

# MARINE ECOSYSTEM

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## EDITORIAL

The Ocean is a means of livelihood for man especially the coastal population, from time immemorial. The coastal fishers venture into the sea in small crafts for fishing using artisanal methods, which has now grown into an industry with majority of the coastal population depending on it for their livelihood. Technological advances in the fishing industry had led to the development of new fishing techniques and well equipped fishing crafts. In India, it began with the introduction of mechanised crafts (1956) viz. trawler, longliner, troller, purse seiner etc and was followed by the motorisation of the country crafts in the 80's. This has revolutionised the fishing industry and the coastal waters were exploited for fish resources with active participation from the coastal fishers and introduction of more crafts.

As the fishing was concentrated mainly in the coastal waters, there was an over crowding of fishing activities and a gradual decrease in catch in the subsequent years. This has forced the fishermen to venture into the deep sea (>200m) which remain under-exploited. Tuna is one such deep sea resource potential. Though there has been a remarkable increase in the landings of coastal tunas during the past decades, the stock of deep-sea tuna remains to be least exploited from the EEZ of India. In India, attempts were made to tap the deep sea tuna resource commercially by long lining, purse seining etc which were met with limited success due to the high initial investment needed.

Another deep sea potential is the DSL or Deep Scattering Layer, which is an assemblage of mostly negatively phototrophic zooplankton and micronekton performing a diurnal vertical migration. This trophic network carries numerous food chains, some of which end up in species of high economic value viz. pelagic sharks, tunas, squids etc. Many of the DSL nekton, especially the Myctophids (Lantern fishes) and Pelagic Shrimps, also have a vast potential to be exploited commercially. Though they may not be used for direct consumption, they can be used for making other value added products or diet supplements. The DSL micronekton also functions as indicator species for economically valuable cephalopods, fin fishes and swarming crabs which follow the layer in search of prey. A preliminary study on this carried out by the Central Marine Fisheries Research Institute with support from Department of Ocean Development, has brought light to the resource of DSL in the EEZ of India.

The deep sea possesses an immense potential, which, if exploited judiciously, can form a staple livelihood to the fishers and also reduce the fishing pressure on the coastal waters. It is eminent that resource-specific diversification of the existing fishing fleet is the need of the hour.

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V. Prasannakumar  
S. Balu

## NEWS BRIEFS

**Series of aftershocks jolt Andamans; latest quake measures 6.3-** Deccan Herald, Saturday, January 01, 2005

Aftershocks measuring 5.2 and 5.0 on the Richter Scale earlier shook the Car Nicobar region at 2332 hours last night and at 0340 hours early today respectively, the Met Department said.

**Thai PM promises probe on lack of tsunami alert-** Deccan Herald, Saturday, January 01, 2005

"There must be an investigation of the whole incident, how it happened, when it happened and why early warnings could not have been issued," Thaksin said in his weekly radio address.

**Tsunami death toll nears 1,25,000-** The Tribune, Saturday, January 1, 2005

Jakarta- The confirmed death toll in the massive earthquake and tidal waves that slammed the Indian Ocean shorelines last weekend approached 125,000 today.

**They rode the tsunami aboard stricken yacht-** The Tribune, Saturday, January 1, 2005

A father told last night how he and his terrified family survived the tsunami aboard their stricken yacht.

**Seafood is safe: CIFT-** The Business Line, Saturday, Jan 01, 2005

Kochi- Following reports that it is unsafe to eat seafood after the tsunami struck the Indian coastline, the Central Institute of Fisheries Technology (CIFT) has come out with a categorical statement that "the fish is as safe as it used to be and we can continue to eat fish with confidence. It is very safe."

**Tsunami impact on marine sector brief'-** The Business Line, Saturday, Jan 01, 2005

Kochi -THE impact of the tsunami on the seafood industry has not been very significant and will be of a temporary nature, Mr G. Mohan Kumar, Chairman of the Marine Products Export Development Authority (MPEDA), has said.

**Series of quakes jolt Andamans-** Deccan Herald, Sunday, January 02, 2005

Fear-stricken residents in the island are taking no chances to stay indoors even during night time as over 80 aftershocks have hit the region.

**Strong quake rocks Sumatra again-** The Tribune, Sunday, January 2, 2005

Jakarta- A strong earthquake struck under the sea off Indonesia's Sumatra Islands today, seismologists said.

**Tsunami disaster toll 9,451, more than 5000 missing-** Deccan Herald, Monday, January 03, 2005

According to the latest status report released by the Home Ministry, Tamil Nadu accounted for largest number of human casualty where 7,793 people lost their lives after the tsunami hit the state in the wee hours of December 26.

**When land becomes sea, and the sea, a wave-** Deccan Herald, Monday, January 03, 2005

A tsunami is not just a variant of an earthquake, but one or a series of subsequent deep water ocean waves having a vertical movement. Misconceived as a tidal wave, tsunamis occur in oceanic and coastal regions as a variant of earthquake, when the sea floor abruptly deforms and vertically displaces the overlying water.

**Scientists divided over ecological impact-** The Hindu, 02-01-2005

KOCHI- The killer waves that hit the State on December 26 have left the scientific community clueless on its impact on marine environment and bio-resources. While a section of the marine scientists argue that the tsunami has passed through the water mass without causing much damage to its bio-resources, some others are of the view that it would have done much damage to them. They say that issue is being addressed by the Indian scientific community for the first time and that no background information is available to verify their respective theories.

**Tsunami has not affected marine life'-** The Hindu, 03-01-2005

CUDDALORE- Preliminary studies have shown that the tsunami has wrought havoc only on terrestrial areas and not in the deep sea. All along the eastern coast, there is no report of washing ashore of marine organisms, including fish, dolphins, sharks or whales, according to T. Balasubramanian, Director, Centre for Advanced Study in Marine Biology, Portonovo.

**Cucumber vs cucumber-** Deccan Herald, 03-01-2005

Marine invertebrates called sea cucumbers resemble the vegetable cucumber by not only shape, but also by some metabolites.

**Slick ways to tackle oil pollution-** The Business Line, 03-01-2005

THE need to combat oil pollution, particularly in the context of increased volumes being handled by oil companies in the country, came up for discussion at a seminar of World Shipping Forum in Chennai recently. As oil spills cause massive destruction, the marine community in India too should take cue from the developed nations that have achieved significant progress in preventive and mitigating measures, according to a paper presented at the seminar by Mr A. R. Kar and Mr H. V. Ramesh of the Indian Register of Shipping.

**Coral reefs in the Andamans suffer extensive damage-** Deccan Herald, 04-01-2005

The coral reefs along the coast of the Andaman islands are about 1000 years old and could not withstand the tsunami.

**Ancestral warning systems saved Andaman tribes-** The Tribune, Tuesday, January 4, 2005

Kolkata- The five aboriginal tribes inhabiting the Andaman and Nicobar Islands, our last missing link with early civilisation, have emerged unscathed from the tsunamis because of their age old "warning systems".

**Israeli firm offers free tsunami alert system-** The Tribune, Wednesday, January 5, 2005

Jerusalem- An Israeli company said it planned to distribute free to Asian countries hit by last week's tsunami a device it says could save lives by warning holiday-makers directly that a tidal wave is coming

**Fishermen venture out into sea-** The Tribune, Wednesday, January 5, 2005

Nagapattinam (TN)- For the first time after the killer tsunami hit this coastal district in Tamil Nadu, fishermen ventured into the sea for fishing this morning. In a bid to instil confidence among panic-stricken fishermen of Akkaraipettai, which housed over 7,000 such families, the Army repaired some of their large fishing boats and went out to sea along with them today.

**More leisurely meals after mass extinction-** The Hindu, 06-01-2005

After a mass extinction event 3 million years ago, marine snails took a safe, exceedingly patient approach to feeding on their prey, presumably because there were fewer predators or competitors. The report was published in *Science*.

**Vessel to analyse tsunami impact on coastal waters-** The Hindu, 07-01-2005

THIRUVANANTHAPURAM-The Department of Ocean Development has commissioned its research vessel, Sagar Purvi, for a five-day cruise along the coasts of Kollam, Thiruvananthapuram, and Kolachel to assess the impact of tsunami on the marine life and water quality. The ship, which arrived at Vizhinjam today, will embark on the mission on Friday morning. Sagar Purvi is one of the two coastal research vessels of the department that are capable of operating in shallow near-shore areas. Its larger cousin, Sagar Sampada, is currently on a cruise to assess the tsunami impact in the deep-sea areas.

**Team to study impact on marine resources-** The Hindu Business Line, 08-01-2005

A scientific team with 12 members from various Central Government agencies and universities has embarked on a 15-day voyage along the eastern and western coasts of the country to assess the impact of the tsunami.

**Damage to Andaman's ecology causing concern-** Deccan Herald, 14-01-2005

Officials in the Andaman & Nicobar Centre for Ocean Development point out that several animal species and marine creatures living could have met with a catastrophe.

**Now the shore has slumped-** Deccan Herald, 16-01-2005

The physical effects of the tsunami devastation are all too obvious on the shorelines of the Indian Ocean. What scientists are still to determine though, is its impact on marine life and its consequent fallout on fisheries, particularly on the east coast of India.

**Drive to protect marine heritage-** BBC News, 18-01-2005

Environmentalists have warned that Scotland's marine heritage is in "a shameful state". WWF Scotland said coastal development, fishing, oil and gas exploration and aquaculture were taking their toll on the country's marine wildlife.

**Sea's master of disguise-** The Telegraph, 20-01-2005

A fish has been found to use a feat of mimicry not seen before in the marine world. There are many examples of creatures that have evolved to mimic another's appearance to gain an advantage - for instance, some adopt the appearance of a foul tasting species to deter would-be predators.

**Geoethical tsunami fiasco-** The Tribune, 21-01-2005

The Sumatra quake which unleashed tsunami waves in Indian Ocean resulted from ocean floor rupture over 1200 kilometres long with three sub-faults extending from Nicobar upto northern Indonesia subduction zone.

**Sonar threat to whales-** The Tribune, 21-01-2005

The bones of beached whales show signs of decompression sickness — the "bends" suffered by deep-sea divers — which scientists believe could explain why some sea mammals are stranded en masse.

**State biodiversity board coming soon-** The Hindu, 24-01-2005

TUTICORIN, JAN. 23. "Draft notification to establish a State Biodiversity Board in Tamil Nadu is on the pipeline and it would become functional very soon," K. Venkatraman, member- secretary, National Biodiversity Authority (NBA), said here yesterday.

**ZSI study on tsunami impact on marine system-** The Hindu Business line, 25-01-2005

The Zoological Survey of India (ZSI) has undertaken a survey along the Indian Coast starting from Gulf of Mannar, to study the impact of tsunami on marine eco-system, including reef and mangroves.

**Studies to assess impact of tsunami-** The Hindu, 28-01-2005

KOCHI- The fisheries division of the Indian Council for Agricultural Research (ICAR) is to conduct a series of studies to assess the impact of tsunami on fish wealth, ocean floor, ocean environment and allied areas.

**Tsunami casts doubts on Sethu project-** The Hindustan Times, January 31 2005

The unexpected and vicious churning of the Indian Ocean on December 26, 2004, should make India and Sri Lanka jointly study its impact on the Palk Strait, where India proposes to dig a shipping canal, says Prof Willie Mendis, a Sri Lankan authority on ports and spatial planning.

**Acid seas 'will kill off coral within 70 years'-** The Telegraph, 04-02-2005

Coral reefs could be dead within two generations and cod replaced by jellyfish because of the acidification of the sea, scientists said yesterday.

**Turtle deaths: wildlife groups blame Orissa govt-** Deccan Herald, 11-02-2005

Volunteers involved in a special operation to save the turtles have already found 5,010 dead

turtles this year.

**Seafood exports may dip 10 pc-** The Business Line, 11-02-2005

Kochi- SEAFOOD exports during the current fiscal are likely to fall by 10-15 per cent over the previous fiscal due to the anti-dumping duties imposed by the US, impact of tsunami and drop in prices of marine products, said Mr A. J. Tharakan, President of the Seafood Exporters Association of India (SEAI).

**Calls to protect marine wildlife-** BBC News, 12-02-2005

Wildlife campaigners in the North West will be calling for better protection of the region's sea birds this weekend. Conservationists from the Royal Society for the Protection of Birds (RSPB) will be in Merseyside and Lancashire as part of its "Safeguard Our Sea" campaign.

**Something fishy in seafood hunger-** The Indian Express, 18-02-2005

NEW DELHI- Indians prefer freshwater fish over seafood. The conclusion of newly released government statistics has triggered a rethink about encouraging marine aquaculture at the cost of coastal ecology. The damaged coastline, caused at least partly by reckless sea-fishing, is known to be a major factor for the widespread destruction wrought by the December 26 tsunami.

**A `fortune' in seaweed waiting to be tapped-** The Hindu, 21-02-2005

RAMANATHAPURAM- Many of the coastal districts of Tamil Nadu are considered backward because they are drought-prone. But they have untapped seaweed wealth of Rs. 2,000 crores.

**Marine planning 'helps economy'-** BBC News, 21-02-2005

Businesses would benefit from the introduction of planning laws for Scotland's seas, according to a report. A study commissioned by the RSPB said regulations could end conflict between competing interests such as oil and gas, fisheries and renewable energy.

**Calamity-resistant, stable seaweed farming soon-** The Hindu, 22-02-2005

MANDAPAM- The Central Salt & Marine Chemical Research Institute, Bhav Nagar, will find out comprehensive solutions to save seaweed cultivation from cyclone, strong wind, strong underwater current, tsunami and other forms of natural calamities within a year in order to ensure stable seaweed farming, according to its director, Pushpito K. Ghosh.

**Tsunami devastates turtle conservation-** BBC News, 24-02-2005

December's tsunami devastated efforts to save Indian Ocean turtles, with scores of conservation field staff killed or missing.

**UK seas 'in peril' - says report-** BBC News 01-03-2005

Fishing and climate change are harming UK marine life, according to a report by the Department for the Environment, Food and Rural Affairs (Defra).

**`Tuna fishing will boost marine product exports'-** The Hindu Business Line, 10-03-2005

The country's marine products exports are stagnating at around Rs 6,000 crore per annum for quite a few years and tuna fishing holds the key to boosting the exports and touching the Rs 10,000-crore mark. However, a concerted effort by all concerned — the Government, seafood exporters and processors, the MPEDA and fishermen — is necessary to reach the goal.

**Government plans to introduce Disaster Management Bill in budget session-** The Hindu, Friday, Mar 11, 2005

NEW DELHI- The Government plans to introduce the Disaster Management Bill, 2005 in the current budget session, the Union Home Minister, Shivraj Patil, informed the Lok Sabha today.

**Expert calls for ban on ormering-** BBC News 11-03-2005.

A marine biologist from the UK is calling for a ban on ormering around parts of Guernsey. David Bodger, who is in Guernsey to give a talk about wildlife, is calling for more protection for animals and plants living below the high tide mark.

**Beached dolphin dies-** The Hindu, Saturday, Mar 12, 2005

VISAKHAPATNAM- A six-foot long dolphin was found on the beach, opposite the Municipal Corporation swimming pool, here on Friday. The bottlenose dolphin, a highly endangered species, is believed to have been caught in a fishing net and later freed. But it drowned and was washed ashore.

**'Sethu project will damage marine life'**- The Hindu, Tuesday, Mar 15, 2005

CUDDALORE, MARCH 14. The Coastal Action Network (CAN) today said that deriving a lesson from the devastation inflicted by tsunami among fishermen, the Centre must abandon the Sethusamudram canal project.

**Spanish 'sleeper nets' hit fish stocks-** The Telegraph, 15-03-2005

A fleet of mostly Spanish vessels is causing enormous damage to fish stocks off the west of the British Isles and to the north of Shetland, an international investigation has found.

**Tanzanians helping save turtles-** BBC News, 22-03-2005

Turtle-based tourism in Tanzania has been given a boost by a successful community-based conservation programme.

**Conservation efforts in marine park to be stepped up-** The Hindu, Friday, Mar 25, 2005

TUTICORIN- A meeting of the District Wildlife Coordination Committee, chaired by the Tuticorin Collector, V. Chandrasekaran, discussed enforcement and regulatory mechanism pertaining to conservation of Gulf of Mannar (GOM) Marine National Park, at the Collectorate here on Wednesday.

**Death toll in hundreds after Indonesia quake-** Deccan Herald, Tuesday, March 29, 2005

MEDAN, INDONESIA- Hundreds are known to have died in a massive 8.7 magnitude earthquake that hit a small island off western Indonesia overnight, but panic across Asia that it would trigger another devastating tsunami soon receded. -REUTERS

**Undersea quake due to Dec 26 stress -** Deccan Herald, Tuesday, March 29, 2005

SYDNEY- A massive undersea earthquake that killed hundreds in Indonesia overnight was a result of increased geological stress caused by the December 26 quake that sent a devastating tsunami across Asia, seismologists said. REUTERS

**11 aftershocks reported in Sumatra-** Deccan Herald, Tuesday, March 29, 2005

CHENNAI/THIRUVANANTHAPURAM- Even after the Central Government withdrew its tsunami warning to the coastal states following a major earthquake off Sumatra island on Monday night, fishermen along the coast have been advised not to venture out to the sea for the next two to three days. "Till now 11 aftershocks have been recorded in and around Sumatra, all measuring around six on the Richter scale. This will mean that the sea waves will be higher than usual," Met office sources said on Tuesday. - UNI, PTI

**Panel to review tsunami impact on ocean eco-system-** Deccan Herald, Tuesday, March 29, 2005

The government has constituted an expert committee to review the long term impact of tsunami on the Ocean Eco-system and its resources in the light of anti-dumping duties imposed by US on the Indian shrimp industry.

**No tsunami fear in Karnataka coastal districts-** Deccan Herald, Tuesday, March 29, 2005

Allaying the fears of those living along the coastline regarding the after effects of the earthquake

that rocked off Sumatra coast on Monday, the Dakshina Kannada district administration on Tuesday ruled out the possibility of a tsunami striking the coast.

**Small tsunami reported off Australia-** The Hindustan Times, March 29, 2005

A 10 centimeter tsunami rolled into Australia's remote Cocos Island early on Tuesday following a powerful earthquake off Indonesia, Australian authorities reported. "The Bureau of Meteorology has reported a 10 centimeter tsunami was measured by the tide gauge at Cocos Island," Geoscience Australia said.

**Undersea quake due to Dec 26 stress-** Deccan Herald, Tuesday, March 29, 2005

A massive undersea earthquake that killed hundreds in Indonesia overnight was a result of increased geological stress caused by the December 26 quake that sent a devastating tsunami across Asia, seismologists said.

**Death toll in hundreds after Indonesia quake-** Deccan Herald, Tuesday, March 29, 2005

MEDAN, INDONESIA- Hundreds are known to have died in a massive 8.7 magnitude earthquake that hit a small island off western Indonesia overnight, but panic across Asia that it would trigger another devastating tsunami soon receded. - REUTERS

**Peeling sheds polluting water: PCB -** The Hindu, Wednesday, Mar 30, 2005

ALAPPUZHA, MARCH 29. An inspection conducted by the officials of the State Pollution Control Board (PCB) at the prawn peeling sheds and meat processing centres in and around Kakkazham, near Ambalappuzha in the district found that they were polluting the Kappithode, a canal there, and other water bodies in the area.

## BOOKS

**Marine Biology : An Ecological Approach (6th Edition) (Hardcover)-** by James W. Nybakken, Mark D. Bertness, 592 pages, Benjamin Cummings, 2004.

Approaches the subject of marine biology by emphasizing the ecological principles that govern marine life throughout all ocean environments and by acknowledging the differences between marine and terrestrial ecosystems. This unique approach adds real-world relevance by exploring how organisms interact within their individual ecosystems while also focusing on the significance of human impact on the sea. Marine Environments, Plankton Communities, Oceanic Nekton, Deep-Sea Biology, Shallow-Water Subtidal Benthic Associations, Intertidal Ecology, Meiofauna, Estuaries and Salt Marches, Tropical Communities, Symbiotic Relationships, Human Impact on the Sea For all readers interested in marine biology and marine ecology.

**Fisheries Ecology and Management (Paperback)-** by Carl J. Walters, Steven J. D. Martell, 448 pages, Princeton University Press, 2004.

Quantitative modeling methods have become a central tool in the management of harvested fish populations. This book examines how these modeling methods work, why they sometimes fail, and how they might be improved by incorporating larger ecological interactions. *Fisheries Ecology and Management* provides a broad introduction to the concepts and quantitative models needed to successfully manage fisheries.

Walters and Martell develop models that account for key ecological dynamics such as trophic interactions, food webs, multi-species dynamics, risk-avoidance behavior, habitat selection and density-dependence. They treat fisheries policy development as a two-stage process, first identifying strategies for varying harvest in relation to changes in abundance, then finding ways to implement such strategies in terms of monitoring and regulatory procedures. This book provides a general framework for developing assessment models in terms of state-observation dynamics hypotheses, and points out that most fisheries assessment failures have been due to inappropriate observation model hypotheses rather than faulty models for ecological dynamics.

Intended as a text in upper division and graduate classes on fisheries assessment and management, this useful guide will also be widely read by ecologists and fisheries scientists.

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