

RES-NRSC-2022-003

Name of ISRO Centre/Unit

National Remote Sensing Centre, Hyderabad

Title of the research proposal

Ocean Surface currents variability in the Bay of Bengal using satellite, In-situ and Numerical models.

Name of Co PI from ISRO Centre/Unit

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Area of Research

Generation and analysis of ocean surface currents in the Indian Ocean using multi satellite data.

Summary of the proposed research and expected deliverables

Ocean currents play an important role in the distribution of heat and salt distribution in the global ocean. Satellite observations since the last 25 years will be utilized for the identification of the intra-seasonal to interannual oscillation in the Bay of Bengal (BoB) circulation. The coastal radar network-based surface currents and the OMNI and RAMA buoys in the BoB will be utilized for understanding of the high frequency variability in the ocean current. Investigation of intra-seasonal (monsoon Intraseasonal oscillation (MISO) and MJO) to interannual variability (Indian Ocean Dipole - IOD) of currents on the heat and salt budget will be carried out. The coastal upwelling, which is one of the coastal processes required for potential fishing zone will be analyzed. Finally, the ocean model using Regional ocean modeling system (ROMS) experiments will be carried out for studying the role of local winds and the coastal trapped Kelvin waves on explaining the observed ocean current variability. This work will identify the ocean surface currents variability in the Bay of Bengal, which has larger impacts on the navigation, oil-spill, heat and salt, sedimentation, eddies and potential fishing zones.

Scope of the Work:

- Identification of the intra-seasonal to interannual variability in the ocean currents in the Indian ocean from satellite derived current and in-situ data.

- Investigation on the role of intra-seasonal to Interannual variability of the surface currents on the oceanic processes; coastal upwelling, heat, and salt budget.
- Ocean model experiments on the role of atmospheric forces on the observed ocean current variability..

Deliverables:

- Identifying the hot-spot regions with large variability in ocean surface currents.
- Assessing the role of ocean currents variability in explaining the Indian Ocean warming..
- Different variability scale of the surface currents using satellite, in-situ and model, which will be useful for different applications like heat and salt transport, eddies, PFZ etc.