Oil Spill

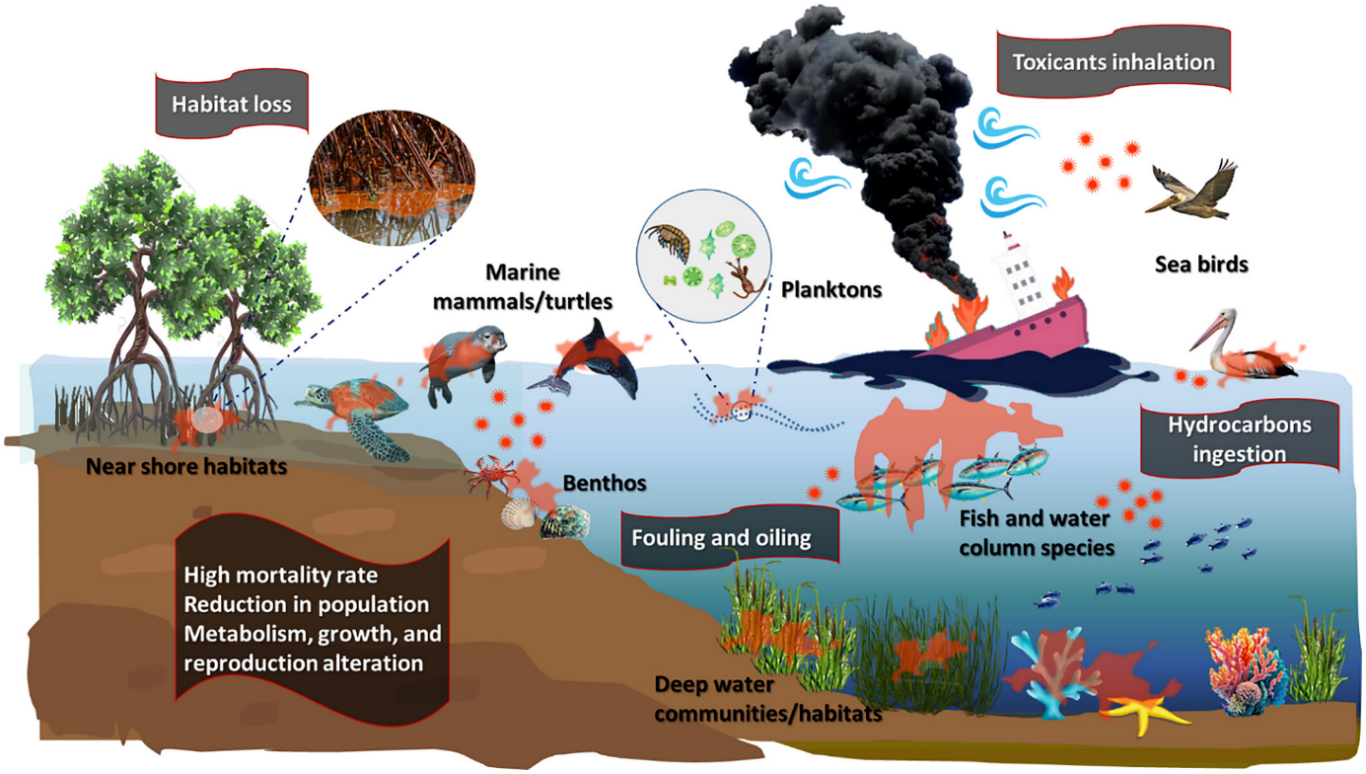
Mains Syllabus: GS III - Conservation, environmental pollution and degradation.

Why in the News?

A Liberian-flagged cargo ship carrying 640 containers onboard, including 13 hazardous cargoes, capsized and sank in the sea off the coast of Kerala, raising fears of an oil spill.

What are the impacts of oil spill?

- **Impacts on Marine Life** - Oil can coat feathers and fur of marine animals, including seabirds, marine mammals, and fish, hindering insulation and leading to hypothermia or overheating.
- Acute exposure to oil can kill large numbers of animals.
- **Habitat Loss -** Sensitive habitats such as wetlands, coral reefs, and mangrove forests can be severely damaged by oil spill.
- **Ecosystem Disruption** - Oil can smother plants and animals, disrupt food chains, and cause long-term changes in ecosystem structure and function.
- **Contamination of Water Sources** - Oil spills can contaminate drinking water supplies, impacting human health.
- **Health Risks** - Oil spills can cause respiratory problems, skin irritation, and other acute health effects for people exposed directly to oil or fumes, including cleanup workers and coastal residents.
- **Water and Air Pollution** - Spilled oil can contaminate drinking water supplies and increase air pollution, leading to broader public health concerns.
- **Damage to Fisheries and Livelihoods** - Oil spills can force the closure of commercial and recreational fisheries, causing significant financial losses for fishermen and related industries.
- **Tourism Losses** - Contaminated beaches and water lead to a sharp decline in tourism.

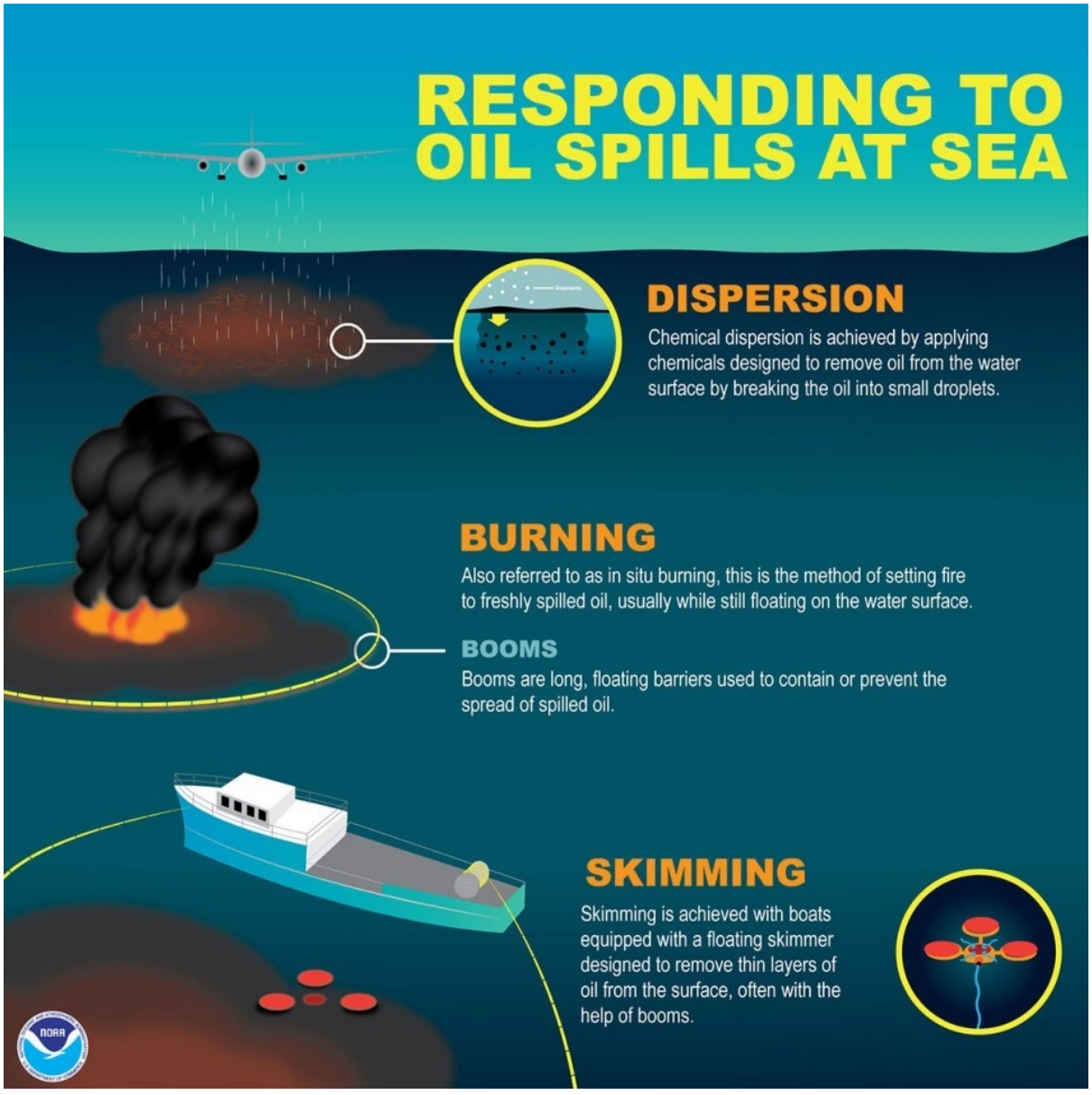


Oil Spill Prevention Norms
• **International Convention for the Prevention of Pollution from Ships (MARPOL)** – It covers prevention of pollution from ships by Oil, Noxious liquid substances, Dangerous goods in packaged form, Sewage, Garbage and Air pollution from ships. • India is a signatory to the convention. • **Merchant Shipping Act of 1958 in India** - It includes provisions to prevent and control marine pollution, particularly oil pollution, in Indian waters and by Indian ships. • It sets the framework for liability, prevention, and response to oil spills and other forms of marine pollution. • **Port Contingency Plans** - Ports also maintain oil spill contingency plans to handle local cases, while the Indian Coast Guard is the nodal agency. • **National Oil Spill Disaster Contingency Plan (NOS-DCP)**- It is a comprehensive framework developed by the Indian Coast Guard (ICG) to address oil pollution incidents in Indian waters.

How are oil spills cleaned?

- **Containment** - Booms are floating physical barriers, made of plastic, metal or other materials, which slow the spread of oil and keep it contained.
- A boom may be placed around a tanker that is leaking oil, to collect the oil, or along a sensitive coastal area to prevent oil from reaching it.
- **Skimming** – It involves removing oil from the sea surface by skim or scoop before it can reach sensitive areas along the coastline.
- **In-situ Burning** – It is a method of burning freshly spilled oil, usually while it's floating on the water.
- **Dispersants** - They are chemicals that are applied directly to the spilled oil to disperse it into the water column.

- It makes much less oil spill stay at the surface where it could move to coastal wetlands, beaches, and tidal flats endangering critical habitat and nursery areas.
- **Bioremediation** - The use of oil-degrading microorganisms (bacteria, fungi, or algae) to break down oil into less harmful substances.
- **Sorbents** - Materials (like peat moss, straw, or synthetic pads) that absorb or adsorb oil, making it easier to collect.
- Sorbents are best for small spills or remnants after other method.



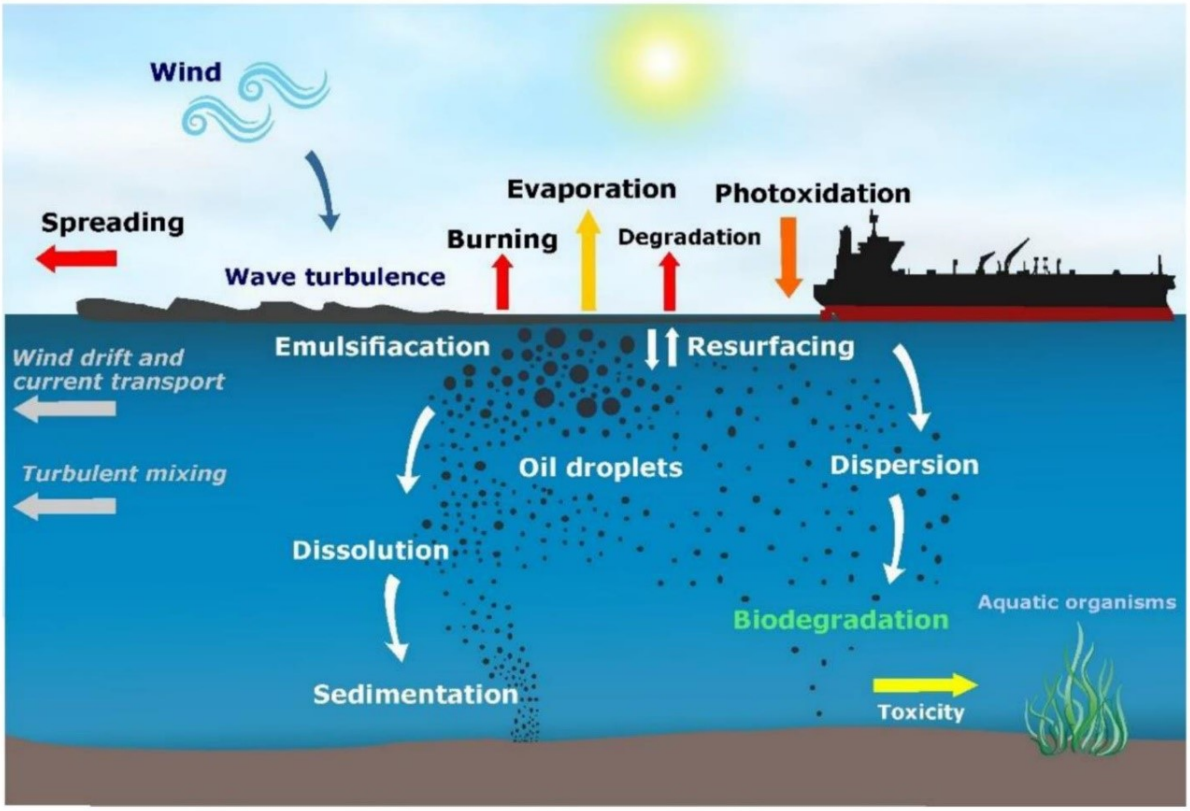
What are the challenges in oil spill cleaning?

- **Quick Spread** - Oil spreads quickly across water by rough seas and strong currents, forming thin films that become harder to recover as time passes.
- **Oil Properties** - Oils vary in properties, with some sinking or emulsifying with water and making separation tough.

Oil Type	Key Properties	Preferred Cleanup Methods
Light Oils	Low viscosity, volatile	Natural recovery, water washing, dispersants
Medium Oils	Moderate viscosity	Vacuum, sorbents, mechanical removal, SWAs

Heavy Oils	High viscosity, persistent	High-pressure washing, manual/mechanical, SWAs
Non-Persistent	Highly volatile	Natural recovery, safety precautions
Sinking Oils	High density, sink	Shallow-water vacuum, sediment relocation

- **Incomplete Removal** - Oil spill cleanup can never achieve 100% removal of spilled oil.
- Residual oil often remains in the environment, continuing to pose risks to ecosystems and wildlife
- **Scale and Duration of Impact** - The sheer scale of some spills, and the fact that oil can drift and spread over vast areas, makes comprehensive cleanup nearly impossible.
- **Safety and Health Risks** - Cleanup operations can expose workers to hazardous substances and dangerous conditions, requiring specialized training and protective equipment.
- **Technological Limitations** - Many innovative materials and techniques are still in the experimental stage or are only practical for small spills.



What lies ahead?

- Routine inspection of vessels, storage tanks, pipelines, and transfer operations to detect and fix leaks or weaknesses before spills occur.
- Detailed information on contents of container vessels entering waters can be shared to facilitate quick action.
- Expansion and modernization of oil spill response infrastructure, including more Pollution Response Teams, vessels, and equipment at key coastal and port locations.
- Though Indian Coast Guard is the central coordinating agency for marine oil spills, effective response requires collaboration with state governments, ports, oil companies,

and local communities.

Reference

Indian Express | Oil Spill