# Hydrodynamic Processes in the Sacramento/San Joaquin Delta: Examples of hydrodynamic processes that might be important and probably are hard to model

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**Abstract.** Understanding the physics of the Sacramento/San Joaquin Delta is key to being able to predict how changes in geometry or management strategies will affect key ecological and water quality processes in this important part of the San Francisco Bay Estuary. Using work carried out in our group at Stanford over the past decade as examples, I will try to point out several aspects of the hydrodynamics of the Delta that may influence ecological and biogeochemical processes operant in the Delta by modifying vertical mixing and horizontal dispersion in the Delta. In particular, I will discuss: (a) tidally variable bottom friction in Threemile Slough, a process that can alter mean flows through this important channel that connects the Sacramento and San Joaquin systems; (b) the role of longitudinal dispersion in shaping horizontal temperature variations in the San Joaquin River/Deep Water Ship Channel; (c) the interaction of stratification and turbulence in the San Joaquin River/Deep Water Ship Channel in determining vertical mixing rates there. Overall, the observations we have in hand appear to be challenging to replicate even for the most sophisticated, state of the art 3D hydrodynamic models.