

## Estimation of unsteady confined groundwater flow with river water intrusion in coastal alluvial plain during a large flood.

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Several aquifers underlie alluvial plains, and confined groundwater is mainly used intensively. The water potential depression and land subsidence have been caused in the coastal area. On the other hand, confined groundwater is generally recharged in the boundary area (ie. Alluvial fan) between the mountain foot and alluvial plain. The groundwater recharge in alluvial fan mainly and preferentially occurs in the high flow period. This type of groundwater flow is considered to be in the steady to semi-steady state. In this research, we focused on a small alluvial plain with a little bit slope, we examined to confirm the recharge process and confined groundwater flow, using 10 years monitoring of groundwater level, water chemistry, and oxygen and hydrogen stable isotopic ratios. Our research area was in Okayama alluvial plain, western Japan, buried by the sediment transported from Asahi river, Yoshii river and Takahashi river. We monitored groundwater level and collected water samples at the 6 observation boreholes on the 4 experimental sites.

The component separation of groundwater by stable isotopes of water indicates that the major recharge source is river water in the upper stream section, whereas the contribution of rainwater increases in the lower stream section, and mixing of seawater in to the coastal groundwater with about 20m deep. In addition, large decline of isotopic ratios, chloride and sodium concentration were observed in the confined groundwater in the central part of the plain after an extreme flooding event. This suggests intensive recharge by river water with low isotopic ratios by volume and elevation effect of precipitation during this period.

Keywords: Coastal alluvial plain, groundwater flow, stable oxygen and hydrogen isotope