

ENVIRONMENTAL | Ecological Weaponization and Infrastructure Vulnerability (2026 Post-Epic Fury Audit)

submitted by sar_jay

DESALINATION DENIAL-OF-SERVICE (DDoS)

Water Infrastructure as a Theater of War

1.1 The Strategic Target: Why Desalination Plants Are the Gulf's Achilles Heel

The Arabian Gulf is one of the most water-scarce regions on Earth. Approximately 450 desalination plants distributed across the GCC coastline are the sole source of drinking water for an estimated 100 million people. Kuwait sources roughly 90% of its drinking water from desalination. The UAE desalinates the equivalent of four billion bottles of water every single day. Qatar and Bahrain operate at similar dependency ratios. There is no meaningful backup infrastructure. There are no rivers. There are no aquifers of sufficient scale. When a desalination plant goes offline, the clock starts immediately.

This is not a vulnerability that emerged from the conflict. It was always there. Operation Epic Fury simply put it on the targeting map.



[Jebel Ali desalination plant, Dubai]

1.2 Confirmed Strikes: The Escalation Timeline

On Day 7 of Operation Epic Fury — March 8, 2026 — an Iranian attack drone struck a water desalination plant in Bahrain, marking the first confirmed direct strike on civilian water infrastructure. This was not an accident or collateral damage. It was a deliberate threshold crossing.

By Day 35, Kuwaiti authorities confirmed that Iranian forces had targeted a power and desalination plant, with Bloomberg reporting that the strike damaged key components of the water production facility. The pattern is unmistakable: Iran is systematically probing GCC water infrastructure as a pressure multiplier, not a one-off act.

Iran also accused the US of attacking a desalination plant on Qeshm Island on October 7, affecting water supply for 30 villages — demonstrating that both sides have now crossed the threshold of targeting water infrastructure.

Actionable Intelligence: The escalation from a single Bahrain strike to a Kuwait strike within 28 days indicates a deliberate campaign cadence, not opportunistic targeting. Water authorities in Qatar, the UAE, and Saudi Arabia

should treat a strike on their facilities as a near-term probability, not a contingency.

US-ISRAEL STRIKES ON IRAN

OIL SPILLS, ENVIRONMENTAL DESTRUCTION & EXPORT DISRUPTION

2.1 Background: Who Struck First

On February 28, 2026, the United States and Israel jointly launched Operation Epic Fury — a large-scale aerial and naval campaign against Iran. Within the first ten days, US forces had struck over 5,000 targets across Iranian territory. The strikes targeted military infrastructure but were concentrated in and around Iran's energy heartland — refineries, naval bases, and oil export terminals that sit within the same geographic corridors as civilian water sources, fishing communities, and fragile marine ecosystems.

The environmental destruction documented in the weeks that followed is a direct consequence of these strikes. It was not incidental. Hitting energy infrastructure in a Gulf environment guarantees oil contamination. This was foreseeable, and the record must reflect that.

2.2 Kharg Island: Striking the Heart of Iranian Oil Infrastructure

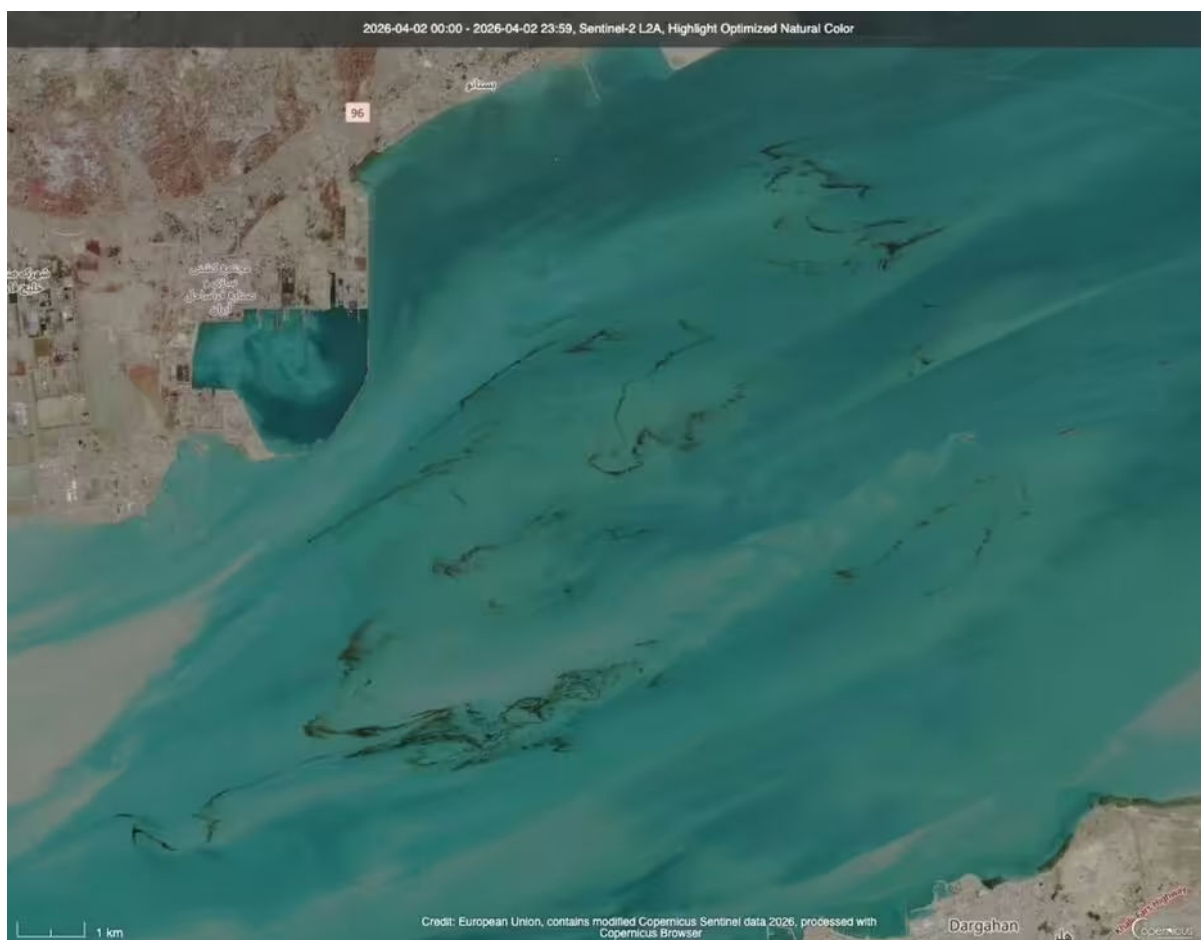
On March 13, 2026, CENTCOM conducted large-scale precision strikes on Kharg Island — the terminal through which approximately 90% of Iran's crude oil exports flow. The stated targets were military installations. But Kharg Island is not a purely military site. It is an integrated energy and logistics hub, and striking its military perimeter in close proximity to 55 crude oil storage tanks and an active tanker anchorage carrying millions of barrels of petroleum was an action with guaranteed environmental consequences.



[U.S. Central Command conducted large-scale precision strikes on Kharg Island in the Persian Gulf on March 13, targeting military installations on the island that handles approximately 90% of Iran's crude oil exports]

CENTCOM confirmed the destruction of naval mine storage facilities, missile storage bunkers, air defenses, the Joshen Sea Base, an airport control tower, and a helicopter hangar — with more than 15 explosions recorded across over 90 targets. Iranian state media reported no oil infrastructure was directly damaged. Independent satellite analysis subsequently confirmed all 55 crude storage tanks remained intact.

However, physical damage to storage tanks is not the only mechanism through which an oil spill is triggered. Concussive blast damage to underwater pipeline infrastructure, disruption to loading arm systems, and the sinking or disabling of vessels in the anchorage zone all constitute spill vectors that do not show up in tank-integrity assessments.



[Satellite images captured from space show oil spills in the Persian Gulf due to the Iran war (Image: Sentinel-1/European Space Agency)]

2.3 The Human and Environmental Cost on Iranian Territory

The contamination resulting from these strikes falls first and hardest on Iranian civilian populations. Strikes on military-industrial facilities — missile storage, fuel depots, naval bases — release heavy metals, hydrazine-based propellant compounds, and petroleum derivatives directly into surrounding soil and groundwater. In Iran's case, multiple struck facilities are located in proximity to agricultural zones and communities dependent on shallow aquifers for drinking water.

Iranian Foreign Minister Abbas Aragchi formally documented this reality — soil and groundwater contamination caused by Israeli and US strikes on Iranian territory. This is not a political statement in isolation. It is consistent with what independent conflict-environment monitoring organizations, including CEOBS, have separately verified through satellite imagery and open-source assessment.



Seyed Abbas Araghchi @araghchi · Mar 16



Israel's bombings of fuel depots in Tehran violate international law and constitute ecocide.

Residents face long-term damage to their health and well-being.
Contamination of soil and groundwater could have generational impacts.

Israel must be punished for its war crimes.



3.3K

13K

41K

920K



2.4 Lavan Island: The Spill That Satellite Cannot Ignore

While Kharg Island absorbed the political spotlight, Lavan Island — further south in the Gulf, hosting Iranian oil processing and export infrastructure — became the most visually documented contamination site of the conflict.



[A satellite image captured on April 10 shows oil surrounding Iran's Lavan Island (Image: Sentinel-1/European Space Agency)]



The April 10 Sentinel-1 imagery is unambiguous. Oil contamination surrounds the island in a visible plume. The Arabian Gulf's semi-enclosed geography means this contamination does not disperse into open ocean — it circulates. The Gulf's dominant clockwise surface current carries contamination

northward toward Kuwaiti and Iraqi coastal waters and southward toward UAE and Qatari desalination intakes. What begins as a localized Iranian coastal event becomes a regional crisis within days.



The fishing communities along Iran's southern coastline — communities that have existed for centuries along these shores — are facing destruction of their livelihoods that will outlast any ceasefire by years. Artisanal fishing in contaminated waters does not simply pause. It collapses. The fish stocks do not return on a political timeline.

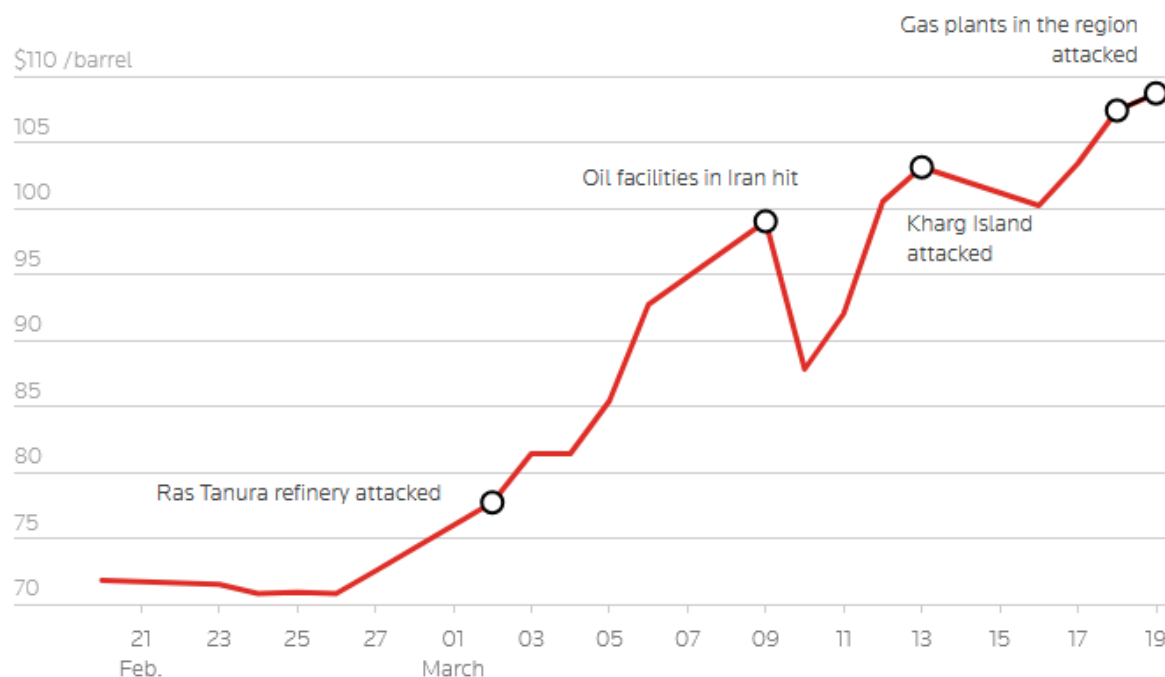
Actionable Intelligence: Independent SAR satellite pass frequency over Lavan and Kharg must be increased immediately to establish a continuous contamination record. This data will be essential for post-conflict remediation claims, legal accountability proceedings, and humanitarian assistance targeting.

2.5 The Export Disruption: Economic Strangulation of a Civilian Economy

Iranian crude exports from Kharg have fallen 51.7% since hostilities began on February 28, with tankers increasingly relying on AIS suppression and location spoofing to obscure export activity. This is not a military outcome — it is an economic one, with direct civilian consequences.

Iran's oil export revenue funds public services, healthcare infrastructure, food subsidies, and social welfare programs for over 85 million people. A 51.7% export reduction does not hurt the IRGC. It cuts hospital budgets, food import

capacity, and energy subsidies for ordinary Iranian households — the same households now dealing with contaminated groundwater and destroyed coastal fisheries.



The graph of oil price movements against confirmed infrastructure strikes since February 21 reveals a secondary consequence that extends beyond Iran: every strike on Gulf energy infrastructure drives up global oil prices, increasing energy costs for developing nations across Asia, Africa, and Latin America who had no part in initiating or sustaining this conflict.



Source: Institute for the Study of War & AEI Critical Threats Project and Google Maps.

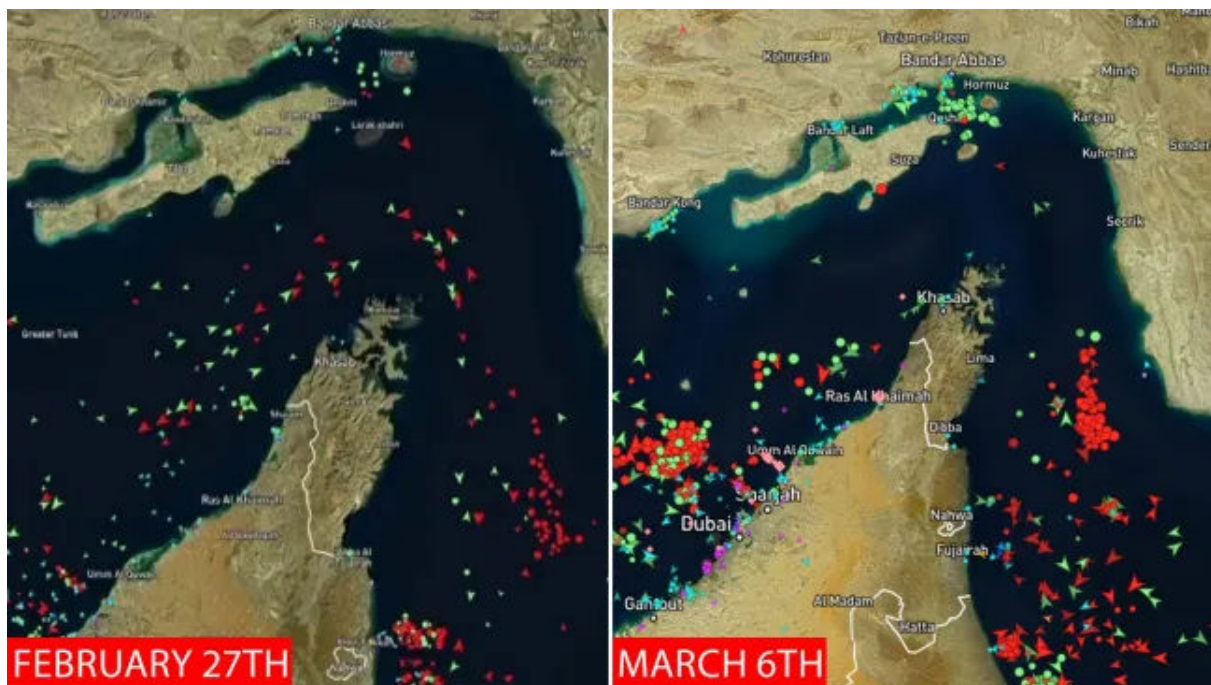
OIL TANKERS TRAPPED IN THE STRAIT OF HORMUZ

IRAN'S RESPONSE AND THE ENVIRONMENTAL TICKING CLOCK

3.1 Context: Iran Did Not Start This — But Controls the Exit

The Strait of Hormuz is the single maritime artery through which approximately 20 million barrels of oil transit daily — roughly one fifth of the world's entire oil supply. When the United States and Israel launched Operation Epic Fury on February 28, 2026, Iran's most consequential available response was not a missile barrage. It was a door. Iran controls the Strait of Hormuz, and closing it — or making it operationally unusable — strikes at the entire global economy without requiring a single nuclear weapon.

Following the attacks launched on Iran by Israel and the United States on February 28, Iran restricted access to the strategically important Strait of Hormuz, trapping more than 68 loaded oil tankers in the Persian Gulf as of March 6, a figure that rose to 85 large tankers by March 12. This was Iran's direct response to an externally initiated military campaign against its territory.



[Traffic in Strait Of Hormuz]

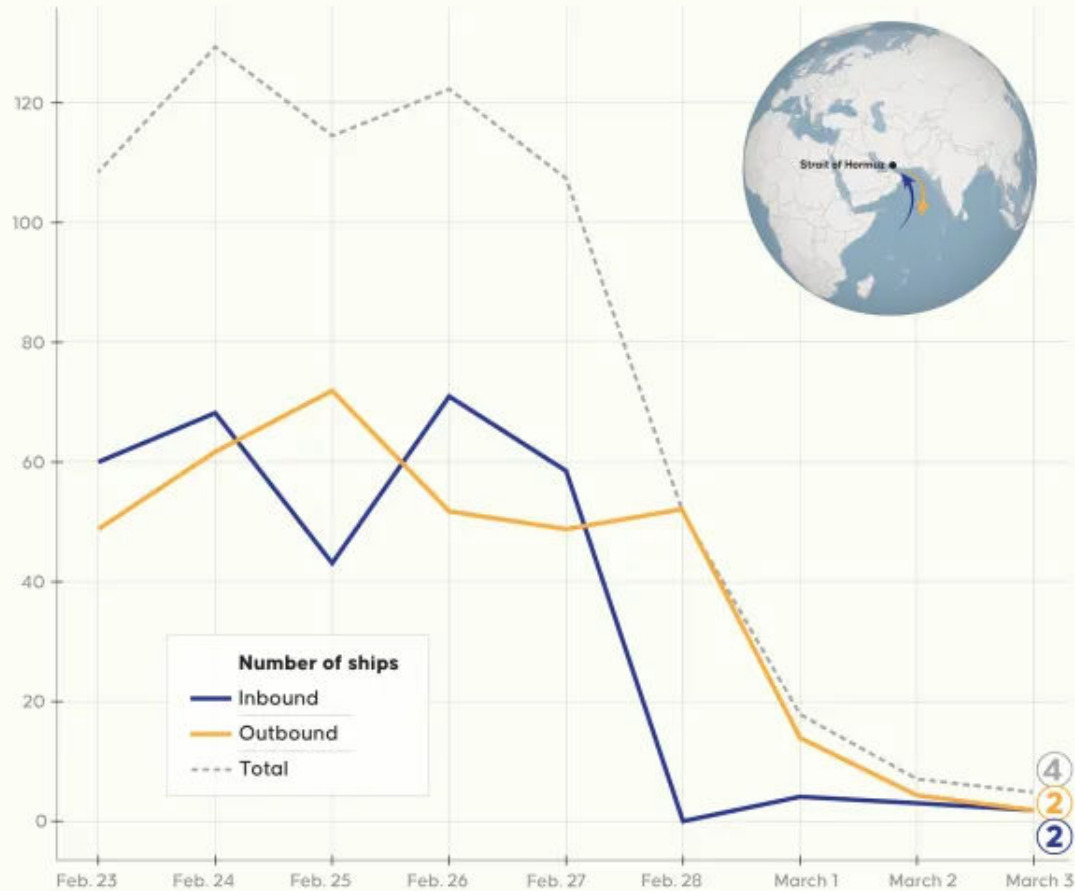
3.2 The Scale of the Trapped Payload: 21 Billion Litres of Floating Risk

As of March 12, 2026, the tankers blocked in the Persian Gulf were collectively carrying at least 21 billion litres of oil — an amount equivalent to Greece's entire annual crude oil consumption. This is not a statistic. It is a loaded weapon sitting in one of the most ecologically sensitive and geopolitically volatile bodies of water on the planet.

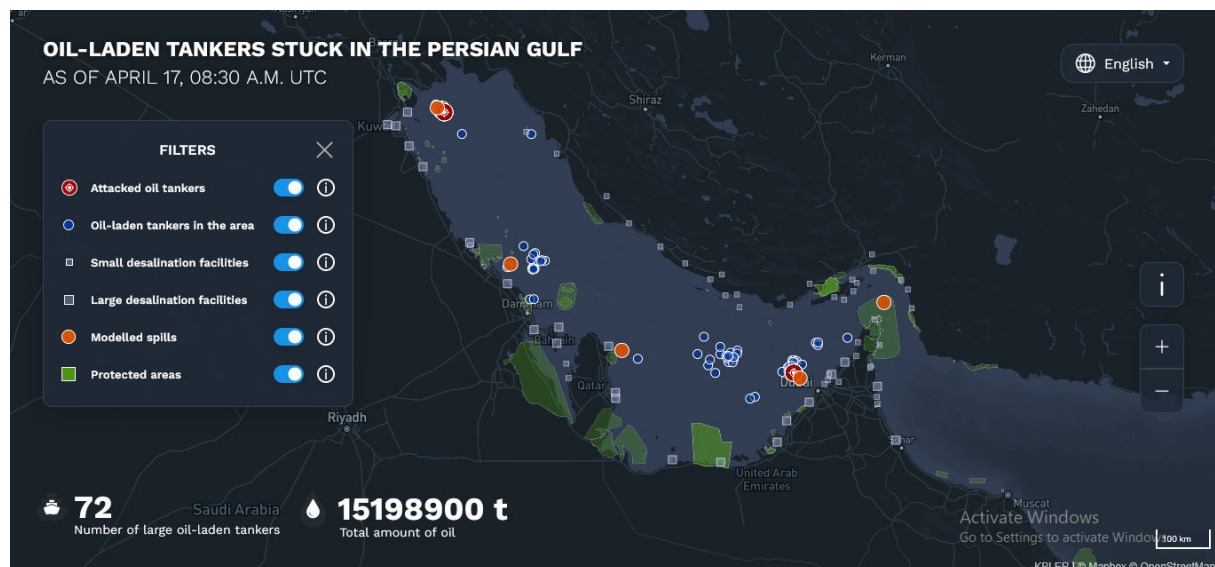
Ongoing hostilities and disrupted vessel position signals dramatically increase the risk of oil spills. Greenpeace data experts used software from the Norwegian Meteorological Institute to simulate the consequences of a spill, modelling a release of 50,000 tonnes of oil based on the current positions of five tankers and historical weather and current data. The results confirmed what maritime experts had warned from day one: a breach event in the Strait or the northern Gulf does not stay local. It spreads.

Ship traffic in the Strait of Hormuz

Only 4 ships passed through the Strait of Hormuz on March 3



March 5, 2026 Source: Windward



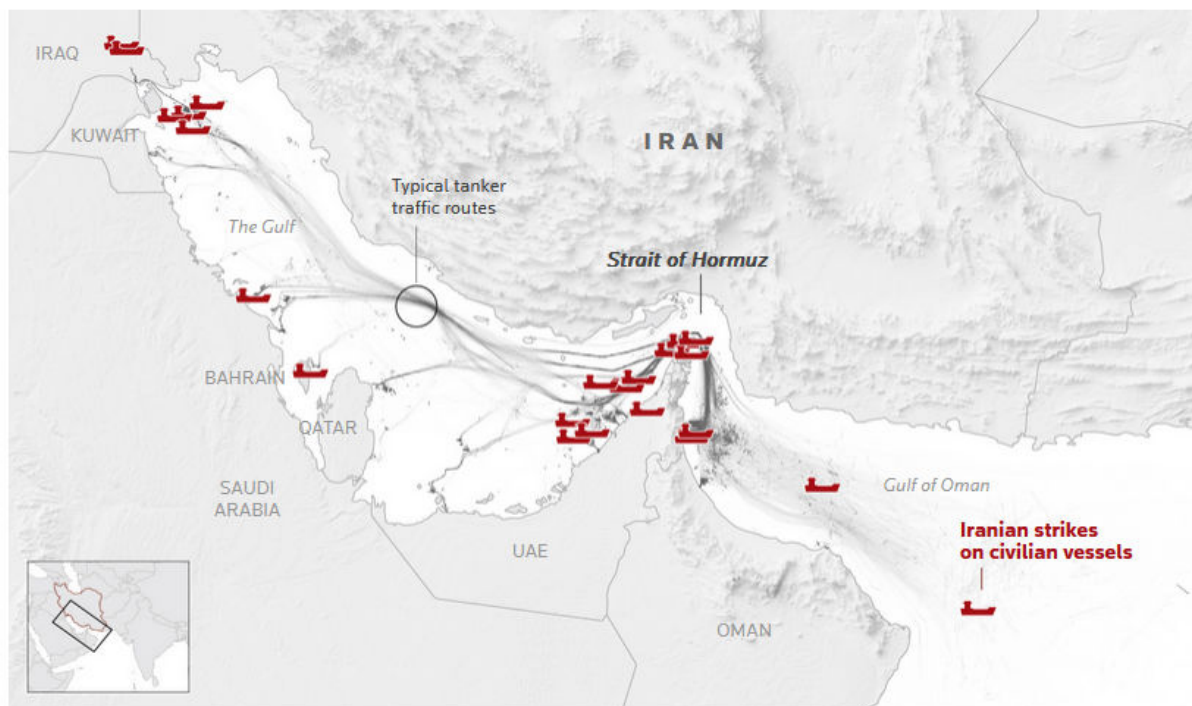
3.3 Ships Under Attack: The Chronicle of Maritime Strikes

Iran's enforcement of the Strait restriction has not been passive. A systematic campaign of vessel strikes, drone attacks, and seizures has made the waterway a live combat zone for commercial shipping. The following is drawn from verified incident reporting.

A large explosion from a sea drone struck the oil tanker Sonangol Namibe, anchored near Mubarak Al Kabeer Port in Kuwait, more than 800 kilometres from the strait. The attack caused an oil spill that posed an environmental risk. A small vessel was observed leaving the scene. The IRGC stated it had struck a US oil tanker.

On March 6, a tugboat dispatched to assist the stricken vessel Safeen Prestige was struck by two missiles and sank, leaving at least three crew members missing. On March 7, the IRGC claimed it struck the oil tanker Prima with a drone in the Persian Gulf and the US oil tanker Louis P with a drone in the Strait of Hormuz.

On March 17, Kuwait-flagged LPG tanker Gas Al Ahmadiyah was hit by a projectile east of Fujairah. The following day, Palau-flagged chemical tanker Parimal was struck east of Khor Fakkan, sparking a fire that forced the evacuation of fifteen crew members, with the captain reported missing.



Source: Institute for the Study of War & AEI Critical Threats Project and MarineTraffic



A foreign tanker carrying Iraqi fuel oil damaged after catching fire in Iraq's territorial waters, following unidentified attacks that targeted two foreign tankers, according to Iraqi port officials, near Basra, Iraq, March 12, 2026. REUTERS/Mohammed Aty

A ship is illuminated by fire from a burning vessel, after Iranian explosive-laden boats appear to have attacked two fuel tankers in Iraqi waters setting them ablaze, according to port, maritime security and risk firms, amid the U.S.-Israeli conflict with Iran, in this screengrab taken from a handout video released March 12, 2026. Media Office of Iraqi Ports/Handout

Each of these incidents carries a direct oil spill risk. A struck tanker does not always sink immediately. It bleeds. And in the enclosed waters of the Persian Gulf, that bleed spreads toward desalination intakes, fishing grounds, and coral ecosystems with no natural dispersal mechanism available.



3.4 IRGC Fast Attack Operations: Enforcement from the Water

Iran reimposed what it described as "strict control" over the Strait of Hormuz, with IRGC gunboats firing on at least three commercial vessels. The UK Maritime Trade Operations agency confirmed receiving a report of two gunboats opening fire on a tanker without issuing a radio challenge, 20 miles north of Oman.



Mario Nawfal ✓
@MarioNawfal

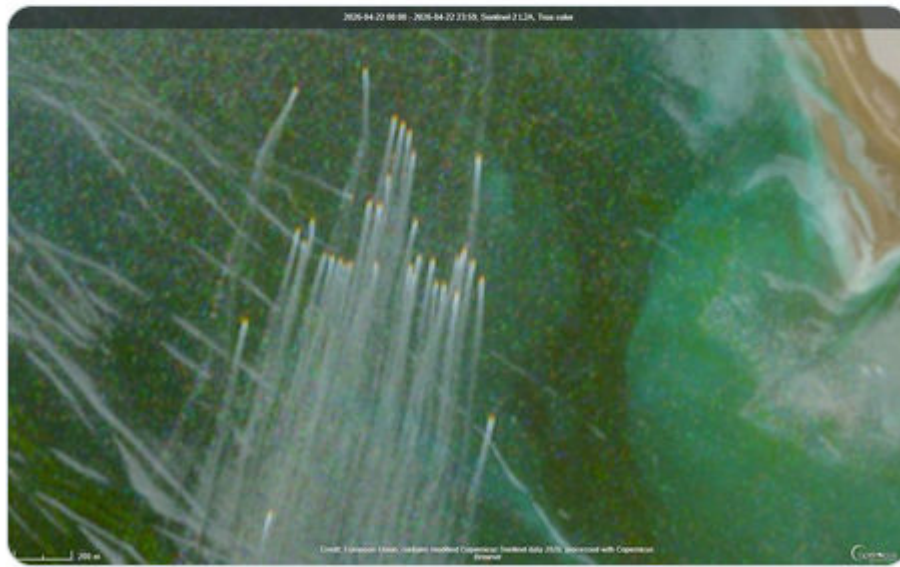
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🇮🇷 Satellite pics just dropped: a massive swarm of 33 IRGC fast attack boats returning to base after patrolling the Strait of Hormuz.

This is the same “completely and utterly destroyed” Iranian navy Trump was talking about

These exact boats are suspected in today’s ship attacks and seizures.

Source: [@Spectator_MENA](#)



The IRGC fast attack boat doctrine is not improvised. These vessels operate in swarms, using speed and numbers to overwhelm the defensive positioning of larger commercial vessels. Their return to base in formation after a patrol run is a statement of operational control, not opportunistic harassment.

Iranian state media confirmed that shots were fired near two Indian-flagged ships to force them to turn back. Radio transmission audio confirmed one vessel, the Sanmar Herald, had received clearance to transit before being turned back by Iranian military fire. The head of Iran's National Security Commission stated that closing the Strait was a response to "America's untrustworthiness."

This matters for the environmental assessment because every vessel forced to anchor, reverse course, or hold position in congested waters under active fire risk increases the probability of collision, grounding, or navigational error that triggers a spill.

3.5 The US Counter-Blockade: Two Blockades, One Strait, Zero Safety

The conflict in the Strait has produced a situation with no modern precedent: two simultaneous and opposing blockades operating in the same waterway.

Following the failure of US-Iran talks on April 12, Trump declared a US naval blockade of the Strait of Hormuz, with the US Navy tasked to prevent ships from entering or exiting the strait and intercept ships that had paid tolls to Iran. CENTCOM clarified the blockade would not impede freedom of navigation for vessels transiting to non-Iranian ports. The IRGC Navy responded that any military vessel approaching the strait would be considered a ceasefire violation and would meet a severe response.

Iran subsequently announced it was reimposing its own blockade, blaming "breaches of trust" by the United States. Tracking data from Marine Traffic showed tankers turning around in the Persian Gulf in real time as the announcement was made.

The environmental consequence of this dual-blockade scenario is compounding congestion. Tankers cannot exit. New tankers attempting entry are turned back. The anchorage zones are becoming increasingly crowded with vessels carrying hundreds of millions of litres of petroleum products, operating under conditions of active military threat, GPS spoofing, disrupted AIS signals, and degraded navigational safety.

Iran's navy seized two container ships in the Strait of Hormuz as recently as April 22, shortly after reports that three cargo ships had been attacked in the waterway.

3.6 The Ecosystem in the Crossfire

The Strait of Hormuz and adjacent waters are home to sensitive ecosystems including coral reefs, mangrove forests, and seagrass meadows that provide vital habitats for numerous species. The Strait of Hormuz is the only maritime connection between the Persian Gulf and the Arabian Sea, playing a crucial role in the exchange of water and nutrients and serving as a migration route for marine mammals. Even in peacetime, these ecosystems face extreme pressure from shipping, oil extraction, desalination, and coastal development.



[Oil off the coast of Kuwait, as seen in images from April 6]

The oil visible off Kuwait's coast on April 6 is not from a single incident. It is the accumulated product of weeks of vessel strikes, grounded ships, leaking anchorage zones, and the general operational chaos of a blockaded waterway. Kuwait's coastline, its fisheries, and its desalination intakes are all downstream of this contamination.

3.7 Iran's Alternative Channel and the Shadow Economy of the Strait

Iran established its own shipping channel north of Larak Island, bypassing the main southern channel. One ship reportedly paid 2 million USD to use Iran's channel. Payments were being assessed by the IRGC in Chinese yuan. Several nations including Malaysia, Pakistan, and France eventually obtained Iranian permission for their vessels to transit.

This development represents a fundamental restructuring of maritime sovereignty in the Strait. Iran has effectively created a toll system enforced at gunpoint, denominated in Chinese yuan, operating outside of SWIFT and outside of Western insurance and legal frameworks. The vessels using this channel are operating with minimal safety oversight, unknown cargo declarations, and no insurance coverage recognizable under international maritime law. In the event of an incident in this channel, there is no established liability framework, no guaranteed response protocol, and no independent environmental monitoring in place.

Priority Recommendation: The 85 trapped tankers constitute the single largest uncontrolled environmental risk in the region. International maritime bodies, specifically the IMO and UNEP, must immediately negotiate a humanitarian-environmental corridor allowing the safe, monitored departure of civilian tankers from the Gulf regardless of the political and military standoff between the US and Iran. The civilian crews aboard these vessels and the civilian populations downstream of any spill event are bearing consequences they had no part in creating.

ATTACK ON KEY PLANTS

REFINERIES, PETROCHEMICAL COMPLEXES, AND DESALINATION INFRASTRUCTURE

4.1 The Logic of Infrastructure War: Why Plants Became Targets

The conflict that began with US-Israel strikes on Iranian military installations rapidly evolved into a full-spectrum infrastructure war. Both sides have now struck the industrial and civilian backbone of the region: refineries, petrochemical complexes, desalination facilities, power grids, and oil terminals. Each strike on these facilities does not just disrupt energy or water supply. It releases toxic chemical loads into the surrounding soil, water, and atmosphere, creating a layered environmental emergency that compounds with every new attack.

Iran had explicitly warned it would target power and desalination facilities across the Gulf and in Israel if its own energy infrastructure came under attack. That warning was a direct response to US-Israel strikes on Iranian power grids. The infrastructure war is therefore not random escalation. It is a documented, symmetrical exchange rooted in the original aggression of Operation Epic Fury.

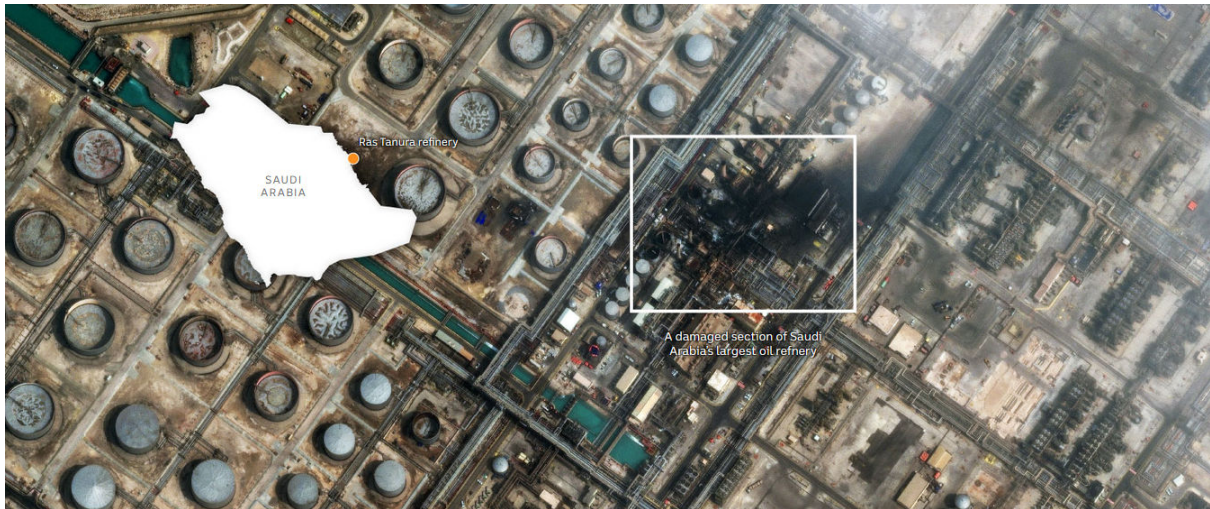


Source: Institute for the Study of War

4.2 Ras Tanura: The Strike That Shook Global Oil Markets

On March 2, 2026, Iranian drones struck Saudi Aramco's Ras Tanura refinery, one of the world's largest and most significant oil export terminals, located in Saudi Arabia's Eastern Province. High-resolution satellite imagery released by spatial intelligence firm Vantor showed burn scars, impact zones, and damaged sections of infrastructure across the facility.

The attack took Saudi Arabia's largest oil refinery offline. Satellite imagery showed visible damage across multiple refinery structures, though the full extent of disruption remained under assessment. Overnight, Brent crude futures surged 13% to above \$82 a barrel, while ICE gasoil futures surged 20% on news of the strike.



The drone strike triggered a fire and a large smoke plume containing particulate matter, nitrogen oxides, sulfur dioxide, carbon monoxide, and toxic organic compounds including polycyclic aromatic hydrocarbons and potentially dioxins, posing health risks to downwind communities. Ras Tanura sits on the Gulf coast directly adjacent to residential and commercial zones. The populations downwind of this plume received no evacuation order and no advance warning.

Saudi military sources told AFP that readiness levels had been raised following the strike, warning that any further targeting of oil infrastructure could prompt a military response. The global consequence was already playing out in commodity markets before the damage assessment was even complete.

4.3 Jubail Industrial City: When Intercepted Missiles Still Cause Catastrophe

The strikes on Jubail Petrochemical Complex, home to the Saudi Basic Industries Corporation (SABIC), revealed a critical vulnerability in modern air defense doctrine that no missile shield can resolve.

Iranian ballistic missile debris struck SABIC's petrochemical complex at Jubail Industrial City on April 7, igniting fires at the heart of Saudi Arabia's \$69 billion downstream industrial empire and forcing partial evacuations of worker housing across what is described as the world's largest industrial zone. Saudi Arabia intercepted all 11 missiles fired at the Eastern Province. It did not matter, because the wreckage falling from those successful intercepts set SABIC ablaze anyway.

← Post



Francis Gaitho ✓

@FGaitho237



IRAN STRIKES AL JUBAIL PETROCHEMICAL COMPLEX (KEMYA): NASA FIRMS Satellite Data Confirms Catastrophic Damage

Newly released NASA FIRMS satellite imagery confirms that Iranian strikes have caused massive, sustained fires at the Al Jubail Petrochemical Company (KEMYA) in Saudi Arabia – one of the largest and most critical petrochemical facilities in the world.

KEMYA is a joint venture between SABIC and ExxonMobil. It is a cornerstone of Saudi Arabia's petrochemical industry, producing vast quantities of ethylene, polyethylene, and other high-value chemicals that feed global supply chains.





The satellite analysis reveals widespread and sustained thermal devastation across the Al Jubail complex, with extensive anomalies visualized as bright red and orange hotspots. Multiple critical nodes appear to have suffered direct hits, with heat exchangers and processing units engulfed in cascading explosions that ignited intense, persistent fires. The most alarming signatures originate from the hydrotreaters—essential for refining and purifying chemical streams—which are visibly consumed, generating the largest fire clusters on the map. This is not a contained incident; the fires span storage tanks, pipelines, and production sheds, indicating comprehensive structural damage. According to FIRMS data from the VIIRS sensor on Suomi NPP and MODIS on Aqua, these red and orange pixels correspond to high-intensity active fires with elevated brightness temperatures in the 300–350 K range, and multiple detections within hours confirm the blazes are not only massive but sustained and difficult to control. Our reliance on NASA's FIRMS stems from the heavy censorship imposed by Saudi Arabia, the UAE, and aligned regimes, who arrest anyone sharing visual evidence from the conflict, making independent verification nearly impossible through mainstream channels and leaving FIRMS as one of the few transparent, real-time sources available. This strike is the direct result of the reckless war of choice launched by Donald Trump, Benjamin Netanyahu,

and Jared Kushner—a delusional bid for regime change and resource grabs that has now set the entire region and global energy markets on a path of uncontrolled escalation. The "military superiority" narrative is collapsing as the empire that once boasted of precision watches its Gulf allies' crown-jewel facilities burn, with expensive assets destroyed, supply chains disrupted, and the world paying for Washington's hubris. The fires at Al Jubail are not just a Saudi problem; they are a global warning that a failing empire's adventurism is costing everyone dearly, and the bill is only beginning to come due.

The IRGC claimed responsibility for the strikes, stating they were carried out in retaliation for attacks on Iran's Asaluyeh petrochemical plants. They specifically confirmed targeting the Sadara complex, a \$20 billion joint venture between Aramco and Dow, as well as other facilities in Jubail linked to ExxonMobil and a petrochemical facility in nearby Juaymah. The April 7 strike was not improvised: twenty days earlier, on March 18, the IRGC had publicly named the Jubail Petrochemical Complex as a direct and legitimate target following Israeli strikes on Iran's South Pars gas complex, issuing explicit evacuation orders for workers and residents. Jubail is home to one of the world's largest industrial cities, producing steel, gasoline, petrochemicals, lubricating oil, and chemical fertilizers. The environmental release from burning petrochemical facilities of this scale is not a localized event; benzene, toluene, ethylene, and heavy metal particulates can travel hundreds of kilometers in sustained wind conditions, settling into agricultural soil, coastal fisheries, and residential water catchment zones.

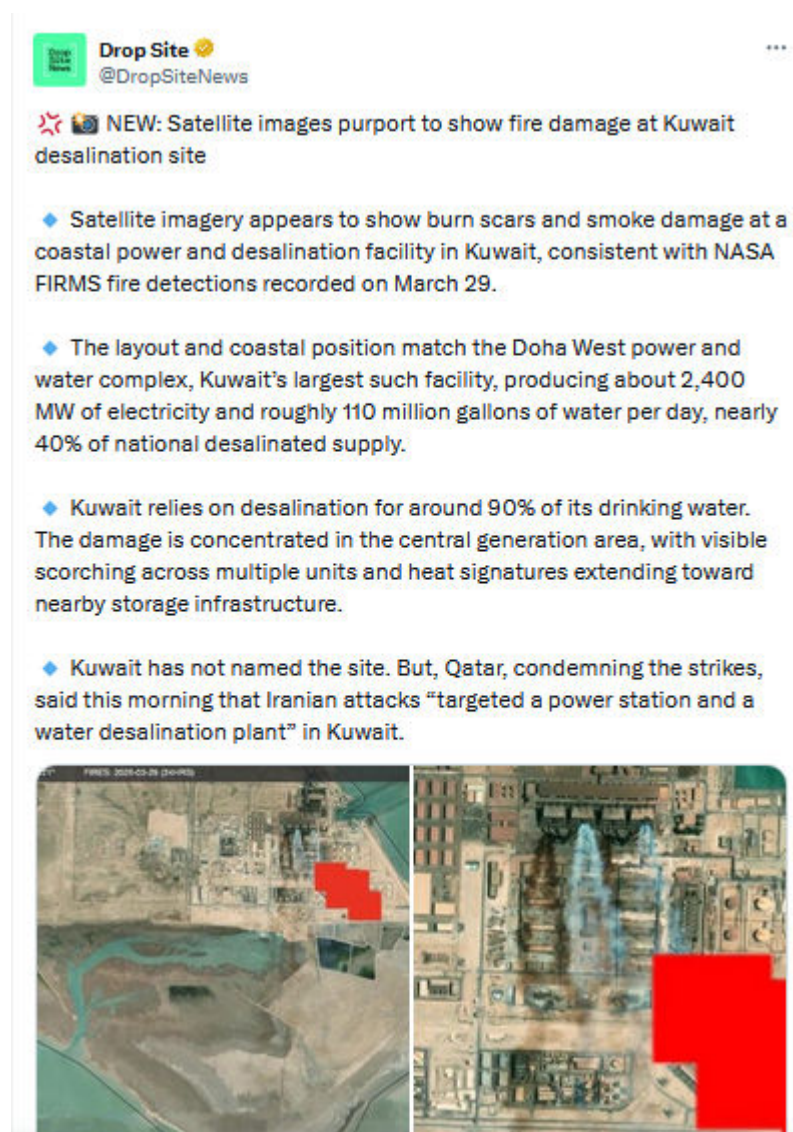
4.4 Kuwait: A Water System Under Sustained, Deliberate Attack

Kuwait became the most intensively targeted GCC state for water and energy infrastructure, absorbing multiple strikes across several weeks in what amounts to a coordinated campaign against its civilian water supply.

Iranian drone and missile strikes hit Kuwait's Mina al-Ahmadi oil refinery and a power-and-water desalination plant on April 3, marking the second attack on Kuwaiti water infrastructure in four days and the first time both energy and civilian water systems were struck simultaneously during the conflict. Kuwait Petroleum Corporation confirmed the refinery sustained fires but no employee casualties.

On April 5, Iranian drones hit Kuwait Petroleum's Shuwaikh complex and two power and desalination plants, causing significant damage and forcing the

complete evacuation of the Shuwaikh complex and the shutdown of two power generation units.



A subsequent Iranian strike killed one Indian worker and damaged a service building at a Kuwait power and desalination plant. Emergency teams contained the immediate impact, but Kuwait's nationwide water operation was described as stable only due to emergency contingency plans being activated, not because the infrastructure was intact.

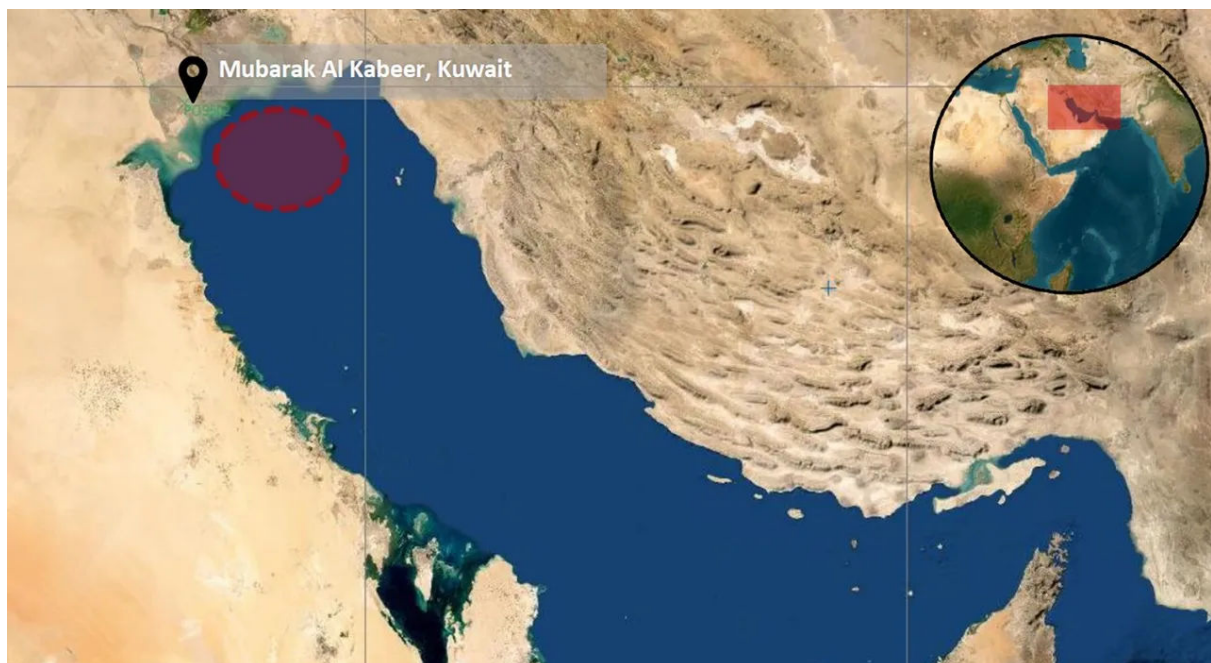
The human cost on the ground is already real. A migrant worker from India — not a soldier, not a decision-maker in any government — became a casualty of a conflict he had no part in starting. The GCC's water and energy infrastructure is maintained in large part by a migrant workforce of millions, and these workers have no evacuation rights, no war compensation frameworks, and no diplomatic leverage.

The Middle East holds just 2 percent of the world's renewable freshwater. Bahrain, Kuwait, Oman, and Qatar rank among the five most water-stressed countries on Earth. Desalination infrastructure across the region produces 41.8 percent of global desalinated water capacity, and about 5,000 plants serve the region's entire civilian population.

A leaked 2008 US diplomatic cable warned that the Saudi capital would have to be evacuated within a week if the Jubail desalination plant were destroyed, and that the current structure of the Saudi government could not exist without that facility. That assessment is now a live operational risk, not a historical warning.

4.5 The Tanker Strike off Kuwait: Oil Meets Contaminated Water

A sea drone struck the oil tanker Sonangol Namibe anchored near Mubarak Al Kabeer Port in Kuwait, causing an oil spill that posed an immediate environmental risk. The attack represented a significant expansion of the conflict in its geographic reach.



[Tanker struck off Kuwait, spilling oil]

The collision of two simultaneous crises — a damaged desalination plant and an oil spill in the same coastal zone — is not coincidental. It is the functional definition of a compounding environmental emergency. The desalination plant's intake sits in the same coastal water body now receiving petroleum contamination from the struck tanker. The plant either operates through

contaminated intake water, degrading its membranes and output quality, or it shuts down entirely, accelerating the water security crisis.

4.6 The Secondary Environmental Harm: Power Blackouts Triggering Industrial Pollution

Blackouts following attacks on energy infrastructure, such as at Ras Laffan Industrial City in Qatar, cause significant secondary harm. Power loss disrupts safety systems and triggers industrial pollution events, as automated containment and monitoring systems go offline simultaneously with the power supply.

This mechanism is systematically underreported. When a refinery or petrochemical plant loses power unexpectedly, controlled burn-off systems fail, pressure release valves may activate unplanned, and chemical containment systems relying on powered pumps stop functioning. The result is a pollution event that occurs not from a direct strike but from the cascading failure of infrastructure that depends on uninterrupted power.

Every power plant strike in the region therefore carries an invisible multiplier: every industrial facility on the same grid becomes a secondary environmental risk the moment the lights go out.

Priority Recommendation: The pattern of strikes on Gulf desalination and energy infrastructure constitutes a documented threat to the water security of over 100 million people. UNEP and the International Committee of the Red Cross must formally designate operational desalination plants and their immediate coastal intake zones as protected civilian infrastructure under international humanitarian law, and demand all parties halt strikes within a defined exclusion radius of these facilities. The window for preventing a full-scale regional water emergency is narrowing with each successive strike.

ATMOSPHERIC RED ZONES

TOXIC PLUMES FROM REFINERY AND OIL DEPOT STRIKES

5.1 Tehran: A City Pushed Past Its Breaking Point

Long before the first missile of Operation Epic Fury struck on February 28, 2026, Tehran was a city in ecological freefall. Even before the first strike, temperature inversions and industrial emissions had pushed Tehran's PM2.5

concentrations to more than 17 times the World Health Organization's recommended limit. This was not a city with reserve capacity to absorb a war. It was a city already at the edge.

Iran entered this conflict as a key example of the concept of "water bankruptcy" — a term used by leading UN expert Kaveh Madani to argue that the word "crisis," which implies a temporary deviation from a baseline, is wholly insufficient to describe what Iran's water systems have become. These conditions are now chronic, and baseline conditions have been irreversibly eroded. Iran has pulled so much water from the ground that it has caused land subsidence across major urban areas. Usage remains so high that shortages are common and water supplies sometimes run out at night in major cities. Air pollution is thought to cause thousands of deaths every year, and Tehran is regularly declared one of the world's most polluted cities.

The bombing of oil refineries in Tehran, Aghdesieh, Shahrān, and Karaj transformed the existing smog into an apocalyptic toxic haze. Long before the first strike, 2025 had marked one of the driest periods in the past 50 years, with Tehran's reservoirs falling to just 12 percent of capacity. Snowmelt in the surrounding Alborz and Zagros mountains, which for centuries fed Iran's rivers and replenished its aquifers, has been steadily declining as temperatures rise. In parts of Tehran, so much groundwater has been extracted from beneath the city that the street level is sinking by more than 10 inches per year.

Some researchers and analysts have directly linked these environmental pressures, particularly the water crisis, to the upswell of popular protest that preceded the war. The conflict has now made those underlying pressures catastrophically and irreversibly worse.

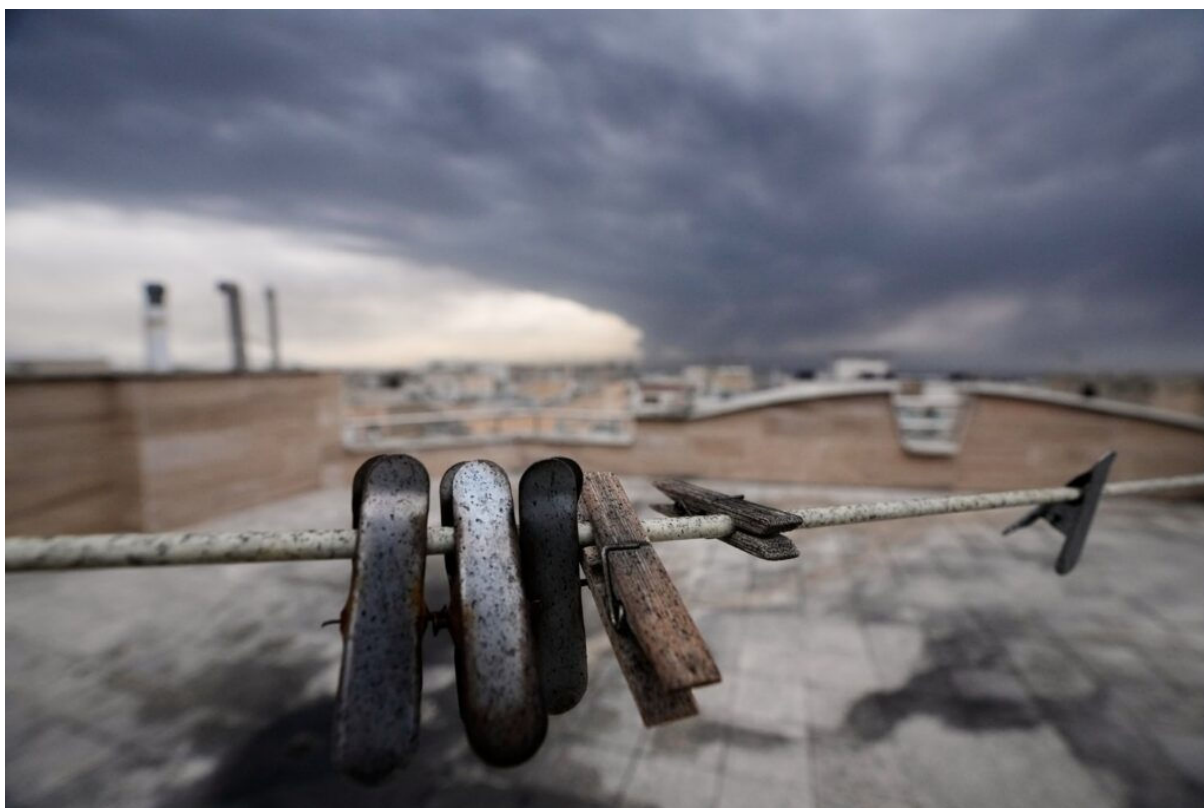
5.2 The Night Tehran's Sky Turned Orange

A little before Nowruz, it rained oil in Tehran. People woke up to see cars, trees, blossoms, and street cats covered with brownish black stains. The midnight before, the skyline was orange. Israeli airstrikes had hit the Shahrān oil depot on the edge of the city. The depot burned for days, releasing toxic fumes into one of the world's most air-polluted capitals.



[After the American-Israeli attack on oil storage depots in Tehran, the city was showered with black acid rain in the form of thin tar. Iran, on March 8, 2026]

The environmental and health consequences of this attack were worsened by Tehran's geography. Sitting in a valley at the foot of the Alborz Mountains, the city is a natural trap for airborne contaminants. There is no prevailing wind that reliably clears the basin. What enters the air above Tehran stays there, cycling through the population with every breath.



[Clothes clips covered in soot from burned fuel are seen as smoke from a U.S.-Israeli strike on an oil facility late Saturday lingers in the cloudy sky over Tehran, Iran, Sunday, March 8, 2026. (AP Photo/Vahid Salemi) Copyright 2026 The Associated Press. All rights reserved.]

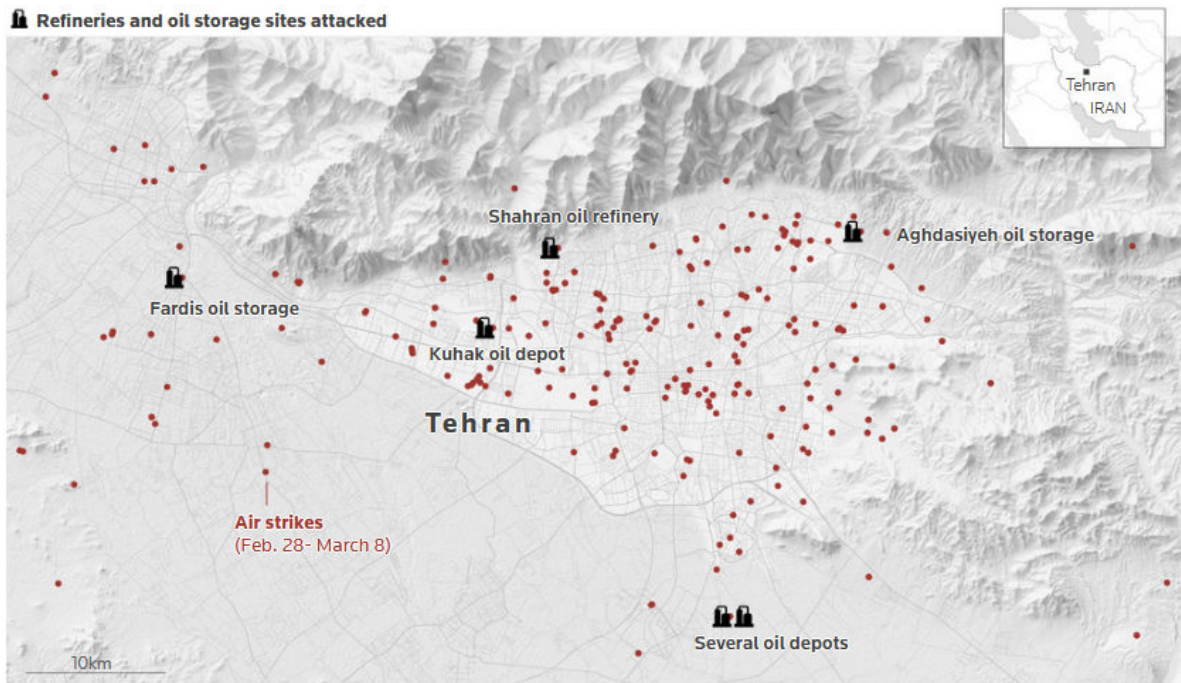
The bombing of oil refineries in Tehran, Aghdesieh, Shahrān, and Karaj caused fires that raged for days. Iran's Environmental Protection Organization warned residents to stay indoors, as the explosions had caused a massive release of toxic hydrocarbons, sulfur oxides, and nitrogen compounds into the air. This was followed by black rain. Scientists confirmed that the rain contained soot, ash, and toxic chemicals from the burning of heavy fuel, and that it may also contain asbestos and silica-laden debris from the bombing and subsequent destruction of older residential and commercial properties.



Plumes of black smoke rise above burning oil facilities around Tehran, including the Sharan oil depot, after Israel said it hit fuel depots and refineries in Iran on March 7.

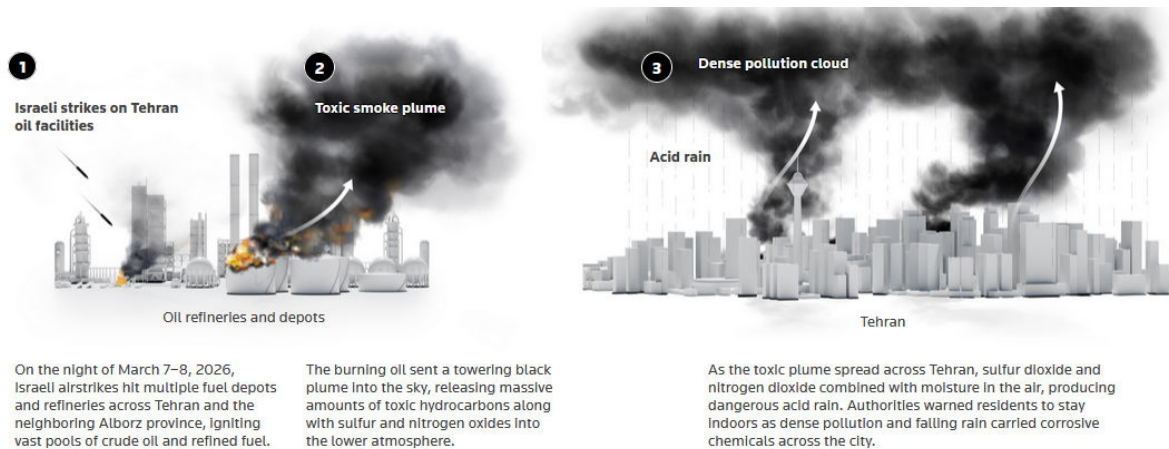
Oil depots and refineries around Tehran spewed thick plumes of black smoke after Israel said it hit fuel depots and refineries in Iran overnight on March 7. Iran's foreign ministry spokesperson Esmail Baghaei said the large-scale attack marked a "dangerous new phase" of the conflict and amounted to a war crime. "By targeting fuel depots, the aggressors are releasing hazardous materials and toxic substances into the air, poisoning civilians, devastating the environment, and endangering lives on a massive scale," he wrote on X. Israeli military spokesman Lieutenant Colonel Nadav Shoshani told reporters the depots were used to fuel Iran's war effort, including producing or storing propellant for ballistic missiles. "They are a legal military target," he said.

The legal designation of a target does not neutralize the chemical consequences that fall on the civilian population surrounding it. Whatever the military calculus, the result on the morning of March 8 was black acidic rain falling on 9 million civilians who had no shelter adequate to the contamination, no evacuation route, and a health system already hollowed out by sanctions and the crackdowns of January 2026.



The thick smoke, laden with harmful chemicals including hydrocarbons, sulfur dioxide, and nitrogen dioxides, enveloped large parts of Tehran. Iranian authorities warned residents to stay indoors as much as possible and specifically advised children, the elderly, heart and lung patients, and pregnant women to avoid going outside altogether. Pakistan's meteorological department also warned that winds may carry pollutants over the border into western parts of the country — confirming that the atmospheric contamination generated by these strikes was not contained within Iranian borders.

5.3 The Chemistry of What Fell: Black Rain as a Weapon of Slow Death



Source: Source: World Health Organization, U.S. Environmental Protection Agency, Iran Red Crescent and Environmental Protection Organization.

Mixed with water in the atmosphere, pollutants from oil fires can become acidic and rain back down to earth. These toxic particles can cause respiratory irritation — especially for those with asthma or bronchitis — chemical burns to the skin, or more serious damage to the lungs.

The health impacts of this chemical soup are both acute and intergenerational. While residents immediately reported difficulty breathing, burning eyes, sore throats, migraines, dizziness, and cardiac triggers, the long-term burden is equally insidious. Prolonged exposure to the aromatic compounds now suspended in Tehran's air, seeping into its soil, and entering its water supply is known to interact with DNA and is associated with elevated risks of stroke, lung and other cancers, elevated blood pressure, and cognitive decline. Numerous studies have established a link between toxic smoke exposure and elevated cancer incidence, yet the long latency periods involved mean this burden will not become fully visible in health statistics for years or even decades.



[March 8: A thick plume of smoke rises from an oil storage facility hit by a U.S.-Israeli strike late Saturday in Tehran, Iran]

Pregnant women and young children are among the most vulnerable. Toxic exposure in utero can contribute to preterm birth and lower birth weights in newborns, as well as impaired lung growth. The children of Tehran who survived the immediate crisis are carrying a biological burden that will manifest across their entire lifetimes — in schools, in hospitals, and in cancer wards — long after any political settlement has been announced and celebrated.

5.4 Cross-Border Contamination: The Plume That Respects No Sovereignty



[Plumes of smoke from a U.S.-Israeli strike on an oil facility late Saturday linger and merge with the cloudy sky over Tehran, Iran, Sunday, March 8, 2026]

The atmospheric contamination from the Tehran strikes did not respect city limits or national borders. Iran's geography ensured that plumes from the Shahrin, Aghdesieh, and Karaj sites traveled along prevailing wind patterns toward western Iran, the Kurdish regions, and onward toward Iraqi and Pakistani territory.

These contaminants do not merely linger in the air. Heavy metals and PFAS compounds leach into groundwater and agricultural soil, creating a persistent toxic legacy, as the post-conflict landscapes of Iraq, Afghanistan, and Lebanon have demonstrated at enormous human cost.

Pakistan's meteorological warning about westward plume drift is the most geographically significant alert of the entire atmospheric crisis. It means that Iranian civilians were not the only population absorbing this contamination. Communities in Pakistani Balochistan and Khyber Pakhtunkhwa, populations with no hospital infrastructure capable of managing toxic exposure events,

were in the path of contamination generated by strikes they had no connection to and no ability to influence.



[A dark smoke cloud near a strike on the Shahrn oil refinery in Tehran]

In a region already strained by climate change and resource scarcity — and in a world bound together by energy markets, shipping lanes, and shared ecosystems — the environmental consequences of this war are already crossing borders.

Richard Milburn, who researches armed conflict and the environment at King's College London, believes those consequences and reconstruction efforts must be part of the ceasefire conversation. But he finds it "highly unlikely" these will occur outside what he calls "the environmental sector echo chamber" — describing it as "the enduring challenge for those of us concerned about the environment." His assessment is a damning indictment of the international community's structural inability to treat environmental destruction as the security emergency it demonstrably is.

5.5 The Scale of Documented Harm Across the Region

By March 3, the Conflict and Environment Observatory had identified 120 incidents of environmental harm related to the conflict across Iran, Iraq, Israel,

Kuwait, Jordan, Cyprus, Bahrain, Qatar, the UAE, Saudi Arabia, and Oman. This figure climbed beyond 300 confirmed incidents within two weeks. The geographic spread across twelve countries is definitive confirmation that this is not a localized environmental emergency. It is a regional one with global consequences.

Qatar's state-owned energy firm suspended all LNG production, citing Iranian attacks on its facilities. A major Saudi Arabian oil refinery was damaged by drones being intercepted nearby. Oil tankers were struck in the Gulf, with at least one crew member dead.

Any strike — or accidental damage — to refineries, storage sites, or tankers risks fires that degrade air quality, contaminate water supplies, and cause harm to fragile marine ecosystems. Reports confirmed potential damage from intercepted Iranian missile debris to the Fujairah F1 power and water complex in the United Arab Emirates and the Doha West Station in Kuwait early in the conflict. These were not direct strikes. They were the debris of successful air defense interceptions falling onto civilian water and power infrastructure. Even defensive military victories in this conflict carry environmental costs that fall on civilians.

History also suggests that countries in the region with fewer resources and weaker environmental governance will struggle to address conflict-linked harm and the risks it poses to people and ecosystems. Iran, which entered this conflict already in the deepest ecological distress of any regional state, is precisely the country least equipped to absorb and recover from the compounding environmental damage being inflicted upon it.

5.6 The Gulf's Structural Water Fragility: A System Built on a Single Point of Failure

The region is already under extremely high water stress. In the six Gulf monarchies, over 60 million people rely heavily on desalinated seawater — 99 percent of drinking water in Qatar comes from desalination. Destroying these plants could effectively make cities like Doha, Dubai, and Manama uninhabitable.

This structural dependency is not a natural condition of geography. It reflects how states have consciously organized societies and natural resources around fossil-fuelled growth and militarised security. Desalination plants supply water for millions, but their brine discharge raises localized salinity and temperatures, and almost all of these plants run on fossil fuels, adding to emissions. The scale

and form of this environmentally destructive water supply is not dictated by economic necessity or natural demographic trends.

Water systems are the most fragile and politically consequential domain in this entire war, precisely because of their capacity to transform environmental destruction into prolonged societal violence. Roughly 83 percent of the Middle East and North Africa's population is considered water-insecure. Disruption to desalination facilities carries immediate humanitarian consequences because water, energy, and food systems are tightly interlinked across the entire region with no meaningful redundancy.

Damage to desalination infrastructure forces overextraction of already stressed groundwater reserves, while contamination from strikes on industrial or military sites risks introducing petrochemicals and heavy metals into irrigation systems and food chains, deepening food insecurity. The World Food Programme estimates 45 million people will face acute hunger if the war continues.

5.7 Post-War Recovery: The Environment Will Be the Last Priority in the Region That Needs It Most

The current conflict is likely to compound existing pressures. Damage to infrastructure, pollution from strikes, and constrained state resources could leave environmental recovery low on the list of post-war priorities. A growing body of research suggests that addressing environmental harm after conflict is essential to long-term stability. The latest fighting risks not only worsening ecological degradation but weakening the very institutions needed to repair it.

Some Gulf states have invested in environmental resilience — Saudi Arabia has plans to plant millions of trees by 2030 and protect large areas of its coastline, and Oman has made a significant commitment to mangrove restoration. But these commitments exist alongside the same governments that are parties to, or hosts of, the military operations generating the environmental destruction in the first place. The contradiction is unresolved.

According to the Iranian Red Crescent, 307 health, medical, and emergency care facilities have been damaged as of April 3, 2026. Health care facilities across the Middle East have been targeted once every six hours across Lebanon, Iran, and Israel.

The destruction of health infrastructure at the precise moment of maximum toxic exposure is the defining compounding tragedy of this phase of the conflict. The population most urgently in need of medical treatment for chemical exposure is living in the geography with the least remaining capacity

to provide it. Post-war environmental recovery requires functioning institutions, trained environmental scientists, and operational monitoring agencies. This conflict is systematically destroying all three simultaneously.

Priority Recommendation: Independent atmospheric and soil monitoring teams under UNEP mandate must be granted immediate access to Tehran and surrounding agricultural zones to establish a contamination baseline before further degradation makes attribution impossible. The 45 million people facing acute hunger, the 83 percent of the regional population considered water-insecure, and the 60 million Gulf residents dependent entirely on desalination infrastructure are not data points. They are the human cost of a war of choice, and the international community's failure to act on environmental monitoring now is a decision that will be paid for across the next generation in cancer wards, birth defect registries, and empty reservoirs.

MARITIME MOBILITY CONSTRAINTS

WRECK SITES, MINES, AND NAVIGATIONAL KILL ZONES

6.1 The IRIS Dena: Iran's First Naval Casualty and Its Underwater Legacy

The IRIS Dena was one of Iran's most capable surface combatants — a Moudge-class frigate equipped with domestically produced weapons systems and recently returned from international fleet exercises. It never made it home. The IRIS Dena was sunk in the Indian Ocean by the US Navy submarine USS Charlotte, approximately 40 nautical miles south of Galle, Sri Lanka. The vessel was returning to Iran following its participation in the International Fleet Review 2026 and the multilateral Exercise MILAN at Visakhapatnam, India.



[The Iris Dena seen in the Bay of Bengal during the International Fleet Review 2026]

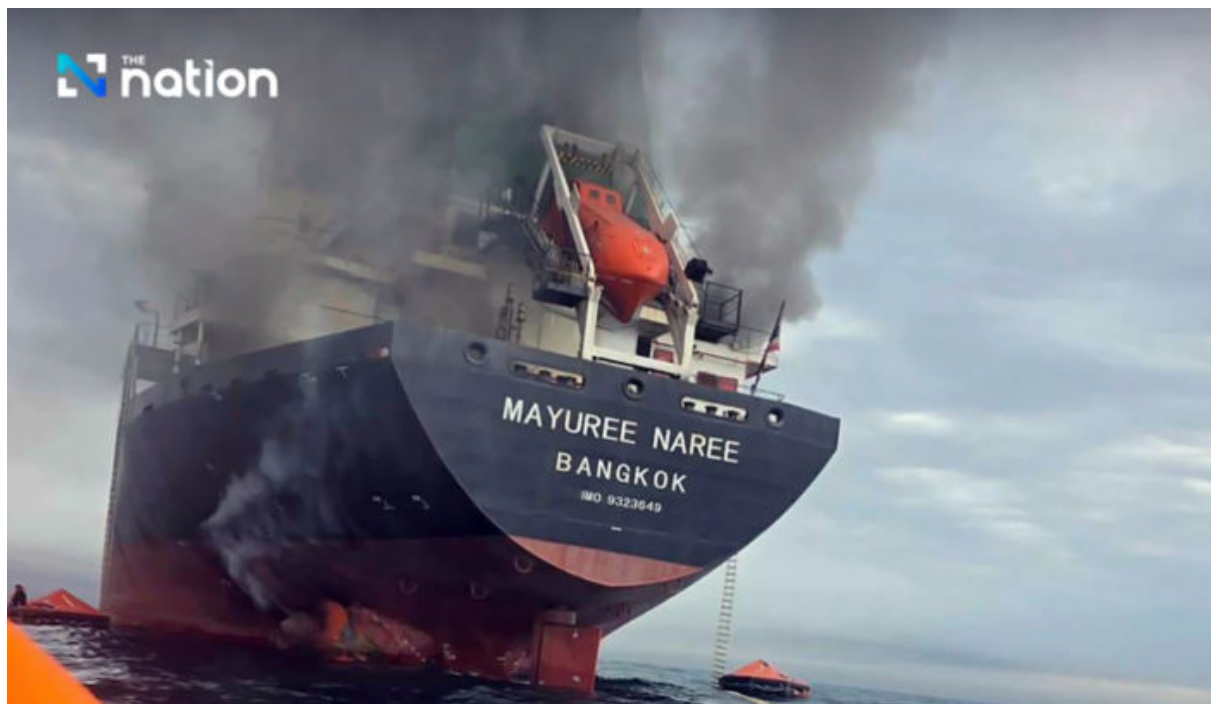
The sinking of the IRIS Dena is not simply a military event. It is an environmental and navigational one. A warship of this displacement, sunk in shallow-to-medium depth waters during its return transit, carries fuel oil, lubricants, weapons-grade propellants, and onboard munitions. The seabed contamination from a vessel of this class is not a question of if — it is a question of how much and how long. The wreck site creates a permanent navigational hazard, a persistent chemical release point, and a location where acoustic signatures from the degrading hull will interfere with regional underwater surveillance baselines for years.

6.2 The Mayuree Naree: A Grounded Wreck at the Strait's Throat

If the IRIS Dena's sinking represents a deep-water environmental event, the grounding of the Mayuree Naree represents something far more immediately dangerous: a wrecked commercial vessel sitting at the entrance to the world's most critical oil transit chokepoint.

The Thai-flagged cargo ship Mayuree Naree, operated by Precious Shipping, was struck by an unidentified projectile in the Strait of Hormuz approximately 11 miles north of Oman, causing a fire and forcing the crew to abandon ship. Twenty crew members were rescued by the Omani Navy, while three crew

members remained missing. The vessel subsequently ran aground off Iran's Qeshm Island.



Qeshm Island sits at the narrowest approach to the Strait of Hormuz. A grounded vessel in this location does not simply present a navigational obstruction. It creates a fixed reference point around which all transiting traffic must deviate, compressing the already narrow 2-mile wide navigable channel further. Any oil or chemical cargo aboard a grounded vessel in these waters enters the same tidal circulation that feeds desalination intakes across the Gulf coast.

The three missing crew members from the Mayuree Naree — civilian mariners from Thailand with no stake in any government's strategic calculations — represent the human cost of a conflict that has turned commercial shipping lanes into a combat zone.

6.3 The Safeen Prestige: The Strait Claims Another Vessel

The maritime environment in the Strait of Hormuz has become one of the most technically complex and hazardous naval operating zones on earth, with the strait narrowing to approximately 21 nautical miles at its tightest point while shipping lanes are significantly narrower, concentrating high-value traffic into predictable corridors.



[Safeen Prestige was seen on fire in a video posted on social media]

The Safeen Prestige added another layer to the wreck and fire record of the Strait. Struck and set ablaze, the vessel joined a growing list of commercial ships that have been disabled in waters where every fire event releases petroleum products, chemical cargo residues, and combustion byproducts into an already contaminated marine environment. The Strait cannot absorb this accumulation indefinitely. Each incident degrades baseline water quality, disturbs the seabed ecology, and contributes hydrocarbon loads that migrate toward the Gulf's coastal fisheries and desalination intakes.

6.4 Iranian Mine Warfare: The Invisible Barrier Beneath the Surface

Iran's response to the US-Israel campaign has not been limited to drones and missiles. Beneath the surface of the Strait, a mine warfare campaign has been quietly transforming the navigational risk profile of the world's most economically critical waterway.

Iran's Maham 3 and Maham 7 mine variants use combined magnetic and acoustic sensing with ship-count logic, meaning they can selectively target vessel types while allowing others to pass. This capability complicates clearance operations significantly because each detected object must be treated as a potential live mine, and decoys or inert objects can further delay operations by forcing detailed classification and identification processes for each contact.

Iran's mine warfare doctrine favors irregular, dispersed placement using small boats or covert platforms, creating uncertainty across wider areas rather than deploying structured minefields. This approach is designed to slow clearance efforts and impose operational hesitation. The types of mines assessed to be in Iran's inventory include moored contact mines, influence mines triggered by magnetic, acoustic, or pressure signatures, bottom mines partially buried in sediment, drifting mines, and limpet mines attached manually to ship hulls.

The environmental consequence of this mine campaign extends far beyond navigational disruption. Bottom mines buried in sediment physically disturb the seabed ecology of the Gulf. Drifting mines that fail to detonate become semi-submerged obstacles that can strike and rupture tanker hulls months after the political crisis that deployed them has ended. And any mine detonation event in the Strait produces a pressure wave and chemical release directly into waters that feed the region's desalination intake systems.

6.5 The US Mine-Clearing Operation: A Race Against Contamination

On April 11, 2026, US Central Command launched mine countermeasure operations in the Strait of Hormuz, deploying Arleigh Burke-class guided-missile destroyers USS Frank E. Peterson and USS Michael Murphy to secure one of the world's most vital shipping lanes. The operation targets a chokepoint carrying a significant share of global oil and trade, where any disruption can trigger immediate economic shockwaves.



[U.S. Navy guided-missile destroyers operate in the Strait of Hormuz on April 11 as U.S. Central Command begins preparations for mine clearance to secure maritime traffic and ensure freedom of navigation. (U.S. Central Command photo)]

The Arleigh Burke-class destroyers are not designed as dedicated minehunters and do not possess the specialized high-definition sonar required for detailed seabed mapping and mine identification. Their primary contributions lie in force protection, command and control, and battlespace integration. The next phase of the operation is expected to involve the deployment of unmanned underwater vehicles and dedicated mine countermeasure systems, including the Mk 18 family of UUVs designed for high-resolution seabed mapping and mine detection.

The US Navy's reliance on AI-assisted automatic target recognition for mine clearance, along with uncrewed surface vehicles towing sonar arrays and Mk 18 Kingfish undersea drones, indicates the service is managing multiple simultaneous capability gaps with limited redundancy at a moment of maximum operational demand.

The environmental dimension of this mine-clearing operation is rarely discussed but critically important. Mine clearance in the Gulf requires repeated high-resolution sonar passes across the seabed. Each controlled detonation of

a discovered mine releases chemical compounds from the mine's explosive charge directly into the water column. In a semi-enclosed basin with limited tidal flushing and active desalination intake points along every coastline, the chemical load from mine disposal operations is not a minor secondary effect — it is a measurable cumulative environmental cost of the clearance process itself.

6.6 The MQ-4C Triton Loss: The Eye That Went Blind

Three corroborating reports confirm the total loss of a US Navy MQ-4C Triton on April 9, 2026, classified as a Class A mishap valued at approximately \$238 to \$240 million. The aircraft's transponder sequence transitioned from code 7400, indicating lost link, to 7700, indicating general emergency, before a rapid descent from 52,000 feet to below 10,000 feet over approximately 15 minutes. The aircraft's anomalous northeast turn toward the Iranian coast before signal loss correlates with GPS spoofing or datalink disruption techniques Iran has previously demonstrated, though mechanical failure remains a credible alternative explanation.

Reporting indicates a visible pause in Triton sorties between April 9 and April 14, creating a surveillance gap during active blockade enforcement of Iranian ports, with operations resuming April 14 at a reduced fleet size. The unresolved crash location and withheld wreckage details suggest recovery has not been achieved, raising the prospect of Iranian access to the AN/ZPY-3 MFAS radar suite and associated electronics.



Egypt's Intel Observer  @EGYOSINT · Mar 6



Replying to @EGYOSINT

The last reported location of the Iranian drone carrier IRIS **Shahid Bagheri** was about 6 kilometers from Bandar Abbas Port, confirmed by satellite imagery & AIS data.

The vessel was left moored there out of fear of potential U.S. strikes just two days before the war began.



OSINTWarfare  @OSINTWarfare · Mar 6



The United States Central Command (CENTCOM) has released footage showing the destruction of the IRGC Navy drone carrier, IRIS **Shahid Bagheri**.





MT Anderson ✓ @MT_Anderson · Mar 29



SOH TRANSIT UPDATE: The "Toll" Route

Mar 28 Sentinel-2 imagery covering the Bandar Abbas Anchorage, Qeshm, and Larak reveals a highly active transit corridor.

➔ The Bagheri: The IRGC **Shahid Bagheri** remains afloat post-strike, but a massive fuel/oil slick is visibly trailing

[Show more](#)



Sal Mercogliano (WGOW Shipping) 🚢 ⚓ 🐪 🚚 🚢 and 2 others

The five-day surveillance gap created by the Triton loss occurred at precisely the moment when mine clearance operations were being planned, blockade enforcement was active, and 85 trapped tankers carrying 21 billion litres of petroleum remained anchored in congested waters. Persistent aerial surveillance is not simply a military intelligence tool in this context — it is the primary mechanism for detecting spill events, tracking vessel movements in congested anchorage zones, and providing early warning of any tanker collision or grounding event that would trigger a catastrophic oil release. When that eye went dark, the environmental monitoring capacity of the Strait went dark with it.

6.7 Iran's Undersea Drone Arsenal: A New Dimension of Maritime Denial

Iran's accelerating deployment of unmanned underwater vehicles introduces a submerged dimension to maritime confrontation that directly challenges established US naval operating assumptions in one of the world's most strategically sensitive waterways. These Iranian underwater drones represent

not simply new hardware, but a deliberate force-structure adaptation designed to exploit shallow littoral geography, high commercial traffic density, and constrained maneuver space that limits traditional blue-water superiority.



The Iranian-made UUV has a 24-hour endurance and can descend as far as 200 meters — a capability profile that permits persistent loitering ambush patterns beneath typical sonar and patrol thresholds in shallow waters. An open-source analyst observed that imagery of an IRGC naval vessel in Bandar Abbas revealed a Nazir-series design that may blend torpedo form factors with unmanned endurance, thereby merging reconnaissance, mine warfare, and strike roles. The vehicle's large payload capacity can accommodate several batteries and a heavyweight warhead, underscoring the ambiguity that defines asymmetric deterrence through uncertainty rather than declared capability.

In practical terms, persistent underwater drones force carrier strike groups to allocate additional anti-submarine warfare assets, potentially dispersing escort ships and reducing offensive concentration. With approximately 20 percent of global oil shipments transiting the Strait of Hormuz and adjacent Gulf sea lanes, even limited disruption enabled by low-signature underwater systems could generate disproportionate global energy market shock, magnifying strategic impact beyond the immediate theatre.

The environmental consequence of this undersea drone campaign operates through two pathways. First, any UUV strike on a laden tanker in the Strait creates an immediate catastrophic spill event in the world's most ecologically and economically sensitive shipping lane. Second, the presence of active underwater drone patrols forces commercial vessels to maintain higher speeds and less predictable routing, increasing the probability of collision events, anchor drag incidents in congested anchorage zones, and navigational errors that produce their own spill risks.

6.8 Korea's Seven Tankers: The Diplomatic Dimension of Maritime Paralysis

Seven Korean oil tankers found themselves trapped in the Strait of Hormuz as the South Korean government weighed its options in response to the conflict, prompting an emergency meeting between the Democratic Party and business leaders at the National Assembly in Yeouido, Seoul, on March 5.

"Seven ships are stuck near the strait and cannot move into routes returning to Korea," said a business source who asked for anonymity. "If the situation persists, it could disrupt the country's crude oil supply."



An emergency meeting between the Democratic Party and business leaders regarding the war in Iran is being held at the National Assembly in Yeouido, western Seoul, on March 5. [NEWS1]

South Korea's dilemma encapsulates the impossible position of non-belligerent states caught in the Strait's paralysis. Seoul has treaty obligations to the United States, energy dependency on Gulf crude, and a commercial shipping fleet now sitting in a combat zone under active mine threat, drone patrol, and IRGC enforcement. The decision of whether to attempt transit, seek Iranian permission, pay the IRGC toll, or wait indefinitely carries economic, diplomatic,

and environmental consequences simultaneously. Seven tankers sitting at anchor for weeks, burning fuel, releasing bilge water, and consuming crew welfare, represent a compounding cost that falls entirely on a country that had no part in initiating the conflict.

6.9 Iran's 10x Drone Production Surge: The Volume Strategy

A tenfold increase in Iranian drone production would enable Iran to adopt a battlefield strategy centered on drone mass rather than relying primarily on precision missile systems. With parts of its ballistic missile infrastructure degraded by US and Israeli strikes, Tehran appears to be compensating by expanding output of expendable unmanned systems that can be launched in large numbers. This approach allows for continuous waves of aerial threats, forcing defenders to engage multiple targets simultaneously and increasing the probability of penetration.

The maritime implication of this production surge is direct. An Iran producing drones at ten times its previous rate can sustain simultaneous aerial and undersea drone operations over the Strait indefinitely — degrading US surveillance assets, threatening commercial shipping, enforcing its toll channel, and maintaining area denial without ever escalating to direct naval combat. For the 85 trapped tankers, for the mine-clearing destroyers, and for the environmental monitoring systems trying to track oil spill plumes in real time, this volume strategy means the threat environment will not decrease as the conflict matures. It will intensify.

Priority Recommendation: The combination of Iranian mine deployment, grounded wrecks at the Strait approach, and the loss of persistent ISR coverage has created conditions in which a catastrophic tanker collision or spill event could occur without adequate warning, response capacity, or attribution clarity. The International Maritime Organization must immediately deploy independent hydrographic survey teams to the IRIS Dena, Mayuree Naree, and Safeen Prestige wreck sites to assess chemical release status and formally chart these hazards. Simultaneously, UNEP must negotiate an environmental monitoring access agreement that survives any ceasefire framework and maintains satellite and aerial surveillance of the Strait's oil contamination levels independent of any military party's operational preferences.

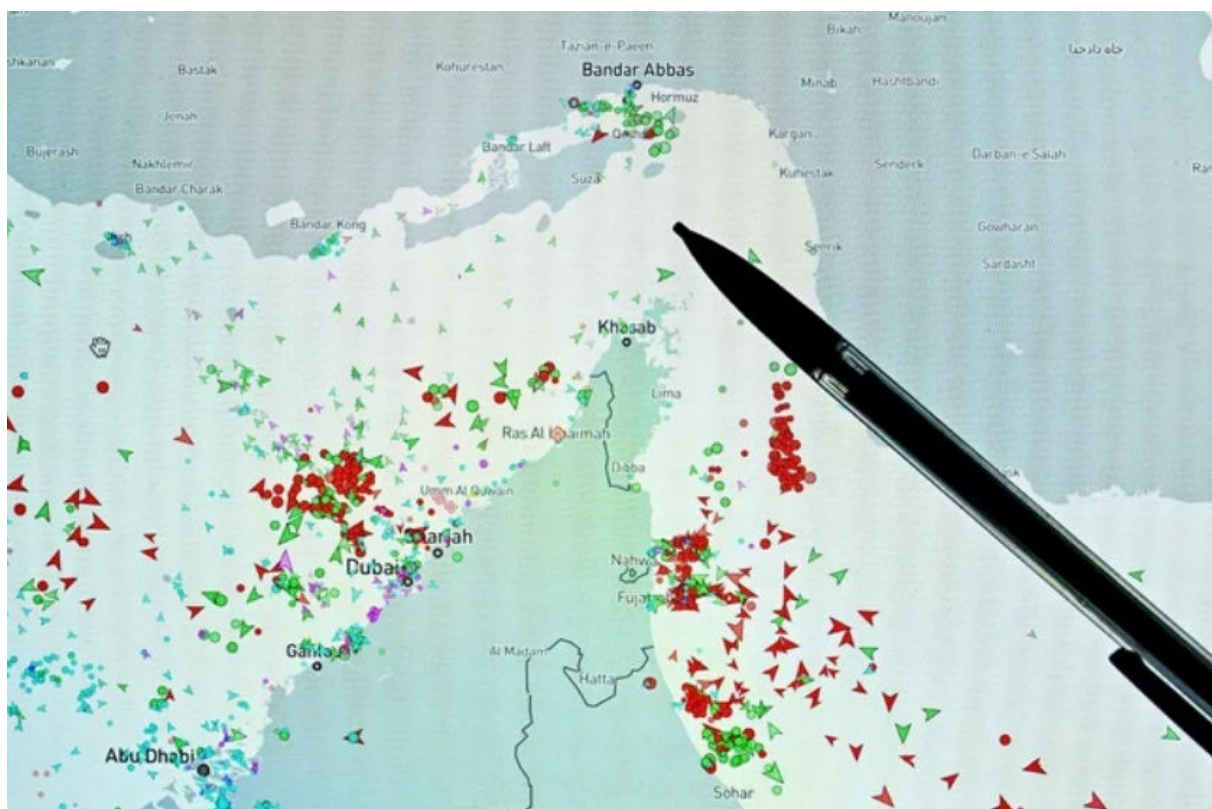
STAGNANT PAYLOAD RISKS

21 BILLION LITRES AND THE VLCC BREACH SCENARIOS

7.1 The Payload: What Is Actually Sitting in the Persian Gulf

Before any missile is fired, before any mine detonates, before any IRGC patrol boat closes on a hull — there is the oil. At peak blockade, 85 large tankers were trapped in the Persian Gulf carrying a collective minimum of 21 billion litres of crude oil and petroleum products. To place this in physical terms: this is the equivalent of Greece's entire annual crude oil consumption, sitting stationary in a semi-enclosed basin, surrounded by active mine fields, under drone patrol, in one of the most ecologically fragile marine environments on earth.

Greenpeace Germany has analysed the blocked Strait of Hormuz using ship movement data and satellite imagery and simulated the potential consequences of oil spills in the Persian Gulf if tankers are damaged. The Strait of Hormuz and adjacent waters are home to pristine coral reefs, mangrove forests, and seagrass meadows. This is an ecological ticking time bomb and represents an enormous risk that further increases instability and human suffering in the region.



The US-Israel attack on Iran and subsequent strikes by Iran on neighbouring Gulf countries has shown once again that our dependence on fossil fuels is a constant threat to peace, security, and prosperity. When oil and gas prices

surge, fossil fuel giants rake in more profits while everyday people are hit by higher costs for heating, electricity, transport, and food.

7.2 The Al Salmi Strike: A VLCC Breach at Dubai's Front Door

At approximately 12:10 a.m. on March 31, an Iranian-origin drone struck the Al Salmi, a Very Large Crude Carrier sailing under the Kuwaiti flag, while the vessel was positioned at Dubai Port anchorage. The vessel was carrying approximately 2 million barrels of crude oil. The attack triggered a fire onboard the massive tanker and caused damage to the hull, raising immediate fears of a catastrophic oil spill in one of the world's most commercially vital waterways.

VLCCs are among the largest vessels afloat, capable of carrying upwards of 2 million barrels of crude oil, and any significant breach of their hull integrity in a port environment represents an environmental and economic nightmare scenario. Dubai maritime response teams were deployed within minutes of the attack. The fire was extinguished and all twenty-four crew members were confirmed safe. The Dubai Maritime Authority stated: "We are currently assessing hull integrity and monitoring for any potential oil discharge into surrounding waters."

The fact that the fire was controlled and the crew survived does not diminish the significance of what occurred. A 2-million-barrel VLCC was struck by a combat drone while at anchor inside the port waters of one of the world's most commercially active harbours. This was not a remote stretch of open water. This was Dubai.

Brent crude soared nearly 60 percent in March, closing at \$112.78 a barrel and surging past \$115 in early Tuesday trading after the Iranian drone struck the fully loaded Kuwaiti oil tanker at Dubai Port. The attack on the Al Salmi, a very large crude carrier holding 2 million barrels of oil, caused a fire and raised fears of a spill.

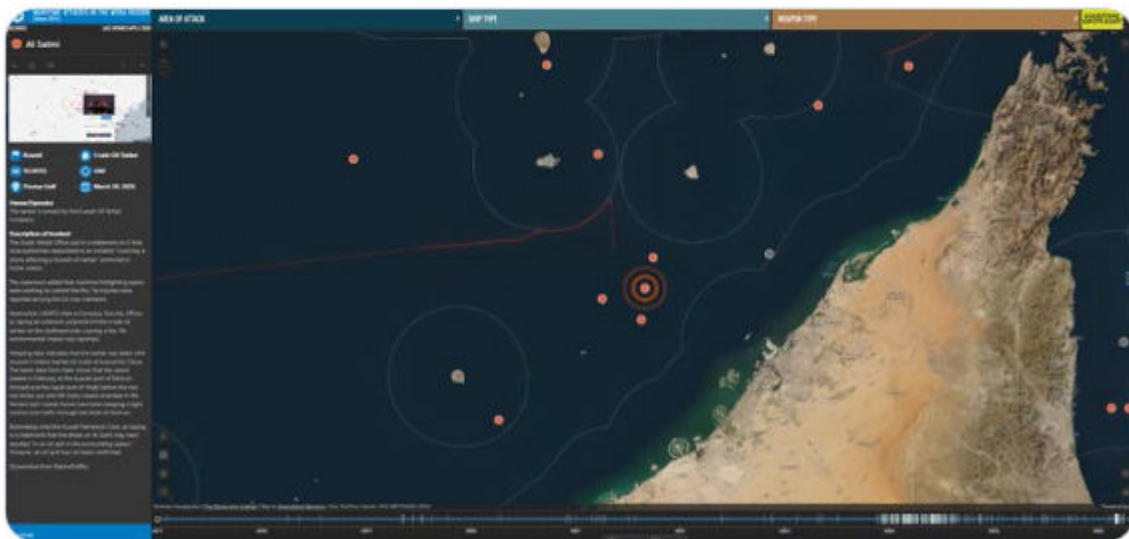


Washington Institute 
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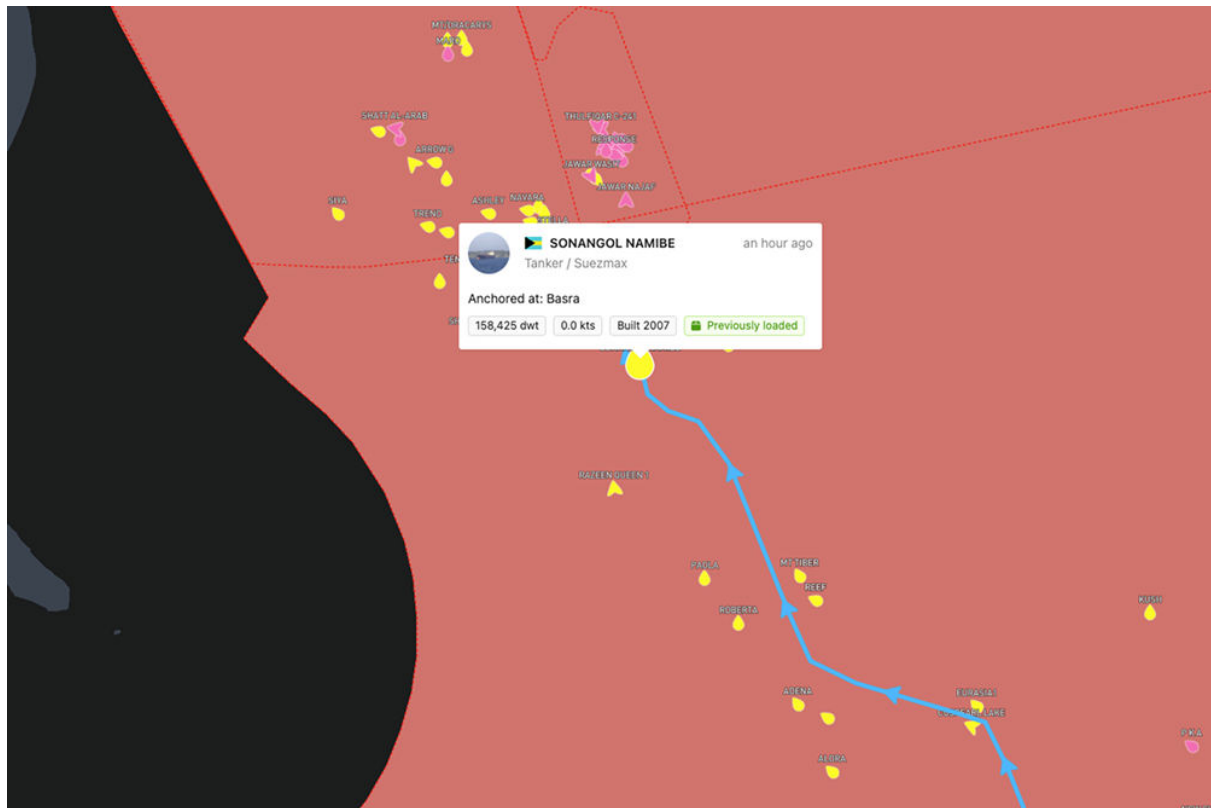
On March 30, an Iranian drone struck the Kuwaiti tanker Al-Salmi. Visit the “Maritime Attacks in the MENA Region” map, a project by [@NoamRaydan](#) and [@FarzinNadimi](#), to learn more about attacks and incidents related to commercial vessels and warships in key chokepoints and waterways across the region.

Learn more: [washingtoninstitute.org/menamaritime/?...](https://www.washingtoninstitute.org/menamaritime/?...)

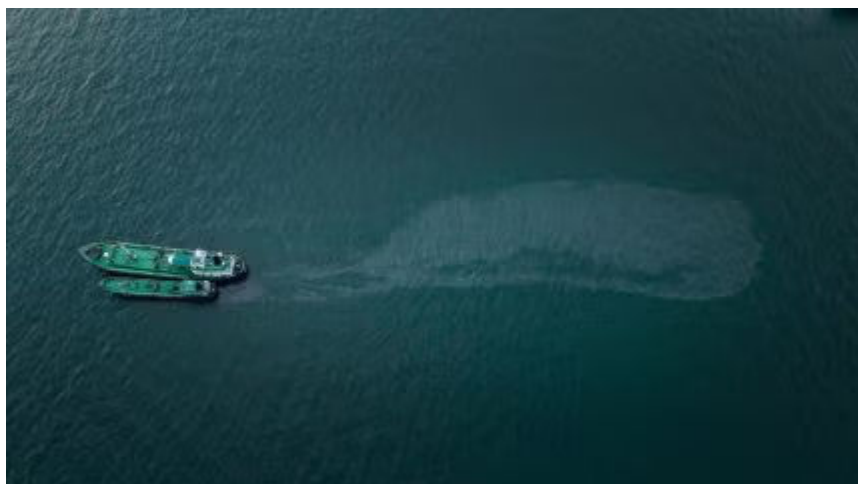


[Al Salmi in 2013]

7.3 The Sonangol Namibe: When the Hull Breaks, the Ocean Pays



The Bahamas-flagged suezmax tanker Sonangol Namibe was attacked while at anchor approximately 30 nautical miles southeast of Mubarak Al Kabeer, Kuwait. The master reported a massive explosion on the port side followed by the departure of a small craft. The vessel took on water and oil was observed leaking from a damaged cargo tank. A Reuters report cited the vessel's US representative company saying the tanker's hull was likely breached during the incident.



[The incident happened beyond Kuwait's territorial waters, around 60km (37 miles) from the port of Mubarak Al Kabeer]

The location of the strike, Mubarak Al Kabeer, is situated some 750 to 800 kilometres from the Strait of Hormuz. This suggests a strategic widening of Iranian strikes, which had previously been concentrated in the strait, Bahrain, and the Gulf of Oman.

This geographic expansion carries a specific environmental intelligence finding: Iranian strike doctrine has extended its reach to encompass the entire Gulf basin, not just the Strait chokepoint. Every tanker at anchor anywhere in the Gulf — including those waiting at Kuwait, Iraq's ABOT terminal, and UAE port anchorages — is now within confirmed Iranian strike range. The environmental risk of a cargo tank breach is no longer localized to the Strait. It is distributed across the entire basin.

7.4 The Sanmar Herald Incident: When Clearance Means Nothing



[A super tanker loads Iraqi crude at the Al Basrah Oil Terminal (ABOT) in the North Arabian Gulf under US Navy escort — the same terminal where the Sanmar Herald loaded its 1.848–2 million barrels of Basrah crude before

entering the transit corridor where IRGC gunboats were waiting. Iraq's offshore terminals remain the key loading point for tankers that must traverse the Strait of Hormuz to reach Asian markets. Photo: U.S. Navy / Public domain]

On April 17, Iranian Foreign Minister Araghchi announced that the Strait of Hormuz was open to all commercial vessels following designated transit corridors. The Sanmar Herald — a VLCC crude oil tanker, 320,475 deadweight tonnes, Indian flag — was on the approved list. The vessel was carrying between 1.848 and 2 million barrels of Iraqi crude loaded at Al Basrah Anchorage, a neutral cargo from a third country aboard a vessel with explicit FM clearance.

At approximately 09:20 UTC on April 18, two IRGC gunboats fired on the Sanmar Herald roughly 20 nautical miles northeast of Oman, south of Larak Island. Before the gunfire, an IRGC patrol unit identifying itself as "Iranian Sepandavi" had broadcast on VHF Channel 16: "The Strait of Hormuz is still closed. We will open it by the order of our leader, Imam Khamenei, not by the tweets of some idiot."

The bridge audio of the Sanmar Herald, captured during the incident, records the vessel's captain under fire stating: "You gave me clearance! You gave me clearance to go! My name is second on your list. You are firing now!"

The environmental significance of this incident is direct and specific. A fully loaded VLCC carrying 1.848 to 2 million barrels of Iraqi crude was fired upon by gunboats in a narrow transit corridor. Had a round penetrated a cargo tank — not a remote scenario given the calibre of IRGC fast attack weapons — the spill would have occurred in the narrowest navigable portion of the Strait, in waters feeding directly into Gulf circulation patterns and regional desalination intakes. The difference between a political incident and an ecological catastrophe was millimetres of hull steel.

Iranian Foreign Minister Araghchi, speaking after the incident, made what amounts to the most senior official acknowledgment of the command split ever recorded: "Our military units are now, in fact, independent and somewhat isolated, and they are acting based on general instructions given to them in advance." The FM of the Islamic Republic told a European news outlet that he cannot control what his own military does in the Strait his government claims to administer.

Actionable Intelligence: This command split is not merely a diplomatic problem. It is an environmental risk multiplier. When the authority issuing transit clearances cannot control the units patrolling the waters those clearances cover, there is no reliable mechanism for preventing a strike on a loaded VLCC. The 21 billion litres of petroleum sitting in the Gulf is protected only by the discipline of units that have demonstrated they do not answer to the civilian government.

7.5 Iran's Shadow Export Route: Oil Moving While the Gulf Freezes

While 85 tankers sat trapped, Iran continued to export. Iran sent at least 11.7 million barrels of crude oil through the Strait of Hormuz since the war began, all headed to China, according to vessel-tracking data. Many ships had gone dark after Tehran threatened to attack any vessel attempting to pass through the waterway. Iran also resumed loading tankers at the Jask oil and gas terminal along the Gulf of Oman, south of the Strait of Hormuz, which could add additional capacity to its crude shipments.

This parallel economy of shadow transit — Iranian oil flowing to China through AIS-suppressed vessels while all other commercial shipping was paralyzed — has a direct environmental consequence. Vessels operating without AIS transponders provide no position data to maritime safety authorities, environmental monitoring systems, or collision avoidance networks. A dark tanker that strikes a mine, collides with another vessel, or suffers a mechanical failure in the Strait produces a spill with no automatic alerting, no pre-positioned response, and no immediate attribution. The shadow fleet is an unmonitored environmental risk operating inside an already contaminated and congested waterway.

7.6 The Insurance Collapse: How the Market Priced the Catastrophe

WAR RISK INSURANCE PREMIUM ESCALATION — PERSIAN GULF			
PERIOD	PREMIUM (% OF HULL VALUE)	COST PER VLCC TRANSIT	CHANGE
Pre-crisis baseline	0.01%	\$10,000-12,000	—
Elevated tension (2024-25)	0.125-0.4%	\$125,000-480,000	12-40x
Post-strike (1 March 2026)	1.0-1.5%	\$1,000,000-1,800,000	100-150x
P&I withdrawal (2 March 2026)	Unavailable	N/A — coverage cancelled	Infinite

Within hours of the February 28 strikes, war risk premiums for Hormuz transits surged from 0.01 percent to over 1.5 percent of hull value per voyage, a 150-fold increase from baseline. For a Very Large Crude Carrier with a hull value of \$100 to \$120 million, this translated to an additional cost of \$1 to \$1.8 million per single transit. Seven of the twelve clubs constituting the International Group of P&I Clubs issued 72-hour cancellation notices for war risk coverage in the Persian Gulf — clubs that collectively insure approximately 90 percent of the world's ocean-going commercial tonnage.

The insurance withdrawal did not merely make transit expensive. It made it legally impossible for most commercial vessels to attempt one. The market had effectively priced in what military planners were still treating as a contingency: the near-certainty that a VLCC strike producing a catastrophic spill was not a question of if, but of when and where.

No cargo had been physically lifted since the war broke out, with broker Fearnleys describing Baltic rates as a "guestimate" by the broking community while the physical trade remained frozen. The tanker market was defined by a stalemate as ships piled up on both sides of the Hormuz Strait.

7.7 Iran's Anti-Ship Arsenal: The Breach Scenarios

IRAN'S ANTI-SHIP MISSILE ARSENAL — KEY SYSTEMS

SYSTEM	TYPE	RANGE	SPEED	WARHEAD	THREAT LEVEL
Khalij-e Fars	Anti-ship ballistic missile	300 km	Mach 3-4	650 kg	Critical — terminal electro-optical guidance
Noor	Sea-skimming cruise missile	120-300 km	Subsonic	200 kg	High — reverse-engineered Chinese C-802
Qader	Cruise missile (upgraded Noor)	300 km	Subsonic	200 kg	High — extended range variant
EM-52	Rocket-propelled rising mine	Seabed to target	High	270 kg (600 lb)	Critical — can threaten carriers

Iran maintains an estimated 5,000 to 6,000 naval mines of Soviet, Russian, Chinese, and North Korean origin. The arsenal includes the EM-52, a Chinese-produced rocket-propelled rising mine armed with a 600-pound high-explosive warhead, deployable in waters up to 600 feet deep, theoretically capable of crippling an aircraft carrier. The Khalij-e Fars anti-ship ballistic missile, based on the Fateh-110 ballistic missile, combines a range of 300 kilometres with terminal electro-optical guidance, traveling at Mach 3 to 4, giving defending ships roughly 30 to 45 seconds of warning from detection to impact.

Against this arsenal, a breach scenario for a laden VLCC in the Strait produces the following environmental consequences, assessed by cargo load and location:

A VLCC carrying 2 million barrels of crude struck by an EM-52 mine in the navigable channel would release petroleum at a rate that would overwhelm any response capability currently positioned in the region. The Gulf's clockwise current would distribute contamination northward toward Kuwait and Iraq within 48 hours, southward toward UAE and Qatari desalination intakes within 96 hours, and into the Gulf of Oman within 7 to 10 days. The 1991 Gulf War spill, the largest in history at the time at 4 to 8 million barrels, caused ecosystem damage that persisted for decades. A single VLCC breach at maximum load exceeds the lower bound of that event.

A strike in the Dubai Port anchorage zone — as demonstrated by the Al Salmi attack — would release petroleum directly into one of the most commercially active port environments in the world, contaminating berths, fuel intake systems for the port's vessel fleet, and coastal desalination intakes serving Dubai's 3.5 million residents within hours.

7.8 The Second Tanker War vs. The First: A Structural Comparison

Between 1981 and 1988, combatants attacked 411 commercial ships, killing more than 400 civilian seafarers. Yet through all of this, fewer than 2 percent of ships transiting the Persian Gulf were attacked. Oil continued to flow. The strait never closed. In March 2026, Iran achieved in 72 hours what eight years of the first Tanker War never managed: it shut the world's most important shipping lane almost entirely.

The critical difference lies in the mechanism of disruption. The first Tanker War was a war of attrition — individual ships were attacked and the industry adapted. The Second Tanker War achieved near-total closure through the combination of physical threat, insurance withdrawal, and electronic GPS disruption. The shipping industry prepared for the wrong war.

VLCC day rates hit an all-time record of \$423,736 per day on March 3, 2026 — an increase of more than 94 percent from the previous Friday's close. Broker reports showed Arabian Gulf-to-Far East fixtures above \$445,000 per day, with confirmed spot deals exceeding any rate previously recorded in the tanker industry's history.

Every \$10,000 increase in daily VLCC rates adds approximately \$0.20 to \$0.30 per barrel to the delivered cost of crude. At peak rates, the freight component alone was adding \$3 to \$4 per barrel above pre-crisis levels, before the war risk insurance surcharge added another \$2 to \$3. The populations of Asia, Africa, and South Asia — populations with no stake in the conflict and no ability to influence its trajectory — were paying dollars more per litre of fuel, per meal cooked on gas, per kilometre traveled, because 85 tankers were sitting stationary in the Persian Gulf.

Priority Recommendation: The 21 billion litres of petroleum sitting in the Gulf's anchorage zones constitutes the largest single uncontrolled environmental risk in the region's history. The International Maritime Organization must immediately negotiate an emergency dispersal protocol — supported by ceasefire framework guarantees from all parties — allowing loaded tankers to exit the Gulf in monitored convoys with environmental response vessels pre-positioned along the transit route. Every day these vessels remain stationary under mine threat and drone patrol is a day closer to a breach event that no ceasefire can undo.

FOOD SECURITY AND ARTISANAL FISHING COLLAPSE

THE HUNGER WAR NOBODY IS REPORTING

8.1 The Strait of Hormuz Is a Food Corridor

The world understands the Strait of Hormuz as an oil chokepoint. It is equally a food chokepoint — and this dimension of the crisis has received almost no strategic attention. The same waterway through which 20 million barrels of oil pass daily also carries the agricultural inputs that feed billions of people across three continents. When the Strait closed, it was not just oil markets that seized up. It was the global food supply chain.

About 27% of the world's oil exports, 20% of global liquified natural gas exports, and 20% to 30% of global fertilizer exports, including urea, ammonia, phosphates, and sulfur, pass through the Strait. Drone and rocket strikes on tankers have made maritime insurance costs prohibitive in the region, resulting in a more than 70% decline in shipping through the Strait since the conflict began.



Onchain Insights @OnchainIns5699 · Apr 21



Urea fertilizer prices have doubled since January 2026 to \$900/metric ton, driven by Strait of **Hormuz** disruptions affecting critical Gulf region ammonia and urea exports. Global fertilizer prices rose 26.2% in March with energy prices up 41.6%, threatening **food security** across

[Show more](#)



UK Foreign Secretary Yvette Cooper, chairing an April 2026 multilateral meeting on Hormuz with over forty countries, described the Strait's contents in terms that require no interpretation: liquefied natural gas for Asia, fertilizer for Africa, and jet fuel for the world. She confirmed that tanker traffic through the Strait had fallen from 150 ships per day to between 10 and 20. Fertilizer supply disruption does not produce crop failure immediately. It produces it with a lag of one to two growing seasons, in regions already operating at the margin of food security. The lag makes it politically invisible at the moment of crisis. It does not mean it does not exist.

8.2 The Double Shock: Fertilizer and Fuel Hitting Farmers Simultaneously

The Food and Agriculture Organization has warned that a prolonged crisis in the Strait, which Iran has closed in retaliation for the United States and Israel's war, could lead to a global food catastrophe. India, Bangladesh, Sri Lanka, Somalia, Sudan, Tanzania, Kenya, and Egypt are among the countries most at risk, according to the FAO.



FAO Newsroom @FAOnews · Apr 20



Opening [#NERC38](#), [@FAODG](#) QU Dongyu warned that the conflict in the Middle East is adding further pressure on fragile agrifood systems and global supply chains.

It will have "long-term consequences for agriculture," even if it were to end today.

[#NERC38](#)



From [fao.org](#)

Since the war erupted, tanker traffic in the Strait of Hormuz declined by more than 90 percent. Normally, 35 percent of global crude oil flows, along with 30 percent of fertilizer trade and a fifth of LNG, passes through this corridor daily. The result for farmers globally is a double shock: rising prices for both fertilizer and fuel, both essential for agricultural production, arriving simultaneously with no prior warning and no stockpile buffer adequate to absorb an extended disruption.

Global food prices rose 2.4 percent last month compared with February, according to the FAO's food price index. While rising prices of oil and fertilisers have driven up food production costs, most food currently being consumed globally was produced well before the war began. But agricultural experts warn this creates a false sense of stability — input shocks often transmit with a lag, as inventories, pre-purchased fertiliser, delayed price pass-through, and uncertainty about duration can temporarily mute the effect. Agriculture works on biological and seasonal timelines, while fertiliser and shipping markets can reprice in days or weeks.

Middle East granular urea prices rose 19 percent in the first week of March alone. Egyptian urea surged 28 percent. The FAO projected global fertilizer prices could average 15 to 20 percent higher in the first half of 2026 if the disruption continues. Oxford Economics models a six-month closure pushing global inflation to 7.7 percent and tipping the world into outright economic contraction.

8.3 The Nations at the Sharpest Edge

Poor people in Africa and Asia will be hurt the most because they have to spend a high share of their income on food anyway. Hunger and undernutrition will very likely rise. In many low-income countries, fuel prices feed directly into retail food prices, since transport expenditure makes up a far larger share of total household expenditure compared to high-income countries. So even before a potential harvest shock this year, rising energy costs are already affecting food budgets in Dhaka, Cairo, and Lagos. As food prices rise, households are often forced to shift away from fruits, vegetables, and protein towards cheaper, calorie-dense staples, with lasting consequences for child nutrition and long-term health.



Justin Waite  @SharePickers · 19m



“We are facing the biggest energy security threat in history,”

Fatih Birol, the head of the International Energy Agency (IEA), told CNBC Thursday.

“As of today, we’ve lost 13 million barrels per day of **oil** ... and there are major disruptions in vital commodities,”

[Show more](#)



From cnbc.com

In the short term, priority must be placed on countries such as Sri Lanka and Bangladesh, where rice harvests are happening now. African nations that depend on fertilizer imports are also critically vulnerable. Food prices in Iran itself are described as "skyrocketing" by FAO — though the country produces roughly 70 percent of its own food supply, the remaining 30 percent is imported through the very supply chains now disrupted by the conflict Iran did not initiate but is now trapped inside.

In an analysis last month, the World Food Programme said nearly 45 million more people could face acute food shortages if the conflict continues into the middle of the year and oil prices remain above \$100 a barrel.

8.4 The Marine Ecosystem at Breaking Point

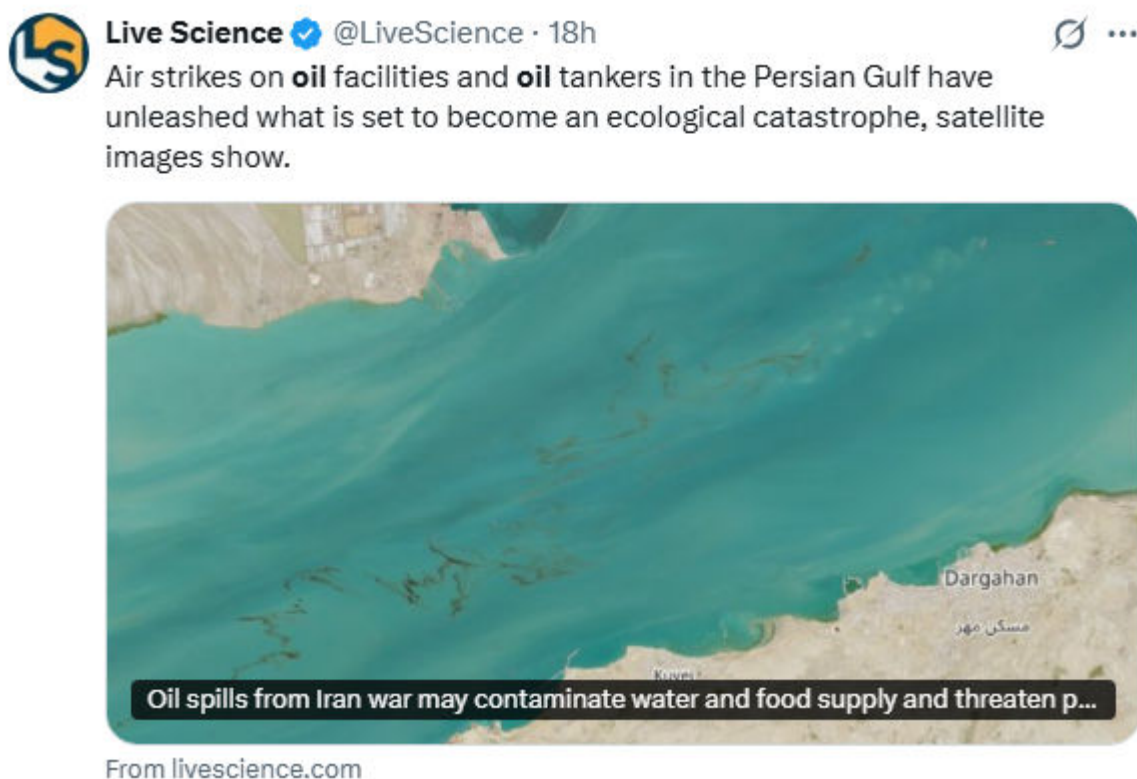


From sea turtles to birds and the gentle dugong, the Persian Gulf's diverse but fragile marine life is threatened by the bombs and oil of the war in the Middle East. The ecosystem was already under pressure from climate change and maritime traffic before the United States and Israel launched their war on Iran at the end of February. More than 300 incidents involving environmental risks, including attacks on oil tankers, have been recorded in the region since the conflict broke out, according to the Conflict and Environment Observatory.

The geography of the Gulf makes its ecosystem particularly vulnerable. A semi-enclosed and shallow sea about 50 metres deep on average, it is connected to the Indian Ocean through the Strait of Hormuz. Its slow water renewal — every two to five years — limits the dispersion of oil or other pollutants. The region hosts the world's second-largest population of dugongs — herbivorous marine mammals listed as vulnerable — with an estimated 5,000 to 7,500 individuals. About a dozen species of marine mammals are also found there, including humpback whales and whale sharks. In total, more than 2,000 marine species have been recorded in the warm Gulf waters, including over 500 fish species and five types of sea turtles, among them the critically endangered hawksbill sea turtle. There are also about 100 species of corals, which together with mangroves and seagrass beds form essential breeding and nursery grounds for fish and crustaceans.

This ecosystem is not a peripheral concern. It is the biological foundation of the artisanal fishing economies that sustain coastal communities across every Gulf state. The Gulf supports more than 700 fish species. Forty-two percent of the Gulf's fish species are classified as threatened on the IUCN Red List. Thirty-two percent are priority fishery targets — meaning the species most at risk are also the species most commercially important. Coral-dependent, threatened, and heavily fished species collectively represent 90 percent of total fish density in Gulf waters.

8.5 The Artisanal Fishing Communities: The Unspoken Casualty



For the global powers in this conflict, the Strait of Hormuz is a strategic corridor. For the fishing communities of Iran's Hormozgan Province, the UAE's eastern coast, Oman's Musandam Peninsula, and Kuwait's northern shores, it is not a corridor. It is a home, a livelihood, and a food source that has existed for centuries. These communities are the unspoken casualty of a conflict in which they have no voice, no representation, and no protection.

Within the first 14 days of intensified conflict, over five million tonnes of carbon dioxide entered the atmosphere from burning oil depots, damaged gas infrastructure, and military operations — placing this conflict among the most significant environmental disruptors globally within its first two weeks. Beyond

carbon, the destruction of oil facilities and maritime infrastructure released heavy metals, hydrocarbons, and toxic dioxins into the Persian Gulf. These pollutants settle in marine sediments, enter the food chain, and reach human communities through seafood. The result is layered ecological violence — immediate from the acute spill event, and long-term as toxins migrate through the biological food chain.

Mangrove ecosystems along the Iranian coast, especially in Hormozgan Province, face oil contamination and chemical runoff. These ecosystems sustain fisheries, stabilize coastlines, and absorb carbon. Their degradation is simultaneously an environmental, economic, and food security loss. Coral reefs, already weakened by decades of climate stress, now face additional pressure from pollution and sediment disruption from naval operations and sunken vessels. Their collapse reduces biodiversity and directly undermines the artisanal fishing economies that depend on healthy reef systems as breeding and nursery grounds.

8.6 What the 1991 Gulf War Taught Us and Why This Is Worse

The Gulf War in 1991 triggered one of the largest marine oil spills linked to armed conflict, when retreating Iraqi forces deliberately opened oil valves in Kuwait and destroyed oil infrastructure. Up to 11 million barrels of oil were released, contaminating 640 kilometres of Saudi coastline and killing more than 30,000 seabirds. It took decades to recover. The wars in the 1980s and 1990s demonstrate how exposed the ecosystems of the Persian Gulf are to conflict pollution, whether from damage to on- or offshore oil facilities or through spills from attacks on shipping.

The 2026 conflict differs from 1991 in one critical dimension: it is happening to an ecosystem that is already severely degraded. A decade-long study of southeastern Gulf reefs published in 2024 documented a 78 percent decline in coral cover between 2010 and 2020, with *Acropora* populations — the primary reef-building species — declining over 90 percent. An estimated 70 percent of the Arabian Gulf's original reef cover may be considered lost, with a further 27 percent threatened or at critical stages of degradation.

In 1991, the Gulf's marine ecosystem had reserve capacity. In 2026, it does not. Every litre of oil that reaches the water, every detonation that disturbs the seabed, every chemical plume from a refinery fire falling into coastal waters is interacting with an ecosystem that was already at the edge of functional collapse. There is no ecological equivalent of the strategic petroleum reserve that can be drawn down to compensate.

8.7 Bomb Noise, Sonar, and the Silent Destruction of Marine Habitat

Sea mines and other explosive devices can cause acoustic disturbance impacting sea mammals and other animals, and blast damage to natural undersea structures such as reefs. In 2003 and 2020, two studies published in *Nature* and in a journal of the Royal Society found links between the use of mid-frequency military sonar and whale strandings. Bombs are also a threat to the area's birds. Their migration could be disrupted by the noise of explosions and by plumes of toxic smoke, as the Arabian Peninsula sits at the crossroads of major migratory routes linking Europe, Central Asia, Africa, and South Asia.

DIMENSION	SAUDI ARABIA	UAE	IRAN	KUWAIT	QATAR
Air Quality	Moderate — localised Ras Tanura smoke, interceptor debris	Moderate-High — Fujairah/ Mussafah fires, AQI reached 125	Extreme — 30+ facilities burning, black rain, pH 4.0	Moderate — downwind of burning oil infrastructure	Low-Moderate — no direct refinery strikes
Water (Desalination)	High — Jubail complex within range, no direct hits yet	High — Fujairah F1 damaged, Jebel Ali 12 miles from strikes	High — Qeshm plant struck, 30 villages without water	High — Doha West plant damaged	High — Ras Laffan blackout halted operations
Marine Ecosystem	High — 800km coastline at risk, tanker leaks, Shaybah runoff	High — Fujairah port fires, sunken vessels	Extreme — Nowruz precedent, naval wrecks, Kharg Island	Moderate — coastal proximity to Iraqi/Iranian contamination	Moderate — LNG spill risk, limited direct strikes
Soil/Land	Moderate — interceptor debris, munitions residue	Low-Moderate — urban debris from interceptions	Extreme — tarcrete formation, unexploded ordnance	Moderate — proximity to contamination zones	Low — minimal ground-level strikes
Public Health	Moderate — 2 civilian deaths, respiratory risk	Moderate — air quality deterioration, port worker exposure	Extreme — 200,000+ emergency presentations, acid rain	Moderate — downwind exposure, desalination disruption	Low-Moderate — evacuation disruption, psychological impact
Food Security	Moderate — strategic reserves, alternative ports via Red Sea	High — only 10 days fresh food supply, Hormuz dependent	Extreme — domestic production disrupted, sanctions	High — 90% import dependent, effectively landlocked	High — 90%+ import dependent, overland routes only

This acoustic dimension of the war's environmental damage receives almost no coverage. Military sonar, mine detonations, and the acoustic signature of sustained naval combat do not produce visible oil slicks or satellite-detectable fire signatures. But they disrupt the navigation, feeding, reproduction, and

communication of every acoustic-sensitive species in the Gulf — including the dugong, whose seagrass feeding grounds have already been compromised by water quality degradation. Species already operating at the margins of viable population thresholds can be pushed below recovery capacity by acoustic disruption alone, without a single direct physical contact.

8.8 The ADALYNN and GPS Spoofing: When Invisible War Creates Visible Spills



[ADALYNN, a Suezmax-class oil tanker]

The ADALYNN spill last June demonstrates a contamination pathway that is entirely distinct from direct strikes or mine events. The incident occurred not from combat but from GPS spoofing — the electronic interference that causes ships to lose their positional awareness and, in this case, their ability to avoid each other. As long as electromagnetic warfare continues in the Strait, as long as vessels navigate blind in contested waters, collision events will occur. And in the Gulf's semi-enclosed basin with its two-to-five-year water renewal cycle, every collision that produces a spill is a contamination event that the ecosystem will carry for years.

The sea absorbs the consequences of decisions made in capitals far removed from its surface. And it does so alone, because there is no legal framework, no accountability mechanism, and no remediation fund that has ever successfully

required the initiators of maritime environmental destruction in conflict to bear its costs.

8.9 The Dual Shock Framework: Hormuz Plus Russian FMD

The food security analysis cannot be completed without acknowledging a second simultaneous shock arriving from a completely separate geography. A Russian foot-and-mouth disease outbreak spreading westward from Siberian livestock populations has received almost no coverage in Western media relative to its potential scale. Foot-and-mouth disease does not kill humans. It devastates livestock — spreading with extraordinary speed across cattle, pig, and sheep populations, triggering international trade bans that cascade across agricultural export networks.

A significant Russian FMD event arriving concurrently with a global food logistics disruption from Hormuz closure is not a coincidence that the food system was designed to absorb. It is a second simultaneous strike on protein supply at exactly the moment when reserves are being drawn down by the first shock. No deliberate coordination is required. The shocks are concurrent by circumstance, and the food system has no playbook for managing both at once.

8.10 The Lag That Makes This a Political Blind Spot

Food prices have not risen sharply yet because existing stocks are absorbing the shock. But if Hormuz traffic does not resume, the impact hits commodity and retail prices later this year and into 2027. The medium-term scenario of a three-month blockade will affect all farmers globally, with different elements impacting mostly in the next season — reduced crop yields and substitutions. The situation could also spark competition from the biofuel sector if oil prices rise above \$100 a barrel, which will be bad for consumers because prices will increase.

This lag is the most dangerous feature of the food security crisis. Political decision-making responds to present pain. Fertilizer price increases that will reduce crop yields in the 2026 planting season will not produce visible food shortages until mid-to-late 2027, by which time the political window for preventive action will have closed, the ceasefire will have been signed and forgotten, and the humanitarian organizations that need to pre-position food aid will be operating reactively rather than preventively.

CONFIRMED OIL FACILITY STRIKES WITH ENVIRONMENTAL CONSEQUENCES (FEB 28 – MAR 10, 2026)				
FACILITY	COUNTRY	CAPACITY/SCALE	DAMAGE	ENVIRONMENTAL RISK
Tehran Refinery	Iran	225,000 bbl/day	Major fire, multiple units	Black rain, acid precipitation
Shahran Fuel Depot	Iran	260M litres (4 of 11 tanks destroyed)	Sustained fire	Groundwater contamination
Ras Tanura Refinery	Saudi Arabia	550,000 bbl/day	Drone debris fire, full shutdown	Coastal oil runoff
Fujairah Oil Terminal	UAE	Major storage hub	Two tanks burning	Coastal marine pollution
Mussafah Fuel Terminal	UAE	Abu Dhabi fuel supply	Drone strike fire (contained)	Urban air quality
Ras Laffan Industrial City	Qatar	World's largest LNG export plant	Blackout, operations halted	LNG release risk
Shaybah Oil Field	Saudi Arabia	1M bbl/day	Drone interceptions (no direct hit)	Desert ecosystem contamination

The populations that will bear the consequences are not in the Strait. They are in the Sahel, in Bangladesh's coastal deltas, in Pakistan's agricultural heartland, in the slums of Cairo. They will experience the food price shock of a war initiated by the United States and Israel in a body of water thousands of kilometres from their homes, through the invisible transmission mechanism of a fertilizer market that repriced in days while their governments were still processing what was happening.

Priority Recommendation: The FAO and WFP must immediately establish a joint Hormuz Food Security Emergency Protocol that pre-positions food aid in the highest-risk countries and pre-purchases fertilizer alternatives before the 2026 planting season closes. The window for preventing a food crisis in 2027 is not when the food prices spike — it is now, while the fertilizer markets are still repricing and the planting decisions are still being made. The artisanal fishing communities of the Gulf coast require dedicated damage assessment and compensation frameworks to be included in any ceasefire agreement, not left for post-conflict recovery plans that the evidence of every prior Gulf conflict suggests will never be implemented.

ENVIRONMENTAL REMEDIATION AND CEASEFIRE GREEN CORRIDORS

THE DIPLOMACY OF SURVIVAL

9.1 The Ceasefire That Did Not Open the Strait

On April 7, 2026, the United States and Iran agreed to a two-week ceasefire dependent on the reopening of the Strait of Hormuz. The agreement was announced. The environmental emergency did not pause to acknowledge it.

Iran's Supreme National Security Council accepted the ceasefire, with negotiations to begin in Pakistan. However, both Washington and Tehran maintained their restrictions on shipping in the Strait of Hormuz while condemning each other's actions. Shipping traffic through Hormuz remained largely halted even after the ceasefire announcement.



The ceasefire produced a political pause. It produced no environmental one. The oil contamination already in the water continued to migrate. The wrecks already on the seabed continued to leach fuel oil. The desalination plants already struck remained offline or operating on degraded capacity. The 21 billion litres of petroleum aboard trapped tankers remained at risk. A ceasefire agreement that does not include a specific environmental remediation protocol and guaranteed access for international response teams is not an environmental ceasefire at all. It is a military one with environmental consequences that continue to accumulate silently on the other side of the ink.

9.2 The Humanitarian Corridor Demand: Who Is Asking and Why It Matters

The International Rescue Committee called for a humanitarian corridor to be established in the Strait of Hormuz to allow lifesaving aid to reach vulnerable populations in countries such as Sudan, Somalia, and Ethiopia.

Italy called for a humanitarian corridor to avert a food crisis in Africa. British Foreign Secretary Yvette Cooper convened around 40 countries to demand the "immediate and unconditional" reopening of the Strait of Hormuz.

Italy was one of 40 nations, including Australia, that met on April 3 to discuss reopening the Strait and called for a humanitarian corridor for fertilizer and essential goods to transit the waterway. France and the United Kingdom co-hosted a subsequent meeting on April 17, discussing "purely defensive" measures to ensure safe shipping through the strait when security conditions allow. French President Emmanuel Macron confirmed the call included dozens of countries.



The humanitarian corridor demand reflects a recognition that the Strait's closure is not a bilateral US-Iran problem. It is a global humanitarian emergency that is being negotiated by two parties whose combined interests represent a fraction of the global population affected. Sudan, Somalia, and Ethiopia — countries receiving no military benefit from either side's strategic calculations — are facing aid shortfalls directly caused by the blockade. African nations dependent on Gulf fertilizer imports are heading into planting seasons with no adequate alternative supply.

9.3 Iran's Post-War Framework: The Oman Channel

Tehran said it was drafting a post-war framework with Oman to oversee maritime traffic through the Strait of Hormuz, though talks had yet to formally begin.

The Iran-Oman framework represents the only bilaterally negotiated maritime governance mechanism to emerge from the crisis. Oman's historic role as a neutral intermediary between Iran and Western states makes it the most credible host for any transit monitoring arrangement. The environmental significance of this framework cannot be overstated: any post-war Strait governance arrangement that does not include environmental monitoring requirements, spill response coordination protocols, and wreck site access

provisions will leave the ecological damage of the conflict unaddressed by design.

Several nations including Malaysia, Pakistan, and France obtained Iranian permission for their vessels to transit the Strait. Ships passing through did so via negotiations with Tehran. The Philippines gained permission to transit. Bloomberg reported that some ships were required to pay in Chinese yuan or cryptocurrency for safe passage.

The precedent being set is alarming from an environmental governance perspective. A maritime transit system administered through informal toll negotiations, denominated in yuan and cryptocurrency, operating outside international maritime law, with no environmental oversight, no incident reporting requirements, and no accountability framework, is not a maritime governance system. It is a shadow economy operating in one of the most ecologically sensitive and commercially critical waterways on earth.

9.4 The UN Security Council: A Divided Body Facing an Undivided Emergency

Bahrain proposed a draft UN Security Council resolution that would authorize the use of force to ensure free transit through the Strait of Hormuz. The US-backed measure divided members ahead of a vote. China, France, and Russia objected to draft resolution language that would authorize the use of military force.

The head of the Gulf Cooperation Council, Jasem Mohamed AlBudaiwi, called for UN backing to protect shipping through the strait, warning that Iran had blocked commercial vessels and imposed conditions on passage.

The Security Council division over the Bahrain resolution reveals the structural impossibility of the current diplomatic situation. The US-backed resolution to authorize force is opposed by China and Russia, whose veto power makes it non-viable. But the absence of a Security Council mandate does not make the environmental emergency less real. The UNEP Statement on Environmental Damage Arising from Conflict in the Middle East confirms the institutional recognition that damage is occurring and that remediation is required. What is missing is the political architecture to deliver it.

Xi Jinping issued his most direct criticism yet of US actions in the Middle East, warning against abandoning international rule of law. Beijing's engagement was driven in part by its dependence on the Strait of Hormuz for oil, but it also signaled that China was trying to play a greater role in the ceasefire process.

China's strategic interest in the Strait is not ideological. It is commercial and energy-dependent. China receives the majority of its Iranian oil through these waters. A sustained environmental degradation of the Gulf that permanently compromises transit safety or increases the frequency of spill events directly damages Chinese energy security. This convergence of environmental and strategic interest is the leverage point through which environmental remediation could be incorporated into any Chinese-mediated ceasefire framework — if environmental organizations have the diplomatic access to make that case to Beijing's negotiators.

9.5 Germany's Minesweepers and the Remediation Coalition Taking Shape

An unnamed German official told Politico that Germany is open to deploying minesweepers and maritime reconnaissance equipment in the waterway if an international mandate to do so is agreed upon. Seven US allies pledged to help ensure safe passage through the strait, but did not specify how.

Germany's willingness to deploy minesweepers is the most concrete environmental remediation offer made by any state actor in the conflict. Mine clearance is not purely a military operation. It is an environmental one. As established in Group 6, bottom mines buried in Gulf sediment contaminate the seabed. Their controlled detonation during clearance releases chemical compounds into the water column. And the navigational hazard they create is inseparable from the environmental monitoring gap they produce — no environmental response vessel can operate safely in a mined waterway.

A coordinated minesweeping operation under international mandate, combined with simultaneous deployment of environmental monitoring equipment — underwater chemical sensors, satellite SAR passes, and surface oil response vessels — would constitute the minimum viable environmental remediation framework for the Strait. Germany's offer, if operationalized with this dual mandate, could become the foundation of a genuine Green Corridor.

9.6 Pakistan's Mediation and the Environmental Blind Spot

Pakistan convened talks with Egypt, Saudi Arabia, and Turkey in Islamabad to explore ways to end the Iran war, with discussions centering on proposals to reopen the Strait of Hormuz. Pakistan's army chief Field Marshal Asim Munir met with Iranian officials in Tehran, while Prime Minister Shehbaz Sharif held meetings in Qatar. Egyptian Foreign Minister Badr Abdelatty said Egypt,

Pakistan, Saudi Arabia, and Turkey were coordinating a broader regional effort to prevent renewed escalation and lay the groundwork for a post-war security arrangement.

Pakistan's mediation effort is the most substantive diplomatic initiative to emerge from any regional actor since the conflict began. It secured the ceasefire extension and created the channel through which US-Iran talks in Islamabad took place. But the entire framework of Pakistan's mediation — and indeed every ceasefire negotiation framework documented in the conflict record — addresses military de-escalation, nuclear issues, Strait transit, and sanctions. Not one reported framework includes environmental remediation as a negotiating track.

This is the defining institutional failure of the international response to this conflict's environmental dimension. The political off-ramp being constructed in Islamabad has no green lane. Environmental response teams, spill cleanup vessels, UNEP assessment missions, and independent atmospheric monitoring access are not on the negotiating table. They are being left to the post-conflict period — which, as every prior Gulf conflict has demonstrated, means they will be left to not happen.

9.7 The "Third Party Risk" Problem: NGOs Blocked From the Emergency

The World Bank warned of mounting risks to inflation, jobs, and food security worldwide. The UNDP estimated the conflict could cost Arab countries between \$120 billion and \$194 billion in lost economic output, a regional GDP decline of between 3.7 and 6 percent.

Environmental and humanitarian NGOs attempting to access conflict-affected areas in Iran, the Gulf coast, and the Strait zone face a compounding barrier problem. The active naval blockade makes maritime access to the Gulf impossible without military clearance. The Iranian government's wartime information controls restrict independent environmental assessment access within Iranian territory. The GCC states, operating under their own censorship regimes, are suppressing independent documentation of domestic damage. And the international legal framework for conflict-zone environmental monitoring — never strong to begin with — provides no enforceable right of access for environmental assessment missions.

The Conflict and Environment Observatory's documentation of 120 incidents within three days of the conflict's start, and over 300 within two weeks, was

achieved entirely through satellite imagery, open-source data, and remote sensing. No CEOBS researcher, no UNEP field assessor, and no NGO environmental team had physical access to any of the documented sites. This means the most comprehensive environmental record of the conflict's early weeks was assembled by organizations operating thousands of miles away, working from satellite passes and AIS data, with no ground truth verification.

A joint letter from US-based international law experts stated that the conduct of all three parties — Israel, Iran, and the United States — raises concerns of serious violations of international law.

The legal accountability dimension of this access problem is direct. Without physical environmental assessment access, the evidentiary record required for future ecocide claims, remediation cost attribution, and international legal accountability proceedings cannot be built. The political actors who initiated this conflict have a structural incentive to delay access until natural processes degrade the evidence. Every week that environmental teams are denied access is a week that accountability becomes harder to achieve.

9.8 What a Genuine Green Corridor Would Require

A genuine environmental Green Corridor, operating under ceasefire guarantee from all parties, would require the following minimum elements — none of which have been formally proposed by any state actor in the current negotiation framework:

First, guaranteed safe passage for environmental response vessels operating under UN or ICRC flag, with explicit immunity from IRGC enforcement and US naval interception, allowing them to access wreck sites, conduct water sampling at desalination intakes, and deploy boom and skimmer equipment around active spill zones.

Second, independent atmospheric monitoring access to the Tehran metropolitan area and surrounding agricultural zones, with certified chain-of-custody sampling protocols that can be used in future legal proceedings.

Third, a formal wreck site hazard assessment mandate covering the IRIS Dena, Mayuree Naree, Safeen Prestige, and all other documented sunken or grounded vessels, with results shared with the IMO, UNEP, and all affected coastal state governments.

Fourth, a dedicated environmental track within the Pakistan-mediated ceasefire framework, with a named environmental focal point on each negotiating

delegation and a binding commitment from all parties to allow UNEP field access within 30 days of any ceasefire agreement.

Fifth, a pre-agreed environmental remediation fund, structured similarly to the UN Compensation Commission established after the 1991 Gulf War, with contributions proportional to environmental damage caused and administered independently of any political resolution timeline.

9.9 The Ceasefire Extension: A Window That Will Not Stay Open

Trump announced an extension to the US-Iran truce to allow Iranian leaders to reach a unified proposal. The extension came as the truce was in its final stretch and marked an abrupt shift, as Trump had earlier reiterated opposition to an extension. Pakistani Prime Minister Shehbaz Sharif thanked Trump for the extension, writing it would allow ongoing diplomatic efforts to take their course.

Iran's foreign ministry spokesperson Esmail Baghaei stated that Washington had violated the ceasefire from the beginning and warned that if the US and Israel launched renewed aggression, Iranian forces would respond accordingly. Tehran cited the overnight seizure of an Iranian carrier and the naval blockade as grounds for refusing talks, with Baghaei dismissing US statements on negotiations as a media game.

The ceasefire extension is the only window through which environmental remediation access could be negotiated without active combat conditions. It is a window that both parties have demonstrated the will and capacity to close on short notice. Environmental organizations, UN agencies, and neutral state mediators who wish to insert an environmental track into the ceasefire framework have a specific, narrow, and closing window to do so. The diplomatic calendar is not waiting for environmental assessments to be completed. It is moving forward with or without them.

Priority Recommendation: The ceasefire extension window must be used immediately to table a standalone UN Security Council Resolution on Environmental Access — distinct from the disputed force authorization resolution — that mandates UNEP field access to all conflict-affected sites, establishes an independent environmental monitoring mission for the Strait of Hormuz and Gulf coast, and creates a pre-agreed remediation fund. Pakistan, as the active mediator with credibility on both sides, is the only state actor currently positioned to introduce this proposal to both the US and Iranian

negotiating delegations. The environmental case must be made to Islamabad now, before the next negotiating session closes without it.

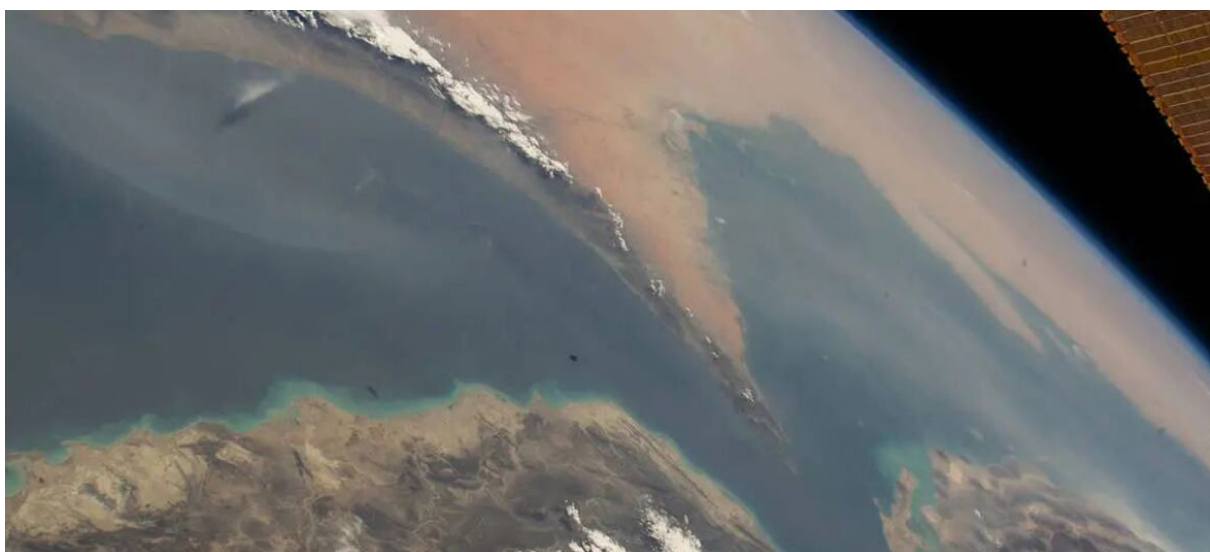
ECOCIDE AS TACTICAL AREA DENIAL

MINE WARFARE, UUV SENSOR FOULING, AND THE LEGAL RECKONING

10.1 The Strategic Logic of Environmental Destruction as a Weapon

When kinetic military operations target critical infrastructure in the energy-dense geographies of the Middle East, the collateral damage is profoundly ecological. The US and Israeli strikes on Iranian infrastructure, and the IRGC's asymmetric retaliation against regional energy grids, petrochemical facilities, and maritime chokepoints, carry the near-certainty of massive environmental spillover. This is not accident. It is embedded in the targeting logic of modern infrastructure war.

The preemptive strikes on Iranian refineries, fuel depots, and naval facilities did not merely degrade military capacity. They released carcinogenic compounds into civilian air, petrochemicals into agricultural soil, and petroleum derivatives into a semi-enclosed sea. When a ballistic missile strikes a refinery, a drone detonates a pipeline network, or a VLCC is struck in the Strait of Hormuz, the resulting oil spills, toxic chemical releases, and atmospheric contamination present an unprecedented legal and humanitarian dilemma. The environment becomes both a casualty of war and a tool of war simultaneously.



[NASA satellite photo shows the strategically important shipping route of the Strait of Hormuz]

10.2 Iran's Mine Arsenal: A Catalogue of Seabed Denial

The Iranian navy had a massive stockpile of sea mines prior to the conflict. Sea mines are relatively easy to deploy — they can be taken out in a fairly small boat, a fishing boat, a dhow, or a dedicated minelayer.

Iranian Naval Mines					
	Maham-3	Maham-1	Maham-2	Maham-7	? Self-propelled mine
Country of Origin:	Iran	Iran	Iran	Iran	Iran
Type:	Moored influence mine (acoustic / magnetic)	Moored contact mine	Bottom influence mine (acoustic / magnetic) (targets 4-15 knots)	Bottom influence mine (acoustic / magnetic)	Bottom influence mine
Warhead	300 kg	120 kg (some smaller)	350 kg (sympathetic – 100m)	150 kg	Est. 350 kg
Maximum depth:	100 m	100m (1-5m floating)	10-50 m	~35 m	~50 m
Ship counter:	Yes, 1-99	No	Yes, 1-15	Yes, 1-99	TBC
Activation delay:	1-30 days	Immediate	Up to 18 hours	0-127 days	TBC
Active for:	365 days	3 - 270 days	Up to 397 days	365 days	TBC
Launch platforms:	Surface	Surface	Surface	Surface, aircraft (parachute) or helicopter	Submarine, shore (?)

The mine catalogue deployed in the Strait represents one of the most sophisticated asymmetric maritime denial systems in existence. Each type carries distinct environmental implications beyond its military purpose. The Maham-3 is the primary deep-water threat, a moored mine deployable in waters up to 100 meters deep. After deployment, it rises along its mooring cable and stabilizes just below the keel depth of passing vessels. It uses low-frequency acoustic sensors and can be enhanced with directional acoustic sensing and a magnetic fuse. It weighs 383 kg with a 120 kg explosive charge. The environmental consequence of detonation in the Strait's narrow navigable channel is a pressure wave that damages coral and seagrass beds within hundreds of meters of the blast site, while the explosive chemical compounds disperse into the water column feeding desalination intake systems downstream.

The Maham-2 is a bottom mine sitting on the seabed, significantly harder to detect than moored types. Its warhead of 320 kg is larger than moored

variants. It uses acoustic or magnetic fusing, has an arming delay of several days, and carries a ship counter that can be set to ignore the first number of vessels that pass — making it extraordinarily difficult to sweep because minesweepers cannot trigger it by a single pass. Partially buried in sediment, the Maham-2 physically disturbs seabed ecology simply through its presence, before any detonation occurs.

The Maham-6 is a close copy of the Italian Manta bottom mine used by Iraq during the Iran-Iraq war. Its conical shape makes it difficult to detect on the sea floor. There have also been persistent reports of Iran importing EM-52 rocket mines from China — moored on the seabed at depths up to 200 meters, these launch upward via rocket propulsion when a ship is detected overhead, capable of devastating even large vessels.



[An image of a small boat carrying a Maham-1 moored contact mine]



[Practice-round Maham-2 being laid by an IRGC Mi-17 HIP helicopter during exercises]

10.3 The Fourth Dimension: Why Mine Clearance Is an Environmental Operation

Clearing sea mines involves working not just in three different depths but also a fourth dimension: time. Over time, mines may move. If an area is cleared and there is a tidal surge or other current, that same area may be contaminated again. Moreover, some mines move through the water driven by a propellant mechanism, so those clearing them are working in a dynamic and changing environment. Temperature layers in the water column can act as a reflector, degrading or deflecting sonar signals sent to detect mines at depth.

Modern mines typically combine multiple sensing modes. Some are designed to detonate only after a certain number of ships have passed, allowing them to ignore smaller vessels or minesweeping attempts and target higher-value ships. Even the possibility of mines can disrupt shipping and force extensive and costly clearance operations. During the 1980s Tanker War, Iran and Iraq

deployed relatively small numbers of mines, causing significant disruption to shipping and forcing costly, time-consuming clearance operations even when direct damage was limited.



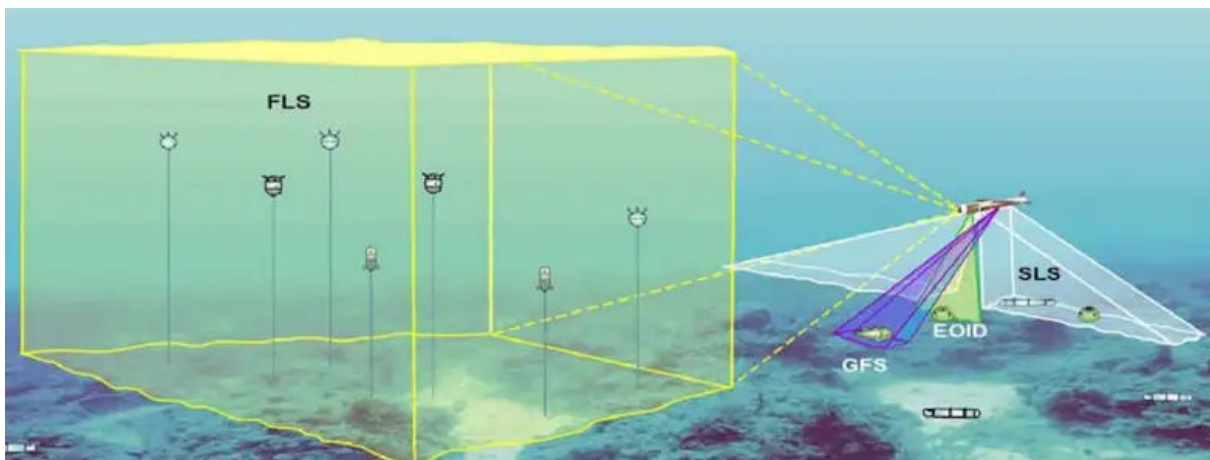
[This is an example of a 'Manta' naval mine]

The environmental consequence of the mine clearance operation itself is a dimension that receives almost no coverage. Each controlled detonation of a discovered mine releases explosive chemical compounds — primarily RDX, TNT, and PETN derivatives — directly into the water column. In a semi-enclosed basin where the Gulf's tidal circulation carries water northward past Kuwait's desalination intakes and southward past Qatar's and the UAE's intake systems, mine disposal is not a purely military operation. It is a chemical injection event into a closed sea with a two-to-five-year water renewal cycle. A convoy-based clearance approach, as described by UNMAS expert Paul Heslop, operating in a channel a couple of kilometres wide, would produce dozens of controlled detonations in close proximity to the Gulf's most sensitive shallow-water ecosystems. The environmental monitoring protocol for this operation — if one exists — has not been made public by any participating military authority.

10.4 The AI Mine-Hunting Race: Technology in a Contaminated Sea

Mine detection is best understood as a wide-area sonar search producing many contacts — essentially, anything unusual in the sonar data. Automatic target recognition algorithms then triage these contacts and classify them as either mine-like objects or benign. Divers or camera systems then provide higher-confidence identification to validate the result. This is known as a detect-classify-identify pipeline.

To collect data, an uncrewed surface vehicle deployed from a larger ship can tow a sonar platform at a fixed height above the seabed. The Navy also operates the MK 18 Kingfish sonar-equipped drone for detecting mines. The British Royal Navy was also preparing to send a towed sonar array to the Persian Gulf region. The US Navy recently decommissioned the minesweeping vessels it had operating in the Persian Gulf region and must rely on these alternative systems.



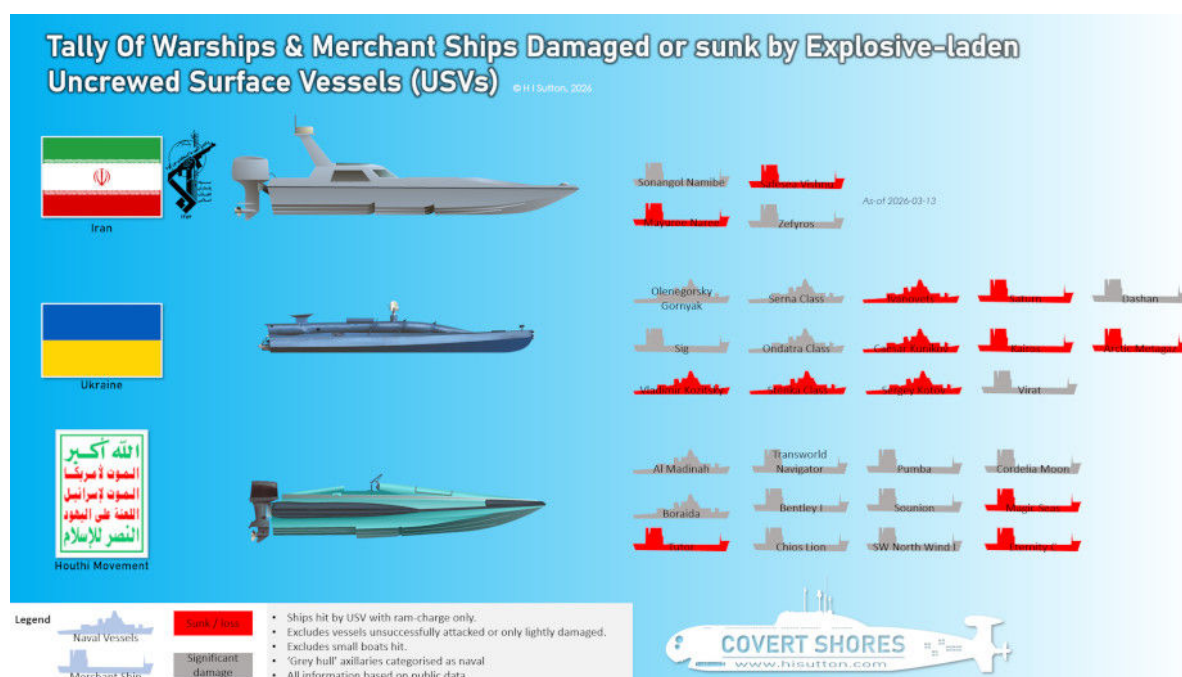
[The US Navy's towed sonar array includes forward-looking sonar to detect moored mines (yellow region) and side-looking sonar to scan for mines sitting on the seabed (white region)]

The intersection of oil contamination and mine detection is an intelligence gap that has received no public analytical attention. Oil floating on the Gulf's surface — from tanker strikes, refinery releases, and the accumulated leakage of weeks of conflict — degrades the acoustic environment in which mine-hunting sonar operates. Oil slicks attenuate sound propagation differently than clean seawater, creating false readings and shadow zones in sonar imagery. Petroleum contamination of the water column scatters acoustic energy in ways that AI target recognition algorithms trained on clean-water datasets have

never been trained to handle.

This is the sensor fouling dimension of ecocide as area denial. The oil released by strikes on Gulf energy infrastructure does not merely damage the marine ecosystem. It actively degrades the US Navy's ability to find and clear Iranian mines. The environmental destruction and the military operational challenge are not separate problems. They are the same problem operating simultaneously in the same water.

10.5 Iranian USVs: The Surface Drone Threat and Its Spill Consequences





Iran was the first country to develop explosive-laden uncrewed surface vessels, supplying this technology to the Houthi movement in Yemen in 2017. The Iranian USV doctrine, refined through Houthi operations against Saudi shipping and now deployed directly in the Persian Gulf, uses small interceptor-type boats with twin outboard motors that can be crewed for part of their mission before transferring command to a following boat at point-blank range.



Each USV strike on a laden tanker is simultaneously a military operation and an environmental incident. The Sonangol Namibe attack off Kuwait — a USV strike that breached the cargo tank and confirmed oil in the water — is the template for what these weapons do to the marine environment when they succeed. A successful strike does not sink a tanker immediately. It ruptures hull compartments, releases petroleum cargo into coastal waters, and then leaves the damaged vessel at anchor bleeding oil into the same tidal systems feeding regional desalination intakes.



[The attack on the tanker Sonangol Namibe off Kuwait on March 5]



[Underground IRGC base showing multiple USV-type vessels]

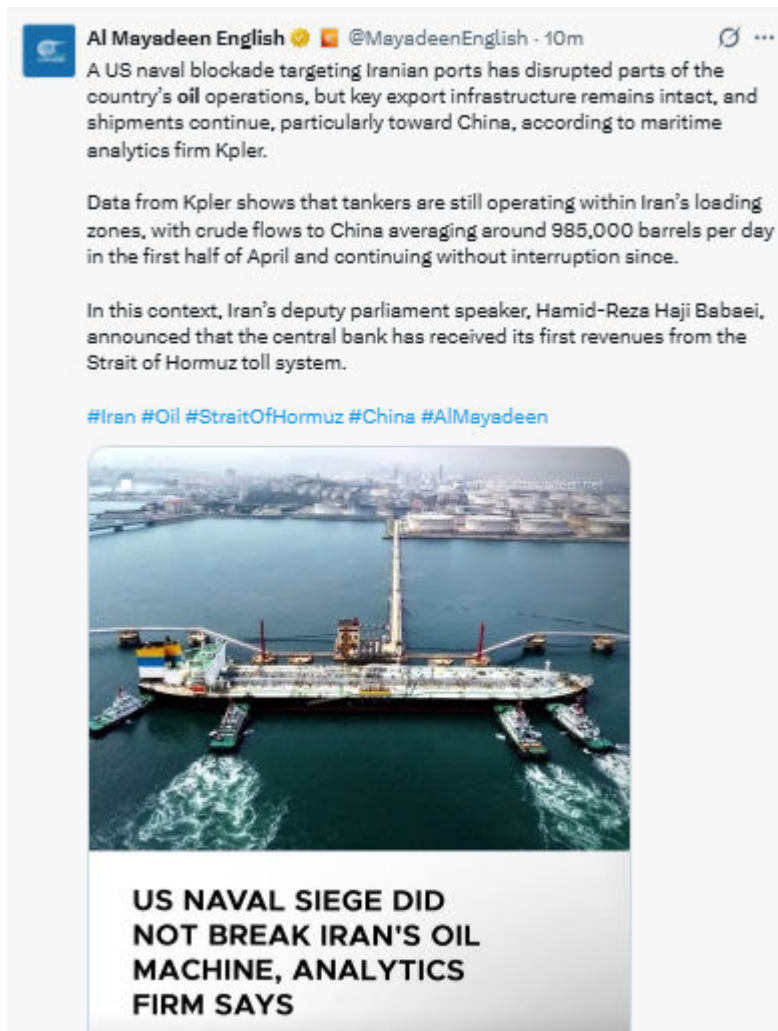
10.6 The Bandar Abbas Fleet: A Naval Force That Did Not Disperse

Before the conflict began, satellite imagery of Bandar Abbas showed Iran's major naval assets berthed in predictable locations — two Kilo-class submarines, multiple Ghadir-class midget submarines, three frigates, an intelligence vessel, amphibious warfare ships, and at least one catamaran stealth missile corvette. The Iranian navy made no significant attempt to disperse or harden its surface fleet before US strikes began.



[Satellite image of Bandar Abbas showing Iranian major warships in port, February 26-27, 2026]

This calculated non-dispersal reflects an understanding that Iran's conventional naval assets are not the strategic instrument in this conflict. The strategic instruments are mines, USVs, UUVs, and Nazir-series underwater drones — assets that are mobile, concealable, and deployable from small craft. Iran's conventional fleet is a secondary consideration. Its asymmetric undersea and surface drone fleet is the primary denial mechanism. This distinction matters for environmental assessment because the assets doing the environmental damage — USVs striking tankers, UUVs patrolling the Strait, mines contaminating the seabed — are not the assets visible in satellite imagery of naval ports.



10.7 The UNCC Precedent: Environmental Destruction Has Quantifiable Legal Standing

The foundational legal precedent for what comes after this conflict is the United Nations Compensation Commission, established by UN Security Council Resolution 687 following the 1991 Gulf War. When Iraqi forces retreated from Kuwait and deliberately set over 600 oil wells ablaze while releasing millions of barrels of crude into the Persian Gulf, the international community faced a novel legal challenge: how do you place a financial value on a destroyed biosphere?

The UNCC's handling of environmental damage claims, designated as the F4/F5 claims category, revolutionized international law. The Commission formally recognized claims for environmental damage and the depletion of natural resources — not just the commercial value of the burned oil itself, but the actual physical cost of restoring natural ecosystems. The UNCC established that compensation could be legally awarded across three distinct

pillars: preventive measures covering emergency costs to mitigate further degradation; reasonable restoration covering long-term capital expenses for cleanup, soil remediation, and aquifer restoration; and monitoring and assessment covering scientific study of long-term health and ecological impacts, formally acknowledging that environmental damage from warfare often takes years or decades to fully manifest.

The Commission ultimately awarded over \$3.2 billion strictly for environmental remediation and restoration. This set an unshakeable precedent in international law: pure ecological harm, distinct and separate from commercial property loss, has quantified, actionable legal standing, and the entity responsible for the military aggression bears the financial burden for the devastation.

For the 2026 conflict, the UNCC precedent dictates a specific reality for every state and corporation with assets in the blast radius. Environmental damage in war is not legally "collateral." It is a financially quantifiable liability. If an international energy company's facility in the GCC is struck by an Iranian retaliatory drone, resulting in a toxic leak that destroys a coastal fishery or contaminates a water table, the host state will seek billions in cleanup costs. If the host state attempts to penalize the foreign investor under domestic environmental regulations, arguing the facility was inadequately hardened against attack, the corporation must demonstrate that the environmental destruction was the direct result of the military aggression — not operational negligence — to shield its balance sheet from the cleanup costs.

Furthermore, as the deliberate destruction of critical infrastructure becomes normalized in modern conflicts, international legal scholars and arbitrators are increasingly engaging with the concept of ecocide — the mass, systemic destruction of nature as a weapon of war. As states and corporations prepare to arbitrate the massive costs of post-war reconstruction, the UNCC's formula for valuing the restoration of water tables, agricultural land, and biodiversity will serve as the baseline methodology for determining damages in the 2026 conflict.

10.8 The Futility Exception: Bypassing Captured Courts

Before any multinational corporation can bring an environmental liability dispute to international arbitration, most Bilateral Investment Treaties require the exhaustion of domestic legal remedies in the host state. In the context of the 2026 conflict, this presents a near-impossible jurisdictional barrier. Host state courts in conflict zones may be suspended, inherently biased against foreign

entities from "enemy" nations, or legally barred from ruling against sovereign military decrees.

The Finnish Shipowners Arbitration of the 1930s, adjudicated in Stockholm between Finnish shipowners and the British government over World War I maritime requisitioning, established the definitive legal framework for bypassing this barrier. The international arbitrator ruled that claimants are legally permitted to bypass local courts and proceed directly to international arbitration if they can convincingly demonstrate the inadequacy, structural bias, or futility of the domestic legal system. The ruling established what became known as the Futility Exception.

For corporations operating in the 2026 Middle East conflict zone, this doctrine is the tactical weapon that allows immediate escalation of environmental liability claims to binding international arbitration without years of litigation in compromised domestic courts. Corporate legal teams must rigorously document the impossibility of justice within the host state — suspended constitutional norms, nationalized industries, publicly declared foreign investors as "enemies of the state," or courts that are physically inaccessible due to airspace closures and active conflict.

Priority Recommendation: Corporate legal teams, national security councils, and international legal bodies must immediately begin building the evidentiary record required for post-war environmental liability proceedings under the UNCC framework. The data collection window is closing with every passing week of conflict. Satellite imagery, atmospheric monitoring records, water sampling data, and ship incident logs must be certified and preserved now. The Futility Exception pathway to international arbitration must be pre-documented for all corporations with affected assets. And the international community must formally recognize that ecocide in the 2026 Persian Gulf conflict is not a metaphor — it is a legally actionable category of harm with precedent, methodology, and financial quantification already established by four decades of international law.