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Application of analytical solutions for salt intrusion and tidal dynamics in the Yangtze estuary, China

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There is a set of analytical equations for the computation of salt intrusion and tidal wave propagation, which have been used in many estuaries successfully, especially in the single-channel estuaries. They were also well tested in a multi-channel estuary - Mekong estuary. The Yangtze estuary is one of the largest estuaries in the world, also with multiple channels. It has a complex topography, and two branches with very different characteristics (North branch and South branch). Due to little fresh water the North branch is a typical marine channel, whereas the South branch is a riverine channel because of large river discharge which is still about 10 000m3/s even in the driest months. This is a big difference from other estuaries researched using this theory. This study applies the analytical equations to the Yangtze estuary, which were calibrated and validated on observations.

Keywords: analytical solutions; salt intrusion; tidal wave propagation; the Yangtze estuary