KITAZAWA LAB.

[Marine Food / Energy Utilization and Ecosystem Preservation]

Large-Scale Experiment and Advanced-Analysis Platform

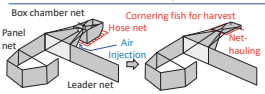
Marine Ecosystem Engineering

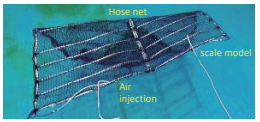
Dept. of Systems Innovation, Graduate School of Engineering

http://mefe.iis.u-tokyo.ac.jp/index_e.html

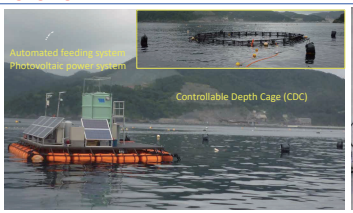
Utilize Marine Food / Energy and Preserve Ecosystem

We are engaged in research on the use of food and energy resources in harmony with the marine ecosystem. We are conducting a water tank model experiment to investigate the interaction between structures and aquatic lives, simulation by a hydrodynamic and ecosystem coupled model, and an easy-to-use monitoring system for observing the aquatic lives. In the ocean, there are many issues that cannot be predicted by experiments and numerical analysis, so we will elucidate the issues for social implementation by field demonstrations. With the achievement of the SDGs and the realization of Society 5.0 in ocean use, we will aim for food and energy security, revitalization and sustainable development of the aging region.





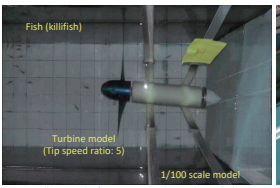
Automated Net-hauling System
Human-saving and labor-saving of net-hauling operation



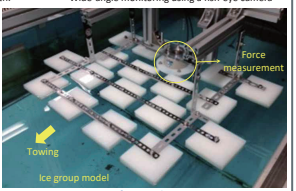
Controllable Depth Cage and Automated Feeding System (Onagawa Bay)
Controllable depth cage (CDC) can be installed at any depth.

Reef-effect Observation (off Kamaishi)
Wide-angle monitoring using a fish-eye camera

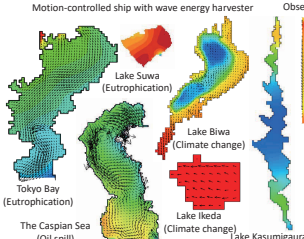
Wave Harmonizer (Yuya Bay; off Hiratsuka)
Motion-controlled ship with wave energy harvester



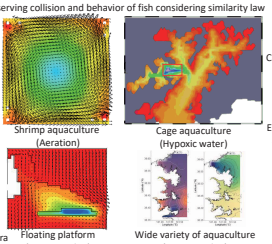
Collision Risk of Marine Animal to Turbine Blades
Observing collision and behavior of fish considering similarity law



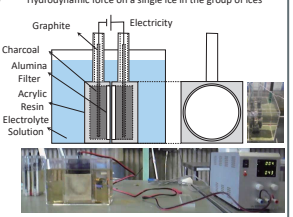
Ice Group Interfering with Marine Structure
Hydrodynamic force on a single ice in the group of ices



Numerical Simulation Using Hydrodynamic and Ecosystem Coupled Model



Mitigation of eutrophication, climate change, and environmental impact assessment



Wastewater Treatment Using Electrochemical Method
Insoluble charcoal enclosed electrodes for electrolysis