

Changes of Ecosystem by the Environment in the Coastal Area (The Final Report of Steering Division)

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Summary

Recent human activities have changed the environment of land and coastal regions, and the changes caused severe damages to the ecosystem of coastal regions. The purpose of our project is to study the dynamics and mechanism of ecological changes in the coastal areas caused by the environmental changes of nearby land areas. This is the interdisciplinary study by the five scientists of coastal engineering, plant physiology, microbiology, and marine chemistry. The study will give us basic knowledge for the effective use of the coastal area and for its ecosystem.

When we started our project research, we exchanged information of each field to deepen our understanding of other study fields. In addition, we believed it is important to study other aspects of marine ecosystems by cooperative studies with marine biologists. During the last three years, we had several meetings with marine biologists and limnologists, and discussed the following topics; establishment of common study field, development of new research technologies, use of university facilities for joint research, and funding.

During the last three years, our researches have remarkably developed as we expected. Following results are important for the future development of environmental studies in coastal area. A new dispersion and accumulation model of chemical substances in the tidal zone has been developed. The model will help explain the mechanism of seaweed growing in the tidal zone. A group has started studying the effect of underground water on growing a mangrove by oxygen isotope tracer technique. The fundamental biogeochemical processes of biologically active substances from various land sources were examined by laboratory model experiments. The results will help explain the complicated field processes of interaction between the mixing zone of river and sea. It was found that the fulvic acid-iron complex is necessary for growing seaweed and for preventing the growth of calcareous weed.

At the initial stage of our research, we planned to do the project under the umbrella of LOICZ-Japan, an IGBP subcommittee of the Science Council of Japan. Now, LOICZ-Japan has not started its research projects unfortunately. Our project is also a part of the future research fields of the Society of Sea Water Science, Japan. We want to develop our studies by cooperating with scientists of other disciplines, such as marine biology, fishery, modeling, hydrology, physical oceanography, and geochemistry.