

## **How intrusions of the Northern Current lead to regime shifts in the biogeochemistry of the Gulf of Lion**

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We present the results from the RHOMA2011-LEG2 campaign that took place in the eastern Gulf of Lion from 7 to 17 Oct 2011 and combine them with remote sensing observations and results from a 3D coupled hydrodynamic-biogeochemical model to study an intrusion event of the Northern Current (NC) onto the continental shelf in the Gulf of Lion (NW Mediterranean). Our analysis shows that during the intrusion, the previously upwelled nutrient-rich water present on the shelf is replaced by warmer and mostly oligotrophic NC water within a matter of 2 to 3 days. This has a marked impact on the local biogeochemistry in the Gulf with pre-intrusion Chl-a concentrations in the surface layer of over 0.5 mg m<sup>-3</sup> dropping to near the detection limit within less than 72 hours. The relative frequency of these intrusions in combination with their impact on the local ecosystem make them primary targets for future study.