

Mixing in Estuaries

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1. Basic ideas of mixing
 - a. Fickian diffusion
 - b. Shear flow dispersion
 - c. Residence time
2. Turbulence
 - a. The turbulence cascade
 - b. Reynolds averaging and the closure problem
 - c. Dynamics of turbulent kinetic energy
 - d. Boundary layers ($P \approx \epsilon$)
 - e. Buoyancy effects – physics and parameters (Ri , Ri_f and $\epsilon/\nu N^2$)
 - f. Measuring estuarine turbulence (including the ADCP variance technique)
3. Stratified turbulence and SIPS
 - a. Observations from San Francisco Bay
 - b. The role of Ri_x
 - c. Thermal stratification and mixed layer dynamics
4. Horizontal mixing by tides
 - a. Unsteady shearflow dispersion
 - b. Trapping
 - c. Chaotic dispersion and the real world (models)
 - d. Inferring dispersion from observations of the salinity distribution