

Laboratory Experiments of Tidal Dispersion  
around Irregular Boundaries

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## **Abstract**

Coastal eddy formation and dissipation are important for the dispersal of biogenic material and pollutants. Eddies are commonly generated by tidal currents that flow near rough boundaries. Previous field experiments with drifters have been used to investigate the tidal currents in Puget Sound, Washington, and have shown that eddies are generated due to tidal flow past headlands. These drifter deployments have revealed irregular patterns of tidal dispersion. In this study, laboratory experiments are used to examine particle trajectories by tracking beads in a water tank to better understand particle dispersion in oscillatory flow. In the laboratory experiments, turbulent dispersion is investigated around a rough boundary in both regular and irregular oscillatory flows. Each irregular oscillatory flow is composed of different sine waves. The average dispersion over a tidal cycle is estimated for each flow configuration as a function of space and is mapped out. The results indicate that the dispersion field depends on the pattern of oscillation.