

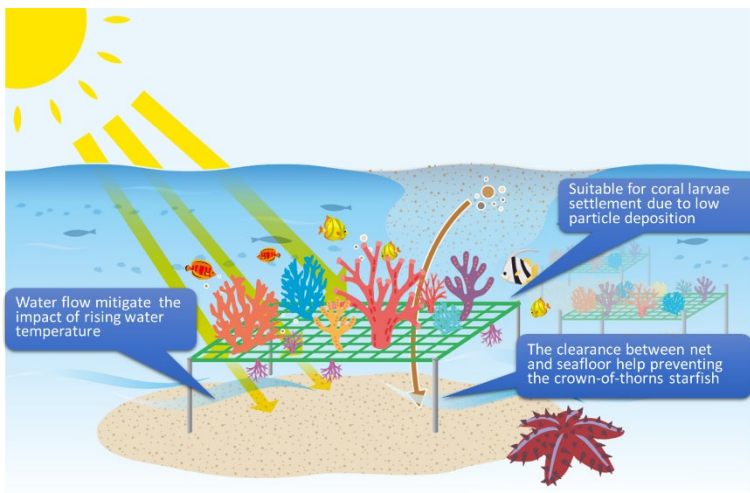
June 2, 2023

Coral Reef Restoration Project InCORE™ Launches in the Philippines Awarded by the Asian Development Bank's international call for proposal

Kajima Corporation (President: Hiromasa Amano) has launched the Integrated Approach for Coral Reef Conservation and Rehabilitation ("InCORE™") project in collaboration with Tokyo Institute of Technology ("Tokyo Tech") and the University of the Philippines Visayas (UPV), aiming to conserve and restore coral reefs, which are at risk of degradation due to climate change and anthropogenic disturbance.

This project proposes and implements an integrated approach that includes environmental assessment, the implementation of coral rehabilitation and the verification of effectiveness through monitoring, by combining Tokyo Tech's environmental assessment of coral reefs using numerical simulation technology, Coral Net™, which is Kajima's coral rehabilitation technology, and UPV's expertise, as it is familiar with the regional ecosystem. The goal of the project is to propose and implement an integrated approach to achieve locally appropriate conservation and the restoration of coral reefs.

The project won an award from by the Asian Development Bank ("ADB") as part of its "Technology Innovation Challenge for Healthy Oceans - Restore and Protect Coral Reefs." international open call for proposal.



Concept and features of Coral Net™



Coral Net™ (durable type)

Background

The triangular-shaped area surrounded by countries including the Philippines, Indonesia, Malaysia and Papua New Guinea is known as the Coral Triangle and is inhabited by three-quarters of the world's coral species, making it an area rich in marine biodiversity. However, in recent years, due to coastal development, overfishing and global warming caused by climate change, the coral reefs in this area are in danger of degradation, and the impact on fishery resources and tourism is becoming more serious. Although there have been many coral rehabilitation projects both in Japan and internationally, prior environmental surveys, the improvement of coral establishment rates, the implementation of continuous monitoring, and the improvement of the marine environment have all proven to be challenges.

Therefore, as part of its efforts to combat climate change and ensure sustainability in the Asia-Pacific region, the ADB issued a call for applications for coral reef conservation and restoration technologies, and Kajima's proposal was selected from among 34 applications from research institutes and organizations around the world.

Role-sharing

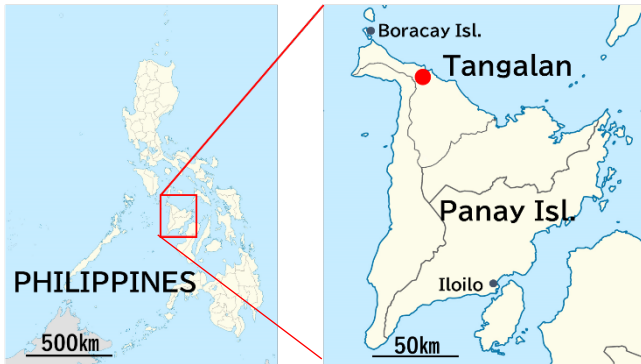
UPV will conduct ecological surveys of the coral reefs in the area based on its previous research experience, and also coordinate with stakeholders, including local governments, research institutes and fishery groups. Tokyo Tech perform will carry out multiple environmental impact assessments using their numerical simulation technology based on coastal ecosystem models. This technology can quantitatively analyze wide-area and time-series changes in environmental conditions that cannot be obtained through short-term field surveys alone. Kajima will consider how to apply Coral Net to suit the local environmental characteristics, as well as planning and coordinating the overall project.

Kajima, Tokyo Tech and UPV will jointly conduct investigations to identify the causes of coral reef degradation, select suitable locations for coral rehabilitation, and carry out monitoring surveys. Based on these, the project team will propose suitable measures to improve environmental conditions for enhancing coral rehabilitation.

Project outline

The coastal area of Tangalan in Aklan Province, which is on Panay Island in the Philippines, has been selected as the project site, and the local government there has been promoting coral rehabilitation efforts. The project will be implemented in close collaboration with local stakeholders.

The project will be carried out over a period of 18 months, implementing an integrated approach to coral restoration in three stages and verifying its effectiveness.



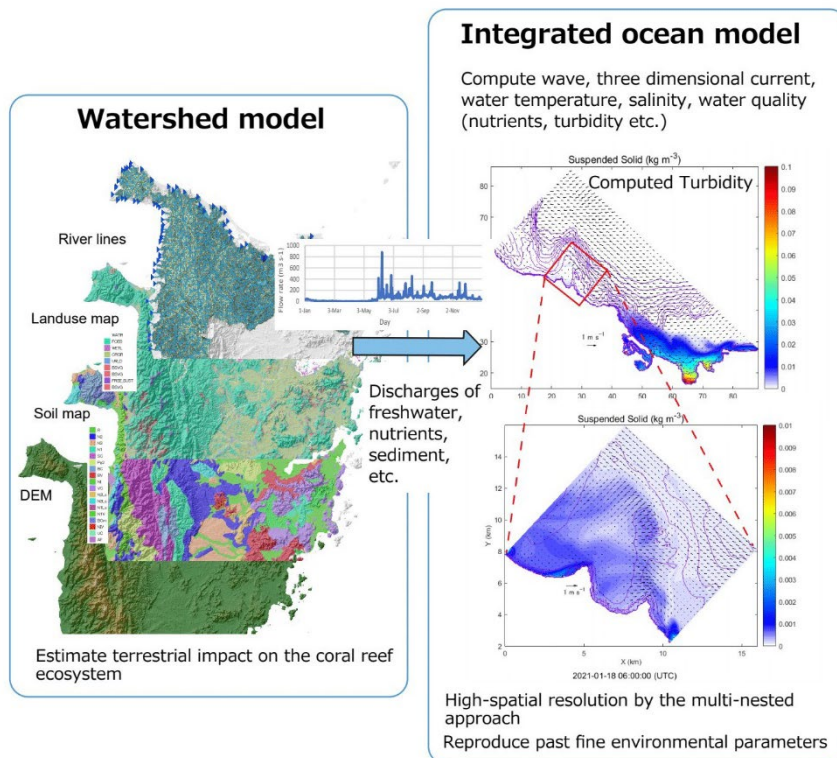
Location of Tangalan



Tangalan coastal area

1. Environmental assessment through field surveys and numerical simulation technology

In collaboration with the local government and the university, ecological surveys will be conducted in the area. Tokyo Tech's numerical simulation technology for coastal environments allows us to analyze in a quantitative manner the spatial distribution of seawater flow, temperature, salinity, and water quality, as well as temporal changes. Subsequently, suitable coral rehabilitation methods and sites will be selected, taking into consideration the environmental conditions of the target area.



Examples of environmental assessment using numerical simulation technology by Tokyo Tech

2. Implementation of coral rehabilitation technology

Coral Net™ is a core coral rehabilitation technology that enables more stable rehabilitation than conventional coral transplantation methods. Kajima has more than 20 years' experience and know-how from demonstration tests conducted in Okinawa, Japan. The Coral Net will be installed in the coastal area of Tangalan based on the environmental assessment, in collaboration with local stakeholders.



Example of coral restoration using Coral Net™ in Okinawa, Japan

3. Monitoring and verification

After the rehabilitation technology is introduced, continuous monitoring will be conducted together with local stakeholders. In addition, possible measures to improve water quality and other environmental conditions surrounding coral reefs will be examined by quantitatively clarifying various relationships with the sources of environmental loads, such as the inflow of fine sediments from the adjacent land areas, by using Tokyo Tech's numerical simulation technology. By using these activities, the effectiveness of the integrated approach of this project will be verified.

Future prospects

In Kajima, Tokyo Tech, and UPV's vision, this integrated approach will be applied and developed in the various countries using this project's outcomes as a foothold, and there will be collaboration with each region's stakeholders for the conservation and restoration of coral reefs.

Through these efforts, Kajima will contribute to global environmental conservation and the transition to a decarbonized society.