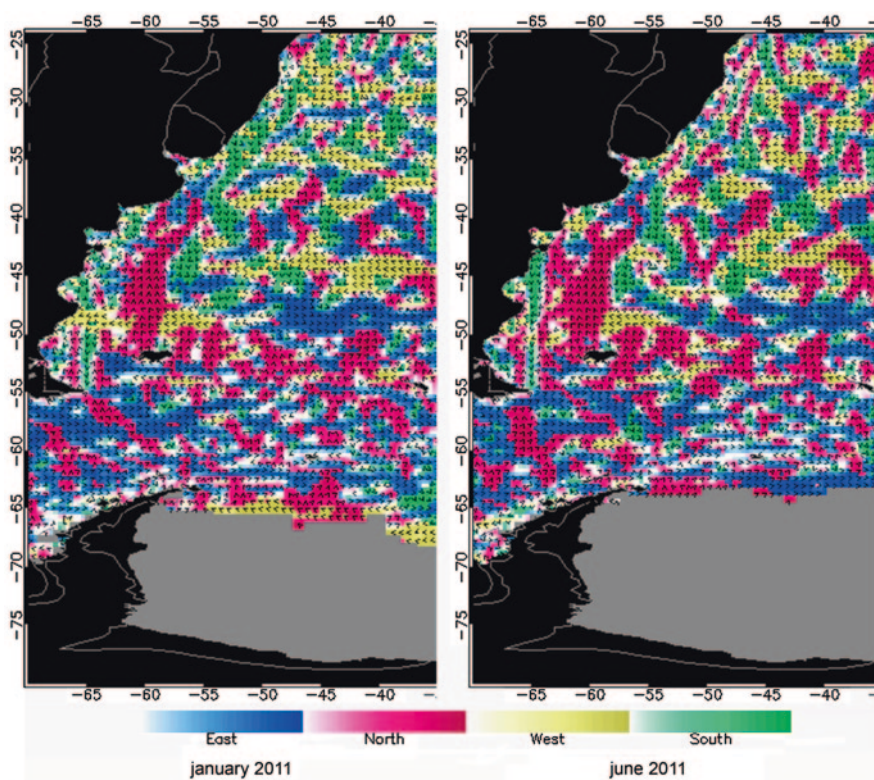


## Chapter 2

### Present Oceanographic Conditions

Along the coast of the Southwestern Atlantic area, there are two currents which cause the thermal gradient in the region: the warm Brazilian current, flowing from north to south, and the cold Malvinas (Falkland) one (MC), that flows northwards (Boltovskoy 1959, 1966, 1979; Podestá et al. 1991; Lentini et al. 2000; Piola and Rivas 1997; Piola et al. 2000; Lucas et al. 2005). Both currents converge at about



**Fig. 2.1** Direction of currents in the Southwestern Atlantic Ocean. Modified from maps downloaded at <http://oceanmotion.org/html/resources/oscar.htm#visstart>

the isobaths of 100 and 200 m developing a complex oceanographic area placed between 30 and 41°S (Podestá et al. 1991; Lentini et al. 2000; Acha et al. 2004) (Fig. 2.1).

Some oceanographic fronts have been defined in the Southwestern Atlantic Ocean (Acha et al. 2004); among them, the Río de la Plata estuary is a particular zone, not only because it is situated close to the middle sector of the confluence of the warm (Brazilian) and cold (Malvinas) currents but also because of its discharge of a huge volume of fresh water and sediments (coming in turn from the Paraná and Uruguay rivers). An important amount of fresh water is also discharged from the nearby Patos Lagoon System. In the Río de la Plata area, it is also recorded a strong interaction with the winds, and the influence of large-scale phenomena, such as El Niño-Southern Oscillation (ENSO). In consequence, environmental conditions in the Río de la Plata area vary greatly of (see in example Piola et al. 2000, 2008; Acha et al. 2004; Ortega and Martínez 2007; Möller et al. 2008) which determines an extremely complex system.

Other factors such as topography and seasonality contribute to the littoral environmental conditions developed in the region (Olson et al. 1988; Podestá et al. 1991; Lentini et al. 2000; Ortega and Martínez 2007; Raicich 2008). In brief, the estuary and the adjacent platform have complex horizontal and vertical structures complicated by with a high degree of seasonal and interannual variability.

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