



### Ocean Currents, Terrain, and Nutrient Supply:

Try to guess the depths of the three seas surrounding Taiwan. Water depth and the material cycling system are closely connected. Using the Kuroshio Current as an example, the Kuroshio Current is a major wind-driven current in the North Pacific Ocean with a thickness of about 700-800m deep. The current originates from the North Equatorial Current (NEC) and flows north from the Eastern Philippines, continuing east of Taiwan. Nutrient levels are relatively high below the euphotic zone of the open ocean (upper layer at 150-200m). When the Kuroshio Current flows to Taiwan's northeast coast, the seabed becomes shallow so that the subsurface water is upwelled and provides high nutrient water to the euphotic zone of the region. This provides phytoplankton with a wealth of nutrients, thus, through the food web, causing the formation of an important fishing ground. Similarly, the subsurface Kuroshio water can also upwell to the East China Sea (ECS). This high nutrient water can be an extra nutrient source in the ECS where the water depth is shallow. Moreover, due to the input of high nutrient riverine water, estuaries are also high nutrient supply regions of the ocean. River discharge also influences nutrient material input and related biogeochemical cycling. Interestingly, the discharge levels of Chang Jiang River can influence the upwelling of the subsurface water of Kuroshio in the ECS. How these two high nutrient waters influence the biogeochemistry of the ECS deserve further study.

