DESCRIPTION OF THE ADRIATIC OUTFLOW CURRENT AS OBSERVED FROM THE ELNA DATA

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The primary export of Northern Adriatic surface waters is shown to be restricted to a well-defined outflow on the western side, the Adriatic Outflow Current (AOC). This is a small-scale version of an equatorward, continental-shelf boundary current that is stable with respect to planetary vorticity, like for example, the Mid-Atlantic Bight Shelf Current or the East Greenland Current. The Po runoff and effluents from smaller rivers distributed along the Italian coast comprise the sources of fresh water that sustain a less-dense, shelf water mass. This coastal input of buoyancy generates an isostatic sea-level rise towards the coast that geostrophically drives the barotropic boundary current. The bottom flow generates an offshore frictional transport, that causes a prograde tilt to the pycnocline and an opposing baroclinic shear with depth (i.e. a downwelling circulation). The AOC can be strongly influenced by local winds (cf. ORLIC *et al.*, 1992). The orographic definition of the land boundaries tends to orient winds along the axis of the basin. Most importantly, the wind-driven effect of the Sirocco, from the southeast, counterpoises the AOC and can, with sufficient strength, set up a temporary upwelling circulation. Winds from the northwest accelerate the AOC circulation; and Bora winds, from the northeast, create a similar but more complicated response (Ekman and barotropic flows in opposition at the surface). The low-frequency consequence, of the AOC transporting water out from the northern terminus of the Adriatic, is a compensating inflow and a cyclonic tendency to the mean circulation of the Northern Adriatic.

A primary objective of the ELNA (Eutrophic Limits of the Northern Adriatic) Project is to establish seasonal budget for carbon-related parameters in the Northern Adriatic. Fundamental to this objective is a quantification of the transport and associated mass fluxes exiting the Northern Adriatic by means of the AOC. This work presents preliminary assessments of these transports from the seven ELNA cruises, and selected values from the monthly sections (from Feb' 93 to Dec' 94) of Senigallia and Cesenatico, using the steric-height method (HOPKINS, 1994). The treatment allows for a reasonably clear depiction of the seasonal, along-stream, and lateral structure of the AOC under different runoff and wind forcing conditions. Several examples of mass-flux calculations are given of the CTD-derived variables, such as freshwater and chlorophyll. The freshwater flux is matched with the estimates of runoff to ascertain the uniqueness of the AOC as the surface export mechanism for the Northern Adriatic. Preliminary conclusions, concerning the implications of the observed AOC variability to the Northern Adriatic ecosystem, are also presented.

REFERENCES

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