

Did the tsunami destroy the ecosystem?



The coral *Acropora rudis* is characteristic of Northern Sumatra: from the barrier reef.

The tsunami in the Indian Ocean west of Sumatra on December 26, 2004, hit Indonesia, especially the Province of Aceh, with enormous force. Human and material losses were great, and there were fears that the tsunami had also damaged the marine ecosystem, destroying the basis of the regional fisheries in the process.

BY BJØRN SERIGSTAD

After the tsunami, a cooperative project involving Indonesian research institutions, local authorities in Aceh and the Institute of Marine Research (IMR) was launched. The World Bank and the Norwegian Embassy in Jakarta helped to determine which studies should be carried out. The project consists of three main parts (see next page) and its proposed duration is from 2005 until 2009. For the time being, it is financed by Norway, but the Indonesians will gradually take over both the financing and execution of the project.

THE WHOLE ECOSYSTEM

The first cruise took place in July-August 2005, and a similar one was carried out in August-September 2006. Some 35 Indonesian scientists and technicians as well as five Norwegian scientists and three scientists from Thailand took part in both cruises. The studies comprise the entire ecosystem, and they combine oceanography with studies of pollution, plankton, benthic communities and fish, in addition to sediment sampling. Detailed mapping of the seabed also provides a better understanding of a wide range of processes that take place in the sea.





Large amounts of coarse coral gravel and sand were found on the barrier reef. Pictures were taken by the ROV, and sand samples were collected by divers. The sand had disintegrated from the reef itself.

of the earthquake, revealed that a major subsea landslide had taken place. In the area around the slide site, large numbers of fish and shrimp were observed.

By comparing fish resources that can be measured acoustically with local topography, scientists can identify interesting patterns of distribution. Studies carried out over a period of time also provide better knowledge of long-term effects on fish and other marine organisms.

SAND DEPOSITS

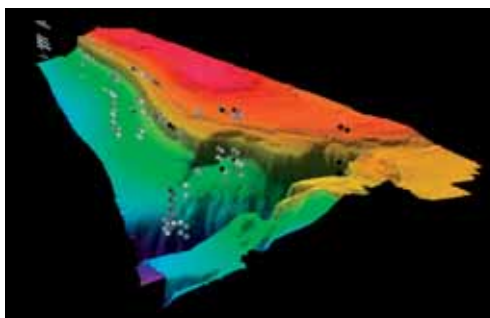
The most obvious observation made by the 2005 cruise was of deposits of sand and gravel between 5 and 22 cm thick on the seabed at most of the locations studied.

There was also large amounts of sand on the barrier reef off the northwest coast of Sumatra. Destruction of the corals that make up such reefs will affect other organisms that grow on or live near them. This has led to worries that the changes observed could have consequences for both fish and other marine organisms. More detailed studies showed that much of the deposits were coral sand from the reef. The tsunami may have stirred up the sand and spread it out over the coral, but we cannot be certain of this since we do not have any pictures from before the tsunami.

Mapping the seabed on the inside of Simeulue Island, which lies near the epicentre

LIMITED EFFECTS

On the 2006 cruise, the area studied was increased and the seabed was mapped in more detail. No major effects of the tsunami on the benthic community, plankton or fish were observed, nor on the ecosystem on the west coast of Thailand studied by our Thai partners. Nature is often capable of dealing with major natural events itself. Human activities that lead to rises in temperature or discharges of chemicals or nutrients may have more serious long-term effects on the ecosystem.

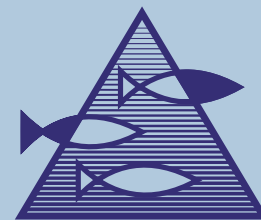


Multi-beam chart of the barrier reef off Northwest Sumatra. The area marked in red is 20 – 30 m deep. The grey and black dots indicate occurrences of fish measured acoustically and show how the fish are distributed relative to the topography.

ABOUT THE PROJECT

Following the tsunami, the IMR take part in a research and survey cruise off the coast of Sumatra. Meanwhile, IMR and the World Bank were discussing the possibility of providing Norwegian assistance in surveying the effects of the tsunami on the marine resources of the Sumatran coast. These contacts led to a three-part cooperative project:

1. Marine environment and habitat studies, in which the Norwegian-built R/V “Baruna Jaya VIII” plays a key role. The vessel has had its technical equipment upgraded, including the installation of a ROV and a multi-beam echo-sounder that gathers data for detailed seabed charting.
2. Fisheries surveys, in which the Ministry of Fisheries’ research institute in Jakarta is participating with the R/V “Bawal Putih”.
3. Fisheries statistics and management studies, in which current fishing activity on the northern coast of Sumatra is compared with corresponding levels of activity before the tsunami.



INSTITUTE OF MARINE RESEARCH
HAVFORSKNINGSINSTITUTTET

INSTITUTE OF MARINE RESEARCH

Nordnesgaten 50
P.O. Box 1870 Nordnes
NO-5817 Bergen – Norway
Tel.: +47 55 23 85 00
Fax: +47 55 23 85 31

www.imr.no

TROMSØ DEPARTMENT

Sykehusveien 23
P.O. Box 6404
NO-9294 Tromsø – Norway
Tel.: +47 55 23 85 00
Fax: +47 77 60 97 01

FLØDEVIGEN RESEARCH STATION

NO-4817 His – Norway
Tel.: +47 55 23 85 00
Fax: +47 37 05 90 01

AUSTEVOLL RESEARCH STATION

NO-5392 Storebø – Norway
Tel.: +47 55 23 85 00
Fax: +47 56 18 22 22

MATRE RESEARCH STATION

NO-5984 Matredal – Norway
Tel.: +47 55 23 85 00
Fax: +47 56 36 75 85

PUBLIC RELATIONS AND COMMUNICATION

Tel.: +47 55 23 85 38
Fax: +47 55 23 85 55
E-mail: informasjonen@imr.no

CONTACT PERSONS

Bjørn Serigstad
Tel.: +47 55 23 69 64
bjorn.serigstad@imr.no

Jan Helge Fosså
Tel.: +47 55 23 85 33
jan.helge.fossaa@imr.no

RESEARCH GROUP

Centre for Development
Co-operation in Fisheries

