Japan Geoscience Union Meeting 2012
(May 20-25 2012 at Makuhari, Chiba, Japan)

AHW30-13 Room:101A Time:May 22 14:30-14:45

Evaluation of the effect of submarine groundwater discharge on the coastal lower tropic ecosystem in the Seto Inland Sea

SAITO, Mitsuyo[1*], ONODERA, Shin-ichi[2], Minoru Tokumasu[3], ONISHI, Koki[2], YOSHIKAWA, Masashi[2], Guangzhe Jin[2], SHIMIZU, Yuta[2]

[1]JSPS PD, CMES, Ehime Univ., [2]Grad. School of Hiroshima Univ., [3]Saijo City

Recent studies have revealed that submarine groundwater discharge (SGD) is one of the important pathways for nutrients to the coastal ecosystems. Seto Inland Sea is the largest semi-enclosed coastal sea in Japan. Recently, some researchers tried to evaluate SGD at the specific area of the Seto Inland Sea by field research and numerical model approach. Nevertheless, its effect on the coastal ecosystem is still not clear. The objective of the study is to evaluate the effect of SGD on coastal lower tropic ecosystems in the Seto Inland Sea. The study area is southwestern part of the Hiuchi-Nada located in central part of the Seto Inland Sea. There is no input of large river into this area, whereas the terrestrial area is characterized by abundant groundwater recharged in mount Ishizuchi, which is the highest mountain (1982m) in western Japan.

The special distribution of the concentrations in radon (222Rn) and nutrients suggest that nutrient supply by SGD occurs around the tidal flat area and near the coastline. Nitrogen stable isotope ratio (d15N) of seaweeds harvested in the coastal area indicates that they uptake the nitrogen derived from groundwater and river water as well as seawater. Besides, relatively low d15N of seaweeds collected near the submarine fresh water spring suggests the effect of groundwater-derived nitrogen with low d15N. It means groundwater would be one of the important pathways for nitrogen from terrestrial area to the coastal lower tropic ecosystems in the study area.

∗This research was supported by the research grant for young scientists from Nissay financial group in 2010.

Keywords: submarine groundwater discharge, coastal lower tropic ecosys, seaweed harvesting, Seto Inland Sea