

al Effect on Subsurface Flow and Biogeochemical Processes at the Coastal Area: some reviews and an research plan in the Yellow River Delta

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Some previous researches reported that direct discharge or nutrient load of groundwater into a marine is significant for the pathway of water and nutrient flow from the land to sea. However, it is difficult to estimate nutrient or contaminant load as well as groundwater discharge. Because both of nutrient and contaminant react chemically in the mixing zone between seawater and groundwater, it is necessary to estimate reaction process and its rate there. The mixing zone is formed not only by groundwater flow into sea with diffusion in a steady state, but also by tidal fluctuation. Based on the simulated results by some previous researches, the seawater intrusion into groundwater was controlled by tidal magnitude, groundwater gradient, and beach slope. It was strong under the condition of the large tidal fluctuation, small gradient and gentle slope. This means large mixing or dispersion of seawater in groundwater. In the coastal area of the Yellow River catchment, the river water did not reach to the Bo-Hai Sea before several years. Therefore, the groundwater gradient would be very small around the delta. In addition, beach slope is also very gentle. These situations would cause the large intrusion of seawater into groundwater in coastal and estuarine area. The objectives of this research are to confirm the intrusion of the present seawater into groundwater in a coastal and estuarine area, and clarify the biogeochemical process in mixing zone between groundwater, river water and seawater. In this research, we will install piezometers and pipes for water collection at several sites on three or four observation lines with collections of sediment samples, and collect water samples at the interval of two hours. In addition, we will conduct chemical analysis (anion, cation including trace metals and DOC, DN) and isotopic analysis (hydrogen, carbon, nitrogen, and oxygen) of water samples, and chemical analysis of sediment samples.

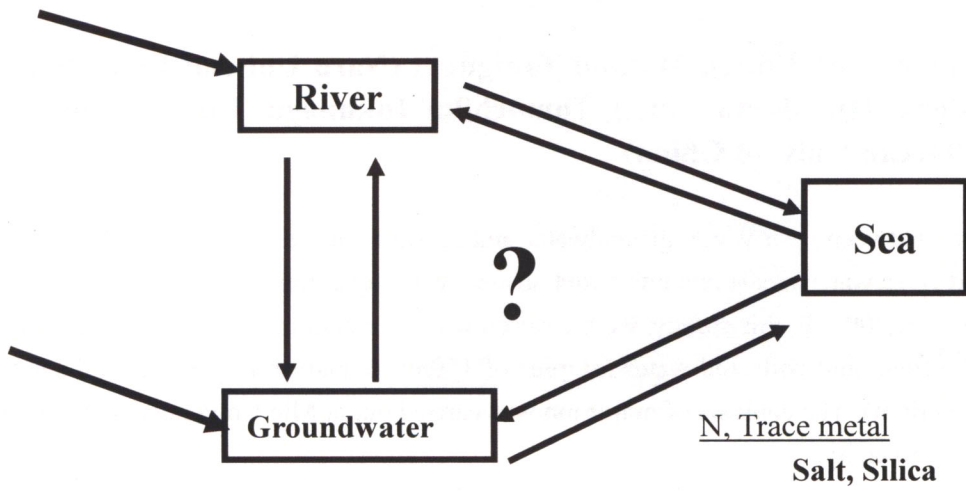


Fig.1 Unknown present element flux around the delta area

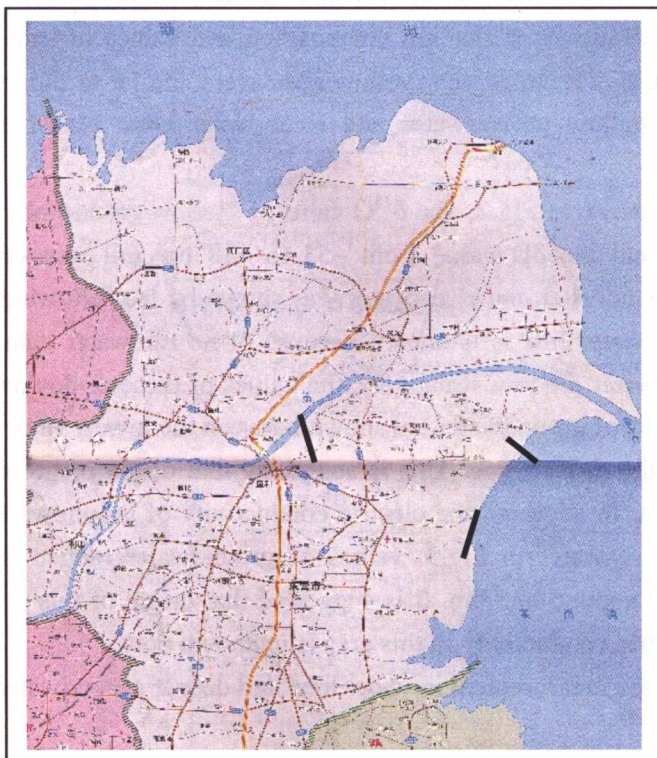


Fig.2 Observation lines on the study area