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When Ships Sink in War: Who Pays for the Environmental Wreckage?



On a quiet stretch of the Red Sea, a commercial tanker sits partially submerged, struck by a missile, abandoned by its crew, and slowly bleeding fuel oil into one of the world's most ecologically sensitive waterways. The war that put it there has moved on. The oil has not.

This is not a hypothetical. Since the escalation of Houthi attacks on commercial shipping in late 2023, dozens of vessels have

been damaged or sunk in the Red Sea and Gulf of Aden. The "Rubymar", a Belize-flagged bulk carrier, was struck in February 2024 and sank days later, reportedly releasing fertilizer cargo and leaking fuel into the sea. It was a stark reminder that the environmental consequences of maritime warfare do not end when a ship goes under, in many cases, they are only beginning.

The question of who bears legal and financial responsibility for cleaning up

a wartime shipwreck is one that international maritime law has never answered cleanly. The frameworks exist, but they were largely built for peacetime accidents. War tears holes in all of them.

The Peacetime Frameworks and Why They Fall Short

International maritime law has developed robust tools for dealing with shipwreck pollution in ordinary circumstances. The Nairobi International Convention on



THOUGHT for the MONTH

What lies behind us and what lies before us are tiny matters compared to what lies within us.

- Ralph Waldo Emerson

the Removal of Wrecks (2007) is the primary instrument governing wreck removal. It obligates the flag state and the registered shipowner to locate, mark, and remove a wreck that poses a hazard, including an environmental one. Shipowners are required to maintain insurance or financial security to cover these costs, and the Convention applies to the exclusive economic zones of states parties or an equivalent area beyond the territorial sea, subject to the Convention's provisions concerning extension of its application to the territorial sea.

The problem is that the Nairobi Convention was designed around accidents, groundings, collisions, mechanical failures. It says very little about what happens when a ship is sunk deliberately by a third party in an active conflict. The definitions of "hazard" and "affected state" presuppose a functioning chain of ownership and liability. In a war zone, that chain often snaps immediately. Owners abandon vessels. Insurers invoke war exclusion clauses. Flag states disclaim involvement. And the wreck simply sits there, leaking.

Similarly, the International Convention on Civil Liability for Bunker Oil Pollution Damage (2001) holds shipowners strictly liable for pollution caused by bunker fuel spills. But strict liability only works when there is an identifiable and solvent defendant. When a vessel is sunk by a non-state armed group, the notion of pursuing the registered shipowner for cleanup costs becomes a legal exercise in frustration.

The International Convention for the Prevention of Pollution from Ships (MARPOL) sets discharge standards and pollution prevention requirements for operational vessels. It was never intended to address the uncontrolled release of oil from a stricken ship on the bottom of the sea.

The Law of Armed Conflict and Its Environmental Blind Spots

One might hope that the laws of war fill the gaps left by peacetime maritime conventions. They do not, at least not satisfactorily.

The 1949 Geneva Conventions and their Additional Protocols impose obligations on belligerents to avoid disproportionate

environmental damage. Additional Protocol I (1977) specifically prohibits methods of warfare intended or expected to cause widespread, long-term, and severe damage to the natural environment. In principle, an attacker who deliberately sinks a laden tanker in an ecologically sensitive area could be in violation of this standard.

In practice, prosecution is nearly impossible. The threshold, widespread, long-term, and severe, is extremely high, and the standard has not been successfully applied in an international criminal proceeding. The attacking party must also be a state, or at least a recognised armed group subject to international humanitarian law. Non-state actors like the Houthis operate in a complicated legal space. And even if liability were established in principle, translating that into actual environmental remediation is another matter entirely.

The UN Convention on the Law of the Sea (UNCLOS) places broad obligations on states to protect and preserve the marine environment, including from pollution caused by vessels. Article 194 requires states to take measures to prevent, reduce, and control such pollution. But UNCLOS addresses state obligations, not the specific mechanics of who funds cleanup after a wartime sinking. The coastal state whose waters are affected may have the clearest interest in acting, but often lacks the legal authority, or the practical ability, to compel anyone to pay for it.

The Insurance Gap

Marine insurance sits at the heart of how pollution liability is normally resolved. Under the International Group of P&I Clubs system, shipowners carry Protection and Indemnity insurance that covers pollution liabilities up to substantial limits. These clubs pool risk globally and are the financial backbone of maritime pollution response.

War changes everything. Standard P&I cover generally excludes liabilities from war risks. Separate war risk insurance can be purchased, but it typically covers hull damage and loss of hire, rather than third-party environmental liability. When a ship is sunk in a conflict zone, the owner may recover the value of the

vessel, but the question of who pays to remove or contain it is left wide open.

The International Oil Pollution Compensation (IOPC) Funds, established under the 1992 Fund Convention, provide a supplementary layer of compensation for victims of oil pollution from tankers. But these funds are triggered by pollution from incidents falling within the scope of the applicable conventions, and their application to deliberate wartime sinkings is legally uncertain and practically untested at scale.

Who Actually Acts, and Who Actually Pays?

When the legal frameworks produce no clear answer, the practical reality is that either the affected coastal state bears the cost, or no one does.

Coastal states have strong incentives to act, a leaking wreck in their waters threatens fisheries, tourism, and public health. Under the Nairobi Convention and UNCLOS, they have the legal authority to intervene and remove or contain a hazardous wreck in their EEZ. Some conventions allow the acting state to seek reimbursement from the shipowner or its insurer. But when the shipowner is insolvent, uncontactable, or operating under a flag of convenience with no meaningful state backing, recovery is illusory.

The International Maritime Organization (IMO) has called for greater international cooperation in exactly these scenarios, but cooperation is easier to call for than to organize during an active conflict. Regional bodies, port state control agreements, and bilateral arrangements between coastal states can help, but they are not substitutes for a clear multilateral framework.

The Case for a New Instrument

The incidents accumulating in the Red Sea, and before that the Black Sea, where several vessels were damaged or sunk during the Russia-Ukraine conflict, suggest that wartime shipwreck pollution is not an edge case. It is an increasingly foreseeable consequence of modern conflict in commercially active waterways.

There is a credible argument for a new international instrument, or a significant amendment to existing ones, that specifically addresses environmental liability for conflict-related wrecks. Such a framework would need to address at minimum: the obligation of attacking parties (whether states or armed groups) to remediate environmental damage; a compensation fund for cases where the liable party cannot be identified or is unwilling to pay; clearer authority for coastal and flag states to act without

waiting for the resolution of armed conflict; and mandatory environmental assessment of sunken vessels in or near sensitive marine areas.

None of this is simple. The politics of creating obligations for non-state armed groups are genuinely difficult. Funding mechanisms require state contributions. And states engaged in or supporting armed conflicts have little appetite for signing instruments that might expose them to liability.

But the sea does not wait for legal clarity. The oil keeps spreading, the cargo keeps dissolving, and the wreck keeps sitting on the bottom, long after the missiles have stopped flying.

International maritime law has done remarkable work over the past century in building frameworks for a safer, cleaner ocean. The next frontier is making sure those frameworks survive contact with war ■



HOT NEWS

When AI Goes Underwater: Are Oceans Becoming the Next Data Center Frontier?



The global artificial intelligence boom is creating an unprecedented demand for data centres, bringing with it growing concerns over energy consumption, freshwater usage, land availability and carbon emissions. As traditional land-based infrastructure comes under increasing pressure, technology developers are beginning to look towards an unconventional frontier: the ocean.

Underwater and floating data centres are emerging as potential alternatives to conventional facilities, with the promise of using seawater for cooling,

reducing freshwater consumption and easing pressure on increasingly scarce land resources. But moving AI infrastructure offshore does not make its environmental footprint disappear. Instead, it introduces a new set of technical, environmental and regulatory challenges.

From Microsoft's experiment to commercial deployment

The concept is not entirely new. In 2015, Microsoft began exploring the feasibility of underwater data centres and, in 2018, deployed a sealed data

centre containing 864 servers on the seabed near Scotland's Orkney Islands.

After two years of operation, Microsoft reported that the underwater servers experienced failure rates approximately one-eighth of those experienced by comparable land-based facilities. The company attributed the improved reliability, among other possible factors, to the controlled environment, reduced exposure to oxygen and humidity, stable temperatures and limited human intervention.

Microsoft ultimately ended the

project in 2024 and shifted its focus back to land-based data centres, which offer greater accessibility for maintenance, upgrades and expansion.

The concept, however, has continued to develop elsewhere.

China's underwater data centre project in Shanghai, reportedly powered partly by offshore wind, entered full commercial operations in May 2026. The approximately US\$226 million facility uses seawater for cooling and is reported to consume at least 30% less electricity than conventional data centres.

Other countries are pursuing different ocean-based models. Japan has been testing containerised data centres on floating platforms, combining seawater cooling with solar power and battery storage. Singapore is also developing a floating data centre, while South Korea has been planning a large-scale underwater facility capable of accommodating more than 100,000 servers.

These developments suggest that ocean-based computing is moving beyond experimental technology and towards a potentially significant component of future digital infrastructure.

The environmental equation

The attraction is clear. Seawater can provide an abundant cooling medium, potentially reducing the energy and freshwater requirements associated with conventional cooling systems. Offshore locations can also provide access to renewable energy sources such as wind, solar and tidal power.

However, the ocean is not an unlimited cooling reservoir.

The discharge of heated seawater from data centres could affect local water temperatures, oxygen levels and pH, potentially disturbing marine ecosystems. Existing

facilities have reported seawater temperature increases of around 1°C near discharge points.

While the impact of an individual facility may be limited, the cumulative effect of multiple large-scale installations could become more significant, particularly in environmentally sensitive areas.

This raises an important question: Can infrastructure designed to make AI more sustainable inadvertently create a new form of marine environmental pressure?

A new regulatory frontier

Perhaps the most complex challenge is not technological, but legal.

Placing large-scale computing infrastructure on or beneath the sea raises questions concerning environmental permits, marine spatial planning, coastal and seabed rights, maritime jurisdiction, renewable energy regulation, environmental impact assessments and liability for potential ecological damage.

Unlike a conventional data centre located on privately owned land, an underwater or floating facility may operate within areas subject to multiple layers of national and international regulation.

Regulators may also need to consider issues such as:

- Environmental impact and marine ecosystem protection;
- Licensing and permitting for seabed or offshore installations;
- Ownership and use of marine and seabed areas;
- Cross-border and jurisdictional considerations;
- Submarine cables and offshore infrastructure;
- Emergency response and removal obligations;

- Maintenance, decommissioning and end-of-life responsibilities; and
- Liability arising from environmental damage or operational failures.

Maintenance presents another practical challenge. A failed server inside a sealed underwater facility cannot simply be accessed by an engineer. In some cases, the entire module may need to be recovered to the surface for repair or replacement. This could significantly affect operational costs, response times and contractual risk allocation.

Can the ocean sustain AI?

Ocean-based data centres could potentially reduce pressure on land, freshwater resources and conventional electricity grids while allowing computing infrastructure to remain relatively close to densely populated coastal regions.

Yet the fundamental environmental challenge remains: AI still requires enormous amounts of energy. Moving the servers underwater does not eliminate electricity consumption or carbon emissions. It simply changes how the infrastructure is powered, cooled and located.

The real question, therefore, is not whether data centres can be placed in the ocean, but whether they can operate there responsibly, economically and within a robust regulatory framework.

As AI continues to expand, the ocean may become the next frontier for digital infrastructure. But before the seabed becomes the next home for thousands of servers, governments, technology companies and maritime stakeholders will need to determine how innovation can coexist with the world's already fragile marine environment.

The future of AI may be underwater. The bigger question is whether the law and the ocean are ready for it ■

Courtesy : - www.maritime-executive.com

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