

# KITAZAWA LAB.



## Marine Food and Energy Utilization with Ecosystem Preservation

Large-Scale Experiment and Advanced-Analysis Platform

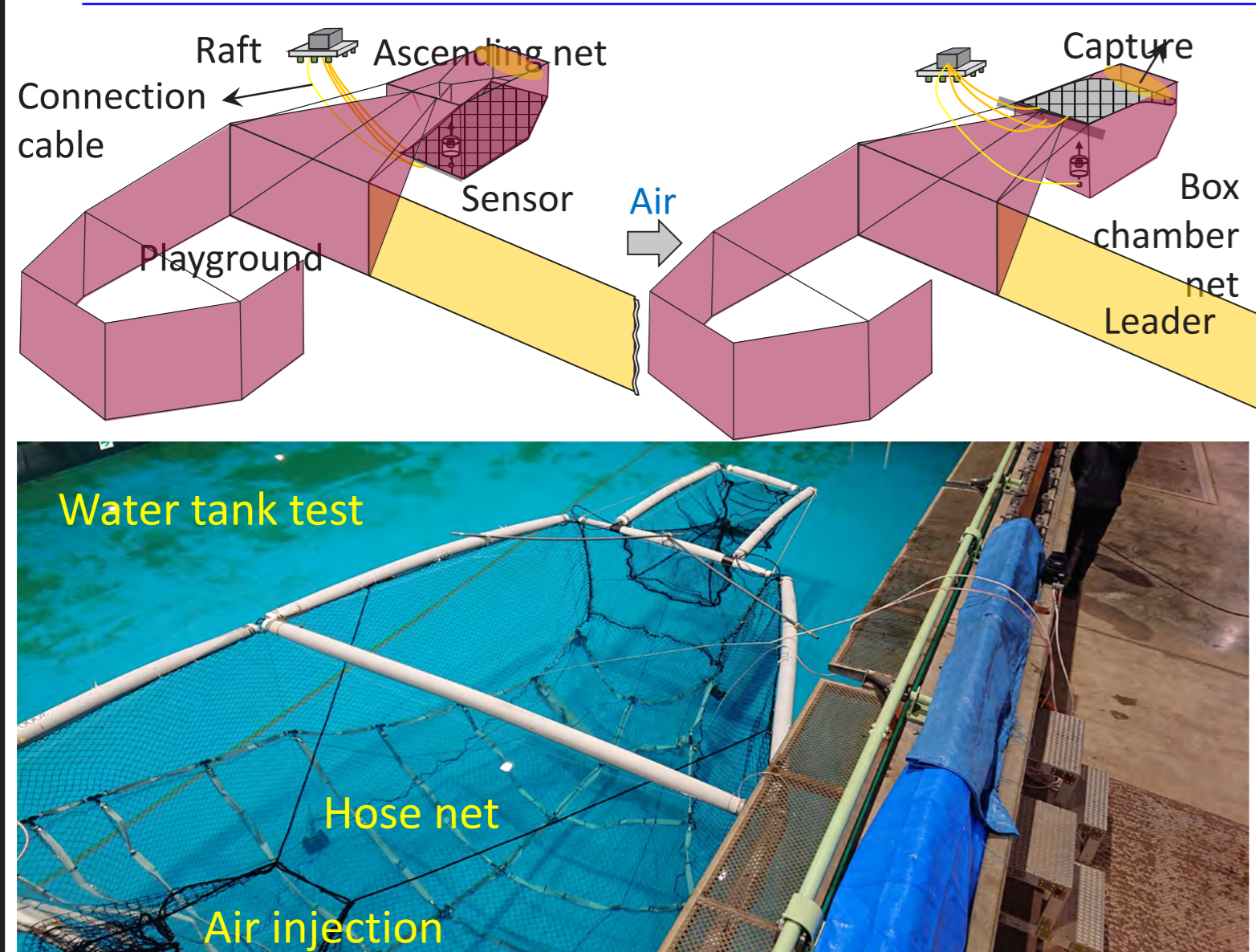
Marine Ecosystem Engineering

Department of Systems Innovation, Graduate School of Engineering

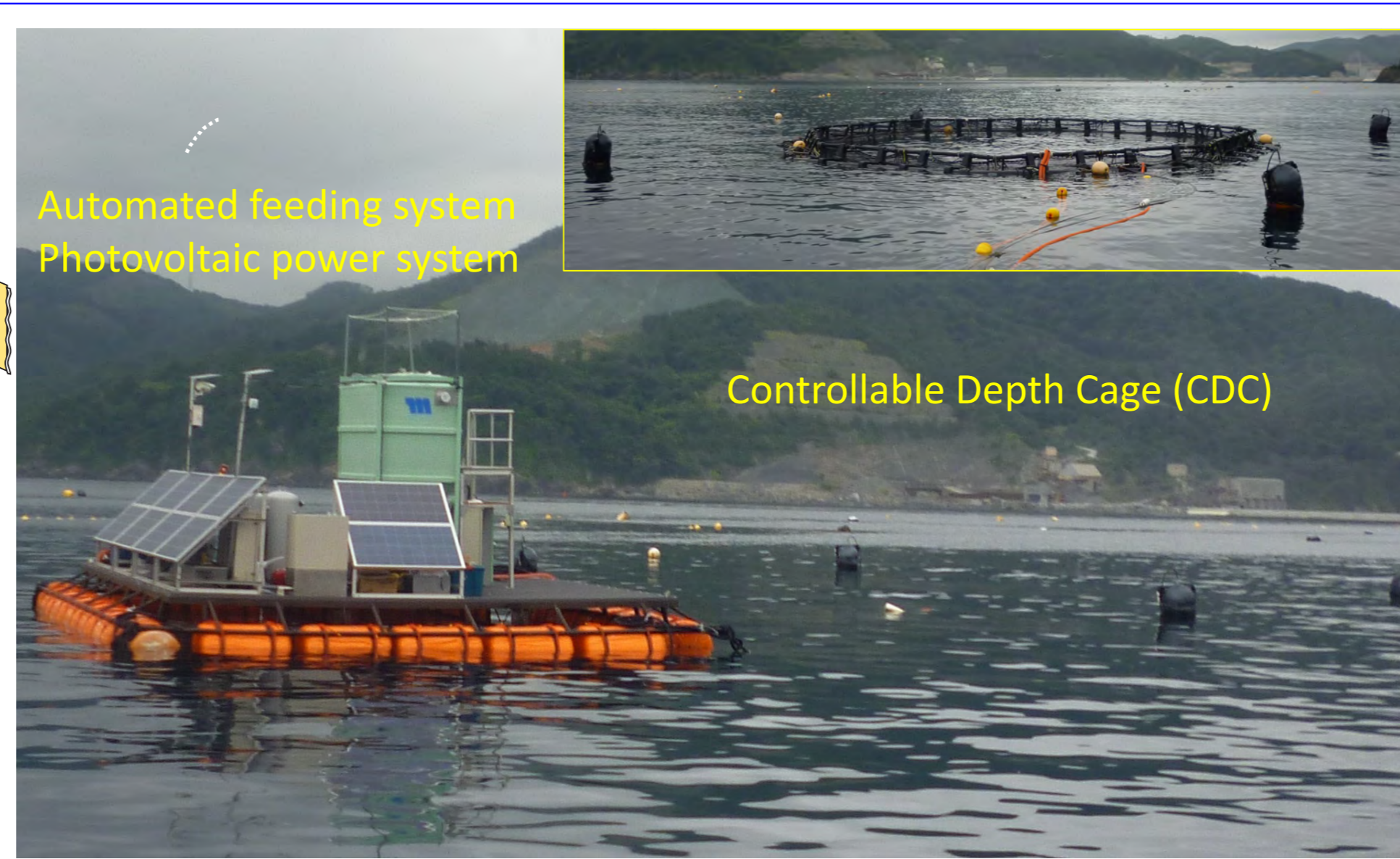
[http://mefe.iis.u-tokyo.ac.jp/index\\_e.html](http://mefe.iis.u-tokyo.ac.jp/index_e.html)

### Utilize Marine Food and Energy with Preserve Ecosystem

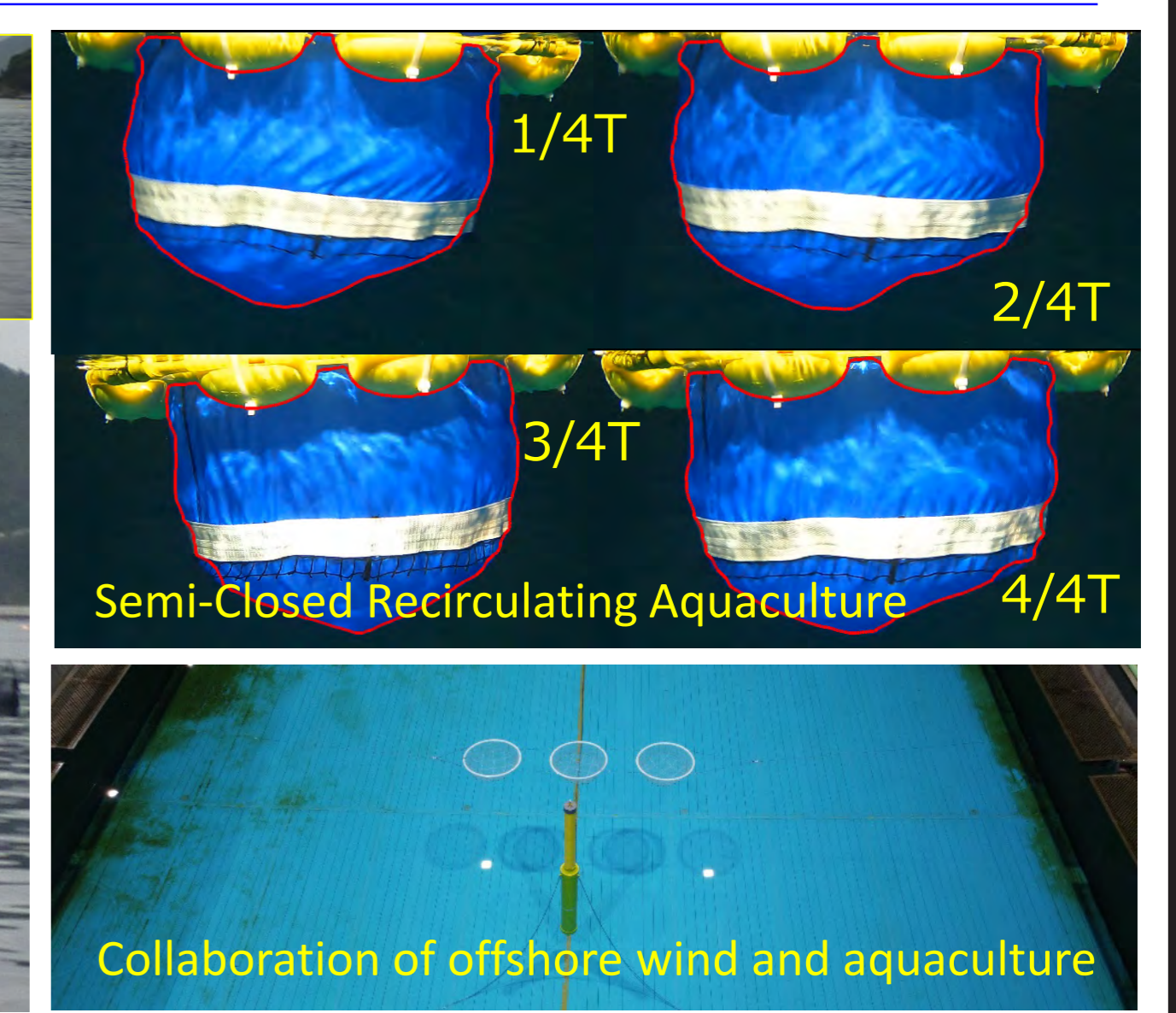
We are engaged in research on **the use of food and energy resources in harmony with the marine ecosystem**. We are conducting a **water tank model experiment** to investigate the interaction between structures and aquatic lives, **simulation** by a hydrodynamic and ecosystem coupled model, and an easy-to-use **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 Fish-guiding System**  
Human-saving and labor-saving of net-hauling operation



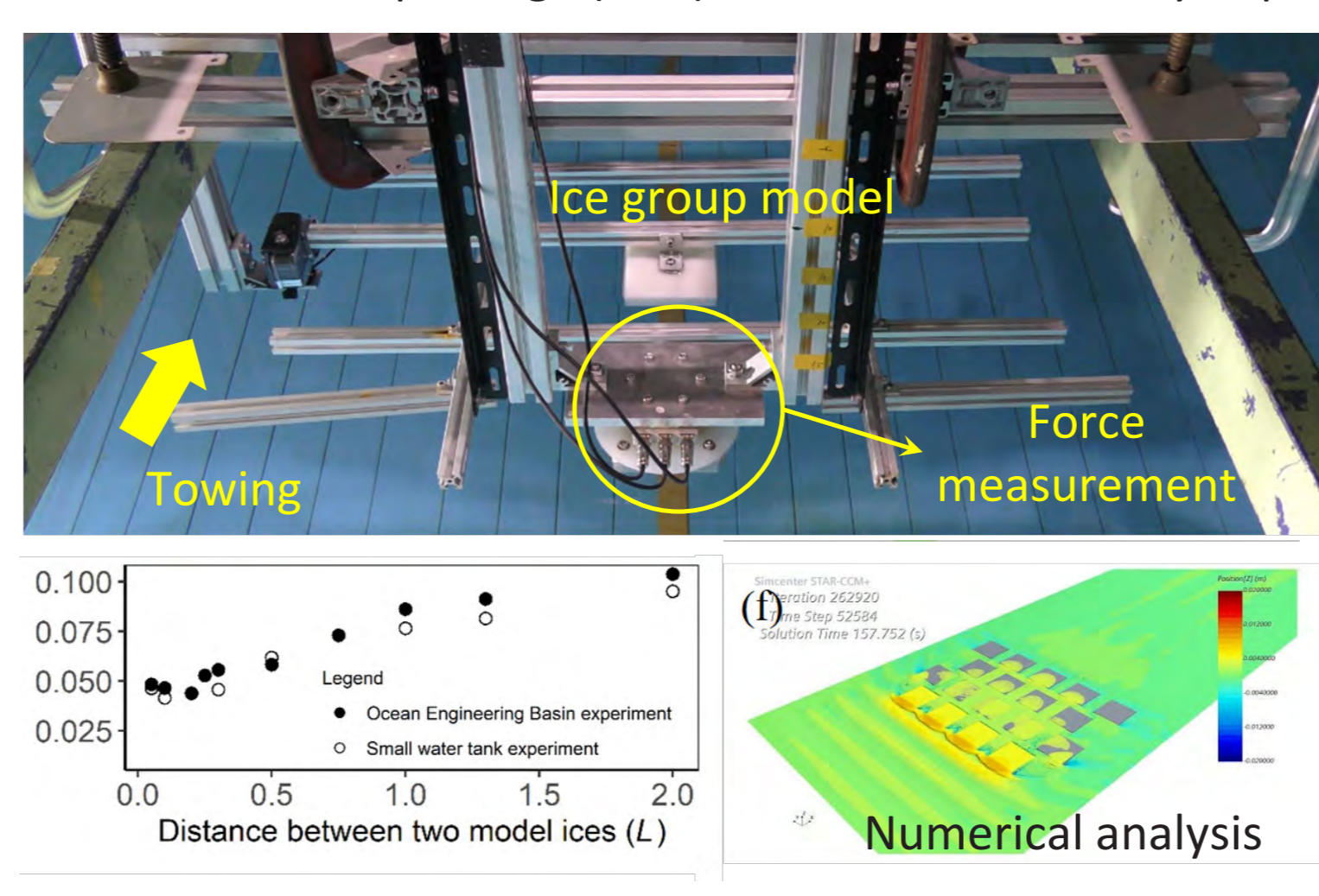
**Controllable Depth Cage and Automated Feeding System (Onagawa Bay)**  
Controllable depth cage (CDC) can be installed at any depth.



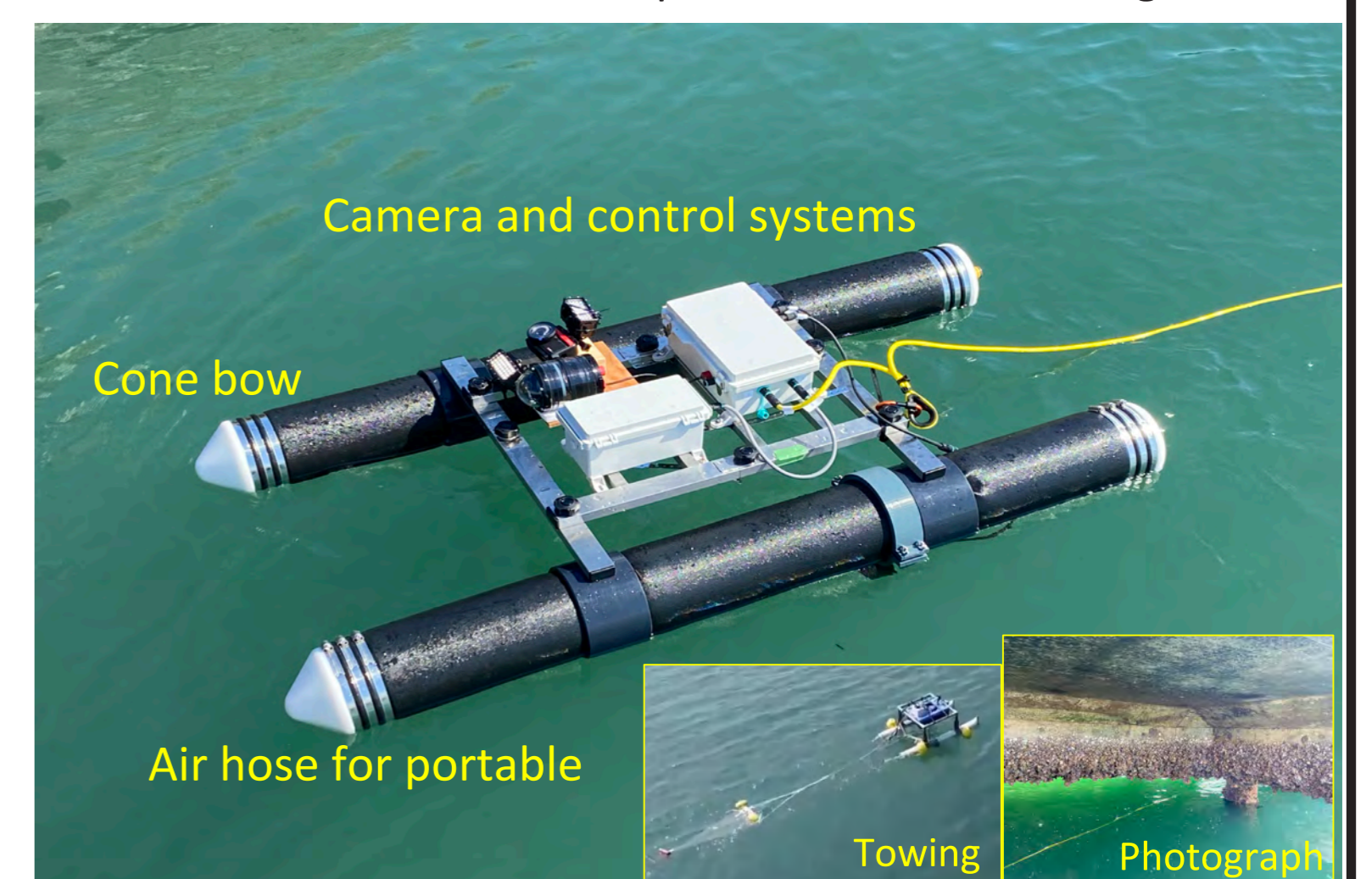
**Innovative Aquaculture System**  
Sea area for aquaculture will be enlarged.



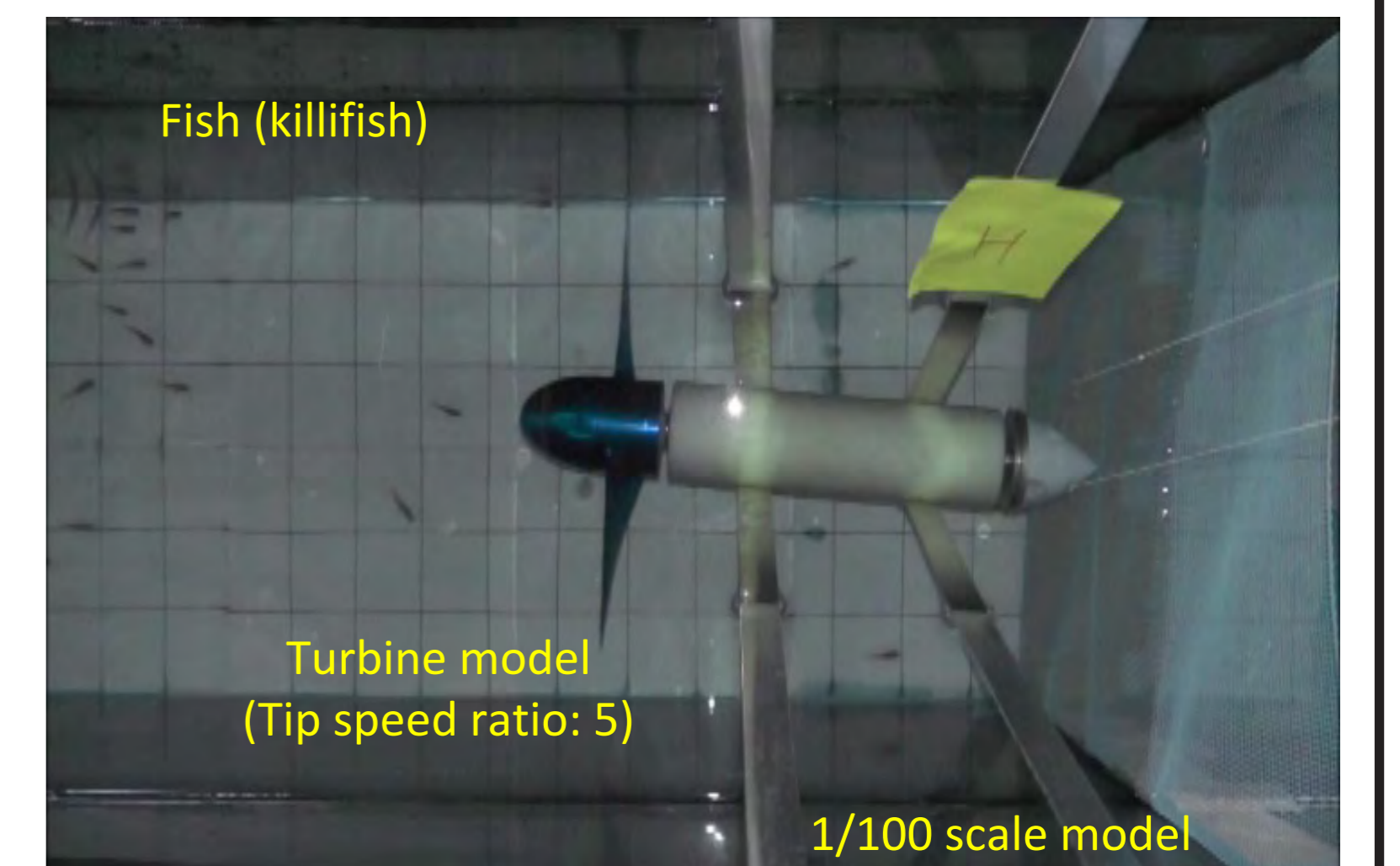
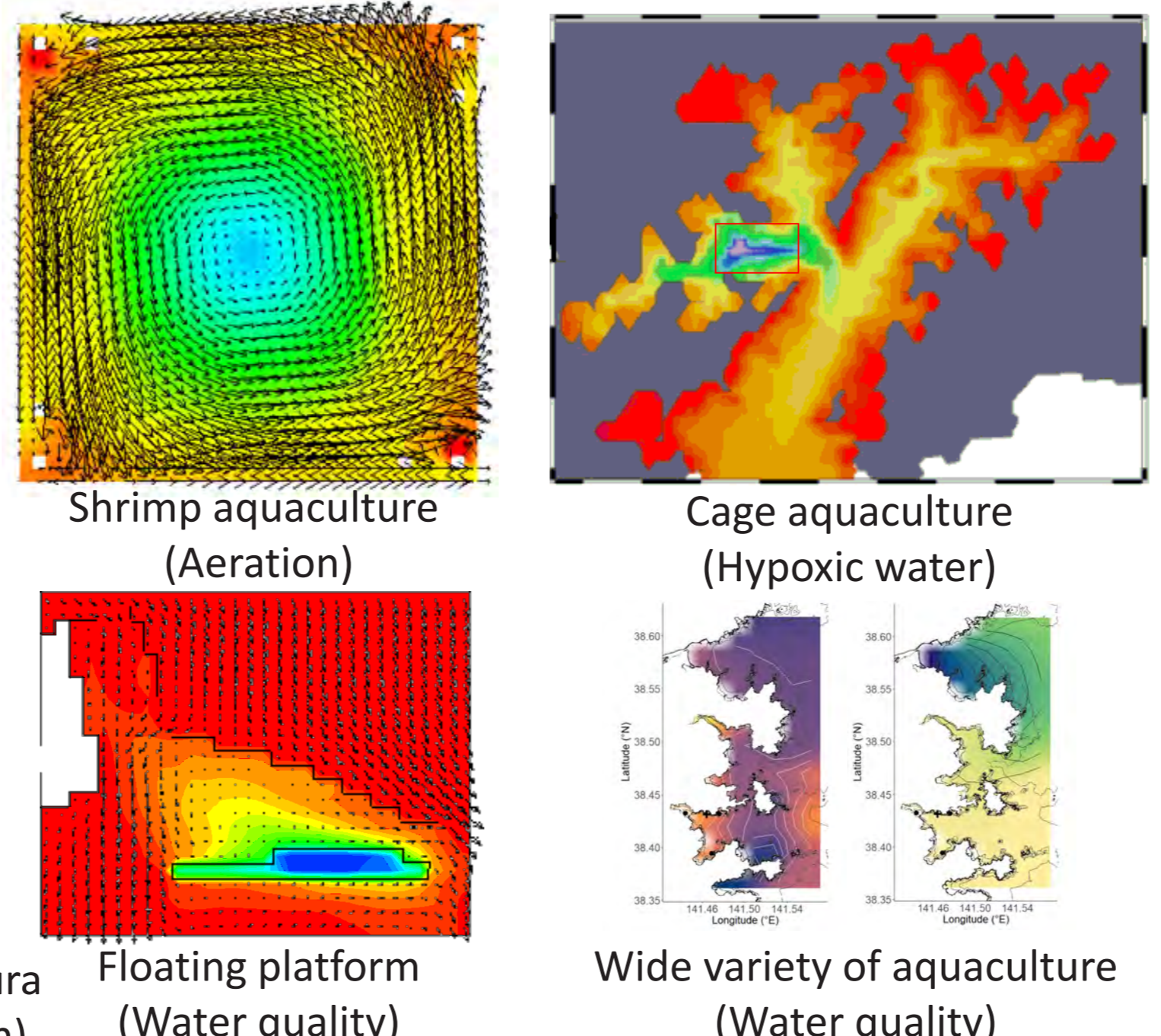
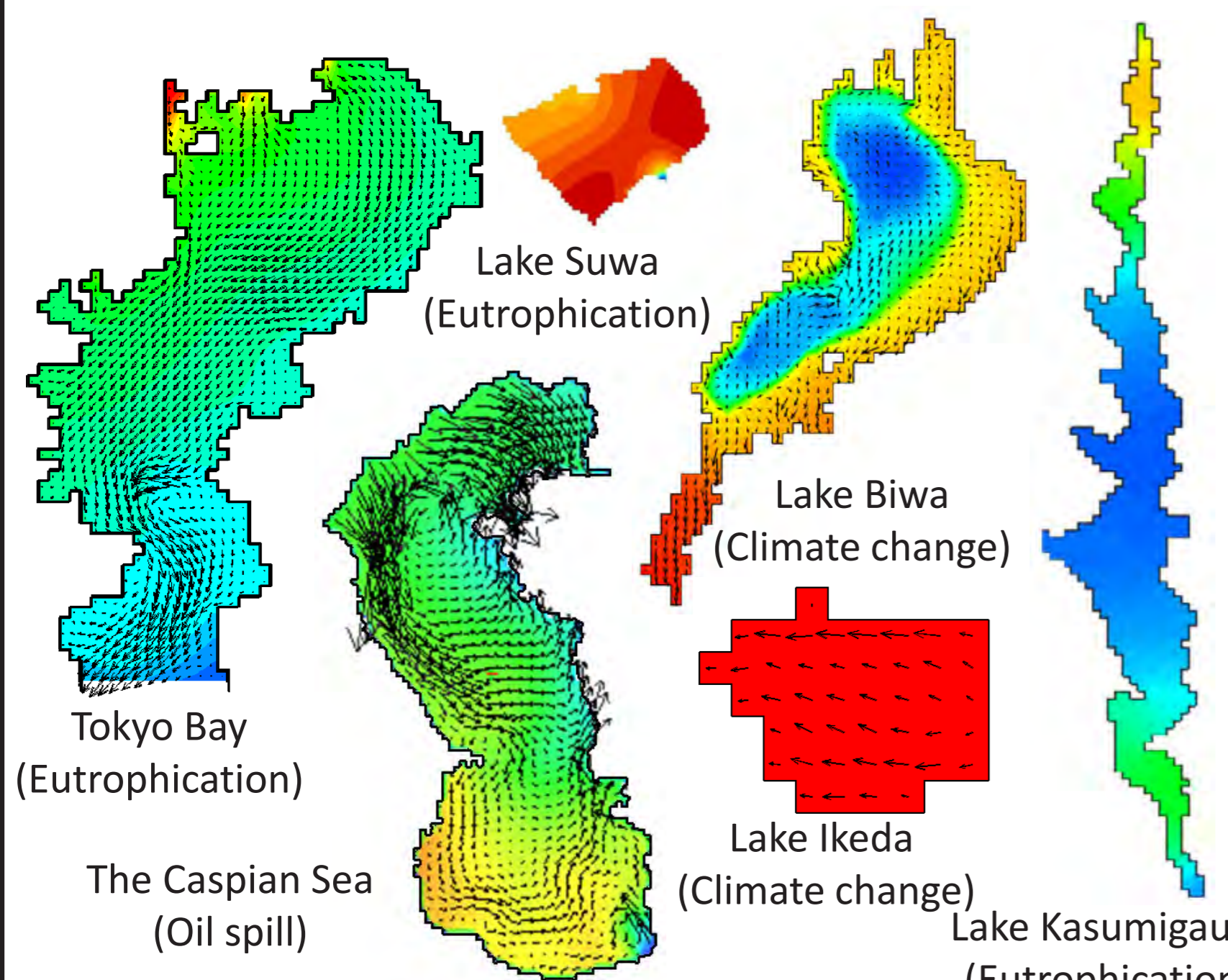
**Wave Harmonizer (Yuya Bay; off Hiratsuka)**  
Motion-controlled ship with wave energy harvester



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



**Reef-effect Observation around Marine Structure**  
A portable monitoring system, MMC (Multi Mover Catamaran)



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

Numerical Simulation Using Hydrodynamic and Ecosystem Coupled Model Mitigation of eutrophication, climate change, and environmental impact assessment

