

Modeling the East Madagascar Current and the Madagascar Phytoplankton bloom through a coupled physical-biogeochemical model

The primary objective of this study is to advance our understanding of the circulation of the East Madagascar Current (EMC) and; the Southeast Madagascar Bloom as well as its driving mechanisms.

The East Madagascar Current and its surrounding waters are of particular interest as it is one of the three major source regions of the Agulhas Current. Changes in how the EMC feeds Indian Ocean water into the Agulhas will have an impact on the Agulhas current itself and its variability. The Southeast Madagascar bloom, one of the largest dendroid blooms in the world, influence the biogeochemistry of the region. Its entrainment into the EMC and potentially into the Agulhas current via rings will have an impact on both local and regional ecosystems, particularly on the biodiversity. A multi-disciplinary approach whereby observations and remote sensing data as well as a high resolution coupled biophysical model (ROMS-PISCES) is adopted to investigate the South West Indian Ocean circulation and its influence on the biodiversity.

Climatological runs of the model (Physical model at this stage) have been performed on the Indian Ocean with a domain of (3°S-33°S; 27°E-125°E) and a resolution of 0.25°. Three different configurations were built, each of them differing in their surface forcings and boundary conditions. These simulations have been assessed for their accuracy against remotely-sensed data, observations and literature. An analysis of this assessment will be presented.