Oceans

Humans both depend on it and threaten it with their activities

Oceans

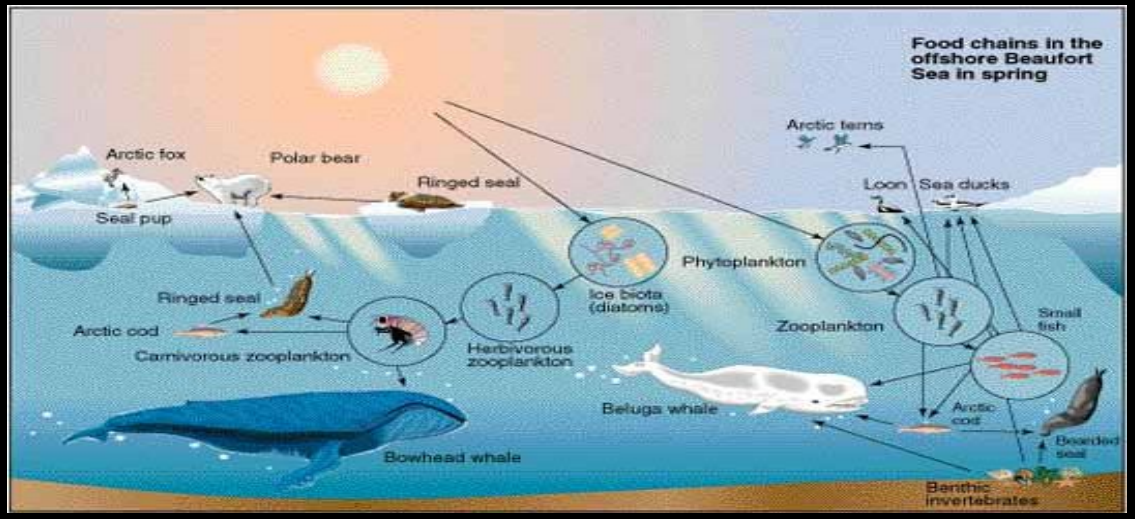
- Water covers nearly ¾ of the Earth's surface
- More than 50% of the world's population lives within an hour of the coast
- Oceans play a role in both climate and day to day weather

Human Dependence on Oceans

- The ocean is our life support system, giving us more than half of the oxygen we breathe, regulating climate, and providing valuable resources

How is Marine Life Dependent on Oceans Systems?

- The amount of sunlight, wave action, water temperature, water pressure, salinity levels and pH levels are important to maintain marine populations



Estuaries

- Estuaries - areas where freshwater flows into oceans, are rich in nutrients to support many types of organisms, and are nurseries for many marine species

Coral Reefs

- Coral Reef – ecosystems commonly found in shallow seas of many tropical regions. They provide a sheltered habitat to many types of animals.

Human Activities Modify the Ocean

Critical Ocean Issues:

- Overfishing
- Sea Temperature Rise
- Marine Pollution
- Ocean Acidification
- Marine Habitat Destruction
- Sea Level Rise
- Marine Invasive Species

Overfishing

- Overfishing is taking wildlife from the sea at rates too high for fish species to replace themselves
  - Fisherman remove more than 170 billion pounds of wildlife a year from the seas
  - Some scientists predict that if current fishing rates continue, *all* the world's fisheries will have collapsed by the year 2048

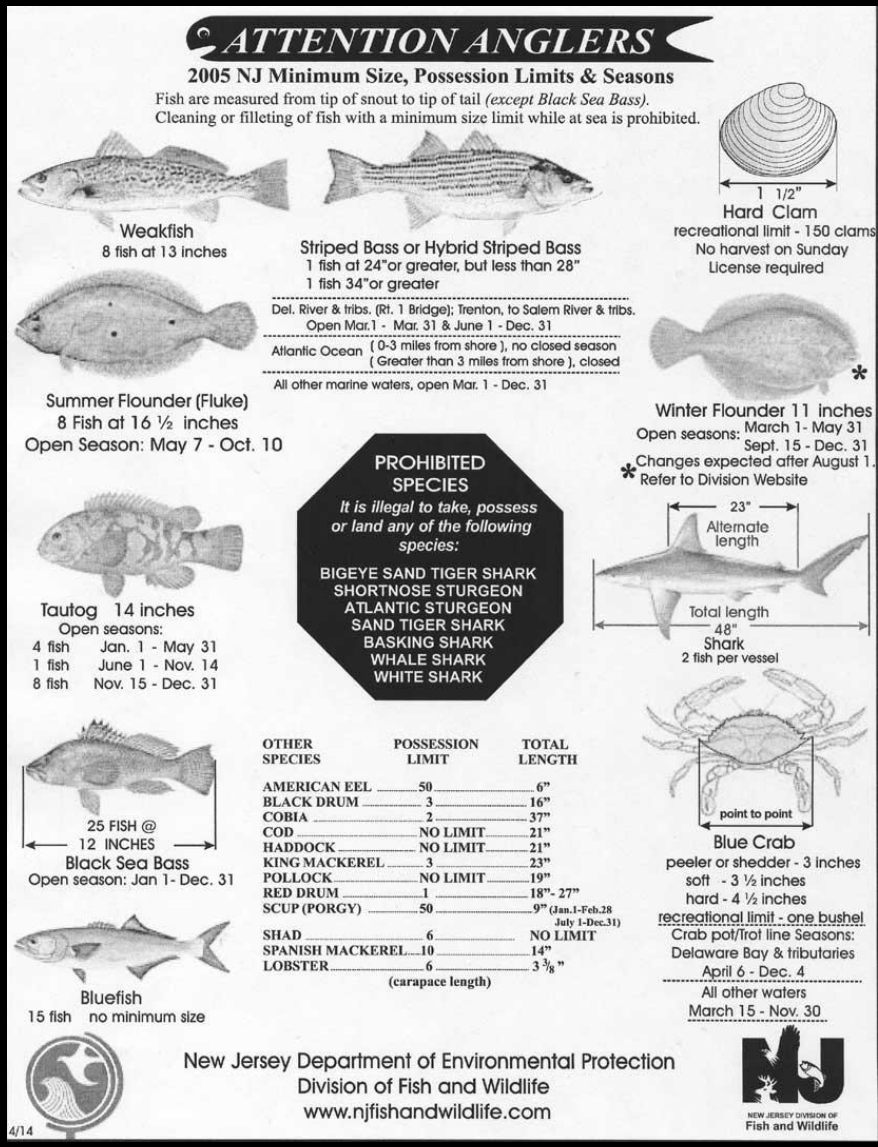
Global Fisheries

Overfishing – The consequences

Ending Overfishing

Fishing Limits

- Laws can help protect individual fish species.
- They may also limit the amount of fish that can be caught or require that fish be at least a certain size.
- If a fishery has been severely overfished, the government may need to completely ban fishing until the populations can recover.

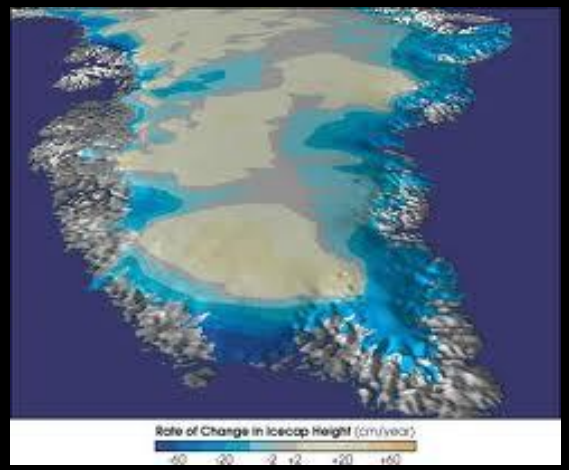


Fishing Methods

- Today fishing practices are regulated by laws.
- Some fishing crews now use nets with a larger mesh size to allow small, young fish to escape.
- Some methods have been outlawed: (i.e. poisoning fish and dynamite)

Resource Use

- Use of Resources
  - Burning Fossil Fuels and deforestation contribute to global climate change, which impact ocean warming, which has a cascading effect on earth



Sea Temperature Rise

- Some climate models predict that higher sea temperatures will lead to more frequent and more severe hurricane activity

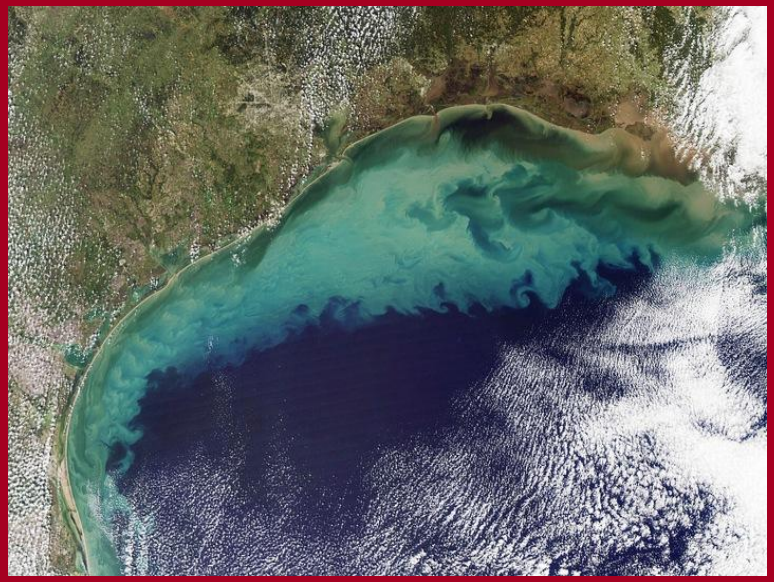
Organisms Affected by Temperature Rise

- Coral is vulnerable to temperature changes
  - Reefs will bleach (eject their symbiotic algae) at even a slight temperature rise
  - Bleaching slows coral growth, makes them susceptible to disease, and can lead to large-scale reef die-off

- Research has shown that krill reproduce in significantly smaller numbers when ocean temperatures rise
  - This can have a cascading effect on marine food webs

Marine Pollution

- Many ocean pollutants are released into the environment far upstream from coastlines
- Solid waste like bags, foam, and other items dumped into the oceans are eaten by marine mammals, fish, and birds that mistake it for food



Runoff

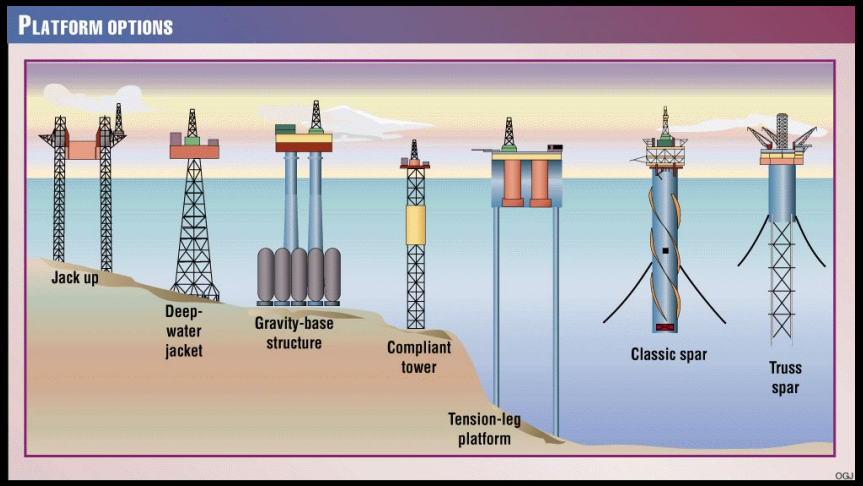
- Use of excessive fertilizers and pesticides runoff into oceans
  - Agricultural practices enable erosion of soil into oceans

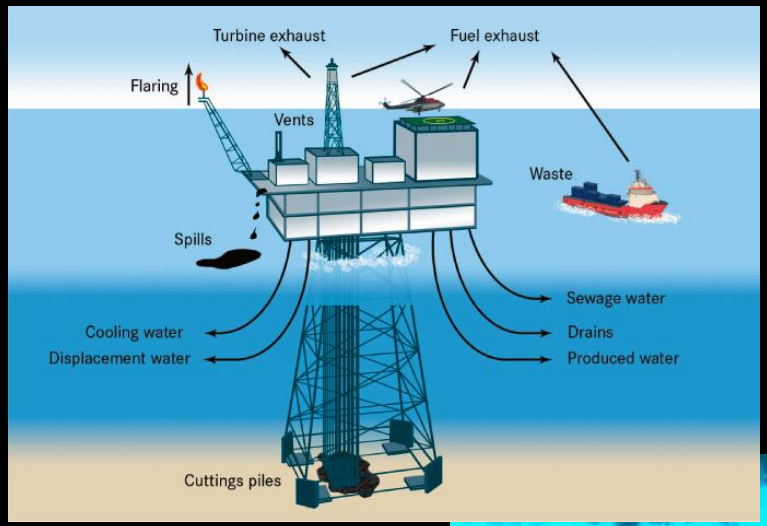
Great Pacific Garbage Patch

Great Pacific Garbage Patch

Drilling for Oil

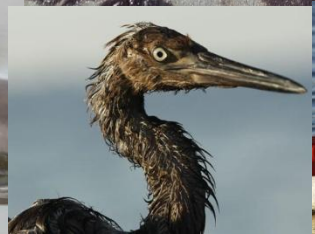
- Drilling for oil disturbs marine habitats
  - Offshore oil platforms become a habitat for marine life but at great risk if a spill occurs

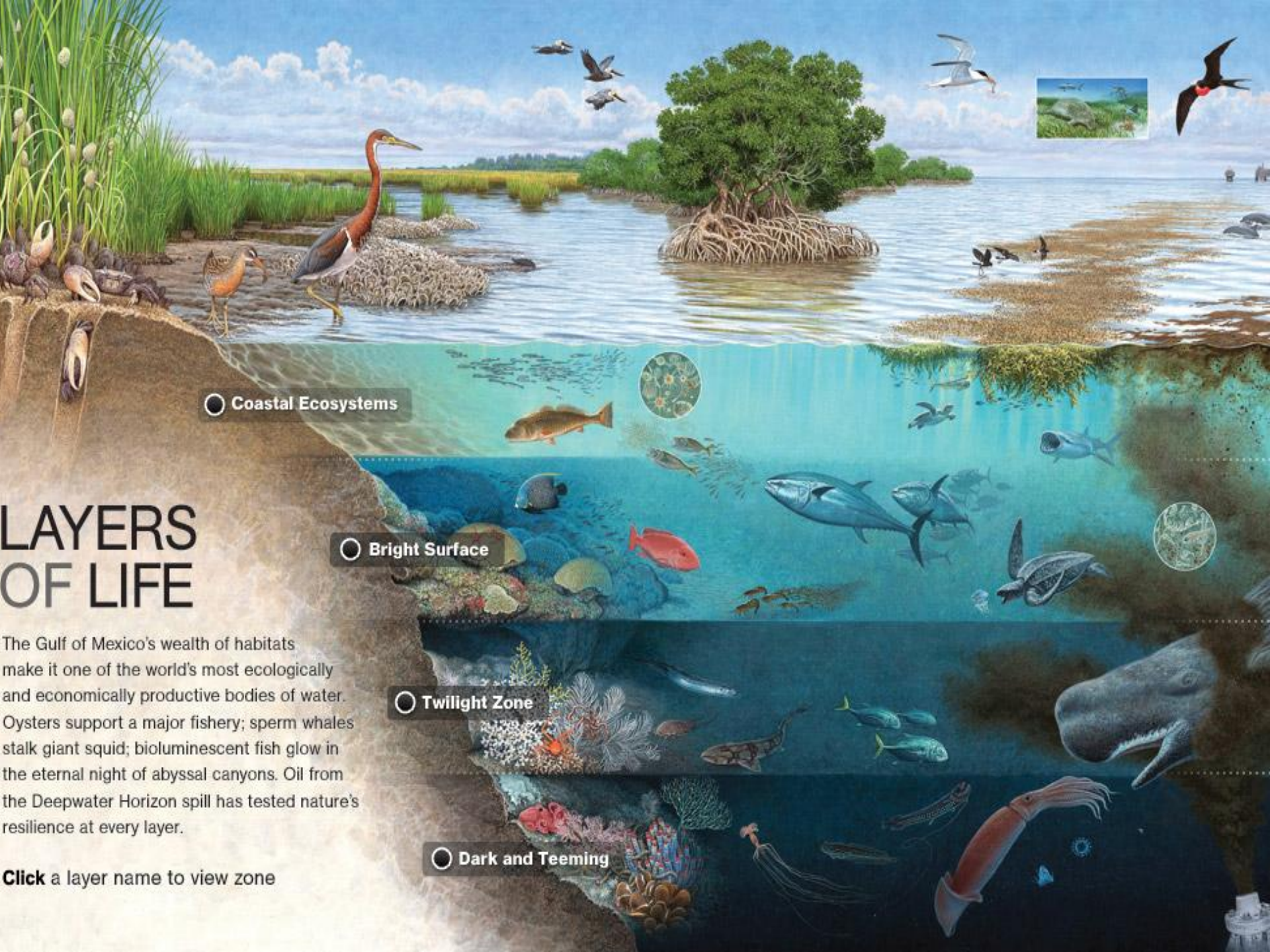




Gulf Oil Spill

- Gulf Oil Spill
- Migrating Birds



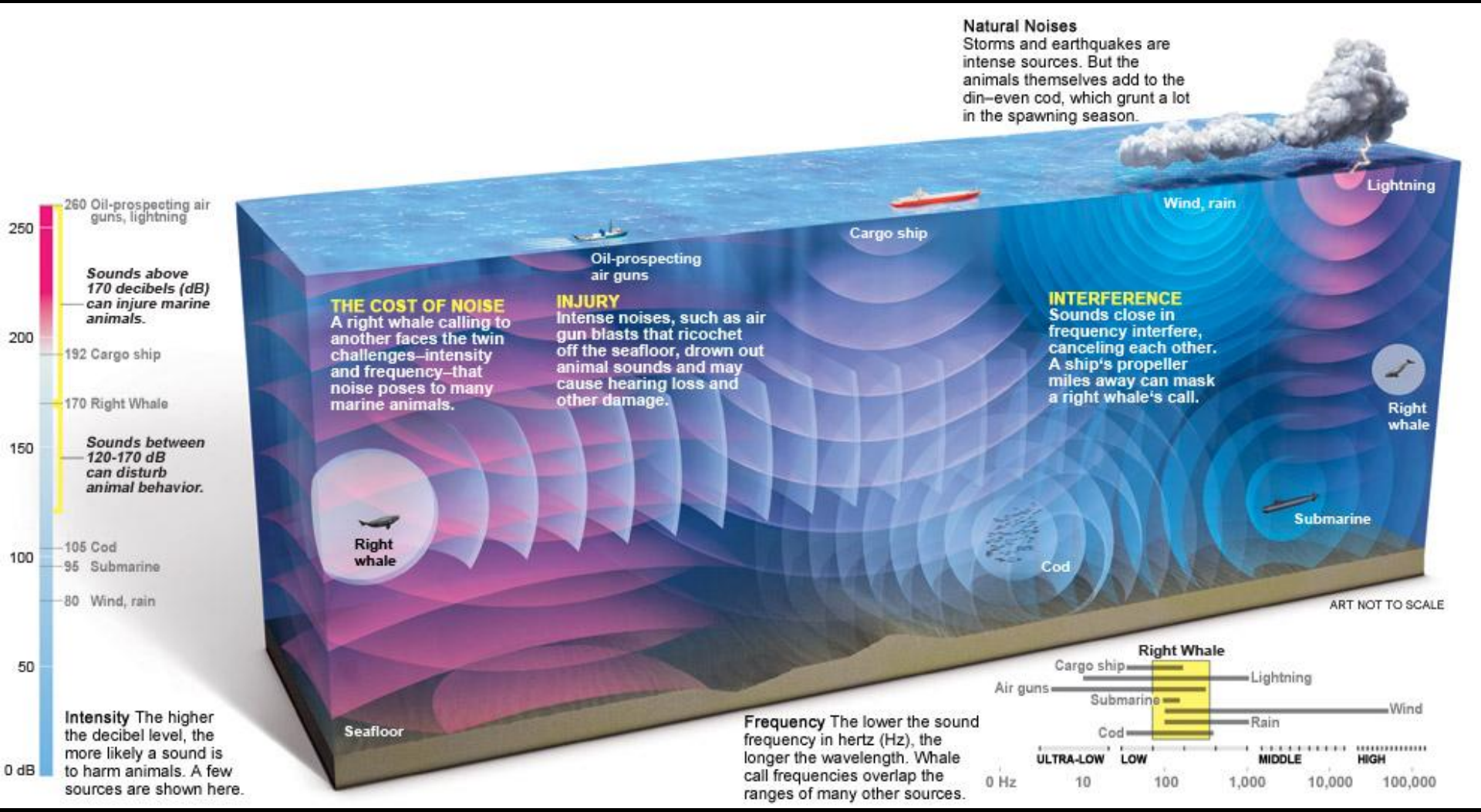


LAYERS OF LIFE

The Gulf of Mexico's wealth of habitats make it one of the world's most ecologically and economically productive bodies of water. Oysters support a major fishery; sperm whales stalk giant squid; bioluminescent fish glow in the eternal night of abyssal canyons. Oil from the Deepwater Horizon spill has tested nature's resilience at every layer.

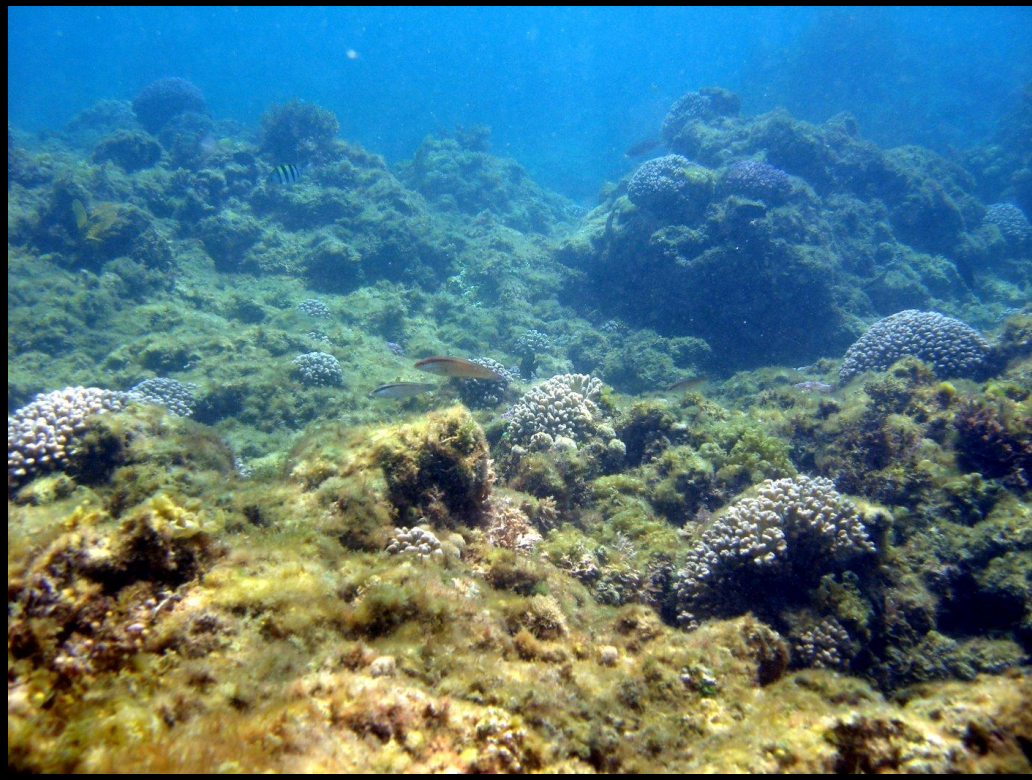
Click a layer name to view zone

Noise Pollution



Ocean Acidification

- When carbon dioxide dissolves in this ocean, carbonic acid is formed
- This leads to higher acidity, mainly near the surface, which has been proven to inhibit shell growth in marine animals



Habitat Destruction

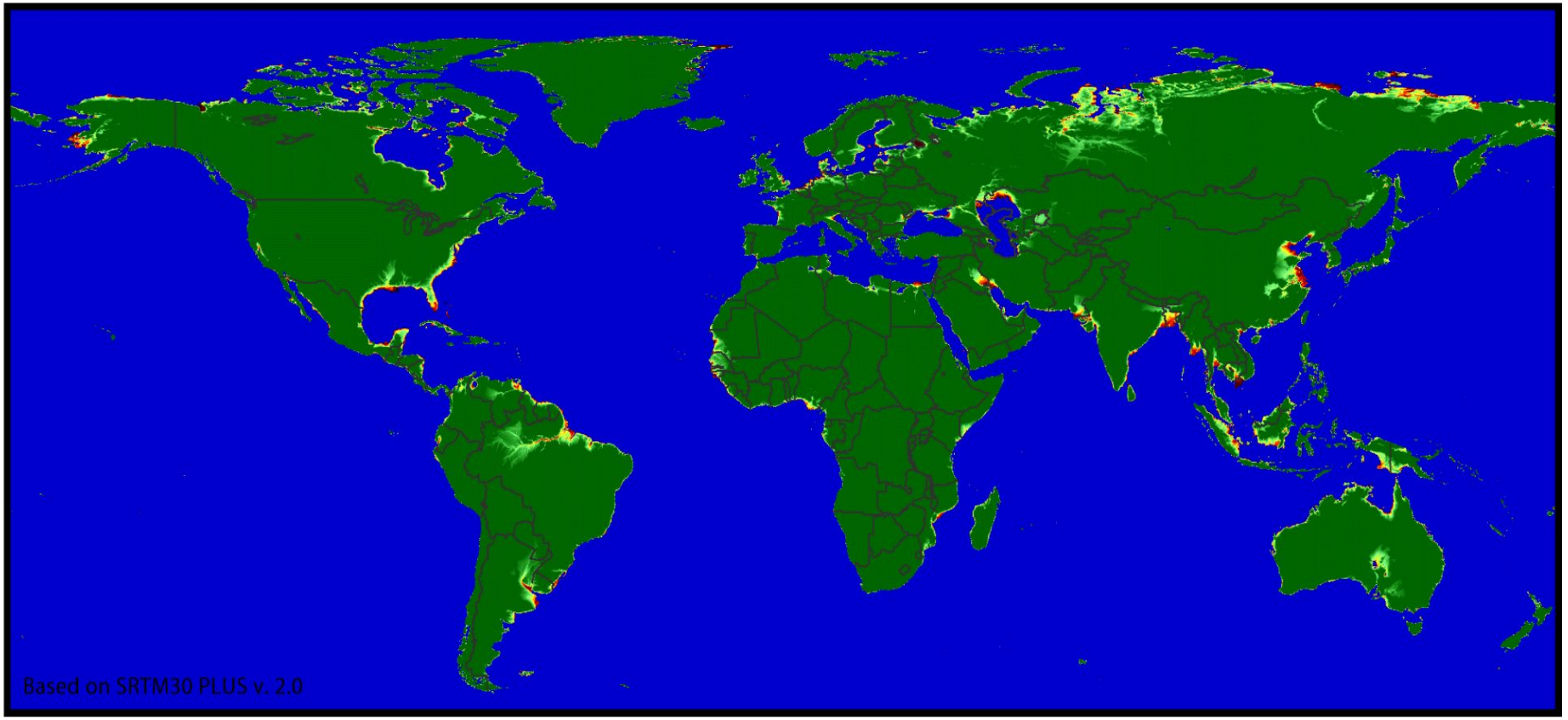
- Most areas of the world's oceans are experiencing habitat loss
- Destructive fishing techniques like bottom trawling, dynamiting, and poisoning destroy habitats near shore as well as in the deep sea

Bottom Trawling

Rising Sea Levels

- When water heats up, it expands
- As seawater reaches farther inland, it can cause destructive erosion, flooding of wetlands, contamination of aquifers and agricultural soils, and lost habitat for fish, birds, and plants.

Regions Vulnerable to Sea Level Rise



Height Above Sea Level (m)

0 1 2 3 5 8 12 20 35 60 80


Boston
Philadelphia
New York
Washington, D.C.
Norfolk
Pine Bluff
Charleston
Houston
New Orleans
Tampa
Miami
Present-d
shoreline

Invasive Species

- these species thrive in their new habitat, usually due to lack of natural predators to control their population
- do damage mainly by consuming native species, competing with them for food or space, or introducing disease
- hitch rides on the outside of ship hulls and on the millions of tons of plastics and other trash that floats around the globe in ocean currents

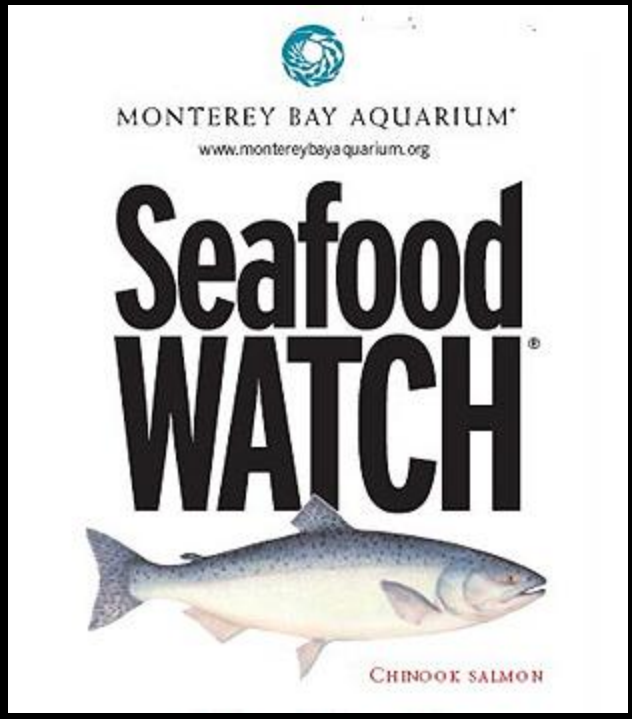
Why Oceans Matter – NG

What you can do to help

- Make safe, sustainable seafood choices
- Use fewer plastic products
- Take care when visiting reefs and beaches
- Take part in a beach cleanup
- Educate and inform others of ocean issues

Make Wise Seafood Choices

- Making wise seafood choices
- Only purchase seafood that is certified sustainable



Marine Stewardship Council
Certified sustainable seafood

Aquaculture

- this is the practice of raising fish and other water dwelling organisms for food
- it is not a perfect solution
  - the artificial ponds and bays often replace natural habitats
  - maintaining the farms can cause pollution and spread diseases to wild fish populations

Aquaculture

- almost half of the seafood we eat comes from farms
- the rapid expansion of the aquaculture industry has not come without impacts
- when done responsibly, aquaculture's impact on wild fish populations, marine habitats, water quality and society is minimal

Mobile Fish Farming
Fish Farming – The End of the Line

Use Fewer Plastic Products

- Use a reusable water bottle
- Buy products with less packaging

Midway Albatrosses

Take Care When Visiting Reefs and Beaches

- Leave no footprint
  - Substantial damage has been caused by people touching coral, stirring up sediment, collecting coral, or dropping anchors on the corals
- Don’t leave trash behind

Artificial Reefs

- sinking old ships helps to create new marine habitats
- artificial reefs created in Gulf of Mexico

Take Part in a Beach Cleanup

Whale Shark Rescued from Discarded Net

Removing Straw from Sea Turtle's Nostril

International Conservation Efforts

Because the world ocean is a continuous body of water that has no boundaries, it is difficult to determine who, if anyone, should control portions of it. Nations must cooperate to manage and protect the oceans.