

Abstract

Mapping the state of the marine ecosystem after the Great East Japan Earthquake 2011

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Keywords: Tsunami, marine debris, Geographical Information System (GIS), Species distribution modelling (SDMs), seafloor mapping

The Tohoku Ecosystem-Associated Marine Science (TEAMS) project started from 2011 with the aim of revealing the impacts of the 2011 tsunami and to assess the present state of the marine ecosystem in affected areas over time during the next decade. The Habitat and Ecosystem Mapping Team in TEAMS aims to integrate data from our project to visualize the state of the ecosystem using maps. Creation of these habitat maps are expected to contribute to our understanding of the effects of large tsunamis, present the status of marine biodiversity in the area, and lead to the identification of key areas for ensuring ecosystem resilience.

We collected various data such as bathymetry, geography, oceanography, benthos and tsunami-debris not only from our project but also from the archived data at our respective institutes and in public databases. We appended location information onto deep-sea images and identified the presence of species and debris at each survey point. We conducted data integration for GIS using geo-statistical models, analysis for species distribution modeling, and made a map of habitat suitability and environmental variables in the research area.

Our preliminary results suggest that the impact of the tsunami in deep-sea areas (ca. 200-500m) was not as severe as in coastal environments. Accumulations of tsunami debris were found mainly in submarine canyons. We also found some large debris using a side scan sonar at depths of 150 to 200 meters. The relationship between the state of the environment and the distribution of organisms (focusing on brittle stars) before and after the tsunami will be discussed in this presentation.