

## Estimating a Freshwater Discharge which Restricts Saltwater Intrusion in Alluvial Rivers: Shatt Al-Arab Estuary, North-West Arabian/Persian Gulf

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Shatt Al-Arab channel is the principal freshwater source to the Arabian/Persian Gulf. In the past, researchers have not significantly investigated the salt intrusion distance upstream from the mouth of Shatt Al-Arab estuary. This salt intrusion may constitute a threat to the fresh water supply to Basra city. Mike 21 has been used to examine the hydrodynamic regime and salinity intrusion in the estuary to clarify the minimum freshwater discharge required at the Abu Flus channel measurement station to maintain an acceptable salinity level along the channel. Different modelling scenarios have been employed to evaluate the function of different discharge values on the salt intrusion in the Shatt Al-Arab dynamics. It was not possible to obtain a reliable estimate of the relative contributions of fresh water discharge and tidal impact based on observations from the five stations surveyed by the Marine Science Centre. Measurements of the vertical salinity distributions and flows in 2013, 2014 and 2016 from a moving boat at different stations over the Shatt Al-Arab channel are employed here to simulate the relationship between the discharge and saltwater intrusion. This study provides a new strategy using the seawater interference model to determine how much upstream freshwater discharge is required to manage the saltwater intrusion from downstream. The results confirm a significant relationship connecting the freshwater discharge and seawater intrusion that can provide a useful understanding of seawater distribution over the estuarine channel. This enhances the analytical model as an effective tool to investigate water resources in tidal zones.

### Biography:

Qassim A-Aesawi is a PhD candidate at the School of Earth and Environmental Sciences, University of Wollongong. He concentrates on geology, water resources and oceanography, with his research focusing on simulation of hydrodynamic and water characteristics in estuarine areas, such as the Shatt Al-Arab estuary, north-west Arabian/Persian Gulf.