



Baroclinic Instabilities in River Plumes : Numerical Idealized Simulations in the Bay of Biscay

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The Bay of Biscay, in the eastern North Atlantic, has two buoyant coastal plumes (Gironde and Loire rivers) linked with a frontal activity observed from remotely sensed observations. In those regions, baroclinic instabilities predominate following high resolution realistic numerical simulations.

To understand underlying processes explaining those observations and simulations, idealized numerical simulations focused on river plume have been developed. In the present study, the influence of the different parameters (wind, tides, river discharge, bathymetric slope, and currents) on the river plume (e.g. baroclinic instability generation) is computed. For each of those parameters, three scenarios are used: weak, moderate and strong. The overall objectives of this study are to determine which conditions lead to baroclinic instabilities and which scenario inhibit or enhance those particular instabilities. The effect on the vertical mixing is also investigated.