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# *Iran and the Changing Military Balance in the Gulf*

**Net Assessment Indicators**

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# Iran and the Changing Military Balance in the Gulf

Three major changes are taking place in the military balance in the Arab/Persian Gulf. This e-book provides a net assessment of the Gulf military balance that focuses on each of these three major shifts:

- First, the changing strategic relationship between Iran and its Arab neighbors and the uncertainty of the future U.S. role in the Gulf.
- Second, Iran's growing capabilities for asymmetric warfare in the Gulf area.
- Third, the impact of Iran's success in creating conventionally-armed, precision guided missiles and more effective air defenses.

The assessment presents a mix of narratives, quantitative data, maps, and charts that addresses each aspect of these changes in the balance. It draws heavily on data provided by the reports from IISS and SIPRI, excerpts from official U.S. government sources like the Defense Intelligence Agency (DIA) and Energy Information Administration (EIA), as well as a wide range of work from other institutions, think tanks, and media sources.

## **Setting the Stage: Clashes, U.S. Commitments, and Comparative Resources**

The analysis in this section of the assessment sets the stage by highlighting the dynamics of the growing crisis in U.S. and Iranian relations that have driven the steadily rising confrontation between Iran, the United States, and the Arab Gulf states. It then highlights a chronology of the patterns in the most recent tensions and clashes between Iran; the United States; and the Arab Gulf states, the current level of U.S. forces in the region, and the growing uncertainties in the U.S. commitments to the Gulf.

The narratives, tables, and charts in this section highlight the impact of the varying different levels of resources available to Iran and its Arab neighbors and the scale of the arms race that has shaped the relative capability of Arab Gulf, Iranian, and U.S. forces over the last decade – including the relative military expenditures and the trends in arms imports of Iran and the Arab Gulf states.

It should be noted that the Coronavirus may have a massive future impact on U.S. deployments and national security expenditures, Arab military expenditures and arms imports, and Iranian military expenditures and domestic military production.

The United States saw a major rise in its future projected national debt and interest payments, driven by civil entitlements expenditures, even before the virus became an issue. It is now considering initial annual economic stimulus and recovery payments of \$2,000 billion to pay for the impact of the virus – costs which compare with Department of Defense (DoD) estimates of the total cost of both the Afghan and Iraq-Syria wars as ranging from \$2,002.4 billion to \$2,106.2 billion between FY2001 and FY2019. The total costs of dealing with the impact of the virus may have a major impact on future U.S. spending in the Gulf region, on power projection forces, on aid, and all the other aspects of national security.

Key national economies affecting the balance were already “failed states” with weak or nearly bankrupt economies even before the virus began to have an impact. These included Iran, Iraq, Lebanon, Syria, and Yemen. There currently is no way to estimate how serious the impact of the virus will be, and the United States has continued to place new economic sanctions on Iran.

As is shown later in this analysis, “oil wealth” is very limited in terms of per capita income in many of the Gulf states and the value of petroleum exports has varied sharply and unpredictably over time. This section warns that the wealthiest petroleum exporter in the Gulf – Kuwait, Qatar, Saudi Arabia, and the UAE – are spending very high percentages of their GNP on national security – some close to 10% – as is at least one less wealthy state: Oman. The virus has already sharply cut demand for petroleum and petroleum prices. Sustained cuts could force even the wealthiest states to reduce national security spending, arms imports, and efforts to reform their economies and cut their dependence on petroleum exports.

These trends are so uncertain, however, that any effort to estimate their impact now involves little more than speculative guesswork. Accordingly, the analysis that follows warns that it is not possible to estimate the detailed impact of the Coronavirus, but they are certain to be all too real.

### **The First Key Shift in the Military Balance: Changes in in the Regional Struggle for Strategic Control and Influence**

The analysis then addresses the first major set of changes in the balance. These include the shifts in political and strategic alignments of the United States, the Arab Gulf states, and Iran – shifts that go far beyond the Gulf. These shifts reflect the impact of three major regional wars, a series of civil wars and political upheavals, and two decades of conflict with extremism and terrorism.

These events have led to changes in the levels of national influence and the military balance that extend from Israel and the Levant to Yemen and the Red Sea. They also reflect the impact of the growing political-military struggle between Iran (and its supporters) and the United States and most Arab Gulf states, a growing emphasis on asymmetric and gray area conflicts, and major changes in the role of outside powers like Russia and Turkey.

These changes have made Iraq the critical strategic prize in the struggle between Iran and the United States and its Arab strategic partners. At the same time, Iran has expanded its influence and its confrontations in the Gulf to now include Yemen, the Indian Ocean, and the Red Sea.

It is also clear from the history of these shifts that Iran, the United States, and its Arab strategic partners have been reluctant to enter into another major war. Instead, it has been gray area operations and hybrid warfare, along with efforts to exert political struggle for influence, that have driven their efforts to gain regional control and influence – and wars of intimidation and lower-levels of violence have become an enduring part of the balance in the Gulf.

### **The Second Key Shift in the Military Balance: The Rising Impact of Iran’s Asymmetric Forces**

The next section of the assessment addresses the second major set of changes in the balance. These are changes driven by Iran’s development of a broad range of asymmetric warfare capabilities in the Gulf and nearby waters in the Gulf of Oman, Indian Ocean, and Red Sea. This part of the assessment not only assesses the naval balance, it looks beyond the current focus on the Al Quds Force to include *all* of the asymmetric elements in the Islamic Revolutionary Guards Corps (IRGC), the regular Iranian military forces or Artesh, and other key parts of the Iranian government. It also uses maps and charts to highlight the fact that these forces are sometimes more important in terms of their ongoing political and strategic impact than their potential impact on large-scale war fighting. This is further illustrated by a graphic and map analysis of the critical strategic importance of the flow of petroleum and liquid natural gas exports.

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The analysis also puts the land force balance in a different perspective. All of the major powers involved have developed large land forces for nations of very different sizes. The geography and broader balance of joint warfare capabilities in the region do, however, sharply limit their capability to carry out sustained offensive and maneuver warfare outside their own territory, and invading and occupying either Iran or Saudi Arabia is scarcely likely to give the “victor” any meaningful form of victory.

### **The Third Key Shift in the Military Balance: The Impact of Iran’s Missile Forces**

The final part of the assessment examines changes in the balance that have been driven by the impact of Iran’s growing missile and rocket warfare capabilities, as well as by the growth of Iran’s wide range of conventional, precision-strike capabilities. It shows how these changes affect the air and land-based air defense balance, as well as how they affect key shifts in the relative balance of Iranian and Gulf Arab deterrent and war fighting capabilities. It shows that these changes are interacting in ways that as of yet remain uncertain and difficult to predict, but that they may significantly improve Iran’s position relative to the U.S. position, that of its Arab strategic partners, and that of their coalition allies. At the same time, it highlights critical weaknesses in the open source literature and data involved that have produced critical gaps in the analysis of Iran’s capabilities.

It shows that these changes are interacting in ways that as of yet remain uncertain and difficult to predict, but that they may significantly improve Iran’s position relative to the U.S. position, that of its Arab strategic partners, and that of their coalition allies. At the same time, it highlights critical weaknesses in the open source literature and data involved that have produced critical gaps in the analysis of Iran’s capabilities.

These gaps are critical because it is not possible to determine the speed with which Iran will be able to carry out decisive attacks on fixed Gulf military targets, petroleum facilities, and critical infrastructure. The same is true of the evolving impact of Iran’s missile forces on the broader air warfare, air/missile defense, and the overall offensive missile and air strike capabilities on both sides. One particularly important issue is the extent to which Iran’s missile forces will be able to suppress operations from U.S. and Arab Gulf airbases.

There is at least the possibility, however, that conventionally armed precision strikes could replace weapons of mass destruction with weapons of mass effectiveness. A major war could do some much damage to the economies of both sides that it would be the economic equivalent of “mutual assured destruction.” If so, as long as all sides control their level of escalation to the levels that best suit their strategic advantage, they will avoid major exchanges of this kind and continue to focus on wars of influence, as well as gray area and hybrid strikes and operations. That said, military history warns that Sarajevo-like scenarios and failure to limit escalation are all too possible.

Finally, the analysis address Iran’s possible progress in developing nuclear warheads, and the lack of reliable data on its chemical and biological warfare programs. It should be stressed that all of the current trends in both Iran’s missile forces and in the speculation regarding its efforts to develop and deploy weapons of mass destruction continue to assume that the Iranian regime will give priority to military forces over civil needs in spite of the steady hardening of U.S. sanctions and the growing impact of the Coronavirus. They also treat U.S. and Arab Gulf reactions as if they could continue to devote the same levels of resources to national security. Neither set of assumptions may prove to be correct.



## The Changing and Uncertain Roles of Key States

This assessment is being distributed at a time when it is clear that the Coronavirus could have a major impact on the regional balance, but that impact is still so unclear that it is not possible to address in any detail. Even if one only examines the major ongoing trends that now affect the Gulf balance, however, it is clear that changes are taking place in virtually every aspect of the political and strategic alignments that shape the balance. The days in which a relatively simple set of divisions between a bloc formed by the United States and the Arab Gulf states, and a smaller bloc of states and non-state actors led by Iran, are long over. The major changes reshaping the Gulf balance include the following trends, many of which have come to favor Iran:

- **Iran’s politics have become steadily more hardline in dealing with its neighbors and the United States.** The recent election of its legislature (majlis) has been manipulated to be dominated by conservatives, by its Islamic Revolutionary Guard (IRGC), and by hardliners around its Supreme Leader, the Ayatollah Ali Khamenei – who has also gained in power. Iran has escalated its level of tension and the level of its clashes with the United States and the Arab Gulf states by using gray area political, asymmetric, and missile/rocket threats and attacks. Iran has also returned to levels of uranium enrichment activity that do not comply with the Joint Comprehensive Plan of Action (JCPOA) with the P5+1 following the U.S. withdrawal from the agreement. At the same time, the future of Iranian regional influence over states like Lebanon, Syria, Iraq, and Yemen – all of which are unstable “failed states” – is uncertain. Iran’s economy is also under severe stress as a result of the return of U.S. sanctions. Iran faces a drop in global demand for petroleum and in petroleum export revenues, and – like all of the states in this analysis – it faces massive challenges of coping with the Coronavirus or COVID-19 virus and its impact on global and national economies.
- **The future role of the United States in the Gulf region and the Middle East and North Africa (MENA) is far less clear than it has been for decades.** There is growing uncertainty over the future role of the United States in the Gulf over the size of its forward deployed forces, its role in Iraq and Syria, and its level of commitment to its Arab strategic partners. So far, the United States has continued to maintain large forward deployed forces and supports its Arab partners with reinforcements whenever a new clash or confrontation in Iraq takes place, but it is making major cuts in the forces it has deployed to meet the threat posed by ISIS. Moreover, the United States has steadily cut its forces in Syria and Iraq and has made it clear that it is examining major force cuts in the MENA region and redeployments to other regions. The United States is actively seeking to reduce the burden posed by its deployments to the Gulf by asking for new Gulf Arab arms purchases and the expansion and modernization of Gulf Arab forces. The future role of the United States in fighting extremist forces, in countering Iranian influence in Iraq, and in defending the Arab Gulf states is far from clear, as is the U.S. strategic focus on ensuring the secure flow of Gulf petroleum exports.
- **Tensions between Arab states now critically limit their collective capability to deter and defend against Iran.** In theory, the forces of **Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and the UAE** are united in a **Gulf Cooperation Council (GCC)** that collectively has far greater resources than Iran and the potential to dominate the Gulf military balance. In practice, a long history of rivalries between these Arab states has left the GCC the hollow shell of a military alliance rather than the predicted reality. The petty feuds of ruling princes have placed critical limits on the GCC’s real world level of interoperability and integration, and their feuds have grown steadily worse since 2011.

- **Qatar has been isolated by several of its neighbors. It has been boycotted since June 2017 by Saudi Arabia, the UAE, Bahrain, and a number of other Arab states over its tolerance of the Moslem Brotherhood and its support of Al Jazeera.** The full list of these boycott states includes Saudi Arabia, the UAE, Bahrain, Jordan, Egypt, Mauritania, the Maldives, Djibouti, Senegal, the Comoros, the Tobruk-based Libyan government, and the Hadi-led Yemeni government. All have severed diplomatic relations with Qatar and banned Qatari airplanes and ships while Saudi Arabia has blocked Qatar's only land crossing. However, only two states – Saudi Arabia and the UAE – cooperated together actively in creating this boycott, in building up some major aspects of their military forces, and in fighting a war in Yemen. Even these two Arab states, however, have their own tensions over issues like how the war in Yemen should be fought and over the role of the UAE outside the Gulf.
- **Bahrain's ruling Sunni minority has become steadily more dependent on Saudi Arabia** for security in dealing with the country's Shi'ite majority and need for outside aid and financial support of its petroleum sector and industries.
- **Relations between Oman and Saudi Arabia are more distant.** The two nations have never been close partners, and Oman has further distanced itself from Saudi Arabia and the UAE while quietly supporting Qatar. Oman has also stood aside from the Saudi-UAE involvement in the Yemen civil war and has been more flexible in dealing with Iran.
- **Kuwait has attempted to be a neutral arbiter and to bring the Arab Gulf states together but is now relatively isolated militarily from the other Gulf states.** It faces some internal tensions within its royal family and also problems with Iranian pressure.
- **Iraq has become the most serious Arab "wild card" in Gulf security.** Its "victory" in breaking up the ISIS "caliphate" has neither eliminated ISIS nor Islamic extremists, has not united the country, and has not prevented the near collapse of the Iraqi government. Tensions between *and within* ethnic factions – like Arabs and Kurds – and sectarian factions – like Sunni and Shi'ite – remain critical sources of tension and conflict. The future alignment of given factions with Iran, the United States, the Arab states, and Turkey are all issues, as is the development and unity of Iraqi military and security forces – and various "popular" militias. Iraq's future alignment with Iran versus the United States and the Arab states and how it affects Iraq's ability to rebuild effective national defenses is one of the most critical single issues shaping the future military balance.
- **Arab states outside the Gulf play a token role in supporting the Arab Gulf states.** For all the talk of broader Arab security and counter-terrorism alliances, key Arab states outside the Gulf – like **Egypt** and **Jordan** – increasingly focus on their own stability and security issues, and they do not play a major role in Gulf security. Arab unity remains a myth, and such alliances are largely pointless and dysfunctional.
- **Syria still remains the scene of what may be a victory by the Assad regime in defeating its largely Sunni opposition, and the regime has made progress in gaining control over Syria's Kurds in the northeast.** Syria's economy has been nearly destroyed by its civil war, and the Assad regime is still dependent on outside support from Iran and groups like the Hezbollah while fighting between Syria and Turkey has added a new dimension to the war. Nevertheless, the Assad regime seems to be the "winner" by both surviving and winning control over most of the populated areas of the country, and it has greatly benefited from Iranian and Russian support. The fight over Idlib has now expanded to include serious clashes between Turkish and Russian-Syrian forces and at present, does remain unsettled – so does the fate of the Kurdish area in the Northeast. However, the combination of Assad and the Russian presence in Syria may make Assad the de facto victor, although some form of enduring tensions and jockeying for power between Assad/Russia and Erdogan seems likely to continue – so does Assad's alignment with Iran and the Hezbollah.

- **Turkey has become another key wild card in the region.** President Erdogan has backed hardline Islamic movements in Idlib and in the fighting against the Assad regime. It also has renewed its conflict against its own Kurds and attempted to keep Syrian Kurds and Iraqi Kurds from becoming supporters of Kurdish separatists in Turkey. It has distanced itself from the United States and NATO, reached out to Russia with very mixed results, and supported Qatar against the Saudi-UAE boycott.
- **Lebanon has virtually self-destructed as a government and economy** although its military forces and the Hezbollah remain largely intact. Iran's future level of influence remains unpredictable.
- **Britain and France also have an uncertain role.** They retain power projection facilities and capabilities in the region and are modernizing some of their power projection forces, but they continue to cut the total size of their forces and their overall power projection capabilities.
- **China and Russia are committed to increasing their strategic role and forward deployment capabilities in the region.** Russia's base in Syria has made it a major player in regional security, and China has acquired its first regional base in Djibouti.

### **The Changing Military Aspects of the Balance**

These shifts have interacted with other important shifts in the regional power. First, they have allowed Iran to become a far more successful competitor than its military resources might indicate. If one examines the balance in abstract terms, the United States and the Arab Gulf states should have a decisive advantage.

**Force Trends in Military Spending, Arms Transfers, and Force Numbers:** The force comparisons throughout this analysis show that the Arab Gulf states alone have more capable conventional forces than Iran, and the tables that follow show that that the Arab Gulf states are spending and modernizing their forces far more quickly than Iran, and that there are many areas where the total forces of the Arab Gulf states now have much larger and more modern total forces. If one examines U.S. force and power projection capabilities, once again, the United States alone has the military strength to dominate the region. The combination of total Arab Gulf and U.S. forces are vastly superior in both quantitative and qualitative terms, and allies like Britain and France can deploy significant additional power projection forces.

The tables comparing Iranian and Arab Gulf military spending and arms imports show that the United States and its Arab strategic partners have vastly outspent Iran in funding force modernization, and it is the Arab Gulf states that have been able to freely import some of the world's most modern weapons and technology. Later tables comparing the balance and quality of weapons show that Iran has fallen far behind in building up its conventional air forces, missile defense forces, and navy.

Iran effectively lost the Iran-Iraq War in a series of major defeats in mid-1988 for many reasons. They included Iraq's near monopoly on the use of poison gas and ballistic missiles, but the key reason was that Iran faced an embargo and other limits on its ability to import modern weapons and technology from 1980 onwards. This embargo began as a result of the fall of the Shah and the Iran hostage crisis. As the tables and charts on military spending and arms transfers show, however, it has continued ever since because of Iran's continuing threats to its Arab neighbors, its development of missile and asymmetric forces, and its ongoing nuclear weapons program.

As the charts and tables in this analysis show, the impact of the original U.S. embargo has now been reinforced by a UN embargo that still sharply limits Iran's access to arms imports and modern military weapons and technology. The also reflect the fact that the impact of the embargo has been compounded by severe U.S. and other economic sanctions, as well as by poor Iranian economic policies.

While Iran has sought to obtain advanced arms and military technology from Russia, China, and North Korea and has also tried to build a major military industrial base, it has experienced only a limited and highly selective success. As a result, Iran's force development has needed to focus on creating a defense in depth capability that mixes a poorly equipped conventional army with irregular reserves like the Basij.

In contrast, the United States and its Arab partners have taken advantage of their superior resources and access to modern weapons and military technology to create a decisive lead in modern airpower and conventional war fighting capability – one that has been greatly reinforced by the re-imposition of U.S. sanctions following the U.S. withdrawal from the JCPOA on May 8, 2018.

Force numbers, however, can also be misleading. As the previous analysis has shown, they do not reflect growing instability in the Gulf region – particularly among the Arab states – or the complex impacts of Iraq's invasion of Iran and the Iran-Iraq War that lasted from 1980 and 1988. The Iraq invasion of Iran did help to create more effective and united Iranian forces, and it also began Iran's long confrontation with its Arab Gulf neighbors and the United States. At the same time, it was a war where Syria's rivalries with Iraq led the elder Assad to make Syria the only Arab state that backed Iran against Iraq. And, the Israeli invasion of Lebanon in 1982 helped to create the Hezbollah and gave Iran influence over another major non-state actor.

Moreover, while Iran faces budget pressures of its own – driven by tax cuts and the steadily rising cost of its civil entitlement programs long before the virus became a global issue – the United States has inadvertently aided Iran by failing to develop anything approaching a cohesive U.S. regional strategy in the Gulf.

The United States has also pushed its Arab strategic partners into spending more on military forces and arms transfers without focusing on what missions really need additional spending or the strain this imposes on their economies and stability. Even the wealthiest Arab Gulf states face challenges in sustaining their current defense spending – which often reach heights of nearly 10% of their GDPs or more.

Their spending on security comes at the cost of spending on their civil needs, dealing with cycles of low petroleum prices and export revenues, and now their ability to deal with the impact of the Coronavirus on both their domestic economies and global demand for petroleum imports. “Oil wealth” already is all too relative – and all too limited – in a region that spends so much on force and that has such a rapidly growing population, needs for diversification, and need to create new jobs.

**Iraq's Shift from Dominant to Weak Military Power:** Iraq has been the exception to these trends in Arab Gulf forces. In spite of its success in the Iran-Iraq War, Iraq survived a major series of blunders and defeats in the Iran-Iraq War after 1982 because it received extensive Western and Russian aid in reorganizing, modernizing, and expanding its military forces, as well as massive aid from its Arab neighbors. As a result, Iraq was able to defeat Iran to the point where Iran was forced to withdraw from its gains in Iraq after 1984 and accept a ceasefire in 1988. It was Iraq that emerged as the dominant military power in the region.

Fortunately for Iran, Iraq lost most of the forces it built up before and during 1980-1988 in the following two wars in 1990-1991 and in 2003. Iraq's military development has since fallen behind most of its major neighbors. The first war was driven by Saddam Hussein's decision to invade Kuwait in 1990, which led to the creation of a joint U.S.-Saudi coalition that decisively defeated Iraq in the First Gulf War in 1990-1991.



The second war had very different causes. Saddam Hussein survived his defeats in 1991, but his efforts to resist outside limits to his power after 1991 and the U.S. fears that he was again developing weapons of mass destruction led to a second major U.S.-led invasion of Iraq in 2003. This round of fighting not only rapidly drove Saddam Hussein from power, it destroyed Iraq as a major military power. Since that time, a series of newly created Iraqi security forces have faced 17 years of fighting against Sunni Islamist extremists, often suffered serious defeats, and have only survived because of U.S. military support – although U.S. failures as an occupying power in Iraq and in developing and supporting Iraqi forces and Iraq’s political and economic development have had a major impact.

Today, Iraq is still a relatively weak military power that is organized more to defend itself against internal extremist threats than outside powers, and where Iraq’s forces include independent militias and armed factions with strong ties to Iran. This near power vacuum in Iraq has made the current U.S.-Iranian struggle for influence in Iraq a critical part of the current military balance, and it is a struggle that is far from clear that the United States and the Arab Gulf states will win. It lacks effective and honest government at every level, and it was nearly bankrupt as CIA, IMF, and World Bank reporting indicated that Iraq had one of the worst managements and structure economies in the region even before the Coronavirus began to have a major impact.

This near power vacuum in Iraq has made the current U.S.-Iranian struggle for influence in Iraq a critical part of the current military balance, and it is a struggle that is far from clear that the United States and the Arab Gulf states will win.

**The Broad Regional Arms Race from 1980 to 2020:** It is Iran that has exploited the many of the fault lines between Arab states with growing success. Iran has steadily exploited the internal divisions in Lebanon and the rise of the Hezbollah since the Israeli invasion in 1982. The political upheavals that began in 2011 divided Syria in ways that have allowed Iran to steadily expand its influence within Syria ever since. Iran has also been able to take advantage of divisions in the Arab Gulf over how to deal with the rise of extremist movements – like the Moslem Brotherhood – and has successfully exploited the civil war in Yemen that began in 2015.

Over the last decade, Iran has shown a steadily improving capability to support and win influence over states – like Syria – and non-state actors – like the Houthi and Hezbollah – by exploiting hybrid and gray area political-military struggles. It has used tools like its Al Quds Forces, arms transfer, “volunteers,” and cash aid to take advantage of the Arab struggle with Islamic extremism and with sectarian divisions between Sunni and Shi’ite as well as ethnic divisions between Arabs and Kurds.

**Asymmetric Warfare Capabilities:** Iran has taken advantage of military developments as well. The most immediate Iranian step forward has been to develop a wide range of affordable asymmetric warfare capabilities and capabilities for gray area and hybrid warfare. These capabilities range from the Al Quds force – and the ability to support foreign military forces and non-state actors – to major naval-missile-air capabilities to threaten and attack naval targets, shipping/tankers, and coastal-fixed targets in the Gulf.

- The Iraqi invasion that began on September 22, 1980 led the Iranian regime to create an Islamic Revolutionary Guards Corps (IRGC) that relied heavily on asymmetric tactics weapons while the U.S. invasion of Iraq in 2003 led Iran to restructure its national defense forces to combine regular military forces, IRGC forces, and popular resistance forces called the Basij, to provide both defense in depth and the ability to carry out sustained irregular warfare against any advancing or occupying power – a critical threat in a large nation of over 80 million people.

- As the charts and tables in this analysis show, Iran’s forces have steadily improved in training, arms, and capability over time. They have given Iran a steadily improving capability to threaten the flow of petroleum out of the Gulf and to intimidate or attack shipping and naval movements throughout the Gulf, at the Strait of Hormuz, and increasingly in the Gulf of Oman, Indian Ocean, Bad el Mandeb, and Red Sea. This poses a critical threat to the export of some 20% of the world’s petroleum supplies and large portions of its natural gas liquids (NGL) exports.

Missile warfare capabilities: Iran is also now in the process of carrying out another critical set of military developments by improving its missile and rocket forces. Ever since the Iran-Iraq War, Iran has developed ballistic missiles in an effort to compensate for its inability to modernize its air force and air defense capabilities and offset its reliance on aging U.S. combat aircraft, export versions of Russian and Chinese aircraft, and decades old designs of surface-to-air missiles. As various sections of this report show, Iran demonstrated in 2019 that it had made major advantages in conventional precision strike capability in both its ballistic missiles and in its air breathing cruise and unmanned combat aerial vehicles when it executed precision strikes on a U.S. occupied base in Iraq and on Saudi oil facilities. It also has shown that it can deploy systems that can be used by allied non-state actors like Hezbollah and the Houthi.

- Iran is now developing and deploying a growing range of land, sea, and air based ballistic and air breathing systems that can attack key military targets – and that some experts feel will become precise enough to destroy key U.S. and Arab military targets and potentially suppress enemy air bases and operations using conventional warheads. It already can achieve a significant degree of “mutually assured destruction” – or MAD – by striking critical fixed civil targets like key petroleum production and export systems, and Iran may be able to do major damage to critical infrastructure like electric power stations, desalination facilities, utilities, and major buildings. It also is deploying these systems on a wide range of launch platforms from ship to mobile land-based TELs to aircraft, and it is shifting to solid fueled or smaller systems that allow high levels of dispersal, mobility, and quick reaction.

**Development of nuclear, chemical, and biological weapons capabilities:** Iran’s efforts to develop weapons of mass destruction have resulted in a more uncertain impact. Reporting by the International Atomic Energy Agency (IAEA) has made it clear that Iran had an ambitious nuclear weapons program that evolved to the “break out” point in terms of weapons design and weapons-grade nuclear enrichment in the period between the first time Iraq began to use chemical weapons as well as long-range missiles against Iran in the Iran-Iraq War and an agreement on a Joint Comprehensive Plan of Action (JCPOA) between Iran and the P5+1 (China France, Germany, Russia, the United Kingdom, and the United States) on July 14, 2015.

- So far, the U.S. unilateral withdrawal from the agreement has not triggered a decisive Iranian return to nuclear weapons development and production, but Iran is able to exploit its progress in becoming a nuclear power to threaten its neighbors and give it potential leverage in deterring an major conventional attacks on Iran if it can actually deploy such weapons without triggering preventive U.S. or Israeli attacks. Moreover, Iran’s efforts to develop a satellite launch capability – and tests of potential launch vehicles on January 15, 2019; February 5, 2019; August 29, 2019; and February 8, 2020 – indicate that it may be developing a future ICBM.

At a different level, Iran remains a declared chemical weapons power and has the technical base to develop advanced biological weapons. The CIA stated that Iran had manufactured and stockpiled blister, blood, and choking agents in combination with the bombs and artillery shells needed to deliver chemical agents in 1997, and the U.S. State Department stated that Iran was in non-compliance with the Chemical Weapons Convention in 2019. The United States has not provided any unclassified details about these programs or updated assessments of Iran’s biological weapons programs – if any. It should be noted, however, that Iran’s steadily improved cruise missile and UCAV programs to give it a greatly improved capability to deliver such weapons through line source area dissemination at long-ranges.

### **Probable Patterns of Deterrence, War Fighting, and Escalation**

The developments do not mean that a U.S.-led coalition could not achieve a decisive military defeat of Iran, or that the United States alone could not destroy much of Iran’s war fighting capability and economy. The Arab Gulf states can also reverse many of these trends if they can achieve some degree of real unity, preserve their alliance with the United States, develop effective missile defenses, and establish forces better tailored to countering Iran’s growing asymmetric warfare capabilities. They certainly have the ability to continue their outspending of Iran, and the balance would also shift in their favor if Iraq emerged as a real strategic partner – or even as a strong enough independent nation to deter and defend against Iranian pressure and influence.

At the same time, the Arab states are currently losing the decisive advantage that their investment in airpower gave them in striking against Iran between roughly the mid-1990s and the present. Iran’s improving missile forces may soon give Iran the advantage and ability to strike critical Arab civil targets and critical Arab and U.S. military point targets. If so, the end result may be a military balance where no country or combination of countries will want to escalate a conflict to the point where it threatens its own economy, endangers its long term ability to export the flow of petroleum out of the Gulf, and forces that country to deal with the cost of a major war.

The term “mutual assured destruction” has a very different meaning in the Gulf than in a superpower nuclear exchange, but high levels of mutual escalation will become increasingly costly to each side. Moreover, any form of “victory” is becoming steadily more unlikely.

As the United States learned in Iraq and Afghanistan, occupying another power – with a different culture and mix of values – is an immensely costly and uncertain affair. This would be as true, however, of any Arab occupation of Iran or an Iranian occupation of an Arab state. It would be particularly true for Iran simply because it has such a large territory, a well-established national identity, over 80 million people – not to mention it would require immense amounts of aid to recover from a truly major war. Iran may be able to transform itself but trying to transform it from the outside seems like a recipe for turning any military victory into strategic defeat.

In short, it is far from clear that the ability to win a major war is the proper measure of the Gulf military balance. The Gulf needs the strategies and tactics of Sun Tzu, not Clausewitz. It is the ability to use military force to influence and intimidate, to support other state and non-state actors, and to carry out gray area operations that reflects the practical limits of how force can best be used in the region. Here, somewhat ironically, Iran’s other military weaknesses have forced it to learn how to best use its power within these limits. In far too many ways, the Arab states have learned to be fractured, divided, and dysfunctional while the United States has focused on counterterrorism, arms sales, and – increasingly so – reducing the burden of deploying to the region.

The one key caution that must be applied to such a “rational bargainer” view of the balance is the “Sarajevo scenario.” The assassination of Archduke Franz Ferdinand demonstrates that one irrational and unpredictable action can create a domino effect to a major conventional war such as the First World War. As such, the possibility of war with Iran is not beyond the realm of possibilities, but as the following analysis suggests, it will be less likely to occur compared to conflicts executed at the gray zone level.

Whatever strategy should be, history is far often the predictor on how to prevent major failures, limit escalation, calculate the risks in war, and operate in meaningful strategic terms. Given the history of war in the Gulf since 1980, it is dangerous to assume that anyone learns from history even if they do bother to remember it.

And yet, events may also change behavior. The Coronavirus may have a massive future impact on how the Gulf state perceive their security challenges and the relative priority of civil versus national security expenditures. It may lead to cuts in U.S. deployments, Arab military expenditures and arms imports, and Iranian military expenditures and domestic military production.

The U.S. saw a major rise in its future projected national debt and interest payments, driven by civil entitlements expenditures, even before the virus became an issue. The total costs of dealing with the impact of the virus may have a major impact on future U.S. spending in the Gulf region, on power projection forces, on aid, and all the other aspects of national security.

Key national economies affecting the balance were already “failed states” with weak or nearly bankrupt economies even before the virus began to have an impact. These included Iran, Iraq, Lebanon, Syria, and Yemen. There currently is no way to estimate how serious the impact of the virus will be, and the U.S. has continued to place new economic sanctions on Iran.

“Oil wealth” is very limited in terms of per capita income in many of the other Gulf states and the value of petroleum exports has varied sharply and unpredictably over time. This section warns that the wealthiest petroleum exporter in the Gulf – Kuwait, Qatar, Saudi Arabia, and the UAE – are spending very high percentages of their GNP on national security – some close to 10% -- as is at least one less wealthy state: Oman.

The virus has already sharply cut demand for petroleum and petroleum prices. Sustained cuts could force even the wealthiest states to reduce national security spending, arms imports, and efforts to reform their economies and cut their dependence on petroleum exports. As has been noted earlier, however, these trends are so uncertain, however, that any effort to estimate their impact now involves little more than speculative guesswork. According, the analysis that follows warns that it is not possible to estimate the detailed impact of the Coronavirus, but they are certain to be all too real.



# A Current Note on the Impact of COVID-19 Virus on Iran

Iran has become an epicenter of the pandemic. As of March 23, 2020, Iran reported that the number of infections from COVID-19 in the previous 24 hours had climbed by 1,411 to 23,049, with 127 deaths, bringing the toll to 1,812. However, the official number is most likely an undercount of the true statistic. Iran announced its first case on February 19, 2020, but only a few days later, satellite and video evidence showed that Iran was digging mass graves, demonstrating that officials had withheld information about the true severity of the virus.

Iranian officials are attempting to control the COVID-19 narrative. On February 21, 2020, Iran held “elections” in which only government-selected officials ran for office. As a result, voter participation was extremely low and jeopardized the legitimacy of the election. The Iranian regime justified the low turnout by blaming the United States for overhyping the COVID-19 severity.

Iran is also conducting a campaign to pressure the United States to ease its sanctions. Iranian Foreign Minister Mohammed Javad Zarif tweeted that the United States was impeding the global fight against the COVID-19 virus by sustaining sanctions. Iranian Supreme Leader Ali Khamenei even suggested that the United States had engineered and created the virus. U.S. Secretary of State Mike Pompeo responded to Khamenei’s comments by condemning Iran for hiding the true scale of the virus in Iran and stealing money intended for medical supplies.

Yet, as Iran is trying to shape the narrative, adequate measures to prevent the further spread of the virus are not being taken by the regime. Unaware of the outbreak, 43% of the population voted in the elections and risked exposure. A recent study by the *Atlantic Council* compiled estimates of the real number of infected people in Iran, and the data produced an average of 2 million Iranians infected with COVID-19.

Without an official and adequate response to the pandemic by the Iranian leaders, the regime risks self-destruction by a rapidly-growing rate of infections and subsequent death of its own population.

This assessment understands that the unpredictable effects of the COVID-19 virus will actively affect the situation in Iran. As such, this analysis is limited to the current conditions up to the date of its publication as the situation in Iran can change while the pandemic progresses.

Source: Liz Sly, “Fresh barbs fly between Tehran and Washington over who’s to blame for coronavirus’s spread in Iran,” *The Washington Post*, March 23, 2020, [https://www.washingtonpost.com/world/middle-east/fresh-barbs-fly-between-tehran-and-washington-over-whos-to-blame-for-coronavirus-spread-in-iran/2020/03/23/e7ea0e4a-6d03-11ea-a156-0048b62cdb51\\_story.html](https://www.washingtonpost.com/world/middle-east/fresh-barbs-fly-between-tehran-and-washington-over-whos-to-blame-for-coronavirus-spread-in-iran/2020/03/23/e7ea0e4a-6d03-11ea-a156-0048b62cdb51_story.html); and Graeme Wood, “Iran has far more Coronavirus cases than it is letting on,” *The Atlantic Council*, March 9, 2020, <https://www.theatlantic.com/ideas/archive/2020/03/irans-coronavirus-problem-lot-worse-it-seems/607663/>

# Table of Contents

The document has the following table of contents:

<b>Iran and the Changing Military Balance in the Gulf</b> .....	<b>2</b>
The Changing and Uncertain Role of Key States .....	5
The Changing Military Aspects of the Balance .....	7
Probable Patterns of Deterrence, War Fighting, and Escalations .....	11
<b>Setting the Stage: Clashes, U.S. Commitments, and Comparative Resources</b> .....	<b>23</b>
Setting the Stage and Defining the Balance .....	24
The Dynamics of the Growing Crisis in U.S. and Iranian relations .....	25
Uncertain Future U.S. Commitments and Current Bases and Forward Deployed Forces .....	38
Comparative Military Budgets and Arms Imports .....	47
<b>The First Key Shift in the Military Balance: Changes in the Regional Struggle for Strategic Control and Influence</b> .....	<b>73</b>
Shifts in the Regional Struggle for Strategic Control and Influence .....	74
Iraq is a Pivotal Focus of the U.S. and Iranian Struggle for Influence in the Gulf .....	86
Yemen, the Indian Ocean, and the Red Sea .....	98
<b>The Second Key Shift in the Military Balance: The Rising Impact of Iran’s Asymmetric Forces</b> .....	<b>105</b>
The Rising Impact of Iran’s Asymmetric Forces .....	106
Naval-Missile-Air Forces and Threats to Shipping and the Gulf .....	116
The Global Importance of the Flow of Persian-Arab Gulf Petroleum Exports .....	143
Limits to the Role of Land Forces .....	151

# Table of Contents

- The Third Key Shift in the Military Balance: The Impact of Iran’s Missile Forces ..... 162**
  - The Changing Impact of Iran’s Missile Forces .....163
  - The Air and Air Defense Side of the Air-Missile Balance ..... 165
  - Comparing the Missile Forces on Each Side ..... 184
  - The Changing Character of Iran’s Missile Forces ..... 203
  - Beyond the Chronology, Examples of Iran’s Recent Use of Missile Forces ..... 204
  - Gulf Vulnerability and the Regional Nature of “Mutually Assured Destruction” (MAD) ..... 217
  - The Need for Missile Defense? ..... 243
  - The Iranian Nuclear, Chemical, and Biological Risk ..... 251
  - The Uncertain Future Evolution of Missile Forces ..... 257
  - Probable Patterns of Deterrence, War Fighting, and Escalation .....261

# Appendix of Charts, Maps, Tables, and Graphics

The document has the following charts, maps, and tables:

Map of Iraqi Military Bases with U.S. Forces Present as of 1/2020 .....	28
Table of Illustrative U.S. Power Projection Weapons Investments FY2020-FY2021-I .....	41
Table of Illustrative U.S. Power Projection Weapons Investments FY2020-FY2021-II .....	42
Map of IISS Summary Estimate of Location of Major U.S. Deployments in the MENA/Gulf Region-2020 .....	43
Map of Iranian and U.S. Military Bases .....	44
Table of Iran and the Arab Gulf Balance in 2020 .....	52
Chart of IISS: Comparative Military and Security Spending in 2020 .....	53
Chart of WMEAT: Mean Annual Value of Military Expenditure from 2007-2017 .....	54
Chart of IISS Comparative Estimates of Military Spending as Percent of GDP, 2020 .....	55
Chart of WMEAT: Mean Annual Value of Military Expenditure as Percent of Mean Annual GDP from 2007-2017 .....	56
Table of SIPRI: Low Iranian Military Spending Relative to Arab States, 2000-2018 .....	57
Chart of DIA Estimate of Iranian Defense Spending .....	58
Table of CRS Gulf Arms Orders and Deliveries: 2008-2015 in millions of current U.S. Dollars .....	59
Chart of CRS: New Conventional Arms Transfer Agreements by Supplier, 2008-2015 .....	60
Chart of SIPRI: Comparative Gulf Arms Imports, 2000-2018 .....	62
Chart of WMEAT: Total Value of Annual Arms Imports in 2017 .....	63
Chart of WMEAT: Trends in the Total Value of Annual Arms Imports from 2007 - 2017 .....	64
Chart of WMEAT: Total Value of Annual Arms Imports in 2007-2011 and 2012-2017 .....	65
Chart of WMEAT: Total Value of Cumulative Arms Transfer Deliveries in 2015-2017 .....	66



# Appendix of Charts, Maps, Tables, and Graphics

Chart of WMEAT: Total Value of Arms Transfer Deliveries from Russia and China between 2015-2017 .....	67
Chart of WMEAT: Value of Arms Transfer Deliveries from Russia and China as Percent of Total Value of Arms Transfer Deliveries between 2015-2017 .....	68
Chart of Economics. War, and Uncertainty in Global Oil Prices: 1950-2020 .....	69
Chart of Sudden Swings and Radical Differences in National “Oil Wealth” .....	70
Chart of Initial Impact of Renewal of Sanctions on Iran .....	71
Chart of Unplanned Petroleum Production Outages .....	72
Map of Broader Gulf Military Theater .....	78
Map of Iranian Partners, Proxies, and Affiliates .....	79
Map of Iran’s Key Areas of Strategic Influence .....	80
Table of Scale of Gulf Region for Military Operations .....	81
Map of A Deeply Divided Arab Gulf Cooperation Council .....	82
Map of Bahrain’s Island Vulnerability Map .....	83
Map of Key Naval Operating Areas In and Near the Gulf .....	84
Map of The Yemen War in February 2020 .....	85
Map of Iraq’s Strategic Position .....	89
Map of Iraq: The Current Struggle for Influence Map .....	90
Map of Iraq’s Continuing Internal Violence .....	91
Map of Iraq’s Vulnerable Energy Facilities .....	92
Map of The Iranian Supported Popular Mobilization Forces Missile War in Iraq .....	96
Map of Yemen and the Gate of Tears .....	100

# Appendix of Charts, Maps, Tables, and Graphics

Map of Yemen: Sectarian Divisions .....	102
Map of Yemen: The Southern Movement .....	103
Map of Deadliest Conflict Events in Yemen .....	104
Chart of Iran’s Complex Security Structure: 2019 .....	107
Chart of DIA Estimate of Iranian Military Command and Control .....	108
Chart of DIA Assessment of Iranian Military Modernization Goals .....	109
Map of Key Naval Operating Areas in the Arabian Peninsula, Gulf of Oman, Indian Ocean, and Red Sea Areas .....	119
Map of Gulf Powers’ Rivalries in the Indian Ocean .....	120
Chart of Iran and the Arab Gulf Naval Forces in 2020 .....	121
Map of Iranian Naval Commands .....	123
Map of Vulnerability of the Strait of Hormuz .....	124
Chart of DIA Estimate of Iranian Naval Forces .....	125
Map of Iranian Coastal Defense Cruise Missile Ranges .....	135
Map of Iranian Port Visits and Naval Exercises .....	137
Map of Iranian Attacks in May-September 2019 .....	138
Map of Iranian Tanker Attacks in 2019 .....	139
Chart of Iranian and Houthi Remotely Controlled Small Craft with Explosive Devices .....	140
Map of Peacetime Tanker and Cargo Ship Traffic in the Gulf Region: 6.3.2020 .....	141
Map of Peacetime Tanker and Cargo Ship Traffic in the Gulf 6.3.2020 .....	142
Chart of The Strategic Importance of Gulf Exports and the Strait of Hormuz .....	146

# Appendix of Charts, Maps, Tables, and Graphics

Chart of Total Oil Flows through the Strait of Hormuz .....	147
Map of The Strategic Importance of the Bab el-Mandeb .....	148
Chart of The Strategic Importance of the SUMED Pipeline and Suez Canal (I) .....	149
Chart of The Strategic Importance of the SUMED Pipeline and Suez Canal (II) .....	150
Map of The Iran-Iraq Border Area .....	154
Map of The Kuwaiti “Hinge ” in Land Combat in the Gulf .....	155
Chart of Comparative Active Armed Forces, Estimated Reserves, and Active Paramilitary Personnel: 2019 .....	156
Chart of Comparative Active Army, National Guard, Royal/Presidential Guard, IRGC Military Personnel (Thousands) 2019 .....	157
Chart of Comparative Total Land Force Major Weapons Holdings in 2019 .....	158
Chart of Comparative Main Battle Tank Strength, 2019 .....	159
Chart of Comparative Other Armored Vehicle Strength by Major Category, 2019 .....	160
Chart of Comparative Artillery Strength by Major Category, 2019 .....	161
Map of Gulf Air Power and Air and Missile Bases .....	167
Chart of Comparative Total Fixed-Wing Combat Aircraft Strength, 2020 .....	168
Chart of Comparative Modern Dual Capable and Strike Combat Aircraft Strength, 2020 .....	169
Chart of Comparative Fighter and Strike-Attack Combat Aircraft Strength by Type .....	170
Map of Iranian Combat Airbases and Major Combat Aircraft .....	173
Map of Iran’s Strategic Depth .....	175
Map of Range of Iran’s Air Power .....	176
Map of Iranian (Pars) View of Gulf Air Threat .....	177

# Appendix of Charts, Maps, Tables, and Graphics

Chart of Major Iranian UAVs .....	178
Map of Gulf SAM Defenses (Pre S-300) .....	179
Map of Iranian Major Bases and SAM Defenses .....	180
Map of DIA Assessment of Iranian Long-Range Land-Based Air Defense Systems and Surface to Air Missiles .....	182
Map of Key Deployment Factors .....	183
Chart of DIA Estimate of Iranian Missile Profiles .....	192
Chart of Iran’s Major Missiles .....	193
Map of Iran's Current Surface-to-Surface Missile Ranges .....	194
Map of DIA Estimate of Iranian Missile Ranges .....	195
Map of Shabab 3M Coverage .....	196
Map of The Missile War in Yemen .....	205
Chart of Houthi Attacks versus Saudi Intercepts .....	206
Chart of Houthi Missile, UAV, and Other Attacks on Saudi Infrastructure: (Jul 2016-Jul 2019) .....	207
Map of Iranian Missile Attacks: 2017-2020 .....	208
Photo of Iranian Precision Strikes on Abqaiq in September 2019 .....	209
Satellite Photo of Attacks on Ain al-Asad Air Base .....	212
Photo of Damaged and destroyed structures at Ain al-Asad Air Base .....	213
Photo of Sample Damage to Ain al-Asad Air Base .....	214
Map of Sample PMF Rocket Damage to PMF Bases in Iraq on March 13, 2020 .....	215
Map of Major Gulf-Wide Petroleum Targets .....	223

# Appendix of Charts, Maps, and Tables

Map of Broader Gulf Energy Infrastructure .....	224
Map of Petroleum Targets Near Strait of Hormuz .....	225
Map of Major Iranian Petroleum Targets .....	226
Photo of Iran’s Kharg Island .....	228
Map of Nationwide Saudi Petroleum Targets .....	229
Photo of Saudi Ras Taura Main Facility .....	230
Photo of Oil Tank Farm at Ras Tanura .....	231
Map of Nationwide UAE Petroleum Targets .....	232
Map of Major Gulf Urban Areas, Seaports and Tanker Terminals .....	233
Chart of Hostage Cities: Gulf Urbanization and Area Targets (2020) .....	234
Map of Gulf Desalination Facilities –2009 .....	235
Map of Gulf Desalination Facilities – 2013 .....	236
Map of Saudi Desalination Plant .....	237
Map of Major Air Facilities Near the Gulf Coasts .....	238
Satellite Photo of Dubai City .....	239
Map of Qatari Energy Facilities .....	240
Photo of Qatari NGL Gas Train .....	241
Map of Regional Nuclear Capabilities .....	242
Chart of THAAD vs. Patriot .....	248
Map of Iran with S400 .....	250

# Appendix of Charts, Maps, and Tables

Chart of Iran Reinvigorated Push for Atomic Fuel .....	254
Map of Remaining Iranian Nuclear Facilities .....	255
Photo of Hard Targets: Iran's Fordow Facility .....	256

# **Setting the Stage: Clashes, U.S. Commitments, and Comparative Resources**

## Setting the Stage and Defining the Balance

This analysis is far more of a net assessment of past and current trends than a count of the military balance. A military balance is a comparison of forces that implies relative war fighting capability, but a net assessment examines probable actual capability in a given scenario. This is a critical distinction in the case of the Gulf because the United States can deploy so much power relative to Iran and the Arab Gulf states. Put differently, there is only an Iranian-Arab Gulf balance if the United States does not participate in a conflict – a contingency that still seems unlikely in any serious crisis or conflict.

At the same time, other outside powers – local powers – like Israel, Jordan and Egypt – or more remote powers – like China, Russia, and Turkey – can also intervene. At the same time, as the current war in Yemen shows, some Arab Gulf states may fight in a given contingency and others may stand aside.

The chronology at the start of this section focuses on actual events and “scenarios” to show the complex interactions between politics, threats, and the actual use of forces – as well as the number of players that can become involved on any given date.

The charts and tables that follow highlight the separate capabilities of currently deployed U.S. forces. The data in this section are highly unstable. They reflect important shifts following the successful effort to break up the ISIS “caliphate,” but they also reflect the unpredictable shifts in the U.S. effort to both cut U.S. forces or reinforce them – driven by day-to-day events.

The final part of this effort to set the stage shows the resources and spending that shape the current capabilities of Iranian and Arab Gulf forces by country. Later tables and charts show the size and sometimes the qualitative capability of the personnel and major weapons.

It should be stressed, however, that such spending and arms transfers are only rough indicators of the resources that might now be used in any given contingency. Moreover, they do not reflect the differences in the capability of individual countries and their ability to fight limited wars and use their military forces to intimidate and influence their neighbors.

That said, these defense spending and arms transfers analyses still highlight the immense gap between Iran’s limited ability to fund its defense budget and import weapons and military technology compared to the capability of the Arab Gulf states. This is a gap that clearly has been compounded by the re-imposition of U.S. sanctions on Iran in 2018 but is now complicated by the later drop in world petroleum prices and the economic impact of the Coronavirus.

Once again, such uncertainties illustrate the differences by source in even the best the unclassified literature now available and the inability to determine the level of uncertainty in most data – problems that affect virtually every aspect of this analysis and uncertainties now highlighted by the inability to determine how the Coronavirus will or will not reshape future behavior.



# **The Dynamics of the Growing Crisis in U.S. and Iranian relations**

# Using a Chronology to Illustrate Real World Military Dynamics

This section shows the dynamics of the confrontations and clashes between Iran and the United States using a detailed chronology that focuses on 2019 and covers a critical year in both the political and military confrontations between the United States and Iran, as well as their resulting impact on the Arab Gulf states.

Complex as this chronology is, it still oversimplifies the current situation in the Gulf. It does not highlight the war in Yemen, the regional arms race, or the full spectrum of threats and conflict between the Arab states and Iran. It does, however, still show the sheer complexity of the interactions between politics and diplomacy, threats, and the actual use of radically different kinds of force. It highlights the Iranian, U.S., and Arab reluctance to escalate to major attacks; their use of outside powers and forces; their reliance on “gray area” operations that mix civil and military actions, and their efforts to control the resulting level of escalation.

It also highlights the degree to which Iran relies on a wide spectrum of military options ranging from the low-level support of non-state actors like the Iraqi Popular Mobilization Forces (PMF) to the use of long-range ballistic missiles, as well as the wide range of different kinds of forces in the Gulf.

It serves as a practical warning to military specialists that no one element of Iran’s forces – or its use of force – can dominate its behavior or even the U.S. and Arab response – regardless of whether the event involves the train and assist activities of the Al Quds Force, naval attacks by Iranian Navy and IRGC-Navy forces, or the IRGC’s long range missile forces. Similarly, the U.S. and Arab response show equal diversity, and each confrontation and actual deployment of forces takes on a different and unpredictable character.

The history behind this chronology also needs careful consideration. It long predates the fall of the Shah in 1979. Major tensions existed between Iran and the Arab Gulf states even under the Shah – such as the time when the Shah took advantage of Britain’s departure from the Gulf to seize Arab territory in Abu Musa and the Tunbs while even attempting to claim Bahrain.

Iran and the Arab Gulf states have been direct rivals ever since the fall of the Shah in 1979-1980, and the United States has confronted Iran ever since 1980 as a result of the Iranian hostage crisis and the threat Iran began to pose to a critical part of the world’s petroleum exports.

The United States has also seen Iran as a threat ever since that hostage crisis. It fought a brief “tanker war” with Iran in 1987-1988. Iran has since played a major role in terrorist attacks against U.S. forces in Lebanon and Saudi Arabia, and the United States has clashed regularly with Iranian supported and supplied Iraqi Popular Mobilization Forces (PMF) in Iraq ever since 2005. Like the Arab states, the United States has sometimes come to the edge of a serious conflict with Iran, but in each such case, one or both sides chose to back away from a major conflict.

# Using a Chronology to Illustrate Real World Military Dynamics

The key issue for the future is whether this process will continue, evolve to some form of meaningful negotiate resolution, or escalate to far more serious forms of conflict – either deliberately or unintentionally. Both sides have serious reasons to back away from such escalation. Iran would at best suffer massive damage. As the later portions of this analysis will show, both sides face the fact that a major war would inflict immense damage to all parties.

The fighting could damage fragile petroleum-driven economies in ways that have not been impacted upon them for a decade or more, ruin the prospects for stable growth, and have a major impact on the global economy and that of the United States. It is possible that even major strikes against petroleum facilities and infrastructure could be contained or limited, but there is still a serious risk that a conflict could escalate to become the Gulf equivalent of “mutual assured destruction,” or MAD.

More broadly, as the United States has learned the hard way from its experience in Afghanistan and Iraq, “winning” wars militarily in no way guarantees winning a stable peace. Real world military history is far more equivalent to the history of miscalculation and escalation than strategy and restraint. U.S sanctions may push Iran to the edge, or Iran may feel its growing asymmetric and missile capabilities are giving it a window of opportunity. As the following chronology shows, the sheer complexity of the current politico-military struggle between both sides continues to create new risks of more serious forms of war.

# Iraqi Military Bases with U.S. Forces Present as of 1/2020

Source: Nafiseh Kohnavard "Iraq base attack: US in retaliatory strikes on Iran-backed fighters," BBC, <https://www.bbc.com/news/world-middle-east-51865489>.



# Chronology of U.S-Iranian Confrontations and Attacks: 2019 - I

**May 8, 2018:** Trump announces that the U.S. is withdrawing from the nuclear deal signed by his predecessor, President Barack Obama, which had provided sanctions relief in exchange for restrictions on Iran's nuclear program and stepped-up U.N. monitoring. Over the next several months, the U.S. ratchets up sanctions, exacerbating an economic crisis in Iran.

**May 21, 2018:** US Secretary of State Mike Pompeo issues 12 demands that Iran make sweeping changes – from dropping its nuclear program to pulling out of the Syrian war – or face severe economic sanctions. They are rejected by Tehran.

**August 7, 2018:** U.S. reimposes the first round of sanctions on Iran, that had been lifted as part of the nuclear deal. They prohibit trade with a number of business sectors - from aviation and carpets to pistachios and gold.

**September, 2018:** A rocket attack takes place on the U.S. Consulate in Basra. The U.S. blames Iran and Iranian-backed Shiite forces in Iraq. Soon after, the U.S. closes its Basra consulate.

**Nov. 5, 2018:** U.S. imposes tough sanctions on Iran's oil industry, this time specifically targeting the key oil and banking sectors – the lifeline of its economy. Secretary of State Mike Pompeo emphasizes list of 12 demands it must meet for sanctions relief. Iran rejects the wide-ranging demands, which include ending its support for armed groups in the region, withdrawing from the Syrian civil war, and halting its ballistic missile program.

**April 8, 2019:** Trump announces that the elite Islamic Revolutionary Guard Corps (IRGC) is designated as a foreign terrorist organization. It is the first time Washington has formally labelled another country's military a "terrorist group." The designation imposes wide-ranging additional economic and travel sanctions on the IRGC that go into effect on **April 15**.

**May 5, 2019:** Then National Security Adviser John Bolton announces the U.S. is sending an aircraft carrier strike group, Patriot batteries, and B-52 bombers to the Middle East “in response to a number of troubling and escalatory indications and warnings...The United States is not seeking war with the Iranian regime, but we are fully prepared to respond to any attack, whether by proxy, the Islamic Revolutionary Guard Corps or regular Iranian forces.”

**May 8, 2019:** Iran says it is preparing to increase uranium enrichment and heavy water production as part of its decision to stop certain commitments made under the nuclear deal. President Rouhani states that, “Starting today, Iran does not keep its enriched uranium and produced heavy water limited. The EU/E3 2 will face Iran's further actions if they cannot fulfill their obligations within the next 60 days and secure Iran's interests. “Win-Win conditions will be accepted.” Trump announces new measures against Iran's steel and mining sectors.

**May 12, 2019:** The United Arab Emirates says four commercial ships off its eastern coast and Fujairah “were subjected to sabotage operations.” Trump warns that if Tehran does “anything” in the form of an attack, “they will suffer greatly.” Officials identify the damaged ships as the Saudi oil tankers Al-Marzoqah and Amjad, the Norwegian tanker Andrea Victory, and a UAE bunkering barge, the A Michel. Fujairah is the only Emirati terminal located on the Arabian Sea, bypassing the Strait of Hormuz through which most Gulf oil exports pass.

# Chronology of U.S-Iranian Confrontations and Attacks: 2019 - II

**May 14, 2019:** Yemen's Houthi rebels, fighting with a Saudi-UAE-led military coalition, launch drone attacks on Saudi Arabia on **May 14**, striking a major oil pipeline and taking it out of service. Two days later, Riyadh, a key U.S. ally, blames Iran for the attack. The U.S. and Saudi Arabia accuse Iran of arming the Houthis, but Tehran denies the claim.

**May 19, 2019:** A rocket lands near the U.S. embassy in Baghdad. No one is harmed. President Trump tweets: "If Iran wants to fight, that will be the official end of Iran. Never threaten the United States again!"

**May 27, 2019:** After meeting with Japanese Prime Minister Shinzo Abe, who offers to broker dialogue between Washington and Tehran, Trump says the U.S. is not looking for regime change in Iran.

**June 12, 2019:** Abe lands in Tehran seeking to mediate between the U.S. and Iran. The next day, he meets Iran's Supreme Leader Khamenei who states: "I don't consider Trump as a person worthy of exchanging messages with. I have no response for him and will not answer him."

**June 13, 2019:** A Norwegian and a Japanese oil tanker in the Gulf of Oman near the Strait of Hormuz are attacked with limpet mines in an Iranian attack that leaves one ablaze and adrift as 44 sailors are evacuated by Iran from both vessels and the U.S. Navy rushes to assist. America later blames Iran for the attack, something Tehran denies. Iran speaks initially of "accidents" and Zarif calls the tanker "attacks" during Abe's visit "suspicious."

**June 18, 2019:** A rocket attack takes place on an operations headquarters of several global major oil companies, including American oil firm, ExxonMobil, near the Iraqi city of Basra. The attack occurs near the Iranian border, is largely by Shiite, and is dominated by pro-Iranian Shiite Iraqi militias. Three people were injured in the attack.

**June 20, 2019:** Iran's Revolutionary Guard shoots down a U.S. Global Hawk military surveillance drone one source indicates cost some \$210 million. The US says it was flying above international waters. Iran says the drone was flying in Iranian airspace. Trump announces that he called off a military strike on Iran the night before, which was intended as retaliation against Tehran for the downing of the unmanned U.S. drone. He states he did so 10 minutes before the planned attack because of potential casualties, saying it was "not proportionate to shooting down an unmanned drone." Trump also states a U.S. strike could have killed 150 people, and that he is open to talks with Tehran.

However, one source states there are reports that the United States Cyber Command (CyberCom) did launch cyber-attacks on Iranian spy groups and cyberwarfare units. For the past several months it was reported that Iranian cyber-attacks on U.S. government and industrial targets by Iranian hackers were increasing.

**June 22, 2019:** Iran warns that it is ready to respond firmly to any US threat against it. "We will not allow any violation against Iran's borders. Iran will firmly confront any aggression or threat by America," Abbas Mousavi, foreign ministry spokesman, says. On the same day, Iran orders the execution of a "defense ministry contractor" convicted of spying for the U.S. Central Intelligence Agency, while the U.S. warns it will impose fresh sanctions, adding that military action was still "on the table."

# Chronology of U.S-Iranian Confrontations and Attacks: 2019 - III

**June 24-25, 2019: June 25,** Trump signs an order targeting Khamenei, Iran's supreme leader, and associates with additional financial sanctions. "Sanctions imposed through the executive order ... will deny the supreme leader and the supreme leader's office, and those closely affiliated with him and the office, access to key financial resources and support," the U.S. president says. Zarif, the Iranian foreign minister, responds by tweeting that "hawkish politicians close to Trump were thirsty for war rather than diplomacy," and that Trump is "100% right that the US military has no business in the Persian Gulf. Removal of its forces is fully in line with interests of US and the world. But it's now clear that the B Team is not concerned with US interests—they despise diplomacy, and thirst for war."

**June 29, 2019:** The U.S. Air Forces Central Command says in a statement that F-22 Raptor stealth fighters are being deployed in the region "to defend American forces and interests."

**July 1, 2019:** Iran follows through on its threat to exceed the limit set by the nuclear deal on its stockpile of low-enriched uranium, which is used for civilian applications and not for nuclear weapons. The United Nations' atomic watchdog confirms that its inspectors had verified the 300kg cap had been breached. Zarif says the accumulation of more enriched uranium than permitted under the deal is not a violation of the pact. On **July 8**, Iran states it has exceeded the cap on Uranium enrichment set in the nuclear deal, the second time in one week that it acts on its statements it will reduce compliance with the accord.

**July 4, 2019:** British Royal Marines, police and customs agents in Gibraltar seize a supertanker accused of carrying Iranian crude oil to Syria in breach of European Union sanctions. The *Grace I* vessel is boarded when it slowed down in a designated area used by shipping agencies to ferry goods to ships in the UK territory along Spain's southern coast. On **July 12**, police in Gibraltar arrest the captain and chief officer of the Iranian tanker.

**July 11, 2019:** Iranian Revolutionary Guard Corps (IRGC) is accused of harassing a British merchant vessel in the Persian Gulf. The presence of a British warship in the area is believed to have saved the ship from a possible takeover or attack.

**July 13, 2019:** A Panamanian-flagged oil tanker *Riah*, which is based in the UAE, disappeared from ship tracking systems after approaching Iranian waters. It is believed to have been seized by the IRGC.

**July 15, 2019:** Saudi forces find a remote-controlled ship, called a Blowfish, filled with explosives in the Red Sea, in the path of the oncoming UK destroyer, HMS Duncan. The Duncan was heading to the Gulf to reinforce the British naval presence there in the ongoing Iran crisis. It is believed that the "bomb boat" was placed there by the Yemeni Houthi Shiite group that is engaged in a civil war in Yemen. The Houthis are long-time allies of Iran.

**July 19, 2019:** The IRGC seizes a British oil tanker in the Strait of Hormuz. The *Stena Impero* tanker "was confiscated by the Revolutionary Guards at the request of Hormozgan Ports and Maritime Organization when passing through the Strait of Hormuz, for failing to respect international maritime rules."

**July 25, 2019:** The British government announces its warships will escort all British-flagged vessels through the Strait of Hormuz, a change in policy that takes place amid rising tensions in the Gulf. The HMS Montrose, a British frigate, is assigned to escort ships: "Freedom of navigation is crucial for the global trading system and world economy, and we will do all we can to defend it."

# Chronology of U.S-Iranian Confrontations and Attacks: 2019 - IV

**August 1, 2019:** U.S. imposes sanctions on Zarif . “Javad Zarif implements the reckless agenda of Iran's Supreme Leader, and is the regime's primary spokesperson around the world,” Treasury Secretary Steven Mnuchin says in a statement. Zarif tweets this indicated Washington saw him as a “threat.”

**August 15, 2019:** Gibraltar's Supreme Court rules that the *Grace I* is free to sail, just hours after the U.S. makes a last-minute attempt to keep the vessel under detention.

**August 23, 2019:** Rouhani announced deployment of a new Iranian designed and made air-defense system into the country's missile defense network at an unveiling ceremony in Tehran. Iran had begun production after the purchase of Russia's S-300 system was temporarily suspended in 2010 due to international sanctions that have barred it from importing offensive and heavy weapons. Rouhani claims the mobile surface-to-air system was “better than S-300 and close to [more advanced] S-400.”

**August 26, 2019:** Zarif holds talks with President Emmanuel Macron of France at the sidelines of a G7 summit following a surprise invite to the gathering in Biarritz. Zarif says that, “Iran’s active diplomacy in pursuit of constructive engagement continues. (The) Road ahead is difficult. But worth trying.”

**August 30, 2019:** The UN’s IAEA reported that Iran is still increasing its stock of enriched uranium and refining it to a greater purity than allowed in the agreement.

**September 3, 2019:** The U.S. sanctions Iran’s agency and two research organizations for being used to advance Tehran's ballistic missile program. The measures imposed by the US Department of the Treasury target the Iran Space Agency, Iran Space Research Center and the Astronautics Research Institute. “The United States will not allow Iran to use its space launch program as cover to advance its ballistic missile programs.”

**September 4, 2019:** U.S. blacklists an oil shipping network that Washington alleges is directed by the IRGC.

**September 7, 2019:** Iran begins injecting gas into its advanced centrifuges to increase its stockpile of enriched uranium and warns time is running out for the nuclear deal's other signatories to save the landmark pact. An Iranian spokesman, Behrouz Kalahandi, states Iran's Atomic Energy Organization has started up advanced centrifuges at the enrichment facility in Natanz, the third step by Tehran in scaling back its commitments under the crumbling pact following Washington’s withdrawal.

**September 14, 2019:** Drone attacks take place on two major Saudi Aramco oil facilities: Abqaiq – the world's largest oil processing plant – and the Khurais oilfield, in eastern Saudi Arabia. The pre-dawn strikes knock out more than half of crude output from the world's top exporter. Saudi oil facilities temporarily cuts off half the oil supplies of the world’s largest producer – about 5% of the world supply of oil – causing a spike in prices. Iran denies involvement, while the Iran-backed Houthi rebels in Yemen claim responsibility. The U.S. says Iran carried out the attack directly, calling it an “act of war” against Saudi Arabia.

**October 2019:** Massive anti-government protests erupt in Lebanon and Iraq. While the protests are primarily driven by economic grievances, they target governments that are closely allied to Iran. In Iraq, protesters openly decry Tehran’s influence and attack Iranian diplomatic facilities.

**November 2019:** Protests break out in some 100 cities and towns in Iran after authorities raise the price of gasoline. The scale of the protests and the resulting crackdown are hard to determine as authorities shut down the internet for several days. Amnesty International later estimates that more than 300 people were killed.



# Chronology of U.S-Iranian Confrontations and Attacks: 2019 - V

**November 9, 2019:** Iranian-backed Shia militias fired rockets at Q-West Air Base located in North-West Iraq.

**December 3, 2019:** Shiite militias launch a rocket attack against Al Asad Air Base.

**December 5, 2019:** Shiite militias fire rockets against Balad Air Base.

**December 9, 2019:** Shiite militia groups fire rockets at the Baghdad Diplomatic Support Center located on the Baghdad International Airport.

**December 27, 2019:** A U.S. contractor is killed and four American and two Iraqi troops are wounded in a rocket attack on the K1 base in northern Iraq, near the city of Kirkuk. The attack is made by Kataeb Hezbollah, one of several Iran-backed militias operating in Iraq.

**December 29, 2019:** In response, U.S. airstrikes hit Kataeb Hezbollah positions in three bases in Iraq and two in Syria, killing at least 25 fighters and bringing vows of revenge. Iraq calls the strikes a “flagrant violation” of its sovereignty.

**December 31, 2019:** Hundreds of Iran-backed Iraqi Shiite militiamen and their supporters force their way through an outer barrier of the U.S. Embassy in Baghdad and hold two days of violent protests in which they smash windows, set fires and hurl rocks over the inner walls. U.S. Marines guarding the facility respond with tear gas. An American contractor is killed. 100 Marines deploy from Kuwait to the Baghdad Embassy to bolster security. A battalion of U.S. troops from the 82nd Airborne deploy from North Carolina to the Middle East.

**January 2, 2020:** U.S. Secretary of Defense Esper states, “To Iran and its proxy militias: we will not accept continued attacks against our personnel & forces in the region. Attacks against us will be met with responses in the time, manner, & place of our choosing. We urge the Iranian regime to end malign activities.

- Also on **January 2**, sources report the U.S. launched an unsuccessful attack on an important Quds Force leader in Yemen. Abdul Reza Shahlai is a Yemen-based financial backer and high-ranking member of Iran’s Quds Force. The covert U.S. attack was not revealed until several days later.

**January 3, 2020:** A U.S. airstrike near Baghdad’s international airport kills Gen. Qassem Soleimani, the leader of Iran’s elite Quds Force and the mastermind of its regional military interventions. Abu Mahdi al-Muhandis, leader of the Kata’ib Hezbollah (KH) and a senior commander of Iran-backed militias in Iraq is also killed in the strike. Iran vows “harsh retaliation.” Trump says he ordered the targeted killing to prevent a major attack. Congressional leaders and close U.S. allies say they were not consulted on the strike, which many fear could ignite a war.

**January 4, 2020:** Two rockets hit Balad Air Bases near Baghdad. Two mortars also hit Baghdad’s Green zone. These attacks do not result in no casualties or damage.

**January 5, 2020:** Iran announces it will no longer abide by the nuclear deal and Iraq’s parliament holds a non-binding vote calling for the expulsion of all U.S. forces. Some 5,200 American troops are then based in Iraq to help prevent a resurgence of the Islamic State group. Trump vows to impose sanctions on Iraq if it expels U.S. troops.

- The anti-ISIS Coalition suspends operations against ISIS and halts training programs with the Iraqi military.

# Chronology of U.S-Iranian Confrontations and Attacks: 2019 - VI

**January 6, 2020:** Iran attacks U.S facilities in two bases in Iraq in Erbil and Assad, housing U.S. forces. The U.S. states some 5,000 U.S. troops are still present in country. The Ayn al-Asad air base handles air operations. Erbil houses a U.S. Special Forces operational hub. The Iranian missile attack came on a day that began with thousands of Iranians taking to the streets for General Suleimani's funeral procession, a public mourning marred by a deadly stampede, as millions of people flooded the streets of Kerman to witness the procession. The IRGC announced that, "The fierce revenge by the Revolutionary Guards has begun." Iraqi military officials said that Iran had fired 22 missiles, and U.S. officials state that "It is clear that these missiles were launched from Iran." Zarif tweets that "Iran took & concluded proportionate measures in self-defense... We do not seek escalation or war but will defend ourselves against any aggression." The head of Iran's emergency medical services claims 56 people had died and 213 were injured, the broadcaster IRIB reported on its website. No soldiers are directly killed or suffer fragmentation wounds, but some 109 soldiers suffer blast and concussion damage and at least 34 suffer Traumatic Brain Injury (TBI).

Descriptions of the attack differ. A spokesman for USCENTCOM said a total of 15 missiles were fired, with ten hitting the Ayn Al Asad airbase, one hitting the Erbil base, and four missiles failing to reach their target. U.S. Secretary of Defense, Mark Esper, later gave a similar estimate, saying 16 short-range missiles had been launched from three locations within Iran, with 11 striking Ayn al-Asad (instead of the prior estimate of 10) Other sources reported that two targeted Erbil: one was said to have hit Erbil International Airport and did not explode, the other landed about 20 miles west of Erbil.

According to the Iraqi military, 22 missiles were fired between 1:45 a.m. and 2:15 a.m. local, 17 toward Ayn Al Asad base and five at Erbil. According to U.S. troops at Al Asad, the first missiles landed at 1:34 a.m. and were followed by three more volleys, spaced out by more than 15 minutes each. The attack was over by 4:00 a.m. Iran's Tasnim News Agency reported that the IRGC used Fateh 313 and Quiam ballistic missiles in the attack and claimed that U.S. forces failed to intercept them because they were equipped with cluster warheads (a claim without any technical credibility).

Work by Uzi Rubin indicates that the Quiam 2 (700 km range) and Fatah 313 (500 km range) missiles were used, with 11 missiles assigned to Al Asad, nine of which impacted, and 6 of which struck close to their probable target. Five were fired at Erbil – only one of which came close. While Iran may have given Iraq some warning, the missiles were clearly intended to high populated targets, and the attacks showed that Iranian missiles had the necessary precision. Their problem was reliability.

**That same day, an IRGC air defense unit, fearing a U.S. attack in response,** used a light surface-to-air missile to shoot down a B-737-800, which crashed shortly after takeoff from Tehran Imam International Airport, killing all 176 passengers on board. These included at least 130 Iranians. Iranian officials initially lied and said the plane crashed due to technical failures unrelated to the missile attacks. However, they refused to allow Boeing or U.S. aviation officials access to the aircraft black boxes On 11 January, after *The New York Times* obtained and published a video showing the moment the aircraft was actually hit by an Iranian missile Iran admitted to having shot down the plane due to human error, claiming their military mistook the plane for a "hostile target". The fact the government had lied led to a wave of anti-government protests against the perceived cover-up, with some demanding that Khamenei resign.

# Chronology of U.S-Iranian Confrontations and Attacks: 2019 - VII

**January 8, 2020:** A U.S. drone strike kills the Islamic Revolutionary Guards Corps (IRGC) Quds Force Commander Qassem Soleimani and Popular Mobilization Forces Deputy Commander Abu Mahdi al-Muhandis outside the Baghdad International Airport. According to President Trump, “Last week, we took decisive action to stop a ruthless terrorist from threatening American lives. At my direction, the United States military eliminated the world’s top terrorist, Qasem Soleimani. As the head of the Quds Force, Soleimani was personally responsible for some of the absolutely worst atrocities.”

- **That same day as a response to Soleimani’s death,** the IRGC Aerospace Force launches 16 short-range ballistic missiles at the Ain Al Asad Airbase in Anbar and towards the U.S. consulate and Hariri Air Base in Arbil. The attack resulted in zero fatalities but caused 11 traumatic brain injuries among the U.S. forces stationed at Ain Al Asad Airbase.
- After President Trump’s speech on **January 8** when he announces “Iran appears to be standing down, which is a good thing for all parties concerned and a very good thing for the world. No American or Iraqi lives were lost because of the precautions taken, the dispersal of forces, and an early warning system that worked very well,” Iran also launches two rockets toward Baghdad’s Green Zone, and one rocket lands within 100 meters of the U.S. embassy.

**January 9, 2020:** One rocket lands near Balad Air Base, which hosts U.S. troops and equipment. No casualties or damage resulted from the attack, and no group claimed responsibility.

**January 12, 2020:** Eight Katyusha rockets target Balad Air Base and injure four Iraqi soldiers. No group claimed responsibility for this attack.

**January 14, 2020:** Five Katyusha rockets land near Camp Taji. No casualties or damage resulted from the attack, and no group claimed responsibility.

**January 20, 2020:** Three rockets fired from the Zafaraniyah neighborhood located just outside of Baghdad target the U.S. Embassy inside Baghdad’s Green Zone, and two of the rockets land within the Embassy’s outermost fence. The attack occurred during ongoing protests in Iraq.

**January 26, 2020:** Three mortars target the U.S. Embassy in Baghdad. One of the mortars strikes the Embassy cafeteria during dinner and wounds at least one American. The U.S. State Department commented, "We view last night's attack on the Embassy as an attempt to distract Iraqi and international attention away from the brutal suppression of peaceful Iraqi protesters by Iran and its proxies."

**February 13, 2020:** A rocket fired from a Christian cemetery north of K1 military base and hits an open area on the base.

**February 16, 2020:** Three rockets fired toward the U.S. Embassy land outside the complex but cause no damage.

# Chronology of U.S-Iranian Confrontations and Attacks: 2019 - VIII

**March 2, 2020:** Two rockets fired from the Zayouna neighborhood land near the U.S. Embassy in Baghdad's Green Zone but do not cause any damage.

**March 5, 2020:** Three rockets fired from the Zayouna neighborhood land near the U.S. Embassy in Baghdad's Green Zone but do not cause any damage.

**March 11-12, 2020:** Two U.S. service members and a troop from a coalition partner nation were killed in an attack on Iraq's Camp Taiji Base using unguided 107mm "Katusha" artillery rockets, evidently fired improvised truck-mounted launchers. About 30 rockets were fired at Taiji, a major base roughly 15 miles north of Baghdad. 12 to 18 rockets landed on the base, wounding 14 people, including five seriously, and causing some structural damage. A Defense Department official said that there were also about a dozen people were injured. Britain's Ministry of Defense on Thursday confirmed the death of Lance Corporal Brodie Gillon, 26, a Reserve with the Scottish and North Irish Yeomanry. U.S. intelligence analysts believe that the Kataib Hezbollah militia was involved. At this point, the command reports that more than 109 Katyusha rockets had been launched at locations housing US troops in Iraq since October 2019, and 13 sets of attacks have been made on U.S. occupied bases in 2019.

This militia's strategy often involves a mobile launcher, such as a truck, parked within several miles of one of several American bases and armed with a timed trigger set to fire in around 30 minutes. The timer gives the crew ample time to flee before the rockets launch. Articles indicate that the U.S. bases lack C-RAM defenses against such attacks, and other defense systems like Patriot missiles, which had previously been deployed to Afghanistan. The were most likely Iranian Fajr-1 rockets, which are copies of a Chinese rocket called the Type 63. At just over 4 inches in diameter and 4 feet long, the Fajr-1 weighs roughly 40 pounds and carries a 3- to 5-pound high-explosive warhead to a maximum range of about 5 miles. They do not need to be fired from special launchers; instead, they can be fired from a simple dirt ramp or a pile of rocks with nearly as much accuracy as they could from a purpose-built launcher.

**March 12-13, 2020:** U.S. launches retaliatory strikes targeting an Iranian-backed Shia militia group believed responsible for a rocket attack that killed and wounded American and British troops. The U.S. strikes five Katib Hezbollah bases and weapons facilities inside Iraq to "significantly degrade their ability to conduct future attacks against Operation Inherent Resolve (OIR) coalition forces." These facilities stored weapons used to target U.S. and coalition troops, according to the Pentagon. The Defense Department said Thursday's "defensive" strikes were "proportional" and a "direct response" to the threat of the Iranian backed groups operating in Iraq." The United States will not tolerate attacks against our people, our interests, or our allies," Secretary of Defense Mark Esper said in the release. "As we have demonstrated in recent months, we will take any action necessary to protect our forces in Iraq and the region." The strikes were a partnered operation with the British, a U.S. official said.

**March 14, 2020:** Camp Taji was attacked by a barrage of 33 rockets fired from concealed launch pads hidden in an industrial garage in the Abu Adam area located north of Baghdad. The attack wounded three U.S. soldiers and two Iraqi Air defense personnel. Usbat al-Thaireen, a new Shi'ite militia calling for the departure of U.S. forces from Iraq, claimed responsibility.

# Chronology of U.S-Iranian Confrontations and Attacks: 2019 - IX

**March 16, 2020:** Basmaya base, which houses the U.S.-led Coalition against ISIS and NATO forces, was attacked by two rockets launched from an agricultural area in Nahrawan. Usbat al-Thaireen claimed responsibility.

**March 17, 2020:** Two rockets launch from Baghdad Arab Jabur neighborhood toward the Jadriyah neighborhood. One rocket lands in the Tigris River, and the other hits an abandoned building just across the Tigris River from the U.S. Embassy.

**March 18, 2020:** The U.S. State Department on Wednesday announced new sanctions on Iran after the renewed rocket attacks by Iran-backed militias.

Secretary Pompeo stated, “Yesterday, the U.S. Department of State sanctioned nine entities and three individuals who have engaged in activity that could enable the Iranian regime’s violent behavior. The actions of these individuals and entities provide revenue to the regime that it may use to fund terror and other destabilizing activities, such as the recent rocket attacks on Iraqi and Coalition forces located at Camp Taji in Iraq. Our sanctions will deprive the regime of critical income from its petrochemical industry and further Iran’s economic and diplomatic isolation. The United States will continue to fully enforce our sanctions.”

**March 19, 2020:** U.S.-led coalition troops pull out of Iraq. Iraqi and coalition officials states that the withdrawal was part of a planned drawdown, and training activities were already suspended due to concerns about the coronavirus. Coalition forces withdrew from al-Qaim on the Iraq-Syria border. Further troop withdrawals are also planned in the coming weeks.

“The withdrawal was agreed between the Iraqi government and the coalition forces,” said Brig. Tahseen al-Khafaji, who was at a withdrawal ceremony. Another senior Iraqi military official said he expected the coalition to leave two bases in northern Iraq in the coming weeks, including Qayara south of Mosul and K1, in the province of Kirkuk.

**March 23, 2020:** U.S. and UAE forces hold a joint military exercise at Al-Hamra Military Base in the UAE. The military exercise is part of a biennial exercise called Native Fury. According to Brig. Gen. Thomas Savage of the 1st Marine Expeditionary Force, “We’re about stability in the region. So if they [Iran] view it as provocative, well, that’s up to them. This is just a normal training exercise for us.”

Source: Adapted from: Wikipedia, PennLive, “U.S.-Iran attacks: Timeline of events leading up to countries’ confrontations, threat of war,” Jan 08, 2020

<https://www.pennlive.com/nation-world/2020/01/us-iran-attacks-timeline-of-events-leading-up-to-countries-confrontations-threat-of-war.html>; NPR, “Timeline: How The U.S. Came To Strike And Kill A Top Iranian General,” January 4, 2020 7:00 AM ET, <https://www.npr.org/2020/01/04/793364307/timeline-how-the-u-s-came-to-strike-and-kill-a-top-iranian-general>; Al Jazeera, “US-Iran standoff: A timeline of key events,” [www.aljazeera.com/news/2019/06/iran-standoff](http://www.aljazeera.com/news/2019/06/iran-standoff); The History Guy, “Timeline of Attacks in the 2019-2020 Iran Crisis,” [www.historyguy.com/timeline\\_iran\\_crisis\\_2020.htm](http://www.historyguy.com/timeline_iran_crisis_2020.htm); By Thomas Gibbons-Neff and John Ismay, “An Iraq Attack, a Rudimentary Insurgent Tactic Allows Little Defense,” New York Times, March 12, 2020, <https://www.nytimes.com/2020/03/12/world/middleeast/iraq-iran-rockets.html?referringSource=articleShare>; Kyra Rauschenbach, “US-Iran Escalation Timeline: March 2020 Update,” *Institute for the Study of War*, March 20, 2020, <http://www.understandingwar.org/backgrounder/us-iran-escalation-timeline-march-2020-update>; Samya Kullab and Qassem Abdul-Zahra, “US-led coalition troops pull out of base in western Iraq,” Military Times, March 20, 2020, <https://www.militarytimes.com/news/your-military/2020/03/20/us-led-coalition-troops-pull-out-of-base-in-western-iraq/>; Michael Pompeo, “Further Sanctions on Entities Trading in or Transporting Iranian Petrochemicals,” *U.S. State Department*, March 18, 2020, <https://www.state.gov/further-sanctions-on-entities-trading-in-or-transporting-iranian-petrochemicals/>.

**Uncertain Future U.S.  
Commitments and Current Bases  
and Forward Deployed Forces**

# The United States as an Uncertain Partner

The maps and tables in this section show the United States is now investing heavily in improved power projection forces and capabilities, and that there are still major U.S. deployments in the Gulf region even at the end of 2019. These increases in power projection capabilities not only include plans to buy major advances in major combat systems like the F-35 stealth fighter and B-21 stealth bomber, but also include significant increases in readiness and strategic lift.

They also highlight the dangers in any assessment of the balance or of the war fighting capability that focuses on current U.S. forward deployments. It is the combined size and capability of both current forward deployments and U.S. power projection forces that will shape U.S. capability in any given situation – a factor that some analysts in the Gulf do not fully understand and one that leads them to focus on each major shift in current forward deployments as the key indicator of U.S. capability.

The United States has shown all too clearly that it lacks a coherent long-term security strategy for the Gulf ever since it invaded Iraq in 2003 – other than one of continuing the fight against Islamist extremist movements like ISIS and Al Qaida. For example, both President Obama and President Trump have called for added Arab burden sharing in somewhat different forms in spite of the fact that several Gulf Arab strategic partners are already spending at levels that threaten their economy and stability.

President Trump has both talked about enduring commitments and discussed major cuts in U.S. forward deployed forces. The out-years in his FY2021 defense budget request at least implies he plans further cuts if reelected but the indicators are unclear. During the first months of 2020, senior U.S. officials have also talked about maintaining a presence in Syria.

Senior U.S. officers and officials have also said on background that the United States will not leave Iraq, but Iraqi attitudes are unclear and so is the U.S. resolve in staying. The United States officially stated it had 5,200 personnel in Iraq in early 2020 – with that figure sometimes surging over 1,000 more. The United States also announced in early March 2020 that it was retaining two aircraft carriers in the Middle East and was in the process of moving Patriot and C-RAM missile defense batteries into Iraq as tensions mounted over attacks on U.S.-occupied Iraqi bases by Iraqi Popular Mobilization Forces with links to Iran.

Yet, Iran may be gradually push the United States into a further withdrawal. On March 16<sup>th</sup>, a series of new Popular Mobilization Forces' attacks on U.S. forces in Iraqi bases led the United States to withdraw forces from three bases (joint bases at al Qaim near the Syrian border, Qayyarah Airfield West near Mosul, and K-1 Air Base in Kirkuk) and move some out of Iraq – leaving a minimal U.S. military and diplomatic presence and effectively ceding new area to Iranian influence.

# The United States as an Uncertain Partner

Moreover, U.S. officials also announced in the background that the United States was considering withdrawing troops at Al-Taqaddum Air Base west of Baghdad later in 2020 and also considering changing the overall structure of Combined Joint Task Force Operation Inherent Resolve from a three-star billet to a two-star command, putting a major general in charge rather than a lieutenant general.

More broadly, the United States has not announced any new or longer-term plans regarding future deployments in Iraq and has not reacted elsewhere largely than by reacting to any immediate crisis. The United States also has not reacted in any clear way to the rising level of Russian arms sales and activity in the Gulf or Chinese activity in the Indian Ocean and Red Sea Areas. It has not intervened decisively in an effort to resolve the boycott crisis in the Gulf or to put the GCC on a track that would lead to major improvements in its interoperability and effectiveness. If anything, the United States seems to have focused more on selling arms than how they are to be used.

The United States has also continued to stress the importance of its strategic partnerships with the Gulf Arab states. However, it has done a poor job of planning and defining its own future role in the Gulf, and – aside from the relatively smooth military-to-military relations that exist between USCENTCOM, the COAC in Qatar, and the 5<sup>th</sup> Fleet in Bahrain – its actions have led to growing uncertainty on the part of its Arab partners. This is a critical issue in the balance because at this point, the United States is the only power with the battle management; C<sup>4</sup>; cyberwarfare; and intelligence, surveillance, and reconnaissance (ISR) assets to integrate the individual Arab Gulf states into cohesive military operations with other Arab states as well as with the U.S. and European power projection forces.



## Illustrative U.S. Power Projection Weapons Investments FY2020-FY2021 - I

<b>Item</b>	<b>FY2020 Enacted (\$US billions)</b>	<b>FY2021 Requested (US billions)</b>
<b>B-21 Long Range Strike Bomber</b>	3.0	2.8
<b>Long-Range Stand-Off (LRSO) Missile</b>	0.7	0.5
<b>Ground Based Strategic Deterrent (GBSD)</b>	0.6	1.5
<b>Sea-Based Interceptors (SM-3 IIA and IB)</b>	0.7	0.6
<b>AEGIS Ballistic Missile Defense System</b>	1.0	1.1
<b>Terminal High Altitude Area Defense (THAAD)</b>	0.8	0.9
<b>Patriot Advanced Capability (PAC-3) Missile</b>	0.7	0.8
<b>F-35 Joint Strike Fighter</b>	12.6	11.4
<b>KC-46 Pegasus Tanker</b>	2.2	3.0
<b>AH-64 Apache Attack Helicopter</b>	1.0	1.2
<b>CVN-78 Ford Aircraft Carrier</b>	2.6	3.0
<b>DDG-51 ARLEIGHBURKE Class Destroyers</b>	5.8	3.5
<b>Landing Platform Dock Ship (LPD)</b>	0.3	1.2

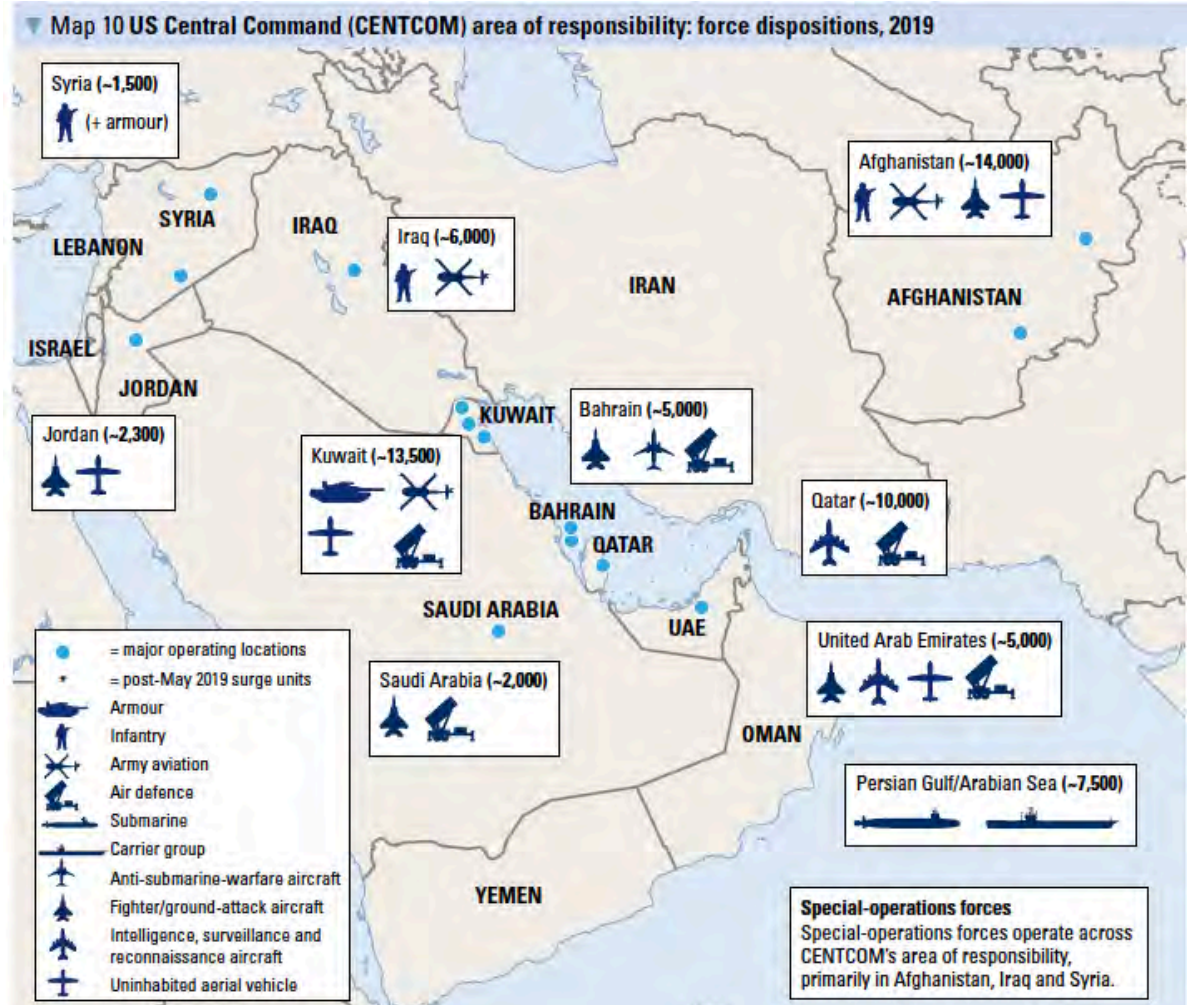
## Illustrative U.S. Power Projection Weapons Investments FY2020-FY2021 - II

<b>Item</b>	<b>FY2020 Enacted (\$US billions)</b>	<b>FY2021 Requested (US billions)</b>
<b>Global Positioning System (GPS) III and Projects</b>	1.7	1.8
<b>Space Based Overhead Persistent Infrared (OPIR) Systems</b>	1.6	2.5
<b>Joint Light Tactical Vehicle</b>	1.6	1.4
<b>M-1 Abrams Tank Modifications/Upgrades</b>	2.2	1.5
<b>Amphibious Combat Vehicle</b>	0.4	0.5
<b>Armored Multi-Purpose Vehicle</b>	0.6	0.3
<b>Joint Direct Attack Munition (JDAM)</b>	1.1	0.5
<b>Guided Multiple Launch Rocket System (GMLRS)</b>	1.3	1.5
<b>Standard Missile-6 (SM-6)</b>	0.7	0.8
<b>Joint Air-to-Surface Standoff Missile (JASSM)</b>	0.6	0.6
<b>Long Range Anti-Ship Missile (LRASM)</b>	0.2	0.6
<b>Hellfire Missile</b>	0.7	0.5
<b>Small Diameter Bomb</b>	0.4	0.4

Source: US Department of Defense, Irreversible Implementation of the National Defense Strategy, Office of the Under Secretary of Defense (Comptroller/CFO), February 2020, FISCAL YEAR 2021 BUDGET REQUEST, pp. 14-16

# IISS Summary Estimate of Location of Major U.S. Deployments in the MENA/Gulf Region - 2020

US Army	
Afghanistan	3rd Brigade Combat Team, 82nd Airborne Division 2nd Security Force Assistance Brigade 10th Combat Aviation Brigade
Iraq	1st Stryker Brigade Combat Team, 25th Infantry Division
Qatar	12th Missile Defence Battery
Saudi Arabia	3/4th Air Defense Artillery Battalion*
Bahrain; Kuwait	1/7th Air Defense Artillery Battalion
Iraq; Kuwait	244th Army Reserve Expeditionary Combat Aviation Brigade
Kuwait; Syria	30th ARNG Armored Brigade Combat Team
Qatar; UAE	4/3rd Air Defense Artillery Battalion
US Marine Corps	
Bahrain	VMA-311 fighter/ground-attack squadron with AV-8B
Afghanistan; Iraq; Kuwait; Syria	1 & 2/7th Marine Regiment
US Air Force	
Afghanistan	79th Expeditionary Fighter Squadron with F-16C 354th Expeditionary Fighter Squadron with A-10C 62nd Expeditionary Attack Squadron with MQ-9A
Jordan	389th Expeditionary Fighter Squadron with F-15E 46th Expeditionary Attack Squadron with MQ-9A
Kuwait	361st Expeditionary Attack Squadron with MQ-9A
Qatar	340th Expeditionary Air Refueling Squadron with KC-135 7th Expeditionary Airborne Command and Control Squadron with E-8C
Saudi Arabia	763rd Expeditionary Reconnaissance Squadron with RC-135
Saudi Arabia	27th Expeditionary Fighter Squadron with F-22A*
United Arab Emirates	4th Expeditionary Fighter Squadron with F-35A 159th Expeditionary Fighter Squadron with F-15C 494th Expeditionary Fighter Squadron with F-15E* 908th Expeditionary Air Refueling Squadron with KC-10A 968th Expeditionary Airborne Air Control Squadron with E-3 99th Expeditionary Reconnaissance Squadron with U-2S/RQ-4 Reconnaissance Unit with RQ-170/RQ-180
US Navy	
Arabian Sea; Persian Gulf	1 Ohio-class submarine 2-3 Los Angeles/Virginia-class submarines USS Abraham Lincoln aircraft carrier <ul style="list-style-type: none"> <li>Strike Fighter Squadron 25 with F/A-18E</li> <li>Strike Fighter Squadron 86 with F/A-18E</li> <li>Strike Fighter Squadron 103 with F/A-18F</li> <li>Strike Fighter Squadron 143 with F/A-18E</li> <li>Electronic Attack Squadron 140 with EA-18G</li> <li>Airborne Early Warning Squadron 121 with E-2D</li> </ul>
Bahrain	Patrol Squadron 45 with P-8A
Saudi Arabia	Electronic Attack Squadron 134 with EA-18G
	USS Lyle Gulf cruiser USS Normandy cruiser USS Farragut destroyer USS Forrest Sherman destroyer USS Lassen destroyer





# Iranian and U.S. Military Bases



Source: IISS, "The Military Balance 2019," 60-62,  
<https://www.iiss.org/publications/the-military-balance/the-military-balance-2019>

# Nominal Total U.S. Deployments in the MENA/Gulf Region (I)

Based on IISS 2020 *Military Balance* Estimate

## ARABIAN SEA: US Central Command

- US Navy • 5th Fleet: 2 SSGN; 1 CVN; 2 CGHM; 2 DDGHM;  
**Combined Maritime Forces** • TF 53: 1 AE; 2 AKE; 1 AOH; 3 AO

## ASCENSION ISLAND: US Strategic Command

- 1 detection and tracking radar at Ascension Auxiliary Air Field

## BAHRAIN: US Central Command

- 5,000; 1 HQ (5th Fleet); 1 fr sqn(-) with 5 AV-8VB *Harrier* II; 1 ASW sqn with 5 P-8A *Posidon*; 2 AD bty with MIM-104E/F *Patriot* PAC-2/-3

## BRITISH INDIAN OCEAN TERRITORY: US Strategic Command

- 300; 1 Spacetrack Optical Tracker at Diego Garcia; 1 ground-based electro-optical deep space surveillance system (GEODSS) at Diego Garcia

## US Pacific Command

- 1 MPS sqn (MPS-2 with equipment for one MEB) at Diego Garcia with 2 AKRH; 3 AKR; 1 AKEH; 1 ESD; 1 naval air base at Diego Garcia, 1 support facility at Diego Garcia

## DJIBOUTI: US Africa Command

- 4,700; 1 tpt sqn with C-130H/J-30 *Hercules*; 1 spec ops sqn with MC-130H/J; PC-12 (U-28A); 1 CSAR sqn with HH-60G *Pave Hawk*; 1 CISR UAV sqn with MQ-9A *Reaper*; 1 naval air base

## EGYPT: MFO

- 454; elm 1 ARNG recce bn; 1 ARNG spt bn

## IRAQ: US Central Command

- *Operation Inherent Resolve* 6,000; 1 mech inf bde(-); 1 EOD pl; 1 atk hel sqn with AH-64E *Apache*

## ISRAEL: US Strategic Command

- 1 AN/TPY-2 X-band radar at Mount Keren

## KUWAIT: US Central Command

- 13,500; 1 ARNG armd bde(-); 1 USAR (cbt avn) hel bde; 1 spt bde; 1 tpt sqn with 12 MV-22B *Osprey*; 1 CISR UAV sqn with MQ-9A *Reaper*; 3 AD bty with MIM-104E/F *Patriot* PAC-2/-3; 1 (APS) armd bde set; 1 (APS) inf bde set

# Nominal Total U.S. Deployments in the MENA/Gulf Region (II)

Based on IISS 2020 *Military Balance* Estimate

**LIBYA: UN • UNSMIL 1**

**PERSIAN GULF: US Central Command**

• US Navy • 5th Fleet: 10 PCFG; 6 (Coast Guard) PCC

**Combined Maritime Forces • CTF-152: 4 MCO; 1 ESB**

**QATAR: US Central Command**

• 10,000: 1 ISR sqn with 4 RC-135 *Rivet Joint*; 1 ISR sqn with 4 E-8C JSTARS; 1 tkr sqn with 24 KC-135R/T *Stratotanker*; 1 tpt sqn with 4 C-17A *Globemaster*; 4 C-130H/J-30 *Hercules*; 2 AD bty with MIM-104E/F *Patriot* PAC-2/-3

**US Strategic Command**

• 1 AN/TPY-2 X-band radar

**SAUDI ARABIA: US Central Command**

• 2,000; 1 ftr sqn with 12 F-22A *Raptor*; 1 EW sqn with 5 EF-18G *Growler*; 1 SAM bty with MIM-104E/F *Patriot* PAC-2/-3

**SYRIA: US Central Command**

• *Operation Inherent Resolve* 1,500; 1 ARNG armd BG; 1 mne bn

**TURKEY: US European Command**

• 1,700; 1 tkr sqn with 14 KC-135; 1 ELINT flt with EP-3E *Aries II*; 1 air base at Incirlik; 1 support facility at Ankara; 1 support facility at Izmir

**US Strategic Command • 1 AN/TPY-2 X-band radar at Kürecik**

**UNITED ARAB EMIRATES: US Central Command**

• 5,500: 1 ftr sqn with 12 F-15C *Eagle*; 1 FGA sqn with 18 F-15E *Strike Eagle*; 1 FGA sqn with 12 F-35A *Lightning II*; 1 ISR sqn with 4 U-2; 1 AEW&C sqn with 4 E-3 *Sentry*; 1 tkr sqn with 12 KC-10A; 1 ISR UAV sqn with RQ-4 *Global Hawk*; 2 AD bty with MIM-104E/F *Patriot* PAC-2/-3

# **Comparative Military Budgets and Arms Imports**

# Comparative Military Budgets and Arms Imports

The charts and tables in this analysis ignore the over \$700 billion a year in U.S. military spending that shapes the pivotal role that U.S. forces play in the Gulf military balance. They also ignore the comparative resources of outside powers – those that align with Iran – like Syria, the Houthi, and Hezbollah – those that align with the Arab Gulf – like Egypt and Jordan – and additional outside powers – like Turkey, Russia, China, and Israel.

They do, however, show that Iran has been massively outspent by its Arab Gulf neighbors. The first figure in this section provides a summary count of Iranian and Arab Gulf forces and shows that if one only looks at numbers – rather than force quality and force modernization – Iran is strong in areas like military personnel, main battle tanks, and artillery.

The later charts, which focus more on force quality and force modernization, paint a very different picture. The moment one examines the quality of key weapons – land, air, and sea – the Arab Gulf states have a definitive lead – one explained in large part by the financial data on military spending. This lead is clearly reflected in the charts and tables that show comparative military spending, military spending as a percent of GDP, and the relative flow of arms imports into Gulf countries – all of which have a very limited military industrial base.

**These figures on military spending and comparative levels of effort do suffer from the same problems in quality and reliability that affect virtually all the data on the region – including the most basic economic, population, and civil statistics.** Descriptions of the ways in which data are generated and validated are often from missing figures, and some figures are generated for political purposes.

The spending and arms data shown in this section are drawn, however, from two leading think tanks – the IISS and SIPRI – and from declassified U.S. government data by the Congressional Research Service and the U.S. State Department. While the numbers from each source differ, they still broadly agree in showing that the Arab Gulf states have spent vastly more on military forces than Iran, that many Arab states spend an exceptional high percentage of their GDP, and that the Arab lead in arms imports is even greater than the lead in military spending.

**At the same time, these numbers need to be put in careful context even if one ignores the now unpredictable impact of the Coronavirus:**

- Open source reporting by DIA warns that official estimates of Iranian spending seriously undercount the cost of its military and foreign train and assist efforts.



- Arab Gulf states often under report actual spending – and Qatar and the UAE have stopped open source reporting in recent years.
- IMF, World Bank, and CIA reporting indicate that Iraq is effectively bankrupt and has the economy of a failed state. Its lack of political unity and leadership raises major questions as to when it can achieve economic stability and a stable pattern of military spending.
- For all of the U.S. whining about burden sharing, the Arab Gulf states are spending more of their economies on security than the United States and far more than the 2% of GDP goal set by NATO.
- Four Arab Gulf states have spent nearly 10% – or more – of their GDP on security in recent years: Iraq, Qatar, Saudi Arabia, and the UAE. These spending levels are so high that they seriously affect their economic development and ability to fund the economic reforms and diversification that can create the levels of employment and per capita income needed to maintain or achieve internal stability.
- The divisions and tension between the Arab Gulf states and the internal national policies waste vast amounts of Arab spending on forces that lack any coherent focus on key missions, interoperability, integration, and standardization. Arab self-destructiveness critically undercuts the value of Arab military spending and arms imports.
- Corruption is a major problem in the ways both Iran and the Arab Gulf states spend their national security funds, but it is often hard to trace because the money is officially allocated within the budget rather than misappropriated or stolen.
- Iran’s ruling elite and IRGC are able to draw directly on state funds and contracts, as well as run state enterprises and projects in ways that serve their interests.
- The problems that the Arab Gulf states have in using money honestly and effectively to pay for national security expenditures are compounded by contractual arrangements that benefit given royal families and senior military, and sometimes divert major funds directly to them. This is often of various offset and coproduction agreements. Outside assessments of corruption often ignore these sources of diversion and waste.
- Waste and the misuse of national security funds are further compounded in the Arab Gulf states by “glitter factor” investments in special configurations and advanced technology that is not needed alongside efforts to create military industrial bases that are little more than expensive assembly and local service efforts that benefit given defense contractors.
- While USCENTCOM attaches and military advisory teams that often do focus on trying to create truly effective Arab Gulf forces, both the United States and other foreign governments often emphasize sales over actual military needs at the national political level – compounding the waste and real-world corruption problems in arms transfers.

- The sales data in the charts in this section show that the United States and Europe face growing competition for arms sales from Russia and China.
- As is noted in the next section of this report, Iran’s ties to the Assad regime, Syria, factions in Lebanon, factions in Iraq, and factions in Yemen link it to “failed states” that cannot finance their own military efforts and seriously limit the military capabilities of such outside states.

**The trends shown in these charts also must be interpreted in terms of both historical perspective, and the broader economic trends in the individual regional economies.** National security spending trends generally do not reflect the radical sudden changes that regularly take place in the demand for – and price for – petroleum. These changes produce radical sudden shifts in export revenues, Gulf state GDPs, and the funds available in the national budget. The spending data do not reflect the impact of poor governance and the competing needs of the civil sector, which generally are shaped by major inequities in income and job creation.

They do not reflect the combined impact of sanctions and failed economic policies on Iran’s overall ability to spend. More specifically, they do not show how much sanctions affect Iran’s oil exports, even as one of the most diversified economics in the Gulf, but also one where the *CIA Factbook* reports that petroleum and petroleum-related products still counted for 60% of exports in 2018. These petroleum and petroleum-related products also accounted for 99% of Iraq’s exports, virtually all of Kuwait’s, most of Oman and Qatar’s, 90% of Saudi Arabia’s, and more than 45% of the UAE’s.

In short, only the last charts and tables in this section, which show the instability in petroleum export income and the sudden shocks that past wars have caused, begin to reflect the warnings that would come from a full-scale analysis of regional and national economic trends. The civil needs and expectations of even the wealthiest Gulf Arab oil exporters present major funding and budget challenges that cannot be met as long as they spend so much of their economy on military forces and security.

Each national case is radically different – both in funding military forces and meeting nation-by-nation civil challenges – *but UN, World Bank, and IMF studies all show that the need for job creation and diversification alone confronts every regional state with critical dilemmas in trying to fund both a civil future and its current role in the regional arms race.*

Moreover, the drops in oil export revenues caused by the drop in petroleum prices and income shown in the final charts in this section are now compounded by the massive impact of the Coronavirus as well as the competition between Saudi Arabia and Russia to maximize their own petroleum revenues. This net assessment is being made at the start of a massive shift in the global economy that has little to do with any traditional military geopolitical competition, and whose outcome is now extremely unpredictable.

The Coronavirus also introduces another key element of uncertainty. As noted in the introduction, the Coronavirus may have a massive future impact on Arab military expenditures and arms imports, and Iranian military expenditures and domestic military production. Even before the virus became an issue, some of the key Gulf economies affecting the balance were already “failed states” with weak or nearly bankrupt economies. These included Iran, Iraq, Lebanon, Syria, and Yemen. There currently is no way to estimate how serious the impacts of the virus will be, and the United States has continued to place new economic sanctions on Iran.

As is shown later in this analysis, “oil wealth” is very limited in terms of per capita income in many of the Gulf states and the value of petroleum exports has varied sharply and unpredictably over time. This section warns that the wealthiest petroleum exporter in the Gulf – Kuwait, Qatar, Saudi Arabia, and the UAE – are spending very high percentages of their GNP on national security – some close to 10% – as is at least one less wealthy state: Oman. The virus has already sharply cut demand for petroleum and petroleum prices. Sustained cuts could force even the wealthiest states to reduce national security spending, arms imports, and efforts to reform their economies and cut their dependence on petroleum exports.

These trends are so uncertain, however, that any effort to estimate their impact now involves little more than speculative guesswork. Accordingly, the analysis that follows warns that it is not possible to estimate the detailed impact of the Coronavirus, but they are certain to be all too real.

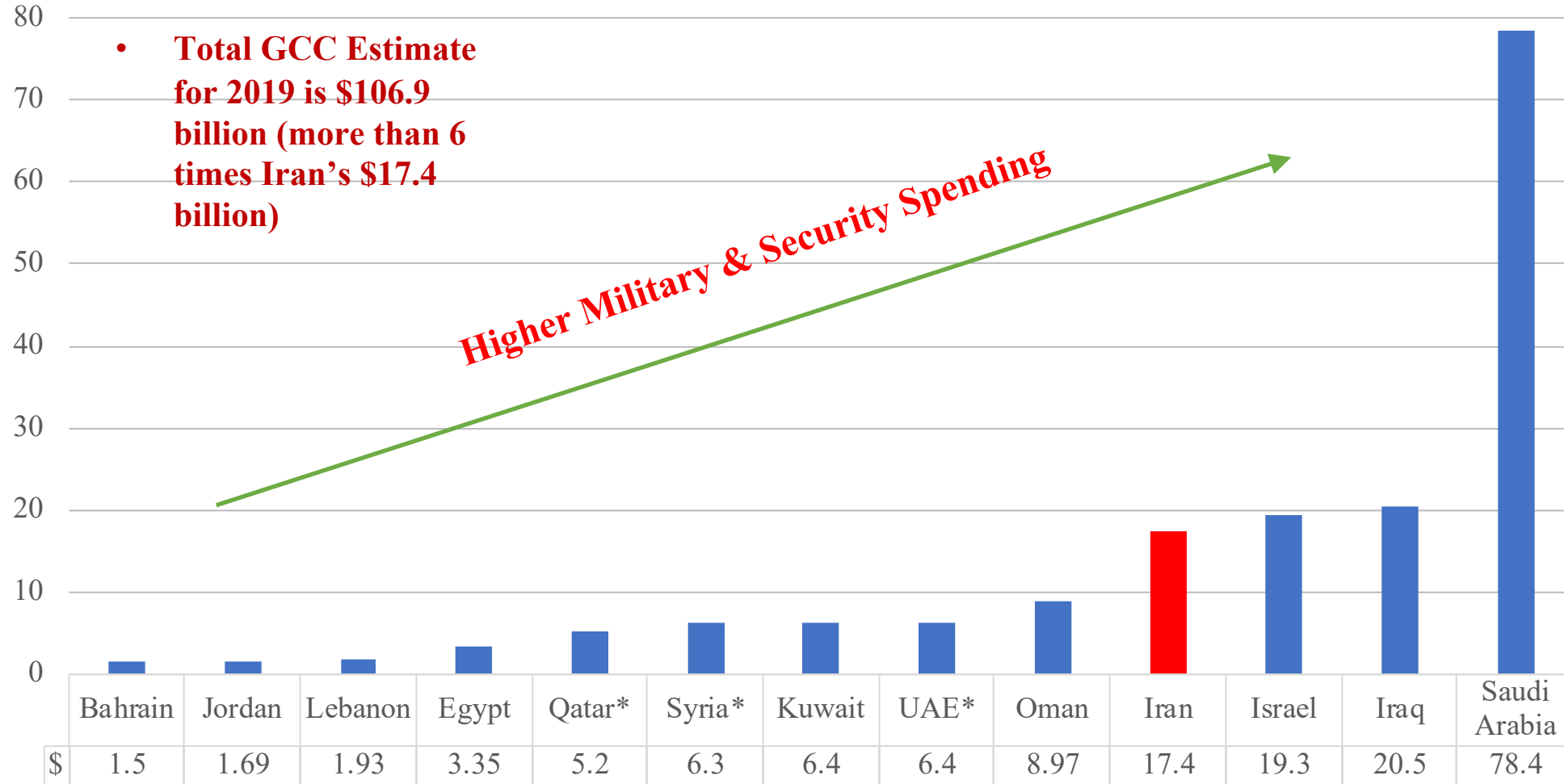
# Iran and the Arab Gulf Balance in 2020

## Based on IISS 2020 *Military Balance* Estimate

	Iraq	Iran	GCC	Saudi	UAE	Bahrain	Kuwait	Oman	Qatar
Active Personnel	64,000	523,000	374,800	227,000	63,000	8,200	17,500	42,600	16,500
Reserve Personnel	-	350,000	23,700	-	-	-	23,700	-	-
Main Battle Tanks	393	1,513	1,937	900	385	180	293	117	62
AIFVs	240	610	1,766	760	405	67	492	2	40
APCs	2,092	640	3,121	1,340	928	203	260	200	190
Towed Artillery	60	2,030	359	110	93	36	-	108	12
Self-Propelled Artillery	72	292	669	224	181	82	106	24	52
Multiple Rocket Launchers	3	1,476	194	60	88	13	27	-	6
Combat Aircraft	65	336	748	407	156	38	66	63	18
Attack Helicopters	28	-	79	35	-	28	16	-	-
Major SAM Launchers	0	205	296	236	14	6	40	-	-
Destroyers	-	-	3	3	-	-	-	-	-
Frigates	-	-	6	4	1	1	-	-	-
Corvettes	-	6	21	4	10	2	-	5	-
Patrol and Coastal	32	61	111	28	32	10	20	10	11
Submarines	-	21	0	-	-	-	-	-	-
Submersibles	-	3	0	-	-	-	-	-	-
Mine Warfare	-	-	5	3	2	-	-	-	-
Landing Ships	-	12	3	-	2	-	-	1	-
Landing Craft	-	11	42	5	17	9	6	5	-

Source: Adapted from IISS, “The Military Balance 2020,” 334-373, <https://www.iiss.org/blogs/military-balance/2020/02/new-features-military-balance-2020>

# IISS: Comparative Military and Security Spending in 2020 (Current \$ U.S. Billions)

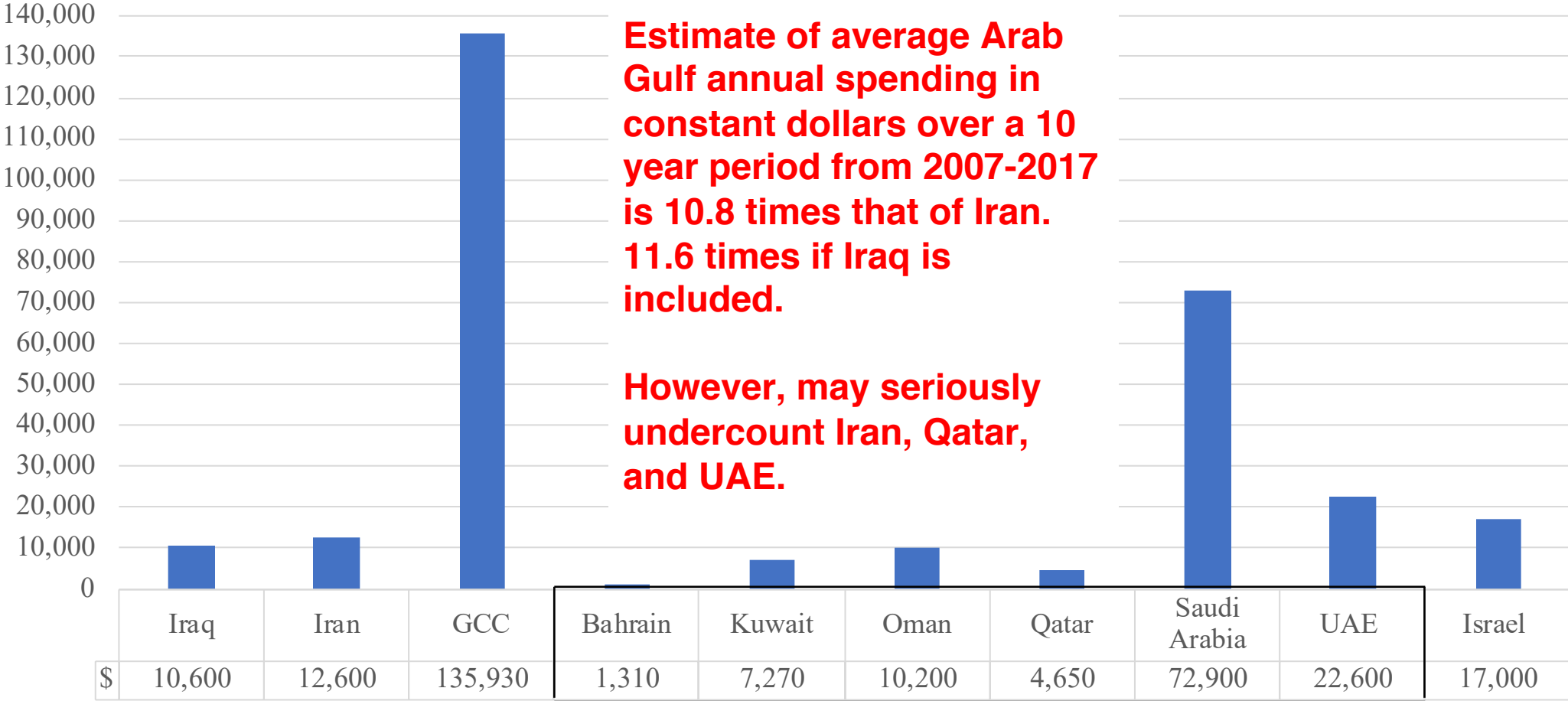


Source: Adapted by the author from IISS, *Military Balance 2020*, “Chapter Seven The Middle East and North Africa.”

\*Author’s estimate for Qatar, UAE, and Syria

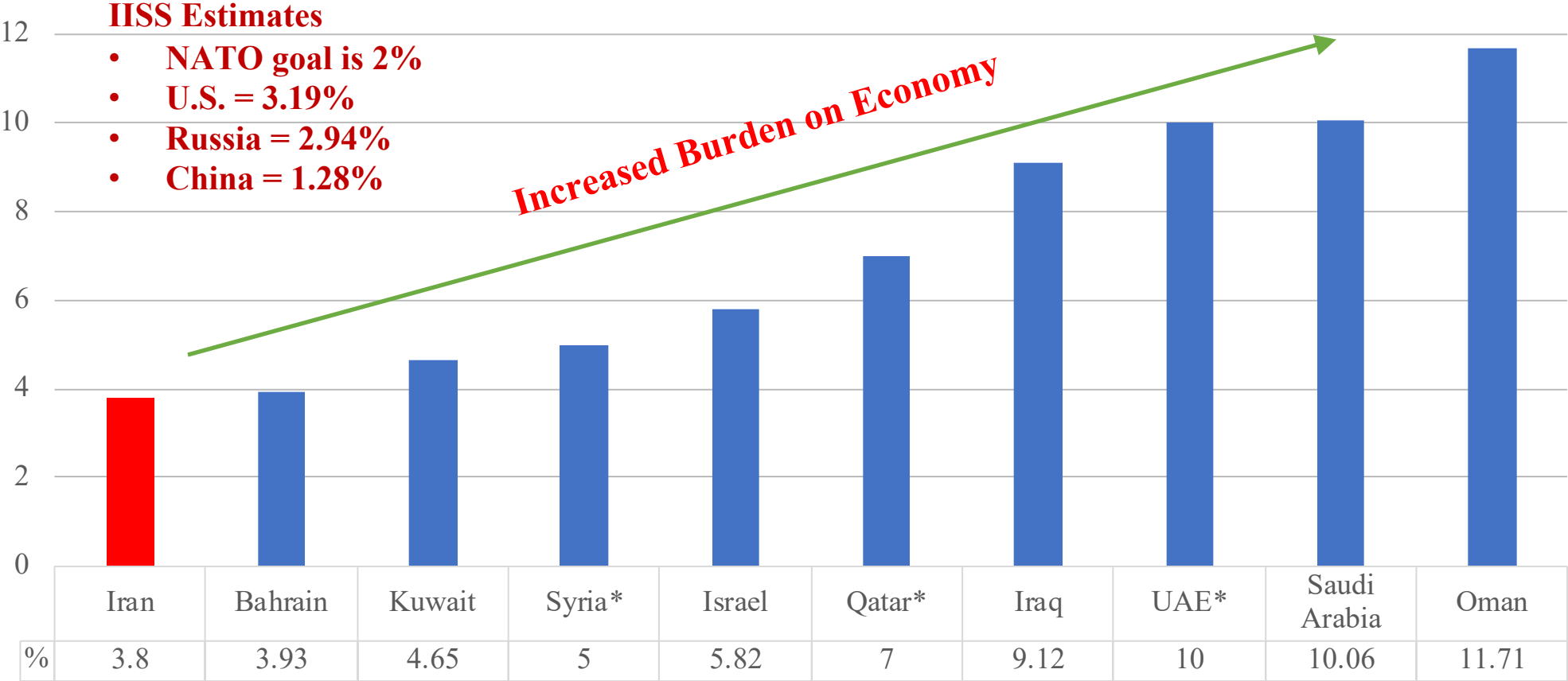
# WMEAT: Mean Annual Value of Military Expenditure from 2007-2017

(in constant 2017 \$ U.S. millions)



Source: Bureau of Arms Control, “World Military Expenditures and Arms Transfers 2019 Table I Military Expenditures and Armed Forces Personnel, 2007 2017,” Table I: Country Rankings & Trends, *U.S. Department of State*, 2019, <https://www.state.gov/world-military-expenditures-and-arms-transfers-2019/>

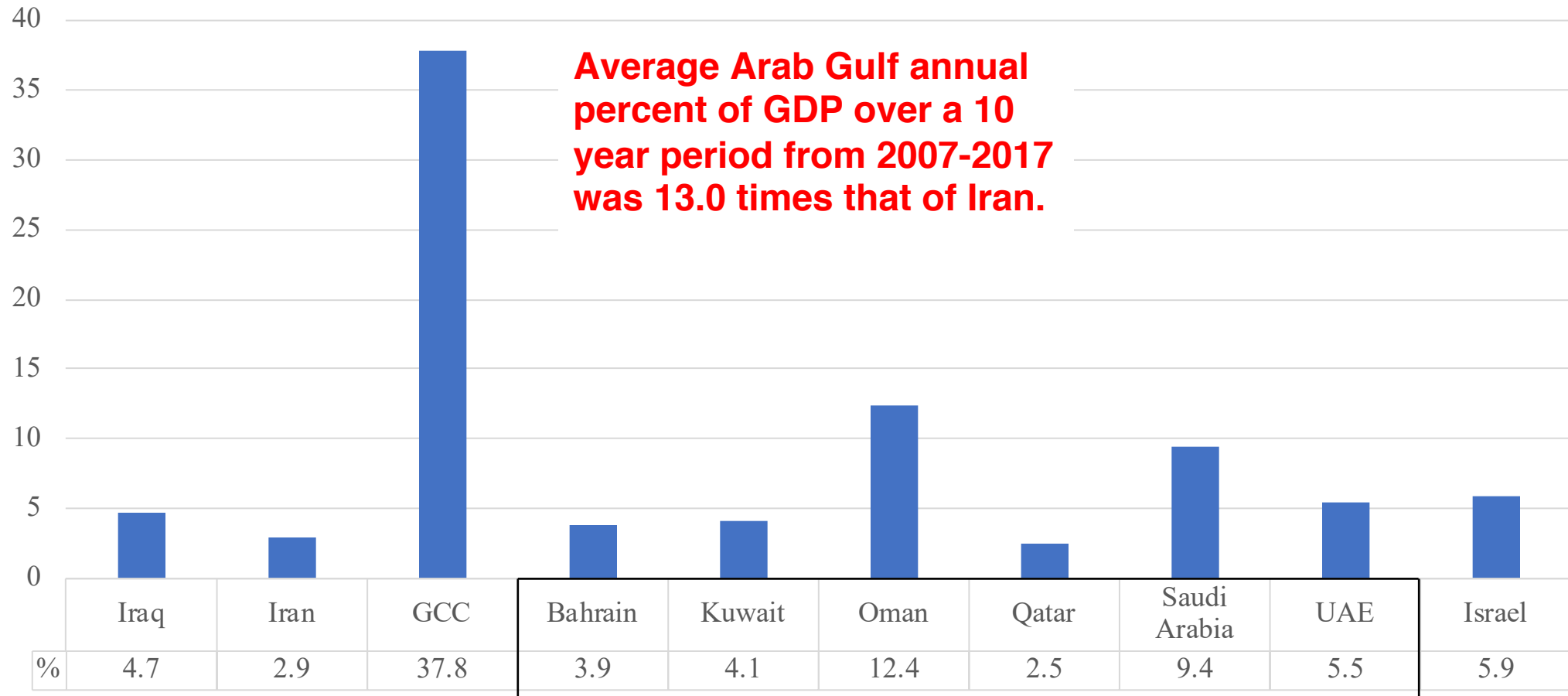
# IISS Comparative Estimates of Military Spending as Percent of GDP, 2020



\*Author’s estimate for Syria, Qatar, and UAE

Source: Adapted by the author from IISS, *Military Balance 2020, Chapter Seven, “The Middle East and North Africa.”* and IHS Markit, *Jane’s Sentinel Security Assessment – The Gulf States 2017*

# WMEAT: Mean Annual Value of Military Expenditure as Percent of Mean Annual GDP from 2007-2017



Note: Figures for Iran, Qatar and UAE are too low to be credible.

Source: Bureau of Arms Control, "World Military Expenditures and Arms Transfers 2019 Table I Military Expenditures and Armed Forces Personnel, 2007 2017," Table I: Country Rankings & Trends, *U.S. Department of State*, 2019, <https://www.state.gov/world-military-expenditures-and-arms-transfers-2019/>



# SIPRI: Low Iranian Military Spending Relative to Arab States, 2000-2018 (Military expenditure by country, in constant (2017) \$US million, 1988-2018 SIPRI 2019)

Middle East	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Bahrain	359.0	372.3	444.1	516.0	531.9	513.3	574.2	642.6	719.9	828.2	842.8	1033.5	1182.2	1347.6	1475.3	1442.0	1505.5	1532.7	1396.8
Egypt	2627.7	2834.3	2902.8	2383.9	2369.7	2659.4	2952.5	3306.9	3779.9	4017.4	4407.3	4464.0	4557.7	4359.8	5085.1	5475.5	4513.0	2765.6	3110.0
Iran	8327.1	10378.8	3243.9	3717.1	5243.6	6796.7	8751.5	9330.9	11082.0	12584.6	13561.3	14277.7	16494.0	11997.2	9901.1	10588.8	12264.0	13931.2	13194.2
Iraq	..	..	..	..	613.7	1120.3	1236.1	1989.9	3116.3	3237.2	3752.9	4278.6	4141.1	7780.2	6921.3	9604.2	5970.4	7416.4	6318.0
Israel	9407.8	9607.4	10090.9	10827.5	11127.1	10919.2	11559.0	12128.9	14191.9	14030.4	14605.3	16343.2	15567.1	17319.7	18485.8	16969.4	14783.8	15581.6	15946.8
Jordan	529.3	528.9	521.9	611.8	586.7	603.7	701.6	1032.4	1358.4	1568.3	1557.9	1594.8	1472.8	1444.9	1548.9	1614.9	1768.3	1939.7	1957.7
Kuwait	2697.1	2685.7	2821.5	3130.7	3450.1	3509.4	3597.8	4115.7	4430.3	4208.9	4335.2	5393.5	5941.5	5698.1	5832.2	5735.1	6446.7	6764.6	7296.3
Lebanon	930.0	958.5	907.5	923.4	954.6	962.5	1009.0	1152.2	1169.5	1426.2	1585.4	1626.5	1757.2	1935.7	2270.1	2239.4	2606.5	2441.1	2775.6
Oman	1577.2	1819.9	1868.5	1969.3	2230.7	2739.0	3022.6	3244.6	3462.5	3367.5	3671.4	5000.7	9250.7	8766.3	8213.5	7533.6	7936.0	6802.7	6710.0
Qatar	..	..	761.0	784.6	772.4	887.5	1065.7	1562.2	2317.5	1948.4	1876.8	..	..	..	..	..	..	..	..
Saudi Arabia	19964.3	21026.7	18501.9	18747.5	20910.4	25392.0	29580.5	35469.5	38222.9	41267.2	45244.5	48530.9	56497.9	67020.0	80762.4	87185.9	63672.8	70400.0	67554.7
Syria	897.0	1022.5	1102.9	1436.2	1388.5	1450.3	1435.2	1599.0	1732.4	2182.0	2346.0	2494.9	..	..	..	..	..	..	..
Turkey	9993.7	7216.1	9050.4	10277.9	10920.8	12081.2	13363.3	15319.2	17127.3	16352.3	17939.4	17304.9	17958.2	18662.6	17772.2	15880.9	17854.0	17824.0	18967.1
UAE	5875.8	5798.0	5354.1	5834.7	6816.9	6604.2	7165.4	8461.0	11571.7	13836.4	17504.7	19181.8	19024.1	23561.1	22755.1	..	..	..	..
Yemen	473.7	540.1	737.4	807.3	735.5	815.6	822.1	1050.5	1196.4	1420.8	1448.2	1612.3	1618.8	1648.8	1714.8	..	..	..	..

- Iran never spent more than \$16.5 billion per year from 2000-2018
- Saudi Arabia alone average over \$0 billion per year and spent \$67.5 billion in 2018 vs. \$13.1 billion in 2018.
- UAE rose from \$5.4 billion in 2002 to \$25.6 billion in 2013. Estimated to have spent over \$24 billion from 2015 on.

Source: SIPRI, "Military Expenditure Database," February 19, 2020,

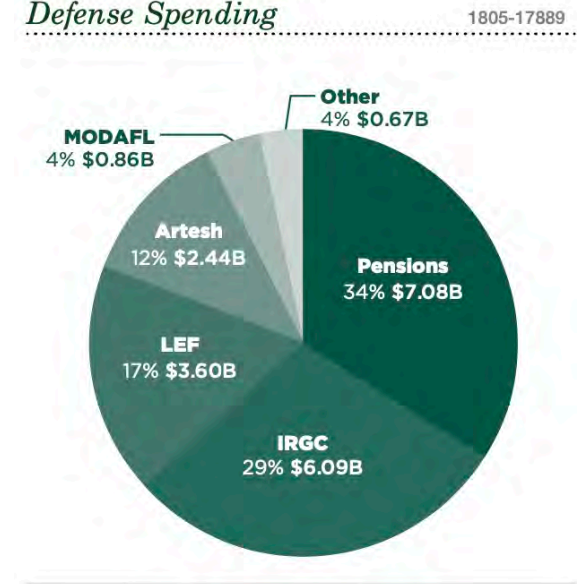
<https://www.sipri.org/sites/default/files/Data%20for%20all%20countries%20from%201988%E2%80%932018%20in%20constant%20%282017%29%20USD%20%28pdf%29.pdf>

# DIA Estimate of Iranian Defense Spending

Official Iranian Defense Expenditures 2011–2019



Official 2019 Iranian Defense Spending



Following a significant increase in Iranian defense spending from 2014 to 2018 after the implementation of the JCPOA, Iran’s security forces have experienced a funding decrease in 2019. Key drivers of this defense budget decrease include the reimposition of U.S. oil and banking sanctions, the depreciation of the Iranian rial, and chronic economic mismanagement. Iran’s official defense budget for 2019 is approximately \$20.7 billion, roughly 3.8 percent of gross domestic product (GDP), as passed by the Iranian Majles. **This total includes funding for the major components of Iran’s security apparatus, including the IRGC, Artesh, and LEF, as well as the Armed Forces General Staff (AFGS), the Ministry of Defense and Armed Forces Logistics (MODAFL), and security forces pensions.** The decline in funding for 2019 is similar to the decrease following the implementation of multi-lateral oil and financial sanctions in 2012. Iran’s current defense funding may face further cuts as Iranian oil export revenue continues to decline.

Although it is smaller in size, the IRGC receives a greater proportion of the defense budget than the Artesh. In 2019, Iran allocated 29 percent of the defense budget to the IRGC, compared with 12 percent for the Artesh. The government allocated 34 percent of the budget to pensions for all military personnel, and law enforcement personnel received about a third of the budget. ... Iran also distributes funding to its many partners and proxies, expenditures not fully accounted for in the official budget. **Between 2012 and 2018, Iran provided more than \$16 billion to the Syrian regime, Hizballah, Iraqi Shia militias, the Houthis, and Palestinian groups...**

**Tehran has a variety of off-budget sources of funding, making it difficult to accurately estimate the true size and scope of Iranian defense spending. The supreme leader can authorize transfers to defense and security organizations from the National Development Fund, Iran’s reserve fund, as it reportedly has done to support military activities in Syria.120 Moreover, the IRGC runs numerous private companies—most notably the wide-ranging Khatemolambia (“seal of the prophets”) Construction Headquarters—and exploits its far-reaching political and social influence to raise additional revenue. The IRGC and IRGC-QF can also gain extra income through smuggling and other illicit activities in the region.**

Iran’s new 5-year national development plan, released in July 2017, emphasizes a broader range of conventional capabilities than past plans. The plan continues to prioritize missiles and naval forces, but it also emphasizes air power, including the first public reference to offensive air capabilities in an Iranian strategic document. The plan also provides new focus on electronic warfare (EW) capabilities.



# CRS: U.S. Estimates Massive Arab Lead in Arms Imports:

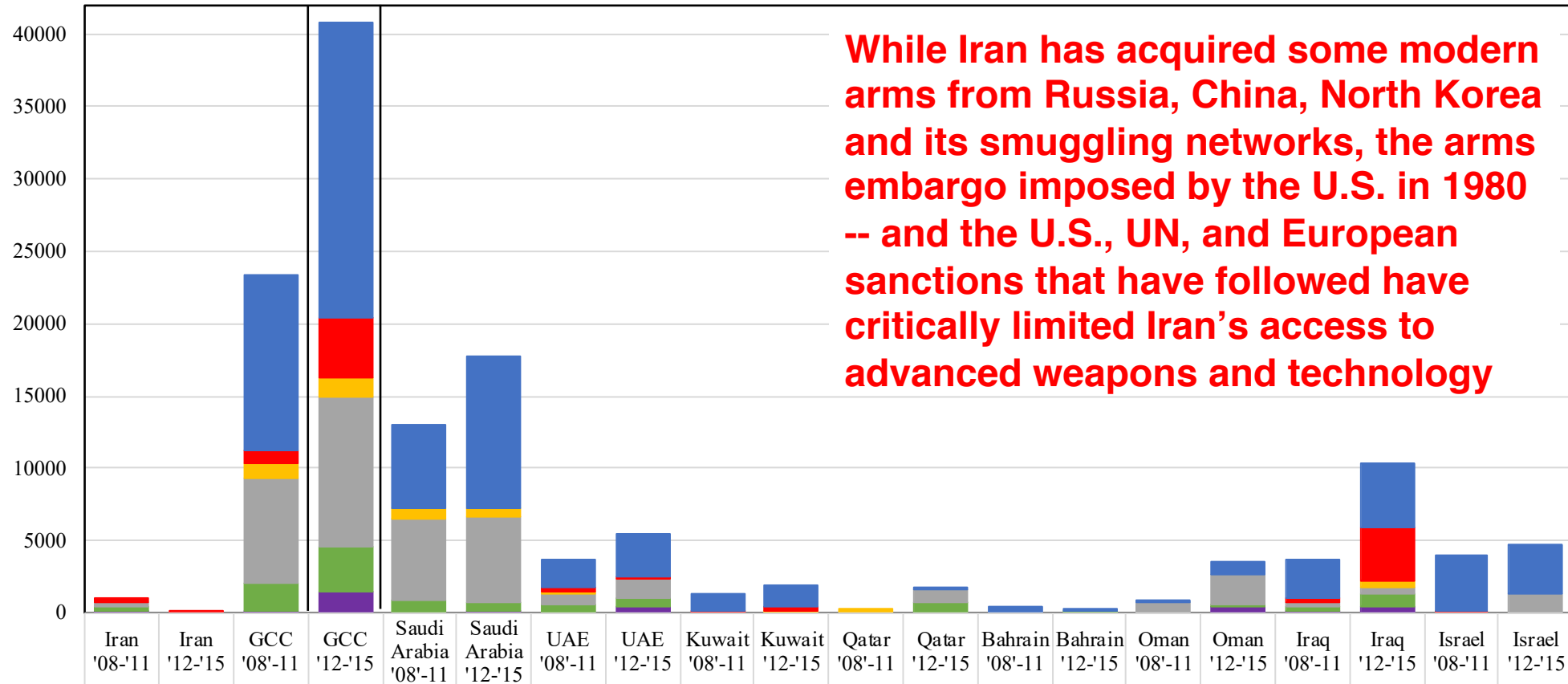
**Arab Gulf states placed \$199.7 billion in new orders during 2008-2015.  
Iran placed \$900 million. The Arab states outspent Iran by over 22:1.**

**(Gulf Arms Orders and Deliveries: 2008-2015 in millions of current U.S. Dollars)**

Country	Arms Orders			Arms Deliveries		
	<u>2008-2011</u>	<u>2012-2015</u>	<u>Total</u>	<u>2008-2011</u>	<u>2012-2015</u>	<u>Total</u>
Saudi Arabia	52,500	41,000	93,500	13,000	17,700	30,700
Other GCC Countries						
Bahrain	400	500	900	400	100	500
Kuwait	2,400	4,400	6,800	1,300	1,900	3,200
Oman	1,600	3,300	4,900	500	3,500	4,000
Qatar	1,000	6,200	7,200	300	1,700	2,000
UAE	13,500	22,900	36,500	3,700	5,500	9,200
Sub-Total	21,300	28,600	49,900	4,500	12,800	17,300
<b>Total GCC</b>	<b>92,700</b>	<b>106,900</b>	<b>199,700</b>	<b>23,700</b>	<b>43,200</b>	<b>120,700</b>
<b>Iraq</b>	<b>5,200</b>	<b>23,900</b>	<b>34,400</b>	<b>3,700</b>	<b>10,300</b>	<b>14,000</b>
Iran	300	600	900	300	100	400
Yemen	800	100	900	400	200	600
<b>Total</b>	<b>99,000</b>	<b>131,500</b>	<b>235,500</b>	<b>28,100</b>	<b>53,800</b>	<b>135,700</b>

# CRS: New Conventional Arms Transfer Agreements by Supplier, 2008-2015

(In current \$ U.S. million)



	Iran '08-'11	Iran '12-'15	GCC '08-'11	GCC '12-'15	Saudi Arabia '08-'11	Saudi Arabia '12-'15	UAE '08-'11	UAE '12-'15	Kuwait '08-'11	Kuwait '12-'15	Qatar '08-'11	Qatar '12-'15	Bahrain '08-'11	Bahrain '12-'15	Oman '08-'11	Oman '12-'15	Iraq '08-'11	Iraq '12-'15	Israel '08-'11	Israel '12-'15
■ U.S.	0	0	12100	20400	5800	10500	1900	3000	1200	1500	0	100	400	100	200	800	2600	4400	3800	3500
■ Russia	200	100	800	4200	0	0	400	200	100	300	0	0	0	0	0	0	300	3700	200	0
■ China	0	0	1100	1200	700	600	100	0	0	100	300	0	0	0	0	0	0	500	0	0
■ Major Western Euro.	300	0	7300	10400	5600	5800	700	1200	0	0	0	900	0	0	700	2100	300	400	0	1300
■ All Other European	300	0	1800	3200	900	700	600	700	0	0	0	700	0	100	0	200	300	800	0	0
■ All Others	200	0	200	1400	0	100	0	400	0	0	0	0	0	0	0	400	200	500	0	0

Source: Catherine A. Theohary, *Conventional Arms Transfers to Developing Nations, 2008-2015*, 30, Congressional Research Service, December 19, 2016, <https://www.google.com/search?q=Congressional+Research+Service%2C+data+on+arms+transfers&ie=utf-8&oe=utf-8>

# SIPRI Estimates of Global Arms Sale Trends by Seller and Region: 1979-2018

- The five largest exporters in 2014–18 were the United States, Russia, France, Germany and China. Together, they accounted for 75 per cent of the total volume of arms exports in 2014–18.
- US exports accounted for 36 per cent of the global total in 2014–18. US arms exports in 2014–18 grew by 29 per cent compared with 2009–13.
- Russian arms exports decreased by 17 per cent between 2009–13 and 2014–18. French, German and Chinese arms exports in 2014–18 were higher than in 2009–13, with respective increases of 43, 13 and 2.7 per cent.
- The five largest importers in 2014–18—Saudi Arabia, India, Egypt, Australia and Algeria— together received 35 per cent of all arms imports.
- The main recipient region in 2014–18 was Asia and Oceania (accounting for 40 per cent of global imports), followed by the Middle East (35 per cent), Europe (11 per cent), Africa (7.8 per cent) and the Americas (6.2 per cent).
- Between 2009–13 and 2014–18 arms imports by states in the Middle East increased by 87 per cent.
- By contrast, overall imports decreased in the Americas (–36 per cent), Europe (–13 per cent), Asia and Oceania (–6.7 per cent) and Africa (–6.5 per cent).

# SIPRI: Comparative Gulf Arms Imports, 2000-2018

(Current \$ U.S. Billions)

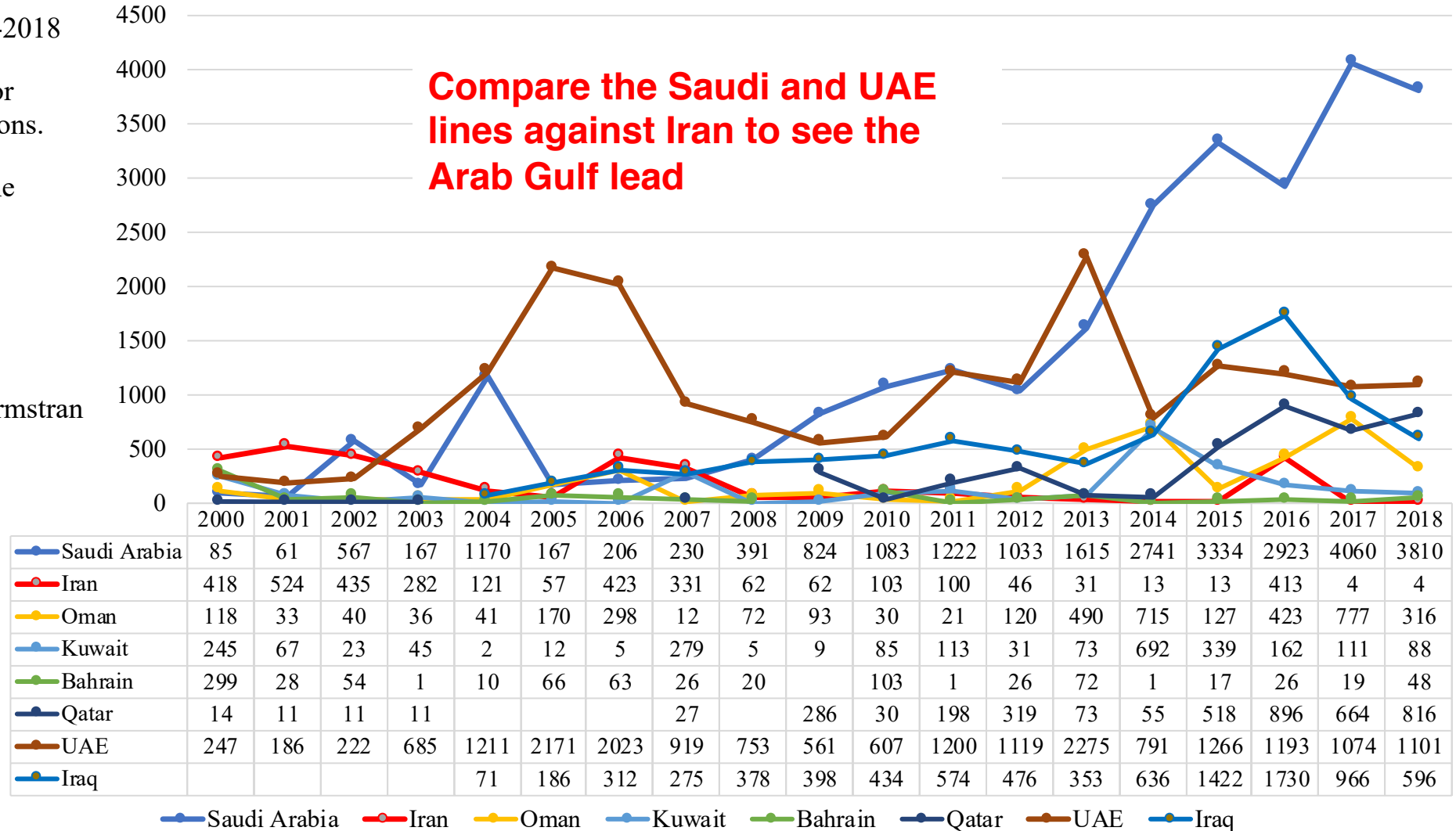
TIV of arms exports to all, 2000-2018

Figures are SIPRI Trend Indicator Values (TIVs) expressed in millions.

Figures may not add up due to the conventions of rounding.

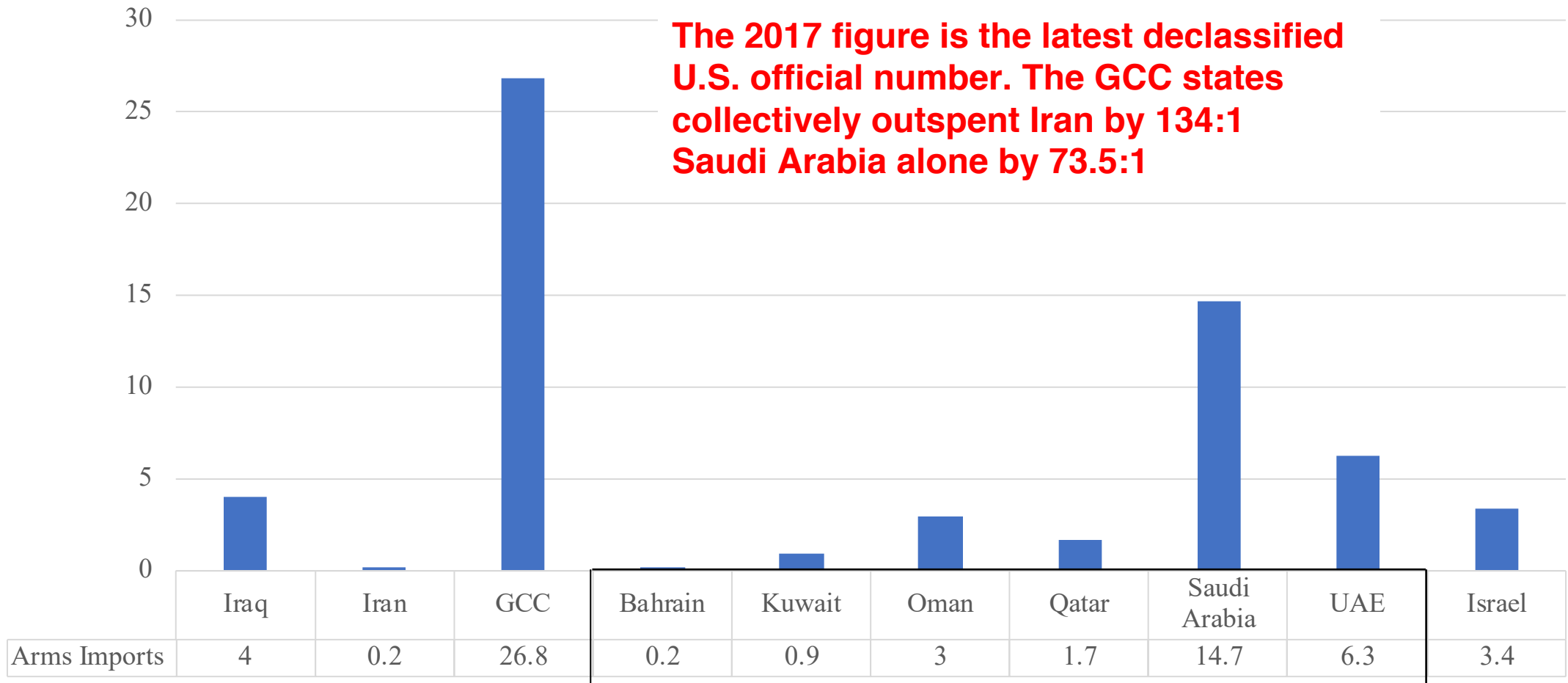
A '0' indicates that the value of deliveries is less than 0.5m

For more information, see <http://www.sipri.org/databases/armstransfers/sources-and-methods/>



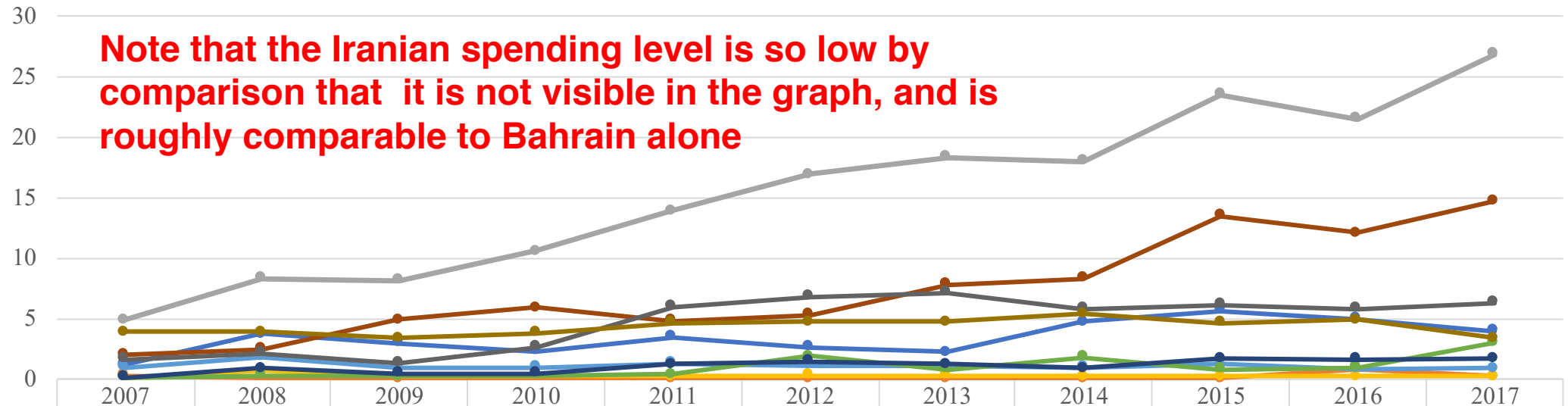
# WMEAT: Total Value of Annual Arms Imports in 2017

(Current \$ U.S. billions)



Source: Bureau of Arms Control, “World Military Expenditures and Arms Transfers 2019 Tables II IV Arms Transfer Deliveries, 2007 2017,” Table IIe., *U.S. Department of State*, 2019, <https://www.state.gov/world-military-expenditures-and-arms-transfers-2019/>

# WMEAT: Trends in the Total Value of Annual Arms Imports from 2007 - 2017 (Current \$ U.S. billions)



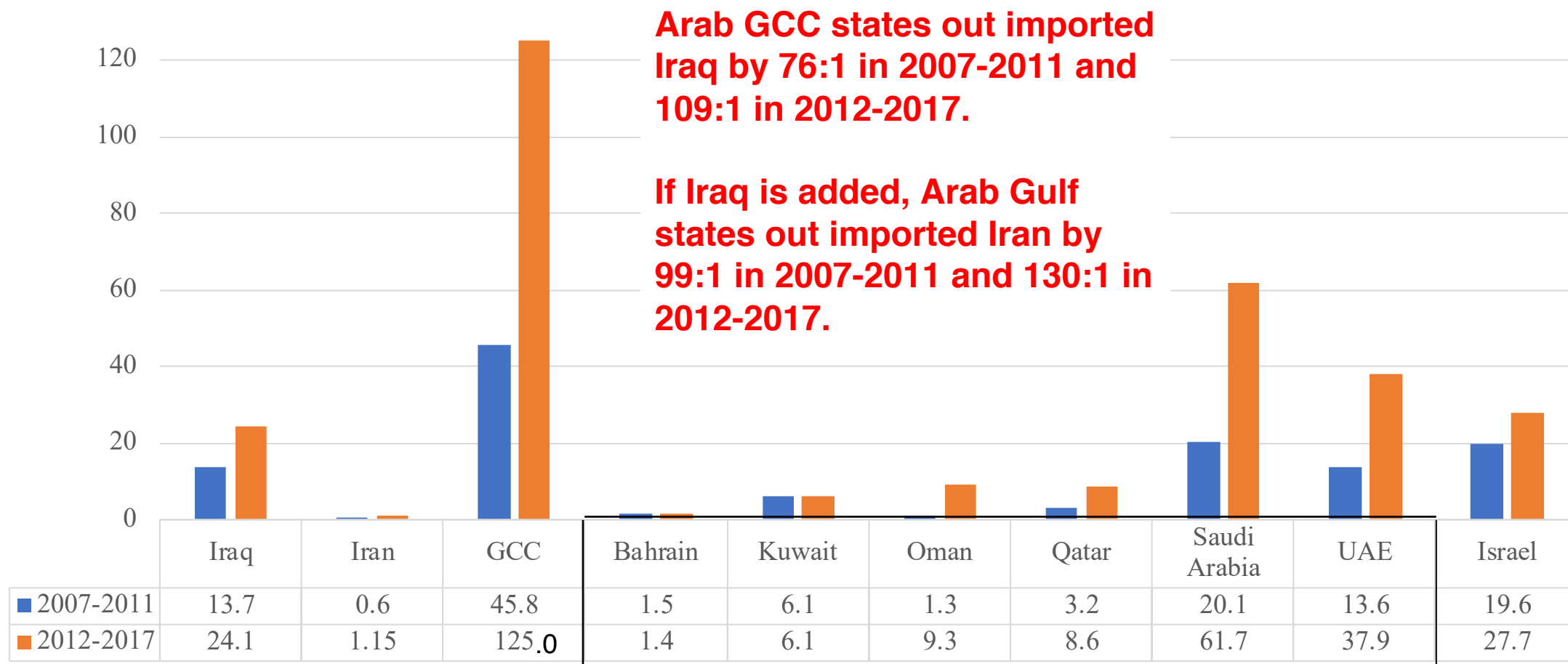
**Note that the Iranian spending level is so low by comparison that it is not visible in the graph, and is roughly comparable to Bahrain alone**

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Iraq	1.2	3.7	3	2.3	3.5	2.6	2.2	4.7	5.6	5	4
Iran	0.3	0.1	0.05	0.1	0.05	0.05	0.05	0	0.05	0.8	0.2
GCC	4.9	8.3	8.1	10.6	13.9	16.9	18.3	18	23.5	21.5	26.8
Bahrain	0.1	0.7	0.2	0.3	0.2	0.3	0.3	0.2	0.2	0.2	0.2
Kuwait	1	1.8	1	1	1.3	1.1	1.1	1	1.2	0.8	0.9
Oman	0.1	0.3	0.2	0.3	0.4	1.9	0.8	1.8	0.8	1	3
Qatar	0.1	0.9	0.5	0.5	1.2	1.5	1.2	0.9	1.7	1.6	1.7
Saudi Arabia	2	2.5	4.9	5.9	4.8	5.3	7.8	8.3	13.5	12.1	14.7
UAE	1.6	2.1	1.3	2.6	6	6.8	7.1	5.8	6.1	5.8	6.3
Israel	3.9	3.9	3.4	3.8	4.6	4.7	4.7	5.4	4.6	4.9	3.4



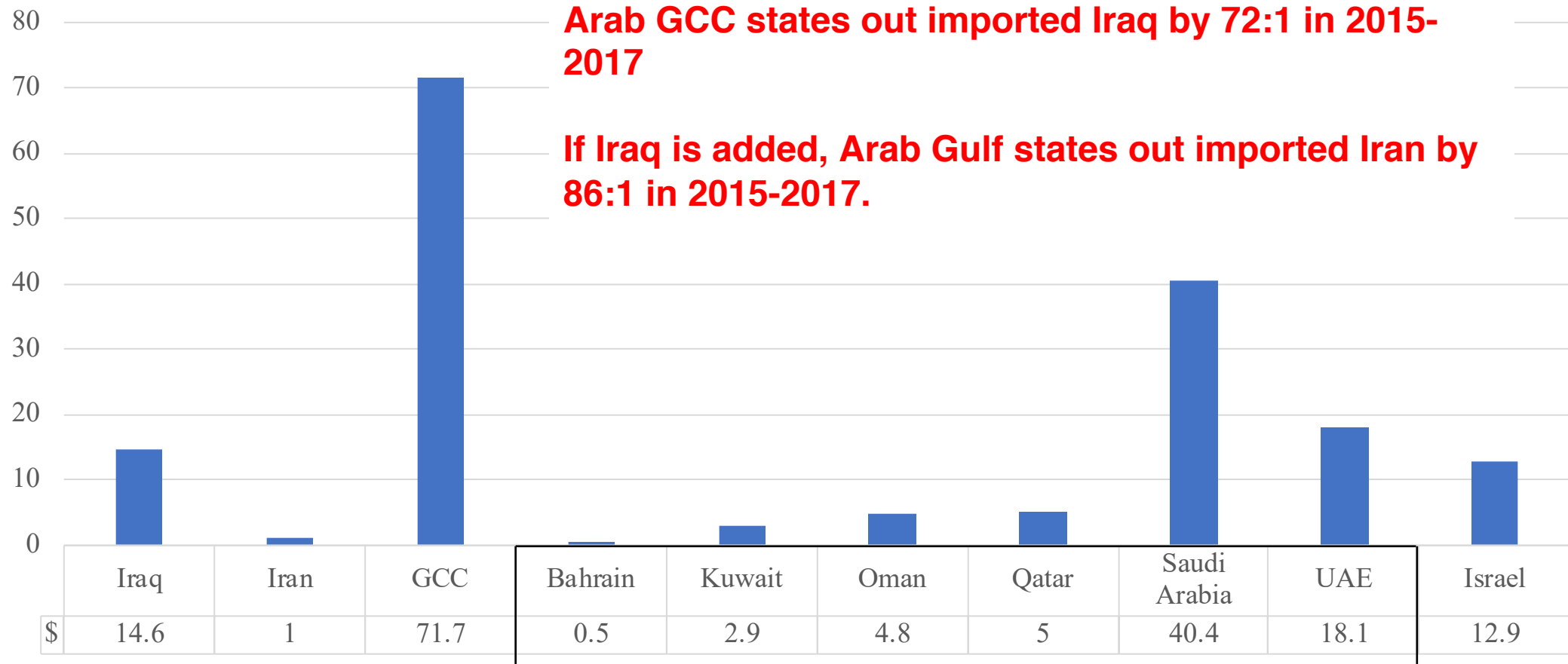
# WMEAT: Total Value of Annual Arms Imports in 2007-2011 and 2012-2017

(Current \$ U.S. billions)



Source: Bureau of Arms Control, “World Military Expenditures and Arms Transfers 2019 Tables II IV Arms Transfer Deliveries, 2007 2017,” Table IIe., *U.S. Department of State*, 2019, <https://www.state.gov/world-military-expenditures-and-arms-transfers-2019/>

# WMEAT: Total Value of Cumulative Arms Transfer Deliveries in 2015-2017 (Current \$ U.S. billions)



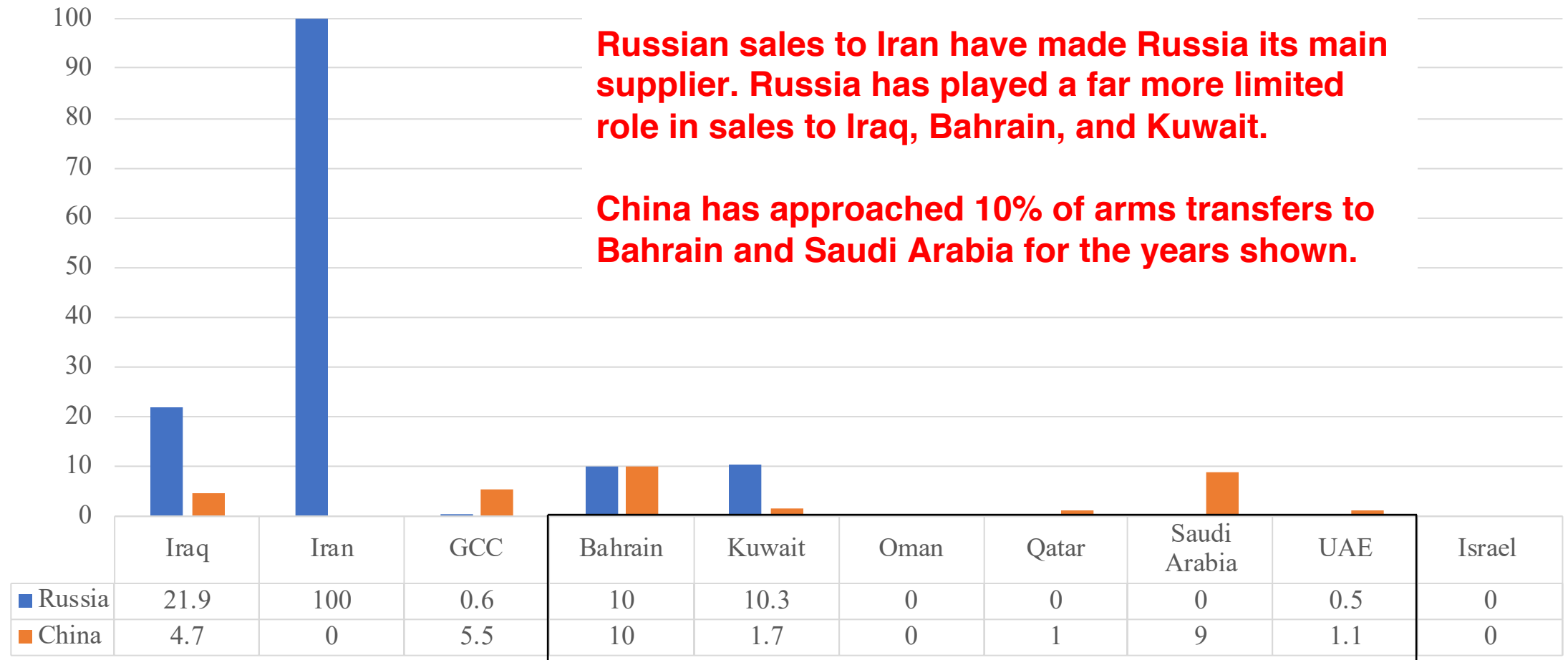
Source: Bureau of Arms Control, “World Military Expenditures and Arms Transfers 2019 Tables II IV Arms Transfer Deliveries, 2007 2017,” Table III, *U.S. Department of State*, 2019, <https://www.state.gov/world-military-expenditures-and-arms-transfers-2019/>

# WMEAT: Total Value of Arms Transfer Deliveries from Russia and China between 2015-2017 (Current \$ U.S. billions)



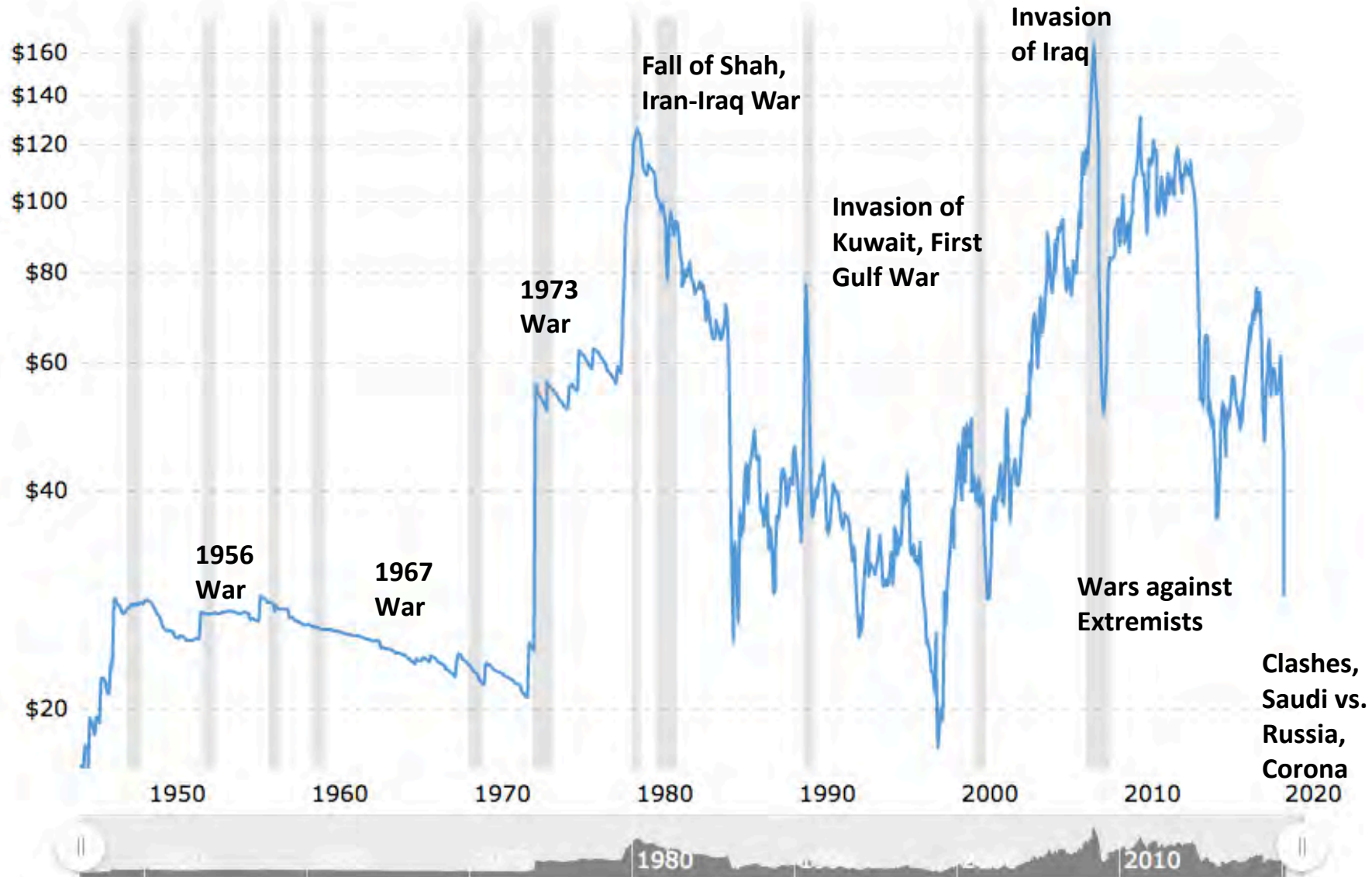
Source: Bureau of Arms Control, “World Military Expenditures and Arms Transfers 2019 Tables II IV Arms Transfer Deliveries, 2007 2017,” Table III, *U.S. Department of State*, 2019, <https://www.state.gov/world-military-expenditures-and-arms-transfers-2019/>

## WMEAT: Value of Arms Transfer Deliveries from Russia and China as Percent of Total Value of Arms Transfer Deliveries between 2015-2017



Source: Adapted by author from Bureau of Arms Control, “World Military Expenditures and Arms Transfers 2019 Tables II IV Arms Transfer Deliveries, 2007 2017,” Table III, *U.S. Department of State*, 2019, <https://www.state.gov/world-military-expenditures-and-arms-transfers-2019/>

# Economics. War, and Uncertainty in Global Oil Prices: 1950-2020



Source: West Texas Intermediate (WTI or NYMEX) crude oil prices per barrel back to 1946. The price of oil shown is adjusted for inflation using the headline CPI and is shown by default on a logarithmic scale. The current month is updated on an hourly basis with today's latest value. The price of WTI crude oil as of March 16, 2020 was **\$28.70** per barrel; Adapted by Anthony H. Cordesman from Marcotrends, <https://www.marcotrends.net/1369/crude-oil-price-history-chart>

# Sudden Swings and Radical Differences in National “Oil Wealth”

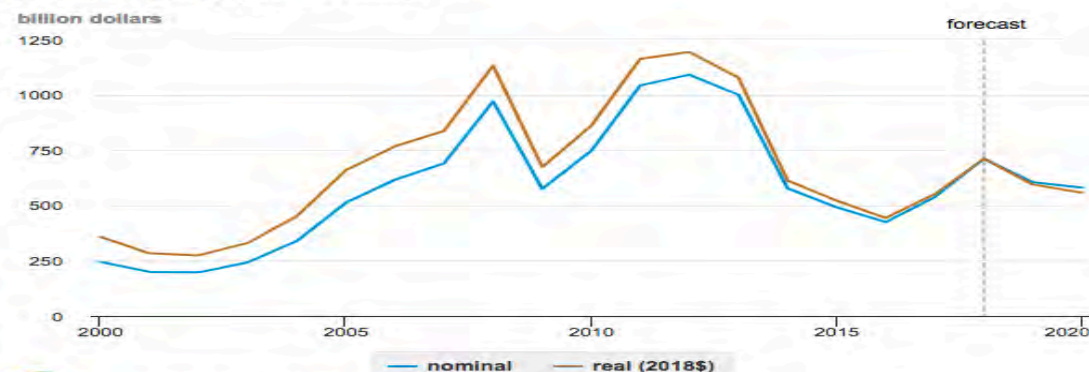
OPEC net oil export revenues

Country	Nominal (billion \$)				Real (billion 2018\$)					
	2017	2018	2019	2020	Jan-Jul 2019	2017	2018	2019	2020	Jan-Jul 2019
Algeria	\$24	\$30	--	--	\$16	\$24	\$30	--	--	\$15
Angola	\$30	\$37	--	--	\$19	\$31	\$37	--	--	\$18
Congo (Brazzaville)	\$5	\$8	--	--	\$5	\$5	\$8	--	--	\$5
Ecuador	\$5	\$6	--	--	\$3	\$5	\$6	--	--	\$3
Equatorial Guinea	\$4	\$5	--	--	\$2	\$4	\$5	--	--	\$2
Gabon	\$4	\$5	--	--	\$3	\$4	\$5	--	--	\$3
Iran	\$55	\$67	--	--	\$20	\$57	\$67	--	--	\$19
Iraq	\$66	\$91	--	--	\$52	\$67	\$91	--	--	\$51
Kuwait	\$45	\$61	--	--	\$34	\$46	\$61	--	--	\$33
Libya	\$13	\$21	--	--	\$13	\$14	\$21	--	--	\$13
Nigeria	\$32	\$42	--	--	\$23	\$33	\$42	--	--	\$22
Saudi Arabia	\$172	\$237	--	--	\$120	\$176	\$237	--	--	\$118
United Arab Emirates	\$56	\$74	--	--	\$42	\$57	\$74	--	--	\$41
Venezuela	\$28	\$27	--	--	\$9	\$29	\$27	--	--	\$8
OPEC	\$538	\$711	\$604	\$580	\$359	\$551	\$711	\$593	\$556	\$353

OPEC per capita net oil export revenues

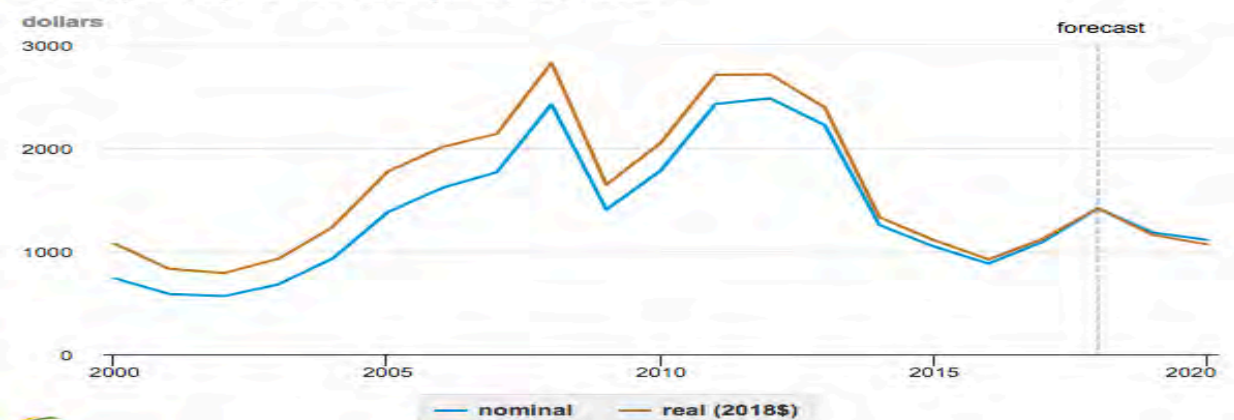
Country	Nominal (\$)				Real (2018\$)					
	2017	2018	2019	2020	Jan-Jul 2019	2017	2018	2019	2020	Jan-Jul 2019
Algeria	\$579	\$709	--	--	\$370	\$593	\$709	--	--	\$363
Angola	\$1,011	\$1,208	--	--	\$586	\$1,036	\$1,208	--	--	\$576
Congo (Brazzaville)	\$859	\$1,561	--	--	\$828	\$880	\$1,561	--	--	\$813
Ecuador	\$280	\$348	--	--	\$198	\$287	\$348	--	--	\$194
Equatorial Guinea	\$3,108	\$3,540	--	--	\$1,632	\$3,184	\$3,540	--	--	\$1,602
Gabon	\$1,753	\$2,223	--	--	\$1,212	\$1,796	\$2,223	--	--	\$1,190
Iran	\$685	\$820	--	--	\$240	\$701	\$820	--	--	\$235
Iraq	\$1,715	\$2,304	--	--	\$1,292	\$1,757	\$2,304	--	--	\$1,269
Kuwait	\$10,965	\$14,683	--	--	\$8,003	\$11,232	\$14,683	--	--	\$7,858
Libya	\$2,096	\$3,214	--	--	\$1,949	\$2,147	\$3,214	--	--	\$1,914
Nigeria	\$166	\$212	--	--	\$112	\$170	\$212	--	--	\$110
Saudi Arabia	\$5,248	\$7,098	--	--	\$3,529	\$5,376	\$7,098	--	--	\$3,465
United Arab Emirates	\$5,911	\$7,797	--	--	\$4,343	\$5,376	\$7,797	--	--	\$4,264
Venezuela	\$875	\$834	--	--	\$262	\$897	\$834	--	--	\$258
OPEC	\$1,094	\$1,416	\$1,180	\$1,109	\$702	\$1,121	\$1,416	\$1,158	\$1,065	\$689

OPEC net oil export revenues



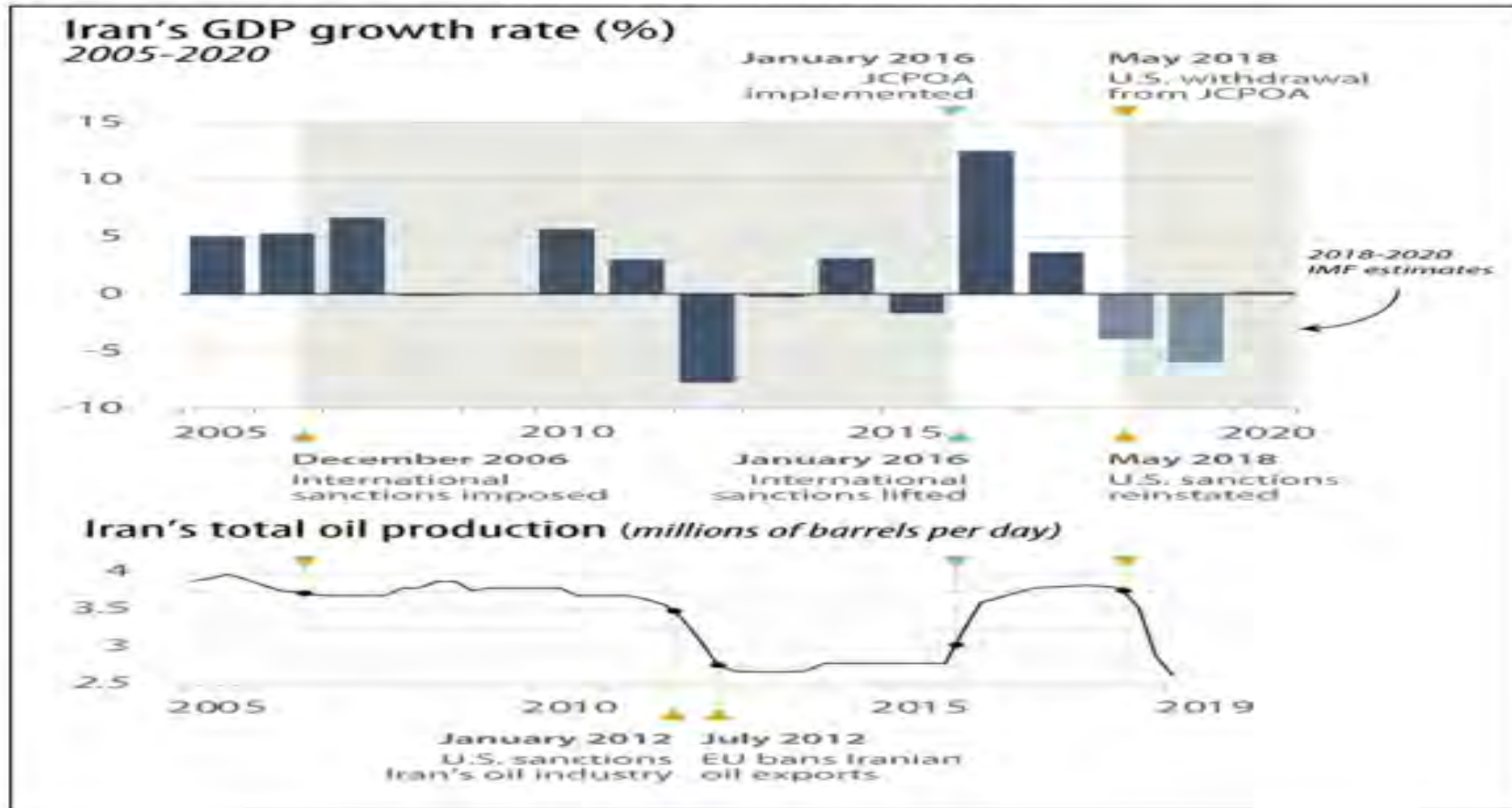
Sources: EIA, derived from data published in the August 2019 Short-Term Energy Outlook.

OPEC per capita net oil export revenues





# Initial Impact of Renewal of Sanctions on Iran (Congressional Research Service)



Sources: IMF 2019, U.S. Energy Information Administration, OPEC.

# Impact of Sanctions on Iran Unplanned Petroleum Production Outages

EIA defines spare crude oil production capacity—which only applies to OPEC members adhering to OPEC production agreements—as potential oil production that could be brought online within 30 days and sustained for at least 90 days, consistent with sound business practices.

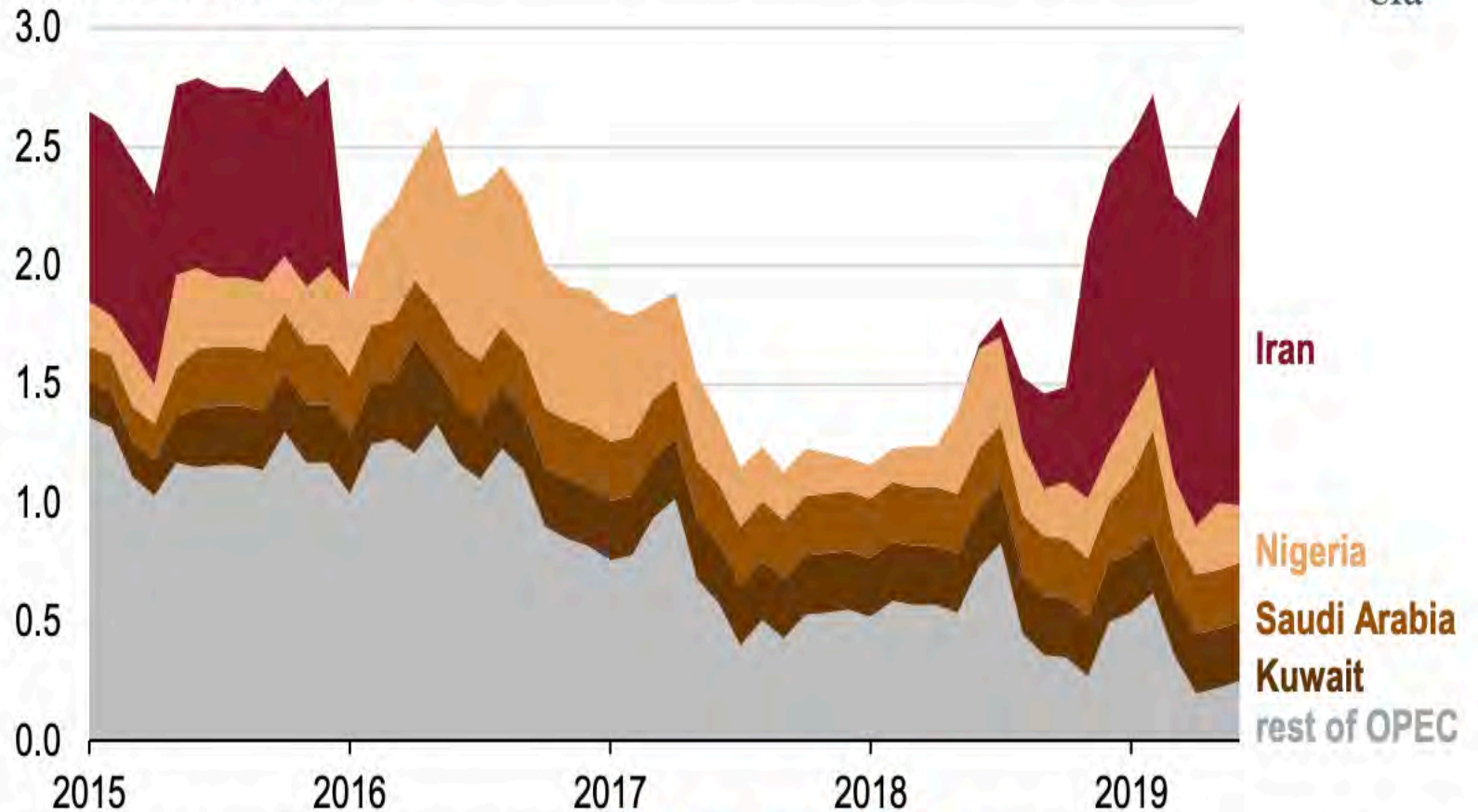
EIA does not include unplanned crude oil production outages in its assessment of spare production capacity.

As an example, EIA considers Iranian production declines that result from [U.S. sanctions](#) to be unplanned production outages, making Iran a significant contributor to the total OPEC unplanned crude oil production outages.

During the fourth quarter of 2015, before the [Joint Comprehensive Plan of Action](#) became effective in January 2016, EIA estimated that an average 800,000 b/d of Iranian production was disrupted.

In the first quarter of 2019, the first full quarter since U.S. sanctions on Iran were re-imposed in November 2018, Iranian disruptions averaged 1.2 million b/d.

Unplanned OPEC crude oil production outages (January 2015 - June 2019)  
million barrels per day



Source: U.S. Energy Information Administration, [Short-Term Energy Outlook](#), July 2019

Note: OPEC disruptions include crude oil only.



**The First Key Shift in the  
Military Balance:  
Changes in the Regional  
Struggle for Strategic Control  
and Influence**

# Shifts in the Regional Struggle for Strategic Control and Influence

The maps and data in this section focus on the first key shift in the Gulf military balance: Changes in the regional struggle for strategic control and influence. They illustrate the changing strategic relationships between Iran and the Arab world, Iran's rising influence outside the Gulf, and the importance of developments in Syria, Lebanon, Iraq, and Yemen – as well as the strategic depth of Saudi Arabia and Iran as well as the importance of the Red Sea – an issue discussed in more detail later in the section on the impact of petroleum exports on the Gulf military balance.

Several key points deserve emphasis because they help illustrate just how unstable the current military balance really is when it comes to possible conflicts and confrontations – even if one ignores the Coronavirus:

- **Major Shifts in the Regional Struggle**

- The Strait of Hormuz and the actual waters of the Gulf have great strategic importance, but they are only a limited part of the territory that needs to be secured. The emergence of Syria and Yemen as key centers of conflict – and Iranian activity – since 2011 has radically changed the nature and strategic depth of the Gulf military balance, as has Russia's efforts to rebuild its military ties and bases in Syria, and Turkey's efforts to intervene in Syria and Iraq.
- Iraq's location alone makes its future alignments with Iran versus the United States and the Arab Gulf states one of the most critical factors shaping the regional balance – along with its role as a major oil exporter, a key factor in Sunni-Shiite and Arab-Kurdish-Turkish tensions, and its future decisions in rebuilding its military forces to go from counterinsurgency forces to defense against foreign powers.
- China as of yet has kept a relatively low profile, but its creation of ports in Pakistan and Djibouti, its Belt and Road Initiative (BRI), its growing regional arms sales, and its creation of a naval base in Djibouti all indicate its interest in both securing the flow of petroleum to China and its role as a major global power.

- **The Uncertain Shi'ite Crescent**

- For all the talk of a "Shi'ite crescent," it is important to note that most of Syria's conventional forces are now ineffective, and the remainder are best suited to fighting various rebel factions. The Assad regime's portions of Syria lack effective governance and economic development and are dependent on Iran and Russia for military support and humanitarian aid for support of its civil economy.
- The Assad regime's exceptional levels of corruption and its crippled economy place severe limits on its ability to act as a military power and even on its ability to complete efforts to fully regain control of Syria in the face of its conflict with Turkey over the control of Idlib and continuing (if uncertain) U.S. support of the independent Kurdish-Arab zone in Northeast Syria.

- The Hezbollah and some Iraqi Shiite Popular Mobilization Forces with links to Iran are relatively effective and light military forces, but they are not modern, well-equipped combat forces.
- Lebanon has virtually imploded as both a government and an economy. The Hezbollah has emerged as a key faction and major military force, but the state remains deeply divided along sectarian lines and the Lebanese Army is not tied to the Hezbollah. Like Syria, Lebanon has also become a failed state, with exceptional levels of corruption and a crippled economy that places severe limits on its ability to act as a military power.
- Iraq remains a key wild card, and there is no real “Shi’ite crescent” unless it can somehow be brought under far more direct Iranian influence and control. In spite of its sectarian and ethnic tensions, Iraqi nationalism remains a real force, and Iran is far from broadly popular even among Iraq’s Shi’ites.
- Iran has made good use of the Yemeni civil war(s) and the Saudi fight with the Houthi to gain access to the Red Sea and put military pressure on Saudi Arabia. Just as its transfers of missiles and weapons to the Hezbollah put pressure on Israel – as do more limited transfers to Palestinian elements in Gaza and the Sinai – its transfer of missiles and rockets to the Houthi has allowed it to indirectly attack Saudi Arabia with varying degrees of plausible and implausible deniability. It is far from clear, however, whether any current faction in Yemen can establish control over the entire country, end its civil conflicts, create some form of meaningful economy, and make it an effective player in the region’s power struggles.

#### **Arab as a Four Letter “Acronym” for Dysfunctional and Divided**

- At the same time, the maps in this section reinforce the self-destructiveness of the divisions between the Arab Gulf states and its petty “game of thrones.” It is clear from geography alone that effective military action requires cooperation and interoperability while the boycott and the rivalries between Arab Gulf states not only limit the effectiveness of their military forces but also make them extraordinarily dependent on the U.S. – particularly the 5<sup>th</sup> Fleet in Bahrain and the Combined Air Operations Center (COAC in Qatar) for common training, military exercises, effective battle management, C<sup>4</sup>, cyberwarfare, and IS&R in any serious conflict.

# DIA Assessment of Iran's Ties to Syria and the Hezbollah

**Partners, Proxies, and Affiliates:** The IRGC-QF maintains a wide and varied network of nonstate partners, proxies, and affiliates primarily in the Middle East. Iran provides a range of financial, political, training, and materiel support to these groups. Iran's provision of military hardware has included small arms, ammunition, explosives, improvised explosive devices (IEDs), explosively formed penetrators (EFPs), vehicles, antitank guided missiles (ATGMs), man-portable air defense systems (MANPADS), artillery, rockets, UAVs, and some more-advanced systems, such as ASCMs and ballistic missiles, despite UN resolutions prohibiting Iranian arms exports.

Tehran's partners, proxies, and affiliates include Hezbollah, Iraqi Shia militias, the Huthis, some Palestinian groups, the Taliban, and Bahraini militants. The level and type of support Iran provides to these groups depends on the nature of the relationship and the objectives Iran seeks to achieve. Stronger partners, such as Hezbollah, are highly capable, reliable, and receptive to Tehran. Other groups, such as the Afghan Taliban, are less receptive to Iranian guidance but still help further Iran's regional objectives because they combat common enemies.

**Hizballah:** Hizballah is Iran's most important and longest-standing nonstate partner and a core member of Tehran's "Axis of Resistance." Shared goals, ongoing personal relationships, and enduring ideological, cultural, and religious ties have contributed to the strength of the partnership. The IRGC-QF has collaborated closely with Hizballah to grow Iran's influence and capacity throughout the region and beyond, using the group to help train and equip other proxies. Iran has attempted to help temper international perceptions of Hizballah as a terrorist organization and increase

Hizballah's legitimate political standing in Lebanon. In recent years, both groups have focused their cooperation on immediate needs in Syria and Iraq...Hizballah, a highly adaptable and malleable organization, has evolved from its insular origins as a sectarian actor in Lebanon into a far more complex regional actor. Hizballah's role in Lebanon—in its formal political institutions, as a social provider for Shia society and as a self-proclaimed defender against Israeli aggression— primarily defines its reason for existence.

However, the group has increasingly defined its other regional activities—including involvement in Syria, Iraq, and Yemen—as working in concert with its internal Lebanon-centric goals. This concept of Hizballah as a regional power directly contradicts Lebanon's policy of disassociation and has increased sectarian tensions at home...Hizballah has steadily grown as a military power during the past several decades. Asymmetric attacks against Israel in the 1980s and 1990s, followed by a major conflict in 2006, initially confirmed Hizballah's self-imposed title as a "resistance" force against Israel. Since the 2006 Israel-Hizballah War, Hizballah has steadily increased its military arsenal, promising that any future conflict will be more devastating.

Source: DIA, *Iran Military Power, Ensuring Regime Survival and Securing Regional Dominance*, DIA, November 2019, pp. 58-60

# DIA Assessment of Iran's Ties to Syria and the Hezbollah

Hizballah's concentration of power has allowed it to transform from a hybrid guerilla force into a nascent conventional military, with the capacity to deploy an expeditionary force in Syria in support of the Assad regime and Iran. Hizballah maintains a stockpile of approximately 120,000– 150,000 rockets, a massive expansion in capability compared with the approximately 13,000 it had available during the 2006 conflict....Hizballah has an estimated 45,000 fighters, divided between as many as 21,000 full-time personnel and a 24,000-person reserve force.

## **Shia Foreign Fighters:**

To support its operations in Syria, Iran has employed a variety of Shia foreign fighters from the region, including the Fatemiyun, Zeinabiyun, and Heidariyun, who are fighters of Afghan, Pakistan, and Iraqi origin, respectively. The Fatemiyun and Zeinabiyun are recruited primarily from refugee populations in Iran, while the Heidariyun generally come from established Iraqi Shia militias. These groups have served as a proxy force to fight alongside pro-regime forces in Syria under the direction of the IRGC-QF and Hizballah. Before being sent into combat, these foreign fighters receive basic training in military skills from Iran or Hizballah.

Training usually lasts only 20–45 days, although some fighters reportedly receive additional specialized training, such as sniper courses. Tehran is likely to continue using these fighters in Syria, and it is unclear if there are plans to deploy them to other locations.

## Broader Gulf Military Theater

US Role?  
European power Projection?  
Russia?  
China?  
Turkey?  
Egypt, Jordan, Yemen?  
Red Sea, Arabian Sea? Gulf of Oman?  
Afghanistan?



Source: Geographic Guide, “Map of Middle East,” 2008,  
<https://www.geographicguide.com/asia/maps/middleeast.htm>

## DIA Map of Iranian Partners, Proxies, and Affiliates

Source: DIA, *Iran Military Power, Ensuring Regime Survival and Securing Regional Dominance*, 58, 2019, [https://www.dia.mil/Portals/27/Documents/News/Military%20Power%20Publications/Iran\\_Military\\_Power\\_LR.pdf](https://www.dia.mil/Portals/27/Documents/News/Military%20Power%20Publications/Iran_Military_Power_LR.pdf)





# Iran's Key Areas of Strategic Influence



Source: Glenn Kates, "Iran's Reach Widens," *Radio Free Europe/Radio Liberty*, <https://www.rferl.org/a/iran-influence-yemen-iraq/26924135.html>



# Scale of Gulf Region for Military Operations

Called the Persian Gulf by Iran and the Arabian Gulf in the Arab world.

Gulf waters cover 96,912 square mi (251,000 square km), between the Arabian peninsula and Iran.

Extend some 600 miles (989km) from the Shatt al Arab delta to the Strait of Hormuz, which links it with the Gulf of Oman, 932 kilometers from Kuwait to Strait of Hormuz.

Width ranges from 35 miles (56 kilometers) in the southeast to a maximum of 210 miles (338 kilometers).

Average depth: 50 m (160 ft), Max. depth: 90 m (300 ft)

Strait of Hormuz at its narrowest point, is only 21 miles wide, and the width of the shipping lane in either direction is just 2 miles, separated by a two-mile buffer zone.

Comparative National Area and Coastlines:

	<u>Area (Square Kilometers)</u>	<u>Coastline (Square Kilometers)</u>	<u>Land Boundaries Area (Square Kilometers)</u>
Bahrain	760	161	0
Iran	1,648,195	2,440	5,894
Iraq	438,317	58	3,809
Kuwait	17,818	475	499
Oman	309,500	2,092	1,561
Qatar	11,586	87	563
Saudi Arabia	2,149,680	2,640	4,272
UAE	93,600	1,318	1,066
Yemen	27,968	1,906	1,601

# A Deeply Divided Arab Gulf Cooperation Council



Source: National Council on U.S.-Arab Relations, “The GCC summit in perspective: A Conversation with John Duke Anthony,” December 20, 2010, [https://ncusar.org/email\\_graphics/announcements/10-12-20-gcc-summit.html](https://ncusar.org/email_graphics/announcements/10-12-20-gcc-summit.html) ; and On the World Map, “United Arab Emirates Maps UAE,” <http://ontheworldmap.com/uae/>

# Bahrain's Island Vulnerability

## Ethnic groups:

Bahraini 46%, Asian 45.5%, other Arab 45.7%, African 1.6%, European 1%, other 1.2% (2010 census)

## Languages:

Arabic (official), English, Farsi, Urdu

## Religions:

Muslim (Shia and Sunni) 70.3%, Christian 14.5%, Hindu 9.8%, Buddhist 2.5%, other 2.8% (2010 census)

Shi'ite-Sunni sectarian tension has been a continuing challenge.

## Population:

1,410,942 July 2017 est.

country comparison to the world: 155 note: population is 48% immigrant.

urban population: 89.3% of total population (2018); rate of urbanization: 4.38% annual rate of change (2015-20 est.)

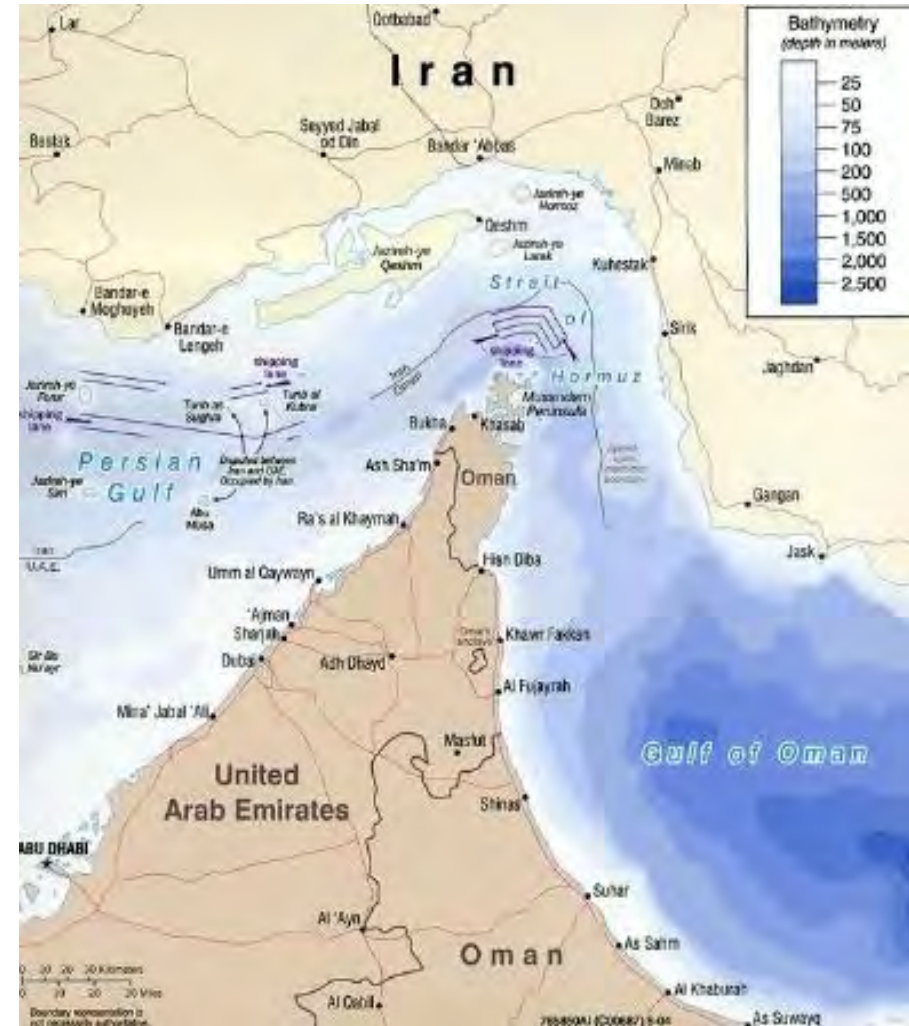




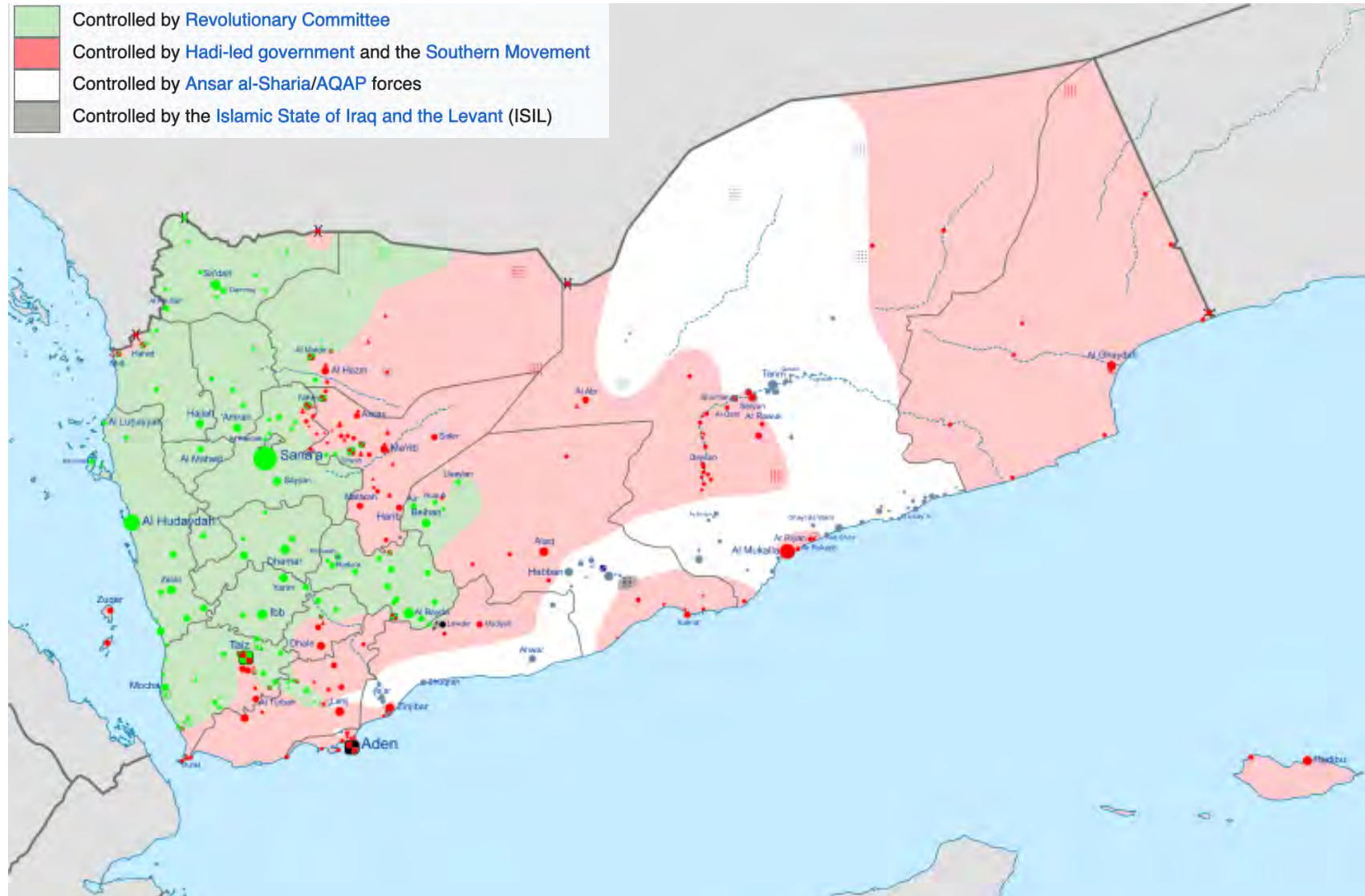
# Key Naval Operating Areas In and Near the Gulf



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# The Yemen War in February 2020



# **Iraq is a Pivotal Focus of the U.S. and Iranian Struggle for Influence in the Gulf**

# Iraq is a Pivotal Focus of the Struggle for Influence

The previous chronology and analysis have already shown how critical of a role Iraq plays in shaping the overall regional balance, the regional stability, and Iran's broader levels of regional influence. The following charts only focus on the military balance – and do not address Iraq's massive political, governance, and economic problems or the possible impact of the Corona virus – but they show that Iraq's geographic position makes it critical to Iran's ability to sustain its growing strategic influence in the Levant and operate against the other Arab Gulf states. Syria may be the key problem in the region, but Iraq is the prize.

The maps and data in this section provide a picture in graphs of Iraq's strategic depth, its ongoing levels of violence, its vulnerabilities as a major petro-state, the current deployment of U.S. and coalition forces, and broad sectarian areas where Iraqi Popular Military Forces have ties to Iran.

To put these maps in context, it should be noted that:

- The lack of a working central government since 2003, the near-collapse of the Iraqi economy, and Iraq's sectarian and ethnic divisions sharply limit Iraq's ability to develop, implement, and fund any cohesive plan for military modernization.
- The break-up of the ISIS “caliphate” in Iraq has sharply reduced ISIS as a threat, but scarcely eliminated it. Iraqi forces still concentrate on ISIS and other internal threats, and the cost dominates the Iraqi military budget.
- Iraq is still only beginning to rebuild modern forces capable of allowing it to defend against Iran and outside threats. On paper, Iraq has a relatively large number of military personnel – some 193,000. However, these figures often do not reflect real manning or properly trained and equipped personnel, and the exaggerated total of 193,000 still only compares with 310,000 for Iran.
- Similarly, even if one ignores the critical issue of equipment quality:
  - Iraq has 391 main battle tanks; Iran has 1,513.
  - Iran has 333 combat capable aircraft and 184 fighters with some 60% serviceability for older U.S. types and 80% for Russian-PRC supplies aircraft. Iraq has 90 combat capable aircraft. These include some 66 fighters and fighter-attack aircraft. 44 are modern F-16C/D fighters.

- As the previous chronology has shown, Iran and the United States compete for influence at every level.
  - The United States is Iraq's major source of train and assist support and weapons for its regular combat forces, although Russia is also a major arms supplier.
  - Iran has significant influence within the regular armed forces and security forces – and key elements of the Popular Security Forces have ties to Iran and the IRGC. The Kurds has their own forces.



# Iraq's Strategic Position

Source: Maps of the World., “Large detailed political and administrative map of Iraq with roads and cities – 2008,” <http://www.maps-of-the-world.net/maps-of-asia/maps-of-iraq/>



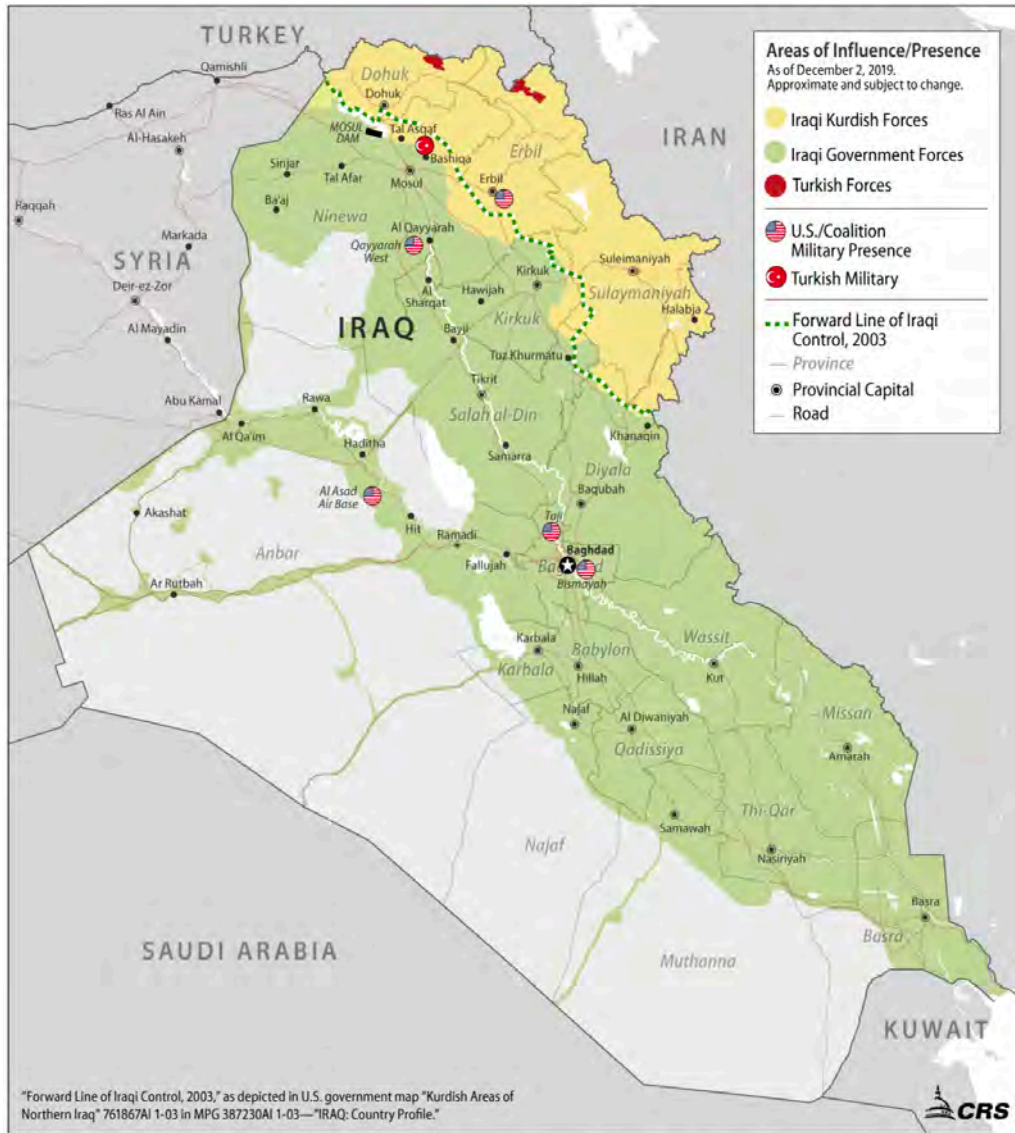
# Iraq: The Current Struggle for Influence

Although the Islamic State’s exclusive control over distinct territories in Iraq ended in 2017, the U.S. intelligence community assessed in 2018 that the Islamic State had “started—and probably will maintain—a robust insurgency in Iraq and Syria as part of a long-term strategy to ultimately enable the reemergence of its so-called caliphate.” ...

U.S. officials have reported that through October 2019, the Islamic State group in Iraq continued “to solidify and expand its command and control structure in Iraq, but had not increased its capabilities in areas where the Coalition was present.”... Combined Joint Task Force-Operation Inherent Resolve (CJTF-OIR) judged that IS fighters “continued to regroup in desert and mountainous areas where there is little to no local security presence” but were “incapable of conducting large-scale attacks.”

...Iraq’s Popular Mobilization Committee (PMC) and its associated militias—the Popular Mobilization Forces (PMF)—were founded in 2014 and have contributed to Iraq’s fight against the Islamic State, but they have come to present an implicit, and, at times, explicit challenge to the authority of the state...Despite expressing appreciation for PMF contributions to the fight against IS, some Iraqis and outsiders have raised concerns about the future of the PMC/PMF and some of its members’ ties to Iran.

...The U.S. Intelligence Community described Iran-linked Shia militia—whether PMF or not—as the “primary threat” to U.S. personnel in Iraq...



**Source:** Congressional Research Service using ArcGIS, IHS Markit Conflict Monitor, U.S. government, and United Nations data.

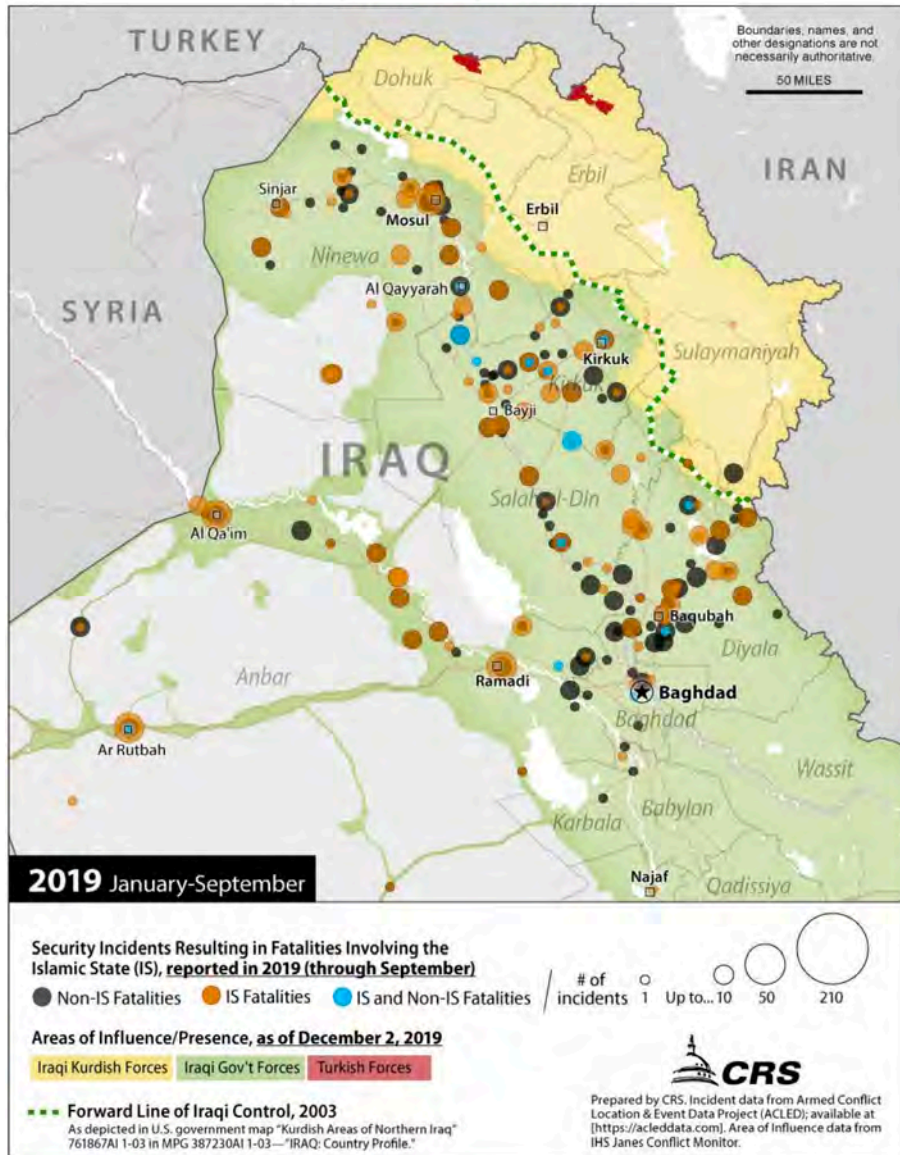
**Notes:** Areas of influence are approximate and subject to change.

Source: Christopher M. Blanchard, “Iraq and U.S. Policy Iraqis Struggle to Define a Way Forward”, *CRS*, R45633, Updated January 10, 2020, [cblanchard@crs.loc.gov](mailto:cblanchard@crs.loc.gov)



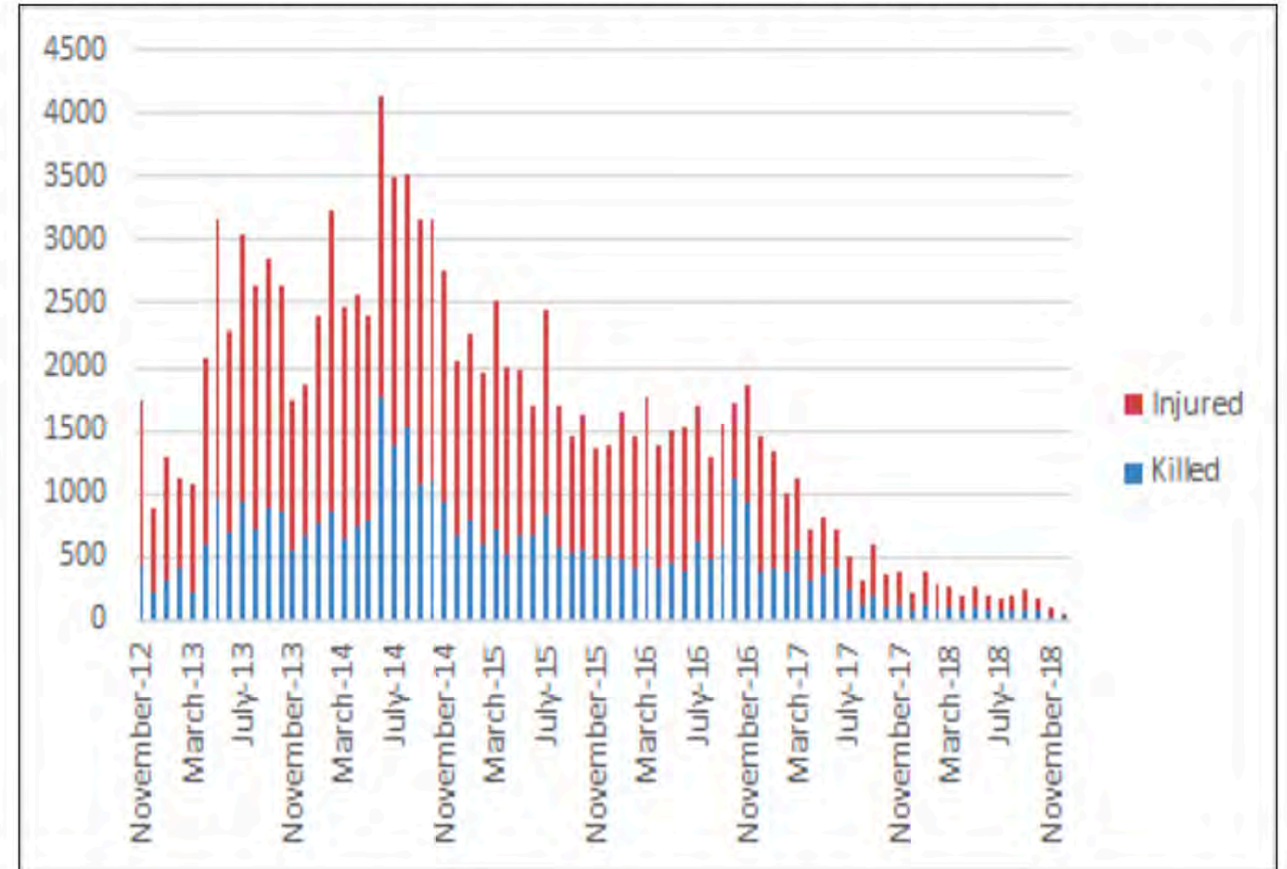
# Iraq's Continuing Internal Violence

**Figure 4. Iraq: Reported Islamic State-Related Security Incidents**  
January 1, 2019 to September 30, 2019



## Estimated Iraqi Civilian Casualties from Conflict and Terrorism

United Nations Assistance Mission in Iraq Estimates of Monthly Casualties, 2012-2018



**Source:** United Nations Assistance Mission in Iraq. Some months lack data from some governorates.

Source: Christopher M. Blanchard, "Iraq: Issues in the 116th Congress," *Congressional Research Service*, R45633, 19, 22, January 20, 2020, <https://fas.org/sgp/crs/mideast/R45633.pdf>

# Iraq's Vulnerable Energy Facilities

Iraq is the second-largest crude oil producer in the Organization of the Petroleum Exporting Countries (OPEC) after [Saudi Arabia](#), and it holds the world's fifth-largest proved crude oil reserves.

Most of Iraq's major known fields—all of which are located onshore—are producing or are in development.

Iraq's crude oil production grew by an average of about 300,000 barrels per day (b/d) from 2013 through 2017, and it averaged 4.4 million b/d in 2017. During the first half of 2018, Iraqi crude oil output stood at about 4.5 million b/d.

These production estimates include oil produced in the Iraqi Kurdistan Region, the semiautonomous northeast region in Iraq governed by the Kurdistan Regional Government (KRG).

Iraq's economy is heavily dependent on crude oil export revenues. In 2017, crude oil export revenue accounted for an estimated 89% of Iraq's total government revenues, according to the International Monetary Fund (IMF).

In 2017, Iraq (excluding KRG) earned almost \$60 billion in crude oil export revenue, \$16 billion more than in 2016, as a result of increasing oil prices and slightly increasing export volumes.

Source: EIA, "Iraq Country Analysis," January 7, 2019,  
<https://www.eia.gov/beta/international/analysis.php?iso=IRQ>





# Iraq's Popular Mobilization Forces

Iraq's regular military forces remain highly dependent on U.S. Security Force and Assist Brigades, which also supports Iraq's army and air force. Iraq also, however, has a wide variety of Popular Mobilization Forces – some of which are closely linked to Iran, others of which support the Iraqi government, and still others that act as more independent elements.

These forces were originally created to fight ISIS in 2014. In theory, they were recognized after the break-up of the ISIS “caliphate” into a new Iraqi Republican Guard in 2018 by then Prime Minister Haider al-Abadi, who supposedly became their commander in chief and linked them to Iraq's regular forces. In practice they have remained highly independent, and many remain loyal to a given Shiite, Sunni, or Kurdish leader or faction. As the previous chronology has shown, key Iranian backed Popular Mobilization Forces have repeatedly attacked U.S. and Coalition forces.

There are no reliable estimates of the current order of battle and force strength of these Popular Mobilization Forces, and some grossly exaggerate actual manning. A Wikipedia estimate as of early 2020 does try to develop a detailed order of battle and states that the forces, “around Tikrit are believed to be about 20,000 engaged militiamen, while the grand total ranges are from 2–5 million to 300,000–450,000 Iraqi armed forces including about 40,000 Sunni fighters – a figure evolving from an early 2015 one, which counted 1,000 to 3,000 Sunni fighters.” In practice, the actual strength of trained and equipped fighters is far lower and varies sharply by individual units of the Popular Mobilization Forces.

The majority of the Popular Mobilization Forces are deeply divided into Sunni and Shi'ite forces, as well as some minority elements. Some Shiite Popular Mobilization Forces support the Iraq central government, some are tied to Iran, and others are tied to individual Iraqi political leaders. Some focus on playing a role in national politics, some on building actual military capability, and some on local policing and security.

**Wikipedia provides a broad summary analysis of these Popular Mobilization Forces, which has major uncertainties and does not reflect the current level of near chaos at the top of the Iraqi government, but it is still of value.**

The Popular Mobilization Forces consist of both new volunteers and pre-existing militias, which have been grouped within the umbrella organization formally under the control of the Ministry of Interior Popular Mobilization Units directorate. Among these militias there are the [Peace Companies](#) (formerly known as the Mahdi Army), [Kata'ib Hezbollah](#), [Kata'ib Sayyid al-Shuhada](#), [Kata'ib al-Imam Ali](#), [Asa'ib Ahl al-Haq](#) and the [Badr Organization](#).

The militias are trained and supported by military advisers from [Turkey](#) (for Sunni and Turkmeni troops), [Iran](#), and [Hezbollah](#), including prominent [Quds Force](#) figures, formerly such as [Qasem Soleimani](#). The Popular Mobilization Forces also appeared to have deployed at least a regiment under the command of Colonel Jumaa al-Jumaily in [Al Anbar Governorate](#). They are also said to have their own military intelligence, administrative systems, a sort of "media war team" that provides morale boosting, battlefield updates and propaganda videos, and a court of law.

Source: See Wikipedia and AP reporting for broad summaries. Force elements shift so rapidly that each element must be individually researched to estimate its current strength and character

Prime Minister [Haider al-Abadi](#) ordered on April 7, 2015, that the Popular Mobilization Forces be placed under the direct command of the prime minister's office, thus giving a further official status to the militia.

The chairman of the Popular Mobilization Committee in the Iraqi government is Falih al-Fayyadh, who is also the National Security Adviser; the Popular Mobilization Committee is under the Office of Prime Minister. The Popular Mobilization Forces are said to be led on the battlefields by Jamal Jaafar Mohammed, also known as [Abu Mahdi al-Muhandis](#), the head of Kata'ib Hezbollah, but the [chain of command](#) runs through pre-existing leaders. According to Iraqi sources, as well as to the London-based pro-Saudi [Asharq Al-Awsat](#), the different militias rely on their own chain of command, and rarely work together or follow regular [Iraqi Army's](#) orders.

Alongside Abu Mahdi al-Muhandis, other people in charge of the Popular Mobilization Forces include [Qais al-Khazali](#), commander of Asa'ib Ahl al-Haq, and [Hadi Al-Amiri](#), the chief of the [Badr Organization](#). According to [The New York Times](#), such organizational autonomy may present a challenge to the consolidation of Haider al-Abadi's authority. Volunteers include [Shiite](#) Arabs, Iraqi Christians, Sunni Arabs, and Shiite Turkmen.

Estimates of the Popular Mobilization Forces' weapons and equipment vary sharply. Some- pro-Iranian Popular Mobilization Forces like the Katib Hezbollah – which the United States has designated as a terrorist force – have publicly shown convoys including American-made military vehicles, including M-1 tanks, M-113 APCs, MRAPs, artillery, and rocket launchers. Other key Iranian-supported Popular Mobilization Forces or forces with some ties to Iran include the Imam Ali Brigades and Sayed al-Shuhada. Other Popular Mobilization Forces that are not tied to Iran – like the Badr militia – have complained about the lack of heavy weapons supplies. As is the case throughout Iraq, relative supplies of – and access to – squad level weapons, explosives, rocket launchers, and some ATGMs and MANPADs is impossible to determine.

Wikipedia describes the main Shiite elements in the Popular Mobilization Forces as follows, but it should be stressed that their composition and alignments keep changing and remain unstable: ([https://en.wikipedia.org/wiki/Popular\\_Mobilization\\_Forces#Shiite\\_Arab\\_component](https://en.wikipedia.org/wiki/Popular_Mobilization_Forces#Shiite_Arab_component)) :

The Popular Mobilization Forces are factionally divided into three Shiite components: a component pledging allegiance to [Supreme Leader of Iran Ali Khamenei](#); a faction pledging allegiance to Grand Ayatollah Ali al-Sistani; and the faction headed by Iraqi cleric Muqtada al-Sadr... The pro-Khamenei faction would consist of already established parties and of relatively small paramilitaries: Saraya Khurasani, Kata'ib Hezbollah, Kata'ib Abu Fadhl al-Abbas, the Badr Organization and Asa'ib Ahl al-Haq. These groups serve as a kind of border guard—a sort of Iranian insurance policy against threats on its immediate border... the pro-Sistani faction consists of those armed groups formed by Sistani's fatwa to defend Shiite holy sites and by paramilitary of the [Islamic Supreme Council of Iraq](#). There are four major groups organized by Najaf: Saraya al-Ataba al-Abbasiya, Saraya al-Ataba al-Hussainiya, Saraya al-Ataba al-Alawiya, and Liwa 'Ali al-Akbar, corresponding to Shiite shrines in [Kadhimiya](#), [Karbala](#), and [Najaf](#)... The Islamic Supreme Council of Iraq also swears allegiance to Sistani. After the Badr Organization left the Islamic Supreme Council of Iraq, its leader Ammar al-Hakim formed new paramilitary units, including Saraya el-Jihad, Saraya el-'Aqida, and Saraya 'Ashura.

Source: See Wikipedia and AP reporting for broad summaries. Force elements shift so rapidly that each element must be individually researched to estimate its current strength and character

Muqtada al-Sadr's Peace Companies (Saraya al-Salam) were founded in June 2014 from the Mahdi Army. According to Faleh A. Jabar and Renad Mansour, the Sadrists have largely been cut off from Iranian funding. The Popular Mobilization Forces has been run by Abu Mahdi al-Muhandis, a commander designated a terrorist by Washington.

The Badr Organization is one of the largest groups within the Popular Mobilization Forces. Its chief, Hadi al-Amiri, also leads the powerful Fatah bloc in parliament.

Qais al-Khizali, who is on a U.S. terror list, heads the Iranian-backed Shiite militia, Asaib Ahl al-Haq, or League of the Righteous. He rose to prominence as a leader in the Shiite insurgency after the 2003 U.S.-led invasion. He has called for U.S. troops to leave Iraq now that the Islamic State group has been largely defeated

A more independent force and parliamentary bloc is led by populist Shiite cleric Muqtada al-Sadr, who has realigned himself with recent anti-government protests opposing Iranian influence in Iraq.

The exact level of Iranian influence over the Popular Mobilization Forces is hard to determine, as is that of pro-U.S. support in Iraq's regular military forces. Iran's Al Quds force and other Iranian forces have played a major role in trying to win influence over the Popular Mobilization Forces and build-them up as major factors in Iraqi politics, but so have the Iranian government at the political level, other IRGC forces and training centers, elements of the Artesh, and element of Iranian intelligence like the MOIS. The distinction between a real militia and a political element is often unclear, as are the loyalties of given sub-elements.

Source: See Wikipedia and AP reporting for broad summaries. Force elements shift so rapidly that each element must be individually researched to estimate its current strength and character



# The Iranian Supported Popular Mobilization Forces Missile War in Iraq

Iran has provided training and lethal aid to IBGs since the 1980s.<sup>5</sup> Tehran’s provision of sophisticated missiles to these militias, however, is a more recent and growing concern for the United States. An August 2018 report revealed that Iran had transferred a few dozen short-range ballistic missiles to the IBGs.

These shipments included the Zelzal (150-250 km), Fateh-110 (200-300 km), and Zolfaghar (700 km) missiles, complementing the militias’ existing arsenal of unguided 107-mm and 122-mm rockets.<sup>6</sup> These transfers follow and are likely meant to compensate for Iran’s failed efforts to establish forward-deployed bases in Syria.<sup>7</sup>

By early May 2019, Secretary of State Mike Pompeo made an unannounced trip to Iraq to discuss the danger of Iranian missile transfers.<sup>8</sup> Both Congress and the Trump administration have also issued repeated warnings that the United States would consider any attack by Iranian proxies as an attack by Iran.<sup>9</sup>

IBG missile acquisitions have also prompted Israel to launch at least seven airstrikes so far on PMF missile depots in Iraq in 2019, expanding upon Israeli policy of targeting Iranian missile bases in Syria.<sup>10</sup> Nevertheless, recent news reports have highlighted the prospect of additional Iranian missile transfers into Iraq.

IBGs in Iraq possess a sizeable stockpile of unguided 107-mm and 122-mm rockets, manufactured both locally and in Iran.<sup>12</sup> Since September 2018, IBG militants have fired over 30 rockets at U.S. facilities in Iraq, including the U.S. embassy in Baghdad, consulate in Basra, and military training facilities in Taji, Mosul, and Nineveh.<sup>13</sup> They have also targeted an Iraqi oil field in Basra which contained American personnel.

Based on their timing—often following statements or actions considered harmful to Iranian/IBG interests—and inaccuracy, these attacks are primarily conducted to signal frustration with U.S. or Iraqi policy. Nevertheless, they have still resulted in casualties. An October 30 salvo killed one Iraqi soldier working at a Green Zone checkpoint in Baghdad, and an earlier June 19 attack injured three Iraqi civilians

## Prominent Iran-backed Groups in the PMF

NAME	LED BY	ASSIGNED TO PMF BRIGADE
Badr Organization	Hadi al-Amiri	4, 20, 23, 24
Kata’ib Hezbollah (KH)	Abu Mahdi al-Muhandis	45, 56, 57
Asa’ib Ahl al-Haq (AAH)	Qais al-Khazali	41, 42, 43
Kata’ib Sayyid al-Shuhada (KSS)	Abu Alaa al-Walai	14
Harakat Hezbollah al-Nujaba (HHN)	Akram al-Kaabi	12

## Militia Rocket Attacks on U.S. & Iraqi Facilities

▲ Militia Rocket Attack Targets



Source: Excerpted from Missile Defense Project, Shaan Shaikh, *Iranian Missiles in Iraq* CSIS, December 11, 2019, <https://www.csis.org/analysis/iranian-missiles-iraq/>

# DIA Assessment of Iran's Ties to Iraqi Shi'ite Militias

One of Tehran's strongest levers of influence in Iraq is through the many Iran-backed Shia militias. Iran has provided financial backing for some of these groups for decades.

The Badr Organization, Asaib Ahl al-Haq, and Kataib Hizballah have long served as reliable partners for Tehran, including conducting attacks on U.S. military personnel in Iraq from 2003 to 2011 using Iranian-provided munitions.

Following ISIS's widespread territorial gains in Iraq in mid-2014 and the subsequent formation of the Popular Mobilization Forces (PMF), Iran sent IRGC advisers, weapons, and other military support for the PMF and Iraqi counter-ISIS operations.

Since 2011, the IRGC-QF has also deployed these Shia militants outside Iraq in support of Iranian interests.

Since at least 2013, Iraqi Shia militias have greatly expanded their strength, influence, and combat capabilities, owing largely to Iranian support and their experience fighting in Iraq and Syria.

Shia militias under the Popular Mobilization Committee (PMC) played a leading role in counter-ISIS operations in Iraq, and the majority of these groups have had elements fighting in Syria at Iran's behest as part of Syrian pro-regime forces.

During the counter-ISIS campaign, Shia militias staffed more than 50 PMF brigades under the PMC. There are an estimated 75,000–145,000 mainly Shia fighters active in more than 35 Iraqi militias

# **Yemen, the Indian Ocean, and the Red Sea**

# Yemen has Become a New Front for Iran

The fall of the Saleh dictatorship in Yemen has led to a major civil war with Saudi Arabia and the UAE backing the so-called Hadi government and Iran backing the Houthi – who now control the capital and heavily populated northwest and border areas with Saudi Arabia. There are also many tribal and local struggles for power, AQAP controls some parts of the country, and there are major divisions between north and south Yemen.

Saudi Arabia and the UAE failed to defeat the Houthi using their airpower and they have split over which Yemeni forces to back in the continuing war. Iran has exploited the situation to become a major influence over the Houthi, and supply them with missiles and rockets they use in attack Saudi targets. Iran has also significantly increased its presence in the lower Red Sea and near the Bab el Mandeb at the entrance to the Red Sea.

Iran has also supplied the Houthi with increasingly long-range rockets, missiles, and drones. Work by Uzi Rubin also shows that it has developed precision strike systems and guidance conversion kits that have sharply increased the accuracy and potential lethality of the missiles Iran deploys and transfers to the Houthi and Hezbollah. It also supplies engines and critical components to the Houthi for use in its drones and UAVs/UCAVs.

Iran not only has assisted the Houthi in carrying out strikes progressively deeper into Saudi Arabia, it has also use the Houthi as a cover for its own missile strikes on the Kingdom's oil facilities at Abqaiq and Khurais on September 14, 2019. Iran launched the attacks from southwestern Iran. It used its more accurate propeller driven UCAVs to attack its main targets and still developing jet-propelled UCAVs to attack secondary targets – claiming that both sets of strikes were carried out by the Houthi.

Source: See the work of Uzi Rubin in “Iran's Missiles and Its Evolving ‘Rings of Fire,’” Mideast Security and Policy Studies No. 169, Begin-Sadat Center for Strategic Studies, Bar-Ilan University, January 2020. Also see the work of Michael Knights and Alex Meida for the Washington Institute, including PolicyWatch 3276, *Escalating Houthi Offensives in Yemen: U.S. Options*, March 6, 2020

## Yemen and the Gate of Tears

Source: EIA,  
<https://www.eia.gov/beta/international/regions-topics.cfm?RegionTopicID=WOTC>



# DIA Assessment of Iran's Ties to the Houthi

Iran probably sees supporting the Huthi rebels in Yemen as a low-cost, high-reward opportunity to indirectly confront Saudi Arabia, embarrass Riyadh militarily, and establish an ally on the Arabian Peninsula...Iran provides a wide range of support—including advisers, training, and lethal aid—to the Huthis to support their operations against the Saudi-led coalition in the Yemen conflict. Tehran claims Riyadh is the aggressor and the cause of the humanitarian crisis in Yemen and has refuted accusations that it is supporting the Huthis with missiles and other advanced military equipment.

Estimates of Huthi fighters range from 10,000 to 30,000 personnel consisting of core believers, tribal supporters, and familial alliances. The Huthis seek to rule the northern Yemen region or, at a minimum, retain a dominant role in northern Yemen and substantial political and military influence in any future government. Huthi leaders seek to use negotiations, international pressure, military operations, and ballistic missile and maritime attacks to pressure the Saudi-led coalition into accepting settlement terms favorable to the Huthis.

The Huthis depend on Iran for military equipment and support, including ballistic missiles, UAVs, and explosive boat technology. Tehran is using covert means to support this effort while publicly denying its military involvement in Yemen. Although the Huthis have always maintained a sense of identity as Shia Zaydis and Yemenis, they probably are receptive to further strengthening ties with Iran.

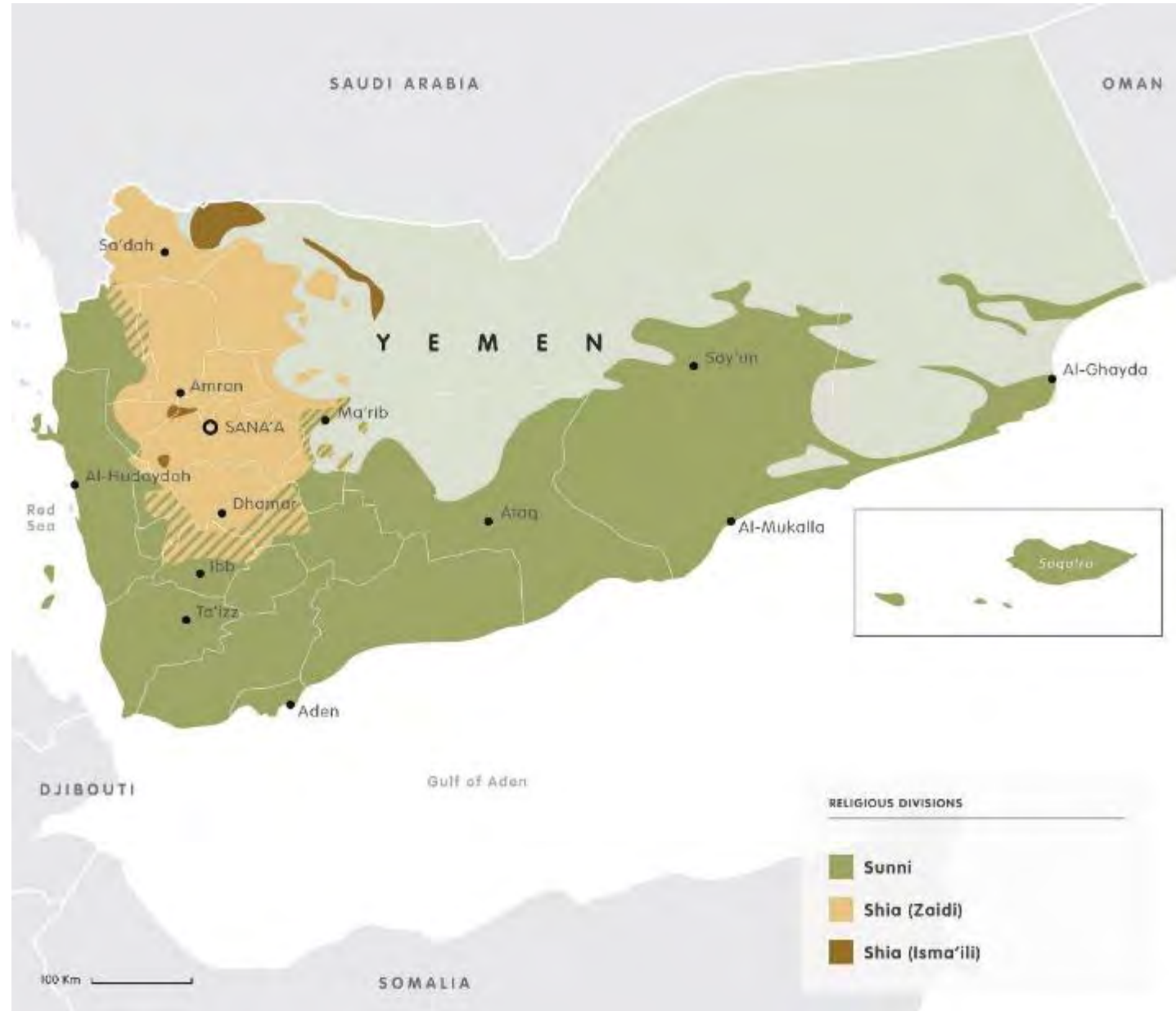
Huthi forces hold and defend territory in northern Yemen, disrupt Saudi-led coalition movement and supply efforts, and conduct retaliatory and offensive strikes against the coalition. Huthi fighters are armed with small arms, artillery, and tanks from preconflict Yemeni stockpiles...

Iranian-supported Huthi missile forces have conducted multiple ballistic missile attacks against Saudi Arabia—with targets including the capital, Riyadh, and a Saudi oil refinery—using Iranian SRBMs. Huthi maritime forces have ASCMs, naval mines, manned and unmanned explosive boats, and other small boats used for small arms attacks...The Huthis possess most of the surface-to-air missiles (SAMs) from Yemen's prewar stockpiles and have modified air-to-air missiles (AAMs) for use as SAMs.

In 2018, Saudi-led coalition forces also seized advanced Iranian SAMs en route to the Huthis during countersmuggling operations. The Huthis have also used Iranian UAVs to attack Saudi-led coalition Patriot batteries



# Yemen: Sectarian Divisions



Source: CIA Factbook, Yemen,  
<https://www.cia.gov/library/publications/the-world-factbook/geos/ym.html>.



# Yemen: The Southern Movement

Source: ECFR.EU, Mapping the Yemen Conflict,  
<https://www.ecfr.eu/mena/yemen>.



# ACLED: Yemen: as of October 2019

## The Conflict in 2019:

- ACLED records over 100,000 total reported fatalities<sup>2</sup> from 2015 to the present
  - Approximately 20,000 have been reported so far in 2019, making it the second most lethal year after 2018
- More than 40,000 conflict events have been reported since the start of 2015
  - Approximately 8,000 have occurred so far in 2019
  - The monthly number of conflict events has declined since March
    - This trend is primarily driven by a drop in explosions/remote violence events, such as shelling and airstrikes, while the number of battles has not decreased
- Deadly violence in 2019 is trending downward overall
  - April was the most lethal month so far this year, with over 2,500 reported fatalities, compared to approximately 1,700 in September
  - The third quarter of 2019 has seen the lowest number of reported fatalities since the end of 2017, largely due to a decline in battle intensity
- The number of coalition airstrikes declined over the past year, while Houthi attacks on Saudi Arabia increased until the group declared a unilateral ceasefire against targets inside Saudi territory in September
  - Saudi Arabia only partially accepted the ceasefire proposal, and has continued to conduct attacks in Yemen
  - In regions under Houthi control, ACLED has recorded an [uptick in infighting](#) between opposing Houthi factions

<sup>1</sup> ACLED data do not include deaths from indirect causes linked to the conflict, such as starvation and disease; according to the UNDP-commissioned study, these indirect causes could result in another 131,000 deaths by 2020, bringing the full toll to more than 230,000.

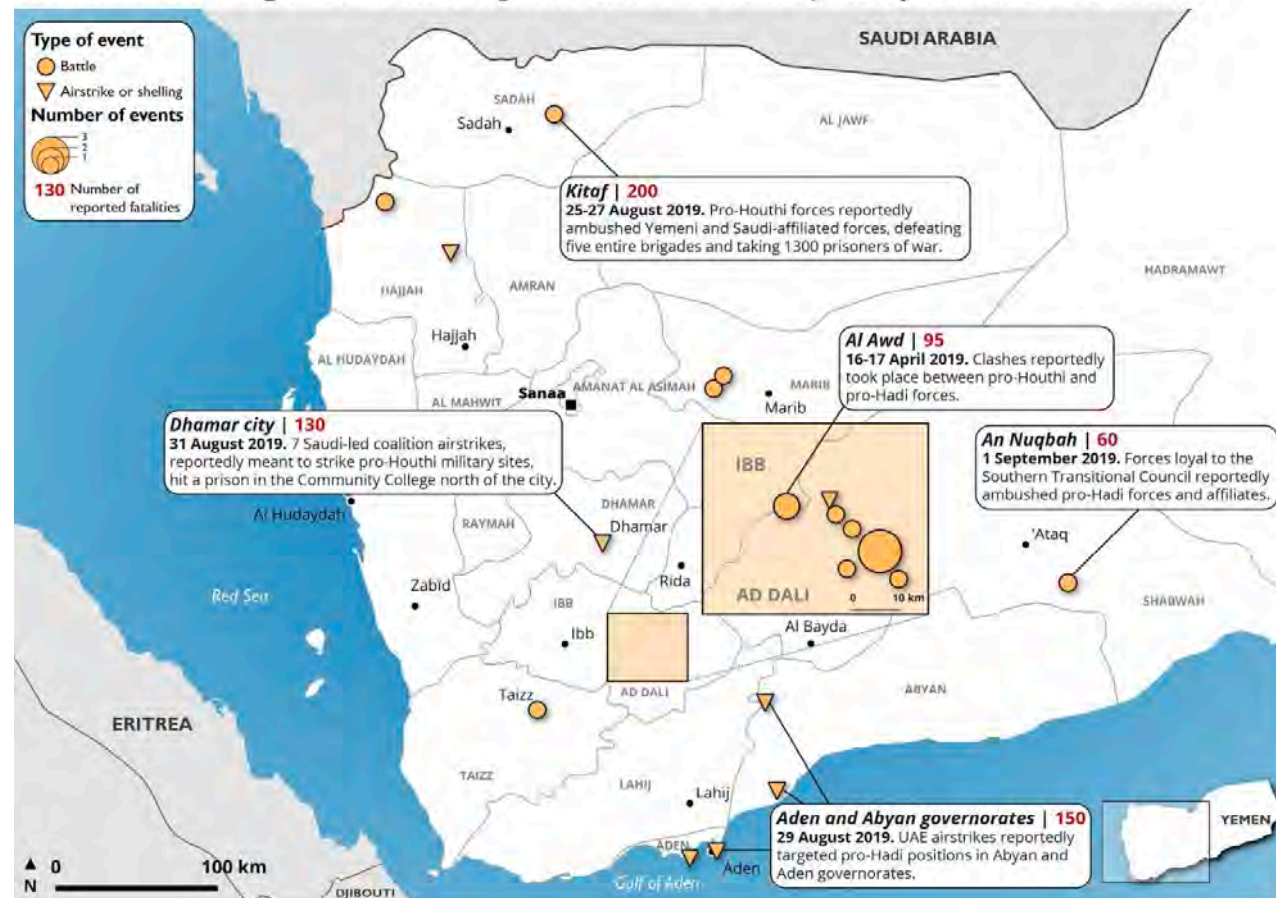
<sup>2</sup> Fatality numbers are often the most poorly reported component of conflict data. While ACLED codes the most conservative reports of fatality counts to minimize over-counting, this does not account for biases that exist around fatality counts at-large. As such, these figures should be considered estimates, rather than exact counts. Find more information about ACLED's methodology for coding fatalities [here](#).

**31 October 2019:** The [Armed Conflict Location & Event Data Project \(ACLED\)](#) currently records more than 100,000 reported fatalities in Yemen since 2015, including over 12,000 civilians killed in direct attacks. These findings are consistent with [recent projections](#) drawing on ACLED data issued by the United Nations Development Programme (UNDP) and the Frederick S. Pardee Center for International Futures, which estimate that approximately 102,000 people will be killed in direct violence by the end of 2019.

ACLED's Yemen data are collected in partnership with the [Yemen Data Project](#).

## Deadliest conflict events in Yemen

All events resulting in 30 or more reported fatalities from 1 January 2019 to 26 October 2019



**The Second Key Shift in the  
Military Balance:  
The Rising Impact of Iran's  
Asymmetric Forces**

# The Rising Impact of Iran's Asymmetric Forces

The second key shift in the balance in recent years has been the rising capabilities of Iran's asymmetric forces. The charts and data that follow illustrate the fact that Iran's asymmetric force elements go far beyond the Al Quds Force – which is Iran's best-known element that trains and equips foreign military state and non-state forces. The following charts show Iran's overall military structure, and it has other major force elements in its national training base, IRGC, and regular forces or ARTESH that contribute to such train and equip missions, along with its intelligence agencies like the MOIS and elements in its Foreign Ministry. All play a role in building politico-military relationships, recruiting “volunteers,” and building coalitions. There are often differences in policy and competition between given elements – a key part of every aspect of Iranian society and governance – but there is also cooperation as well.

As noted earlier, every aspect of Iran's forces have asymmetric elements, and Iran focuses on building strategic relationships outside its territory, on hybrid and “gray area” operations, and integrated political, military, and civil efforts rather than conventional war fighting. Once again, it tends to follow the strategic advice of Sun Tzu rather than focus on the perfect war strategy emphasized in most chapters of Clausewitz.

The two elements where changes pose a rising challenge to the U.S, its Arab strategic partners, and U.S. coalition allies in Europe like Britain and France are:

- First, the growth of its naval-missile-air capabilities in the Arab/Persian Gulf, Gulf of Oman and Arabian Sea/Indian Ocean, and the approaches to the Bab el Mandeb and operations in the Red Sea.
- Second, the combination of the rising precision conventional strike capabilities of its ballistic and air breathing missile forces, improved land-based air defenses, and ability to mix attacks by a full range of land, air, and sea-based strike-capabilities with the ability to influence rocket and missile strikes by other outside actors like the Hezbollah, Popular Military Forces in Iraq, and the Houthi in Yemen.

The following sections of this analysis focus on Iran's growing capabilities to use such forces in a tactical and strategic context. They do not attempt to predict major warfighting scenarios, which the previous analyses have shown are highly uncertain and more likely to evolve out of events than any grand strategy. This part focuses on first set of force changes – Iran's the naval-missile-air capabilities – but it also touches upon its land forces and their capabilities for defense in depth, to threaten Iraq and Kuwait, and pose major challenges to any invasion and attempt to occupy Iran and change its political structure.



# Iran's Complex Security Structure: 2019

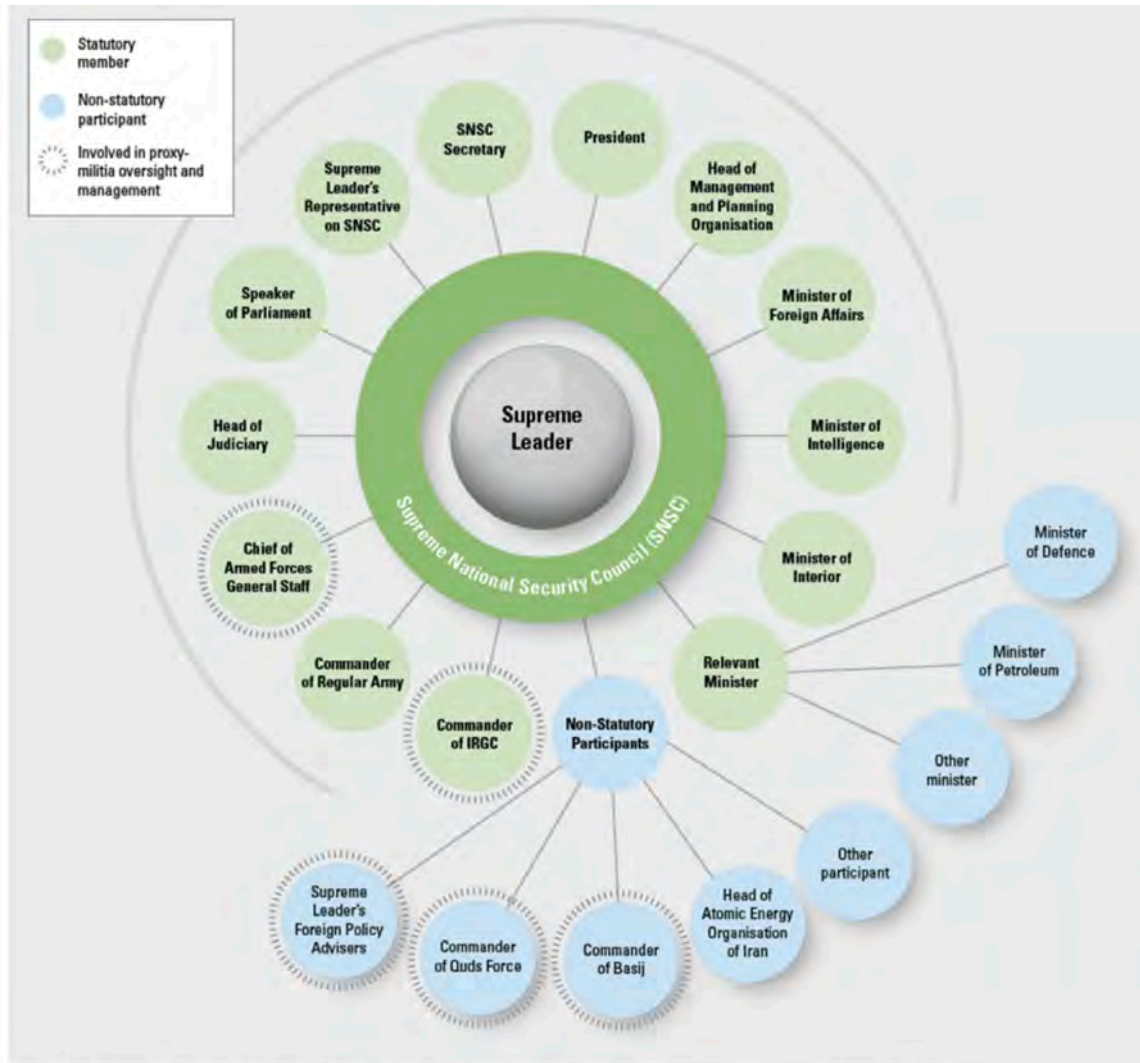


Figure 1.1: Iran's Supreme National Security Council: structure and participants

Source: IISS

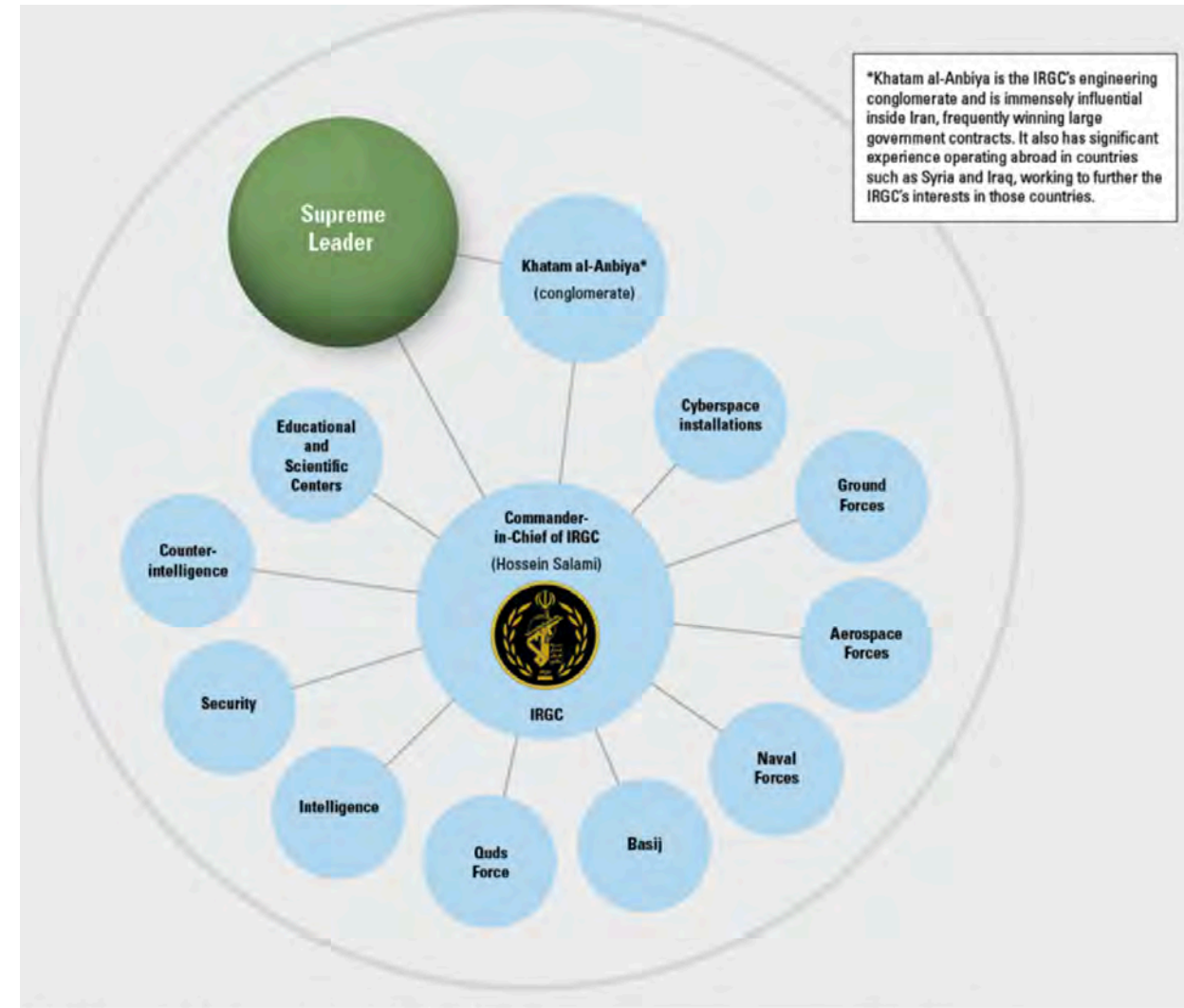


Figure 1.2: Structure of the Islamic Revolutionary Guard Corps

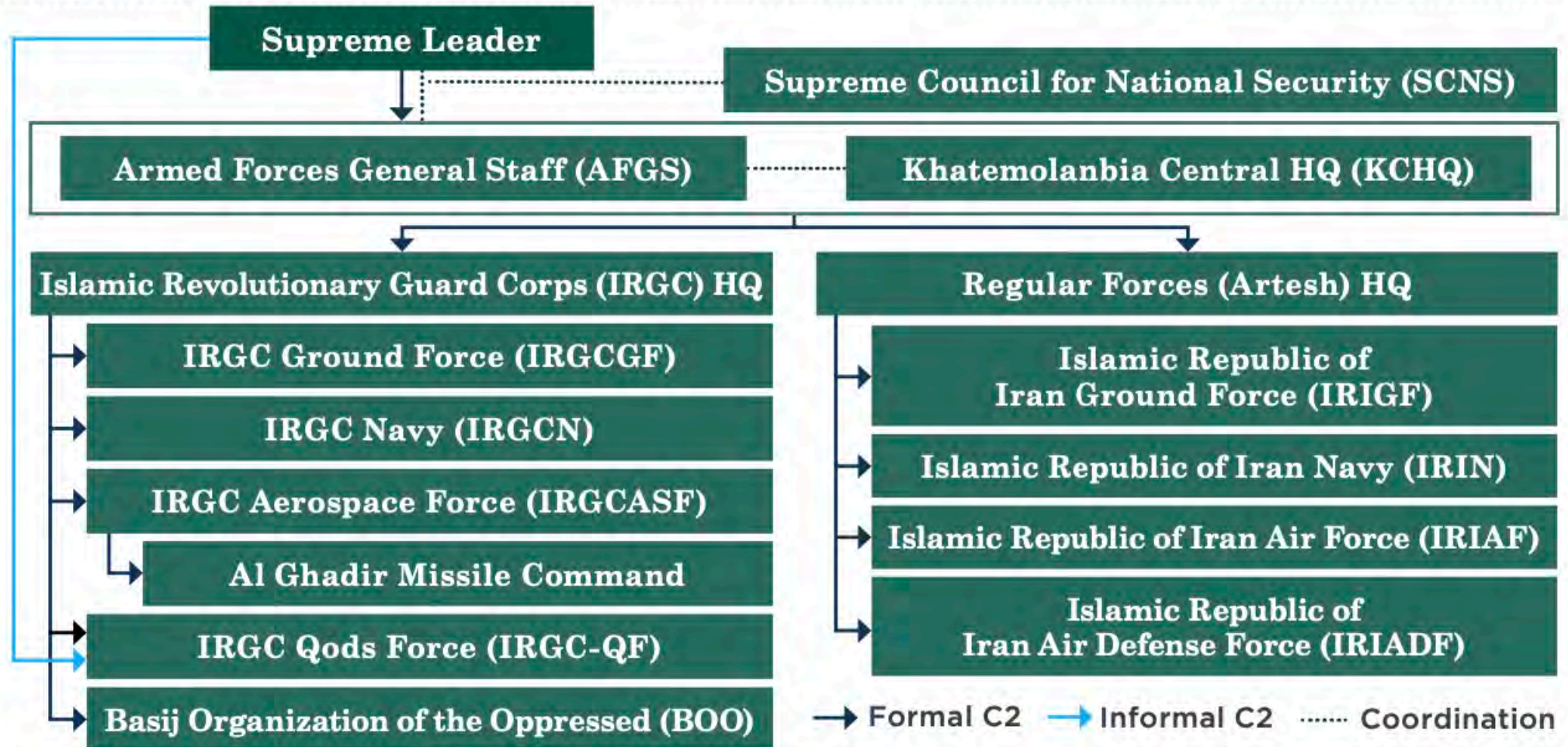
Source: IISS

Source: Adapted from Iran's Networks of Influence in the Middle East, November 2019, <https://www.iiss.org/publications/strategic-dossiers/iran-dossier/iran-19-03-ch-1-tehrans-strategic-intent>

# DIA Estimate of Iranian Military Command and Control

## *National Military Command and Control*

1805-17889





# DIA Assessment of Iranian Military Modernization Goals

Capability	Stated Goals
Missile	Increase the accuracy, lethality, and production of ballistic and cruise missiles
Air Defense	Develop longer-range SAMs and improve short- and medium-range systems
Air	Develop advanced offensive and defensive air power
Navy	Attain regional and deterrent sea power
Ground	Strengthen ground combat and rapid-reaction capability
EW/C4ISR	Improve EW and C4ISR posture, including space-based capabilities
Cyberspace	Increase cyberspace presence and hold adversary infrastructure at risk

Source: DIA, *Iran Military Power, Ensuring Regime Survival and Securing Regional Dominance*, DIA, November 2019, p. 42.



# IRGC versus Iran's Regular Forces

- Iran has roughly 610,000 active military personnel, of which approximately 195,000 are in the IRGC.
- Its forces include roughly 350,000 soldiers from the regular army (220,000 of whom are conscripts), 18,000 from the regular navy, 37,000 from the regular air force, and 15,000 from air defense force
- Iran has two main ground components: the Islamic Republic of Iran Ground Forces (IRIGF) and the Islamic Revolutionary Guard Corps Ground Forces (IRGC-GF).
- The IRIGF includes six infantry divisions, four armor divisions, six artillery divisions, two commando divisions, one airborne brigade, and one special forces brigade.
- Iran's army is relatively weak. Though Iran does not possess a robust arsenal of modern tanks or armored vehicles, it has rebuilt its armored strength since the 1980-1988 Iran-Iraq War.
- Iran employs smaller vessels that emphasize speed and mobility. Iran could employ these fast-attack vessels to fire on tankers, lay mines, or conduct swarming tactics to isolate and overwhelm targets.
- Iranian acquisition of the Houdong-class missile boats, C 14-class missile boats, and MK 13-class patrol craft—all from China—highlights Iran's focus on irregular capabilities and its ability to fire precision missiles from mobile maritime platforms. Iran produces domestic variants, such as the Peykaap I-/II-class patrol craft and missile boats.
- Mines are similarly used by Iran as an area denial tool. Late in the Iran- Iraq “tanker war” in the 1980s, Iran utilized mine warfare against commercial shipping in the Persian Gulf, planting mines through the Persian Gulf, Gulf of Oman, and the Strait of Hormuz. In 1988, Iran deposited roughly 150 mines in the Strait of Hormuz, one of which succeeded in severely damaging the U.S. guided-missile frigate USS *Roberts*.

## Estimate of IRGC Al Quds Force (IRGC-QF)

- Reports directly to the supreme leader of Iran.
- While the IRGC as a whole has over 125,000 total personnel, there are between 5,000 and 20,000 IRGC-QF soldiers.
- Active in supporting state and sub-state partners outside of the country through units such as Department 400 (or the Misaq Unit), which is in charge of external special operations.
- Engages in a wide range of activity, such as gathering intelligence; training, equipping, and funding state and non-state partner forces; conducting assassinations and bombings; and providing humanitarian and economic aid to Islamic causes.
- Includes roughly 5,000 soldiers, much smaller than other components of the IRGC.
- Includes sections devoted to specific countries and regions, such as the Ramazan Corps (Iraq), Levant Corps (Syria, Lebanon, Jordan, and Israel), the Rasulallah Corps (Arabian Peninsula), and Ansar Corps (Afghanistan).
- Examples of forces supported by the IRGC-QF include Lebanese Hezbollah; the *hashd al-sha'abi* in Iraq (including groups such as the Badr Organization, Kata'ib Hezbollah, and Asaib Ahl al-Haq); militia forces in Syria, including Lebanese Hezbollah; the Houthis in Yemen; Liwa Fatemiyoun in Afghanistan; Liwa Zainebiyoun in Pakistan; and several groups in Palestinian territory, such as Hamas and Palestinian Islamic Jihad
- Forces help Iran counter its state adversaries in a broad “Axis of Resistance” that extends from the Persian Gulf through Lebanon, Syria, and Iraq to the eastern parts of the Mediterranean Sea. Other Iranian organizations, such as the MOIS, provide support to the IRGC.

# DIA Assessment of Iran's Al Quds Force and Other Elements Using Asymmetric Force - I

Iran depends on a variety of unconventional and proxy forces to bolster its conventional military. The IRGC-QF (Qods meaning “Jerusalem”) is Iran’s primary means for conducting unconventional operations abroad, with connections of varying degrees to state and non-state actors globally. It was founded in 1990 in the aftermath of the Iran-Iraq War as the IRGC unit responsible for covert operations and unconventional warfare operations abroad. Before the IRGC-QF’s creation, a variety of government organizations, including the IRGC’s Office of Liberation Movements, handled Iran’s support to Islamic militant, terrorist, and resistance groups.

Since its establishment, the IRGC-QF has become an increasingly professional unit trusted by the supreme leader to conduct operations outside Iran, provide support to Islamic militants, and collect intelligence against Iran’s enemies. IRGC-QF personnel number roughly 5,000, though some estimates are higher. Tehran uses the IRGC-QF to provide financial, training, and materiel support—including facilitating terrorist attacks—mainly to regional Shia militant groups ideologically aligned with Iran. These partner and proxy groups provide Iran with a degree of plausible deniability, and their demonstrated capabilities and willingness to attack Iran’s enemies serve as an additional deterrent.

Major General Qasem Soleimani command (ed) the IRGC-QF and ha(d) a close relationship with Supreme Leader Ali Khamenei, often communicating with and taking orders from him directly. Soleimani overs(aw) all IRGC-QF external operations, including support for active combat missions and clandestine activities. In recent years, he traveled frequently to Iraq and Syria to support Iran’s involvement in battlefield operations against ISIS and Syrian opposition groups, and bec(a)me one of Iran’s most visible—and popular—military leaders.

The IRGC-QF receives official funding from Iran’s defense budget, but it augments its operating budget through a network of IRGC-QF-affiliated companies worldwide. The IRGC-QF and some affiliated companies have come under international sanctions because of their involvement in terrorist activities and weapons proliferation...

... Iran has consistently demonstrated a preference for using partners, proxies, and covert campaigns to intervene in regional affairs because of limitations in its conventional military capabilities and a desire to maintain plausible deniability, thereby attempting to minimize the risk of escalation with its adversaries.. Iran’s reliance on unconventional operations—which is enabled by its relationships with a wide range of primarily Middle Eastern militias, militant groups, and terrorist organizations—is central to its foreign policy and defense strategy.

The IRGC-QF is Tehran’s primary tool for conducting unconventional operations and providing support to partners and proxies. The commander of the IRGC-QF, Major General Soleimani, has a close relationship with Khamenei, often communicating with and taking orders from him directly.

Through the IRGC-QF, Iran provides its partners, proxies, and affiliates with varying levels of financial assistance, training, and materiel support. Iran uses these groups to further its national security objectives while obfuscating Iranian involvement in foreign conflicts. Tehran also relies on them as a means to carry out retaliatory attacks on its adversaries. Most of these groups share similar religious and ideological values with Iran, particularly devotion to Shia Islam and, in some cases, adherence to velayat-e faqih. However, Iran has also established relationships with more diverse groups based on shared enemies, common threats, and mutually beneficial goals.

The strength of Iran’s relationship with these groups varies widely. Iran’s strongest and most successful regional partnership is with Hizballah, dating back to 1982. The relationship today involves Iranian sponsorship, cooperation, and shared sectarian and political interests, especially against Israel and the United States. However, Hizballah retains its decision making in internal Lebanese affairs...

# DIA Assessment of Iran's Al Quds Force and Other Elements Using Asymmetric Force - II

In recent years, the conflicts in Syria, Iraq, and Yemen have placed new demands on the IRGC-QF to manage Iranian involvement in multiple combat zones, including some support from Iranian conventional forces. In Syria, Iran maintains a strong relationship with the Assad regime, which it views as a critical ally and conduit to Hizballah.<sup>201</sup> In Iraq, the IRGC-QF has strong influence with Iranian-aligned Shia groups operating within the Popular Mobilization Forces (PMF), many of whom have cooperated with Baghdad to defeat ISIS.<sup>202</sup> In Yemen, Iran has supported the Huthi rebels with financial assistance, weapons, military training, and operational advice...

Iran also uses the IRGC-QF to provide varying levels of support to Shia groups in Bahrain, some Palestinian militant groups, and the Taliban in Afghanistan. As active combat operations have drawn down in Syria and Iraq, Tehran could choose to increase support to historical unconventional lines of effort in the region or pursue new opportunities.

...Iran has limited expeditionary warfare and force projection capabilities. It has shown itself capable of sending small groups of conventional forces—including ground forces, military air lift, and UAV operators—into permissive allied countries to support larger operations. Since the outbreak of the Syrian civil war in 2011, Iran has become increasingly involved in regional conflicts, with varying levels of military intervention in Iraq, Syria, and Yemen. The IRGC-QF remains the lead for these operations, but Iran has adapted its approach to external operations incorporating conventional Iranian forces in addition to large numbers of Shia foreign fighters. Iran's military has also revised professional military education to emphasize lessons learned from operations in Syria and Iraq, where it also has gained its first experience conducting combined operations with allied military forces.

In Syria, Iran has worked to defeat ISIS and defend the Asad regime against insurgent groups, with Iranian and Iranian-affiliated forces serving as critical force multipliers for the regime. In the spring of 2016, Tehran deployed a small number of ground forces from the Artesh to Syria—the first such deployment outside Iran since the Iran-Iraq War.

As early as 2014, Iran deployed military advisers and some conventional ground forces to Iraq to combat ISIS and prevent the state's fragmentation, although Iran maintains a larger conventional military presence in Syria. The IRGC-QF has strong ties to many Iraqi Shia groups that have participated in operations to retake Iraqi territory from ISIS...

In Yemen, Iran provides military support to the Huthis against the Saudi-led coalition, enabling Tehran to indirectly pressure Riyadh without entering into a direct military conflict. Huthi missile launches against targets in Saudi Arabia and attacks on Saudi-led coalition ships demonstrate Iran's provision of increasingly lethal capabilities to the Huthis. Tehran's provision of explosive boat technology and Iranian-made missiles, including the extended-range Qiam SRBM, provides the Huthis with systems exceeding the capabilities of the pre-conflict Yemeni inventory.

Iran does not participate meaningfully in international peacekeeping operations, contributing only a few personnel to the African Union-United Nations Hybrid Operation in Darfur (UNAMID). However, Tehran has expressed interest in expanding its military support to international peacekeeping missions, potentially as a way to increase legitimacy, participate in multilateral initiatives, and develop expeditionary-like capabilities through operations other than war.

Iran can also conduct limited out-of-area naval operations as far as China, South Africa, and the Mediterranean Sea. The Islamic Republic of Iran Navy (IRIN) maintains regular rotations of deployed naval groups (DNGs) for counter piracy, presence, and naval diplomacy missions in the Arabian Sea, Gulf of Aden, and sometimes the Indian Ocean. Often plagued with maintenance issues, the DNGs are largely symbolic, showcasing Iran's projection of force beyond its territorial waters.

# DIA Assessment of Iran's Other Asymmetric Capabilities: Cyber

Iran uses cyberspace operations as a tool of statecraft and internal security, and it continues to improve its capabilities. Tehran views these operations as a safe, low-cost method to collect information and retaliate against perceived threats. Tehran often masks its cyberoperations using proxies to maintain plausible deniability. However, there are often clear indications that link these operations to Iran's security apparatus. Domestically, the Iranian government pursues domination of the cyberspace environment to influence the population's ideological and cultural exposure. Abroad, Tehran intimidates, harasses, and influences adversaries by conducting cyberoperations and empowers its proxy networks to do the same.

Compared to more technologically advanced states, such as the United States, China, and Russia, Tehran's offensive cyberspace capabilities remain underdeveloped. Although accounts of Iranian hacking first emerged in the early 2000s, state-sponsored cyberspace activities did not appear publicly until 2007. Prompted by the 2010 Stuxnet cyberattack on Iran's nuclear centrifuges, Iran recognized the need to develop its cyberspace capability as a strategic priority. Tehran receives technical assistance for cyberspace defense from Russia and China, and Ruhani has repeatedly made commitments to increase Iran's cyberspace budget.

Iran has quickly evolved from using web defacements and basic censorship to conducting more-sophisticated internal information controls, destructive attacks, and espionage campaigns. Iranian cyberspace actors use phishing and defacing campaigns against commercial enterprises, as well as cyberespionage against military and government data. Iranian cyberactors frequently target aerospace companies, defense contractors, energy and natural resource companies, and telecommunications firms for cyber espionage operations. Since at least 2014, Iranian cyberactors have stolen credentials and spread malware on business networks. These cyberespionage efforts can support Iran's military research and development efforts and commodities industries.

Iran has shown it is capable of disruptive and destructive offensive cyberattacks, including against U.S. targets. After a 2012 malware attack targeting an Iranian oil facility, Iran responded with a cyberattack on Saudi Aramco and Qatari RasGas, using malware to cause irreparable damage to thousands of computers. During 2012–2013, Iranian hackers launched a distributed denial of service (DDoS) campaign against major U.S. banks and the U.S. Stock Exchange, and in 2014 conducted a data-deletion attack on a U.S. casino. During the 2014 Israel-Gaza conflict, Iranian cyberactors launched a DDoS attack against Israel Defense Forces infrastructure.

From late 2016 to early 2017, Iran conducted another larger and more damaging malware attack against Saudi targets, including the civil aviation authority, labor ministry, and central bank. Iranian cyberactors also conduct ongoing information operations aimed at promoting pro-Iranian political interests via the use of a network of fake social media accounts. These accounts promote anti-Saudi and anti-Western stances and support policies that Tehran views as favorable

# DIA Assessment of Iran's Other Asymmetric Capabilities: Intelligence and Deception

**Intelligence:** Iran's intelligence services are capable of sophisticated operations worldwide to counter potential threats to the regime, its revolutionary ideology, and its interests. Iran's intelligence community is composed of 16 organizations charged with foreign intelligence, counterintelligence, and internal monitoring and security missions... These organizations include the MOIS and headquarters elements and subcomponents within the IRGC and Artesh.

Overlapping missions and parallel chains of command—particularly between the MOIS and elements of the IRGC—fuel competition between the organizations for resources, missions, and prestige. The Intelligence Coordination Council, chaired by the MOIS, is charged with coordinating and deconflicting the operations of Iran's intelligence organizations.

The MOIS is Iran's national-level civilian intelligence service. It is responsible for domestic security and intelligence, foreign intelligence, monitoring Iranian expatriate communities, liaising with foreign intelligence services, counterintelligence, and sanctioned lethal operations. The MOIS primarily collects information regarding the intentions and capabilities of foreign governments and dissidents Iran regards as hostile...

The IRGC Intelligence Organization (IRGC-IO) is Iran's foremost military intelligence service, capable of all-source collection, analysis, and investigations. The IRGC also operates a Counterintelligence Organization that is charged with protecting IRGC personnel, operations, and facilities from espionage, information leaks, and other counterrevolutionary threats. The Artesh has a joint military intelligence capability tasked with tactical intelligence gathering, counterintelligence operations, and internal security

**Denial and deception (D&D)** is a core component of Iranian military doctrine, and Iran uses D&D techniques extensively to reduce the vulnerability and increase the survivability of its military forces. To apply these techniques across the military, Tehran has established what it calls a "passive defense" doctrine. The effort was based on lessons learned from past military conflicts, including U.S. operations in the Middle East and the 2006 Israel-Hizballah conflict.

Iran's nationwide passive defense program comprises a wide range of D&D tactics to hinder foreign intelligence collection and ensure the survivability of critical infrastructure and core military capabilities.

Key Iranian passive defense measures include camouflage and concealment, force dispersals, underground facilities, and highly mobile units. For example, Iran configures some military vehicles to resemble civilian trucks. Iran's passive defense doctrine also includes aspects of cyberdefense, mainly to protect networks from cyberattack and intrusion from outside influences.

The National Passive Defense Organization (NPDO) sends guidance and regulations to passive defense offices embedded across Iranian industries and civilian organizations. The NPDO has pressed the importance of the passive defense doctrine beyond the military in public forums, including Friday prayers. In 2012, Iran established Passive Defense Week, a nationwide effort to promote awareness for key passive defense measure

# **Naval-Missile-Air Forces and Threats to Shipping and the Gulf**



# The Naval Deterrence, Intimidation, and Warfare

Iran is not capable of winning a major naval battle in the Gulf region or any major conflict that involves the United States. It lacks the joint warfare capabilities, numbers, range of mission capabilities, and battle management/IS&R capabilities to survive a major engagement, although elements of its naval forces might survive for some time.

In contrast, its capabilities relative to Arab Gulf forces are much higher if the Gulf Arab states lacked the support of the United States. The Arab Gulf forces have more modern major combat ships than Iran, and could exploit a major advantage in air surveillance and strike capabilities.

However, the Arab Gulf navies are divided, get second to third priority in improving readiness and equipment, and are poorly designed to meet Iran's mine and anti-ship missile threats. Elements of the Arab Gulf navies also lack training, exercise experience, joint warfare capability, and overall readiness. The Saudi Navy in particular has long needed modernization and restructuring to deal with the Iranian Navy, and its readiness standards in the Red Sea area have needed to further improve. Such efforts now seem to be underway, but their success is uncertain.

At the same time, neither Iran nor the Gulf states have a clear incentive to fight a major naval war that would block the imports and petroleum exports of both sides, lead to attacks on its ports and coastal targets, and have no clear outcome that could offer strategic advantages to the “winner” worth the war's cost.

It may take a far more serious war that also involves major missile and air strikes to do enough damage to create the Gulf equivalent of mutual assured destruction, but anything approaching escalation to a major naval war where the United States did not intervene decisively from the start might at best end in Pyrrhic victory.

As the earlier analysis of the chronology of events in 2019 has shown, however, more limited uses of sea power to deter, intimidate, and carry out hybrid or gray areas operations is a different story. Moreover, an Iran subject to sanctions on its exports has strong incentives to threaten, carry out limited attacks, and fight at low to medium levels if this puts pressure on its Arab neighbors. Iran also has strong incentives to acquire long-range anti-ship missiles that can attack U.S. Navy targets and use that threat – or even limited clashes – to restrict U.S. and Gulf Arab freedom of action in the Gulf and nearby waters.

The maps and data that follow illustrate the range of waters and major ports at stake. They show that Iran has created naval forces that rely heavily on smaller missile ships, submarines, submersibles, mine warfare, land and sea-based anti-ship and anti-fixed target missiles that are broadly distributed in the Gulf and in ports outside the Strait of Hormuz that Iraq is significantly improving.

Iran is also steadily improving its operations outside the Gulf, in nearby waters, and in the Red Sea – and is even equipping the Houthi for limited naval attack missions as well.

It also is developing its own anti-ship ballistic missiles and a range of dual-capable sea and land launch platforms that have missiles it could use against not only ships, but also against fixed targets like oil platforms in the Gulf, and coastal targets in the Arab Gulf states. Aside from Saudi Arabia, Iran’s targets are dependent on Gulf ports, facilities, and population centers, and they have limited strategic depth. Iran may not be able to risk the retaliation that would come from any sustained attempt to “close the Gulf,” but it has already shown that it can benefit from more limited operations or even just by threatening to close the Gulf.

Other slides summarize recently unclassified U.S. Defense Intelligence Agency (DIA) and Office of Naval Intelligence (ONI) report on the mix of regular and asymmetric capabilities in the Iranian Navy and IRGC Navy. These represent the most authoritative sources for such open source data.

The final slides in the section also show just how dense the commercial shipping traffic is on a normal day. The Gulf, local waters, and Red sea are target rich to say the least. Moreover, Iran’s ability to use small craft, commercial ships, and dhows to attack ships without involved major combat ships gives it further advantages in escalating to asymmetric warfare, and also gives it the potential to carry out limited wars of attrition using a wide range of means.

Iran will still decisively lose any major conflict that escalates to involve the high intensity use of U.S naval and air forces, but it has developed effective naval asymmetric forces for a range of other scenarios and threats.

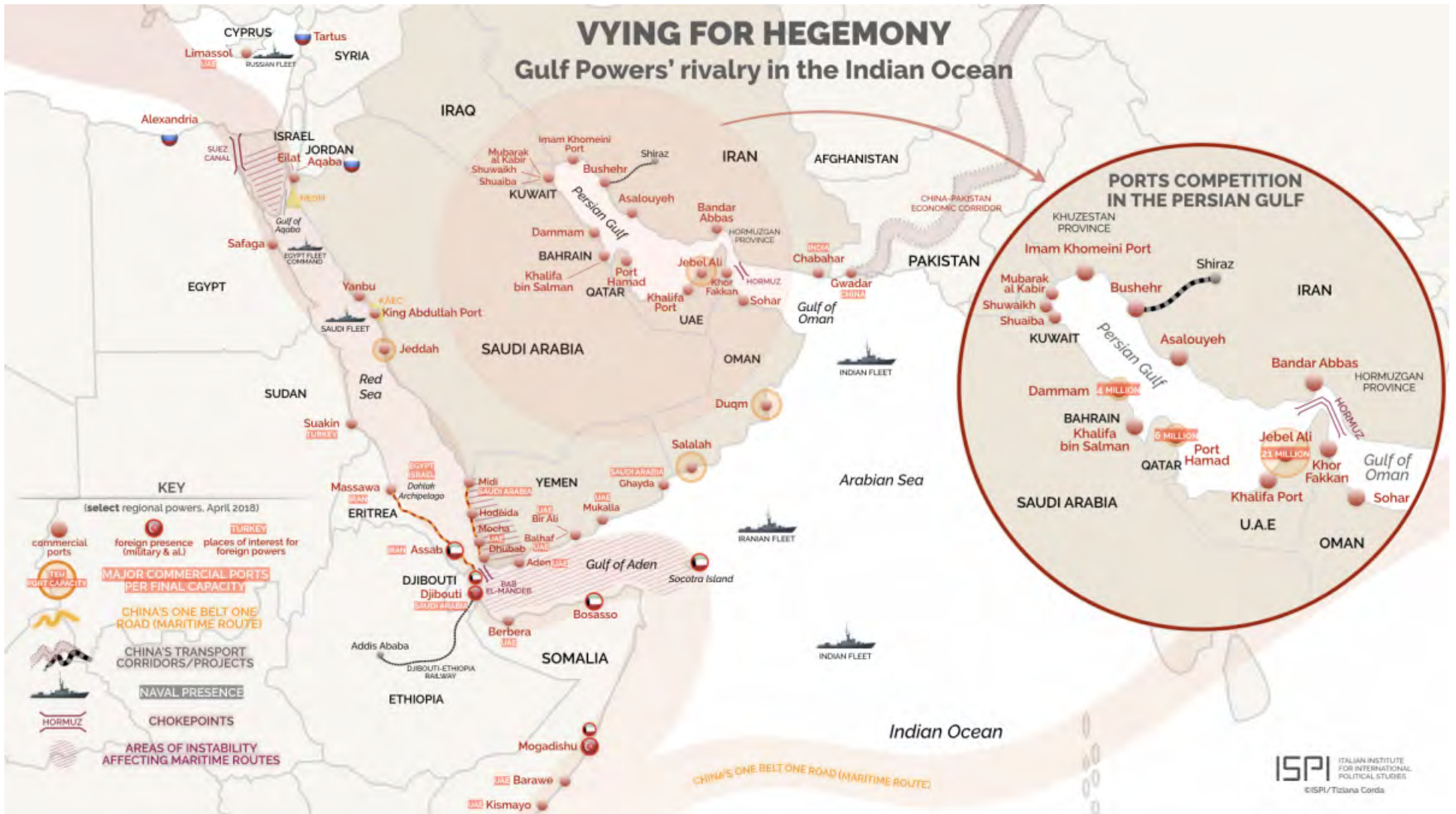
# Key Naval Operating Areas in the Arabian Peninsula, Gulf of Oman, Indian Ocean, and Red Sea Areas





# VYING FOR HEGEMONY

## Gulf Powers' rivalry in the Indian Ocean



**Iran and the Arab Gulf Naval Forces in 2020**  
**Based on IISS 2020 *Military Balance* Estimate**

	<b>Iraq</b>	<b>Iran</b>	<b>GCC</b>	<b>Saudi</b>	<b>UAE</b>	<b>Bahrain</b>	<b>Kuwait</b>	<b>Oman</b>	<b>Qatar</b>
<b>Active Naval Personnel</b>	<b>3,000</b>	<b>18,000</b>	<b>25,400</b>	<b>13,500</b>	<b>2,500</b>	<b>700</b>	<b>2,000</b>	<b>4,200</b>	<b>2,500</b>
<b>Marines</b>	<b>1,000</b>	<b>2,600</b>	<b>3,000</b>	<b>3,000</b>	-	-	-	-	-
<b>Naval IRGC</b>	-	<b>20,000+</b>	-	-	-	-	-	-	-
<b>Destroyers (with missiles)</b>	-	-	<b>3</b>	<b>3</b>	-	-	-	-	-
<b>Destroyers (without missiles)</b>	-	-	-	-	-	-	-	-	-
<b>Frigates (with missiles)</b>	-	-	<b>9</b>	<b>4</b>	<b>1</b>	<b>1</b>	-	<b>3</b>	-
<b>Frigates (without missiles)</b>	-	-	-	-	-	-	-	-	-
<b>Corvettes (with missiles)</b>	-	<b>7</b>	<b>18</b>	<b>4</b>	<b>10</b>	<b>2</b>	-	<b>2</b>	-
<b>Coastal Patrol Boats (with missiles)</b>	-	<b>78</b>	<b>51</b>	<b>9</b>	<b>20</b>	<b>4</b>	<b>10</b>	<b>1</b>	<b>7</b>
<b>Coastal Patrol Boats (without missiles)</b>	<b>32</b>	<b>107</b>	<b>58</b>	<b>19</b>	<b>12</b>	<b>6</b>	<b>10</b>	<b>7</b>	<b>4</b>
<b>Submarines</b>	-	<b>3</b>	-	-	-	-	-	-	-
<b>Submersibles</b>	-	<b>16</b>	-	-	-	-	-	-	-
<b>Mine Warfare</b>	-	-	<b>5</b>	<b>3</b>	<b>2</b>	-	-	-	-
<b>Landing Ships</b>	-	<b>15</b>	<b>3</b>	-	<b>2</b>	-	-	<b>1</b>	-
<b>Landing Craft</b>	-	<b>13</b>	<b>42</b>	<b>5</b>	<b>17</b>	<b>9</b>	<b>6</b>	<b>5</b>	-

# Arab Gulf Missile-Armed Naval Forces

## Based on IISS 2020 *Military Balance Estimate*

### Bahrain

#### Missile Ships & Craft

FFGHM 1 Sabha (ex-US Oliver Hazard Perry) with 1 Mk 13 GMLS with SM-1MR Block VI SAM/RGM-84C Harpoon Block 1B ASHM, 2 triple 324mm SVTT Mk 32 ASTT with Mk 46 LWT, 1 Mk 15 Phalanx Block 1B CIWS, 1 76mm gun (capacity 1 Bo-105 hel)  
FSG 2 Al Manama (GER Lurssen 62m) with 2 twin Inchr with MM40 Exocet ASHM, 2 76mm guns, 1 hel landing platform  
PCFG 4 Ahmed el Fateh (GER Lurssen 45m) with 2 twin Inchr with MM40 Exocet ASHM, 1 76mm gun

### Iraq

None

### Kuwait

PCFG 2:  
1 Al Sanbouk (GER Lurssen TNC-45) with 2 twin Inchr with MM40 Exocet ASHM, 1 76mm gun  
1 Istiqlal (GER Lurssen FPB-57) with 2 twin Inchr with MM40 Exocet ASHM, 1 76mm gun  
PBF 10 Al Nokatha (US Mk V Pegasus)  
PBG 8 Um Almaradim (FRA P-37 BRL) with 2 twin Inchr with Sea Skua ASHM

### Oman

FFGHM 3 Al-Shamikh with 2 twin Inchr with MM40 Exocet Block 3 ASHM, 2 6-cell CLA VLS with VL-MICA SAM, 1 76mm gun  
PATROL AND COASTAL COMBATANTS 10  
CORVETTES • FSGM 2:  
2 Qahir Al Amwaj with 2 quad Inchr with MM40 Exocet ASHM, 1 octuple Inchr with Crotale SAM, 1 76mm gun, 1 hel landing platform  
PCFG 1 Dhofar with 2 quad Inchr with MM40 Exocet ASHM, 1 76mm gun

### Qatar

PCFG 4 Barzan (UK Vita) with 2 quad Inchr with MM40 Exocet Block 3 ASHM, 1 sextuple Sadral Inchr with Mistral SAM, 1 Goalkeeper CIWS, 1 76mm gun  
PCFG 3 Damsah (FRA Combattante III) with 2 quad Inchr with MM40 Exocet ASHM, 1 76mm gun

### Saudi Arabia

DDGHM 3 Al Riyadh (FRA La Fayette mod) with 2 quad Inchr with MM40 Exocet Block 2 ASHM, 2 8-cell Sylver A43 VLS with Aster 15 SAM, 4 single 533mm TT with F17P HWT, 1 76mm gun (capacity 1 AS365N Dauphin 2 hel)  
FRIGATES • FFGHM 4 Madina (FRA F-2000) with 2 quad Inchr with Otomat Mk2 ASHM, 1 octuple Inchr with Crotale SAM, 4 single 533mm TT with F17P HWT, 1 100mm gun (capacity 1 AS365N Dauphin 2 hel)  
PATROL AND COASTAL COMBATANTS 32  
CORVETTES • FSG 4 Badr (US Tacoma) with 2 quad Mk140 Inchr with RGM-84C Harpoon Block 1B ASHM, 2 triple 324mm ASTT with Mk 46 LWT, 1 Mk 15 Phalanx CIWS, 1 76mm gun  
PCFG 9 Al Siddiq (US 58m) with 2 twin Inchr with RGM-84C Harpoon Block 1B ASHM, 1 Mk 15 Phalanx CIWS, 1 76mm gun

**Note: Does not identify anti-Ship and dual-capable anti-ship and fixed-target missile systems, or land-based anti-ship missiles**

### UAE

FRIGATES • FFGH 1  
1 Abu Dhabi with 2 twin Inchr with MM40 Exocet Block 3 ASHM, 1 76mm gun  
PATROL AND COASTAL COMBATANTS 42  
CORVETTES 10  
FSGHM 6:  
6 Baynunah with 2 quad Inchr with MM40 Exocet Block 3 ASHM, 1 8-cell Mk 56 VLS with RIM-162 ESSM SAM, 1 21-cell Mk 49 GMLS with RIM-116C RAM Block 2 SAM, 1 76mm gun  
FSGM 4:  
2 Muray Jib (GER Lurssen 62m) with 2 quad Inchr with MM40 Exocet Block 2 ASHM, 1 octuple Inchr with Crotale SAM, 1 Goalkeeper CIWS, 1 76mm gun, 1 hel landing platform  
2 Ganthoot with 2 twin Inchr with MM40 Exocet Block 3 ASHM, 2 3-cell VLS with VL-MICA SAM, 1 76mm gun, 1 hel landing platform  
PCFGM 2 Mubarraz (GER Lurssen 45m) with 2 twin Inchr with MM40 Exocet ASHM, 1 sextuple Sadral Inchr with Mistral SAM, 1 76mm gun  
PCFG 6 Ban Yas (GER Lurssen TNC-45) with 2 twin Inchr with MM40 Exocet Block 3 ASHM, 1 76mm gun  
PBF 12 Butinah (Ghannatha mod) with 4 single Inchr with Marte Mk2/N ASHM



**Iran Operates  
on a Gulf-Wide,  
Gulf of Oman,  
Indian Ocean,  
and Red Sea  
Basis:**

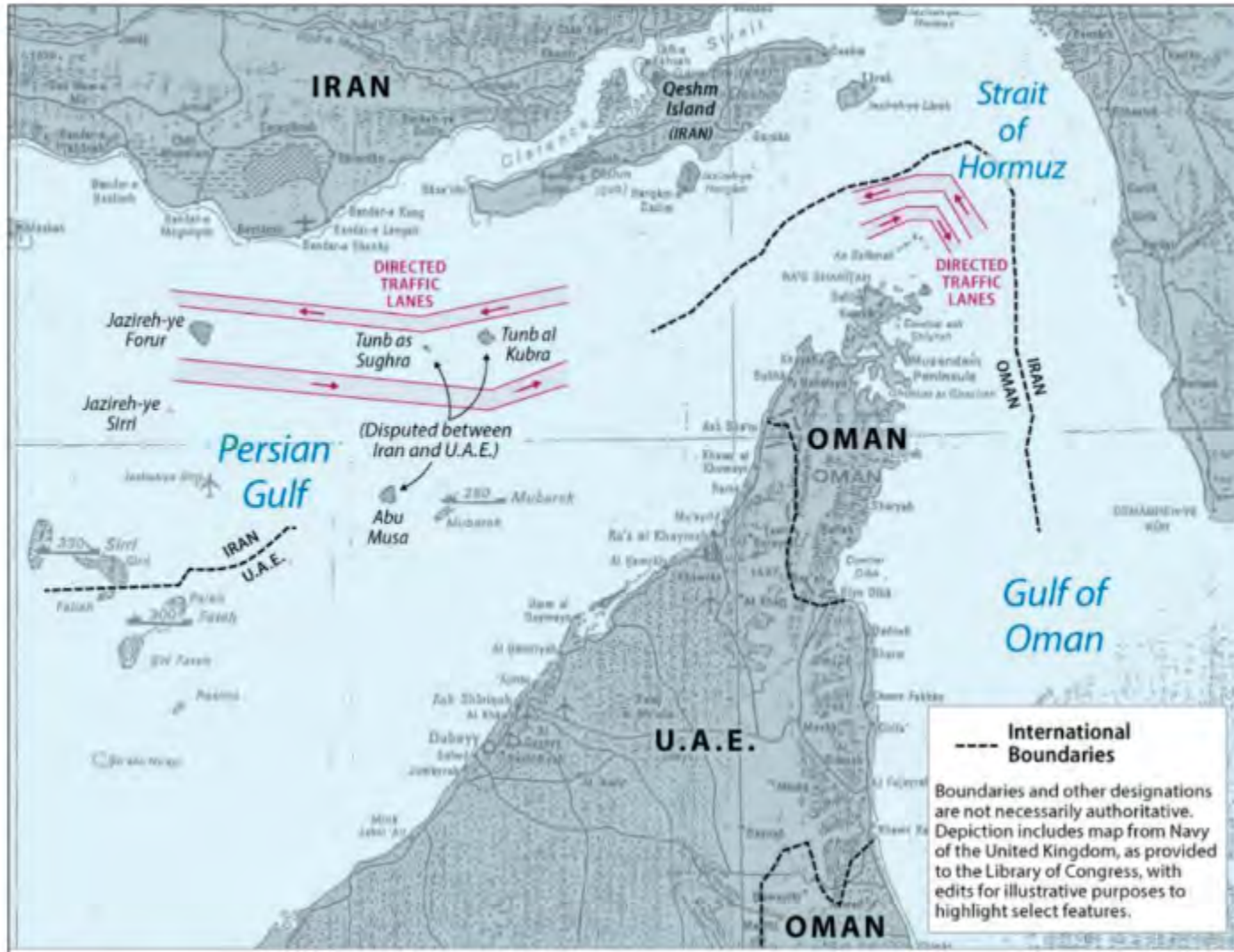
**DIA Map of  
Iranian Naval  
Commands**



Source: DIA, *Iran Military Power, Ensuring Regime Survival and Securing Regional Dominance*, 48, November 2019.



# Vulnerability of the Strait of Hormuz



- “Smart” and Contact Mines
- Land-Based Long-range Anti-Ship Missiles
- Armed Civilian Ships and Craft
- Remotely Controlled Small Craft with Explosives
- Swarming Attacks
- Coastal or Goat Island Raids
- Submarines and submersibles in periphery
- Boundary Dispute and Other Seizures
- Manpad, Rocket, and ATGM attacks

# DIA Estimate of Iranian Naval Forces

IRIN Order of Battle<sup>285</sup>

1805-17887

Class	Type	Inventory
Kilo	Attack submarine	3
Fateh	Coastal submarine	1
Yono (Ghadir)	Midget submarine	14
Nahang	Midget submarine	1
Jamaran (Mowj)	Corvette	3
Vosper Mk 5	Corvette	3
PF 103 (Bayandor)	Corvette	2
Combattante II (Kaman)	Fast attack craft, missile	13
Hendijan	Patrol craft, missile	3
PGM-71 (Parvin)	Patrol craft, missile	3
Cape (Kayvan)	Patrol craft, missile	3
U.S. Mk II	Patrol craft, coastal	6
U.S. Mk III	Patrol craft, coastal	10
C-14	Patrol craft, coastal	9
FB 40	Patrol craft, inshore	6
Hengham	Landing ship, tank	3
Karbala	Landing ship, logistic	6
Wellington Mk 4	Hovercraft	2
Wellington Mk 5	Hovercraft	4
Kharg	Replenishment ship	1
Bandar Abbas	Fleet supply ship	2
Delvar	Support ship	6
Hendijan	Tender	7
Shahsavari	Training ship	1

IRGCN Order of Battle<sup>294</sup>

1805-17887

Class	Type	Inventory
Houdong (Thondor)	Fast attack craft, missile	10
Peykaap I	Patrol craft, coastal, torpedo	15
Peykaap II	Patrol craft, coastal, missile	25
Peykaap III	Patrol craft, coastal, missile	5
Mk 13	Patrol craft, coastal, missile	10
C-14	Patrol craft, coastal, missile	5
Tir	Patrol craft	10
Tarlan	Patrol craft, inshore	15
Kashdom II	Patrol craft, inshore	15
Ashoora	Patrol craft, inshore	Unknown*
Cougar	Patrol craft, inshore	Unknown*
FB RIB-33	Patrol craft, inshore	Unknown*
Gashti	Patrol craft, inshore	Unknown*
Kuch	Patrol craft, inshore	Unknown*
Bladerunner (Siraj)	Patrol craft, inshore	Unknown*
Boghammar	Patrol craft, inshore	20
Hormuz 21	Landing ship	2
Hormuz 24	Landing ship	3
Harth 55	Support ship	1
Safir Kish	Transport	3
Naser	Transport	3

\*Note: The exact numbers for many Iranian small boat types are unknown, but the IRGCN has hundreds of small boats throughout the Persian Gulf.



# Iranian Naval and IRGC Naval Asymmetric Forces in 2020

**Islamic Revolutionary Guard Corps Naval Forces** 20,000+ (incl 5,000 Marines)

Some arty bty

Some AShM bty with HY-2 (CH-SSC-3 *Seersucker*) AShM

## EQUIPMENT BY TYPE

In addition to the vessels listed, the IRGC operates a substantial number of patrol boats with a full-load displacement below 10 tons, including €40 *Boghammar*-class vessels and small *Bavar*-class wing-in-ground effect air vehicles

**PATROL AND COASTAL COMBATANTS** 126 **PBFG** 56:

5 C14 with 2 twin Inchr with C-701 (*Kosar*)/C-704 (*Nasr*) AShM

10 Mk13 with 2 single Inchr with C-704 (*Nasr*) AShM, 2 single 324mm TT

10 *Thondor* (PRC *Houdong*) with 2 twin Inchr with C-802A (*Ghader*) AShM, 2 twin AK230 CIWS

25 *Peykaap* II (IPS-16 mod) with 2 single Inchr with C-701 (*Kosar*) AShM/C-704 (*Nasr*), 2 single 324mm TT

6 *Zolfaghar* (*Peykaap* III/IPS-16 mod) with 2 single Inchr with C-701 (*Kosar*)/C-704 (*Nasr*) AShM **PBFT** 15 *Peykaap* I (IPS -16) with 2 single 324mm TT

**PBF** 35: 15 *Kashdom* II; 10 *Tir* (IPS-18); €10 *Pashe* (MIG-G-1900)

**PB** €20 *Ghaem* **AMPHIBIOUS**

**LANDING SHIPS** • **LST** 3 *Hormuz* 24 (*Hejaz* design for commercial use)

**LANDING CRAFT** • **LCT** 2 *Hormuz* 21 (minelaying capacity)

**LOGISTICS AND SUPPORT** • **AP** 3 *Naser* **COASTAL DEFENCE** • **AShM** C-701 (*Kosar*); C-704 (*Nasr*); C-802; HY-2 (CH-SSC-3 *Seersucker*)

**NOTE: Does not include air forces or land and air-based anti-ship missile and mine warfare capabilities.**

Source: Adapted from IISS, “The Military Balance 2020,” 350-351, <https://www.iiss.org/blogs/military-balance/2020/02/new-features-military-balance-2020>

## HELICOPTERS

**MRH** 5 Mi-171 *Hip*

**TPT** • **Light** some Bell 206 (AB-206) *Jet Ranger*

**Islamic Revolutionary Guard Corps Marines**

5,000+

**Amphibious** 1 marine bde

**Navy** 18,000

In addition to the vessels listed, the Iranian Navy operates a substantial number of patrol boats with a full-load displacement below 10 tons

## SUBMARINES – SUBMERSIBLES 19

**SSK** 3 *Taregh* (RUS *Paltus* Project-877EKM) with 6 single 533mm TT

**SSC** 1 *Fateh* (in trials)

**SSW** 15: 14 *Qadir* with 2 single 533mm TT with *Valfajar*

HWT (additional vessels in build); 1 *Nahang*

## CORVETTES 7

**FSGM** 2 *Jamaran* (UK Vosper Mk 5 derivative – 1 more undergoing sea trials) with 2 twin Inchr with C-802 (*Noor*) (CH-SS-N-6) AShM, 2 single Inchr with SM-1 SAM, 2 triple 324mm SVTT Mk 32 ASTT, 1 76mm gun, 1 hel landing platform

**FSG** 5:

3 *Alvand* (UK Vosper Mk 5) with 2 twin Inchr with C-802 (CH-SS-N-6) AShM, 2 triple 324mm SVTT Mk 32 ASTT, 1 114mm gun

2 *Bayandor* (US PF-103) with 2 twin Inchr with C-802 (CH-SS-N-6) AShM, 2 triple 324mm SVTT Mk 32 ASTT, 1 76mm gun

**PATROL AND COASTAL COMBATANTS** 67 (Dopes not include

**PCFG** 13 *Kaman* (FRA *Combattante* II) with 1–2 twin Inchr with C-802 (*Noor*) (CH-SS-N-8 *Saccade*) AShM, 1 76mm gun

**PBG** 9:

3 *Hendijan* with 2 twin Inchr with C-802 (*Noor*) (CH-SS-N-8 *Saccade*) AShM

3 *Kayvan* with 2 single Inchr with C-704 (*Nasr*) AShM 3 *Parvin* with 2 single Inchr with C-704 (*Nasr*) AShM

**PBFT** 3 *Kajami* (semi-submersible) with 2 324mm TT

**PBF** 1 MIL55

**PB** 34: 9 C14; 9 *Hendijan*; 6 MkII; 10 MkIII

**AMPHIBIOUS LANDING SHIPS** 12

**LSM** 3 *Farsi* (ROK) (capacity 9 tanks; 140 troops)

**LST** 3 *Hengam* with 1 hel landing platform (capacity 9 tanks; 225 troops)

**LSL** 6 *Fouque*

**LANDING CRAFT** 11 **LCT** 2

**LCU** 1 *Liyan* 110

**UCAC** 8: 2 *Wellington* Mk 4; 4 *Wellington* Mk 5; 2 *Tondar* (UK *Winchester*)

**NAVAL AVIATION** 2,600

**Aircraft:**

**TPT** 16: **Light** 13: 5 Do-228; 4 F-27 *Friendship*; 4 *Turbo Commander* 680;

**PAX** 3 *Falcon* 20 (ELINT)

## HELICOPTERS

**ASW** €10 SH-3D *Sea King*

**MCM** 3 RH-53D *Sea Stallion*

**TPT** • **Light** 17: 5 Bell 205A (AB-205A); 2 Bell 206 *Jet Ranger* (AB-206); 10 Bell 212 (AB-212)

**Navy Marines** 2,600

**Amphibious** 2 marine bde

# DIA Assessment of Iran Naval Warfare Capabilities - 2019

Iran operates two independent naval forces—the Islamic Republic of Iran Navy (IRIN), the Artesh’s naval branch, and the IRGC Navy (IRGCN). Iran established the IRGCN in 1985; the IRIN existed as part of the Artesh before the 1979 revolution. The commander of the IRIN is Rear Admiral Hossein Khanzadi, and the commander of the IRGCN is Rear Admiral Alireza Tangsiri.

In 2007, the two naval forces reorganized, and Iran assigned specific areas of operation for each. Tehran assigned the IRGCN sole responsibility for the Persian Gulf and assigned the IRIN the Gulf of Oman and Caspian Sea. Both services continued to share responsibility for the Strait of Hormuz. The geographic split helped streamline command and control (C2) while reducing confusion, miscommunication, and duplication of efforts.

With the added responsibility, the IRGCN established two new naval districts (NDs) in the central and southern Persian Gulf. The reorganization also provided the IRIN with a greater mandate to operate farther from the Iranian coast.

...Amid increased tension with the United States in mid-2019, Iran has used its naval forces to demonstrate resolve and threaten freedom of navigation. In May and June 2019, Iran conducted limpet mine attacks against several merchant vessels in the Gulf of Oman. In July 2019, the IRGCN also seized a UK-flagged oil tanker in the Strait of Hormuz after the United Kingdom seized an Iranian-flagged oil tanker near Gibraltar.

**Islamic Republic of Iran Navy:** The IRIN comprises approximately 18,000 personnel and is considered Iran’s “blue water navy” with its larger and more traditional surface ships compared with the IRGCN. Iran is the only Persian Gulf nation with a submarine force, which the IRIN operates.

The service’s primary mission is to defend Iranian territorial waters and protect the country’s economic interests in the Caspian Sea, Gulf of Oman, and beyond. It consists of primarily older, small surface combatants along with mostly small submarines and some logistic support vessels.

As part of Iran’s layered maritime defenses, the IRIN provides anti-surface warfare capabilities focused on the Gulf of Oman with coastal defense cruise missiles (CDCMs), naval mines, surface combatants, and submarines. The IRIN is Iran’s first line of defense in the Gulf of Oman and the Arabian Sea. The IRIN also aims to secure Iranian economic interests by safeguarding the flow of commerce in the region from piracy and interdiction.

The IRIN is geographically divided into four NDs, with the central IRIN headquarters in Tehran.

- 1st ND: Headquartered at Bandar Abbas (Strait of Hormuz); also the location of the IRIN’s Southern Forward Naval Headquarters (SFNHQ), which coordinates across all southern IRIN NDs
- 2nd ND: Headquartered at Bushehr (Persian Gulf) and Jask (Gulf of Oman); 2<sup>nd</sup> ND HQ moving to Jask following 2007 Reorganization
- 3rd ND: Headquartered at Chah Bahar (Gulf of Oman)
- 4th ND: Headquartered at Bandar Anzali(Caspian Sea)

One of the IRIN’s key missions is to conduct out-of-area operations and naval diplomacy in the region and beyond. Since 2009, the IRIN has maintained near-continuous out-of-area naval deployments for counterpiracy operations in the Gulf of Aden, foreign port visits, and bilateral exercises with regional navies.

Despite its aging platforms, the IRIN has been moderately effective in maintaining readiness and sustaining operations. If the IRIN is to fulfill its longer-term ambitions to function as a true blue-water navy, it will have to invest in more modern combatants and support ships. Iran has been able to domestically build corvettes and patrol boats for the IRIN and upgrade legacy platforms with new capabilities, including antiship cruise missiles (ASCMs). Despite its need for new auxiliaries, Iran has given no indication it is planning to invest in acquiring new support vessels.

Iran acquired three Russian Kilo class attack submarines in the 1990s and began domestically producing North Korean Yono class midget submarines in the mid-2000s. Iran continues to invest in domestically developing and producing more-capable subsurface platforms, including larger coastal submarines.

The IRIN typically conducts a major national-level exercise each year called VELAYAT. The event usually entails a series of naval maneuvers involving IRIN surface combatants, submarines, and CDCM forces.

...The IRIN operates Iran's larger surface combatants, which include three 1960s-era British-built Vosper Mk 5 class corvettes and several French-built Combattante class patrol craft acquired before the Islamic Revolution.

To expand the IRIN fleet, Iran has since domestically built several of its own Combattante patrol craft and three new Jamaran class corvettes, which closely resemble Iran's Vospers with modifications, such as an added helicopter flight deck. Iran has commissioned three of the vessels, including one on the Caspian Sea, which was severely damaged in early 2018. The IRIN has also expanded its number of missile combatants by upgrading older auxiliaries and patrol ships with short- and medium-range ASCMs.

Submarines are a critical component of the IRIN, which has undertaken an ambitious construction program to increase its subsurface production capabilities and expand its fleet. Iran has four classes of submarines in its order of battle. Iran's largest and most capable subsurface platforms are the three Kilo class attack submarines it purchased from Russia in the 1990s. The IRIN also has 14 North Korean-designed Yono class midget submarines, which it can arm with Iranian Valfajar heavy-weight torpedoes. In February 2019, Iran presented its first submarine-launched ASCM, the Jask-2, which can be launched from the Yono.

Iran also has a single domestically designed and produced Nahang midget submarine, which lacks torpedo tubes and may serve as a special operations platform. Also in February 2019, the IRIN officially commissioned its first coastal submarine, the Fateh . Iran claims the Fateh class, Iran's largest domestically built submarine, can launch both torpedoes and ASCMs.

**Islamic Revolutionary Guard Corps Navy:** The IRGCN, which comprises approximately 20,000 personnel, is tasked with protecting primarily the Iranian littoral. It employs an asymmetric doctrine that emphasizes speed, mobility, large numbers, surprise, and survivability and takes advantage of Iran's geography with the shallow and confined waterways of the Persian Gulf and Strait of Hormuz.

Although the IRGCN has significantly upgraded its fleet in terms of size and lethality since the end of the Iran-Iraq War, it remains a force composed of smaller platforms. Rather than acquire larger ships as a more traditional navy might, the IRGCN has pursued smaller, faster vessels armed with a variety of weapon systems. Iran views acquiring these types of vessels in sufficient numbers will allow it to threaten foreign navies and overcome wartime attrition.

The IRGCN aims to overwhelm an adversary's defenses by using multiple platforms and weapons together to achieve tactical surprise. These systems include small boats armed with guns, rockets, torpedoes, and missiles; CDCMs; naval mines; and maritime special operations forces.

IRGCN units train to use hit-and-run attacks against larger enemy naval vessels using swarms of small boats. The IRGCN could also restrict access or even attempt to fully close the Strait of Hormuz. Iran has modified a range of small boats to be able to deliver naval mines rapidly.

In support of these goals, IRGCN acquisition efforts have focused on fielding a large fleet of faster and more-capable small boats; developing more-advanced ASCMs to be launched from sea, ground, or air; and building a large inventory of more-sophisticated naval mines.

The IRGCN is geographically divided into five NDs, with the central IRGCN headquarters at Bandar Abbas.

- 1st ND: Headquartered at Bandar Abbas (Shahid Bahonar); responsible for the Strait of Hormuz
- 2nd ND: Headquartered at Bushehr; responsible for the north-central Persian Gulf
- 3rd ND: Headquartered at Bandar Mahshahr; responsible for the northern Persian Gulf
- 4th ND: Headquartered at Asaluyeh; responsible for the central Persian Gulf
- 5th ND: Headquartered at Bandar Lengeh; responsible for the southern Persian Gulf, including the disputed islands of Lesser Tunb, Greater Tunb, and Abu Musa.

...Many of Iran's NOBLE PROPHET exercises—the IRGC's typical large-scale annual exercise—are naval-focused with IRGCN elements leading the activities. IRGCN NOBLE PROPHETs are usually deterrent-themed events intended largely for strategic messaging, primarily aimed at the West and regional states.

...The IRGCN is the primary operator of Iran's hundreds of fast attack craft (FAC) and fast inshore attack craft (FIAC). These platforms have been the mainstay of the IRGCN since its inception in the 1980s, although the Iranian FAC/FIAC inventory has grown significantly in terms of size and lethality since that time. Larger and more-capable, Iranian FAC are usually armed with ASCMs or torpedoes.

The largest of these vessels are Iran's 10 Chinese-built Houdong missile boats acquired in the mid-1990s, which serve as the capital ships of the IRGCN fleet; these vessels are frequently used in Persian Gulf and Strait of Hormuz patrols. Originally equipped with C802 missiles, Iran has since upgraded the Houdongs with extended-range Ghader ASCMs. Iranian FIAC, which are smaller but far more numerous, are lightly armed and usually fitted with only machine guns or rockets. Used en masse, these vessels can harass merchant shipping and conduct swarm tactics during a force-on-force naval engagements.

Iranian FIAC, which are smaller but far more numerous, are lightly armed and usually fitted with only machine guns or rockets. Used en masse, these vessels can harass merchant shipping and conduct swarm tactics during a force-on-force naval engagements.



# ONI Estimate of Iranian Naval Capabilities - 2017

Prior to the Islamic Revolution, Iran built its military capability primarily through foreign acquisitions. After experiencing isolation during the Iran-Iraq War, which greatly inhibited its ability to procure foreign weapons, Tehran has since placed considerable emphasis on improving its defense industries and domestic production capabilities. More recently, sanctions have only reinforced this approach. While not entirely abandoning foreign acquisition of complete systems, Iran has taken a long-view perspective by sacrificing immediate gains to increase technological knowhow... Consequently, Iran has significantly improved its defense industries, but it has also resulted in some downsides: prolonged delays, inferior quality, and less sophisticated capabilities, than if it had otherwise emphasized foreign acquisition to build its navies. In many respects, Iran is still in the nascent stages of building domestic capabilities, but with each new domestic initiative, it gains valuable knowledge and experience.

Driven by an asymmetric doctrine--based on speed, numbers, stealth, survivability, and lethality-- the IRGCN focuses its naval acquisitions along four primary capabilities: fast attack craft, small boats, anti-ship cruise missiles, and mines. Considering it began as a fleet of lightly-armed small boats in the 1980s, IRGCN acquisitions in each of these four core areas have greatly improved its capabilities. Individually, these improvements cannot compete with western technology. However, taken together, they could create an overall capability that is greater than the sum of its parts, particularly when employed in tight operational spaces like the Persian Gulf and Strait of Hormuz.

## **Fast Attack Craft (FAC)**

Since the end of the Iran-Iraq War in 1988, the IRGCN has significantly upgraded its fleet in terms of size and lethality, but it has remained a force comprised of smaller platforms. Rather than acquire larger ships as might a more traditional navy, the IRGCN has instead chosen to pursue smaller, faster vessels, armed with capable weapons systems, such as cruise missiles and torpedoes. It believes acquiring these types of vessels in sufficient numbers will allow it to threaten foreign navies and overcome wartime attrition. The IRGCN still employs ten Chinese-built Houdong WPTGs, acquired in the mid-'90s. Originally equipped with C802 missiles, these vessels have since been upgraded with Iranian derivatives known as, Ghader missiles. The Houdong WPTGs serve as the capital ships of the IRGCN fleet and are frequently used in Persian Gulf and Strait of Hormuz patrols. and domestic production. Between 1996 and 2006, the IRGCN received approximately 46 FAC of various classes from China and North Korea. Depending upon the platform, they are equipped with torpedoes, short-range ASCMs, or both, and can reach speeds of 40-50 knots. The North Korean procurement effort included four distinct classes of torpedo boats; two of which are submersible / semisubmersible. Both Chinese classes include short-range ASCMs. Iran has copied the North Korean Peykaap-class boat and is domestically producing it as a missile boat with Nasr (C704) ASCMs. The IRGCN continues to look for the right combination of vessel performance characteristics and weaponry, with platform speed and missile range as critical elements to incorporate into its procurement efforts.

## **Fast Inshore Attack Craft (FIAC)**

FIAC are lightly armed small-boats that have been a mainstay of the IRGCN since its inception in the 1980s, and they are by far, the most numerous of all IRGCN vessels. Usually fitted with only machine guns and/or rockets, and used en masse, these vessels are capable of harassing merchant shipping and conducting swarm tactics during a force-on-force naval engagement. The IRGCN's infatuation with speed has also influenced its FIAC acquisition efforts. One of the IRGCN's most notable additions is a copy of the British built Bladerunner, designated "Siraj-1." The IRGCN claims the Siraj-1 is the fastest military vessel in the world, in its current modification to carry crew-served weapons and rockets. In the future; however, the Siraj-1 will likely incorporate additional armament: either torpedoes or ASCMs.

## Mines and Mine-layers

Naval mines are a critical component of the IRGCN's strategy in the Strait of Hormuz and the Persian Gulf. It realized the impact mines made during the Tanker War and operation *Desert Storm* and invested in new mines and mine delivery vessels. The IRGCN has a large inventory of mines including contact and influence mines.

Though it possesses a number of larger vessels that can be used to lay mines, the IRGCN has integrated its philosophy of using smaller, faster vessels into its mine-laying strategy. It has equipped a large number of standard Ashoora small boats with mine rails capable of holding at least one mine. Using numerous boats complicates laying mines in mass, it is better suited for rapidly laying small amounts of mines and improving force survivability, both key elements of IRGCN doctrine.

## IRIN Principal Naval Capabilities

Unlike the IRGCN, the IRIN's fleet is comprised of mainly traditional surface ships and submarines. Most of the IRIN's surface ships are old, dating back to the 1960s and 1970s. Despite its aging platforms, the IRIN has done fairly well in preserving materiel readiness, but it will likely need to reconstitute its fleet in the coming years, given its mission in the Gulf of Oman and its ambitions for extra-regional deployments. Iran is the only Persian Gulf nation with a submarine force. The IRIN's submarine fleet originated after the Iran-Iraq War when it received three Kilo-class attack submarines from Russia. Although domestic submarine production and maintenance programs exist, they seem to be plagued by setbacks and delays.

**Surface Combatants:** Until 2007, the IRIN's most capable surface combatants included only three 1960-era British built Vosper MK 5 corvettes (FFLs), ten French La Combattante patrol boats (PTGs) and several domestically produced Combattantes. Each of these classes were originally fitted or upgraded with C802 ASCMs. Following the naval reorganization of 2007, the IRIN added 11 missile combatants. They achieved this by upgrading three Hendijan-class auxiliaries and two PF 103-class patrol ships with medium-range C802/Noor ASCMs, as well as upgrading three PGM 71 and three Cape patrol craft with short-range C704 / Nasr ASCMs.

The IRIN presently has two domestic combatant construction programs underway. The first is the IRIN's new capital ship, the Jamaran-class, which closely resembles Iran's Vosper-class corvettes and is likely intended to replace those aging ships. The Jamaran's armament differs slightly from Vosper MK 5. Jamarans incorporate a helicopter flight deck, a 76 mm main deck gun, two 20 mm cannons and a 40 mm aft gun. Additionally, Jamarans carry up to four C-802 or Noor ASCMs, Standard Missile 1 anti-air missiles (SAMs) and torpedoes. In December of 2015, RADM Sayyari announced IRIN destroyers were being upgraded to carry the domestically-produced Ghadir ASCMs, which would allegedly increase the strike range of the Jamaran to 300 km. Iran has commissioned two Jamaran-class ships, one in Bandar Anzali, in the Caspian Sea, and one in Bandar Abbas, where four more are under construction, or being fitted out.

The IRIN's other major combatant construction program is known as project Sina, which is intended to replace its aging French La Combattante IIB-class patrol craft. Since 2003, Iran has completed seven ships in this class, which operate in the Caspian Sea and Southern Fleet. The Iranian built Combattantes are armed with four box launchers for either C-802, or Noor ASCMs, and a 76mm forward gun. Surface Auxiliaries Overall, the IRIN has nearly 20 auxiliaries in its order of battle, but most are of smaller classes, and all are older platforms. Only two, the Bushehr and Kharg oilers, are capable of conducting legitimate replenishment at sea (RAS) missions.

While the IRIN is looking to become a “strategic navy”, its aging and small auxiliary fleet has highlighted how critical logistics and infrastructure are, to continuous out-of-area deployments. In order for the IRIN to achieve the goal of conducting extended deployments at greater ranges from home, the IRIN requires a robust and capable auxiliary fleet. Since the IRIN began out-of-area deployments in 2009, Iran has given no indication that it intends to invest in additional auxiliaries.

**Subsurface Fleet:** Submarines are a critical component of the IRIN, which has undertaken an ambitious construction program to increase its subsurface production capabilities and expand its fleet. Iran has three classes of operational submarines in its order of battle. First, Iran received three Kilo-class attack submarines from Russia in the 1990s. The Kilo is Iran’s most capable submarine and is presently equipped with torpedoes and mines. Unlike many other countries using the Kilo-class submarine, Iran chose to forego sending its Kilos to Russia for mid-life overhaul, and instead, complete it in-country. This decision came at a significant time and operational cost, taking more than seven years to complete. Iran claims to have begun overhaul of its second Kilo submarine. With so few attack submarines available, the emphasis on domestic maintenance of its Kilo submarines will significantly impact submarine operations for well more than a decade, from the time it began.

Second, the IRIN has 14 North Korean-designed Yono-class midget submarines (SSM). Iran originally acquired at least one Yono submarine from North Korea in 2004 and began domestically producing them shortly thereafter. Displacing only 120 tons, the Yono has two torpedo tubes capable of carrying Iran’s 53 cm Valfajar heavy-weight torpedo. One of the Yono submarines reportedly sank during a patrol in April 2014, after a possible collision with rocks. Finally, Iran has a single domestically-designed and produced Nahang SSM. The Nahang does not have torpedo tubes and may serve as a special operations platform

In addition to the three classes of submarines that are currently operational in the IRIN, Iran is domestically producing two other classes of submarines. The first is the Fateh-class coastal submarine (SSC). The Fateh reportedly displaces 600 tons with an operational diving depth of 200 meters and a range of 5000 kilometers. RADM Sayyari stated up to 20 Fateh-class submarines would be constructed in the future. Reportedly, the Fateh submarines will be equipped with torpedoes, missiles, and mines. In April 2016, Fateh hull one was still undergoing sea trials with the goal to be certified operational by the end of 2016, but as of January 2017, the IRIN has yet to declare the Fateh submarine operational. Iran is also building a 1300 ton attack submarine known as Besat. According to Iranian press reports, the Besat will be approximately 60 meters in length, capable of diving to 300 meters, and able to sustain 12 knots surfaced and 20 knots submerged. In terms of armament, the Besat will likely have six torpedo tubes, capable of employing torpedoes and mines, as well as submarine-launched ASCMs.

**Coastal Defense Cruise Missiles:** The tight water space in the Strait of Hormuz, as well as vast miles of coastline, both provide optimal firing positions for coastal defense cruise missiles (CDCMs). Accordingly, as one of the primary layers of defense for both the IRGCN and the IRIN, Iran has invested heavily in procurement, research, and production of multiple anti-ship missile systems, over the past several years. Iran’s initial experience with CDCMs was gained with the Chinese-built Silkworm missiles during the Tanker War. Over the past decade, Iran has expanded its inventory by developing a domestic production capability for the Chinese C802 and C700 series cruise missiles. The C802 derivatives are known as Noor, Ghader, and Ghadir, with ranges reportedly of 120 km, 200 km and 300 km, respectively. In addition to the development and deployment of these systems, Iranian CDCMs continue to evolve in all categories including, range, speed, flight profile, autonomy, seeker, and destructiveness.

Source: Excerpted from U.S. Office of Naval Intelligence, *Iranian Naval Forces: a Tale of Two Navies*, February 2017, <https://www.oni.navy.mil/Portals/12/Intel%20agencies/iran/Iran%20022217SP.pdf>, pp 27-41

**Unmanned Aerial Vehicles: (UAV):** Both the IRGCN and the IRIN have incorporated UAVs into their respective operations and planning. Historically, UAVs have been reserved for reconnaissance missions, but as Iran improves its lethal and armed UAV technology, both navies are likely to employ these advancements in the maritime environment. Antiship Ballistic Missiles (ASBM)The Islamic Revolutionary Guard Corps Aerospace Forces (IRGC ASF) controls Iran’s ballistic missile forces. The IRGC ASF has advertised several ballistic missile variants with the capability to target ships. The variants include the Khalij-e Fars, Hormuz-1 and Hormuz-2 missiles, which reportedly have a range of 300 km and are equipped with terminal seekers, one of which is anti-radiation homing (ARH). With each new domestic program, Iran gains valuable technical experience, advancing its defense industries in support of its military objectives. While still lagging considerably behind leading nations, Iran’s defense industries have made recognizable strides in equipping its navies and other military services, with a broad range of capabilities for the maritime environment. As Iran incorporates these capabilities and develops proficiency in using them, the IRGCN and IRIN will be more capable of fulfilling their respective missions. For any navy, training, exercises, and operational proficiency are critical elements to achieve that objective.

Source: Excerpted from U.S. Office of Naval Intelligence, *Iranian Naval Forces: a Tale of Two Navies*, February 2017, <https://www.oni.navy.mil/Portals/12/Intel%20agencies/iran/Iran%20022217SP.pdf>, pp 27-41



# Open-Source Estimates of Iranian Naval and Anti-ship Missiles

**Noor Anti-ship, Anti-Coastal Target Missile:** long-range anti-ship cruise missile.

Manufactured by Iran. The missile is in primary service with the Iranian Navy. The missile is a land and sea-based sea-skimming anti-ship missile, originally reverse engineered from the Chinese C-802 anti-ship missile. It has radar homing, a turbojet engine, a fragmentation warhead, and has had range of upgrades. It is now deployed with both anti-ship and coastal and sea based fixed target attack capability.

- **Basic Noor:** Initial reverse-engineered missile with a range of 30 km (19 mi).
- **Noor Phase 2:** Improved version with 130 km (81 mi) range.
- **Noor Phase 3:** Further increased the range to 170 km (110 mi).
- **Noor Phase 4:** Better electronics and computer algorithms.
- **Qader:** An upgraded version with the range of 200 km (120 mi).
- **Noor Export Version:** A version with the range of 120 km (75 mi). It has been sold to Syria and deployed on 6 Tir-2 fast attack craft.

**"Qader" (Able) Anti-ship, Anti-Coastal Target Missile** is an Iranian designed and produced system for use against coastal targets and warships. It was announced in 2011, and is claimed to have a range of 300 km, it is a sea-skimmer with a low radar profile and ECCM capability with air, sea, and land launch options and a digital autopilot and active radar guidance.

**Ghadir Anti-ship Missile** with a range of 330 km. The missile is capable of being employed both from shore and from ships afloat. The missile was unveiled in Tehran in 2014.

**Ra'ad Anti-ship Missile:** A system developed using technology from the Chinese HY-2 and HY-4 Silkworm. It is a sea skimming, solid propellant missile with a range of up to 360 kilometers, with a solid propellant booster and a turbojet engine deployed in both ships and along the coast of Iran with some concentrated for use against targets at the Strait of Hormuz. Guidance may be infrared imaging or active radar.

**Kowsar/ Kosar (Thunderbolt):** A medium-range, sea skimming anti-ship missile made in Iran, with ECCM and a solid rocket engine. It is reported to have been in service since 2006, and is deployed on land vehicles and the Zolfaghar class fast attack craft. Some reports indicate it is derived from the Chinese C-701 and/or the TL-10A. Range is 15-20 kilometers and it is reported to have a speed of Mach 8, and a 29 kilogram time-delayed semi-armor-piercing high-explosive warhead. This was the missile the Hezbollah used on July 14, 2006 against the Israeli corvette INS *Hanit*, causing serious damage and killing Israeli servicemen. Another missile hit an Egyptian merchant ship causing heavy damage

**Nasr-1 Anti-ship Missile** is an Iranian copy of the Chinese C-704 short-range anti-ship missile with a solid rocket engine. It is in volume production and broadly deployed. It is reported to have a 35-kilometer range and a 150-kilogram semi-armor piercing warhead. It can be launched from inland bases and offshore military vessels, and is reported to be modified to be fired from helicopters and submarines. In December 2008, the Iranian Navy test-fired the surface-to-surface Nasr-1 during the final stage of "Unity 87" wargames. On 7 March 2010, Iran's defence minister announced mass-production of Nasr-1 missiles. It was tested on TELs on 10 February 2013

**Khalij Fars ("Persian Gulf") ballistic anti-ship missile:** Reported to be a derivative of Iran's domestically developed Fateh-110 short-ranged ballistic missile. The Fateh-110 uses solid fuel for quick reaction, and is reported to use an electro-optical/infrared seeker target a 1,433-pound warhead on moving naval targets. Iran has claimed that in a 2013 test, such a missile struck a moving naval target with eight-meters of accuracy). A CSIS report in 2014 indicated that it would fall within a few dozen meters of the target, and that it had probably entered service in IRGCN forces.

**Chinese YJ-18 Dual Speed-Supersonic Burst Anti-Ship Cruise missile:** Unconfirmed reports indicate some technology transfer to Iran of missiles like this may have occurred. Chinese technology is highly advanced and this system has a reported range of up to 540 kilometers. China may have derived it in part from the Russian SS-N-27 Klub.

**Zafar Triumph** Short-range anti-ship missile: Older Iranian engineered and produced cruise missile with ECM and box launch capability with shore launch and high-speed small craft launch capability.

**Sadid-1, Sadid 361, Fathah 362, and Sadid 342 TV-guided anti-armor guided missile:** Iran has claimed the system was employed in 2018. The system may still be developmental and is linked to the Iranian Toophaan missiles. It has some similarities to the Israeli Spike System. It has a reported range of 4,000 meters, and some variants are claimed to be UCAV mounted. It can be fired from land or small craft.

**Dehlavieh crew-capable light anti-armor guided missile:** Said to be an Iranian copy of the Russian KBM 9M133 Kornet missile acquired from Syria. Claimed to use advanced anti-armor and anti-material weapons, capable of destroying stationary or moving main battle tanks equipped with reactive armor and be equally effective against non-armored targets, such as bunkers or buildings, as well as low-flying and naval targets, and to have guidance employs an advanced guidance system that makes it immune to current electronic countermeasures. Has an effective range of 100 – 5500 meters and a tandem warhead capable of penetrating of 1000-1200 mm steel armor (RHA) with reactive protection as well as a version with a thermobaric warhead to be used against bunkers and structures.

Source: Iranian claims and open source reports have many uncertainties and contradictions.

This estimate is derived from many sources including Wikipedia, [https://en.wikipedia.org/wiki/Noor\\_\(missile\)](https://en.wikipedia.org/wiki/Noor_(missile)); <https://nationalinterest.org/feature/c-hinas-yj-18-supersonic-anti-ship-cruise-missile-america-13010>; <https://fas.org/sgp/crs/row/RL33153.pdf>; <https://nationalinterest.org/blog/buzz/we-need-talk-about-irans-missiles-they-could-strike-us-navy-57832>; [https://en.wikipedia.org/wiki/Ra%27ad\\_\(anti-ship\\_missile\)](https://en.wikipedia.org/wiki/Ra%27ad_(anti-ship_missile)); ["Ra'ad". Missile Threat, Center, for Strategic and International Studies. 9 August 2016; https://en.wikipedia.org/wiki/Sadid-1](https://www.missilethreat.com/2016/08/09/iran-introduces-a-locally-produced-kornet-e-copy.html); [https://en.wikipedia.org/wiki/Qader\\_\(missile\)](https://en.wikipedia.org/wiki/Qader_(missile)); [https://defense-update.com/20120707\\_iran-introduces-a-locally-produced-kornet-e-copy.html](https://defense-update.com/20120707_iran-introduces-a-locally-produced-kornet-e-copy.html).



# Iranian Coastal Defense Cruise Missile Ranges

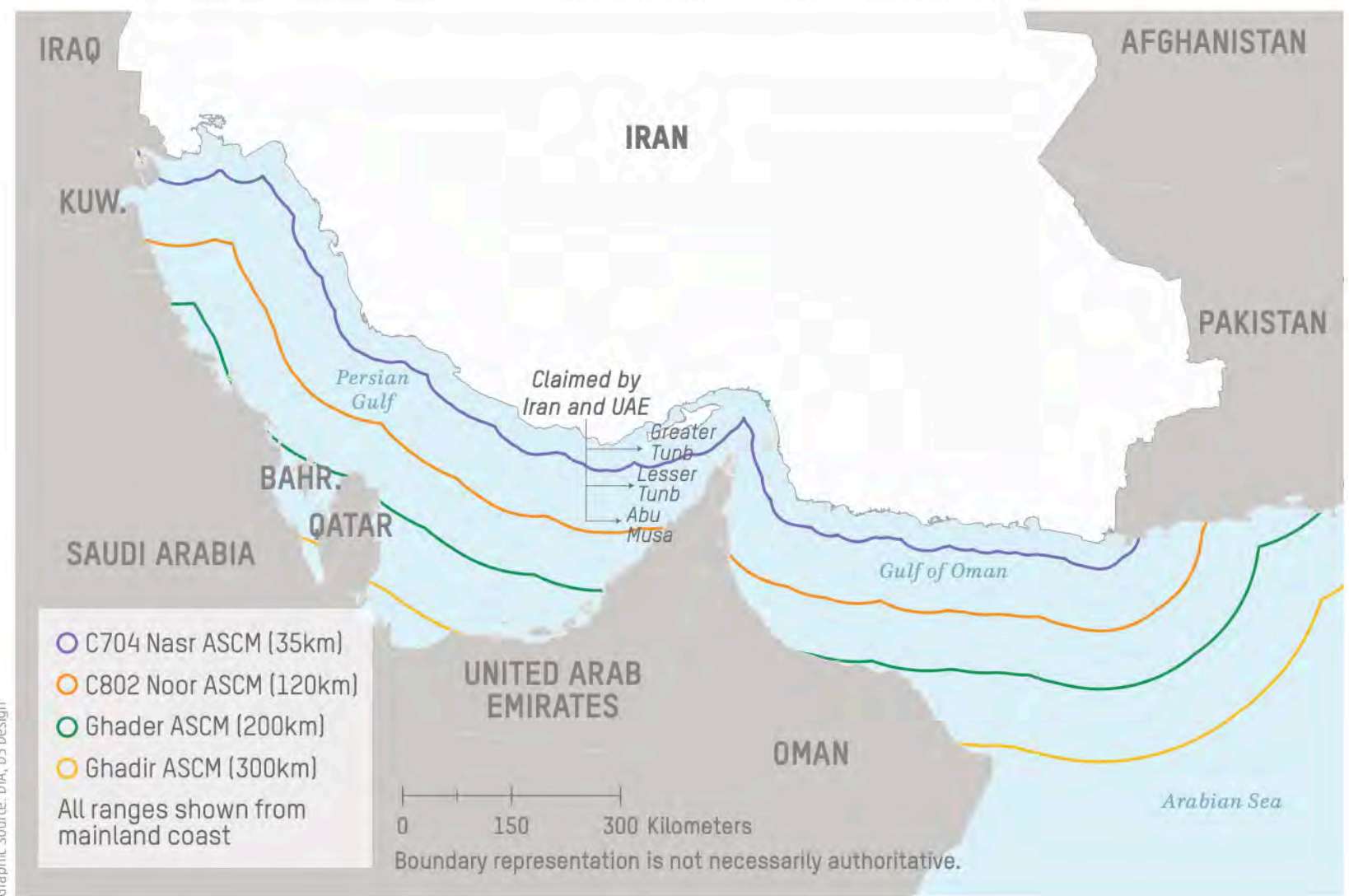
CDCMs have been one of Iran's primary layers of defense for both navies to protect the country's littoral and maritime approaches. Iran initially gained experience with CDCMs using Chinese-built Silkworm missiles during the Tanker War. Both the IRGCN and IRIN operate CDCM forces, and Iran has invested greatly in developing and producing more-capable ASCMs, primarily based on Chinese C802 and C700-series missiles. Based on its domestic copy of the C802, called the Noor, Iran has developed the 200-kilometer-range Ghader and the 300-kilometer-range Ghadir ASCMs. Iran also domestically produces the 35-kilometer-range Chinese C704 ASCM as the Nasr.

## Antiship Ballistic Missiles

The IRGCASF has publicly announced and tested its ability to target ships with several ballistic missile models—including the Khalij Fars, Hormuz 1, and Hormuz 2—based on the Fateh-110 SRBM. These anti-ship ballistic missiles (ASBMs) have ranges of up to 300 kilometers and are equipped with terminal seekers that steer the missile to its target. These systems use a variety of seekers, including electro-optical and antiradiation homing.

## Iranian CDCM Ranges

1805-17885





# Open Source Data on Iranian Mine Warfare Capabilities

Iran demonstrated during the Iran-Iraq War that it could use naval mines in asymmetric warfare by placing some mines in fixed locations while letting others float freely in key tanker and shipping routes through the Gulf. This allowed it to use one of its older World War I mine designs to seriously damage the USS Samuel B. Roberts in 1988. Iran also did not need to use specialized mine warfare vessels to place such mines. It could use small ships – like Dhows – to carry and place mines or let local currents move the mines down a given path.

Iran's IRGC naval branch has regularly practiced mine warfare in the years since the end of the Iran-Iraq War in 1988. Iran also has conducted recent actual attacks. Two freshly loaded tankers – the *Frontline* and the *Kokuka Courageous* – were attacked in the Gulf of Oman on June 12, 2019 – just outside the "Persian" or "Arab" Gulf. These attacks came less than a month after four previous attacks on tankers near a port in the UAE, and after months of rising tensions over Iran's nuclear program, the war in Yemen, and the growing arms race in the region. Iran used limpet mines – which divers or small craft can covertly attach to the hull of a ship– to attack several ships. The Iranians evidently deliberately placed the mines to cause damage above the waterline to ensure the ships would not actually sink.

Iran has much larger mines, however, with warheads up to 2,500 pounds. Some sources indicate it has increased its inventory from some 1,500 mines in the 1980s to more than 6,000 currently. Conventional contact mines are also only part of this threat. Iran may have air and submarine launched anti-ship mines.

Iran also has so-called “smart mines.” The basic design for such mines allows the mine to sink to the bottom in a given area. Once in place, they can use sensors that can detect the sound pattern, pressure, and magnetic impact of ships passing above the mine. They can be set to arm themselves at given intervals over given periods of time, only attacking passing ships of a given size and type. As a result, such mines do not have to be regularly re-laid, and the threat becomes highly unpredictable and difficult to identify and disarm. Iran may also now have “active” versions of such mines that have more powered movement capability and the range to more actively attack given targets.

It is unclear how far such Iranian designs for “smart mines” have advanced, and whether Iran is seeking to create more modular and adaptable mine designs. DIA summarizes Iran's capability as follows, “ Mine warfare has been an integral part of Iran's naval strategy since the Tanker War. Iran has an estimated inventory of more than 5,000 naval mines, which include contact and influence mines. Both navies have devised strategies to rapidly deploy mines while improving force survivability. Iran has a variety of vessels that can lay mines, but the IRGCN has integrated its doctrine of using smaller, faster vessels into its mine-laying strategy. Iran has equipped many of its Ashoora small boats with mine rails capable of holding at least one mine.” (pp. 54-55)

The U.S. British, and Arab Gulf navies have all participated in mine clearing exercises over the years since 1988. However, most such exercises have revealed only negligible to limited capability to actually disarm or recover such mines. Moreover, the Arab Gulf navies have very limited minesweeping capability, and U.S. mine warfare deployments have been limited.

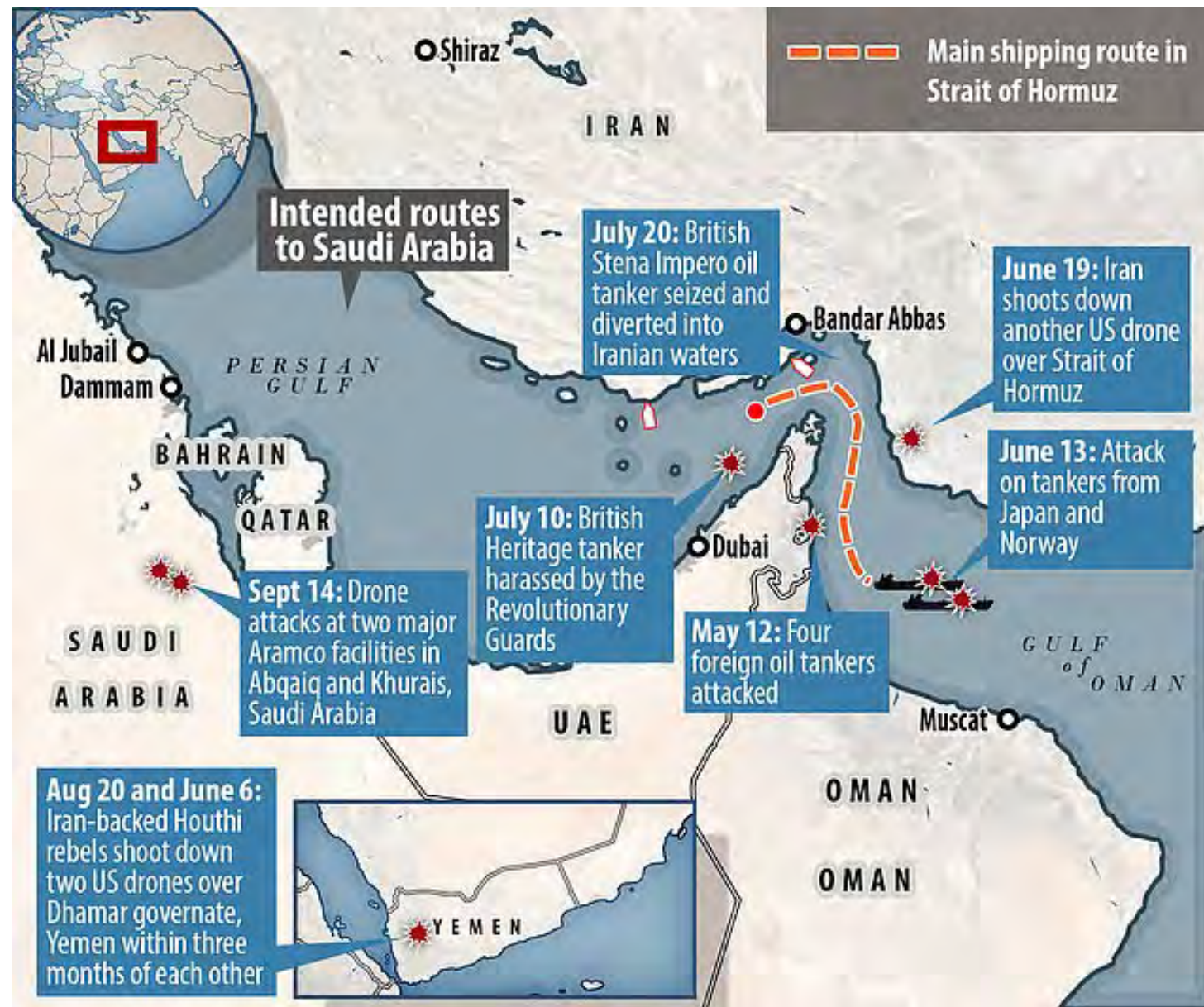
U.S. mine sweepers like the Avenger-class mine sweeper as well as the MH-53 Sea Dragon mine warfare helicopters are aging – as are British and European designs. The readiness and performance capabilities of the aging Avengers and Sea Dragons are suspect. U.S. plans to create effective unmanned mine detection and destruction systems lag badly behind, and ship building plans would replace the existing force of 11 minesweepers with only eight specially equipped Littoral Combat Ships – a class of vessels that so far has fallen far behind schedule and expectations.

# Iranian Port Visits and Naval Exercises



Source: DIA, *Iran Military Power, Ensuring Regime Survival and Securing Regional Dominance*, 19, November 2019.

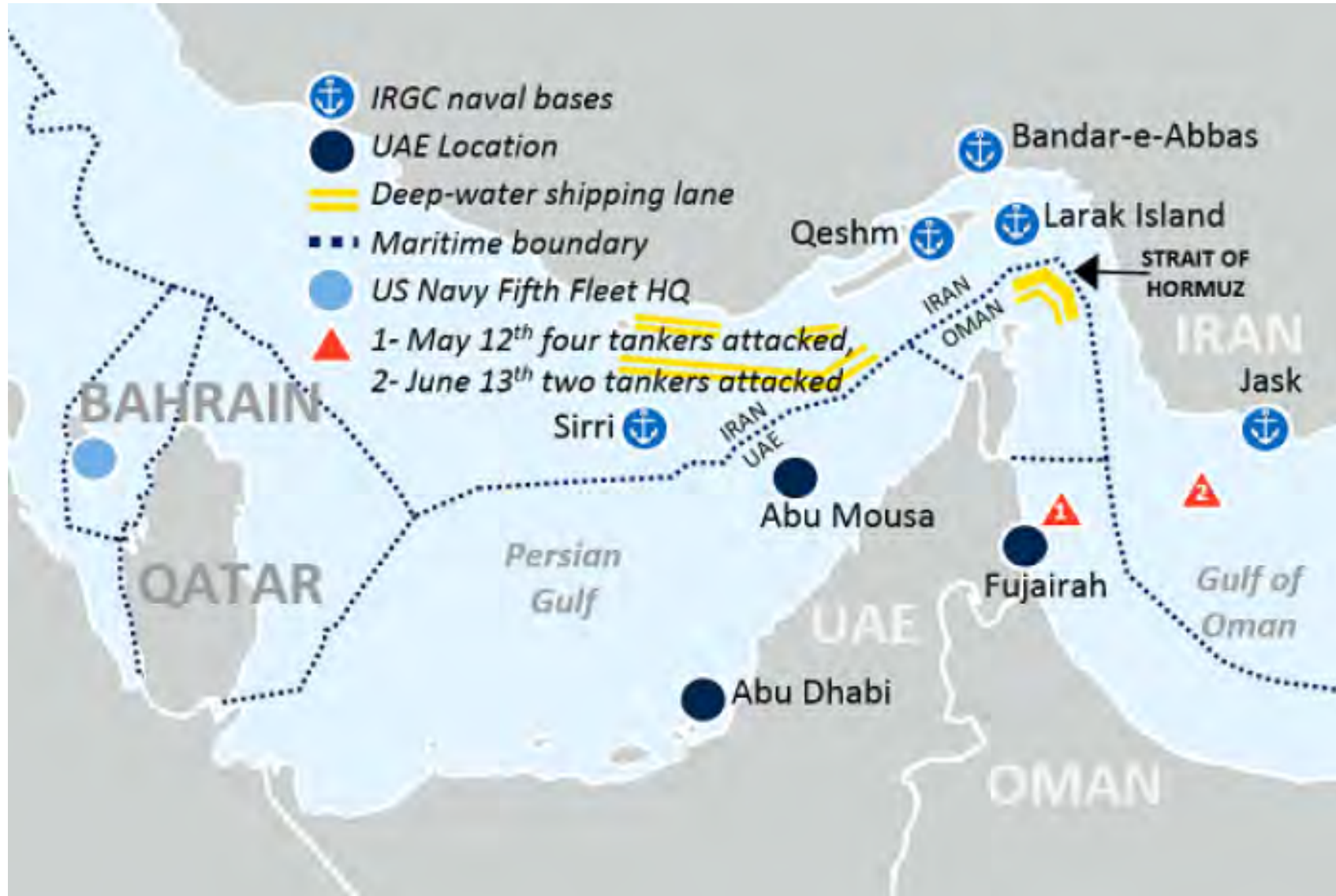
## Iranian Attacks in May- September 2019



Source: Henry Martin, "Iran-backed militants admit drone swarm strike on world's largest oil processing plant in Saudi and at second nearby facility sparking huge fires as tensions reach boiling point following tanker attacks," Daily Mail, September 14, 2019, <https://www.dailymail.co.uk/news/article-7463189/Drone-attacks-spark-huge-fires-two-Saudi-oil-refineries.html>



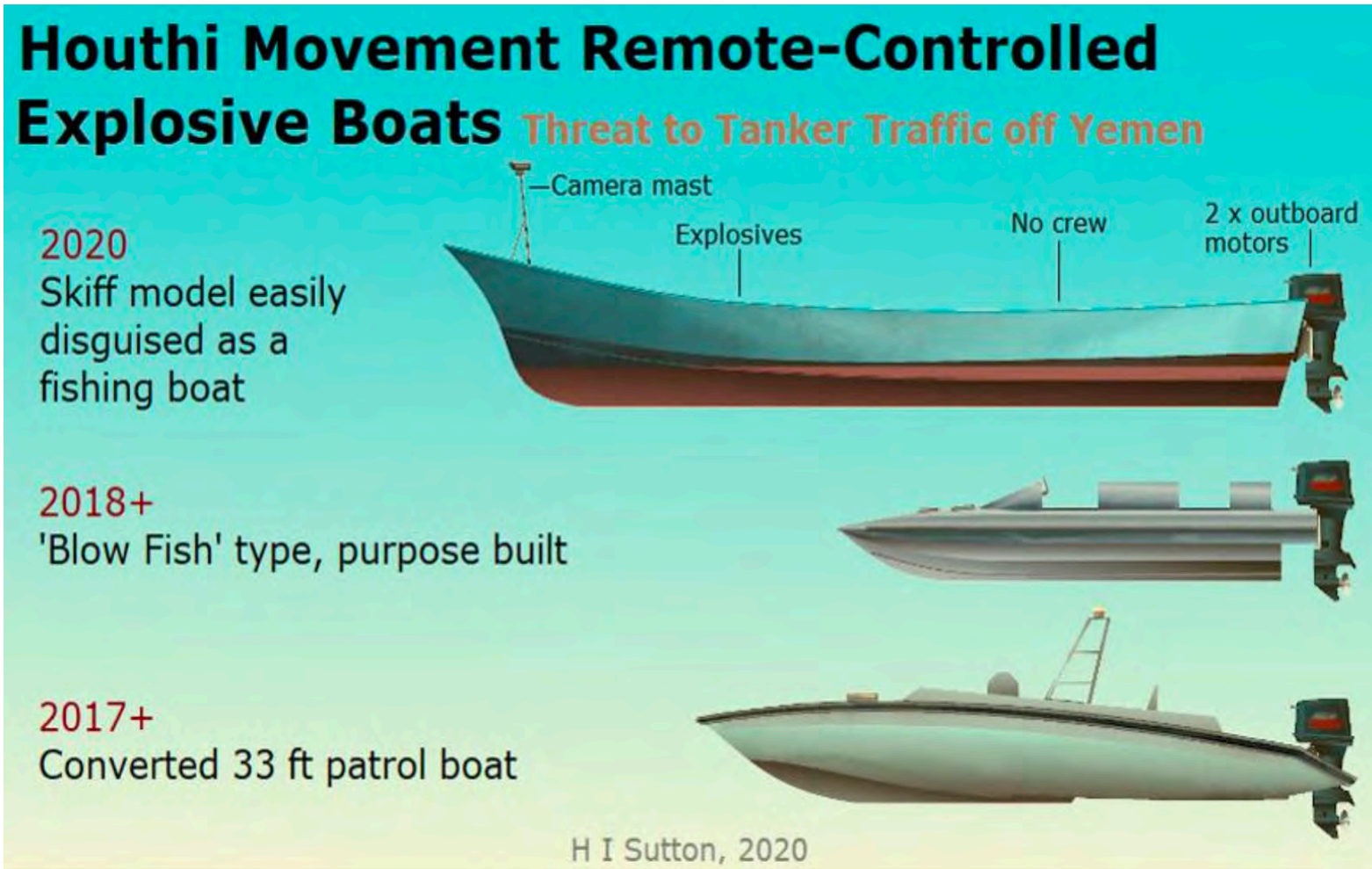
# Iranian Tanker Attacks in 2019



Source: "Iran's Revolutionary Guard Seizes foreign oil tanker, state TV reports," ABC News, <https://www.abc.net.au/news/2019-07-19/iran-seizes-oil-tanker-in-persian-gulf/11323564>

# How Small Can “Smart” Get?

Iranian and Houthi Remotely Controlled Small Craft with Explosive Devices

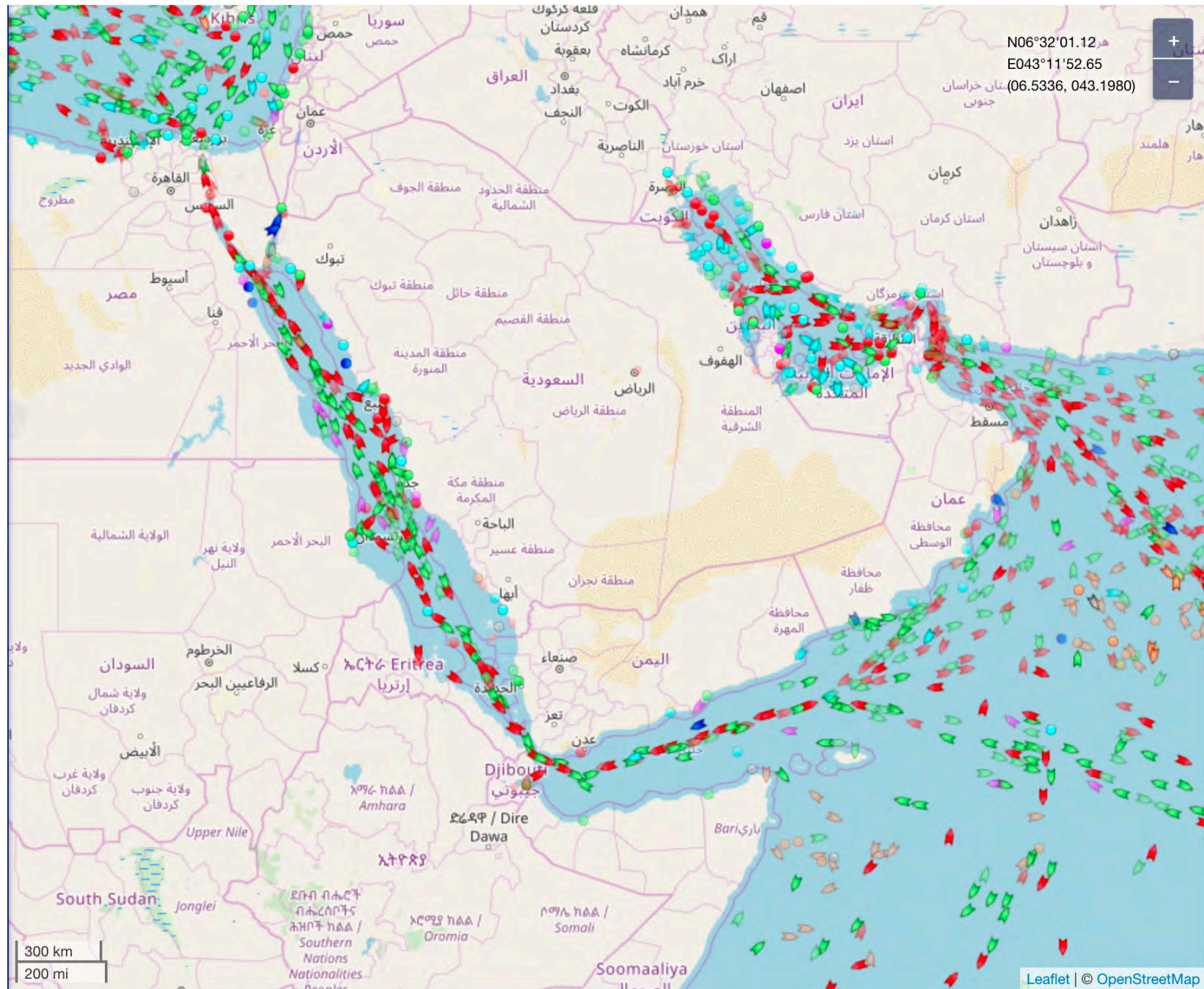


Source: “Saudi-led coalition says it foiled attack on oil tanker off Yemen,” Reuters, March 4, 2020.



# Peacetime Tanker and Cargo Ship Traffic in the Gulf Region: 6.3.2020

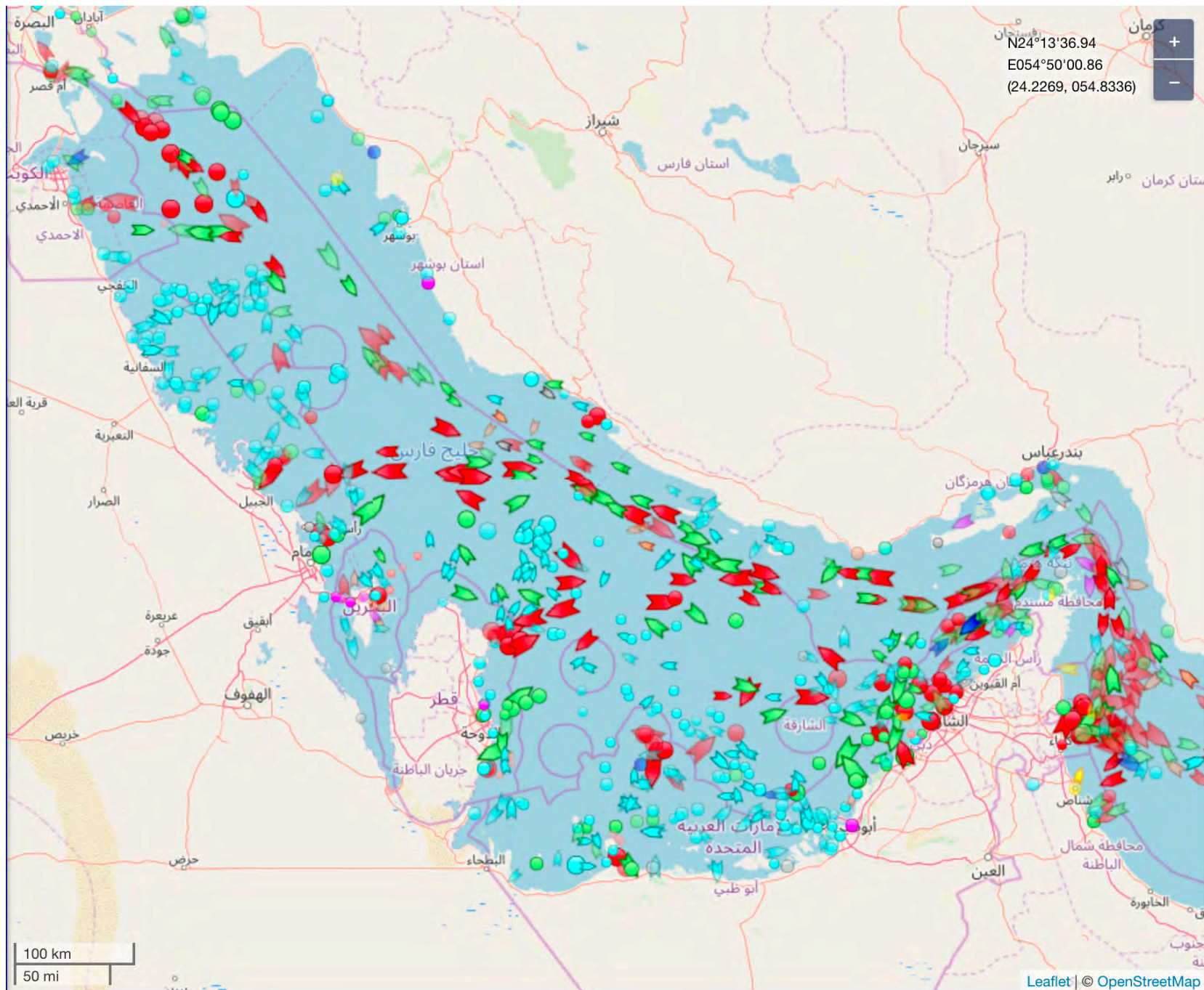
Source: Hellenic Shipping  
News,  
<https://www.hellenicshippingnews.com/worldwidetraffic/>





# Peacetime Tanker and Cargo Ship Traffic in the Gulf 6.3.2020

Source: Hellenic Shipping  
News,  
<https://www.hellenicshippingnews.com/worldwidetraffic/>



# **The Global Importance of the Flow of Persian- Arab Gulf Petroleum Exports**

# The Global Importance of the Flow of Persian-Arab Gulf Petroleum

The previous section has shown that Iran can use its naval, air, and/or missile forces and proxies to attack ships anywhere in the Gulf, around the Strait of Hormuz, in the Gulf of Oman outside the Gulf, and in Indian Ocean waters near the Strait of Hormuz. It has long threatened to "close the Gulf" at the Strait of Hormuz, but its military exercises involve dispersing its navy of Revolutionary Guard forces broadly in the Gulf and around it.

Iran does not have to launch a major war. It can conduct sporadic, low-level attacks that do not necessarily provoke a major U.S. or Arab reaction, but they will create sudden risk premiums in petroleum prices and the equivalent of a war of attrition. Tankers are slow moving commercial targets that a heavy weapon or mine can sink or incapacitate. They may cease operating or develop massive insurance premiums, even if they are attacked by relatively small anti-ship missiles, UCAVs, submersibles, and radio-controlled small craft filled with high explosives. Iran can also plant "smart" mines in the bottom of tanker routes that can detect large tankers and hone in on them, or they can be set to arm at widely spaced intervals.

These methods of "hybrid" attack can be carried out by individual ships and dhows that are not part of Iran's armed forces, that do not have Iranian flags or operators wearing Iranian uniforms, and that cannot be directly tied to actions by the Iranian government. They can also be carried out by proxies like the Houthis or "false flag" groups made up for the occasion.

Iran is expanding the areas in which it can carry out such attacks as well. The Islamic Republic of Iran Navy (IRIN) and Islamic Revolution Guards Corps Navy (IRGCN) have established a presence in the Gulf of Oman based at Chabahar – to "prevent smuggling" – and in the Gulf of Aden and near Yemen to "deal with Somali pirates."

Iran's growing role in the Gulf of Oman includes basing for its Kilo submarines to reduce U.S. ability to track and cover their movements. An IHS Janes assessment reports that Iran plans to establish three new bases on its Makran Coast in the Gulf of Oman – one of which near Pasabandar (close to the Pakistani border) was completed in February 2017.

At the same time, outside extremist groups like ISIS can carry out such attacks – potentially dragging Iran, the United States, and Arab states into some form of clash or war. No one can safely assume that Iran is – or is not – the cause of the attack in the absence of reliable intelligence or evidence. Even "implausible" Iranian denial can limit the military response of other states, particularly since virtually any such response risks triggering a far more serious conflict and an even more serious reduction in the flow of Gulf oil.

## **The Petroleum Threat to the Global Economy**

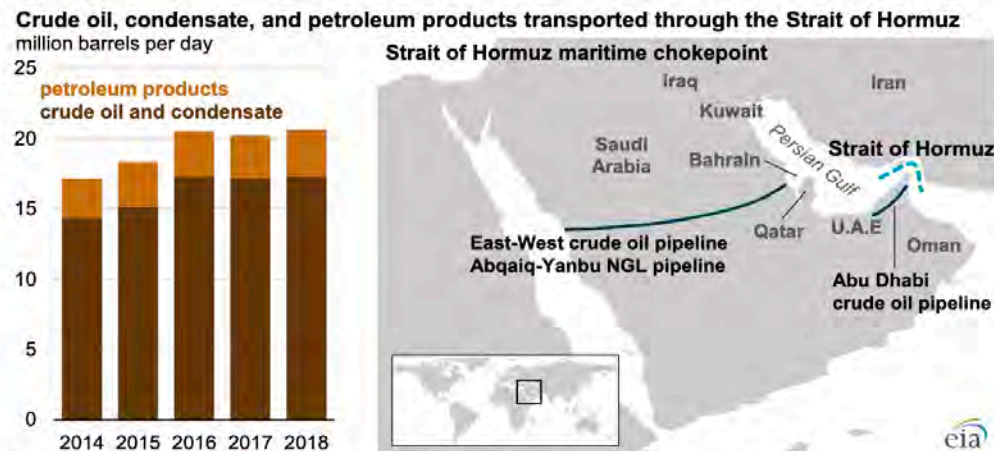
The charts, maps, and data in this section focus on the Gulf and the region's vulnerability to such attacks. Petroleum is a global commodity, and any serious risk or reduction in the supply affects prices everywhere in the world. The charts in this section show that the Arabian Peninsula and the Gulf are critical sources of exports, and some 60-million barrels of oil, plus product and natural gas, move out of the Gulf by sea every day.

While the volume of the Gulf petroleum exports varies over time, the U.S. government's Energy Information Administration (EIA) estimates that the volume has risen by about 9% in the half-decade between 2011 and 2016, and that, the **Strait of Hormuz** is the world's most important chokepoint, with an oil flow of 18.5 million b/d in 2016.

The Strait of Hormuz connects the Persian Gulf with the Gulf of Oman and the Arabian Sea, and in 2015 its daily flow of oil accounted for 30% of all seaborne-traded crude oil and other liquids. More than 30% of global liquefied natural gas trade also transited the Strait of Hormuz in 2016. At its narrowest point, the Strait of Hormuz is 21 miles wide, but the width of the shipping lane in either direction is only two miles wide, separated by a two-mile buffer zone.



# The Strategic Importance of Gulf Exports and the Strait of Hormuz



The Strait of Hormuz, located between Oman and Iran, connects the Persian Gulf with the Gulf of Oman and the Arabian Sea. The Strait of Hormuz is the world's most important oil chokepoint because of the large volumes of that flow through the strait. In 2018, its daily oil flow averaged 21 million barrels per day (b/d), or the equivalent of about 21% of global petroleum liquids consumption.

Chokepoints are narrow channels along widely used global sea routes that are critical to global energy security. Inability of oil to transit a major chokepoint, even temporarily, can lead to substantial supply delays and higher shipping costs, resulting in higher world energy prices. Although most chokepoints can be circumvented by using other routes that add significantly to transit time, some chokepoints have no practical alternatives.

Volumes of crude oil, condensate, and petroleum products transiting the Strait of Hormuz have been fairly stable since 2016, when international sanctions on Iran were lifted and Iran's oil production and exports returned to pre-sanctions levels. Flows through the Strait of Hormuz in 2018 made up about one-third of total global seaborne traded oil. More than one-quarter of global liquefied natural gas trade also transited the Strait of Hormuz in 2018.

**Crude oil, condensate, and petroleum products transported through the Strait of Hormuz**  
million barrels per day

	2014	2015	2016	2017	2018
<b>Total oil flows through Strait of Hormuz</b>	<b>17.2</b>	<b>18.4</b>	<b>20.6</b>	<b>20.3</b>	<b>20.7</b>
Crude and condensate	14.4	15.2	17.3	17.2	17.3
Petroleum products	2.8	3.2	3.3	3.1	3.3
<b>World maritime oil trade</b>	<b>56.4</b>	<b>58.9</b>	<b>61.2</b>	<b>62.5</b>	<b>N/A</b>
<b>World total petroleum and other liquids consumption</b>	<b>93.9</b>	<b>95.9</b>	<b>96.9</b>	<b>98.5</b>	<b>99.9</b>
<b>LNG flows through Strait of Hormuz (Tcf per year)</b>	<b>4.0</b>	<b>4.2</b>	<b>4.2</b>	<b>4.1</b>	<b>4.1</b>

There are limited options to bypass the Strait of Hormuz. Only Saudi Arabia and the United Arab Emirates have pipelines that can ship crude oil outside the Persian Gulf and have the additional pipeline capacity to circumvent the Strait of Hormuz. At the end of 2018, the total available crude oil pipeline capacity from the two countries combined was estimated at 6.5 million b/d. In that year, 2.7 million b/d of crude oil moved through the pipelines, leaving about 3.8 million b/d of unused capacity that could have bypassed the strait.

**Operating pipelines that bypass the Strait of Hormuz, 2018**

million barrels per day

Pipeline name	Country	Capacity	Throughput	Unused capacity
Petrolina (East-West Pipeline)	Saudi Arabia	5.0	2.1	2.9
Abu Dhabi Crude Oil Pipeline	United Arab Emirates	1.5	0.6	0.9
Abqaiq-Yanbu Natural Gas Liquids Pipeline	Saudi Arabia	0.3	0.3	0.0
<b>TOTAL</b>		<b>6.8</b>	<b>3.0</b>	<b>3.8</b>

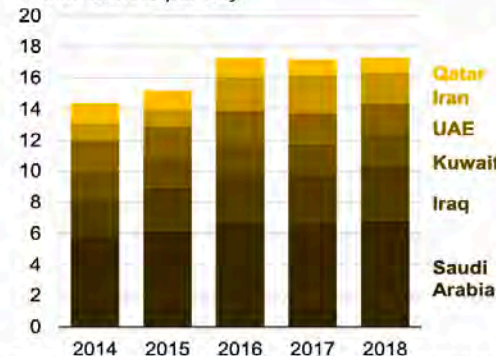
Source: U.S. Energy Information Administration, based on ClipperData, Saudi Aramco bond prospectus (April 2019)  
Note: Unused capacity is defined as pipeline capacity that is not currently used but can be readily available.

Based on tanker tracking data published by ClipperData, Saudi Arabia moves the most crude oil and condensate through the Strait of Hormuz, most of which is exported to other countries (less than 0.5 million b/d transited the strait in 2018 from Saudi ports in the Persian Gulf to Saudi ports in the Red Sea).

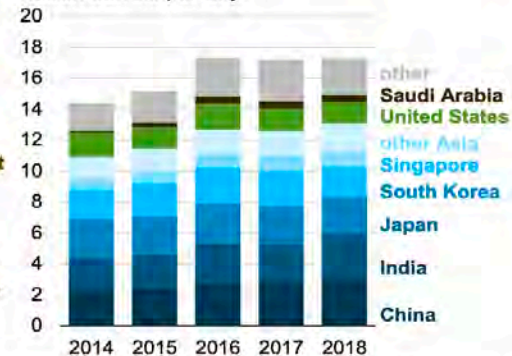
EIA estimates that 76% of the crude oil and condensate that moved through the Strait of Hormuz went to Asian markets in 2018. China, India, Japan, South Korea, and Singapore were the largest destinations for crude oil moving through the Strait of Hormuz to Asia, accounting for 65% of all Hormuz crude oil and condensate flows in 2018.

**Volume of crude oil and condensate transported through the Strait of Hormuz**

by origin  
million barrels per day



by destination  
million barrels per day



Source: U.S. Energy Information Administration, based on tanker tracking data published by ClipperData, Inc.

In 2018, the United States imported about 1.4 million b/d of crude oil and condensate from Persian Gulf countries through the Strait of Hormuz, accounting for about 18% of total U.S. crude oil and condensate imports and 7% of total U.S. petroleum liquids consumption.

# Strait of Hormuz

The Strait of Hormuz is the world's most important oil chokepoint because of the large volumes of oil that flow through the strait. In 2018, its daily oil flow averaged 21 million barrels per day (b/d), or the equivalent of **about 21% of global petroleum liquids consumption**.

Flows through the Strait of Hormuz in 2018 made up about one-third of total global seaborne traded oil. **More than one-quarter of global liquefied natural gas trade** also transited the Strait of Hormuz in 2018.

At the end of 2018, the total available crude oil pipeline capacity from the two countries combined was estimated at 6.5 million b/d. In that year, 2.7 million b/d of crude oil moved through the pipelines, leaving about 3.8 million b/d of unused capacity that could have bypassed the strait.

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World maritime oil trade	56.4	58.9	61.2	62.5	N/A
World total petroleum and other liquids consumption	93.9	95.9	96.9	98.5	99.9
LNG flows through Strait of Hormuz (Tcf per year)	4.0	4.2	4.2	4.1	4.1

**Vessels transiting to the Western part of the Persian Gulf** must first enter from the Gulf of Oman, and pass through the Strait of Hormuz. The shipping lanes separate inbound and outbound traffic and keep vessels in navigable waters. The inbound lane, outbound lane, and separation lane (a median strip in between) occupy a width of 4 miles, completely in Omani territorial waters and as far from Iran's shore as safe navigation permits, but never further than 30 miles from Iran's Qeshm Island.

**Upon entering the Persian Gulf, east of the Strait of Hormuz**, vessels navigate a second set of directed traffic lanes keeping vessels headed in opposite directions apart, and clear of obstacles. The inbound lane, which is to the north, at one point comes within 6 miles of the Iranian mainland. The outbound lane lies to the south of the inbound lane; the separation lane directs traffic on either side of the Tunb Islands.

**During the Iran-Iraq war, to avoid Iranian naval forces**, ships entered the Gulf through the Strait of Hormuz shipping lane and headed along the U.A.E. coast to a point 12 miles south of Abu Musa Island.

Source: EIA, "The Strait of Hormuz is the world's most important oil transit chokepoint," June 20, 2019, <https://www.eia.gov/todayinenergy/detail.php?id=39932>



# The Strategic Importance of the Bab el-Mandeb



Source: U.S. Energy Information Administration

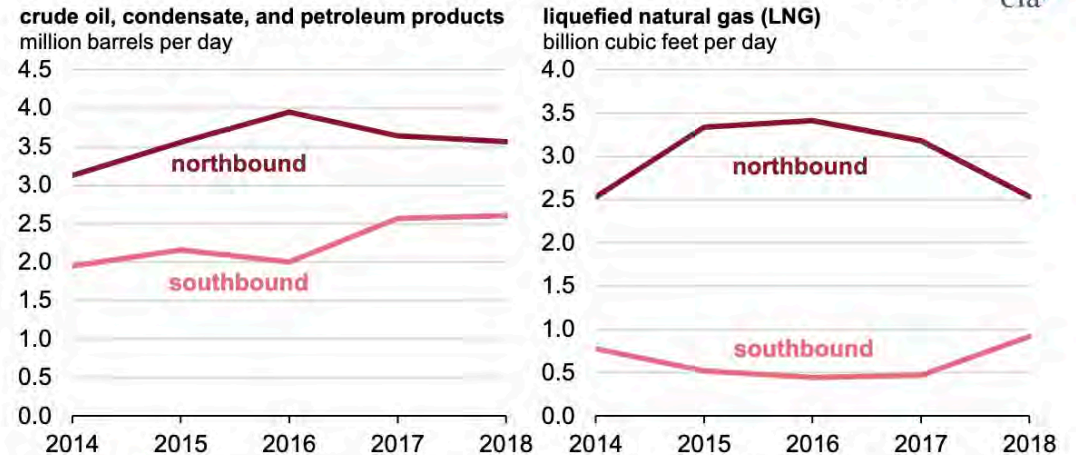
The Bab el-Mandeb Strait is a sea route chokepoint between the Horn of Africa and the Middle East, connecting the Red Sea to the Gulf of Aden and Arabian Sea. Most exports of petroleum and natural gas from the Persian Gulf that transit the [Suez Canal or the SUMED Pipeline](#) pass through both the Bab el-Mandeb and the [Strait of Hormuz](#).

**Chokepoints** are narrow channels along widely used global sea routes that are critical to global energy security. The Bab el-Mandeb Strait is 18 miles wide at its narrowest point, limiting tanker traffic to two 2-mile-wide channels for inbound and outbound shipments.

Closure of the Bab el-Mandeb Strait could keep tankers originating in the Persian Gulf from transiting the Suez Canal or reaching the SUMED Pipeline, forcing them to divert around the southern tip of Africa, which would increase transit time and shipping costs.

In 2018, an estimated 6.2 million barrels per day (b/d) of crude oil, condensate, and refined petroleum products flowed through the Bab el-Mandeb Strait toward Europe, the United States, and Asia, an increase from 5.1 million b/d in 2014. Total petroleum flows through the Bab el-Mandeb Strait accounted for about 9% of total seaborne-traded petroleum (crude oil and refined petroleum products) in 2017. About 3.6 million b/d moved north toward Europe; another 2.6 million b/d flowed in the opposite direction mainly to Asian markets such as Singapore, China, and India.

Total petroleum and LNG flows through the Bab el-Mandeb Strait (2014-2018)



Source: U.S. Energy Information Administration, based on ClipperData, Inc; Suez Canal Authority; and International Group of LNG Importers (GIIGNL) using EIA conversion factors.  
Note: [CSV data](#)

Before 2015, volumes of liquefied natural gas (LNG) passing through the Bab el-Mandeb Strait matched those passing through the Suez Canal because the Red Sea did not have any LNG infrastructure. In 2015, both Jordan and Egypt began importing small volumes of LNG into Red Sea ports, and these countries' imports of LNG peaked in 2016 at 1.4 billion cubic feet per day, 80% of which was delivered through the Bab el-Mandeb Strait.

More recently, as new natural gas fields in Egypt have come online, the need for Egypt to import LNG has decreased. Like flows to Egypt, total northbound flows of LNG via the Bab el-Mandeb have also decreased since 2016 as northbound flows to other destinations have remained fairly constant.

Source: EIA, "The Bab el-Mandeb Strait is a strategic route for oil and natural gas shipments," August 27, 2019, <https://www.eia.gov/todayinenergy/detail.php?id=41073>



# The Strategic Importance of the SUMED Pipeline and Suez Canal (I)

Suez Canal and SUMED Pipeline chokepoints



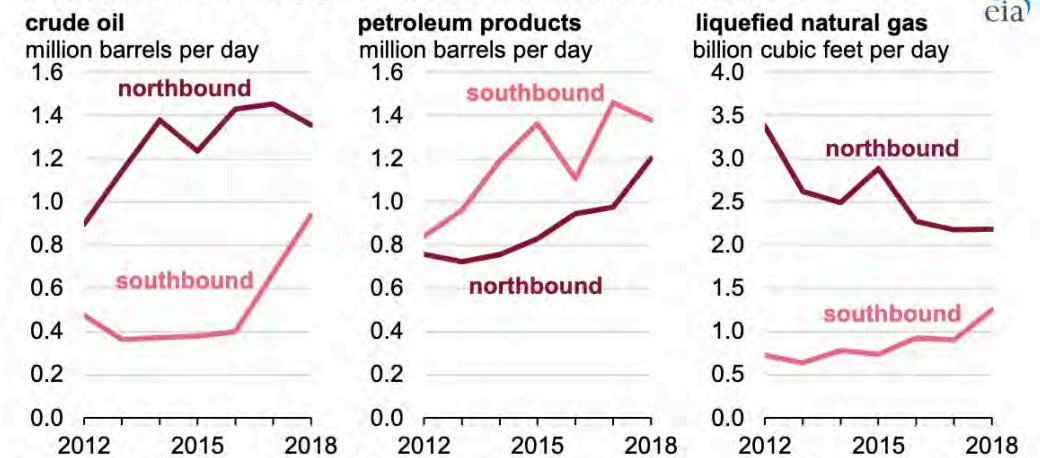
Source: U.S. Energy Information Administration

The Suez Canal and the SUMED Pipeline are strategic routes for Persian Gulf crude oil, petroleum products, and liquefied natural gas (LNG) shipments to Europe and North America. Located in Egypt, the Suez Canal connects the Red Sea with the Mediterranean Sea, and it is a critical chokepoint because of the large volumes of energy commodities that flow through it.

**Chokepoints** are narrow channels along widely used global sea routes that are critical to global energy security. Total oil flows through the Suez Canal and the SUMED pipeline accounted for about 9% of total seaborne traded petroleum (crude oil and refined petroleum products) in 2017, and LNG flows through the Suez Canal and the SUMED pipeline accounted for about 8% of global LNG trade.

Since 2016, growth in northbound total petroleum flows through the Suez Canal and the SUMED pipeline has slowed, and southbound flows through the canal have risen substantially. In particular, the Suez Canal is gaining importance as a southbound route for U.S. and Russian crude oil and petroleum products to destinations in Asia and the Middle East.

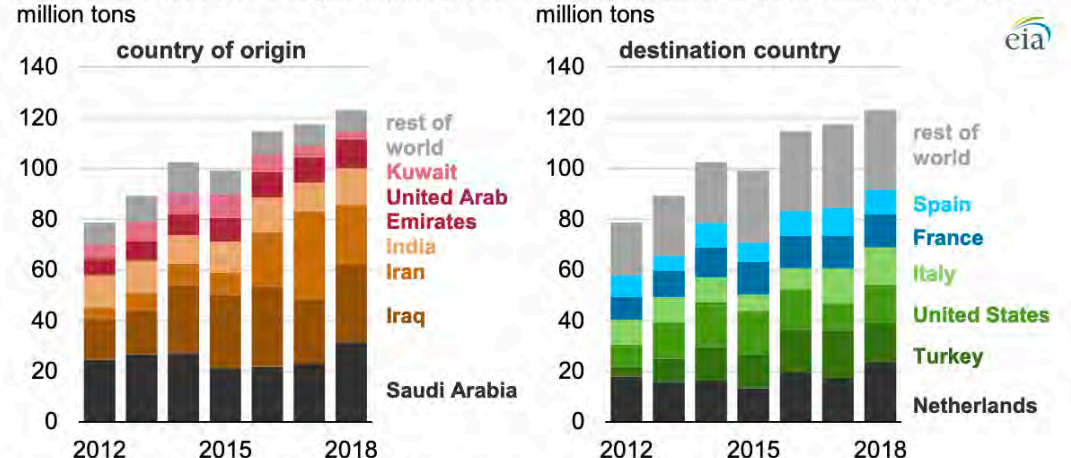
Suez Canal and SUMED pipeline flows of selected energy products (2012-2018)



Source: U.S. Energy Information Administration, based on Lloyd's List Intelligence, Clipper Data, and Suez Canal Authority (with EIA conversions)

Slightly more than half of total petroleum transiting the Suez Canal in 2018 was sent northbound to destinations in Europe and North America. Petroleum exports from Persian Gulf countries, such as Saudi Arabia, Iraq, and Iran, accounted for 85% of Suez Canal northbound traffic. Northbound flows of petroleum products have risen in recent years, particularly as more ultra-low sulfur diesel fuel has been shipped from Saudi Arabia to European countries.

Northbound crude oil and petroleum product volumes transiting Suez Canal (2012-2018)



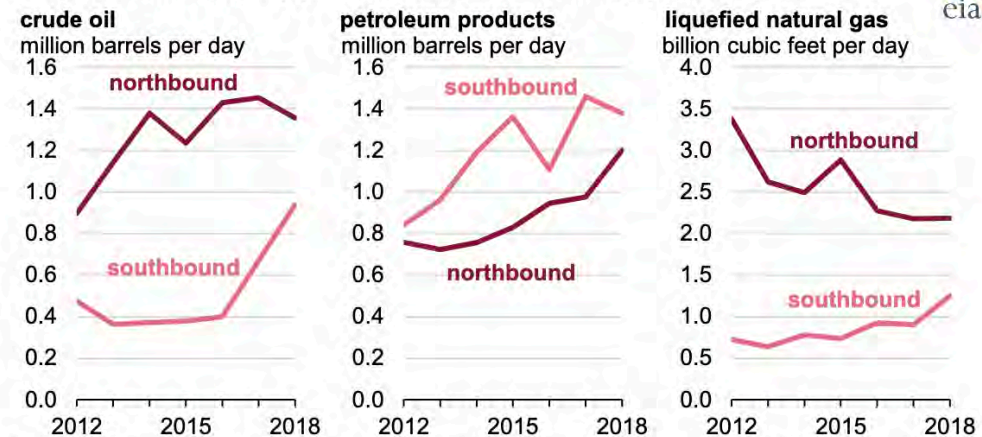
Source: U.S. Energy Information Administration, based on Suez Canal Authority

Source: EIA, "The Suez Canal and SUMED Pipeline are critical chokepoints for oil and natural gas trade," July 23, 2019, <https://www.eia.gov/todayinenergy/detail.php?id=40152>



# The Strategic Importance of the SUMED Pipeline and Suez Canal (II)

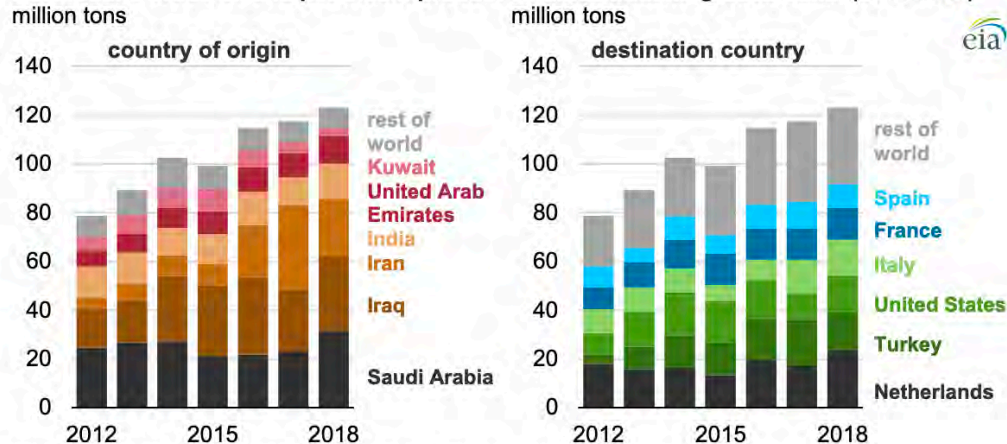
Suez Canal and SUMED pipeline flows of selected energy products (2012-2018)



Source: U.S. Energy Information Administration, based on Lloyd's List Intelligence, Clipper Data, and Suez Canal Authority (with EIA conversions)

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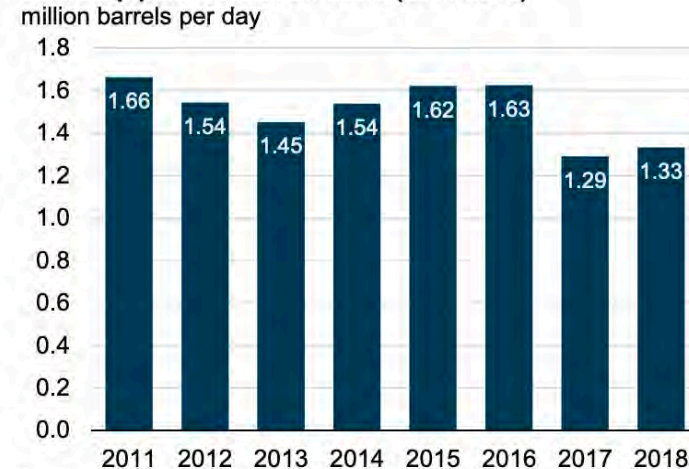
Northbound crude oil and petroleum product volumes transiting Suez Canal (2012-2018)



Source: U.S. Energy Information Administration, based on Suez Canal Authority

The 200-mile long SUMED Pipeline transports crude oil northbound through Egypt from the Red Sea to the Mediterranean Sea. Crude oil flows through two parallel pipelines that have a total maximum flow capacity of 2.8 million barrels per day. The SUMED Pipeline is the only alternative route to transport crude oil from the Red Sea to the Mediterranean Sea if ships cannot navigate through the Suez Canal. Crude oil flows through the SUMED Pipeline have declined since 2016 as a result of the shifting oil trade patterns and a widening of the Suez Canal.

SUMED pipeline crude oil flows (2011-2018)



Source: U.S. Energy Information Administration, based on Lloyd's List Intelligence and Clipper Data



Source: EIA, "The Suez Canal and SUMED Pipeline are critical chokepoints for oil and natural gas trade," July 23, 2019, <https://www.eia.gov/todayinenergy/detail.php?id=40152>

# **Limits to the Role of Land Forces**

# Limits to the Role of Land Forces

Iran has the capability to conduct special forces, commands, and marine force raids, and the charts and maps in this section show that the risk of such raids cannot be dismissed. An Iranian special unit raid on Iraq's offshore petroleum loading platforms had a major tactical impact early in the Iran-Iraq War. Iran also has substantial amphibious and ferry lift capability, although it has not practiced major amphibious raids in the face of armed resistance.

Iran can also project land power less formally by sending "volunteers" to advise or fight in foreign countries and to train and equip foreign state and non-state forces in or outside Iran. Iran has so far used the IRGC and Al Quds force for most such missions but has also shown that the regular army and marine forces also have the capability to perform these missions.

At the same time, the maps throughout this analysis show that the geography of the Gulf limits the prospects for large scale-land combat missions other than a major Iranian military intervention in a divided Iraq or a demonstrative attack on Kuwait. Any major Iranian invasion of another Arab Gulf state would require Iran to carry out large-scale maneuver warfare, supply its forces at a distance, and deal with the local population.

Any Iranian invasion of Saudi Arabia would present major problems, given the Kingdom's strategic depth and comparatively large population of over 36 million. Iran does have a major lead in land force manning and massive artillery forces that are a legacy of the Iran-Iraq War, but Iran lacks modern armor, much of its equipment is aging and worn, and it has relied far more on mass in the Iran-Iraq War than maneuver. Iranian land forces lack even effective exercise experience in sustaining maneuver warfare outside Iran. They could not survive combined U.S. and Saudi air attacks and would have problems in surviving against well managed Saudi air attacks without U.S. support.

In contrast, any U.S. and Gulf Arab land invasion of Iran would at best mean dealing with a country whose forces are organized and trained to provide defense in depth and whose Basij Resistance Force can deploy up to 600,000 men for local defense and irregular warfare – all while trying to occupy a nation of more than 80 million people.

As a result, the most likely areas for any form of scenario involving sustained land combat are Kuwait and Iraq. Such a conflict, however, presents the problem that an effort to win a limited war could easily escalate out of control. At best, it would present Iran with the challenge of occupying a significant part of another country in ways that could trigger massive U.S. intervention in the conflict.



Attacking Kuwait would also unite most of the Arab world against Iran. Unless Iraq divided to the point where Iran would be welcome by many or most of Iraq's Shi'ites, the end result also could be as unpleasant for Iran as a U.S. invasion of Iran would be for the United States.

A lack of proper training and readiness also seem likely to limit any form of serious land combat that involves sustained maneuver warfare outside national territory. Land combat units vary sharply in quality by unit in Iran and the Arab Gulf states, and their recent combat experience is limited. It has now been some 30 years since the first Gulf War, and only Iraq's counterinsurgency and counterterrorism forces have had recent combat experience.

No one can dismiss the possibility of a large-scale land war, but it seems more likely that the overall land balance will not be a key factor. Land conflicts are more likely to be fought by limited groups of forces that are fighting limited conflicts tailored to very specific contingencies, or they will be involved in train and assist missions. Given the sharply varying quality of the units in most Gulf armies and the inability to predict the scenario, it makes it exceptionally difficult to predict the comparative capability of land forces in the most likely local and limited conflicts, although the U.S. and Iran clearly have the most experience in train and assist missions.

## The Iran-Iraq Border Area

Source: Australian National University, "Iraq-Iran border region," February 13, 2020,  
<https://asiapacific.anu.edu.au/maponline/base-maps/iraq-iran-border-region>

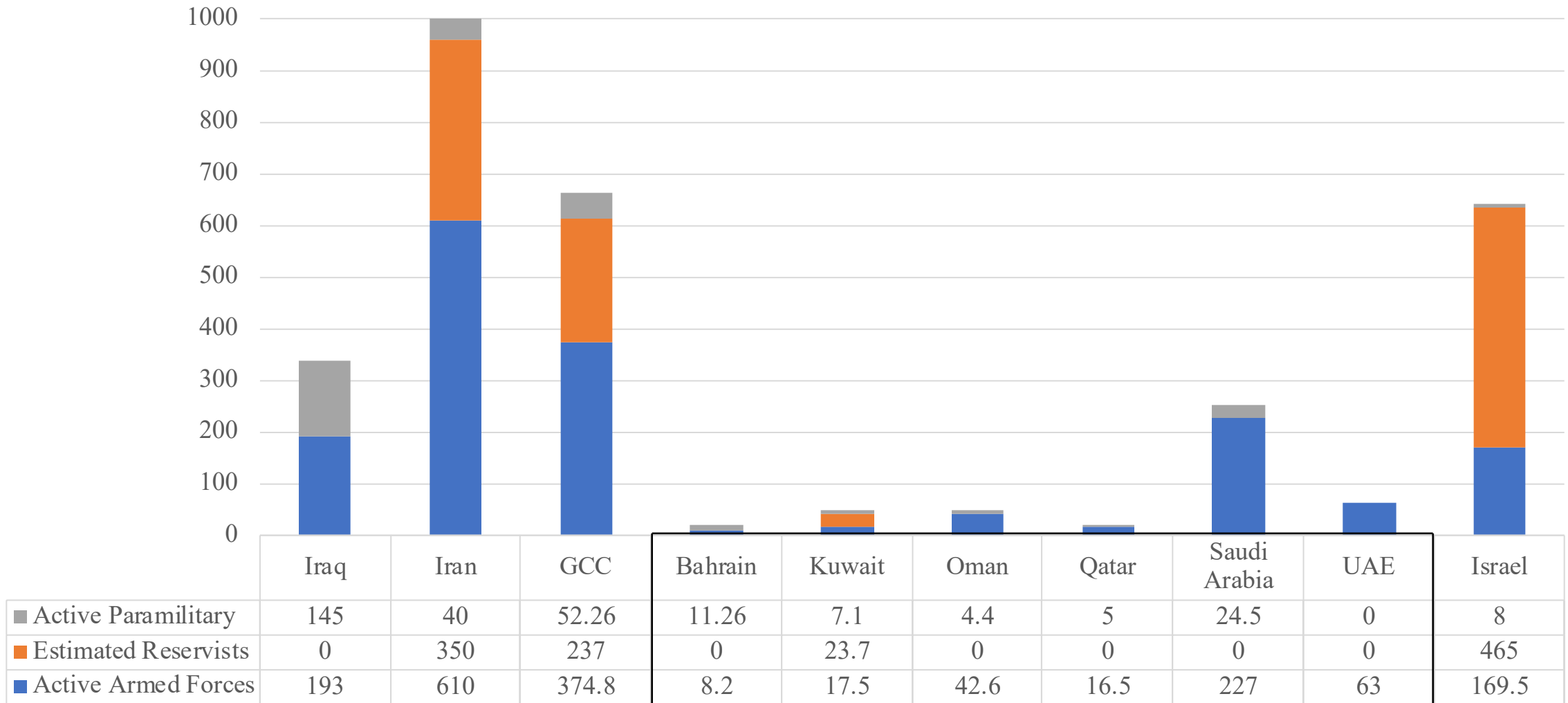


## The Kuwaiti “Hinge” in Land Combat in the Gulf

Source: Google Maps, Kuwait,  
[https://www.google.com/maps/place/Kuwait/data=!4m2!3m1!1s0x3fc5363fbcea51a1:0x74726bcd92d8edd2?s\\_a=X&ved=2ahUKEwiZ8rzMqrjoAhW6IHIEHUEMDb4Q8gEwAHoECAsQAQ](https://www.google.com/maps/place/Kuwait/data=!4m2!3m1!1s0x3fc5363fbcea51a1:0x74726bcd92d8edd2?s_a=X&ved=2ahUKEwiZ8rzMqrjoAhW6IHIEHUEMDb4Q8gEwAHoECAsQAQ)

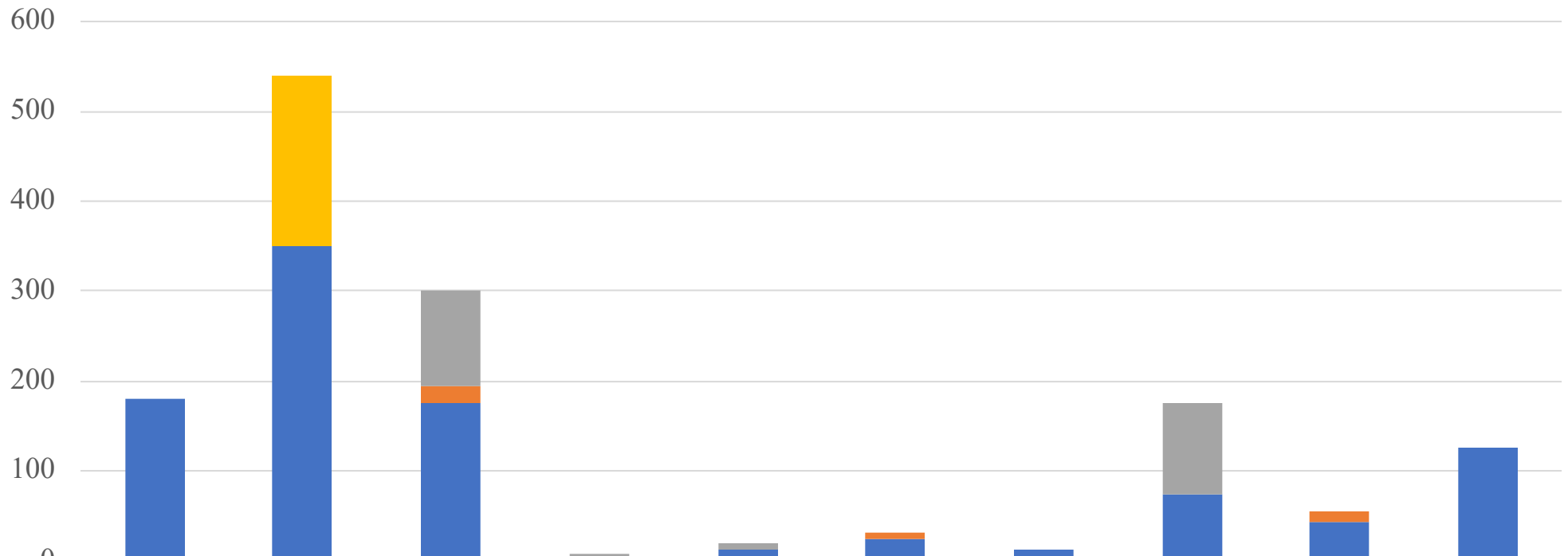


# Comparative Active Armed Forces, Estimated Reserves, and Active Paramilitary Personnel: 2019



Source: Adapted by the author from IISS, *Military Balance 2020*, Chapter Seven, “The Middle East and North Africa,” 342-284.

# Comparative Active Army, National Guard, Royal/Presidential Guard, IRGC Military Personnel (Thousands) 2019



	Iraq	Iran	GCC	Bahrain	Kuwait	Oman	Qatar	Saudi Arabia	UAE	Israel
IRGC	0	190	0	0	0	0	0	0	0	0
National Guard	0	0	108.6	2	6.6	0	0	100	0	0
Royal/Presidential Guard	0	0	18.4	0	0	6.4	0	0	12	0
Army	180	350	175	6	13	25	12	75	44	126

Source: Adapted by the author from IISS, *Military Balance 2020*, Chapter Seven, “The Middle East and North Africa,” 342-284.

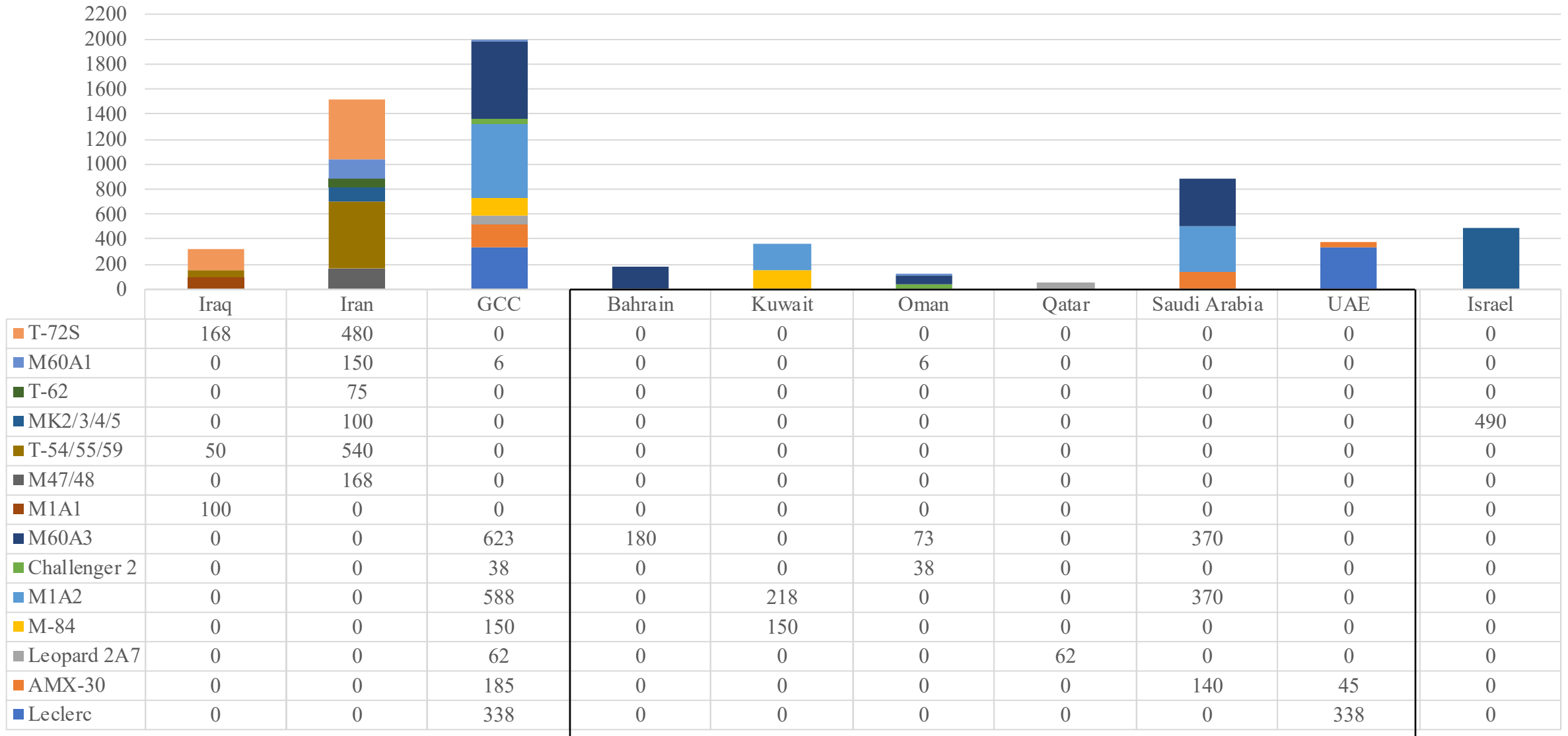


## Comparative Total Land Force Major Weapons Holdings in 2019

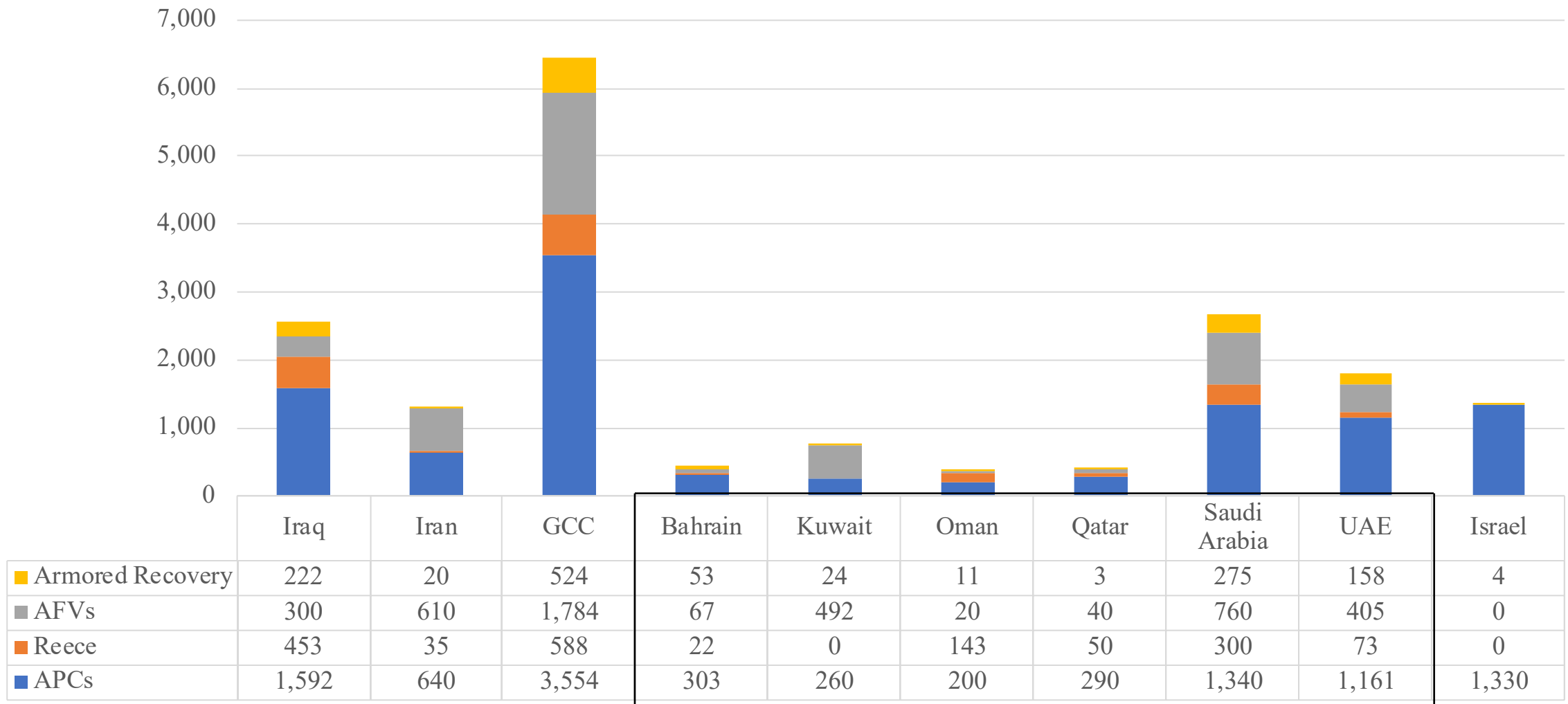
	Iraq	Iran	GCC	Saudi	UAE	Bahrain	Kuwait	Oman	Qatar
<b>Main Battle Tanks</b>	391	1,513	1,915	880	383	180	293	117	62
<b>AFVs</b>	300	610	1,784	760	405	67	492	20	40
<b>APCs</b>	1,592	640	3,554	1,340	1,161	303	260	200	290
<b>Towed Artillery</b>	60	2,030	359	110	93	36	-	108	12
<b>Self-Propelled Artillery</b>	48	292	641	224	181	82	106	24	24
<b>Multiple Rocket Launchers</b>	3	1,476	197	63	88	13	27	-	6
<b>Combat Aircraft</b>	90	333	785	429	156	38	66	63	33
<b>Attack Helicopters</b>	28	50	109	35	28	28	16	-	2
<b>Major SAM Launchers</b>	-	42	149	108	-	-	40	-	1

Source: Adapted by the author from IISS, *Military Balance 2020*, Chapter Seven, “The Middle East and North Africa,” 342-384.

# Comparative Main Battle Tank Strength, 2019

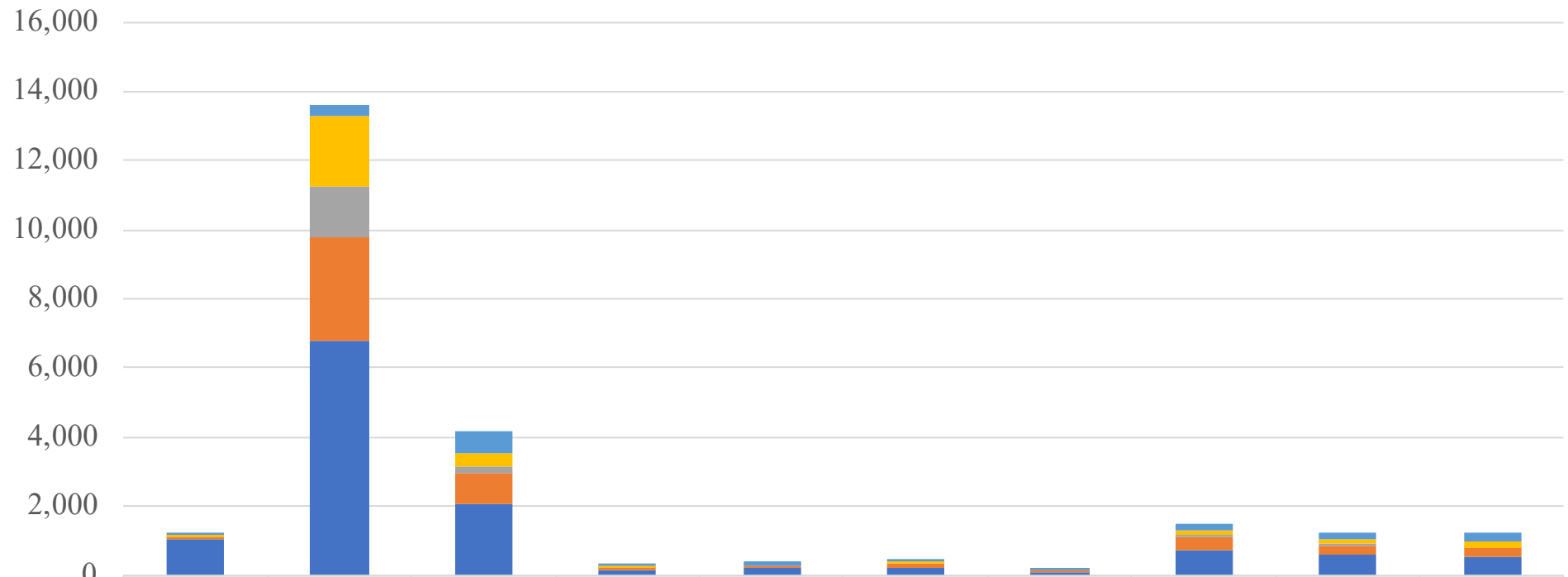


## Comparative Other Armored Vehicle Strength by Major Category, 2019



Source: Adapted by the author from IISS, *Military Balance 2020*, Chapter Seven, “The Middle East and North Africa,” 342-284.

# Comparative Artillery Strength by Major Category, 2019



	Iraq	Iran	GCC	Bahrain	Kuwait	Oman	Qatar	Saudi Arabia	UAE	Israel
■ Self-propelled	48	292	641	82	106	24	24	224	181	250
■ Towed	60	2,030	359	36	0	108	12	110	93	171
■ Multiple Rocket Launchers	3	1,476	197	13	27	0	6	63	88	30
■ Mortars	48	3,000	886	44	78	101	45	367	251	250
■ Total Major	1,061	6,798	2,083	175	211	233	87	764	613	530

Source: Adapted by the author from IISS, *Military Balance 2020*, Chapter Seven, “The Middle East and North Africa,” 342-284.

**The Third Key Shift in  
the Military Balance:  
The Impact of Iran's  
Missile Forces**



# The Changing Impact of Iran's Missile Forces

The third key shift in the balance is the rising capabilities of Iran's missile forces and their growing conventional precision strike capability – evolving capabilities whose end state is still far from clear and interacts with both unclear changes in airpower of each nation shaping the Gulf balance and changes in their land-based air and missile defenses.

The charts and data that follow address both known changes in this aspect of the balance and the uncertainties involved. They do not attempt to forecast the impact of the Coronavirus.

The assessment is divided into the following sections to illustrate both the importance of known shifts in the balance and the key uncertainties that still exist regarding the character and effectiveness of these changes:

- **The Air and Air Defense Side of the Air-Missile Balance** shows that the United States and the Arab Gulf states steadily built-up a decisive lead in air power during the time from the fall of the Shah to the present. It further illustrates the impact of sanctions and of the arm embargoes that placed severe limits on Iran's imports of advanced combat aircraft, precision guided munitions, and advanced surface-to-air missiles (SAMs) and missile defenses.
- **Comparing the Missile Forces on Each Side** provides a rough comparison of Iranian and Arab missile forces that highlights the range of missile forces in Iranian and Arab Gulf forces. The unclassified or open source data now available are limited in coverage and quality, but Iran's lead is clear.
- **The Changing Character of Iran's Missile Forces** illustrates the steady advances in Iran's capabilities to deliver precision conventional strikes. Once again, the comparisons are limited by current problems in the unclassified data, but still clearly reflect major Iranian improvements.
- **Beyond the Chronology, Examples of Iran's Recent Use of Missile Forces** provides imagery and other data providing tangible examples of Iran's progress in attacking military and civil targets – progress that does not reflect the advances in Iran's anti-ship/anti-fixed target naval forces described in the previous analysis of asymmetric forces.
- **Gulf Vulnerability and the Regional Nature of “Mutually Assured Destruction” (MAD)** focuses on the vulnerability of the civil target base in the Arab Gulf states and Iran. It highlights key targets at risk to Iranian missile attack and Arab/U.S. air and missile attack where a major conflict could lead to conventional strikes whose damage would be so severe that it would produce the regional equivalent of “mutually assured destruction.”

- **The Uncertain Future Evolution of Missile Forces** highlights many key uncertainties that affect any effort to estimate even the short to medium term impact of these developments.
- **The Need for Missile Defense?** addresses key issues in assessing the need for missile defenses.
- **The Iranian Nuclear Risk** highlights Iran's ongoing nuclear programs, as well as the potential cost-benefits of an Iranian acquisition of nuclear weapons and other weapons of mass destruction.
- **The Uncertain Future Evolution of Missile Forces** summarizes the many key issues and uncertainties affecting the overall development of Iran's missile forces.

# **The Air and Air Defense Side of the Air-Missile Balance**

# The Air and Air Defense Balance

The charts and tables in this section illustrate the fact that the United States and the Arab Gulf states steadily built-up a decisive lead in airpower from the fall of the Shah to the present because Iran faced sanctions and severe limits to imports of advanced combat aircraft, precision guided munitions, and advanced surface-to-air missiles (SAMs) and missile defenses.

Iran has been able to keep many of the aircraft the United States supplied before 1980 operational while modernizing some aspects of their avionics and weaponry. It has also acquired a limited supply of more modern Russian fighters, although these are largely export versions of 1980's designs. Iran also still relies heavily on its upgrades of the U.S. I-Hawk SAMs, copies of Vietnam-era Russian SAM designs, and the aging SA-5. Iran's only modern SAM imports are the TOR-M short range system, which was designed to defend against cruise missiles, and the Russian S300 – which is still being absorbed into the Iranian defense system, but is a highly capable modern SAM.

As has been noted earlier, the impact of the Arab superiority in air forces and air defenses shown in these charts is sharply limited by a lack of integrated capability, overall interoperability, and a focus on operational readiness, modern battle management, and IS&R assets. At the same time, the charts in this section do not include U.S. stealth aircraft, cruise missiles, precision strike assets, and SAM defenses. The United States has the capability to provide substantial support in the form of advanced battle management and IS&R capability to all of the Arab Gulf states.

At the same time, the rise of Iran's missile power is clear, and it is affecting this aspect of the balance. Until recently, Iran was highly vulnerable to any major air attack by major Arab air powers and had little defense capability against U.S. air and missile strikes. It still lacks a competitive air force, but it is acquiring better land-based air defenses, better radars, and other sensors.

Iran has also established netted defenses linked by optical fibers. Iran's combat aircraft cannot defend effectively against modern Arab fighters or U.S. fighters, and its land-based air defenses remain vulnerable and limited. However, it is improving its land-based capabilities while Gulf Arab Air Forces have been increasingly limited by the feuding between Arab states and also by the lack of interoperability within the GCC.

U.S. forward deployed and power projection capabilities still make a decisive difference and can do devastating military and civil damage to Iran, but Iran's missile forces are beginning to pose a major counter-threat – and some experts feel that they will develop a level of precision strike lethality that could seriously damage air bases in the Gulf Arab states and eventually be able to suppress their air strike capabilities. Such estimates are still highly uncertain, but the level of Iranian progress cannot be ignored.

### Ballistic Missiles

Iran:	Operational Sites
Tabriz	Missile Base
Karaj	Production
Parchin	Production
Tehran	Production/Training/ Education
Semnan	Production/Missile Base
Hamadan	Missile Base
Kermanshahan	Missile Base
Korramabad	Missile Base
Esfihan	Production
Tabas	Test Site
Shiraz	Production
Bandar Abbas	Missile Base
Kuhestak	Missile Base
Abu Musa Island	Missile Base



### Air Defense/Attack Mission

Iran (Operational):	Inventory
Tabriz	12 F5E/F
Mehrabad	12 F-5E
Mashhad	12 F-5E
Hamadan	12 F-4E
Esfahan	44 F-14A
Dezful	12 F-5E
Omiidiyeh	30 F-7N
Shiraz	28 Su-24 MK
Bushehr	12 F-14E
Bandar Abbas	12 F-4E
Chah Bahar	7 F-4D
GCC (Operational):	Inventory
Tabuk (Saudi Arabia)	24 F-15C
Taif (Saudi Arabia)	72 Typhoon
Khamis Mushait (Saudi Arabia)	84 F-15S
Dhahran (Saudi Arabia)	67 Tornado IDS
Ahmed al-Jaber (Kuwait)	39 F-18C
Issa (Bahrain)	16 F-16C
Doha (Qatar)	9 Mirage-2000-5
Al-Safran (UAE)	42 Mirage 2000-9
Al Dhafra (UAE)	55 F-16C
Adam (Oman)	10 Typhoon
Thumrait (Oman)	23 F-16C

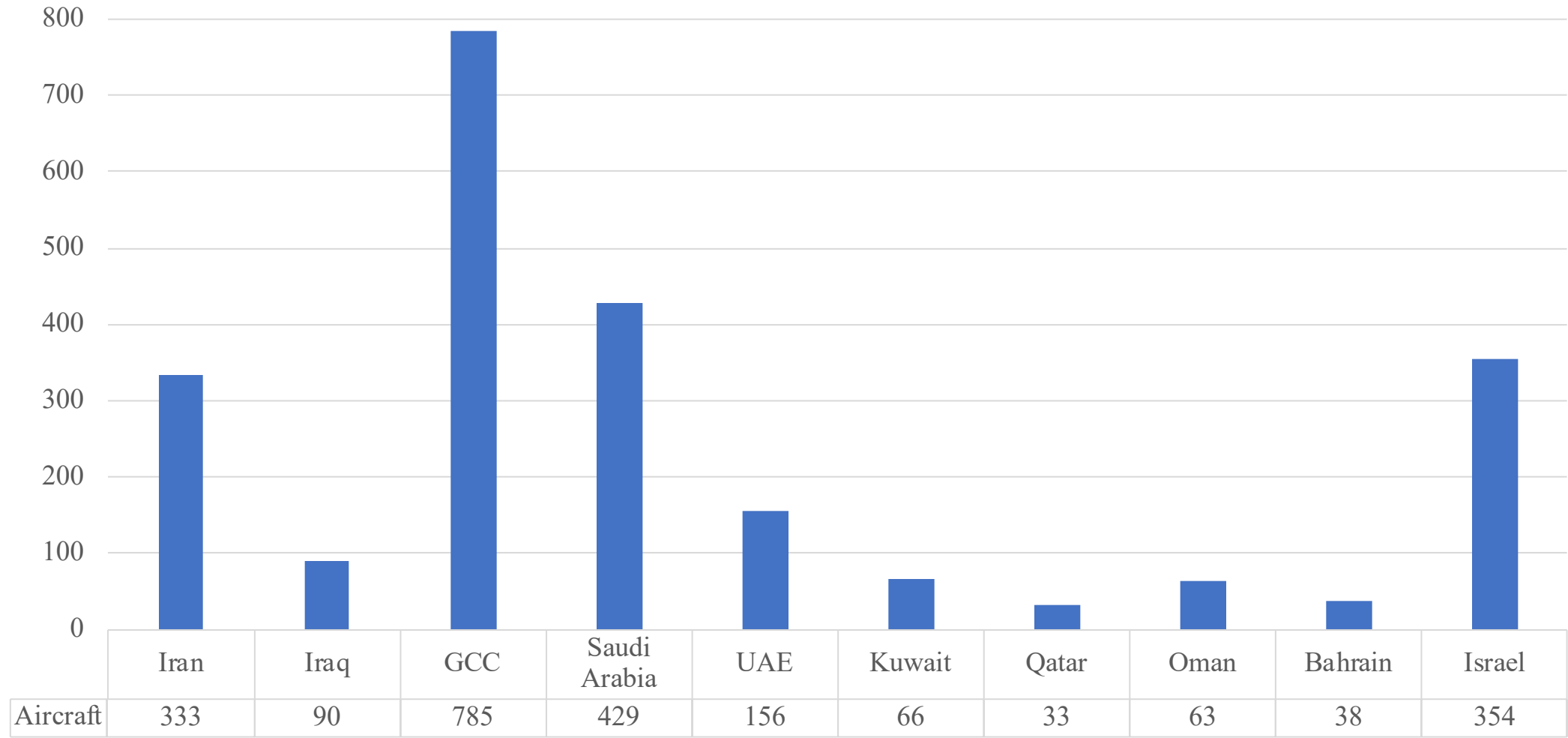
## Gulf Air Power And Air and Missile Bases

{Source:  
Jane's IHS Markit  
NTI: ([https://gmap.nti.org/missile\\_iran.html](https://gmap.nti.org/missile_iran.html))



# Comparative Total Fixed-Wing Combat Aircraft Strength, 2020

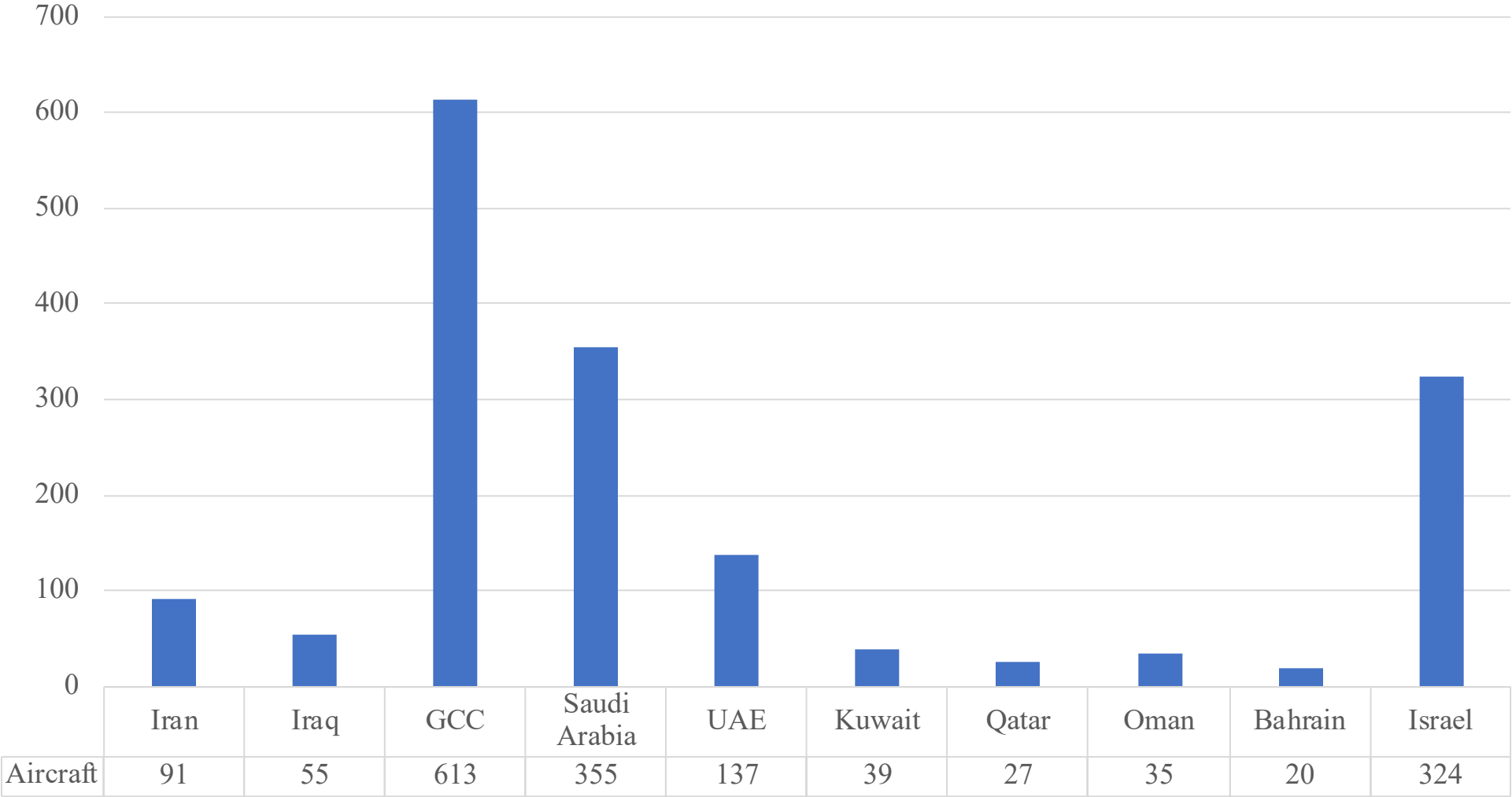
Based on IISS 2020 *Military Balance* Estimate



Source: Adapted from IISS, “The Military Balance 2020,” <https://www.iiss.org/blogs/military-balance/2020/02/new-features-military-balance-2020>

# Comparative Modern Dual Capable and Strike Combat Aircraft Strength, 2020

Based on IISS 2020 *Military Balance Estimate*

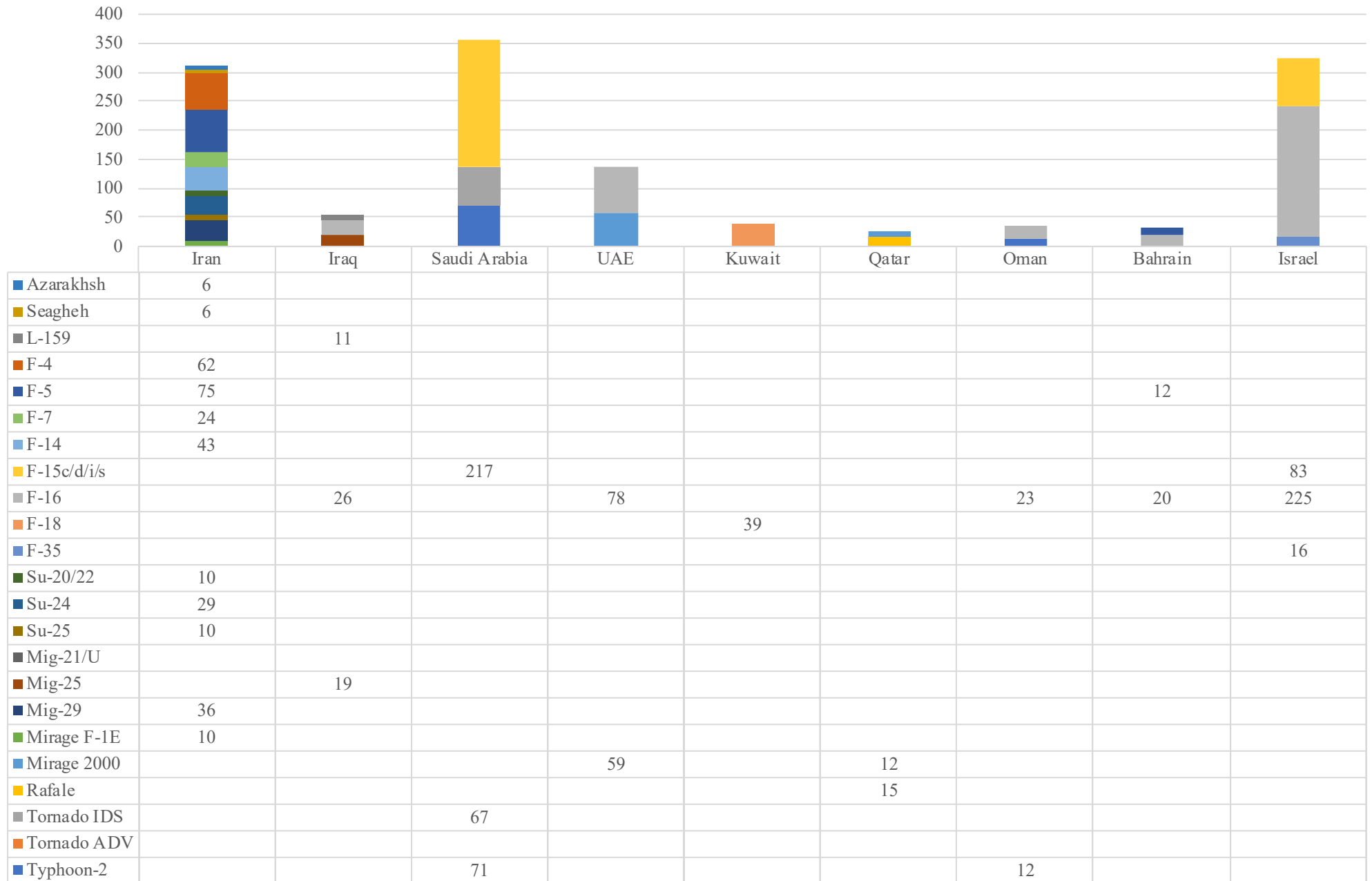


Source: Adapted from IISS, “The Military Balance 2020,” <https://www.iiss.org/blogs/military-balance/2020/02/new-features-military-balance-2020>

# Comparative Fighter and Strike-Attack Combat Aircraft Strength by Type

Based on IISS 2020  
*Military Balance*  
Estimate

Source: Adapted from  
IISS, "The Military  
Balance 2020,"  
[https://www.iiss.org/blogs/  
military-  
balance/2020/02/new-  
features-military-balance-  
2020](https://www.iiss.org/blogs/military-balance/2020/02/new-features-military-balance-2020)



# DIA Assessment of Iranian Air Forces (I)

Iran's air and air defense capabilities are split primarily across three services: the Islamic Republic of Iran Air Force (IRIAF) and the Islamic Republic of Iran Air Defense Force (IRIADF), both under the Artesh, and the IRGCASF. The Khatemolaniah Air Defense Headquarters (KADHQ) is the national-level command responsible for coordinating between the IRIADF and IRGCASF.

## *Islamic Republic of Iran Air Force*

Before the 1979 Islamic Revolution, the shah invested heavily in equipping the Imperial Iranian Air Force with modern combat air capabilities, viewing the service as a symbol of Iran's strength and security. After decades of international sanctions following the revolution and combat losses during the Iran-Iraq War, many of the U.S. aircraft Iran acquired during the 1960s and 1970s still constitute the most-capable platforms in the IRIAF today. Iran later acquired some Soviet-made aircraft during the early 1990s.

The IRIAF has proven adept at maintaining these outdated aircraft to sustain routine flight operations. Despite some domestic efforts to upgrade older airframes, Iran's combat aircraft remain significantly inferior to those of its regional adversaries equipped with modern Western systems. Nevertheless, the IRIAF maintains a basic capability to achieve its assigned missions.

The IRIAF has approximately 37,000 personnel and operates the majority of Iran's combat aircraft. The IRIAF operates multiple combat, transport, and tanker squadrons across 11 major fighter bases. The commander of the IRIAF is Brigadier General Aziz Nasirzadeh.

The IRIAF operates a wide range of aircraft sourced from the United States, Russia, and China, including the U.S. F-14 Tomcat, F-4 Phantom II, and F-5 Tiger II; the Russian MiG-29 Fulcrum and Su-24 Fencer; and the Chinese F-7 Airguard. Iran is the only country in the world still operating F-14s. IRIAF missions include air intercept, ground-attack, and close air support, and some aircraft are capable of mid-air refueling. The IRIAF's F-4s serve as Iran's primary attack aircraft, but it has increasingly incorporated use of its Su-24 fighter-bombers. Although less capable in an attack role, Iran's F-5s and F-7s have also served as multirole platforms.

## DIA Assessment of Iranian Air Forces (II)

The IRIAF usually conducts one major nation- al-level air power exercise each year, called DEVOTEES OF THE VELAYAT SKIES. The event traditionally entails a ground-attack competition among multiple fighter bases and features fighter intercept, air-to-air engagement, electronic warfare (EW), and intelligence, surveillance, and reconnaissance (ISR) training.

Once the UN arms embargo ends, the IRIAF is likely to purchase advanced fourth-generation fighters, most likely from Russia. Tehran and Moscow have already discussed the sale of Su-30s to Iran.

### *Islamic Revolutionary Guard Corps Aerospace Force*

The IRGCASF was founded in 1985 when Supreme Leader Khomeini established the IRGC's three distinct ground, air, and naval services. Previously named the IRGC Air Force, Iran renamed the service in 2009 to reflect its broader mission.<sup>352</sup> Dating back to the Iran-Iraq War, rivalries between the IRGCASF and IRIAF have historically hindered cooperation between the two air services. The IRGCASF also operates Iran's ballistic missile force, the Al-Ghadir Missile Command.

The IRGCASF is a relatively small force of around 15,000 personnel. It provides close air support and lift capabilities with military air- craft and helicopters as well as commercially owned aircraft under the IRGCASF's control. Although the IRGC's manned aviation component historically focused on airlift and logistic support, its mission evolved to include a squadron of its own combat aircraft after Iran began incorporating Iraqi aircraft evacuated to Iran in 1991 during the First Gulf War. The commander of the IRGCASF is Brigadier General Amir Ali Hajizadeh.

The aviation arm of the IRGCASF maintains a fleet that includes Su-22 Fitters, EMB-312 Tucanos, Y-12s, Dassault Falcon 20s, MFI-17s, IL-76s, and An-74s. In 2014, Iran supplied Iraq with most of the Su-25 Frogfoots that the IRG- CASF had maintained since Iraq transferred them to Iran in 1991. Iran still maintains a small number of Su-25 aircraft



# Iranian Combat Airbases and Major Combat Aircraft



<b>1st FB</b>	MiG-29, C-130, B707 (cargo and tanker), B747 (cargo and tanker), Falcon 20, Jetstar, RC-707, RC-130, IL-76, An-74	<b>8th FB</b>	F-14A/AM, F-7/FT-7N, PC-7
<b>2nd FB</b>	MiG-29, F-5E/F, Saeghe I/II (Iranian F-5 variants)	<b>9th FB</b>	F-4E, P-3
<b>3rd FB</b>	F-4E, RF-4E	<b>10th FB</b>	F-4D, Mirage F1
<b>4th FB</b>	F-5E/F	<b>Omidiyeh Air Base</b>	F-7N
<b>6th FB</b>	F-4E	<b>Mashhad Air Base</b>	F-5E/F
<b>7th FB</b>	Su-24MK, C-130, P-3, IL-76, Su-22, Y-12		

Platform	Delivered to Iran (Origin)	Role
F-4D/E Phantom II	1968-1978 (USA)	Multirole Fighter
F-5E/F Tiger II (and later Iranian variants)	1973-1976 (USA)	Multirole Fighter
F-14A/AM Tomcat	1976-1978 (USA)	Fighter
Su-22 Fitter	1991 (Iraq)	Fighter-Bomber
Su-24MK Fencer	1990 (Russia); 1991 (Iraq)	Fighter-Bomber
MiG-29 Fulcrum A	1990 (Russia); 1991 (Iraq)	Multirole Fighter
Mirage F1	1991 (Iraq)	Multirole Fighter
F-7N Airguard	1987-1996 (China)	Multirole Fighter

Source: DIA, *Iran Military Power, Ensuring Regime Survival and Securing Regional Dominance*, 27 November 2019.

# Iran: Reliance on Aging/Worn/Mediocre Air and SAM Systems Based on IISS 2020 *Military Balance* Estimate

## Air Force Aircraft

**FTR** 184+: 20 F-5B *Freedom Fighter*; 55+ F-5E/F *Tiger II* 24 F-7M *Airguard*; 43 F-14 *Tomcat*; 36 MiG-29A/U/UB *Fulcrum*; up to 6 *Azarakhsh* (reported)

**FGA** 89: 64 F-4D/E *Phantom II*; 10 *Mirage* F-1E; up to 6 *Saegheh* (reported); up to Su-22M4 *Fitter K*; 3+ Su-22UM-3K *Fitter G*

**ATK** 39: 29 Su-24MK *Fencer D*; 7 Su-25K *Frogfoot* (status unknown); 3 Su-25UBK *Frogfoot* (status unknown)

**ASW** 3 P-3F *Orion*

**ISR**: 6+ RF-4E *Phantom II*\*

**TKR/TPT** 3: ε1 B-707; ε2 B-747

**TPT** 117: **Heavy** 12 Il-76 *Candid*; **Medium** ε19 C-130E/H *Hercules*; **Light** 75: 11 An-74TK-200; 5 An-140 (Iran-140 *Faraz*) (45 projected); 10 F-27 *Friendship*; 1 L-1329 *Jetstar*; 10 PC-6B *Turbo Porter*; 8 TB-21 *Trinidad*; 4 TB-200 *Tobago*; 3 *Turbo Commander* 680; 14 Y-7; 9 Y-12; **PAX** 11: 2 B-707; 1 B-747; 4 B-747F; 1 *Falcon* 20; 3 *Falcon* 50

**TRG** 141: 25 Beech F33A/C *Bonanza*; 15 EMB-312 *Tucano*; 14 JJ-7\*; 25 MFI-17 *Mushshak*; 12 *Parastu*; 15 PC-6; 35 PC-7 *Turbo Trainer*;

## Air Force Helicopters

**MRH** 2 Bell 412

**TPT** 34+: **Heavy** 2+ CH-47 *Chinook*; **Medium** 30 Bell 214C (AB-214C); **Light** 2+: 2 Bell 206A *Jet Ranger* (AB-206A); some *Shabaviz* 2-75 (indigenous versions in production); some *Shabaviz* 2061

## Major Surface-to Air Missiles (546+)

**Long-range** 42+: 10 S-200 *Angara* (SA-5 *Gammon*); *Bavar-373*

**Medium-range** 195+: 150+ MIM-23B I-*Hawk/Shahin*; 45 S-75 *Dvina* (SA-2 *Guideline*);

**Short-range** 279: 250 FM-80 (*Crotale*);

## Army Aircraft

**AIRCRAFT** • **TPT** 17 **Light** 16: 10 Cessna 185; 2 F-27 *Friendship*; 4 *Turbo Commander* 690; **PAX** 1 *Falcon* 20

## Army Helicopters

**ATK** 50 AH-1J *Cobra*

**TPT** 167: **Heavy** ε20 CH-47C *Chinook*; **Medium** 69: 49 Bell 214; 20 Mi-171; **Light** 78: 68 Bell 205A (AB-205A); 10 Bell 206 *Jet Ranger* (AB-206)

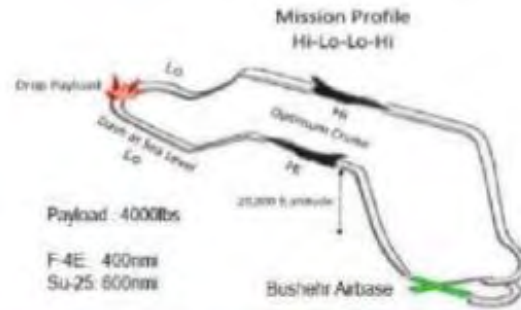


# Iran's Strategic Depth

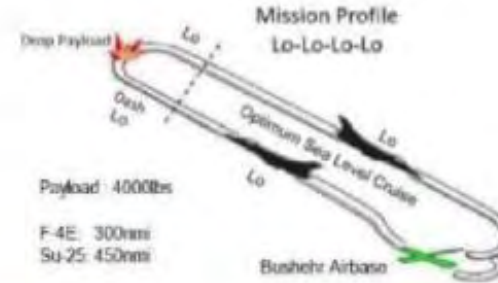
Source: University of Texas Libraries, Iran Maps, *The University of Texas at Austin*, <https://legacy.lib.utexas.edu/maps/iran.html>



# Range of Iran's Air Power



Iran Airforce  
Interdiction  
Mission Radius

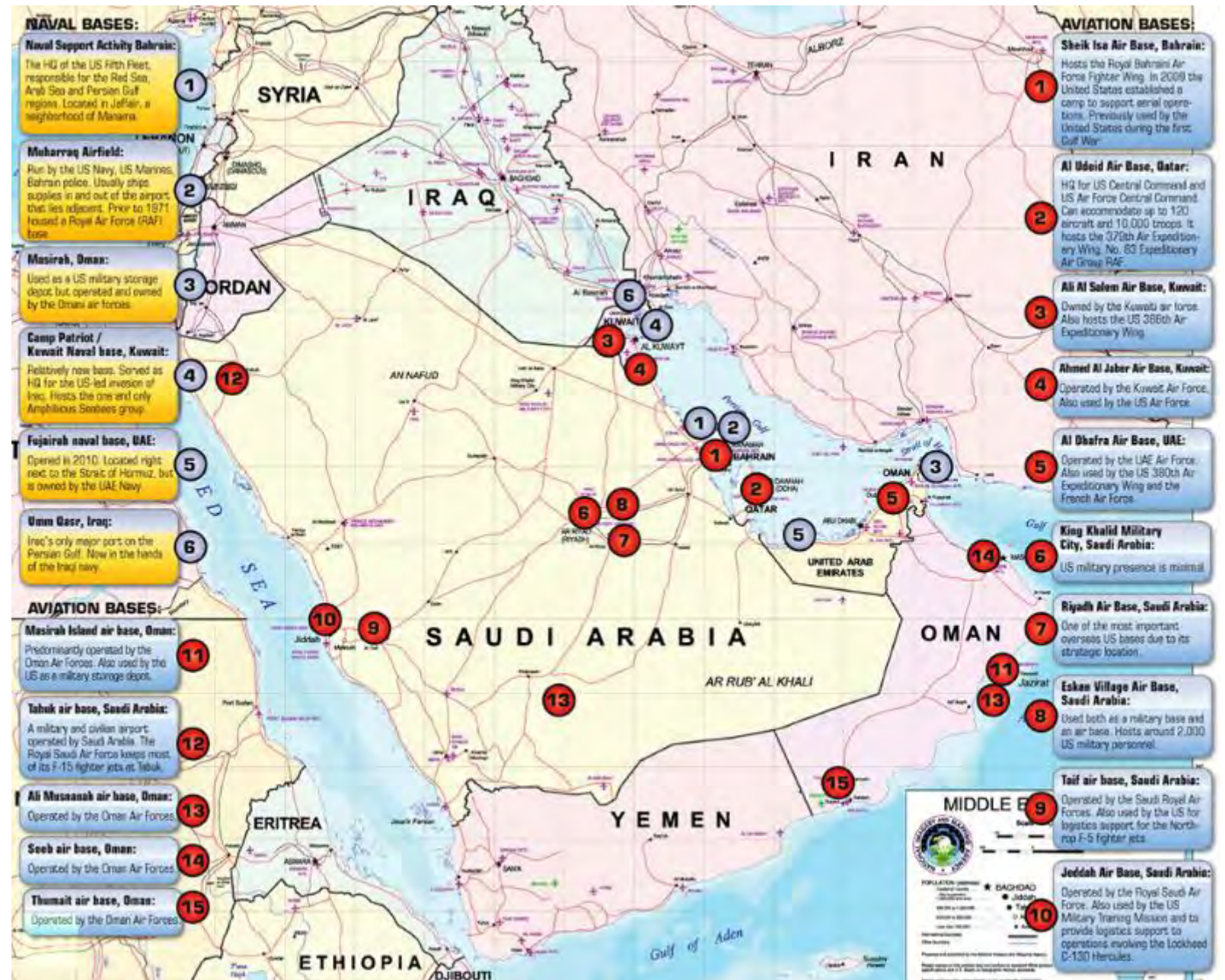


(Source: Abdullah Toukan)

Source: Abdullah Toukan and Anthony H. Cordesman, "GCC – Iran: Operational Analysis of Air, SAM, and TBM Forces," August 20, 2009, [https://csis-prod.s3.amazonaws.com/s3fs-public/legacy\\_files/files/publication/090819\\_GCC\\_Iran\\_AirPower.pdf](https://csis-prod.s3.amazonaws.com/s3fs-public/legacy_files/files/publication/090819_GCC_Iran_AirPower.pdf)



# Iranian (Pars) View of Gulf Air Threat



Source: "Peace Alliance Winnipeg, "The US prepares for war with Iran," January 20, 2012, <https://www.peacealliancewinnipeg.ca/2012/01/the-us-prepares-for-war-with-iran/>

# Major Iranian UAVs

UAVs are Iran’s most rapidly advancing air capability. Iran uses these versatile platforms for a variety of missions, including ISR and air-to-ground strikes. The IRGCASF is the primary operator of Iran’s growing fleet of UAVs, although most Iranian military services employ them.

Iran regularly conducts ISR flights along its border and littoral, including the Persian Gulf and Strait of Hormuz.

The IRGCASF has also deployed various armed and unarmed UAVs to Syria and Iraq for ISR and strike missions to support counter-ISIS operations and the Syrian regime.

In 2018, Iran for the first time employed UAVs to conduct long-range, cross-border strike operations, using armed UAVs in concert with ballistic missiles as part of a retaliatory attack against ISIS in eastern Syria.

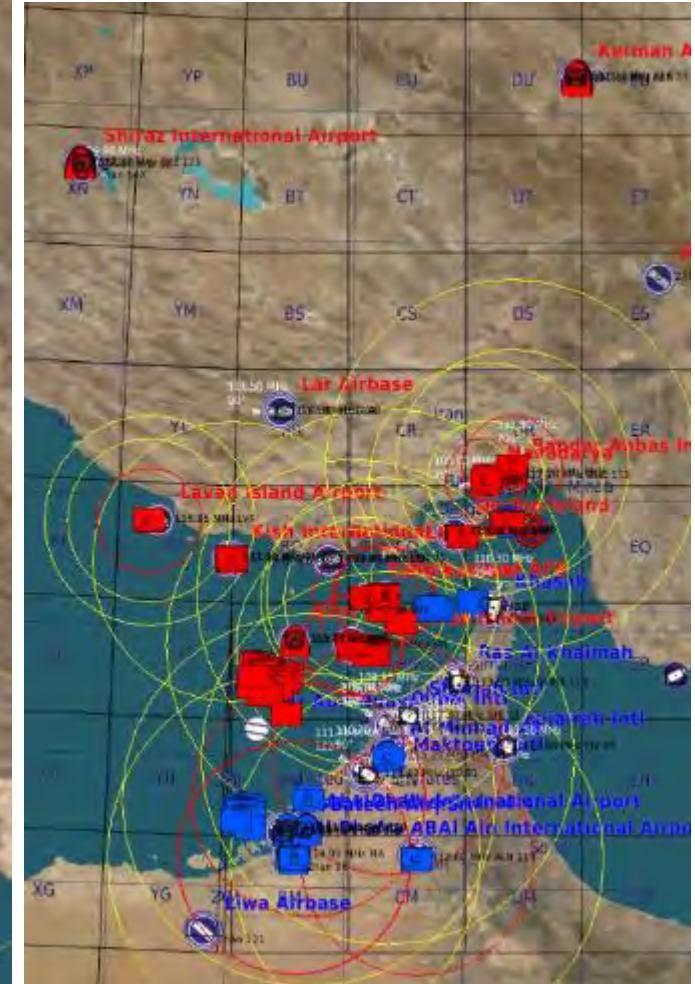
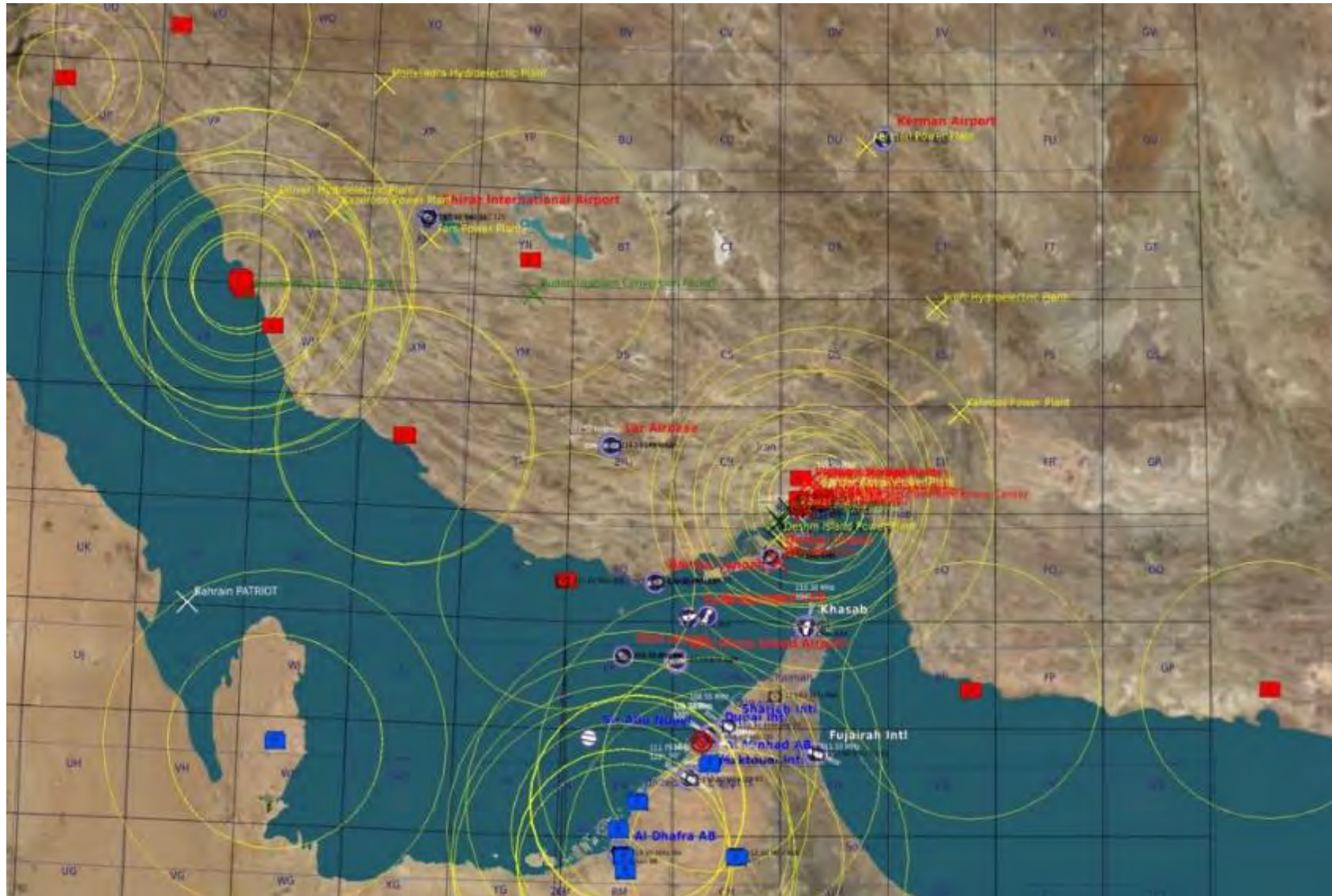
Iran has also provided UAV platforms and technology to Hizballah and the Houthis to challenge its regional rivals.

Platform Family	System	Role
Ababil	Ababil-2	Multirole
	Ababil-3	ISR
	Qasef-1	Multirole
Shahed	Shahed-129	Multirole, including ISR and air-to-ground strike <sup>365,366</sup>
	Shahed-123	ISR
Mohajer	Mohajer-2	ISR
	Sadegh	Multirole
	Mohajer-4	ISR
Toufan	Mohajer-6	Multirole, including ISR and air-to-ground strike <sup>367</sup>
	Toufan 1	One-way attack
Fotros	Fotros	Multirole, including ISR and air-to-ground strike <sup>368,369</sup>
Karrar	Karrar	Multirole
Hemaseh	Hemaseh	Multirole
IRN-170	IRN-170 variants	Multirole

Source: DIA, *Iran Military Power, Ensuring Regime Survival and Securing Regional Dominance*, 67-68, November 2019.

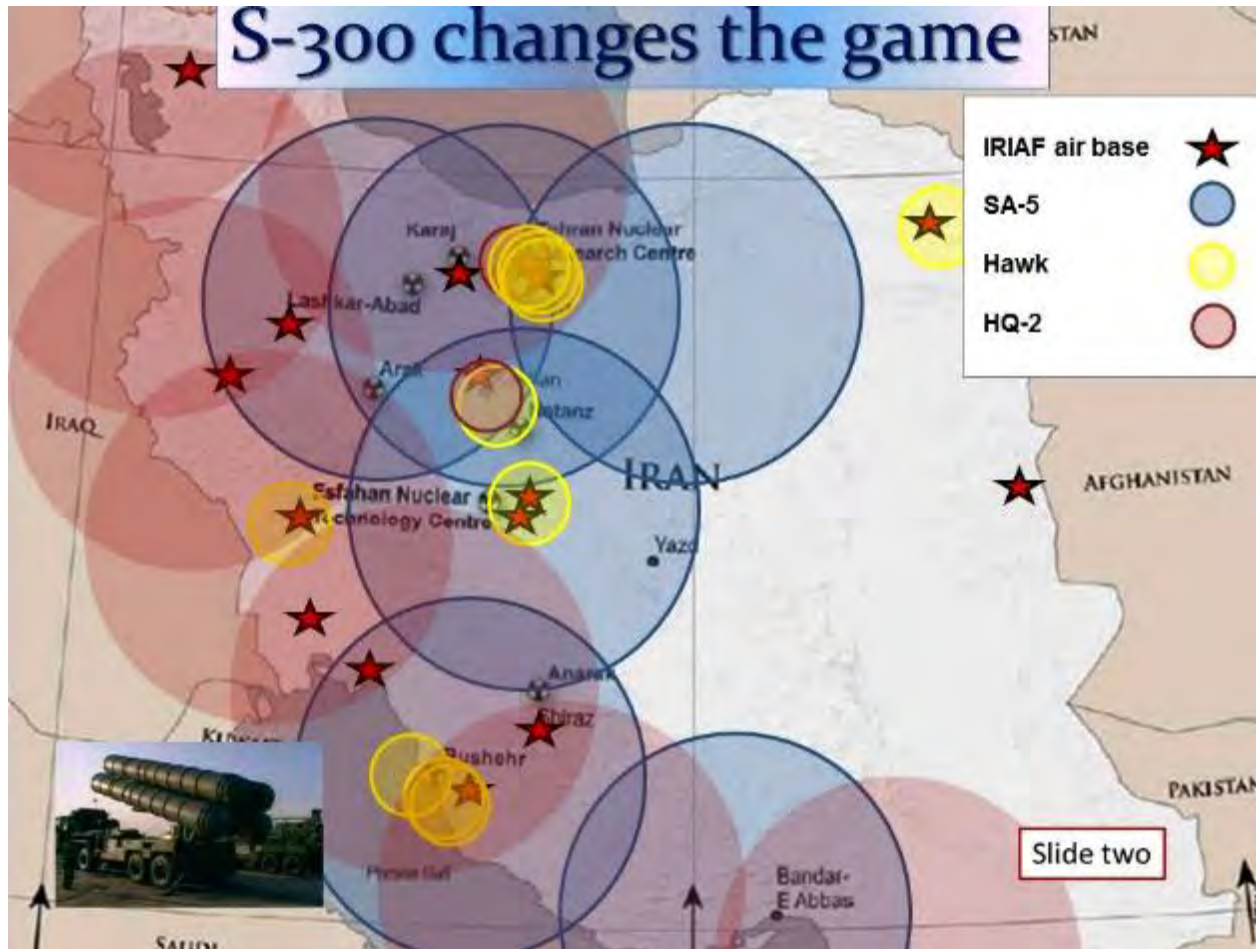


# Gulf SAM Defenses (Pre S-300)





# Iranian Major Bases and SAM Defenses



# DIA Assessment of Iran's Changing Long-Range Land-Based Air Defense Systems and Surface to Air Missiles

Iran originally established the Artesh's air defense force in 2008 as the KADHQ and renamed it the IRIADF in 2019. In 2008, air defense personnel were separated from the IRIAF to form an independent service within the Artesh, consistent with Tehran's goal to expand defense missions in response to a perceived increase in air threats. The IRIADF maintains and operates most of the country's air defense systems and has approximately 15,000 personnel.

As the KADHQ, the force was previously responsible for overseeing Iran's air defenses at the national level and coordinating with the IRGCASF. In May 2019, Tehran elevated the KADHQ to a higher echelon command and rebranded the remaining Artesh air defense service as the IRIADF, separating the national C2 responsibilities from the force. The supreme leader appointed Artesh Commander Major General Abdolrahim Musavi to also serve as commander of the KADHQ, raising it to the Artesh HQ level. Former KADHQ Commander Brigadier General Alireza Sabahifard was retained as the IRIADF commander.

...The IRGCASF also maintains its own air defense assets and mission—conducted in parallel, but coordinated with the IRIADF and KADHQ. The IRGC has been involved in the domestic development and production of many recent Iranian SAM systems—such as the Raad series, Sayyad series, Tabas, and Third of Khordad—which reportedly have multi-target capabilities and ranges up to 120 kilometers.

In June 2019, the IRGCASF used a Third of Khordad SAM system to shoot down a U.S. RQ-4 UAV in international airspace over the Strait of Hormuz. This followed an Iranian attempt to shoot down a U.S. MQ-9 UAV in international airspace over the Gulf of Oman a week earlier.

...The IRIADF operates Iran's most capable air defense system, the SA-20c, which Russia sold to Iran in 2016. This system is highly mobile and designed to defend against aircraft, ballistic missiles, and cruise missiles. Iran is most likely to use the SA-20c to protect its most critical infrastructure, such as its nuclear sites and Tehran. Most of Iran's other SAMs are a mix of U.S., Russian, and Chinese legacy systems, including the long-range SA-5, medium-range I-HAWK and CSA-1, and short-range SA-15 and Rapier.

In addition to procurements from abroad, Iran has invested heavily in domestically developing and producing SAMs, radars, and C2 systems. Iran is developing the long-range Bavar-373 SAM system, which it claims is more advanced than the Russian S-300. Iran has also undertaken a number of projects to domestically improve its legacy SAMs, including the Mersad, a medium-range air defense system that improves the tracking and engagement range of the U.S.-made I-HAWK SAM.<sup>387</sup> Iran has also worked extensively to upgrade its legacy C2 systems to a modern, software-based system.

...Iran's typical annual national-level air defense exercise is called DEFENDERS OF THE VELAYAT SKIES. The event usually involves testing and live fires of variety of SAMs, radars, and ISR and EW equipment, along with a small contingent of aircraft, to exercise a large-scale defense of Iranian airspace



# DIA Assessment of Iranian Long-Range Land-Based Air Defense Systems and Surface to Air Missiles

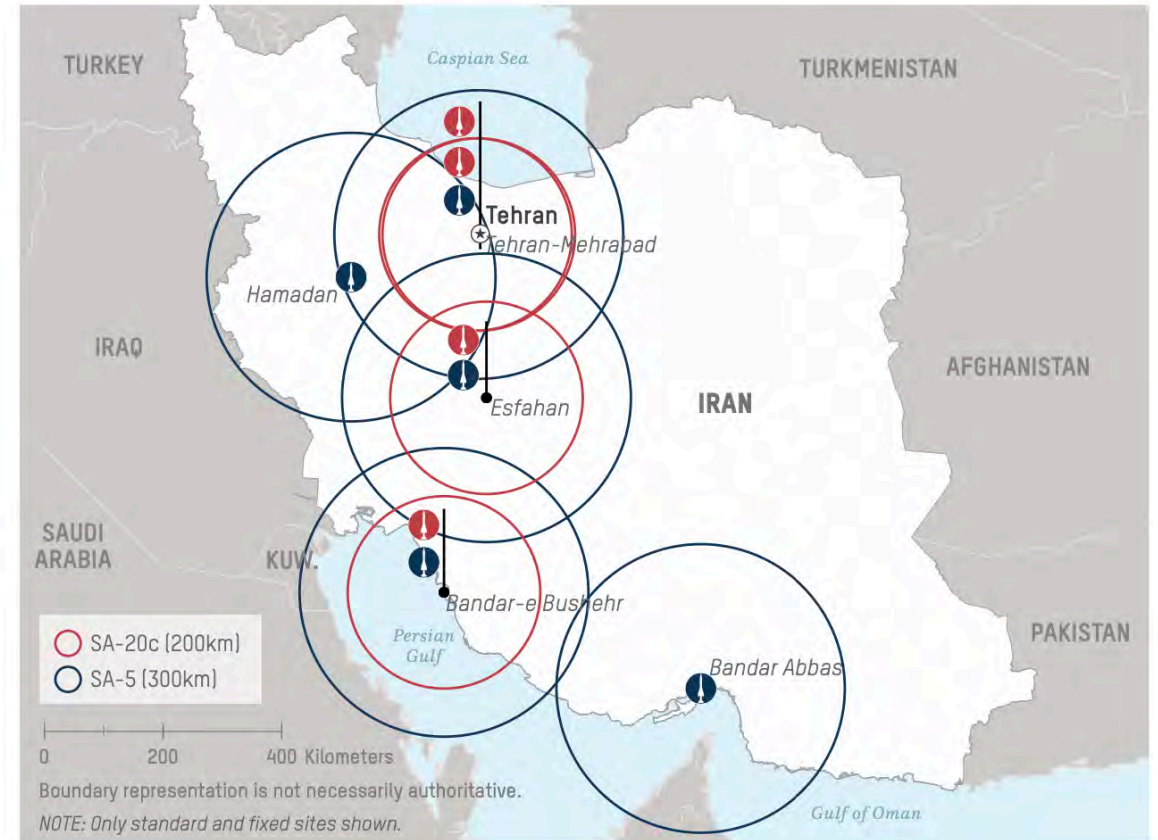
## Khatemolaniah Air Defense Headquarters

The KADHQ maintains responsibility for overseeing and coordinating Iran's national-level air defenses across both the IRIADF and IRGCASF. It controls the country's air defense C2, air surveillance radars, SAM systems, and network of visual observation posts. KADHQ C2 is centralized during peacetime at the national Air Defense Operations Center and can be decentralized during crisis or conflict, transferring decisionmaking authority down to a network of fixed and mobile regional sector operations centers (SOCs). SOCs manage air defense operations within their areas of responsibility and coordinate with adjacent sectors.<sup>380,381,382</sup>

Type	Systems
Long-Range	SA-20c Gargolye (S-300 PMU2), SA-5 Gammon (S-200), Bavar-373, Sayyad-3
Medium-Range	I-HAWK/Mersad, CSA-1, Third of Khordad, Raad, Talash, Sayyad-1, Sayyad-2
Short-Range	SA-15 Gauntlet (Tor M1), Rapier

## Long-Range Air Defense Coverage

1805-17885



# Key Deployment Factors

## GCC vs Iran Airbases, Air Defense, and Ballistic Missile Military Balance

-  Iran Nuclear Program Sites
-  UAE THAAD Battery
-  PAC-2/3 Battery
-  AN/TPY-2 X-Band radar for BMD, with a Terminal Phase Range of 600km
-  Iran Ballistic Missile Launch Sites
-  Iran S-300 AD system deployed around Fordow (NYT August 29, 2016)

Reference: Abdullah Toukan adapted from:

IISS The 2016 Military Balance Chart Gulf Region Missile Defense.

IHS Janes Sentinel 2016

NTI Iran Nuclear and Ballistic Missile Location





# **Comparing the Missile Forces on Each Side**

# Comparing the Missile Forces on Each Side

The slides in this section provide a rough comparison of Arab and Iranian missile forces that shows the full range of missile forces on each side – less some precision guided air missiles. The current unclassified or open source data are limited in coverage and quality, but Iran's lead is clear.

Such comparisons disguise some of the key differences between Iran and its Arab neighbors because so many of Iran's systems are in the developmental stage or are being modified. Iran also often distorts its claims about new and existing missile systems for propaganda purposes.

In general, however, the Arab side has actively pursued air launched precision strike systems and land-based surface-to-air missile defenses while Iran has pursued a wide mix of ballistic missiles, cruise missiles, drones, and artillery rockets – some of which it has transferred outside the Gulf area to the Hezbollah, Iraqi PMFs, and the Houthi.

Saudi Arabia and the UAE have acquired long-range precision air strike systems like the Storm Shadow or SCALP-EG, developed in 1994 by Matra and British aerospace, then manufactured by MBDA. It has a range of 300 nm or 560 km, a 460 kg warhead, an inertial, GPS, and Terprom terminal guidance. This system is being upgraded and will acquire an inflight retargeting capability.

Saudi Arabia also has a small Strategic Missile Forces with upgraded Chinese SSMs. They are deployed in four-five underground ballistic missile bases whose missile deployments and readiness are unclear.

Wikipedia estimates indicate such Saudi forces have some 30 aging [Chinese](#) DF-3 (CSS-2, [Dongfeng](#)) liquid fueled, conventionally armed missiles delivered in the late 1980s with 2,150 kg conventional high-explosive warheads, and (a maximum range of 4,000 km. About 30+ missiles and 9-12 [transporter erector launchers](#) (TEL) were reportedly delivered in 1988, however, no known test-launch has been made in the country. Saudi Arabia publicly displayed them for the first time in 2014. Its guidance platform has an optimal CEP of 300 meters, but its actual performance limits its use to striking area targets and it lacks anything approaching precision strike capability.

Saudi Arabia also has some Chinese DF-21 conventionally armed, solid fueled missiles it bought in 1987. The number of missiles and their launch systems is unclear, although the DF-21 is normally deployed on TELs and highly mobile and dispersible. Some reports claim a 30-meter CEP, but this again is the theoretical accuracy of the guidance platform. In practice, it has limited real-world precision strike capability – if any.

Several Gulf states have actively sought to buy cruise missiles and have some limited unmanned combat aerial vehicle (UCAV) capability. Their actual progress in acquiring such systems is unclear.

# Arab Gulf Missile, Rocket, and Missile Defense Forces - I

## Based on IISS 2020 *Military Balance* Estimate

### Bahrain

#### Army Surface-to-Surface Launchers

SRBM • Conventional MGM-140A ATACMS (launched from M270 MLRS)

#### Air Defense

Medium-range 6 MIM-23B I-Hawk

Short-range 7 Crotale

Point-defence 9K338 Igla-S (SA-24 Grinch) (reported)

### Iraq

#### Air Force

UNMANNED AERIAL VEHICLES • CISR Heavy 10 CH-4†

AIR-LAUNCHED . ASM AGM-114 Hellfire

#### BOMBS

Laser-guided GBU-12 Paveway II

INS/GPS-guided FT-9

#### AIR DEFENCE SAM

Short-range 24 96K6 Pantsir-S1 (SA-22 Greyhound)

Point-defence M1097 Avenger; 9K338 Igla-S (SA-24 Grinch)

### Kuwait

#### Army

MRL 300mm 27 9A52 Smerch

#### Air Defense Command

AIR DEFENCE: 1 SAM bde (7 SAM bty with MIM-104D Patriot PAC-2 GEM); 1 SAM bde (6 SAM bty with Skyguard/Aspide)

#### EQUIPMENT BY TYPE

52: Long-range 40 MIM-104D Patriot PAC-2 GEM

Short-range 12 Aspide with Skyguard

### Oman

#### Air Force

2 sqn with Rapier; Blindfire; S713 Martello

### Qatar

#### Army

SURFACE-TO-SURFACE MISSILE LAUNCHERS SRBM

Conventional 2 BP-12A (CH-SS-14 mod 2)

1 bty with 3 quad Inchr with MM40 Exocet AShM

#### Air Force

AIR DEFENCE • SAM Long-range MIM-104E/F Patriot PAC-2 GEM-T/PAC-3

### Saudi Arabia

#### Strategic Missile Force

IRBM 10+ DF-3 (CH-SS-2)

(service status unclear)

MRBM Some DF-21 (CH-SS-5 – variant unclear) (reported)

#### Army

220mm 3+ TOS-1A MRLs

#### Air Defense Forces

SAM: Long-range 108 MIM-104D/F Patriot PAC-2 GEM/PAC-3

Medium-range 128 MIM-23B I-Hawk

Short-range 181: 40 Crotale; 141 Shahine

# Arab Gulf Missile, Rocket, and Missile Defense Forces - II

## Based on IISS 2020 *Military Balance* Estimate

### Air Force

#### UNMANNED AERIAL VEHICLES

CISR • Heavy some Wing Loong 1 (GJ-1) (reported);  
some CH-4

ISR • Medium some Falco

AIR-LAUNCHED MISSILES AShM AGM-84L Harpoon Block II

#### ARM ALARM

ALCM Storm Shadow

### UAE

#### Army

16 bn with MIM-23B I-Hawk/Shahin

4 bn with S-300PMU2 (SA-20 Gargoyle)

5 sqn with FM-80 (Crotale); Rapier; S-75M Volkhov (SA-2 Guideline); S-200 Angara (SA-5 Gammon); 9K331

Tor-M1 (SA-15 Gauntlet)

Weapons: SAM 546+: Long-range 42+: 10 S-200 Angara (SA-5 Gammon); 32

S-300PMU2 (SA-20 Gargoyle); Bavar-373

Medium-range 195+: 150+ MIM-23B I-Hawk/Shahin; 45

S-75 Dvina (SA-2 Guideline); Talash/15th Khordad

Short-range 279: 250 FM-80 (Crotale); 29 9K331 Tor-M1 (SA-15 Gauntlet)

#### UNMANNED AERIAL VEHICLES

ISR • Medium Seeker II

### Air Force

#### UNMANNED AERIAL VEHICLES

CISR • Heavy Wing Loong I; Wing Loong II

ISR • Heavy RQ-1E Predator XP

#### AIR-LAUNCHED MISSILES

Hakeem 1/2/3 (A/B)

ARM AGM-88C HARM

ALCM Black Shaheen (Storm Shadow/SCALP EG variant)

INS/SAT guided Al Tariq Laser-guided GBU-12/58 Paveway II Bombs

### Air Defense Force

2 AD bde (3 bn with MIM-23B I-Hawk; MIM-104F

Patriot PAC-3), 3 (short range) AD bn with Crotale; Mistral; Rapier; RB-

70; Javelin; 9K38 Igla (SA-18 Grouse); 96K6 Pantsir-S1

2 SAM bty with THAAD

Weapons: Medium-range MIM-23B I-Hawk; MIM-104F Patriot PAC-3

Short-range Crotale; 50 96K6 Pantsir-S1

Point-defence 9K38 Igla (SA-18 Grouse); RBS-70;

Rapier; Mistral

MISSILE DEFENCE 12 THAAD

# Iran Missile and Missile Defense Forces – I

## Based on IISS 2020 *Military Balance* Estimate

### **IRGC**

#### **Surface-to-Surface Missile Forces**

ε1 bde with Shahab-1/-2; Qiam-1

ε1 bn with Shahab-3

#### **Surface-to-Surface Launchers**

MRBM • Conventional up to 50: Shahab-3 (mobile & silo); some Ghadr-1 (in test); some Emad-1 (in test); some Sajjil-2 (in devt); some Khorramshahr (in devt)

SRBM • Conventional up to 100: some Fateh 110; Some Khalij Fars (Fateh 110 mod ASBM); some Shahab-1/-2; some Qiam-1; some Zelzal

GLCM • Conventional some Ya'ali (Quds-1)

#### **Unmanned Aerial Vehicles**

CISR • Heavy Shahed 129

ISR • Medium Ababil 3; Mohajer 4; Shahed 123

#### **Missile Ships & Craft**

PBFG 56:

5 C14 with 2 twin Inchr with C-701 (Kosar)/C-704

(Nasr) AShM

10 Mk13 with 2 single Inchr with C-704 (Nasr) AShM, 2 single 324mm TT

10 Thondor (PRC Houdong) with 2 twin Inchr with C-802A (Ghader) AShM, 2 AK230 CIWS

25 Peykaap II (IPS-16 mod) with 2 single Inchr with C-701 (Kosar) AShM/C-704 (Nasr), 2 single 324mm TT

6 Zolfaghar (Peykaap III/IPS-16 mod) with 2 single Inchr with C-701 (Kosar)/C-704 (Nasr) AShM

#### **Air Defense Forces**

Medium-range Ra'ad/3rd Khordad; Talash/15<sup>th</sup> Khordad  
Point-defence Misaq 1 (QW-1 Vanguard); Misaq 2 (QW-18)

#### **Army**

#### **Surface-to-Surface Launchers**

SRBM • Conventional ε30 CH-SS-8 (175 msl); Shahin-1/ Shahin-2; Nazeat; Oghab

#### **Unmanned Aerial Vehicles**

CISR • Medium Mohajer 6

ISR • Medium Ababil 2; Ababil 3;

Mohajer 3; Mohajer 4;

Light Mohajer 2

#### **Major Artillery Rockets**

240 mm19+: ε10 Fadjr 3; 9 M-1985;

330mmFadjr 5

#### **Air Defense Missiles**

Short-range FM-80

Point-defence 9K36 Strela-3 (SA-14 Gremlin); 9K32

Strela-2 (SA-7 Grail)‡; Misaq 1 (QW-1 Vanguard); Misaq

2 (QW-18); 9K338 Igla-S (SA-24 Grinch) (reported);

HN-5A



# Iran Missile and Missile Defense Forces – II

## Based on IISS 2020 *Military Balance* Estimate

### Air Force ASM Missiles

AGM-65A Maverick; Kh-25 (AS-10 Karen); Kh-25ML (AS-10 Karen); Kh-29L/T (AS-14A/B Kedge)

AShM C-801K

ARM Kh-58 (AS-11 Kilter)

BOMBS

Electro-optical guided GBU-87/B Qassed Bomb

### Navy – Missile Ships

**FSGM 2:** Jamaran (UK Vosper Mk 5 derivative – 1 more undergoing sea trials) with 2 twin Inchr with C-802(Noor) (CH-SS-N-6) AShM, 2 single Inchr with SM-1 SAM, 2 triple 324mm SVTT Mk 32 ASTT, 1 76mm gun, 1 hel landing platform

### FSG 5:

3 Alvand (UK Vosper Mk 5) with 2 twin Inchr with C-802 (CH-SS-N-6) AShM, 2 triple 324mm SVTT Mk 32 ASTT, 1 114mm gun

2 Bayandor (US PF-103) with 2 twin Inchr with C-802 (CH-SS-N-6) AShM, 2 triple 324mm SVTT Mk 32 ASTT, 1 76mm gun

**PCFG 13 Kaman (FRA Combattante II) with 1 twin Inchr with C-802 (Noor) (CH-SS-N-6) AShM, 1 76mm gun**

### Air Defense Force – Surface-to-Air Missiles

AIR DEFENCE

16 bn with MIM-23B I-Hawk/Shahin

**4 bn with S-300PMU2 (SA-20 Gargoyle)**

5 sqn with FM-80 (Crotale); Rapier; S-75M Volkhov (SA-2 Guideline); S-200 Angara (SA-5 Gammon); 9K331

Tor-M1 (SA-15 Gauntlet)

EQUIPMENT BY TYPE

SAM 546+:

Long-range 42+: 10 S-200 Angara (SA-5 Gammon); 32 **S-300PMU2 (SA-20 Gargoyle)**; Bavar-373

Medium-range 195+: 150+ MIM-23B I-Hawk/Shahin; 45 S-75 Dvina (SA-2 Guideline); Talash/15th Khordad

**Short-range 279: 250 FM-80 (Crotale); 29 9K331 Tor-M1 (SA-15 Gauntlet)**

Point-defence 30+: 30 Rapier; Misaq 1 (QW-1 Vanguard); Misaq 2 (QW-18)

# **The Changing Character of Iran's Missile Forces**

# The Changing Impact of Iran's Missile Forces

This section illustrates the steady advances in Iran's capabilities to deliver precision conventional strikes. Once again, the comparisons are limited by problems in the unclassified data now available, but they still display known actual major Iranian improvements whose impact on key targets is illustrated in the following section.

The detailed data on missile performance do, however, have critical limits that shape most unclassified reports and analysis. Almost none of the data are based on actual tests and real-world specifications. Most range data are nominal, and do not reflect the actual payload and range-payload capability of the missile.

Descriptions of the guidance systems and missile accuracy, in terms of CEP or any other metric, are often speculative and based on the optimal accuracy of the guidance system rather than actual missile performance. Virtually no data exist on reliability, although expert like Uzi Rubin have noted that this can be a serious problem. There has also been no open-source efforts to assess the actual character and lethality of the warhead versus assigning a nominal payload weight.

Rubin has documented a wide range of Iranian advances in missile technology, clandestine imports from the West, precision guidance kits to convert rockets into precision guided missiles, inflatable decoy warheads, tailoring missile for uses by forces like the Houthi and Hezbollah, and advances in long range missiles like a precision version of the Khoramshar with 4,000 km range. He has also shown Iran's links to the Quds 1 jet propelled UAV that the Houthi claimed to have used to attack Saudi Arabia on September 14, 2019.

Iran has deliberately increased the problems in assessing its missile forces by announcing different names for the same missile, claiming some missile developments that are not actually taking place, and claiming more progress than it has actually made. It has sometimes photo shopped missile salvo launchings, and faked demonstrations of accuracy by superimposing images like a military airfield over clusters of actual strikes after the fact.

To put it bluntly, the current level of unclassified analysis of Iranian missile programs is unacceptable in an era of growing precision strike capability, but this situation can only be corrected if governments release far better data.

Source: For further discussion see Uzi Rubin, *Operation "Shahid Soleimani": Iran's Revenge*, Mideast Security and Policy Studies No. 170, BESA, February 2020; *Iran's Missiles and Its Evolving "Rings of Fire"*, BESA, January 2020; and *Trends in Middle East Missile Threats*, <https://mail.google.com/mail/u/0/#search/Rusi?projector=1>. Also see the CSIS Missile Threat Project, [missilethreat.csis.org](http://missilethreat.csis.org). work on Iran, <https://missilethreat.csis.org/country/iran/>. Recent reports included *Missiles and Rockets of Hezbollah*, <https://missilethreat.csis.org/country/hezbollahs-rocket-arsenal/> ; Interactive: The Missile War in Yemen, <https://missilethreat.csis.org/missile-war-yemen/> , October 13, 2016 and *Iranian Missiles in Iraq*. December 11, 2019, <https://missilethreat.csis.org/iranian-missiles-in-iraq/>; [Ian Williams](#), *When Iran Attacks* <https://missilethreat.csis.org/when-iran-attacks/> January 9, 2020.

# DIA Estimate of Iranian Missile Profiles

On February 9, [Iran](#) announced a new tactical ballistic missile designated the Raad-500 (“Thunder”). Iranian state media claims the missile is constructed with lightweight composite materials, weighing half of the preceding [Fateh-110](#) system. The missile is additionally thought to feature a range of 500 km and an accuracy of 30 m CEP.

Source: DIA, *Iran Military Power, Ensuring Regime Survival and Securing Regional Dominance*, 43, November 2019. ; and Shaan Shaikh, “Iran Unveils New Ballistic Missile,” *Missile Threat*, Center for Strategic and International Studies, February 10, 2020, last modified February 10, 2020, <https://missilethreat.csis.org/iran-unveils-new-ballistic-missile>



Note: This chart does not include all systems in development. All ranges are approximate.

# Iran's Major Missiles

Missile	Class	Range	News
<u>Safir</u>	SLV	350 km altitude	Operational
<u>Khorramshahr</u>	MRBM	2,000 km	In Development
<u>Qiam-1</u>	SRBM	700-800 km	Operational
<u>Shahab-1</u>	SRBM	285-330 km	Operational
<u>Simorgh</u>	SLV	500 km altitude	In Development
<u>Koksan M1978</u>	Artillery	40-60 km	Operational
<u>Zolfaghar</u>	SRBM	700 km	Operational
<u>Emad (Shahab-3 Variant)</u>	MRBM	1,700 km	In Development
<u>Sejjil</u>	MRBM	2,000 km	Operational
<u>Shahab 2 (Scud C-Variant)</u>	SRBM	500 km	Operational
<u>Shahab-3</u>	MRBM	1,300 km	Operational
<u>Ghadr 1 (Shahab-3 Variant)</u>	MRBM	1,950 km	In Development
<u>Fateh-110</u>	SRBM	200-300 km	Operational
<u>Tondar 69</u>	SRBM	150 km	Operational
<u>Soumar</u>	Cruise Missile	2,000-3,000 km	Operational (presumed)
<u>Ra'ad</u>	Cruise Missile	150 km	Operational

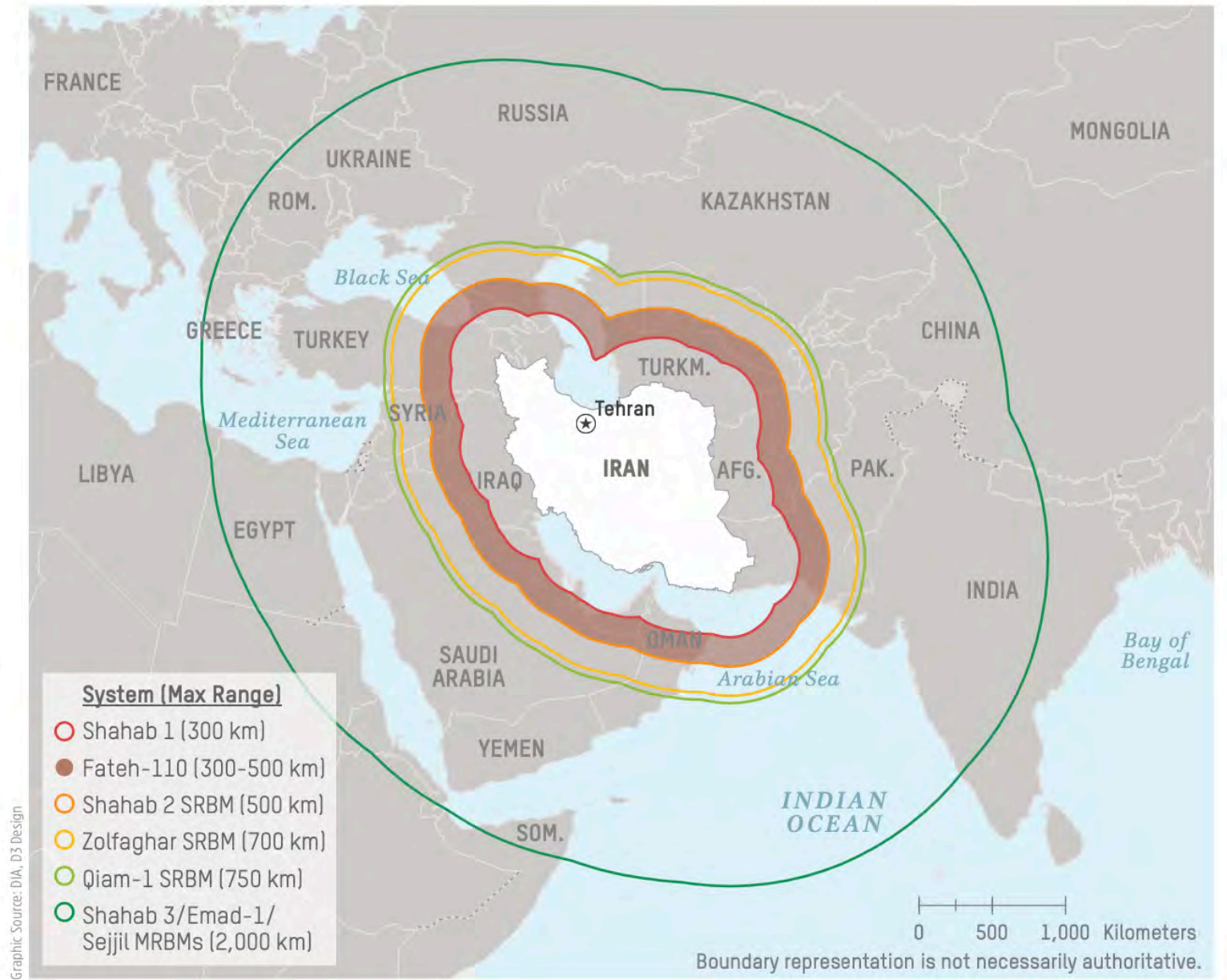


## Iran's Current Surface-to-Surface Missile Ranges



Source: Seth G. Jones, "Iran's Threat to Saudi Critical Infrastructure: The Implications of U.S.-Iranian Escalation," August 5, 2019, <https://www.csis.org/analysis/irans-threat-saudi-critical-infrastructure-implications-us-iranian-escalation>

# DIA Estimate of Iranian Missile Ranges





**Shabab 3M  
Coverage  
(1,000 kg  
Warhead,  
Maximum Range  
1,200 km)**



Source: Abdullah Toukan and Anthony H. Cordesman, "The Gulf Military Balance in 2019: A Graphic Analysis," *CSIS*, November 7, 2019, [https://csis-prod.s3.amazonaws.com/s3fs-public/publication/191122\\_Gulf\\_Military\\_Balance\\_Final.pdf](https://csis-prod.s3.amazonaws.com/s3fs-public/publication/191122_Gulf_Military_Balance_Final.pdf)

# DIA Assessment of Iranian Missile Forces (I)

Iran's ballistic missiles constitute a primary component of its strategic deterrent. Lacking a modern air force, Iran has embraced ballistic missiles as a long-range strike capability to dissuade its adversaries in the region—particularly the United States, Israel, and Saudi Arabia—from attacking Iran. Iran has the largest missile force in the Middle East, with a substantial inventory of close-range ballistic missiles (CRBMs), short-range ballistic missiles (SRBMs), and medium-range ballistic missiles (MRBMs) that can strike targets throughout the region as far as 2,000 kilometers from Iran's borders. Iran is also developing land-attack cruise missiles (LACMs), which present a unique threat profile from ballistic missiles because they can fly at low altitude and attack a target from multiple directions...

Decades of international sanctions have hampered Iran's ability to modernize its military forces through foreign procurement, but Tehran has invested heavily in its domestic infrastructure, equipment, and expertise to develop and produce increasingly capable ballistic and cruise missiles. Iran will continue to improve the accuracy and lethality of some of those systems and will pursue the development of new systems, despite continued international counterproliferation efforts and restrictions under UNSCR 2231. Iran is also extending the range of some of its SRBMs to be able to strike targets farther away, filling a capability gap between its MRBMs and older SRBMs. *[For more details on UNSCR 2231, see Appendix J.]*

Iran can launch salvos of missiles against large-area targets, such as military bases and population centers, throughout the region to inflict damage, complicate adversary military operations, and weaken enemy morale. Although it maintains many older, inaccurate missiles in its inventory, Iran is increasing the accuracy of many of its missile systems. The use of improved guidance technology and maneuverability during the terminal phase of flight enables these missiles to be used more effectively against smaller targets, including specific military facilities and ships at sea. These enhancements could reduce the miss-distance of some Iranian missiles to as little as tens of meters, potentially requiring fewer missiles to damage or destroy an intended target and broadening Iran's options for missile use.

Iran's more-accurate systems are primarily short range, such as the Fateh-110 SRBM and its derivatives. Iran's longer-range systems, such as the Shahab 3 MRBM, are generally less accurate. However, Iran is developing MRBMs with greater precision, such as the Emad-1, that improve Iran's ability to strike distant targets more effectively. Iran could also complicate regional missile defenses by launching large missile salvos.

Iran lacks intermediate-range ballistic missiles (IRBMs) and intercontinental ballistic missiles (ICBMs), but Tehran's desire to have a strategic counter to the United States could drive it to develop and eventually field an ICBM. Iran continues to develop space launch vehicles (SLVs) with increasing lift capacity—including boosters that could be capable of ICBM ranges and potentially reach the continental United States, if configured for that purpose. Progress in Iran's space program could shorten a pathway to an ICBM because SLVs use inherently similar technologies.

Iran has the largest and most diverse ballistic missile arsenal in the Middle East, with a substantial inventory of close-range ballistic missiles (CRBMs), short-range ballistic missiles (SRBMs), and medium range ballistic missiles (MRBMs) that can strike at targets throughout the region up to 2,000 kilometers from Iran's borders, as far as Israel and southeastern Europe. Iran's missile force—the Al-Ghadir Missile Command (AGMC), which falls under the control of the IRGC Aerospace Force (IRG-CASF)—serves as a critical strategic deterrent and a key tool of Iranian power projection.

# DIA Assessment of Iranian Missile Forces (II)

The AGMC periodically conducts highly publicized national-level exercises demonstrating the capabilities and readiness of the force, often as part of the IRGC's NOBLE PROPHET series of exercises. In 2017, Iran for the first time used the name EQTEDAR-E VELAYAT for its major AGMC exercise. These show-of-force events typically include publicized missile launches and statements highlighting Iran's missile capabilities and deterrent posture. Prior exercises have showcased launches against a mock U.S. airfield and naval targets.

Iran has also used its missiles in combat on several occasions in recent years. In June 2017 and October 2018, Iran launched SRBMs from western Iran in high-profile strikes against ISIS targets in Syria. Iran conducted both operations in direct response to terrorist attacks in Iran, although some officials noted the attacks were also intended as a message to any of Iran's potential adversaries. In September 2018, Iran launched SRBMs against Kurdish militant targets in Iraq, damaging the Kurdish Democratic Party of Iran (KDPI) headquarters.

Iran's continued production of missiles and refinement of ballistic missile technology pose a growing threat to U.S. forces and allies in the Middle East. Tehran is also a major proliferator of ballistic missile technology to regional state actors and proxy groups. Although Iranian leaders emphasize self-reliance, Iran continues to depend on foreign suppliers for critical components and technology.

Iran has an extensive missile development program, and the size and sophistication of its missile force continues to grow despite decades of counterproliferation efforts aimed at curbing its advancement. Iran continues to attempt to increase the lethality, reliability, and accuracy of its missile force. In recent years, Iran has unveiled SRBMs with increasingly greater range and precision as well as MRBMs with claimed accuracy and warhead improvements. Iran is fielding an increasing number of theater ballistic missiles, improving its existing inventory, and developing technical capabilities that could enable it to produce an intercontinental ballistic missile (ICBM).

... During a conflict, Iran probably would attempt to attack regional military bases and possibly energy infrastructure and other critical economic targets using its missile arsenal. Even with many of its missile systems having poor accuracy, Iran could use large salvos of missiles to complicate an adversary's military operations. RGCN FAC/FIAC attack a mock U.S. aircraft carrier during an exercise in 2015. in theater, particularly if some of Iran's newer, more-accurate systems are incorporated.

## *Close- and Short-Range Ballistic Missiles*

Iran's liquid-propellant SRBMs—the Shahab 1, Shahab 2, and Qiam-1—are based on Scud technology. The Qiam-1 has a range of at least 750 kilometers, and variants of the system have been used as part of Iranian strikes on ISIS in Syria. Tehran has also supplied extended-range Qiam-1 variants to the Houthis in Yemen. These missiles, launched mostly at Riyadh, Saudi Arabia, have flown to a range of more than 900 kilometers.

Iran's solid-propellant CRBMs and SRBMs primarily consist of the many variants of the Fateh-110 family of missiles. Most of these systems have ranges up to about 300 kilometers, but Iran has unveiled a variant called the Fateh-313 with a 500-kilometer range. Iran has also advertised several variants of these missiles configured with different terminal seeker technologies, including electro-optical and antiradiation homing, which makes them capable of targeting ships. These systems—which include the Khalij Fars, Hormuz 1, and Hormuz 2—reportedly have ranges of about 300 kilometers.<sup>265</sup> In September 2016, Iran unveiled the new Zolfaghar SRBM, a solid-propellant system with a 700-kilometer range. Iran used these missiles in its 2017 and 2018 strikes against ISIS in Syria.



# DIA Assessment of Iranian Missile Forces (III)

Iran has also developed short-range ASBMs based on its Fateh-110 system. Iran could use these ASBMs, in concert with its other countermaritime capabilities, to attack adversary naval or commercial vessels operating in the Persian Gulf or Gulf of Oman.

## *Medium-Range Ballistic Missiles*

The liquid-propellant Shahab 3 is the mainstay of Iran's MRBM force. Iran has modified the Shahab 3, which is based on the North Korean No Dong MRBM, to extend its range and effectiveness, with the longest-range variant being able to reach targets at a distance of about 2,000 kilometers.

In 2015, Iran publicized the first launch of a Shahab 3 variant—called the Emad-1—equipped with a maneuverable reentry vehicle (MARV), which could allow the system to strike targets up to potentially 2,000 kilometers away with near-precision accuracy.

Iran has also conducted multiple launches of the solid-propellant Sejil MRBM, which also has a range of 2,000 kilometers. Iranian officials have announced plans for an Emad-2 with greater precision as well as a new Sejil variant, which can also be guided all the way to the target.

In September 2016, Iran claimed production of the new Khorramshar MRBM would begin in 2017. The Khorramshahr, which Iran states has a 2,000-kilometer range, appears to be derived from North Korean Musudan technology..

## *Land-Attack Cruise Missiles*

In 2012, Iran announced the development of its first land-attack cruise missile (LACM), called Meshkat. In 2015, Iran displayed what it called the Soumar LACM, a ground-launched system that appears to be based on the Russian air-launched AS-15.

Iran claims the Soumar has a 2,000-kilometer range. LACMs can provide Iran with a precision-strike capability up to MRBM ranges that could further complicate missile defenses. (It is a system that seems to have been developed after Iran acquired the KH-55, a Russian long-range nuclear-armed cruise missile, from the Ukraine).

## *Space Launch Vehicles*

Since 2008, Iran has launched multi-stage space launch vehicles (SLVs) that could also aid Iran's development of longer-range ballistic missiles because SLVs use inherently similar technologies.

Iran has conducted multiple launches of the two-stage, liquid-propellant Safir SLV, a mix of successes and failures. It has also launched the larger two-stage, liquid-propellant Simorgh

## *Selected Iranian Ballistic Missiles*

SLV, which is designed to carry satellites higher into orbit and could also serve as a test bed for developing ICBM technologies. The Simorgh could be capable of ICBM ranges if configured as a ballistic missile.

# DIA Assessment of Iranian Space Program Impact on Missile Forces

Iran recognizes the strategic value of space and counterspace capabilities. Tehran claims to have developed sophisticated capabilities, including SLVs and communications and remote sensing satellites.

Iran's simple SLVs are only able to launch microsatellites into low Earth orbit and have proven unreliable with few successful satellite launches. The Iran Space Agency and Iran Space Research Center—which are subordinate to the Ministry of Information and Communications Technology—along with MODAFL, oversee the country's SLV and satellite development programs. Iran initially developed its SLVs as an extension of its ballistic missile program, but it has genuine civilian and military space launch goals.

Iran has conducted several successful launches of the two-stage Safir SLV since its first attempt in 2008. It has also revealed the larger two-stage Simorgh SLV, which it launched in July 2011 and January 2019 without successfully placing a satellite into orbit. The Simorgh could serve as a test bed for developing ICBM technologies.

Because of the inherent overlap in technology between ICBMs and SLVs, Iran's development of larger, more-capable SLV boosters remains a concern for a future ICBM capability. In 2005, Iran became a founding member of the Asia-Pacific Space Cooperation Organization (APSCO), which is led by China, in order to access space technology from other countries. Iran's counterspace capabilities have centered around jamming satellite communications and GPS, and Iran is reportedly making advancements in these areas...

Iran is also seeking to improve its space object surveillance and identification capabilities through domestic development and by joining international space situational awareness projects through APSCO.

# Iran Strategic Missile Inventory - Based on 2019 IHS Jane Estimate (I)

A 2019 estimate by the author based on data from IHS Jane's, another widely respected source, states that Iran has a major production facility in Parchin. It warns that many aspects of range and reliability are unclear, but that Iran has exported missiles to Iraq, Syria, and Yemen and states that Iran is establishing a missile production facility in Syria. It also notes that Iran has supplied Shahab (dubbed 'Burkan' by Houthi forces), Qiam-1 (dubbed 'Burkan-2' and 'Burkan-2H'), and Soumar cruise missiles to the Houthi in Yemen.

The IHS Jane's brief states that Iran's Islamic Revolutionary Guards Corps Air and Space Force (IRGCASF) has the following five brigades:

- 15th Ghaem Missile Brigade, with short-range missiles such as the Fajr
- 5th Ra'ad Missile Brigade equipped with Shahab-3/-4, based in the Karaj area, northwest of Tehran
- 7th Al-Hadid Missile Brigade equipped with Shahab-1 and -2 (Scuds B and C) missiles, based in the Karaj area; and controls the Imam Ali Missile Site in Khorramabad, western Iran. IHS Jane's notes that North Korea supplied Iran with 6-12 Scud-B TELs and up to 200 missiles between 1987 and 1992, and that the US-based Federation for American Scientists estimated in 2008 that Iran possessed between 300 and 400 Shahab-1s and Shahab-2s armed with conventional warheads and distributed among 3-4 battalions.
- 19th Zulfiqar Missile Brigade, equipped with Nazeat and Zelzal short-range missiles, based in the Karaj area
- 23rd Towhid Missile Brigade, based at Khorramabad.

IHS Janes estimates that Iran's short-range missile holdings are separate, and include the Fateh, Shahab-1 and Shahab-2, and enhanced and modified variants of the original Scud-B and Scud-C systems. It also describes five different variants of the Fateh – including anti-ship, anti-radar, and 750 -kilometer range systems. It also reports that China sold up CCS-8 (M-7/Project 8610) short-range, road-mobile, solid-propellant, single-warhead ballistic missiles and 30 TELs based on m modifications of the SA-2 to Iran in 1989. It is not clear they are still fully operational, but they have a 190 kg warhead, a 150 km range, and very poor accuracy. Iran calls them the Tondar 69. Some 90 missiles were delivered to Iran in 1992, and a further 110 may have been delivered later.

Source: Anthony H. Cordesman , “The Iranian Missile Threat,” *CSIS*, May 30, 2019. ; and IHS Markit, “Jane’s Sentinel Security Assessment – Strategic Weapon Systems,” April 2019.

# Iran Strategic Missile Inventory - Based on 2019 IHS Jane Estimate (II)

When it comes to Iran's longer-range missiles, the report indicates that the Nazeat 10 began to be tested in 2014 and is called an MRBM – although its range is unclear. It is felt to be more accurate than the Nazeat – although such reporting seems to focus on the guidance platform rather than missile tests.

IHS Janes indicates that its liquid-fueled Qiam missiles have been mass produced since 2011 and has a range of up to 700 km with a 650 kg payload. It also cites three different versions of the liquid-fueled Shahab missile – which is derived from the North Korean No Dong and exceeds the 1,000-kilometer range limit set by the UN. These versions include the Shahab-3A (Ghadr 101) with a range of 1,500-1,800 km, the Ghadr-1 with a range of 1,800 km, and Shahab-3B (Ghadr 110) with a range of 2,000-2,500 km.

The Shahab is being replaced or supplemented by the more accurate Qadr F with a range of 1,600 km, the Qadr H with a range of 2,000 km and improved multiple re-entry vehicle, and the Qadr S with a range of 2,000 km with cluster munitions warhead.

The Khorramshar is said to still be in the test phase, and similar to the North Korean Hwasong-10 (KN-07) liquid-fueled missile with a maximum range of 2,000 km. The Seiji-2 is estimated to be another longer-range solid fueled system with a range of 2,200 km with a 750 kg warhead. A third system called the Emad may be a modification of the Qadr and to have started delivery in 2016. Finally, Iran seems to be developing an ICBM called the Simorgh (Safir-2) out of its Simorgh satellite launch system.

According to work by Jeffery Lewis of NTI, Iran also displayed new 1,000-km long-range ballistic missile called the *Dezful* in February 2019. Lewis notes that Major General Mohammad Ali Jafar, a former commander of the IRGC, called the missile as “an answer to Westerners ... who think they can stop us from reaching our goals through sanctions and threats,” and state that its purpose was to “to protect our nation and the oppressed and downtrodden nations in the region that may ask for help from the Islamic Republic.”

Source: Anthony H. Cordesman , “The Iranian Missile Threat,” *CSIS*, May 30, 2019. ; and IHS Markit, “Jane’s Sentinel Security Assessment – Strategic Weapon Systems,” April 2019.

# **Beyond the Chronology, Examples of Iran's Recent Use of Missile Forces**



# Beyond the Chronology, Examples of Iran's Recent Use of Missile Forces

This section provides maps and other data that provide tangible examples of Iran's progress in attacking military and civil targets – progress that does not reflect the additional advances provided by Iran's anti-ship/anti-fixed target naval forces that have been described in the previous analysis of asymmetric forces.

Work by experts like Uzi Rubin and those in the *Missile Threat Project* at CSIS highlight the extent to which Iran is not only developing more and more precision ballistic and airborne missiles, but conversion systems to give its existing missile more accuracy. The images provided in this section are only indicators of the steadily increasing Iranian capabilities to come.

At the same time, true precision strike capability requires extreme accuracy when conventional warheads are used, and the targets Iran has hit to date have been relatively exposed and large in comparison to the point of targets that are sometimes the “critical path” for major military systems and civilian infrastructure.

Iran's recent success also needs to be kept in proportion. Some of the effectiveness of recent Iranian strikes has been the result of the misstep when Saudi Arabia and the United States did not deploy active missile defenses against precision ballistic and airborne missiles in the target area. Saudi Arabia also did not adopt passive defense measures to protect key components and rapidly shut down key systems to limit the system wide impact of a given strike. Presumably, the United States and Saudi Arabia are correcting these problems – at least in the form of missile defenses that cover both ballistic and cruise missile systems.

This scarcely means that the capability of rockets and missiles systems that only have accuracies that can hit larger area targets should be dismissed. Both previous chronology and sections, as well as this section, show the damage that even unguided artillery rockets can do – attacks whose political impact often greatly exceeds the physical damage and casualties involved.

Furthermore, no attack to date has shown what shipborne missiles can do to fixed targets, and what dual-capable anti-ship missiles can do against coastal targets and fixed facilities in the Gulf.

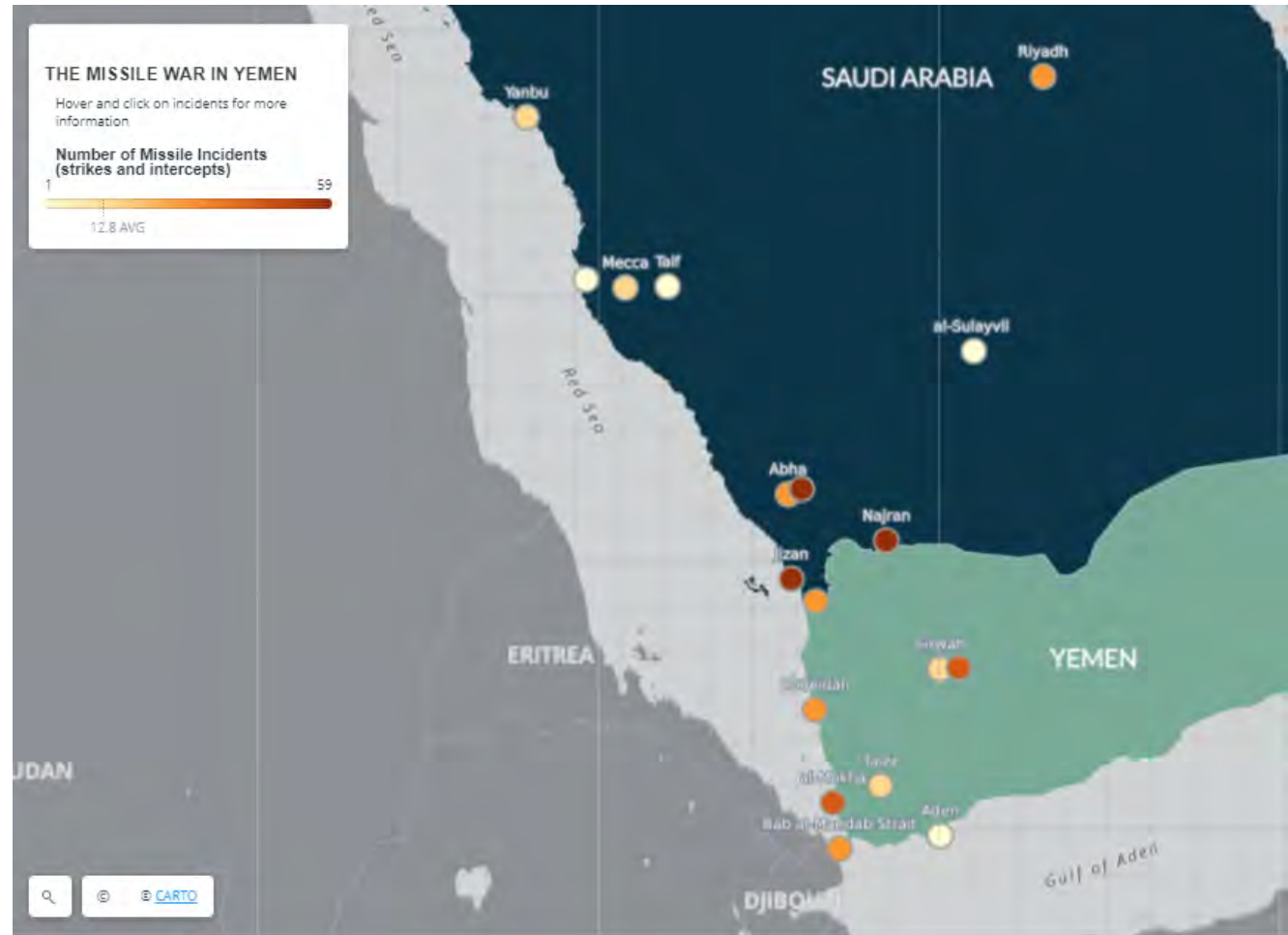
# The Missile War in Yemen

As of December 10, 2019, there had been 156 publicly reported intercepts of missiles fired from Yemen.

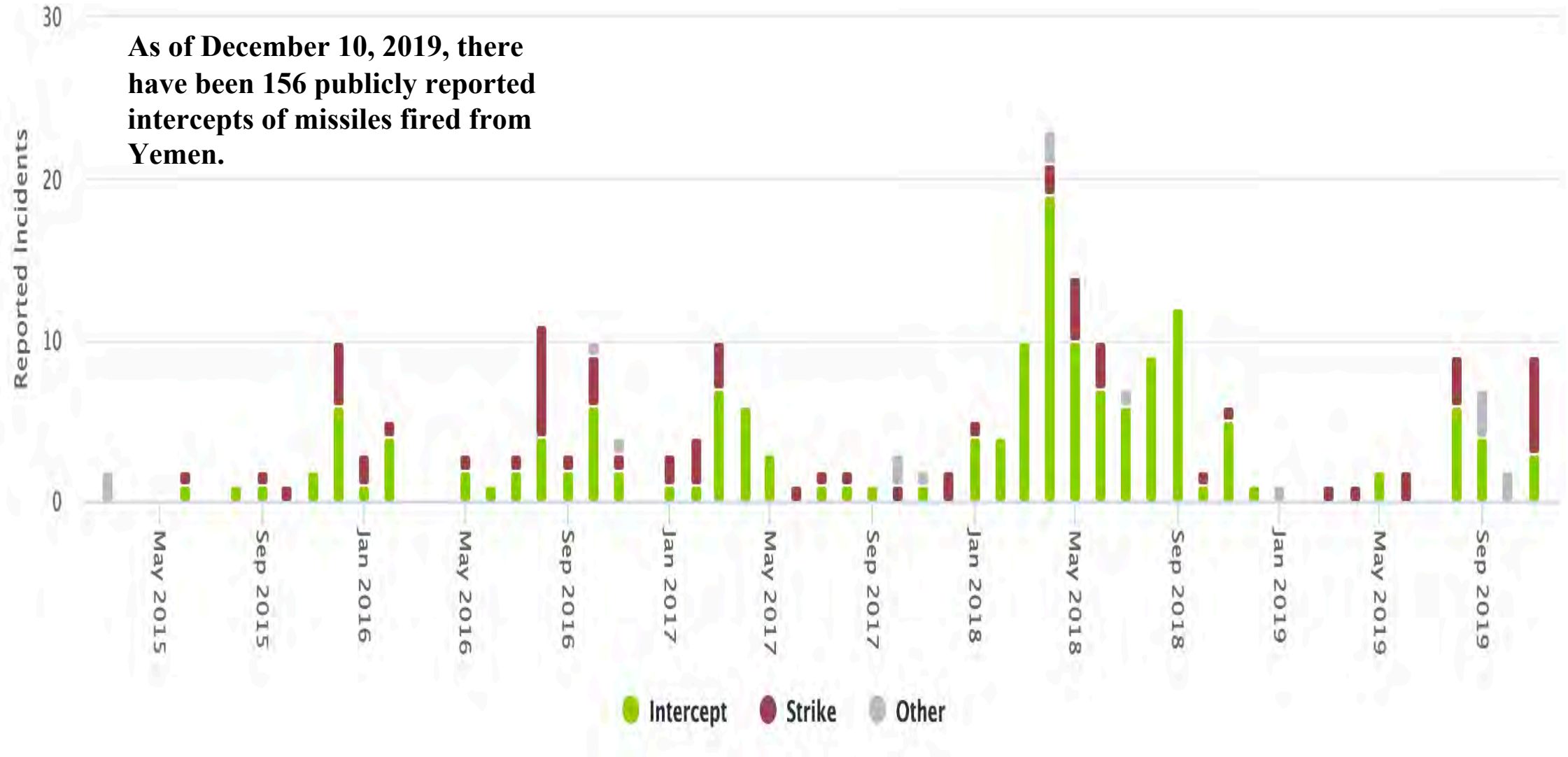
This map shows the relative intensity of missile- and missile defense-related activity across the Arabian Gulf which has occurred as part of the ongoing Yemen conflict.

Beginning in June 2015, the bulk of these incidents have occurred along the Yemen-Saudi border around the cities of Jizan, Najran, and Khamis Mushait, but Houthi acquisition of longer-range missiles have also permitted attacks as far as Riyadh. Saudi and UAE

Patriot missile defenses have intercepted a very high percentage of these launches, greatly limiting damage. Significant activity has also been seen around Al-Mohka and the Straits of Bab-al Mandab, where Houthi-Saleh forces have repeatedly fired antiship cruise missiles at both Emirati and U.S. naval vessels.

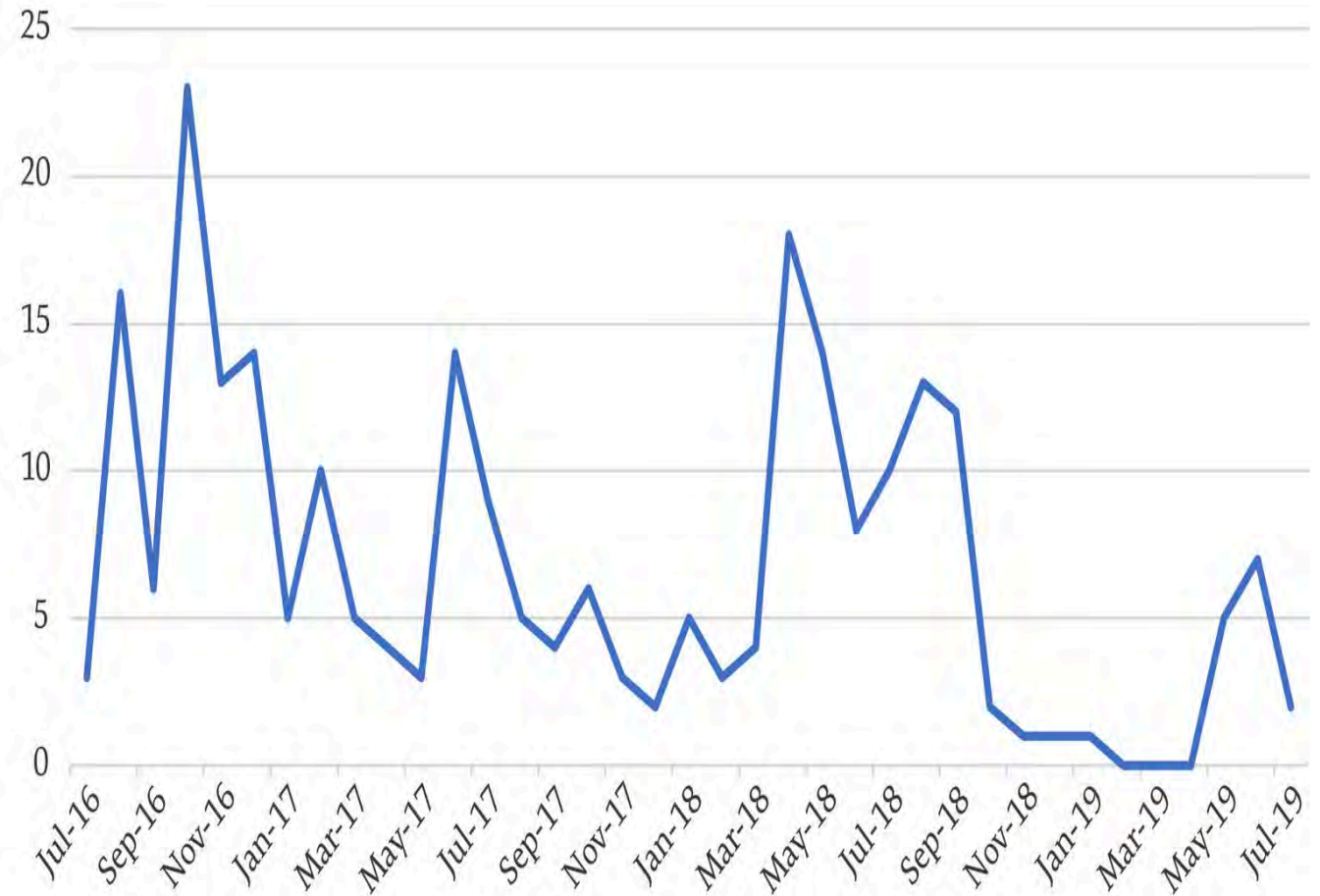


# Houthi Attacks versus Saudi Intercepts



# Houthi Missile, UAV, and Other Attacks on Saudi Infrastructure: (Jul 2016-Jul 2019)

- Over 250 missile, unmanned aerial vehicle, and other attacks against critical infrastructure and other targets in Saudi Arabia over the past three years by the Iranian-linked Houthis. These numbers are likely low because there may be other attacks that are unreported in the press.
- The attacks have included direct fire, explosives (including from unmanned aerial vehicles), guided missiles, and indirect fire (including mortars, rockets, ballistic missiles, and unidentified projectiles).
- The vast majority of attacks were indirect fire (71 percent), and the most frequently targeted provinces in Saudi Arabia were Jazan (107 attacks), Najran (79 attacks), and Asir (39)—all near the Saudi Arabia-Yemen border.



Source: Seth G. Jones, "Iran's Threat to Saudi Critical Infrastructure: The Implications of U.S.-Iranian Escalation," *CSIS*, August 5, 2019, <https://www.csis.org/analysis/irans-threat-saudi-critical-infrastructure-implications-us-iranian-escalation>



# Iranian Missile Attacks: 2017-2020

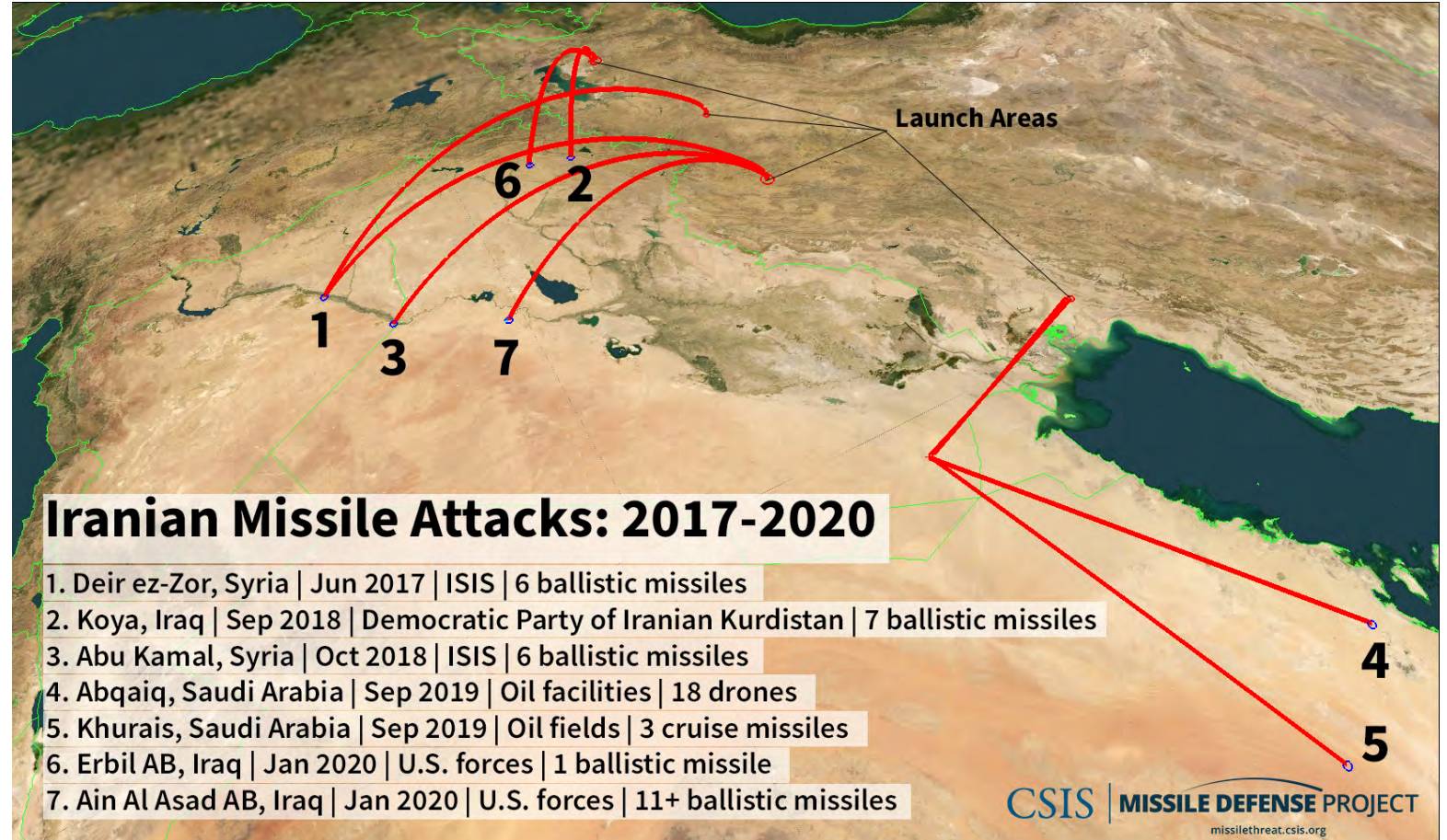
In June 2017, Iran launched six missiles into eastern Syria targeting Islamic States positions near Deir-Ez Zour in retaliation for Islamic States attacks in Tehran.

Iran carried out a similar attack against the Islamic State a year later in October 2018.

In September 2018, Iran launched seven Fateh-110 missiles at the alleged headquarters of the Kurdistan Democratic Party of Iran and Democratic Party of Iranian Kurdistan in Koya, Iraq.

In September 2019, Iran launched [coordinated attacks](#) with unmanned aerial vehicles and cruise missiles against Saudi Arabia's oil facilities at Abqaiq and Khurais. Showing a high degree of precision, the attacks temporarily halted production at the Abqaiq oil refinery, which supplies 5-7% of the world's daily petroleum.

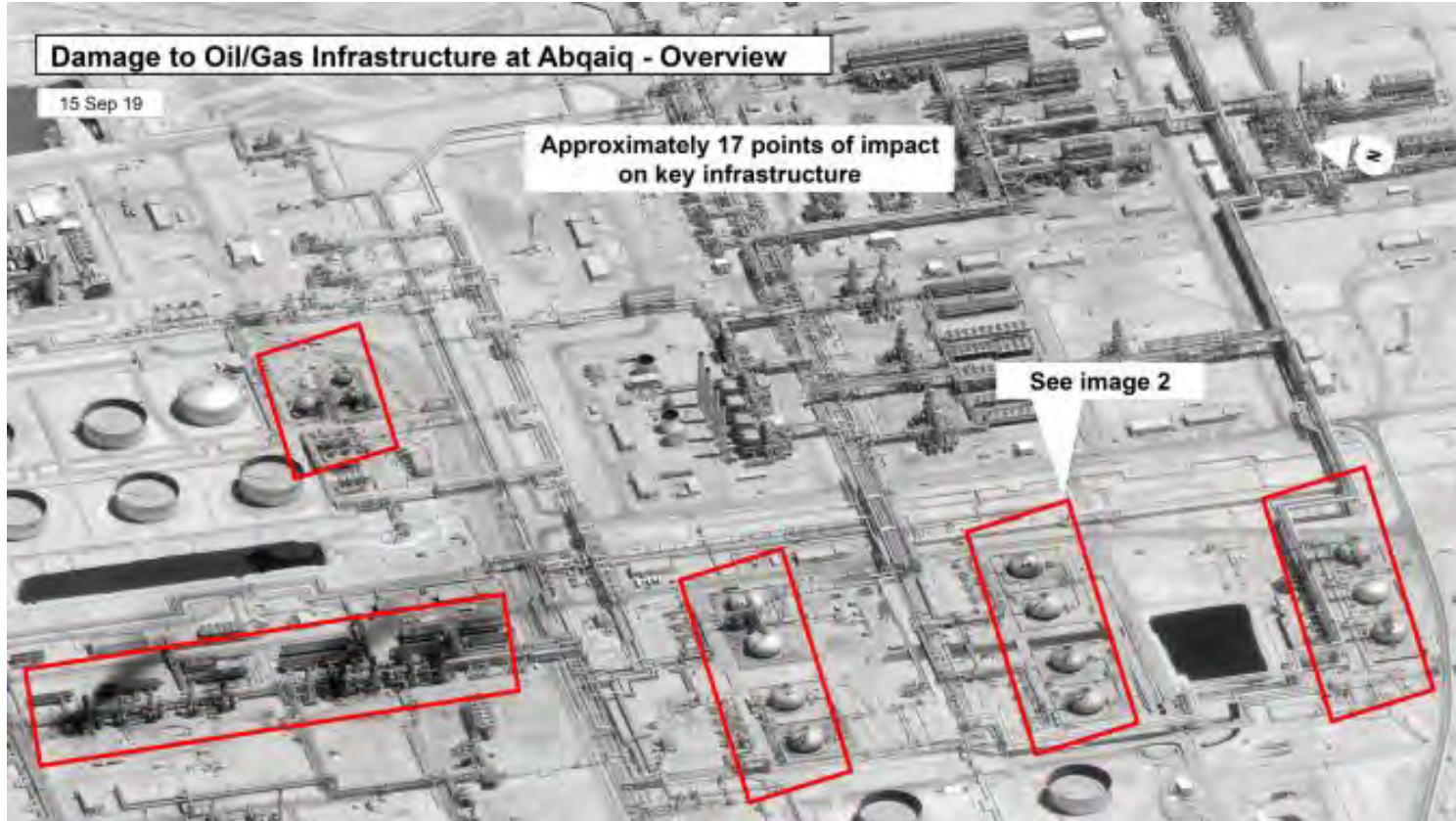
In January 2020, Iran [bombarded](#) U.S. troops in Iraq for several hours with as many as 22 ballistic missiles in retribution for the U.S. killing of Qasem Soleimani. The attacks damaged U.S. facilities at the Al-Asad Air Base west of Baghdad, and left more than 100 U.S. service personnel with Traumatic Brain Injury.



Source: Missile Defense Project, “Interactive: The Missile War in Yemen,” CSIS, October 13, 2016, <https://missilethreat.csis.org/missile-war-yemen/>



# Iranian Precision Strikes on Abqaiq in September 2019



In March 2015, Iran unveiled a cruise missile named Soumar. The missile retains several characteristics of the Russian-made Kh-55, six of which were acquired by Iran from Ukraine, but without the Ukrainian R95-300 turbofan engine the original terrain counter-matching (TERCOM) navigation system. The missile displayed did not appear to possess an advanced seeker head, suggesting that the navigation system is likely a mechanical inertial navigation system (INS) coupled with a GPS system. Other modifications to the original Kh-55 include a solid rocket booster rather than liquid, making it suitable for ground-launched rather than air-launched platforms. With a warhead of between 150 and 170 kg and calculated cruise speed of Mach 0.7, the potential addition of the Soumar is viewed more as a substantial expansion of capabilities rather than a revolutionary enhancement of its missile arsenal.

Source: Natasha Turak, "Detailed satellite photos show extent of 'surgical' attack damage to Saudi Aramco oil facilities," *CNBC*, September 17, 2019, <https://www.cnbc.com/2019/09/17/satellite-photos-show-extent-of-damage-to-saudi-aramco-plants.html> ; and IHS Markit "Iran," 84, 2019.

# Uzi Rubin: Iranian Strikes on Ain al-Asad and Erbil Bases in Iraq: January 8, 2020 (I)

- Fourth time since 2018 that Iran took full responsibility for missiles fired from its territory against targets in Syria and Iraq. First time Tehran admitted a direct attack on US forces in the Middle East. Iranian or Iranian-inspired rocket and UAV attacks on northern Israel remained Unattributed...Last year's sabotage and hijacking of oil tankers in the Persian Gulf were anonymous. Rocket and missile attacks on Saudi Arabia's major cities...Iran's Revenge and oil installations were launched by Tehran's proxy Houthi regime. The attack on September 14, 2019 on Saudi oil installations, while originating in southern Iran, was disguised as a Houthi operation originating from Yemen, with Iran denying it had anything to do with it.
- However, when the regime feels it can put up a convincing case for "justified retaliation," it assumes full responsibility...This was the case on three occasions. Two missile strikes on ISIS forces in Syria were launched in June and October 2018, the first in retaliation for a lethal ISIS terror attack in Tehran and the second in retaliation for a no less lethal ISIS attack in Ahwaz. The third occasion was a September 2018 missile strike on a meeting of senior commanders of the KDPI.
- ...operational aspects of the strike are still somewhat ambiguous. One of the main unknowns is the number of missiles fired and from where. According to the Iraqi Ministry of Foreign Affairs, a total of 22 were fired, of which 17 struck Ein Assad and the other five were aimed at the US base in Erbil. The Pentagon announced a total of 15 missiles fired, of which 10 struck Ein Assad, one hit Erbil, and the other four failed (the destinations of the failed missiles were not specified). US Secretary of Defense Mark Esper corrected this to a total of 16 missiles fired, of which 11 struck Ein Assad. A leading American news magazine quoted an unnamed US official as saying no fewer than 18 missiles had landed in Ein Assad.
- ...One report says the missiles were fired in two waves about one hour apart. American troops in Ein Assad told reporters the missiles came in four waves about 15 minutes apart, and that the duration of the entire attack was two and a half hours. Taken literally, that would mean the missiles had dribbled in at a rate of one every 10 minutes—an obviously unlikely scenario.
- One possible explanation is that the number of launchers was smaller than the number of missiles, requiring time-consuming reloads...the Iranians should not have had any difficulty deploying enough launchers to fire all the missiles at one go. If they did deploy a smaller number of launchers, it could have been in the expectation of a US counterstrike and the desire to expose as few launchers as possible to possible destruction. Another possibility is that the operation was carried out from separate launch sites, and the lull between salvos reflected some difficulty in synchronizing fire. A further theory was suggested by a senior US general, who said the Iranians fired in waves to maximize American casualties. A defender... has no way of knowing whether the last missile to arrive is the last missile in the strike...
- ...two types of missiles were used in the operation. One was the solid propellant Fatah 313, an advanced version of the Fatah 110 precision rocket with its range extended to 500 km by replacing its steel structure with lightweight material.

Source: Uzi Rubin, "Operation "Shahid Soleimani": Iran's Revenge," Mideast Security and Policy Studies No. 170, BESA Centre, February 2020, <https://besacenter.org/wp-content/uploads/2020/02/170-MONOGRAPH-Rubin-Operation-Shahid-Soleimani-ENGLISH-FINAL.pdf>

## Uzi Rubin: Iranian Strikes on Ain al-Asad and Erbil Bases in Iraq: January 8, 2020 (II)

- The other was the liquid propellant Quiam 2, a modernized Scud with its range extended to 700 km. The Quiam as it was unveiled in 2011 had mediocre accuracy, but the more recent version, the Quiam 2, is equipped with a GPS-guided warhead that gives it pinpoint accuracy. This version saw action in the September 2018 strike on ISIS headquarters in Syria...
- ...video clips released by Iran clearly show the takeoff of solid and liquid propellant missiles. Both types—the Fatah 313 and the Quiam 2—carry heavy warheads containing hundreds of kilograms of explosives.
- In the Quiam 2, the warhead breaks away from the missile's body once the rocket motor shuts down. It detaches from the rocket body when the fuel is spent and continues its flight on its own. The spent rocket body falls short of the target by several kilometers....debris of at least one or perhaps two spent Quiam 2 bodies was found in the desert about 40 km southeast of Ein Assad. This is incontestable evidence of the use of the liquid propellant rockets against the US base. The lack of spent bodies of the solid propellant Fatah 313 could indicate that none were used against Ein Assad, or—much more likely—that their warheads remained attached to the bodies and all hit the target together.
- the distance from the Omidiyeh air base—the origin of the Saudi oil installations attack—and Ein Assad is about 730 km, not much more than the claimed range of the Quiam. The shorter range of the Fatah 313 required a closer launch site. Thus, it can be speculated that the liquid propellant missiles were launched from Husiztan while the solid propellant ones were launched from Karmanshah, about 400km northeast of Ein Assad.
- ...the Americans could not ignore the possibility that the missile strike might be accompanied by some kind of ground attack from pro-Iranian militias. For that reason, perimeter guards remained on duty throughout the attack. To better forestall a ground attack, the Americans lofted most of their Predator UAVs for reconnaissance missions above the base. Their operators stayed on duty inside aboveground, thin-walled control cubicles. The perimeter guards as well as the UAV operators were thus most definitely in harm's way.
- ...Reports about damage to equipment varied from “light damage” to one helicopter gunship destroyed and one UAV damaged...journalists were told by US troops that the most significant damage was to the fiber optics landlines linking the UAV controllers' stations to the radio transmitters that communicate with the UAVs.
- ...Ambiguity also surrounds the Iranian strike on Erbil. The Pentagon said it involved a single missile aimed at the US bases near Erbil's international airport, but Kurdish sources report three missile impacts in the province of Iraqi Kurdistan—one near Erbil itself, but the others several tens of kilometers west of it, as if some missiles had overflowed their target. Adding to the ambiguity, in his briefing, Gen. Hadjizadeh spoke of “attacking one single US base” and did not even mention Erbil in the list of culpable US bases involved in the killing of Soleimani. Yet another mystery here is why the same Iranian missiles that were so impressively accurate in Ein Assad failed to hit anything in Erbil, perhaps even missing it by tens of kilometers.

Source: Uzi Rubin, “Operation "Shahid Soleimani": Iran's Revenge,” Mideast Security and Policy Studies No. 170, BESA Centre, February 2020, <https://besacenter.org/wp-content/uploads/2020/02/170-MONOGRAPH-Rubin-Operation-Shahid-Soleimani-ENGLISH-FINAL.pdf>



# Satellite Photo of Attacks on Ain al-Asad Air Base



Source: Nasser Karimi, Amir Vahdat and Jon Gambrell, "Satellite photos show damage to Ain al-Asad base after Iranian missile attack," Associated Press, January 8, 2020, <https://www.sfgate.com/news/article/Sattelite-photos-Ain-al-Asad-base-Iran-attack-14959198.php>



## Damage and destroyed structures at Al Asad Air Base

Descriptions of the attack differ. A spokesman for USCENTCOM said a total of 15 missiles were fired, with ten hitting the Ayn Al Asad airbase, one hitting the Erbil base, and four missiles failing to reach their target. U.S. Secretary of Defense, Mark Esper, later gave a similar estimate, saying 16 short-range missiles had been launched from three locations within Iran, with 11 striking Ayn al-Asad (instead of the prior estimate of 10) Other sources reported that two targeted Erbil: one was said to have hit Erbil International Airport and did not explode, the other landed about 20 miles west of Erbil.

According to the Iraqi military, 22 missiles were fired between 1:45 a.m. and 2:15 a.m. local, 17 toward Ayn Al Asad base and five at Erbil According to U.S. troops at Al Asad, the first missiles landed at 1:34 a.m. and were followed by three more volleys, spaced out by more than 15 minutes each. The attack was over by 4:00 a.m. Iran's Tasnim News Agency reported that the IRGC used Fateh 313 and Quiam ballistic missiles in the attack and claimed that U.S. forces failed to intercept them because they were equipped with cluster warheads (a claim without any technical credibility).

Work by Uzi Rubin indicates that the Quiam 2 (700 km range) and Fateh 313 (500 km range) missiles were used, with 11 missiles assigned to Al Asad, nine of which impacted, and 6 of which struck close to their probable target. Five were fired at Erbil – only one of which came close. While Iran may have given Iraq some warning, the missiles were clearly intended to high populated targets, and the attacks showed that Iranian missiles had the necessary precision. The problem was reliability.

Source: Uzi Rubin, BESA; and Nafiseh Kohnavard "Iraq after Soleimani: What is the future for US troops BBC Persian, Union III airbase, Baghdad , 24 January 2020, <https://www.bbc.com/news/world-middle-east-51228954>.





## Sample Damage to Ain al-Asad Air Base



Source: Scott Lucas, “Iran Daily: 34 US Troops Suffer “Traumatic Brain Injuries” in Jan. 8 Missile Attack, *EA Worldview*, January 25, 2020, <https://eaworldview.com/2020/01/iran-daily-34-us-troops-traumatic-brain-injuries-missile-attack/>



# Sample PMF Rocket Damage to PMF Bases in Iraq on March 13, 2020



# Ian Richards: Iranian Strikes on Al Asad Base in Iraq: 5 January 8, 2020

- The missiles came in several waves separated in some cases by over an hour. This kind of volley staggering is reminiscent of artillery tactics in which an attacker tries to give a false impression that the bombardment has ended to coax the defenders out of their shelters only to resume the shelling with more deadly results. [According to](#) base commander Lt. Col Garland, “it was just enough time to make you feel safe. It was my opinion that it was intended to inflict casualties.”
- Iran did warn the Iraqi government approximately 90 minutes before its first missile salvo.
- First hand accounts of the attack indeed depict a base largely locked down in survival mode. Base personnel went into shelters around 11:00 p.m. and did not emerge until around 4:00 a.m. the following day. Other troops took dispersed positions off base and in aircraft. Some soldiers remained above ground to protect the base against a possible ground attack, and a handful stayed in the unhardened containers to keep the base’s surveillance drones operating in the air.
- The operators, however, were [unable](#) to maintain drone operations during the attack. One of the pilots told journalists that an Iranian warhead struck the sleeping quarters next to the operation rooms, forcing the pilots to retreat to the bunkers. The attack also damaged the fiber wires connecting the pilot station to the communications equipment, severing their link from the aircraft above.
- A [study](#) by RAND, for example, assessed that an attack with 50 ballistic missiles could render a major U.S. airbase unusable to large aircraft for a week. Until quite recently, conventional wisdom among many open-source missile analysts was that, while improving, the precision of Iran’s ballistic missiles remained [too poor](#) to cause this level of disruption to U.S. military operations.
- A 2019 [study](#) assessed that a conventional ballistic missile would require achieving around 50 meters circular error probable, a measurement of missile accuracy, to be reliable against small or hardened military targets. The attack on Ain Al-Asad illustrates that Iran’s ballistic missiles have crossed that threshold, giving Tehran the potential capability to handicap the effectiveness of U.S. forces in the region.

Source: Ian Williams, “Uncomfortable Lessons: Reassessing Iran’s Missile Attack,” Missile Threat, *CSIS Missile Defense Project*, <https://missilethreat.csis.org/uncomfortable-lessons-reassessing-irans-missile-attack/>; and “Surviving was a miracle, Iran's missile attack on Iraq base,” interview with Al Asad base commander,” *AFP*, <https://www.geo.tv/latest/267222-surviving-was-a-miracle-irans-missile-attack-on-iraq-base>

# **Gulf Vulnerability and the Regional Nature of “Mutually Assured Destruction” (MAD)**

**(Illustrative Urban area, Infrastructure, and Petroleum Targets)**

# The Arab-Persian Gulf version of MAD (Mutual Assured Destruction)

This section focuses on the vulnerability of the civil target base in the Arab Gulf states and Iran. It highlights key targets at risk to Iranian missile attack and Arab/US air and missile attack where a major conflict could lead to conventional strikes whose damage would be so severe that it would produce the regional equivalent of “mutually assured destruction.”

Iran can use its naval, air, and/or missile forces and proxies to attack ships anywhere in the Gulf, around the Strait of Hormuz, in the Gulf of Oman outside the Gulf, and in Indian Ocean waters near the Strait of Hormuz. It has long threatened to "close the Gulf" at the Strait of Hormuz, but its military exercises involve dispersing its naval of Revolutionary Guard forces broadly in the Gulf and around it.

Iran also does not have to launch a major war to exert military power. It can conduct sporadic, low-level attacks that do not necessarily provoke a major U.S. or Arab military reaction, but do create sudden risk premiums in petroleum prices and the equivalent of a war of attrition. Tankers are inherently vulnerable to relatively small anti-ship missiles, UCAVs, and attacks by submersibles and radio-controlled small craft filled with high explosives. Iran can plant "smart" mines in the bottom of tanker routes that can be set to detect the character of large tankers and combat ships and hone in on them, and they also can be set to arm at widely space intervals.

These methods of "hybrid" attacks can be carried by individual ships and dhows that are not part of Iran's armed forces, that do not have Iranian flags or operators wearing Iranian uniforms, and that cannot be directly tied to actions by the Iranian government. They can be operated by proxies like the Houthis or "false flag" groups made up for the occasion, and the Islamic Republic of Iran Navy (IRIN) and Islamic Revolution Guards Corps Navy (IRGCN) have established a growing presence in the Gulf of Oman based at Chabahar – to “prevent smuggling” – and in the Gulf of Aden and near Yemen to “deal with Somali pirates.”

Iran’s growing role in the Gulf of Oman includes basing for its Kilo submarines to reduce U.S. ability to track and cover their movements, and an IHS Janes assessment reports that Iran plans to establish three new bases on its Makran Coast on in the Gulf of Oman – one of which near Pasabandar (close to the Pakistani border) was completed in February 2017.

At the same time, outside extremist groups like ISIS can also carry out such attacks – potentially dragging Iran, the United States, and Arab states into some form of clash or war. No one can safely assume that Iran is the cause in the absence of reliable intelligence or evidence. Even “implausible” Iranian denial can limit the military response of other states, particularly since virtually any such response risks triggering a far more serious conflict and an even more serious reduction in the flow of Gulf oil.

## The Petroleum Threat to the Global Economy

Petroleum is a global commodity, and any serious risk or reduction in the supply affects prices everywhere in the world. As the maps that follow – and those describing the flow in the previous section on *The Global Importance of the Flow of Persian-Arab Gulf Petroleum Exports* – have shown, the Arabian Peninsula and the Gulf are critical sources of exports. Some 60-million barrels of oil plus product and natural gas normally move out of the Gulf by sea every day. While the volume of these Gulf petroleum exports varies over time and has recently been sharply reduced by the impact of the Coronavirus, the U.S. government's Energy Information Administration’s estimates note that the normal volume of exports rose by about 9% in the half-decade between 2011 and 2016. The EIA also notes that,



- The **Strait of Hormuz** is the world's most important chokepoint, with an oil flow of 18.5 million b/d in 2016. The Strait of Hormuz connects the Persian Gulf with the Gulf of Oman and the Arabian Sea, and in 2015 its daily flow of oil accounted for 30% of all seaborne-traded crude oil and other liquids. More than 30% of global liquefied natural gas trade also transited the Strait of Hormuz in 2016. At its narrowest point, the Strait of Hormuz is 21 miles wide, but the width of the shipping lane in either direction is only two miles wide, separated by a two-mile buffer zone.
- There are limited options to bypass the Strait of Hormuz. Only Saudi Arabia and the United Arab Emirates have pipelines that can ship crude oil outside of the Persian Gulf and have additional pipeline capacity to circumvent the Strait of Hormuz. At the end of 2016, the total available crude oil pipeline capacity from the two countries combined was estimated at 6.6 million b/d, while the two countries combined had roughly 3.9 million b/d of unused bypass capacity.
- The only options to this traffic by sea are a limited pipeline through Iraq to a port in Turkey that offers little real-world surplus capacity. There is another comparatively small Abu Dhabi Crude Oil Pipeline that can move 1.5 million barrels per day (MMBD) of crude to a point on the Indian Ocean Coast of the UAE where tanker loadings are almost as vulnerable as those in the Gulf.
- And finally, there is a bigger 4.8 MMBD *Petroline (East-West Pipeline)* through Saudi Arabia from Abqiaq near the Gulf to a port at Yanbu on the Red Sea. This pipeline has had less than 2.9 MMBD in surplus capacity in recent years. Even in a best case, this amounts to less than 20% of the petroleum that now flows daily out of the Gulf. In practice, however, Saudi Arabia already had to shut this pipeline down after an attack in mid-May 2019 when the Saudi Press Agency reported that it suffered limited damage from armed drones and a “terrorist and sabotage act.”
- The civil war in Yemen has given Iran considerable influence over the Houthi, and a growing potential to use missiles, mines, or unattributable smaller boats and ships to attack targets going south out of the Red Sea through the Bab el-Mandeb or north through the Suez Canal or Sumed Pipeline.
- The EIA reports that,
- The **Bab el-Mandeb Strait** is a chokepoint between the Horn of Africa and the Middle East and is a strategic link between the Mediterranean Sea and the Indian Ocean. Located between [Yemen](#), Djibouti, and Eritrea, it connects the Red Sea with the Gulf of Aden and the Arabian Sea. Most exports from the Persian Gulf that transit the Suez Canal and the SUMED Pipeline also pass through Bab el-Mandeb.
- An estimated 4.8 million b/d of crude oil and refined petroleum products flowed through this waterway in 2016 toward Europe, the United States, and Asia, an increase from 3.3 million b/d in 2011. The Bab el-Mandeb Strait is 18 miles wide at its narrowest point, limiting tanker traffic to two 2-mile-wide channels for inbound and outbound shipments. Closure of the Bab el-Mandeb could keep tankers originating in the Persian Gulf from reaching the Suez Canal or the SUMED Pipeline.
- The **Suez Canal and the SUMED Pipeline** are strategic routes for Persian Gulf oil and natural gas shipments to Europe and North America. Located in [Egypt](#), the Suez Canal connects the Red Sea and the Gulf of Suez with the Mediterranean Sea. In 2016, 3.9 million b/d of crude oil and refined products transited the Suez Canal in both directions, according to data published by the Suez Canal Authority. Northbound flows rose by about 300,000 b/d in 2016, largely because of increased crude oil exports from [Iraq](#) and [Saudi Arabia](#) to Europe. Southbound shipments decreased for the first time since at least 2009, largely because of lower exports of petroleum products from [Russia](#) to Asia.

- The 200-mile long SUMED Pipeline transports crude oil through Egypt from the Red Sea to the Mediterranean Sea. Crude oil flows through two parallel 42-inch pipelines that have a total capacity of 2.34 million b/d. The SUMED Pipeline is the only alternate route to transport crude oil from the Red Sea to the Mediterranean Sea if ships cannot navigate through the Suez Canal.
- Closure of the Suez Canal and the SUMED Pipeline would require oil tankers to divert around the Cape of Good Hope near the southern tip of Africa, which would add approximately 2,700 miles to the transit from Saudi Arabia to the United States. In 2016, 1.6 million b/d of crude oil was transported through the SUMED Pipeline to the Mediterranean Sea and then loaded onto tankers for seaborne trade.

### **The Threat to the U.S. Economy; Why "Petroleum Independence" Is a Myth**

The United States has recently been a *net* importer of well under than two million barrels a day (MMBD) of petroleum, and less than 20% of its total imports have come from the Gulf. However, the United States pays global price for petroleum, and any crisis in supply increases U.S. prices just as much as in any other country in the world.

What is more important to the global and U.S. economy as a whole, however, is that Gulf petroleum exports move by sea to other critical developed and industrial economies – especially in Asia. These importing states include key “top 15” exporters to the United States like China, Japan, South Korea, Taiwan and Vietnam. Their exports to the U.S. now affect a much larger part of the U.S. economy than was the case with petroleum imports even when the United States was most dependent on direct U.S. petroleum imports.

The latest CIA and US Census Bureau data indicate that Asian countries alone normally provide some 28% to 30% of current U.S. imports – largely in the form of manufactured goods – and that they have a value that amounts to some 4-5% of the U.S. GDP. Seen from this perspective, U.S. energy "independence" is little more than an economic myth.

### **But Iran is vulnerable too: Petroleum and Mutual Assured Destruction**

The other side of the coin is that Iran is just as vulnerable as any of the Arab petroleum exporting states. While its economy is more diversified, it is also poorer than most of its Arab Gulf neighbors and already suffers from U.S. sanctions and serious cuts in its petroleum exports. It cannot export meaningfully without shipping oil through the Gulf, and any attacks that affect tankers effectively means an attack on Iran’s tankers as well. As the maps and satellite photos in the next section show, Iran’s key export facilities are concentrated at Kharg Island. Iran’s revenues are also critically dependent on petroleum exports.

The EIA estimated in January 2019 that, “Iran’s oil and natural gas export revenue was \$33.6 billion in Fiscal Year (FY) 2015–2016, according to the International Monetary Fund (IMF), having decreased nearly 40% from \$55.4 billion in FY 2014–2015. The sudden drop was the result of continued depressed export volumes and lower crude oil prices, which combined resulted in low total export revenue. In FY 2016–2017, oil and natural gas export revenue was estimated to have risen to \$57.4 billion as crude oil export volumes rose following the implementation of the JCPOA.” Sanctions have sharply reduced these revenues, but have also affected all Iranian economic activity, and Iran remains dependent on keeping petroleum exports as high and profitable as possible. Iran is also dependent on oil and gas to meet virtually all of its rapidly increasing needs for domestic power.

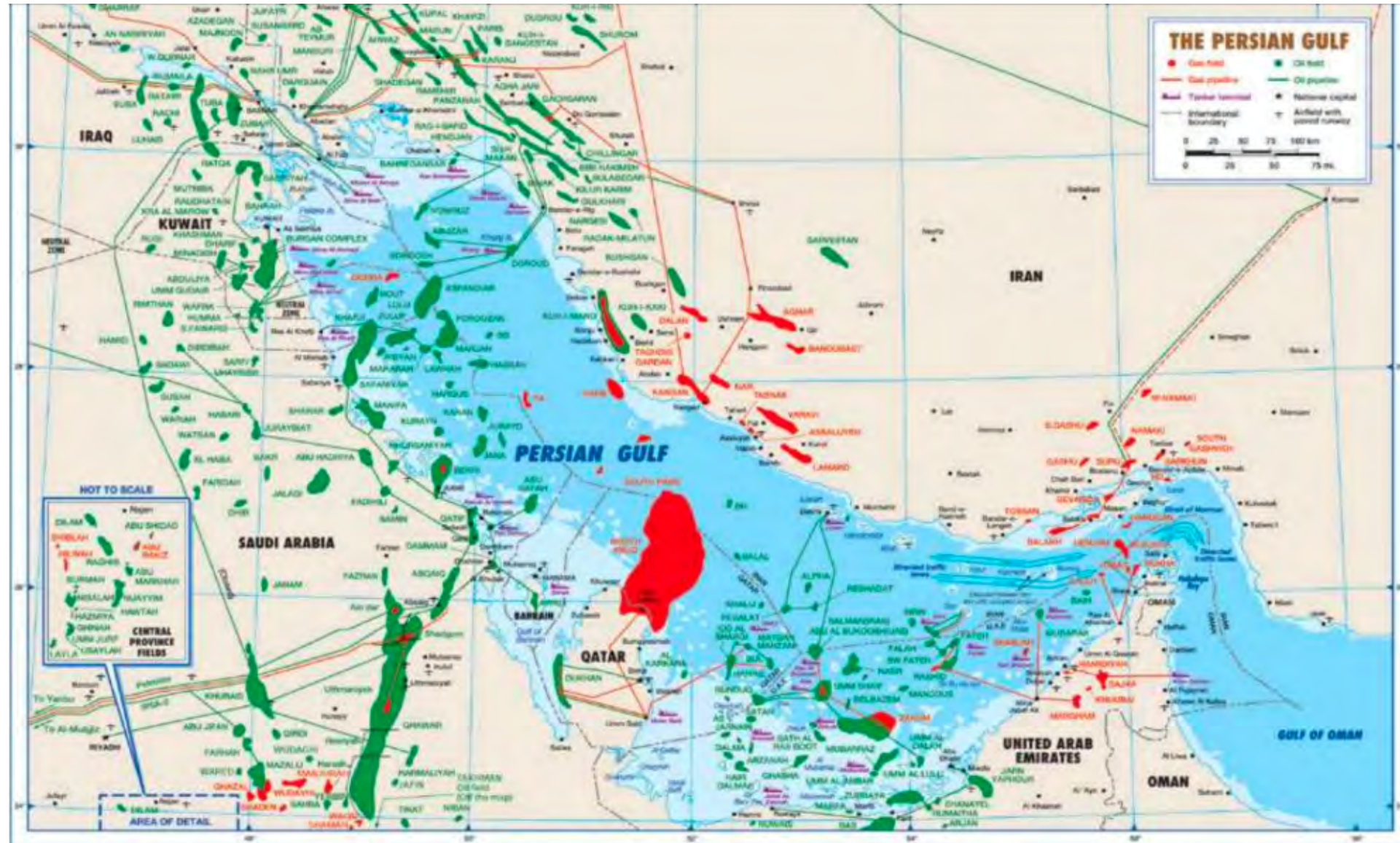
EIA reports that most of Iran's crude oil production comes from the country's southwestern onshore fields, where Iran Heavy and Iran Light grades are produced. This area accounts for about 85% of Iran's total crude oil production capacity. Iran's shipping terminals at Kharg, Lavan, and Sirri Islands – all located in the Gulf – handle almost all of Iran's crude oil exports. Iran also has other terminals that handle mostly refined product exports and imports. **Kharg Island**, the largest export terminal in Iran, is located in the northeastern part of the Persian Gulf. Most of Iran's crude oil exports are sent via Kharg, which includes a main terminal and a four-berth sea island (three of which are operational). The terminal processes all onshore production (the Iranian Heavy and Iranian Light Blends) and offshore production from the Foroozan field (the Foroozan Blend). NIOC has reportedly upgraded the terminal to handle a maximum capacity of 7 million b/d.

- **Lavan Island** mostly handles exports of the Lavan Blend sourced from offshore fields. Lavan is Iran's highest-quality export grade (35.2° API, 1.59% sulfur) and one of Iran's smallest streams, with production volume of about 115,000 b/d in 2017. Lavan's storage capacity is 5.5 million barrels and has a loading capacity of 200,000 b/d.
- **Sirri Island** serves as a loading port for the medium-gravity, high-sulfur Sirri Blend that is produced in the offshore fields. Its storage capacity is 4.5 million barrels.
- **Refining:** Iran has also expanded its domestic refining capacity to meet domestic demand for home, industry, and transportation needs. EIA reports that Iran's total crude oil distillation capacity was slightly more than 2.2 million b/d as of December 2017.
- **Oil Pipelines:** Iran has an extensive domestic oil pipeline network including 19 crude oil and product pipelines ranging in length from 93 miles to 525 miles. Iran's longest pipeline is the product line that runs between Rey and Mashahad. It transports oil between Ahavaz and Rey and supplies feedstock to the Tehran, Arak, and Tabriz refineries. In addition, a new 36-inch condensate pipeline (Assaluyeh-Bandar Abbas) ships feedstock from Assaluyeh to the new PGS refinery. Iran's future plans include construction of three additional petroleum product pipelines, including a new line that will transport gasoline throughout Iran from the Persian Gulf Star (PGS) refinery.
- **Natural gas shipments:** Natural gas distribution is also a critical target. EIA reports that Iran only accounts for about 1% of global natural gas pipeline trade and is not yet a significant natural gas exporter, but Iran's use of natural gas in enhanced oil recovery (EOR) has increased 56% between 2007 and 2017. South Pars is Iran's largest field by production volume, with approximately 55% of Iran's production...other major sources of Iran's natural gas production include the Tabnak, Nar, Kangan, Homan, and Shanoul fields. Iran is the world's fourth-largest consumer of natural gas after the United States, Russia, and China. The largest share in the electric power sector (32%), followed by the residential and commercial sector (29%) and the industrial sector (27%).

# Relative Targeting and Counter-Targeting Capability

- **The United States can provide advanced, satellite-assisted target and battle management systems with limited cyber vulnerability and some redundancy. The United States has advanced UAVs, airborne platforms, ELINT, and other IS&R assets. Some Arab states – Saudi Arabia and the UAE – have some of these capabilities. Iran is seeking to develop them.**
- **Targeting mobile systems, sensors, and offensive missiles remains a key issue. The level of real-world advances in radar and IR remains classified.**
- **Cyberwarfare is an issue.**
- **Iran and the Arab Gulf states do not, however, require such systems to target many fixed facilities. They have actively analyzed and targeted critical nodes in each other's petroleum, civil, and fixed military facilities since at least the early years of the Iran-Iraq War.**
- **Key civilian and military facilities in the Gulf and MENA region are known targets. GPS coordinates have probably been acquired and catalogued, sometimes down to the individual critical component or system – or at least to a given building or location. High cost, critical node, and long lead time repair requirements are well known at the technical level, and some open literature discusses them in detail.**
- **Extensive commercial satellite coverage of fixed civilian and military facilities.**
- **Iran now relies heavily on drones and human intelligence. May acquire satellite capability for dynamic IS&R coverage.**
- **Arab dynamic IS&R coverage and targeting capability in dealing with mobile military forces is limited. Drone and other IS&R capability is improving in some countries but is still limited without U.S. or other outside assistance and coordination.**
- **Israel has advanced IS&R capabilities.**
- **Uncertain and divided Arab use and modernization of AWACs and airborne sensor systems.**
- **Key ground-based radars are limited in number, isolated or poorly netted between countries, and have major potential vulnerabilities. Gaps in low altitude and other aspects of air and missile coverage.**
- **Iran does have extensive optical fiber nets.**

# Major Gulf-Wide Petroleum Targets



Source: Reza Dehghani, "Continental Shelf Delimitation in the Persian Gulf," 2009,

[https://www.un.org/depts/los/nippon/unmff\\_programme\\_home/alumni/tokyo\\_alumni\\_presents\\_files/alum\\_tokyo\\_dehghani.pdf](https://www.un.org/depts/los/nippon/unmff_programme_home/alumni/tokyo_alumni_presents_files/alum_tokyo_dehghani.pdf)



# Broader Gulf Energy Infrastructure

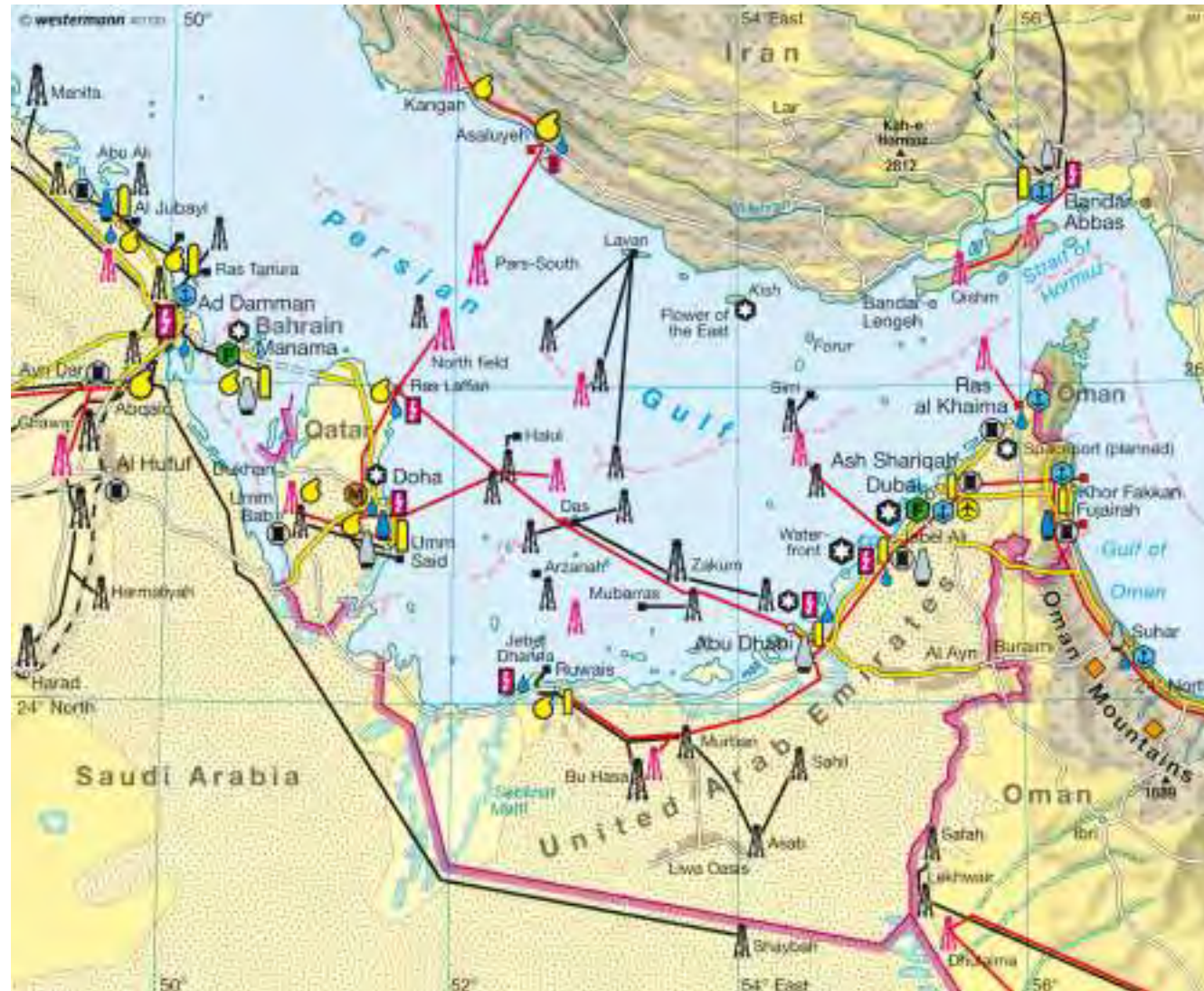
Selected Oil and Gas Pipeline Infrastructure in the Middle East



Source: EIA, “International Analysis- Saudi Arabia,”

<https://www.eia.gov/international/overview/world>

# Petroleum Targets Near Strait of Hormuz



Source: Diercke, "Arab States of the Persian Gulf, <http://www.diercke.com/kartenansicht.xtp?artId=978-3-14-100790-9&stichwort=Iran&fs=1>



## Major Iranian Petroleum Targets

Source: University of Texas Library, "Iran,"  
<http://legacy.lib.utexas.edu/maps/iran.html>



# Key Factors Shaping the Gulf Equivalent of “Mutual Assured Destruction”

- **Extreme dependence on security of petroleum exports, power, water supplies, and critical imports.**
- **Higher levels of escalation may produce critical economic damage even with the best missile defenses, and an asymmetric naval-missile-air war in the Gulf and the outside region could have critical strategic effects.**
- **Only Saudi Arabia, Iran, and Iraq have significant potential strategic depth. All countries but Yemen are hyper-urbanized.**
- **Actual damage levels are only part of the problem. Populations may panic, foreign labor may leave, maritime and air traffic may halt or sharply decline because of potential threats.**
- **Area is hyper-urbanized. Extreme population density in one city, in most countries, and in each of the Emirates.**
- **Key civilian facilities in the Gulf and MENA region are known targets. GPS coordinates have probably been read and catalogued.**
- **Have characterized importance and vulnerability of key infrastructure and petroleum targets since 1973, driven by Iran-Iraq War. May now be down to GPS coordinates of long-lead, high value, critical path components.**
- **Desalination plants are critical targets throughout the Southern Gulf with no alternative sources of supply in many cases. Most Iranian water purification plants are more remote, but also vulnerable.**
- **Nations have very diverse petroleum facilities, but all have critical path components, and links that are isolated by highly vulnerable countries.**
- **Electric power is also critical and power grids are isolated by country.**
- **Airports and seaport activity can be paralyzed by missile strike even if damage is limited. Some key roads have critical overpasses, vulnerable sections.**

# Iran's Kharg Island



Source: Tehran Times, “Super Tankers flocking to Iranian Island in post-sanction time” August 1, 2016, <https://www.tehrantimes.com/news/404818/Super-tankers-flocking-to-Iranian-island-in-post-sanction-time>



# Nationwide Saudi Petroleum Targets

Figure 6. Saudi Arabia major oil and natural gas infrastructure  
Saudi Arabia major oil and natural gas infrastructure



Source: U.S. Energy Information Administration, Iran, IHS Edition.

# Saudi Ras Taura Main Facility



Source: Seth G. Jones, "Iran's Threat to Saudi Critical Infrastructure: The Implications of U.S.-Iranian Escalation," August 5, 2019, <https://www.csis.org/analysis/irans-threat-saudi-critical-infrastructure-implications-us-iranian-escalation>



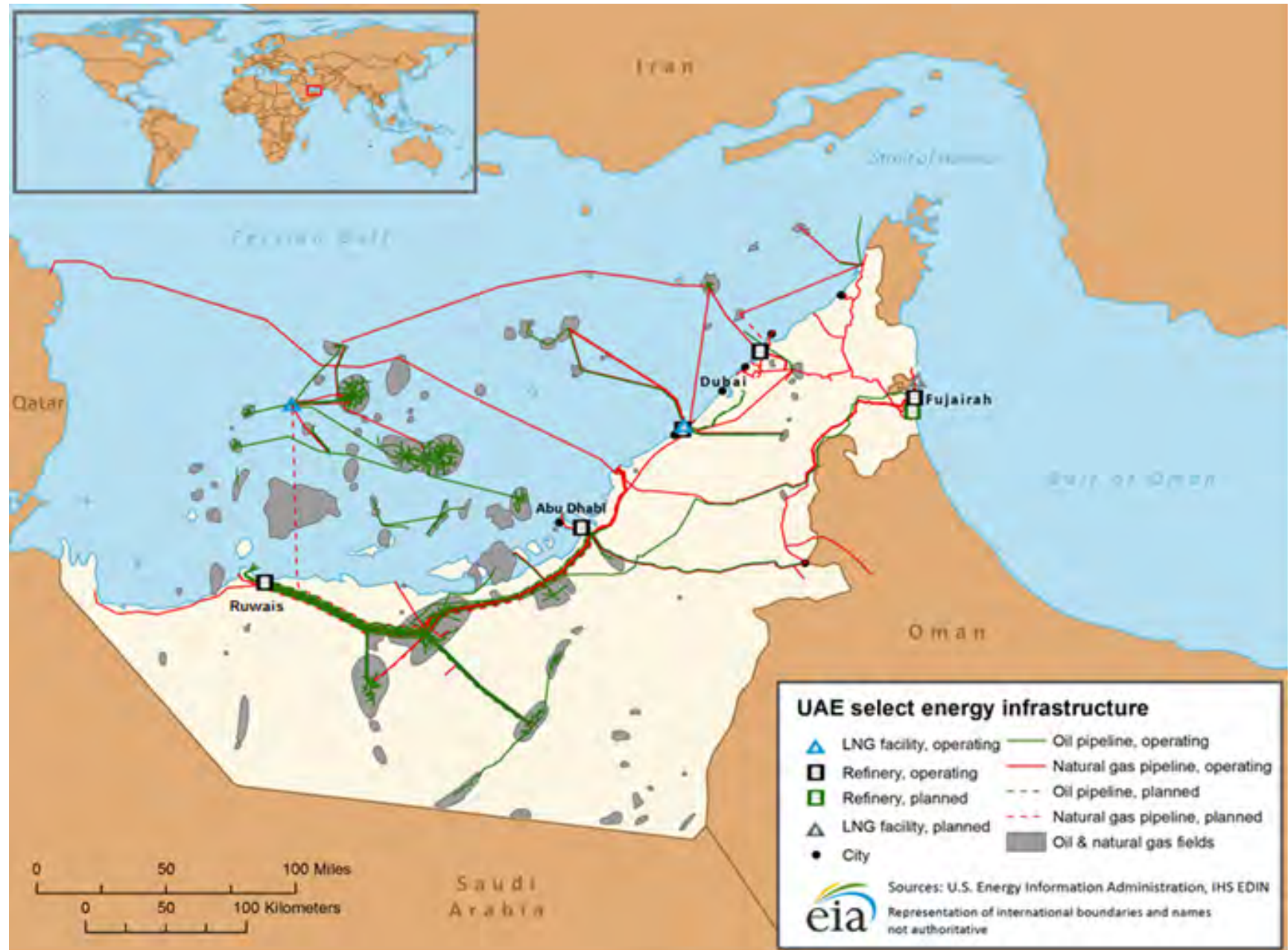
# Oil Tank Farm at Ras Tanura



Source: "Saudi Arabia promised more oil," *New York Times*, <https://www.nytimes.com/2018/07/04/business/energy-environment/oil-prices-opec.html>

# Nationwide UAE Petroleum Targets

Source: EIA, "United Arab Emirates,"  
<https://www.eia.gov/beta/international/analysis.php?iso=ARE>





## Major Gulf Urban Areas, Seaports and Tanker Terminals

Source: Graham Evans, "Persian Gulf," Britannica, <https://www.britannica.com/place/Persian-Gulf>





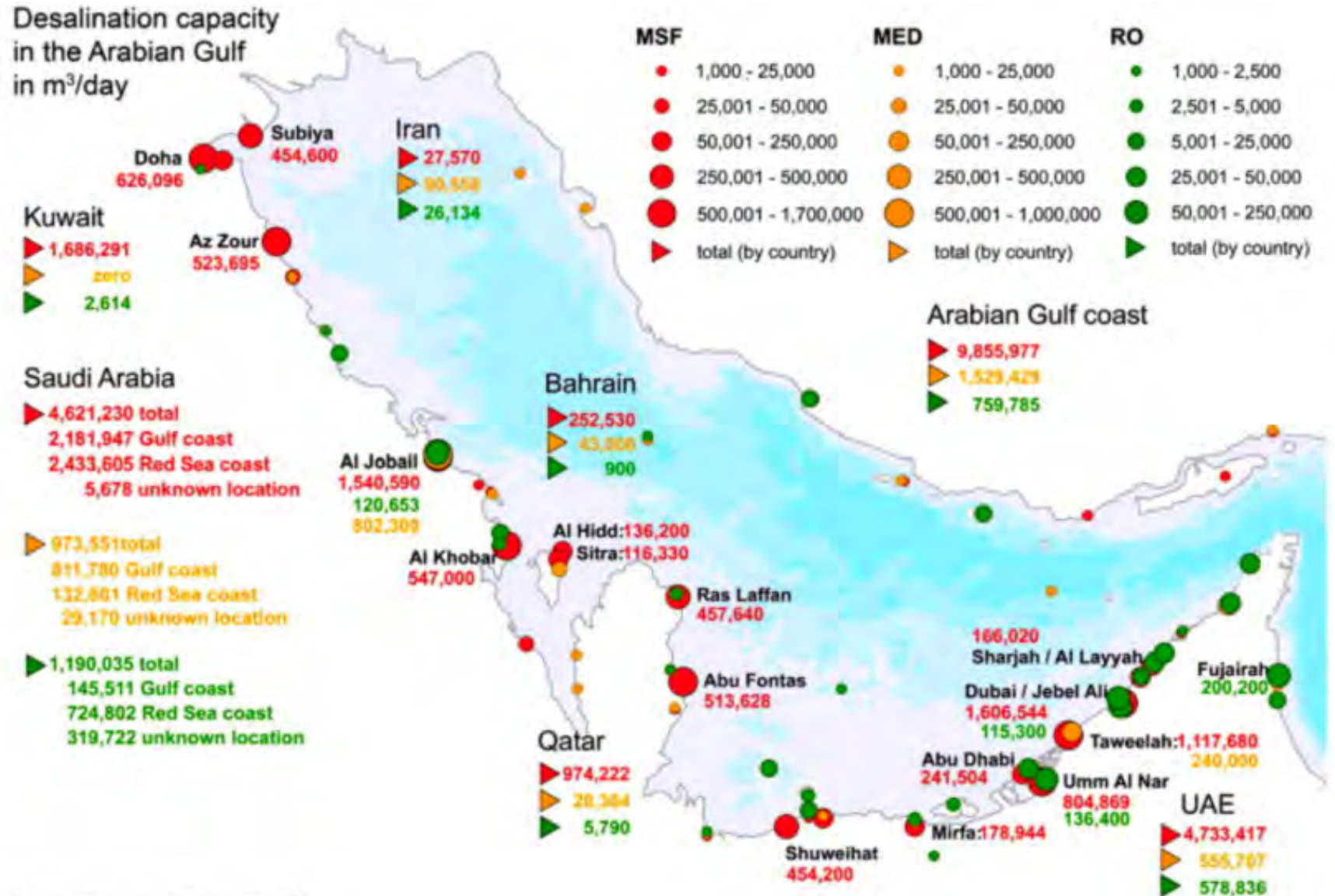
## Hostage Cities: Gulf Urbanization and Area Targets (2020)

Country.	Total Population (Millions)	Urbanization as % of Population	Annual % Rate of Growth	Major Urban Areas-Populations
Bahrain	1.5	89.5%	4.38%	635,000 Manama
Iran	84.9	75.9%	1.71%	9.135 million TEHRAN (capital), 3.152 million Mashhad, 2.086 million Esfahan, 1.628 million Shiraz, 1.581 million Karaj, 1.596 million Tabriz
Iraq	38.9	70.9%	3.06%	7.144 million BAGHDAD (capital), 1.630 million Mosul, 1.352 million Basra, 1.013 million Kirkuk, 874,000 Najaf, 846,000 Erbil (2020)
Kuwait	2.99	100%	1.78%	3.115 million KUWAIT (capital) (2020)
Oman	4.7	86.3%	5.25%	1.550 million MUSCAT (capital) (2020)
Qatar	2.4	99.2%	2.41%	641,000 DOHA (capital)
UAE	9.99	87%	1.71%	2.878 million Dubai, 1.685 million Sharjah, 1.483 million ABU DHABI (capital)
Yemen	29.9	37.9%	4.06%	2.973 million SANAA (capital), 980,000 Aden

Urbanization rate is 2015-2020 estimate.

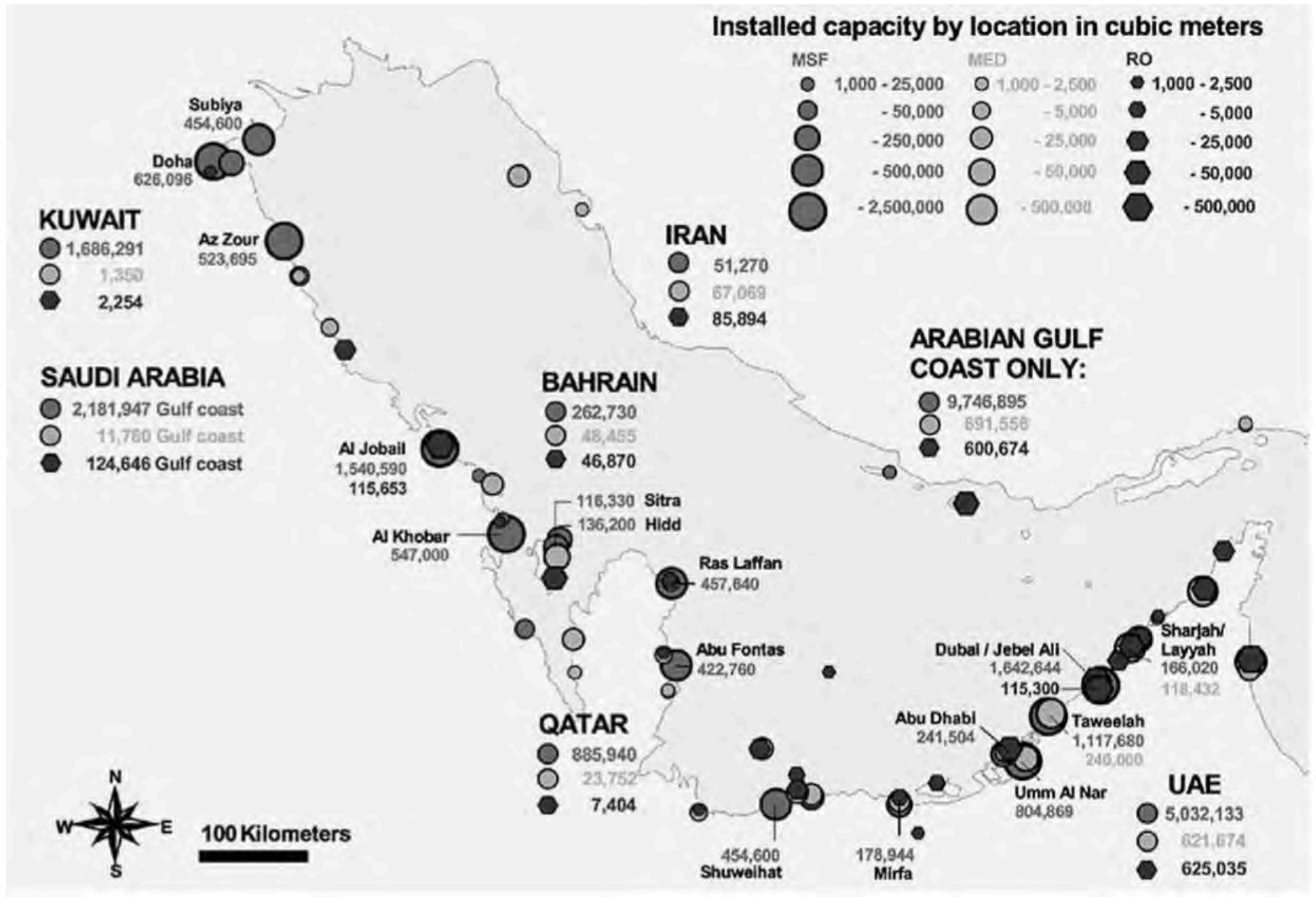
Source: CIA, *World Factbook*, <https://www.cia.gov/library/publications/the-world-factbook/geos/ym.html>, accessed 12.2.2020

# Gulf Desalination Facilities – 2009



© S. Lattemann and T. Höpner 2009

# Gulf Desalination Facilities – 2013

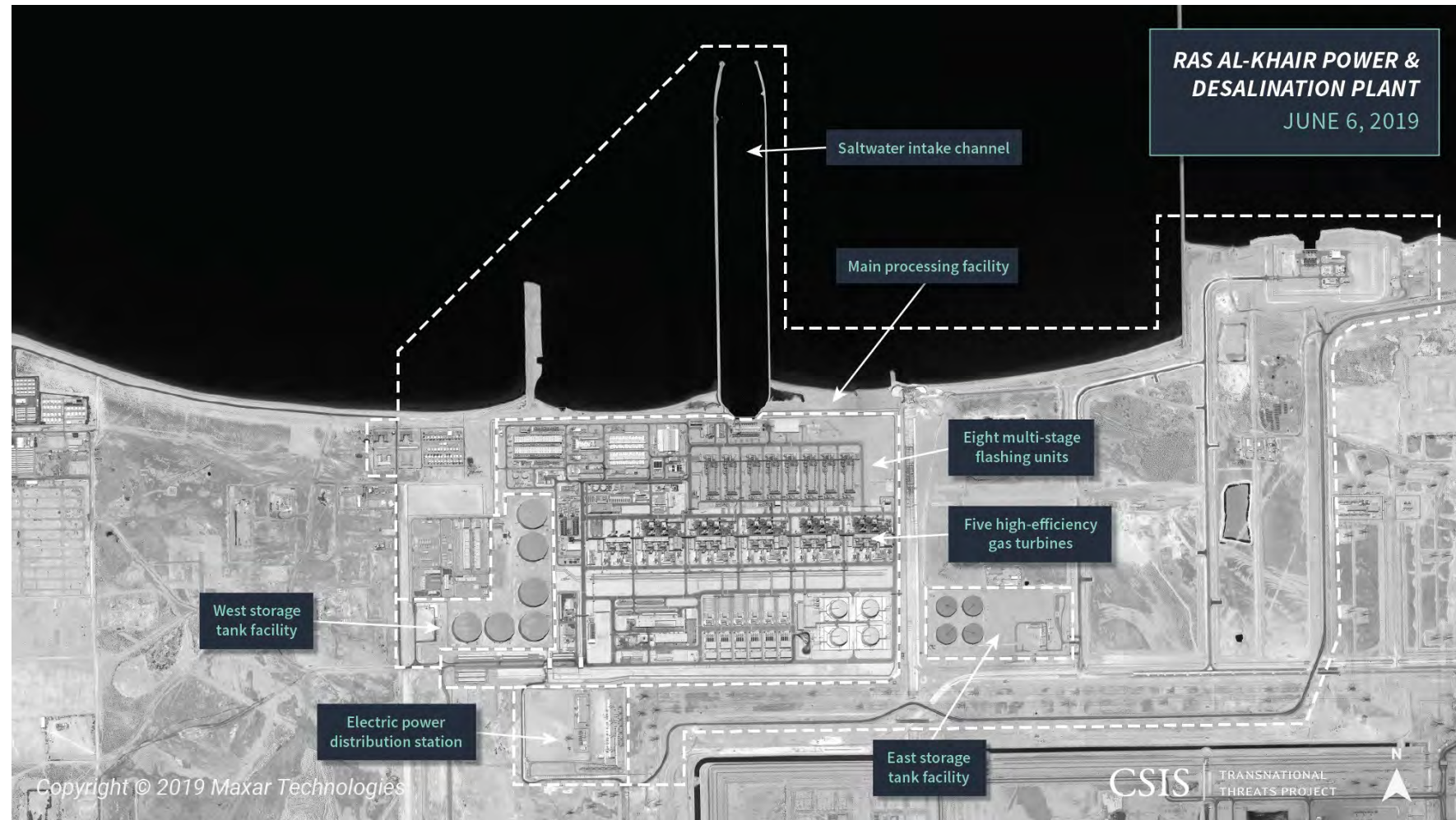


Source: Byung Koo Kim and Yong Hoon Jeong, "High Cooling Water Temperature Effects on Design and Operational Safety of NPPS in the Gulf Region,."



# Saudi Desalination Plant

- In 2009, leaked U.S. State Department diplomatic cables suggested that a hostile act against Saudi Arabia's desalination plant at Jubail would force Riyadh to evacuate "within a week," as the plant at that time provided Riyadh with over 90 percent of its drinking water.
- Ras al-Khair is now Saudi Arabia's (and the world's) largest desalination plant and is also vulnerable to an Iranian attack.
- In one assessment, analysts noted that "every desalination plant built is a hostage to fortune; they are easily sabotaged; they can be attacked from the air or by shelling from off-shore; and their intake ports have to be kept clear, giving another simple way of preventing their operation."
- Cyberattacks also present a serious threat to Saudi desalination plants like Ras al-Khair.



Source: Seth G. Jones, "Iran's Threat to Saudi Critical Infrastructure: The Implications of U.S.-Iranian Escalation," August 5, 2019, <https://www.csis.org/analysis/irans-threat-saudi-critical-infrastructure-implications-us-iranian-escalation>



## Major Air Facilities Near the Gulf Coasts

Source: On the World Map, “Large Detailed Map of Persian Gulf with Cities and towns”

<http://ontheworldmap.com/oceans-and-seas/persian-gulf/large-detailed-map-of-persian-gulf-with-cities-and-towns.html>





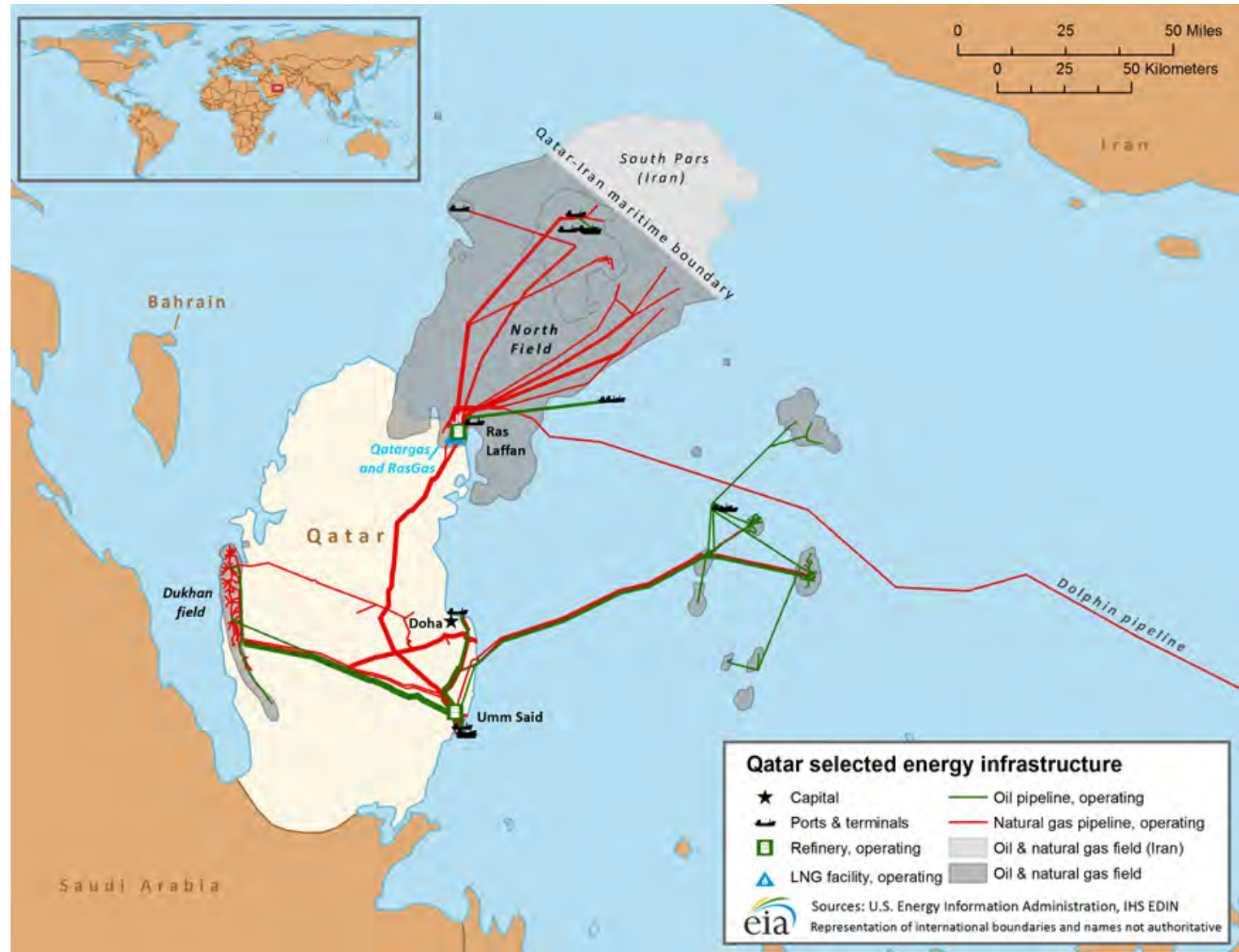
**Satellite  
Photo of  
Dubai  
City**



Source: NASA, "Dubai at Night," April 2, 2012, [https://www.nasa.gov/multimedia/imagegallery/image\\_feature\\_2211.html](https://www.nasa.gov/multimedia/imagegallery/image_feature_2211.html)

# Qatari Energy Facilities

Source: U.S. Energy Information Administration, "Qatar," <https://www.eia.gov/international/analysis/country/QAT>





**Qatari  
NGL  
Gas  
Train**



Source: DalaNews, "Qatari Gas Train."

# Regional Nuclear Capabilities

	SRBM < 1000 km	MRBM 1,000 – 3,000 km	IRBM 3,000 – 5,500 km	ICBM > 5,500 km
Iran	Shahab-1	Shahab-3	Shahab-5	Shahab-6
	Shahab-2	Shahab-4	-	-
	Mushak-120	Ghadr-101	-	-
	Mushak-160	Ghadr-110	-	-
	Mushak-200	IRIS	-	-
	-	Sajil	-	-

	SRBM < 1000 km	MRBM 1,000 – 3,000 km	IRBM 3,000 – 5,500 km	ICBM > 5,500 km
Syria	SCUD-B	-	-	-
	SCUD-C	-	-	-
	SCUD-D	-	-	-
	SS-21b	-	-	-
	-	-	-	-

	SRBM < 1000 km	MRBM 1,000 – 3,000 km	IRBM 3,000 – 5,500 km	ICBM > 5,500 km
Israel	-	Jericho II	-	Jericho III
	-	-	-	-

	SRBM < 1000 km	MRBM 1,000 – 3,000 km	IRBM 3,000 – 5,500 km	ICBM > 5,500 km
Pakistan	Shaheen I	Shaheen II	-	-
	Hatf I	Ghauri I	-	-
	Hatf II	Ghauri II	-	-
	Hatf III	Ghauri II	-	-
	M-11	-	-	-

	SRBM < 1000 km	MRBM 1,000 – 3,000 km	IRBM 3,000 – 5,500 km	ICBM > 5,500 km
India	Agni I	Agni II	Agni III	Surya
	Prithvi I	-	-	-
	Prithvi II	-	-	-



Iran is the only state between the four that has signed and ratified the NPT Treaty

Iran has been heavily investing in:

- Precision Strike Munitions
- Naval-anti-ship weapons such as the Chinese C802 that hit the Israeli Navy ship during the 2006 war in Lebanon and the Ra'ad 350 km anti-ship missile.
- Ballistic Missiles
- Cruise Missiles such as the Kh55 Russian land attack cruise missile, effective against Oil Platforms.

# **The Need for Missile Defense?**



# Iran and the Need for Missile Defense

This section focuses on Iran and the need for missile defense. U.S. defense planners have been examining the need to create effective missile defenses in the Gulf since at least Iraq's first use of ballistic missiles against Iran during the Iran-Iraq War in the 1980s. Actual progress, however, has been slow and has taken place on a country-by-country basis, rather than a part of an integrated effort to create effective regional defenses.

Israel has developed effective layered missile and rocket defenses for itself, but the defenses of our Arab strategic partners consist largely of limited coverage by dual capable Patriot missile and air defense systems and surface-to-air missiles that provide some coverage against cruise missiles, UCAVs, and drones. Meanwhile, Iraq, Oman, and Bahrain do not have a Patriot missile system.

The United States has deployed Aegis cruisers in the past on a contingency basis and has now deployed THAAD missile defenses to the region. Qatar, Saudi Arabia, and the UAE have also bought THADD systems.

As yet, however, there are no clear plans to provide an integrated missile defense system for the region, and the deep divisions between Arab strategic partners make it impossible to develop even integrated air defenses. This has become a critical issue for U.S. and partner defense planning. Iran has already demonstrated that it can conduct precision strikes on key oil facilities in Saudi Arabia and accurate volleys of missile attacks on U.S. forces to bases in Iraq.

It is clear that Iran can also exert considerable influence over the Houthi, the Hezbollah, and the Iraqi Popular Mobilization Forces to conduct attacks with the missiles that it supplies to such forces. Moreover, it is clear that Iran is improving its air defenses using surface-to-air missile defenses like the TOR-M and S-300 while also developing a range of conventionally-armed precision strike systems that range from air breathing drones and cruise missiles to long-range ballistic missile systems that will be far more mobile and easy to shelter or disperse.

The past advantages that the United States and the Gulf Arab states gained from their high levels of superiority in air defense systems – in both fighters and surface-to-air missile defense systems – are eroding. How much these advantages are eroding, and how quickly, is hard to determine because the full nature of Iran's evolving capabilities remain unclear with unclassified sources now also highly uncertain.

What is clear is that such threats do not – by themselves – create a need for missile defenses. That need also depends on the capability of overall system architecture and on the capability of such defenses to defend against the full range of evolving missile and rocket threats at high and low altitudes that can fly complex flight profiles and use decoys. Cost is also a critical issue, as is the real-world ability to intercept and kill incoming systems.

These are areas where ideological advocates of missile defense and manufacturer claims are often based on designs or test programs that have been sharply limited relative to their original requirement. Missile defense is probably no more of a liar's contest than most other military systems, but this scarcely sets a high standard of credibility.

It is also critical to look beyond ballistic missile defense. The United States has been slow to deploy both ballistic missile defenses but even slower to focus on the kind of layered ballistic missile, cruise missile, rocket, and mortar defenses deployed by Israel. The United States is, however, making progress. It is now deploying Patriot and Counter-Rocket, Artillery, Mortar (C-RAM) systems, and the Intercept Land-based Phalanx Weapon System (LPWS) in the more threatened areas.

The United States is following Israel's example in linking ballistic missile and SAM systems into a layered system with C-RAM and modifying C-RAMs to include low cost focused lasers that provide increased range and decreased time-to-intercept over the gun. It is examining Directed-Energy (DE) capabilities to counter missiles that can damage a target using highly focused energy, including laser, microwaves and particle beams. Such targets not only include rockets, and shorter-range missiles, but also unmanned aircraft systems (C-UAS), counter intelligence, surveillance, reconnaissance (C-ISR) targets.

Other open source reporting indicates that the Phalanx radar-controlled rapid-fire gun contains a forward-looking infrared (FLIR) camera to allow a soldier to visually identify these target threats before engaging the targets, and that the land version uses 20mm High-Explosive Incendiary Tracer, Self-Destruct) ammunition, that explodes on impact with the target or on tracer burnout, reducing the risk of collateral damage from rounds that fail to hit their target.

Gulf Arab progress has also been relatively slow and erratic, and it only focuses on buying missile defense weapons without examining the need for fully developed systems, the limits of regional versus nation systems, the need for layered defenses versus limited deterrent purchases, the trade-offs between different kinds of air and missile defense, investments in offensive missile systems as a deterrent, and investments for passive defense that need full examination. To date, most of the arguments for missile defense have failed to meet any of these criteria honestly and objectively.

Once again, creating an accurate estimate of Iran's current and probable future precision strike capability is also critical in a region that provides some of the most vulnerable targets in the world. These include energy facilities that provide 21% of the world's oil and large amounts of its liquid natural gas. They also include cities in some of the most urbanized countries in the world, extremely vulnerable desalination plants – that provide critical sources of portable water to cities that have no other source of water – along with equally vulnerable electric power, air, and seaport facilities.

At the same time, Iran is vulnerable in many similar ways, and the previous analyses have shown that a mix of conventionally armed Iranian missiles – and U.S. and Arab partner air and missile strikes – already are close to evolving to the point where they can act as “weapons of mass effectiveness” that effectively substitute for weapons of mass destruction. The casualties would be much lower, but the economic damage could effectively create the near-equivalent of MAD or mutually assured destruction.

These missile defense challenges are further compounded by Iran’s growing strategic presence in Syria and Yemen, by the uncertain strategic position and future of Iraq, by the challenges posed by continued extremist threats, and by the growing role of Russia, China, and Turkey in Gulf affairs. Moreover, the Iranian missile threat is greatly compounded by the growth of its asymmetric naval forces, by the increase of other threats in the Gulf, by Iran’s potential use of missiles, and by other forms of attack by foreign non-state actors.

So far, the United States and Arab partner response is unclear. The scale and nature of the U.S. commitment to the Gulf region is becoming less and less certain, and the self-destructive tensions between Qatar, Bahrain, Saudi Arabia, and the UAE – along with the uncertain role of Oman and Kuwait – create further major uncertainties as to what process will really be made in missile defense.

Moreover, the growing tensions between Iran, the Arab Gulf states, and the United States have already led to significant clashes at low to moderate levels that warn that deterrence has weakened and that there is both a growing threat of long wars of attrition and escalation to much higher levels of conflict. This is particularly true because Iran is under intense pressure from U.S. sanctions and internal unrest, and the Arab partner states face a common need to fund major economic and social reform although they are already spending far more of their GDP on military forces than the United States – Oman, Qatar, Saudi Arabia, and the UAE are spending close to 10%.

There is no easy way deal with so many complex and unstable variables, and much of the open literature and data now available are dated or uncertain. As a result, it seems better to present the range of key variables that now shape any net assessment of the present and future role of missile defense than to focus on a given set of scenarios with such uncertain data and constantly evolving changes.

# **Evolving Gulf Missile Defense Needs in an Era of Growing Complexity**

- **Real World Evolution of Missile Defense Capability, its Cost, and Effectiveness/Exchange Ratios**
- **Evolving overall Missile, UCAV, Drone, and Precision Air Strike Force Balance**
- **Rising Impact of Other Asymmetric and Conventional Forces**
- **Need to Shape Forces in the Face of Competing Security and Civil Economic Needs**
- **Cost of Given Force Elements – *and Overall System* – Relative to Priority**
- **Lack of Gulf Arab Unity, Common Strategy, plus Uncertain role of U.S. and Outside Powers, now including Russia, China, and Turkey**
- **Iranian Exploitation of Non-State Actors, Other States**
- **Level of Mutual Deterrence, “Mutual Assured Destruction,” Impact on Willingness to Escalate**
- **Volley/Intense Exchanges versus Wars of Attrition**
- **Vulnerability, Target Base, Sensitivity to Attack**
- **Military versus Civilian Targeting; Real-Time Tactical versus Strategic Targeting**
- **Passive Defense Options**
- **Sanctions vs. Third Parties and “Proxies”**



# THAAD vs. Patriot

THAAD and Patriot Pac-3 are complementary to each other. Patriot pac-3 intercepts aircraft/UAVs, and cruise missiles and a ballistic missile in its terminal stage of flight (in atmosphere), while THAAD intercepts a missile while it is in Stratosphere.

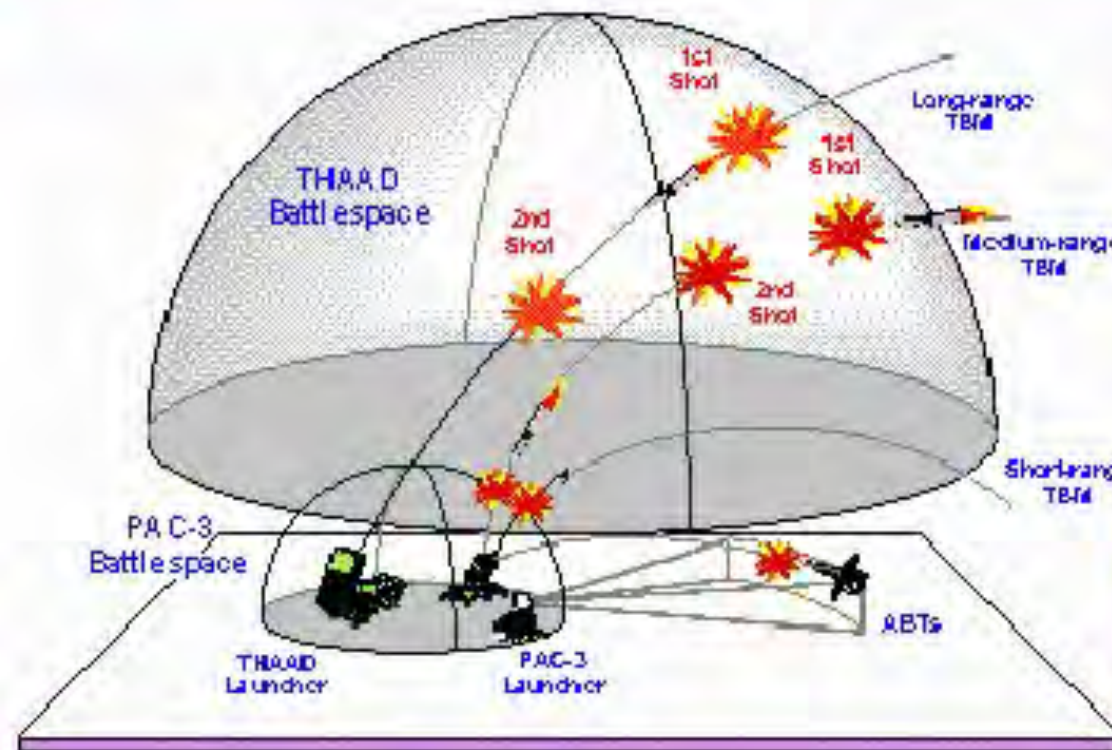
So, if THAAD fails in intercepting a missile, Pac-3 might do that.

UAE is acquiring Patriot pac-3, Patriot pac-2, THAAD and Pantzir-s1 which makes its airspace fully protected.

Source: Pakistan Defense, "Patriot PAC-3 Successfully Intercept a Cruise Missile, 2012." <https://defense.pk/pdf/threads/patriot-pac-3-successfully-intercept-a-cruise-missile.176196/page-2>



## THAAD MISSION / SYSTEM DESCRIPTION



- Upper Tier Of Two-tiered TBM Defense
- Exo And Endo Intercepts Using Hit-To-Kill
- Utilizes THAAD X-band Radar
- Interoperable With Other Army And Joint Systems
- Air Transportable

Legend	
THAAD	Theater High Altitude Area Defense
PAC-3	PATRIOT Advanced Capability 3
ABT	Air Breathing Threat
TBM	Theater Ballistic Missile

**THAAD Provides Effective Defense Against TBM Threats**

# Missiles and Missile Defense from an Arab Gulf Perspective

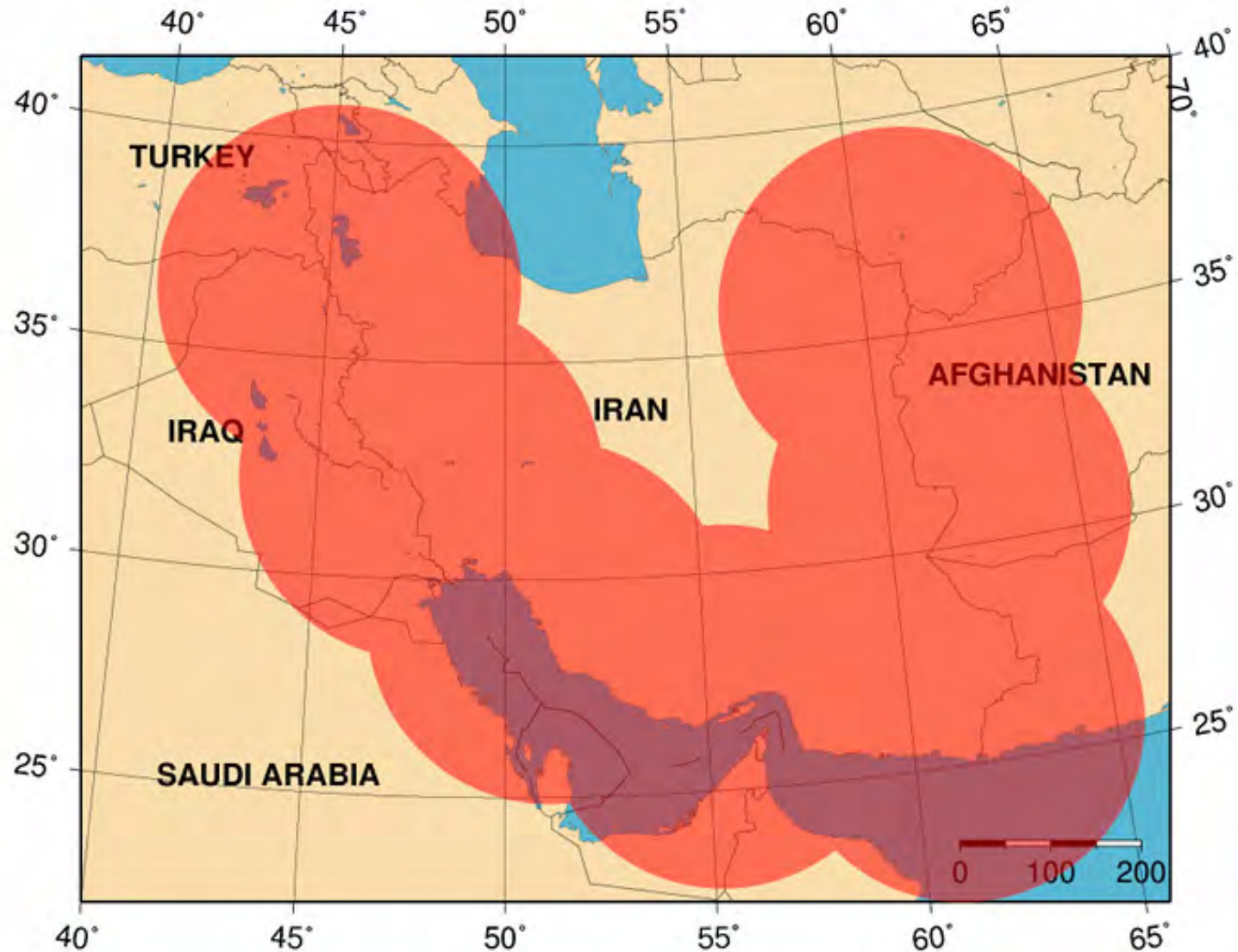
Missile defense and conventionally-armed offensive missiles offer Arab Gulf states major potential advantages, *but:*

- Arab states may be more sensitive to risk of missile strikes and escalation than Iran at level of threats and wars of influence, and potential escalation to major strikes on civilian facilities, and strategic economic damage.
- Primary military investment to date is in air offense and air precision strike. Collectively, Arab states now have major advantage of Iran. Becomes massive if U.S. fully commits, but advantage erodes with advances in Iran's missile forces.
- Initial Qatari, Saudi and UAE buys of missile defenses are not linked to any clear national system, much less integrated theater defense.
- USCENTCOM has focused on missile defense since late 1980s, but no clear systems architecture is public.\*\*\*
- Major investment issues arise in funding missile defenses and offensive missiles, compounded by U.S. and other constraints on offensive cruise and ballistic missile sales.
- United States has deployed THAAD and Aegis cruisers but does not want to deploy a U.S. system to the region.
- Political and military divisions between Arab states, national civil vulnerabilities, lack of advanced battle management, sensor, C<sup>4</sup>, space, cyberwarfare, and IS&R capability presents major problems without full U.S. or outside support. No indication that Gulf Cooperation Council is advancing to provide a regional substitute.
- Oil wealth is relative in scale and in per capita terms for Bahrain, Oman, Saudi Arabia. UAE is divided, and Kuwait is limited in scale.
- Other key Arab states – like Yemen, Jordan, Egypt – are not tied to GCC states. Syria and to some extent Lebanon are tied to Iran. Iraq's role is highly uncertain.
- Israel's expertise in layered missile defenses and offensive missile capability still isolated. Russia and China are future wild cards.

## Iran with S400

Source: Air Power Australia, "Airspace at Risk – Impact of S-400/SA-21 Deployment," <https://www.ausairpower.net/APA-Iran-SAM-Deployment.html>

### AIRSPACE AT RISK – IMPACT OF S-400/SA-21 DEPLOYMENT



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© 2009 Carlo Kopp  
AZIMUTHAL EQUIDISTANT PROJECTION

# **The Iranian Nuclear, Chemical, and Biological Risk**

# The Iranian Nuclear Risk

This section highlights Iran's ongoing nuclear programs and the potential cost-benefits of an Iranian acquisition of nuclear weapons and other weapons of mass destruction.

Iran has so far avoided any open declaration that it is returning to a nuclear weapons program. It denies U.S. and other charges that it retains chemical weapons, and no evidence has surfaced that it has a biological weapons program. The UN's IAEA has, however, confirmed many of the Israeli charges that Iran retained some elements of a nuclear program after signing the JCPOA, although this seems to consider largely with the keeping the records and research data it had acquired in previous years. Iran has also raised its level of uranium enrichment, centrifuge efforts, and capability, and it seems to have added enrichment activities at its mountain site at Fordow.

The IAEA remains the most objective source of reporting on such Iranian activities, and it has not as yet indicated that Iran has revived a weapons program, although it is increasingly clear that Iran had approached the "breakout" point in enrichment and weapons design. There are no other clear post JCPOA indicators or claims that Iran is actively developing new nuclear, chemical, or biological weapons. There are, however, many steps Iran can take to develop actual weapons capabilities – short of an actual test – that can be extremely difficult to detect.

One key question is whether Iran has the same incentives to continue a nuclear program now that it is approaching a level of conventional precision strike capability that could do critical damage to fixed U.S. and Arab military and Arab civil targets in the Gulf. Threatening to go nuclear does give Iran some strategic leverage, but action can provoke preemptive strikes. Developing a nuclear-armed ICBM capability to strike the United States might act as a deterrent, but it might just as easily lead to preemptive strikes, and a nuclear exchange between the United States and Iran would probably destroy Iran as a state. Accordingly, just like threatening to close the Gulf can be more valuable than any real world effort to do so, threatening to go nuclear may give Iran some safe degree of leverage and deterrence, while any actual effort would be far more dangerous than it is worth.

In contrast, creating a clear capability to destroy critical Arab infrastructure with conventionally armed missiles is far less provocative and dangerous in terms of a U.S., Israeli, and even Arab preemption and retaliation. Moreover, Iran cannot go too far without potentially provoking the United States into guaranteeing extended deterrence to its Arab partners and Israel, or leading itself to a regional nuclear arms race that would raise the potential level of escalation from a major regional conflict to one with catastrophic new heights. Once Iran, the Arab Gulf states, and Israel all have nuclear weapons, neither side is likely to have any practical way to "win." That said, India, Pakistan, and North Korea have all proceeded to become nuclear powers. Risk often gets precedence over reason.



As for Iran's chemical and biological programs, the details remain highly uncertain. A DIA unclassified assessment in 2019 states that,

Iranian leaders have long been concerned about the threat of chemical and biological warfare because of the considerable loss of life from chemical weapons during the Iran-Iraq War. Iran is a States party to both the Chemical Weapons Convention (CWC) and the Biological and Toxin Weapons Convention (BWC), which ban the development, production, and stockpiling of certain chemical and biological agents. Iran publicly denounces the use of weapons of mass destruction (WMD), and Khamenei has reportedly issued a fatwa (Islamic legal ruling) against chemical weapons.

In November 2018, the United States found Iran noncompliant with its CWC obligations. Iran failed to declare its transfer of chemical weapons to Libya in the 1980s or its holdings of riot control agents, such as the tearing agent CR, and has not submitted a complete chemical weapons production facility declaration. The United States is also concerned that Iran is pursuing central nervous system-acting chemicals for offensive purposes. Although these chemicals have legitimate uses as pharmaceuticals, they can be lethal at certain doses.

DIA also notes that Iran has the largest underground facility (UGF) program in the Middle East. Based on the central pillars of Iran's passive defense doctrine, Tehran has invested heavily in constructing UGFs to conceal and protect critical military and civilian infrastructure throughout the country. Iran designed and built these facilities to support various aspects of its defense industries, key nuclear infrastructure, and military forces, including naval sites, missile bases, and equipment storage.

In late 2009, Ali Akbar Salehi, head of the Atomic Energy Organization of Iran (AEOI), stated Iran would build nuclear facilities in mountains as a response to international pressure for Tehran to abandon its nuclear ambitions. Iran houses portions of its nuclear program within deep tunnels and underground bunkers at locations such as Natanz and Fordow (Qom). However, both sites are subject to restrictions outlined in the JCPOA and closely monitored by the IAEA. UGFs support most facets of Tehran's ballistic missile capabilities, including the operational force and the missile development and production program. Missile-related UGFs house weapons and equipment storage, underground basing of mobile missiles, and hardened launch sites...

In recent years, Iran has used state media to broadcast the launch of ballistic missiles from underground launch chambers and showcase underground missile garrisons. Regional media also indicates Iran is aiding proxies in the Middle East by helping them construct underground missile production facilities.

# Iran's shift Back to Uranium Enrichment as of 3.2020

“In 2016, Iran shipped out of the country 97 percent of its stockpile of uranium fuel, enough to make more than 14 weapons. It stayed well below the one-bomb threshold through most of 2019, confining itself to a stockpile of 300 kilograms, or 660 pounds.

But now, in its effort to pressure Europe to undermine the American economic sanctions, Iran is back in the fuel-making business.

...The latest figures, contained in a confidential report to the agency's 171 member states, show that for the first time since the nuclear accord went into effect, the country has surpassed 1,000 kilograms, or 2,200 pounds, of uranium fuel enriched up to 4.5 percent. If further enriched, to 90 percent, that is enough fuel to produce a single nuclear weapon, a step the Iranians insist they would never take.

... (A new IAEA) report gave an example of restraint. Iran, it said, currently has 5,060 centrifuges installed underground at its Natanz plant — the number the 2015 nuclear deal allowed. In storage, it also has many other centrifuges that its technicians could in theory fit into the deep bunkers of the Natanz plant, in the Iranian desert.

But the report also noted an increase in the number of the whirling machines at a smaller plant known as Fordow, which is buried under a mountain and extremely difficult to destroy. It said that Iran had installed 1,057 centrifuges there, and that 1,044 are now enriching uranium.

Under the 2015 agreement, Iran could enrich no uranium whatsoever at Fordow and instead was to turn the plant into an international center for esoteric science experiments. The Iranians first put that plan on hold and returned Fordow to its former role as an enrichment plant for uranium.

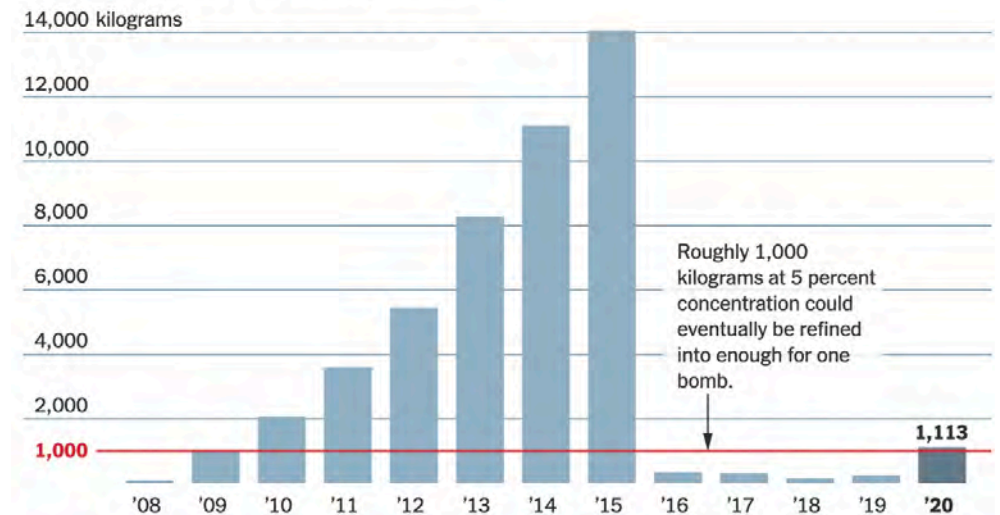
A second report from the atomic inspectors used unusually sharp language to fault Iran's lack of cooperation in addressing a number of nuclear riddles. Starting in July, the report said, the atomic inspectors had repeatedly raised three issues on whether Iran was complying with its obligations under its nuclear safeguards agreement — a standard accord that makes it part of the world's peaceful nuclear club.

Having received no answers, the report said, the agency had now told Tehran of its “serious concern” with the lack of clarifications and access to the sites

## Iran's Reinvigorated Push for Atomic Fuel

After the Iran nuclear deal was reached in mid-2015, the country's supply of low-enriched uranium fell to around 300 kilograms. Since President Trump announced in 2018 that the United States was withdrawing from the deal, Iran's stockpiles have risen. In their newest report, the atomic inspectors who monitor Iran say it has enriched more than 1,000 kilograms of uranium, roughly enough to eventually create the fuel for one atomic bomb.

Iran's annual stockpile of low-enriched uranium\*



\*Excludes stocks that were enriched to under 2 percent purity in the current report and to 19.5 percent purity in the years before the Iran nuclear deal. Source: Institute for Science and International Security By The New York Times

Source: David E. Sanger and William J. Broad, “Iran Crosses a Key Threshold: It Again Has Sufficient Fuel for a Bomb,” *NYT*, March 3, 2020, <https://www.nytimes.com/2020/03/03/world/middleeast/iran-nuclear-weapon-trump.html?referringSource=articleShare>. Also see IAEA Board of Governors *NPT Safeguards Agreement with the Islamic Republic of Iran Report by the Director General*, GOV /2020/15 Date: 3March 2020.

# Remaining Iranian Nuclear Facilities

Iran had two facilities - Natanz and Fordo - where uranium hexafluoride gas was fed into centrifuges to separate out the most fissile isotope, U-235.

Low-enriched uranium, which has a 3%-4% concentration of U-235, can be used to produce fuel for nuclear power plants. "Weapons-grade" uranium is 90% enriched.

In July 2015, Iran had almost 20,000 centrifuges. Under the JCPOA, it was limited to installing no more than 5,060 of the oldest and least efficient centrifuges at Natanz until 2026 - 10 years after the deal's "implementation day" in January 2016.

Iran's uranium stockpile was reduced by 98% to 300kg (660lbs), a figure that must not be exceeded until 2031. It must also keep the stockpile's level of enrichment at 3.67%.

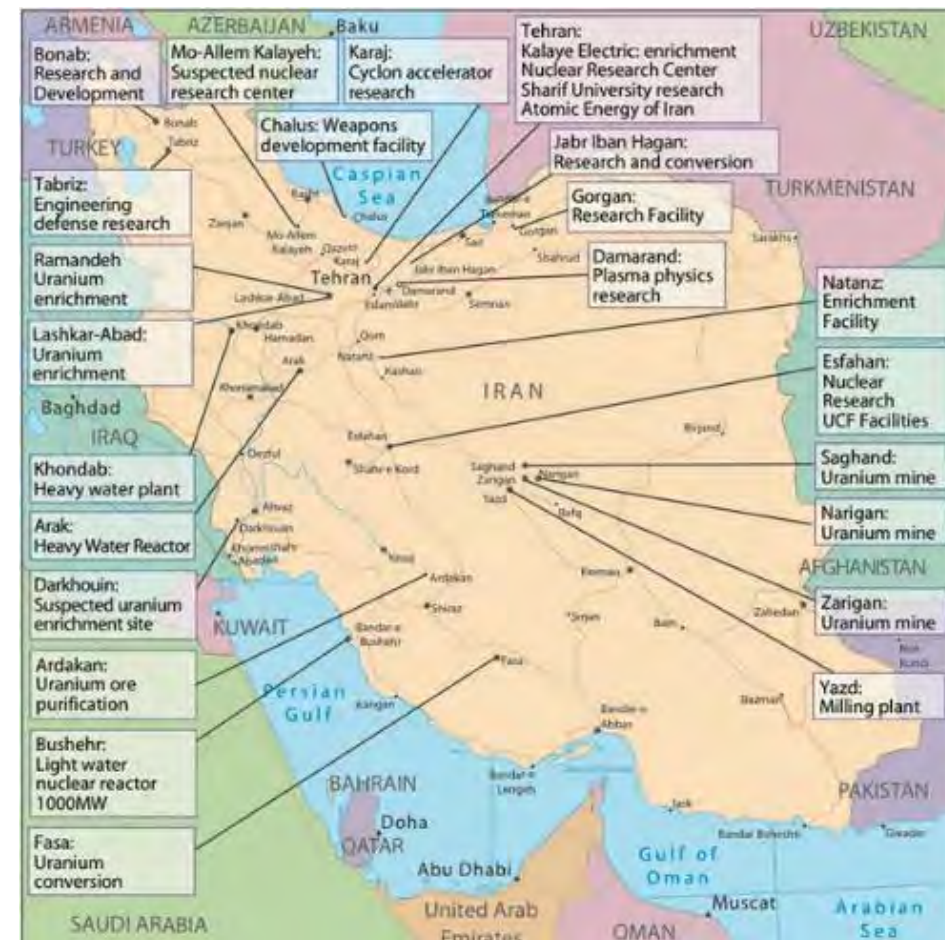
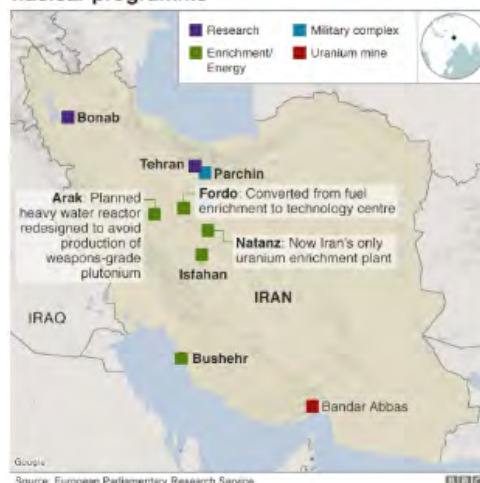
By January 2016, Iran had drastically reduced the number of centrifuges installed at Natanz and Fordo and shipped tons of low-enriched uranium to Russia.

In addition, research and development must take place only at Natanz and be limited until 2024.

No enrichment will be permitted at Fordo until 2031, and the underground facility will be converted into a nuclear, physics and technology center. The 1,044 centrifuges at the site will produce radioisotopes for use in medicine, agriculture, industry and science.

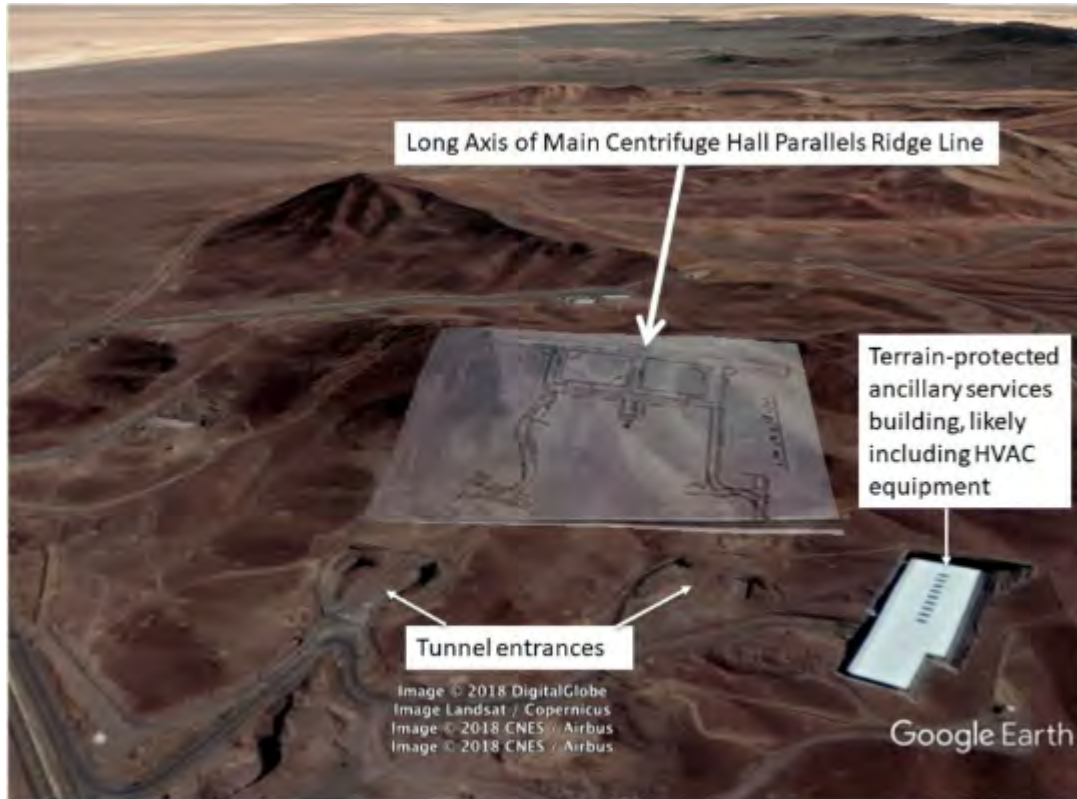
Iran had been building a heavy-water nuclear facility near the town of Arak. Spent fuel from a heavy-water reactor contains plutonium suitable for a nuclear bomb... Under the JCPOA, Iran said it would redesign the reactor so it could not produce any weapons-grade plutonium, and that all spent fuel would be sent out of the country as long as the modified reactor exists. Iran will not be permitted to build additional heavy-water reactors or accumulate any excess heavy water until 2031.

Changes agreed under Iran deal to limit nuclear programme





# Hard Targets: Iran's Fordow Facility



**Figure 1.** A 2018 Google Earth image with a schematic of the underground tunnel complex overlain. The schematic was part of the Iranian Nuclear Archive, as revealed by Israeli Prime Minister Benjamin Netanyahu on April 30, 2018.



**Figure 2.** Overview of the Fordow facility, which includes the underground tunnel complex and the support complex.

Source: David Albright, Sarah Burkhard, Frank Pabian, and Jack Toole, “Conversion of Fordow: Another Unfulfilled Hope of the Iran Nuclear Deal, Institute for Science and International Security, July 10, 2019. <https://isis-online.org/isis-reports/detail/conversion-of-fordow-another-unfulfilled-hope-of-the-iran-nuclear-deal>

# **The Uncertain Future Evolution of Missile Forces**



# The Uncertain Evolution of Missile and Missile Defense Forces

This section uses a series of “bullets” to highlight the many key uncertainties explored through this analysis and that affect any effort to estimate even the short to medium term impact of missile developments. Each bullet is the potential subject of a major analysis, and one filled with uncertainty. Like the previous two major sections of this analysis, each illustrates the level of uncertainty as to the future uses of force, the scenarios for future conflict, and how the various regional military *balances* should be analyzed.

At the same time, the PMF rocket attacks on U.S. Forces in Iraq and the Iranian missile attacks have led the United States to make additional deployments of advanced versions of Patriot surface-to-air defense missiles and the [Counter-Rocket, Artillery, Mortar \(C-RAM\) system](#), to provide missiles and shorter-range anti-rocket defenses and to concentrate U.S. forces where they can be more easily defended. It has also come under Congressional pressure to deploy the two Israeli Iron Dome batteries that Congress pressured the army to buy in spite of their lack of C4I/BM compatibility with U.S. systems.

Gulf Arab states have shown a major new interest in expanding or acquiring both cruises missiles and UCAV/UAVs, and missile defenses since the attacks in 2019, and the killing of General Soleimani in January 2020.

# Volley of What? What Mix of Threats? When?

**Passive use of threat to influence or deter. Limited strike seeking to avoid escalation to major war. Deliberate or unplanned escalation to high levels of conflict.**

**Older conventional missile strike.**

**Unguided conventional rocket strike.**

**Artillery strike: Rocket, tube, mortar.**

**Precision conventional ballistic missile strike (Level of precision? Reliability? Warhead lethality?)**

**Precision cruise missile, UCAV, drone strike (Level of precision? Reliability? Warhead lethality?)**

**Ship-launched missile targeted on land or surface target.**

**Air strike with precision guided weapon? (Storm Shadow).**

**Sabotage.**

**Land or marine/SOC raid?**

**Smart mines, mines, oil slicks.**

**Anti ship missiles and dual capable anti-ship missile platforms.**

**Submarine, submersible? Guided torpedo.**

**Swarming of smaller attack vessels, guided ship bomb.**

**War of Sanctions; Comparative Resources.**

**Role of third countries, non-state actors?**

# What Gulf Missiles? Missile Defenses?

**No meaningful netting of SAM defenses between countries; weak for air combat and IS&R. Iraq, Oman, Bahrain do not have major surface-to-air missile systems.**

## **Uncertain Near-Term Buys/Deployments**

- US THAAD Deployments? AEGIS cruisers/land follow-on?
- Saudi purchase of 44 THAAD launchers?
- Qatar's purchase of two THAAD units, 12 launchers, 150 interceptors, two fire control and communications devices, two AN/TPY-2 radars and an early warning radar at a cost of \$6.5 billion?
- United Arab Emirates wants to purchase 48 THAAD missiles and nine program launchers, including support equipment, at a cost of \$1.1 billion?

## **U.S. Coordinated?, GCC Coordinated?, Country-by-Country?**

- Saudi-UAE? Qatar? Oman? Kuwait? Bahrain? US overlay?
- Combined Air Operations Center (CAOC) in Qatar? New U.S. or Joint command
- Linked to COAC/5<sup>th</sup> Fleet, and coverage of other conventional and asymmetric forces?

**Future is integrated missile defense system, patchwork quilt, full spectrum air defense-cruise missile, ballistic missile? Aegis-Standard, THAAD, Patriot, S400/S300, Shahine? Other short range? Mix?**

- Integrated or separate AC&W, missile warning systems? Dependence on U.S. as system integrator? Operational planning?
- Readiness? Training? Planning? Yemen war learning curves?
- Coverage: High value? Urban? Elite? Key military?

## **Offensive counter-missile capability?**

- Offensive missile/air counterforce or counter value strike?

## **Extent of civil and passive defense?**

# Probable Patterns of Deterrence, War Fighting, and Escalation

These developments do not mean that a U.S.-led coalition could not achieve a decisive military defeat of Iran, or that the United States alone could not destroy much of Iran's war fighting capability and economy. The Arab Gulf states can also reverse many of these trends if they can achieve some degree of real unity, preserve their alliance with the United States, develop effective missile defenses, and establish forces better tailored to countering Iran's growing asymmetric warfare capabilities. They certainly have the ability to continue their outspending of Iran, and the balance would also shift in their favor if Iraq emerged as a real strategic partner – or even as a strong enough independent nation to deter and defend against Iranian pressure and influence.

At the same time, the Arab states are currently losing the decisive advantage that their investment in airpower gave them in striking against Iran between roughly the mid-1990s and the present. Iran's improving missile forces may soon give the advantage of being able to strike critical Arab civil targets and critical Arab and U.S. military point targets. If so, the end result may be a military balance where no country or combination of countries will want to escalate a conflict to the point where it threatens its own economy, endangers its long term ability to export the flow of petroleum out of the Gulf, and forces that country to deal with the cost of a major war.

The term “mutual assured destruction” has a very different meaning in the Gulf than in a superpower nuclear exchange, but high levels of mutual escalation will become increasingly costly to each side. Moreover, any form of “victory” is becoming steadily more unlikely.

As the United States learned in Iraq and Afghanistan, occupying another power – with a different culture and mix of values – is an immensely costly and uncertain affair. This would be as true, however, of any Arab occupation of Iran or an Iranian occupation of an Arab state. It would be particularly true for Iran simply because it has such a large territory, a well-established national identity, over 80 million people – not to mention it would require immense amounts of aid to recover from a truly major war. Iran may be able to transform itself, but trying to transform it from the outside seems like a recipe for turning any military victory into strategic defeat.

In short, it is far from clear that the ability to win a major war is the proper measure of the Gulf military balance. The Gulf needs the strategies and tactics of Sun Tzu, not Clausewitz. It is the ability to use military force to influence and intimidate, to support other state and non-state actors, and to carry out gray area operations that reflects the practical limits of how force can best be used in the region. Here, somewhat ironically, Iran's other military weaknesses have forced it to learn how to best use its power within these limits. In far too many ways, the Arab states have learned to be fractured, divided, and dysfunctional while the United States has focused on counterterrorism, arms sales, and – increasingly so – reducing the burden of deploying to the region.

The one key caution that must be applied to such a “rational bargainer” view of the balance is the “Sarajevo scenario.” The assassination of Archduke Franz Ferdinand demonstrates that one irrational and unpredictable action can create a domino effect to a major conventional war such as the First World War. As such, the possibility of war with Iran is not beyond the realm of possibilities, but as the following analysis suggests, it will be less likely to occur compared to conflicts executed at the gray zone level.

Whatever strategy should be, history is far often the predictor on how to prevent major failures, limit escalation, calculate the risks in war, and operate in meaningful strategic terms. Given the history of war in the Gulf since 1980, it is dangerous to assume that anyone learns from history even if they do bother to remember it.

And yet, events may also change behavior. The Coronavirus may have a massive future impact on how the Gulf state perceive their security challenges and the relative priority of civil versus national security expenditures. It may lead to cuts in U.S. deployments, Arab military expenditures and arms imports, and Iranian military expenditures and domestic military production.

The United States saw a major rise in its future projected national debt and interest payments, driven by civil entitlements expenditures, even before the virus became an issue. The total costs of dealing with the impact of the virus may have a major impact on future U.S. spending in the Gulf region, on power projection forces, on aid, and all the other aspects of national security.

Key national economies affecting the balance were already “failed states” with weak or nearly bankrupt economies even before the virus began to have an impact. These included Iran, Iraq, Lebanon, Syria, and Yemen. There currently is no way to estimate how serious the impact of the virus will be, and the United States has continued to place new economic sanctions on Iran.

“Oil wealth” is very limited in terms of per capita income in many of the other Gulf states and the value of petroleum exports has varied sharply and unpredictably over time. This section warns that the wealthiest petroleum exporter in the Gulf – Kuwait, Qatar, Saudi Arabia, and the UAE – are spending very high percentages of their GNP on national security – some close to 10% – as is at least one less wealthy state: Oman.

The Coronavirus has already sharply cut demand for petroleum and petroleum prices. Sustained cuts could force even the wealthiest states to reduce national security spending, arms imports, and efforts to reform their economies and cut their dependence on petroleum exports. As has been noted earlier, however, these trends are so uncertain, however, that any effort to estimate their impact now involves little more than speculative guesswork. This analysis warns that it is not possible to estimate the detailed impact of the Coronavirus, but they are certain to be all too real.