The oceanic circulation between 40° and 60° S is controlled by the Antarctic Circumpolar Current (ACC), a strong, eastward-flowing current that, in the absence of land masses, circles the globe around Antarctica. A branch of the ACC, the strong, cold Malvinas Current, flows northward along the continental shelf of Argentina until it reaches the weak, warm southward-flowing Brazil Current offshore the Rio de la Plata estuary (south-western margin of the south Atlantic subtropical gyre) (Figure 1). The sharp gradient in temperature and salinity associated to the confluence of these two currents generates highly energetic interactions and the formation of mesoscale eddies, characterized by alternating zones of low and high-productivity. Another major feature that contributes to the complexity of the region is the large input of nutrients, colored dissolved organic matter (CDOM) and sediments from the riverine discharge of Rio de la Plata. The combination of all these factors stimulates the proliferation of phytoplankton blooms along these Argentinian waters.

BLOOM 2008 was an oceanographic expedition sponsored by the Instituto Canario de Ciencias Marinas (ICCM) in Gran Canaria (Spain) and conducted aboard the Spanish Research Vessel Hespérides (Figure 2). This international expedition departed on March 13 from Punta Arenas, Chile and ended on March 28, 2008 in Mar del Plata, Argentina. The main goals of this oceanographic cruise were: (1) to gain a comprehensive knowledge about the inherent optical properties (IOPs) of the phytoplankton communities and CDOM along the continental shelf of Argentina; (2) to evaluate the relationship between these IOPs and the hydrographic characteristics; (3) to characterize the composition of phytoplankton communities and CDOM based on their optical properties; (4) and to develop new algorithms for the classification of phytoplankton blooms based on ocean color data obtained from satellites. A total of twenty-seven stations (seven transects) (Figure 3) were sampled between Puerto Deseado (67°02’ S, 52°37’ W) and Mar del Plata (57°09’ S, 38°47’W). Stations selection was based on near real-time ocean color imagery to ensure sampling within phytoplankton bloom areas. Data acquisition combined radiometric, hydrographic and taxonomic components.