**Ecosystem and biogeochemical cycles in the benthic shelf sediments**

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**INTRODUCTION**

The sediments that blanket the continental shelf are situated in a zone where nutrient input from land and strong mixing produce maximum primary production and tight coupling between water column and sedimentary processes. The intricate coupling between the water column and sediment makes it challenging to quantify the production and decomposition processes and the resultant fluxes in the shelf sediments. Recent technical developments have led to insights into the high biogeochemical and biological activity of these environments and their role in the global cycles of matter. The depositional environment surrounding Taiwan vary with the tectonic setting and sediment loading. Recent anthropogenic activities greatly altered the environment but to various degrees. This study is intended to use the different depositional environments surrounding Taiwan to understand the environment/geological controls on the benthic community, the role of the benthic community in the biogeochemical cycles of deep-sea elements, as well as to address the recent anthropogenic impacts to this environment which we currently have very limited knowledge about.

**GOALS**:

1. Classify benthic faunas and their relationship with variable environmental factors, such as food availability, temperature, oxygen, and nutrient fluxes.
2. Quantitatively understand the biogeochemical cycles and benthic fluxes between seawater and sediments in different environmental/depostitional settings, e.g. southwestern vs. southeastern coast of Taiwan.
3. Examine the relationship between benthic biodiversity and biogeochemical cycles to understand the role of benthic fauna in global elemental cycling.
4. Understand how anthropogenic impacts, including decreasing in oxygen content, increase in nutrient load, would influence the benthic community and the biogeochemical cycles.

**REQUIREMENTS**:

1. Knowledge and interests in biology and chemistry. Interests in marine biology, marine chemistry, ocean observation, and statistical analysis.
2. Laboratory skills in chemistry.
3. Reading/writing/speaking capabilities in English.
4. Capability or interests to work on research cruise.