measures to deal with marine litter and to inform and educate the general public.

Nursery grounds of Green Tiger Prawn (*Penaeus semisulcatus*, De Haan) in the busherh coastal waters, Persian Gulf

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The survey plan for *Penaeus semisulcatus* nursery grounds was designed to encompass the main coastal prawn catching in Bushehr waters, Persian Gulf, from July 2003 to March 2005.
Sampling stations were selected in the shallow waters < 10 m deep and collections of juveniles were made from a small vessel powered by a 150 hp outboard engine that was equipped with a small beam trawl net with 10 mm stretch mesh. Prawns less than 15 mm carapace length were classified as juvenile.
The catches of *P. semisulcatus* juvenile were abundant at only a few sites in the shallow waters around southern (Motaf) and middle (Helaileh) regions of the study area. The maximum number of juveniles occurred in June and November 2003 and April and June 2004. Juvenile abundance was higher in vegetated sites as compared to non-vegetated sites during this study.
Finding from the present study support the facts that the extensive shallow reef of flat and open coastline sea grass and algae communities are therefore likely to be critically important for the fishery and should therefore be afforded protection from pollution, fishing gear damage and industrial development.

Modeling of phytoplankton production in Ise Bay, Japan: application of nitrogen isotopes to identification of DIN Sources

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An important aspect of the nitrogen cycle in coastal environments concerns the source of the nitrogen used in primary production. The continual input of external nitrogen can determine the total capacity of a bay to produce a sustainable fish harvest within the system. Our target area is Ise Bay, which is one of the most eutrophic coastal areas in Japan. Phytoplankton production in Ise Bay is supported by external nitrogen derived from rivers and ocean, and nitrogen regenerated within the bay. The objectives of this study are to clarify the characteristics of DIN in each source including riverine, oceanic and regenerated nitrogen, and to evaluate the contribution of each DIN source to primary production in time and space. In this study, therefore, the three-dimensional ecosystem model including nitrogen isotopes was developed based on the precise observations as follows. First, seasonal observations for identifying endmenber values of riverine DIN were conducted in the lower part of the Kiso Rivers, which empty into the head of the bay. Second, the oceanic DIN endmenbers were determined by the seasonal observations at the bay mouth. Third, the magnitudes of isotope effects by nitrification and denitrification on ^{15}N dynamics were estimated at the central part of Ise Bay to clarify the seasonal changes in regenerated DIN inside the bay. Finally, nitrogen dynamics in Ise Bay were elucidated by the ecosystem model, which could reproduce the DIN concentrations and their isotope signatures obtained by the observations. The model results indicated that phytoplankton production is mainly supported by the internal DIN cycle rather than the external DIN supply. This would be the main reason for sluggish recovery of water quality in the system.

Field observation of water environment characteristics for restoration of the Amagasaki Canal, Japan

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