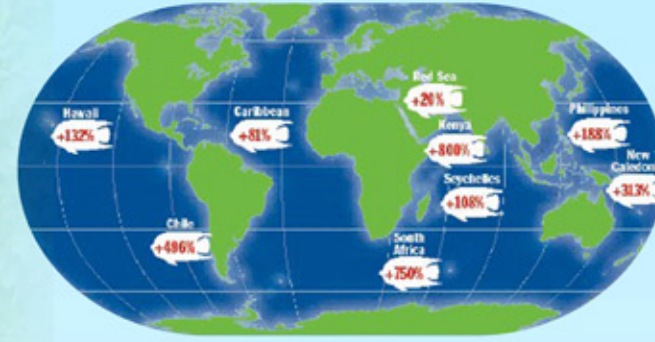


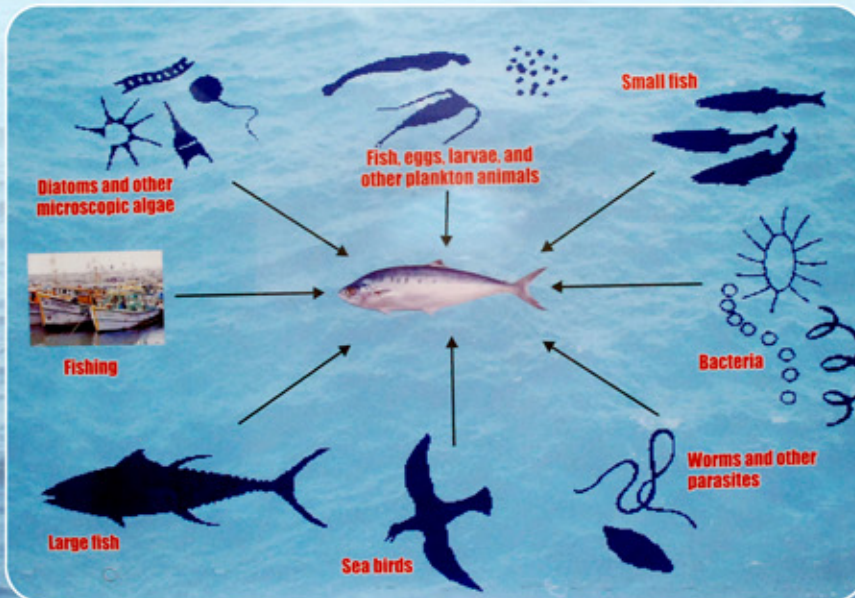
Fisheries in Environmental Perspective...



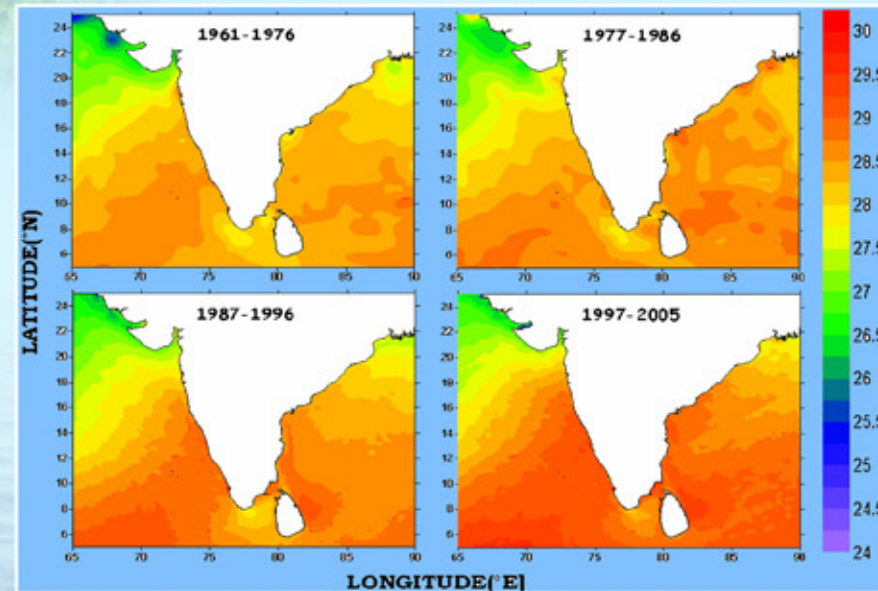
Fish stocks have increased in No-fishing zones in several ecosystems

Eco system based fisheries management

- Fish and fisheries are deeply embedded within the ecosystem. Impact of fishing on marine environment and the impact of environment on fish are being increasingly recognized. Fish and fisheries management should be viewed as a part of an overall ecosystem management. Delineation of ecosystems based on food web models is a pre-requisite for a shift from conventional fisheries management towards eco-system-based fisheries management.
- The idea that fisheries should be managed on an ecosystem approach, is gaining strength world wide. World summit on sustainable development encourages the world wide application of the ecosystem approach by 2010.



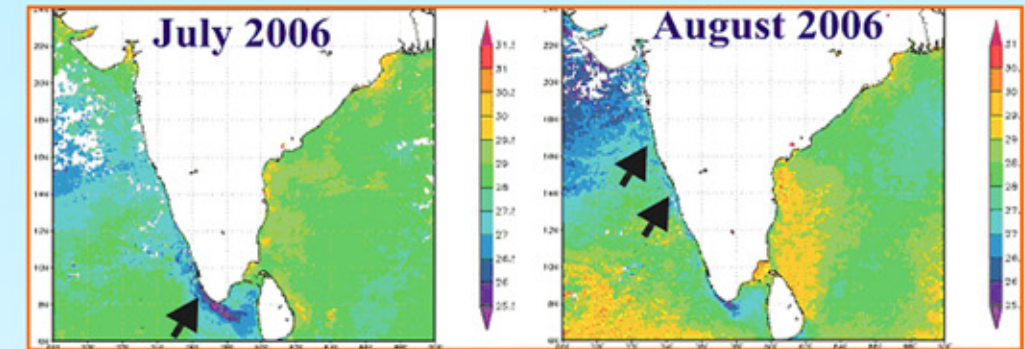
Impact of Climate Change on Indian Marine Fisheries



- Sea Surface Temperature has increased by 0.04 C. per decade in the Indian Seas during the last 50 years.
- Sea level is rising at an average of 1.5 mm per year.
- About 450 Indian coastal fishing villages are within 100 meters from the seashore, and are vulnerable to sea level rise.
- Coral bleaching events will be more frequent and will be an annual feature, Coral reefs will become remnant by the year 2050.
- With warming of Indian Seas, the oil sardine is found to extend its distributional range to the northern latitudes in the Arabian Sea and Bay of Bengal.
- Indian mackerel has tendency to descend to depths.
- Spawning season of threadfin breams is shifting to cooler months.

Environment and Marine Fisheries

- Coastal upwelling occurs during July–September with a peak in August.
- Nearly 70% of the pelagic fish catch, dominated by oil sardine and mackerel was obtained during September – December.



- Seawater and sediment samples collected from locations close to industrialized areas in Mumbai, Cochin, Chennai, Tuticorin and Veraval were relatively contaminated with toxic trace metals such as cadmium, lead, zinc and copper.
- Toxic metal concentrations in most of the commercially important fishes were within the safe limits.
- Sighting cruises conducted for 3 years have indicated that southwest coast and southern Sri Lankan Sea are rich areas in species diversity and abundance of cetaceans.
- A large number of dolphins are incidentally caught in fishing gears along the Indian coast.
- Developed a cetacean DNA bank with 46 individual accessions from 7 species of marine mammals and deposited 20 mitochondrial DNA sequences in Gene Bank.
- Trace metal and organochlorine pesticide concentrations are mostly within safe limits in the organs of cetaceans