The impacts of diversion from the Yellow River on the local aquifer -case study in Shandong Province, China

Changyuan Tang , Jianyao Chen

Graduate School of Science and Technology, Chiba University, Japan

In order to solve salinazation problem in regions of downstream of the Yellow River, the diverted water from the river, used mainly for irrigation and leaching out the salt of the unsaturated zone to the aquifer, has great impacts on the local hydrological processes and aquifer system such as in providing extra water and exterior material, and accelerating the solvent transfer. Yucheng and Qihe cities, which are located in the middle part of Shandong Province, were chosen to study hydrological changes effected by water transfer from other catchments.

The diversion from the Yellow River, started in 1972, provides annually around 50-60% of total amount of local water resources to the study area that used to be waterlogged and is regarded as discharge zone in terms of hydrogeological conditions. The chemical pattern and the relationship of ^{18}O and deuterium (D) for ground water samples and the sample from the Yellow River tend to be unique for the study area, which differ from the area without the diverted water about 100 km to the north of Yucheng and Qihe cities. The whole aquifer system seems to be separated into two layers of shallow (less than 20 m) and deep (more than 20 m), and two strips of within and without 40 km from the Yellow River due to the long period of diversion. However, stream flow became less and less in the past two decades. Salinazation will occur again if no enough water from Yellow River to maintain this human-made agricultural region.