

DEEPWAVE topics

Oil, gas and mineral mining

Issues

- Accidents (Exxon Valdez, etc.)
 - Insufficient accident management
 - Burning surface oil
 - Sedimentation
 - International waters belong to no one = no one is responsible for cleaning up spills
 - Longterm effects of accidents
 - Even coastal cleanup campaigns leave damage = ecosystem will not return to normal, even after 10+ years
- Lack proper control and planning
 - Official protocol gives little importance to environmental consequences of drilling
 - Country-dependent environmental guidelines to adhere to
 - Effects of decommissioning of infrastructure rarely considered
 - Drilling may occur in regions that are important for mating/schooling of species

Pollution

Issues

- Pollutants enter marine foodweb
- Accidental release of high doses of chemicals into the system
 - Minamata Case
 - Mercury in Bordeaux Oysters
- Plastic pollution
 - Humans' over-reliance on plastic
 - Cosmetic and industrial use of plastic
 - Micro- and Nanoparticles
 - Macroparticles
- Terrestrial input
 - Fertiliser run-off and wastewater = eutrophication of lakes/river entering ocean
 - Oil spills
- Bioaccumulation
 - Chemicals adsorbing to sediment/particles in water column = taken up by organisms
 - Biomagnification

Climate change

Issues

- Thermohaline circulation
 - Reason for weather patters as they are = necessary
 - Alters metabolism and behaviour of marine species
- Warming of the water
 - Reduces ability to take up CO2 (in combination with increased CO2 pressure = Ocean acidification)
 - Coral bleaching
- More erratic weather and changing periods of rain/drought
- Rising sea level due to ice caps melting
 - Coastlines under more stress
 - Input of cooler water
 - Reduces light reaching plants
- Decreased vertical mixing
 - Less transport of nutrients through water column
 - Oxygen transport into depths reduced

Ocean policies

Issues

- Consider the ocean as a commodity
 - handling accidents (oil spills, ship wrecks, etc)
 - Threshold for chemicals and pollutants
- Countries handle ocean politics differently
 - International zone with no rules or regulations
 - Quotas and protected species not respected by every country
 - e.g. Whaling

Importance

- MPAs
 - protect breeding grounds, important pathways and ecosystems from harm
 - e.g. Weddellsea
 - Home to many marine mammals that are under protection already
- Set different degrees of protection
- Protecting endangered species
 - What happens to the entire foodweb if one species goes extinct

Coastal protection

Issues

- Without healthy coast lines storms, tsunamis etc. are a lot more damaging
- Building on dunes = sand is no longer stabilised by root network and will be eroded by waves
- Hard structures such as walls, tidal barriers and revetments only make the problem worse

Importance

- Coastline
 - Methods
 - Natural reserves and "soft" methods
 - Walls
 - Dykes
 - Protect coastal regions from waves/rising sea levels and is breeding ground for many marine organisms
- Coral reefs
 - Corals are highly diverse ecosystems = if they die many other species will, too
 - Methods
 - Creating MPAs
 - Replanting corals

Fisheries

Issues

- Illegal fishing
 - No record of how much is really being fished = drive species to extinction
 - Protein pirates remove secondary producers from ecosystem = compete with organisms higher in oceanic foodweb for food
- Destructive methods
 - Sonar detectors = we will find every last fish in the ocean
 - Target reproduction grounds = remove all organisms of a life-stage
 - Bottom trawling = damage ground
 - Ghost- and driftnets = continue trapping organisms after discard
 - Cyanide and dynamite fishing = destroys the ecosystem entirely
- By-catch
 - Marine mammals conservation
 - Endangered/overfished species
- Aquaculture
 - Nutrient over-enrichment of waters
 - Use of fishmeal
 - Escaping hybrids competing with wild fish
 - Increased use of chemicals
 - Re-purpose land otherwise needed for agriculture/nature
- Unfair fisheries agreements = quotas set for countries differently (rich > poor countries)

Importance

- Removing one species from the foodweb can make the ecosystem collapse
- Only a healthy ecosystem stands a chance to fend off external effects such as climate change, warming waters, etc.
- If we want to continue consuming fish, we must ensure a healthy foodweb

Oil, gas and mineral mining

Issues

- Little is known about it = 99% undiscovered
- Destruction of the unknown
- Bottom trawling
 - Removal of organisms: higher in water column reduce food for deep sea organisms

Deep sea

Importance

- Hydrothermal vents
- Bioluminescence
 - Could provide answers to medical and other questions
- Deep sea coral reefs
 - Naturally strong CO2 sink
 - Biodiversity