

## O13.7

### **Toward resilient and sustainable socio-ecological system establishment for Ishigaki Island and Sekisei Lagoon, Japan, with a comprehensive stakeholders partnership**

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#### **Abstract**

Sekisei Lagoon is the largest coral reef in Japan, a part of Iriomote-Ishigaki National Park, having rich ecosystems with more than 360 coral species, and it is expected as a source area providing coral larvae over the Ryukyu Islands along with the Kuroshio Current. Therefore, it is very important to properly conserve the ecosystems in Sekisei Lagoon and its surrounding reef areas. Unfortunately, however, they have declined due to various threats like coral bleaching, soil runoff, and outbreak of crown-of-thorns starfishes (COTS). The periodical monitoring data indicated that massive coral bleaching both in 1998 and 2007 caused sharp decline in the coral covers. The average values of coral coverage showed a good recovery after 1998, while that after 2007 showed almost no recovery. This means the reef ecosystem has lost its resilience after 2007. The monitoring data indicated the recruitment rate of corals has significantly decreased and COTS outbreak become prominent after 2007. Numerical modeling studies in a perspective of an island-coastal-ocean linkage system and data analyses have revealed that soil and nutrient runoff from the adjacent Ishigaki Island may be possible causes of the loss of the ecosystem resilience. Although many efforts have been made by various stakeholders, the status of the ecosystems is still poor and the resilience has not yet well recovered despite the increasing concern of climate change impacts in near future. The basic questions are “how to realize a resilient socio-ecological system under the combined local and global threats?” and “how to realize a “sustainable island” system as a whole?” For effectively achieving these goals, we need to establish a new framework in which various local stakeholder individuals, groups, and institutions, including the youth, may actively collaborate with each other as the main players. Our COAST Card Project should contribute a lot for all these.

#### **Keywords**

Coral reef ecosystem, resilience, socio-ecological system, COAST Card