

VARIABILITY OF THE SOMALI CURRENT AND ASSOCIATED COLD WEDGES IN THE ARABIAN SEA

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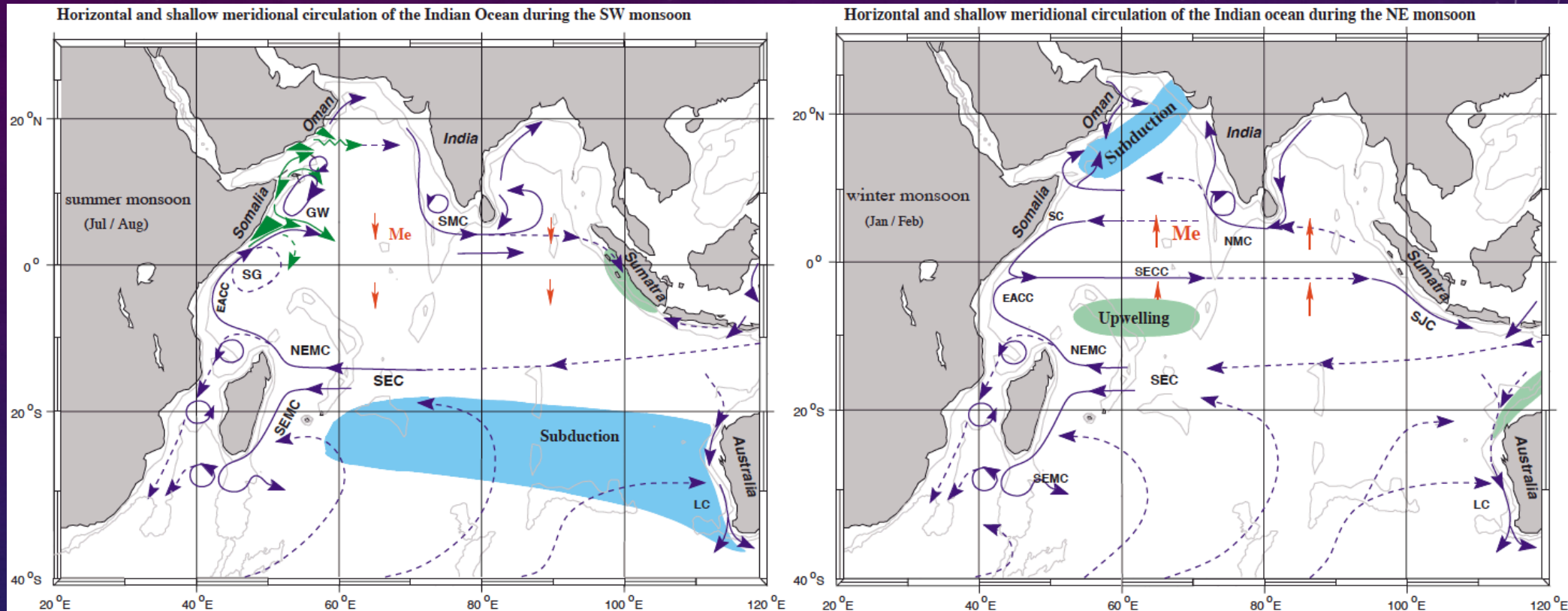
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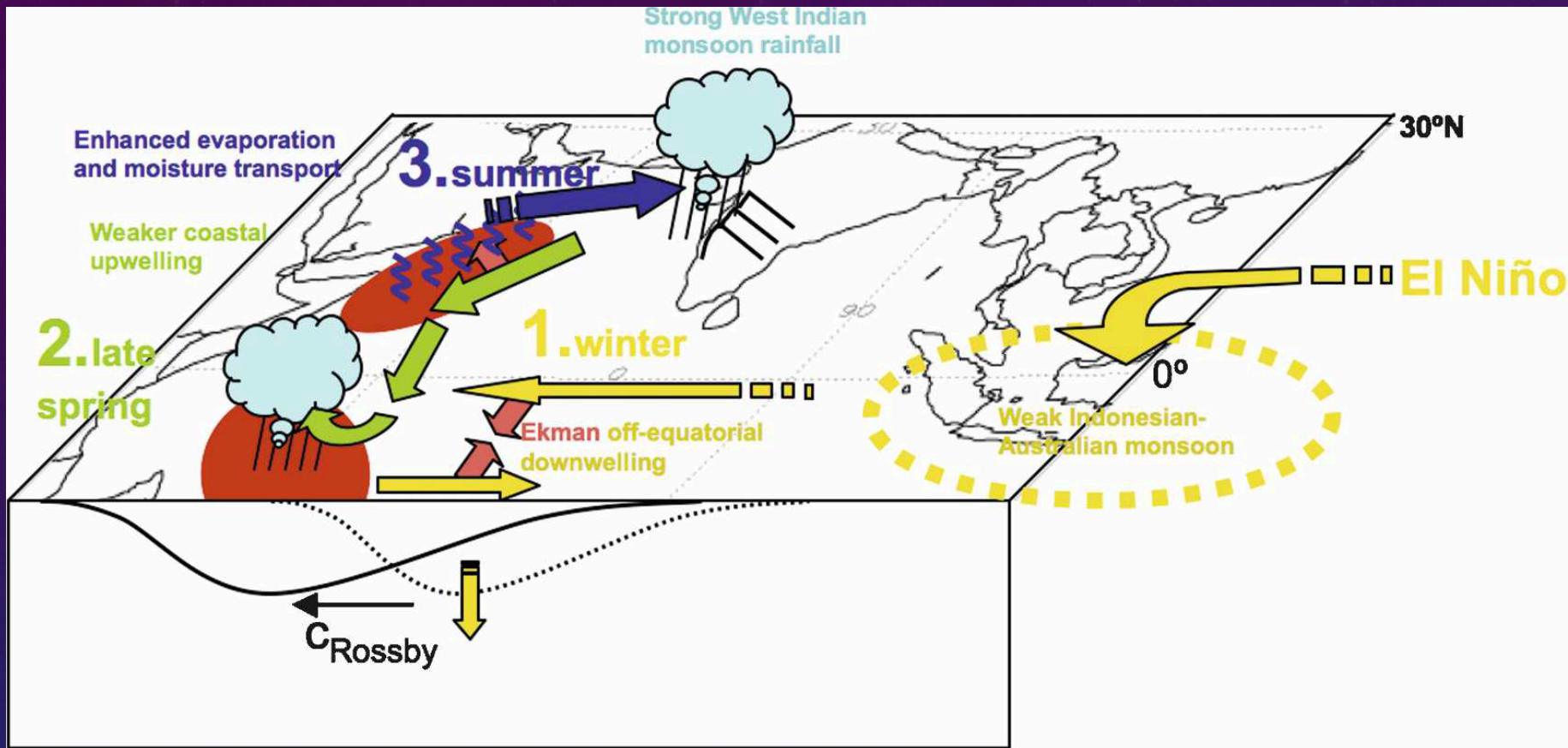


MONSOON CIRCULATION OF THE INDIAN OCEAN



- Seasonally reversing strong boundary currents along with localized intense upwelling – specifically in the Somali Current system, and inter-basin exchanges between the northern Arabian Sea and Bay of Bengal

VARIABILITY OF INDIAN MONSOON RAINFALL

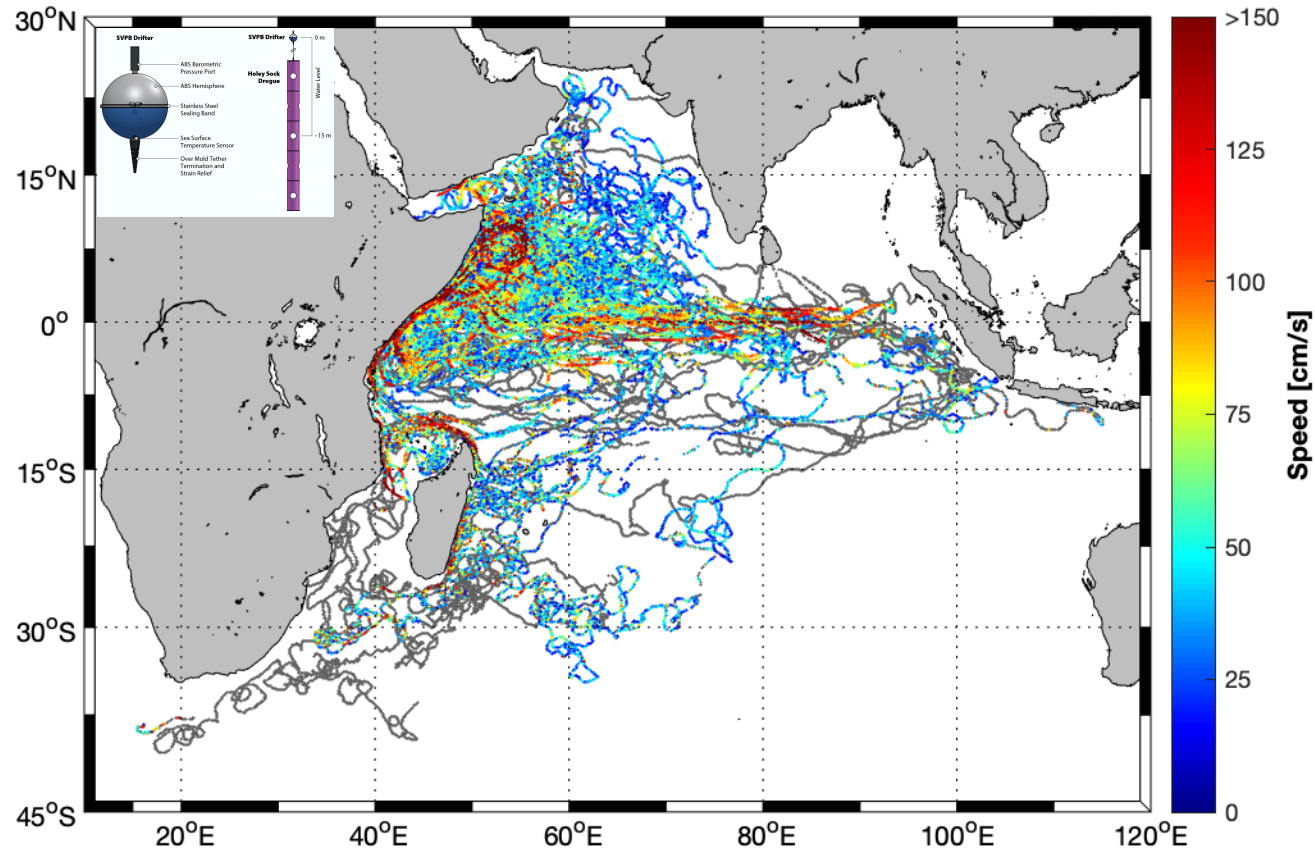


- Horizontal advection, coastal upwelling, wind-driven mixing, and Ekman pumping all affect sea surface temperature (SST) in the Arabian Sea, which ultimately feedbacks to rainfall over India

OBJECTIVES

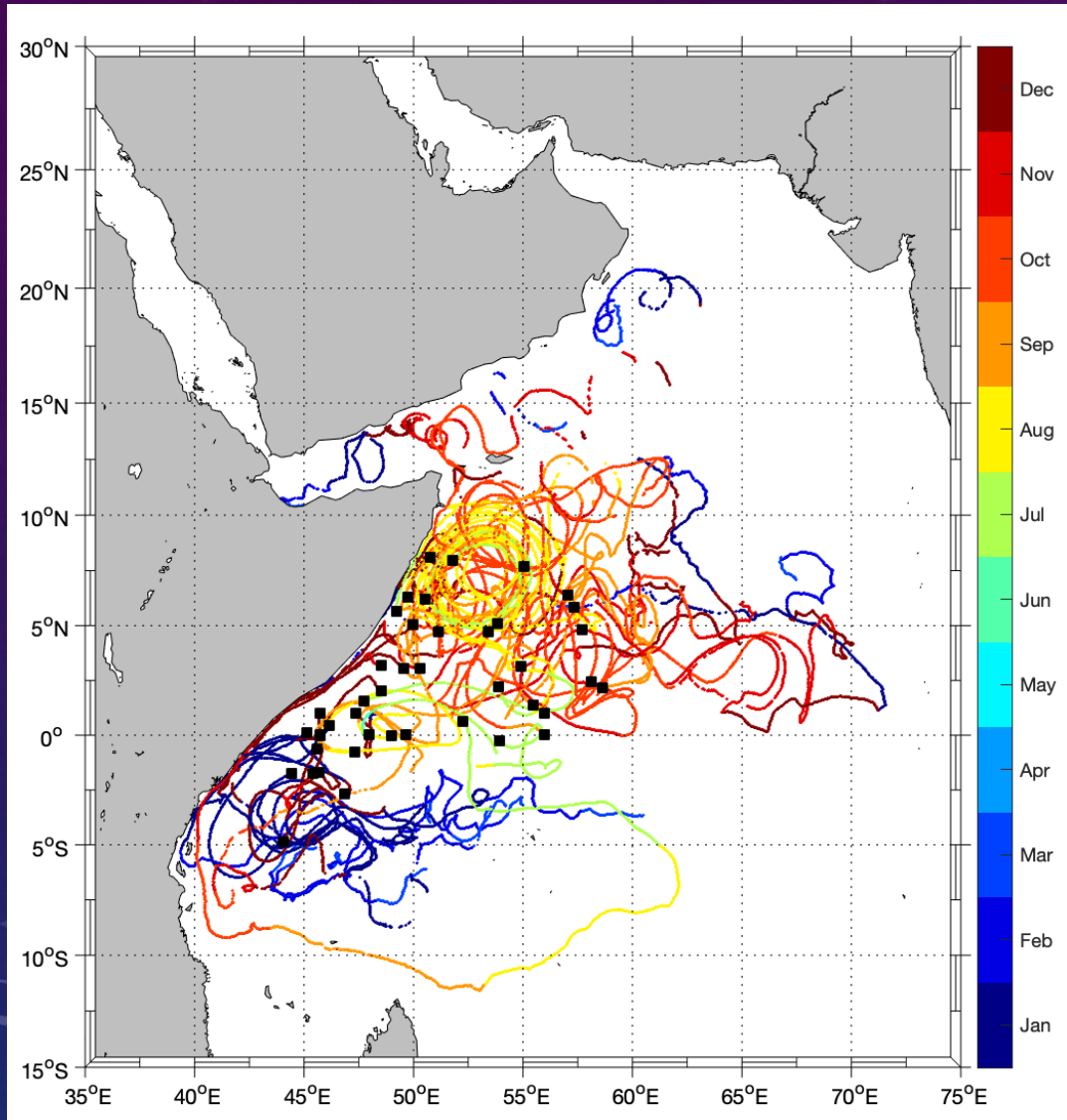
- Maintain time series within the Somali Current system with regular drifter deployments
- Remove sampling biases from the drifter dataset
- Onset/reversal of the Somali Current and its connectivity to the interior circulation of the Arabian Sea
- Onset, persistence, and decay of upwelling wedges in the Somali Current system as well as their effect on the near-surface circulation
- Connectivity between the Arabian Sea and Bay of Bengal

LAGRANGIAN DRIFTERS



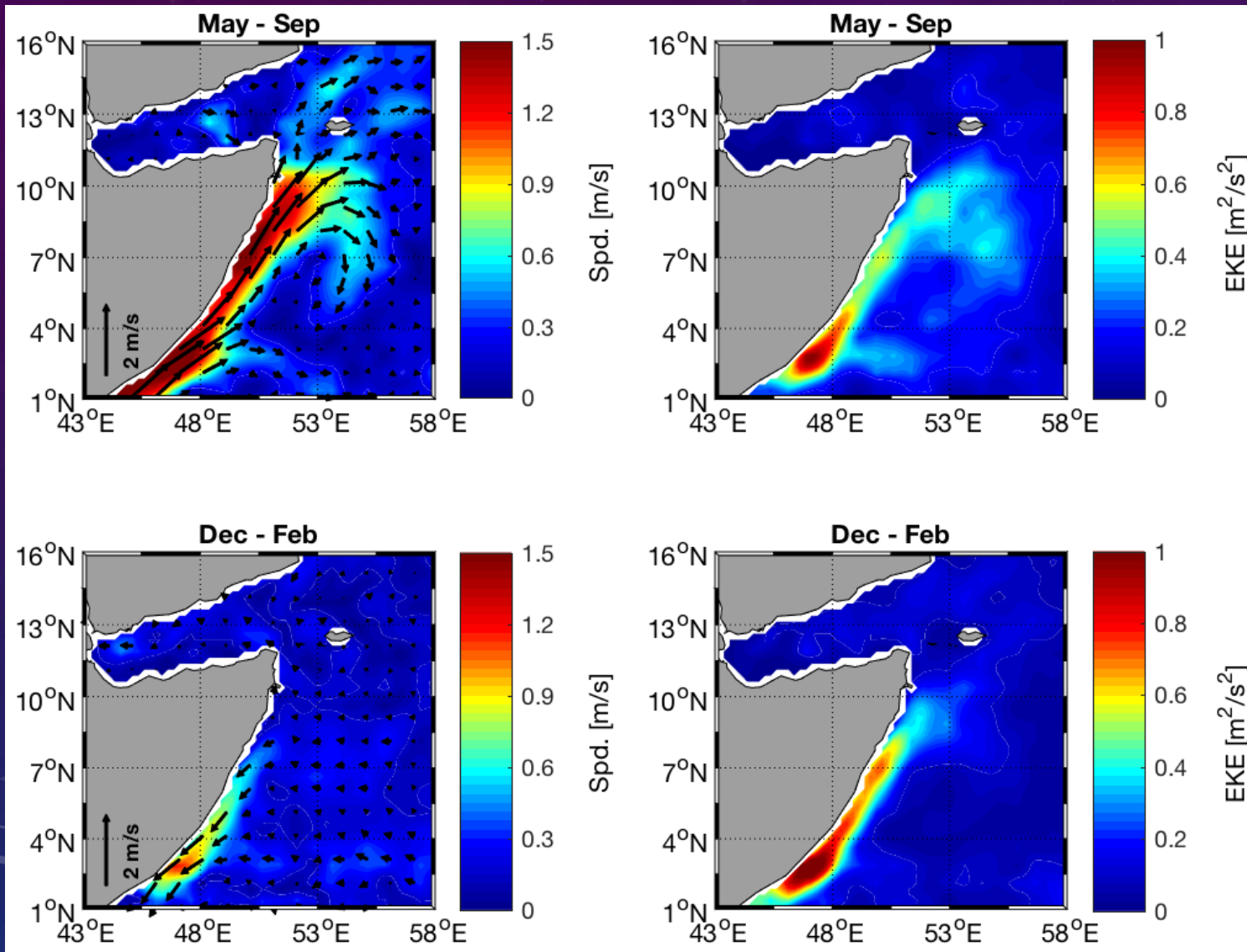
- Over 200 SIO-LDL drifters deployed in the western Indian Ocean since 2013
- MOU established between SIO and the Kenya Meteorological Office to facilitate VOS deployments in the Arabian Sea

2019 DEPLOYMENTS



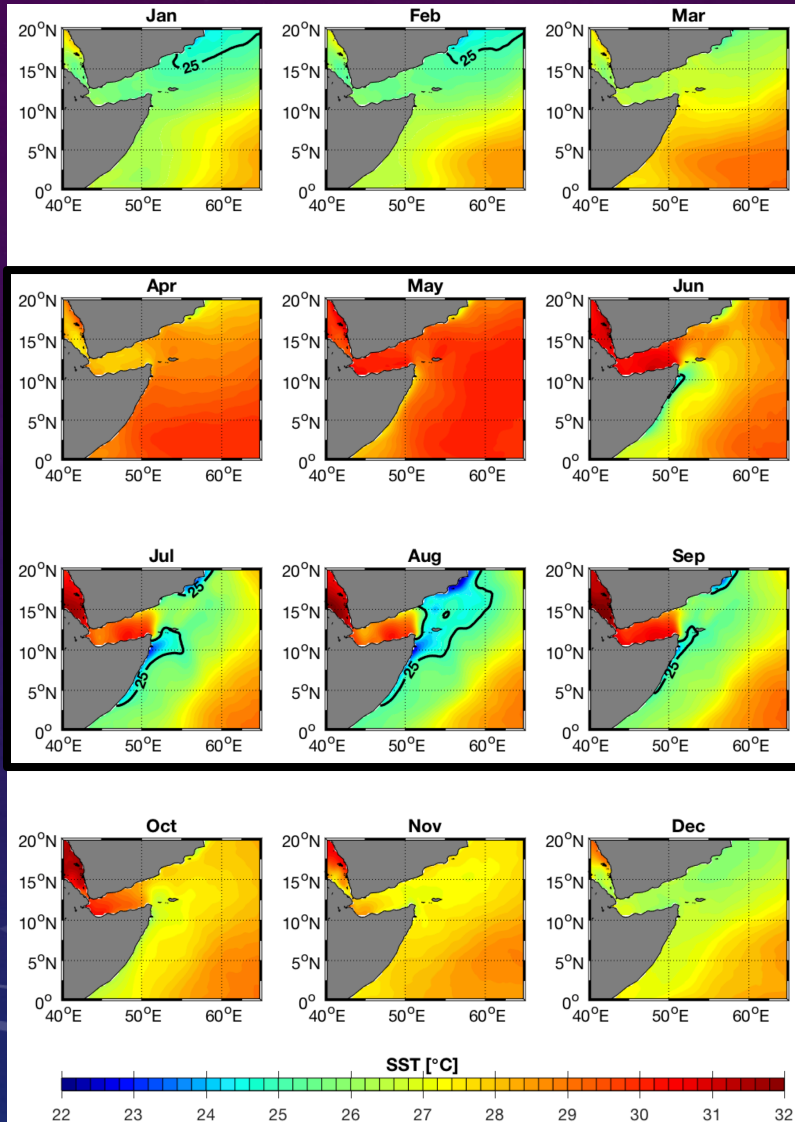
- Intensive drifter observations in 2019, coinciding with developing Indian Ocean Dipole mode
- Drifter data important for better understanding of air-sea interactions in the Arabian Sea, particularly during climate events

MONSOON CIRCULATION & EDDY KINETIC ENERGY

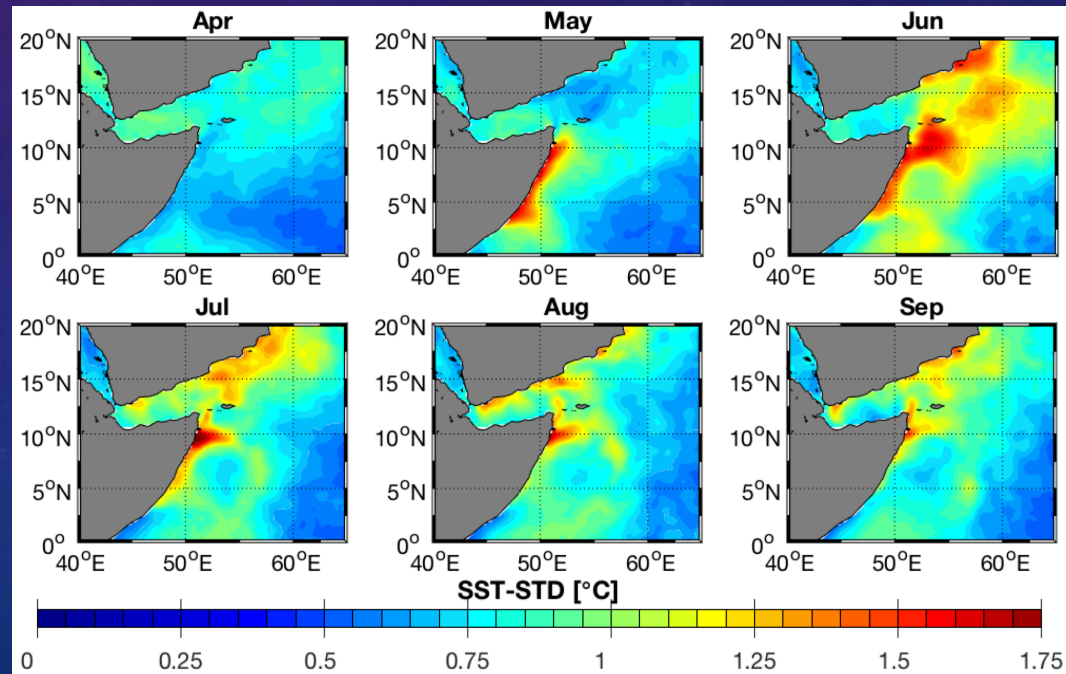


- Apparent connectivity between the Somali Current and Great Whirl during the summer southwest monsoon, with Somali Current speeds in excess of 1 m/s
- Large eddy kinetic energy along the Somali coast

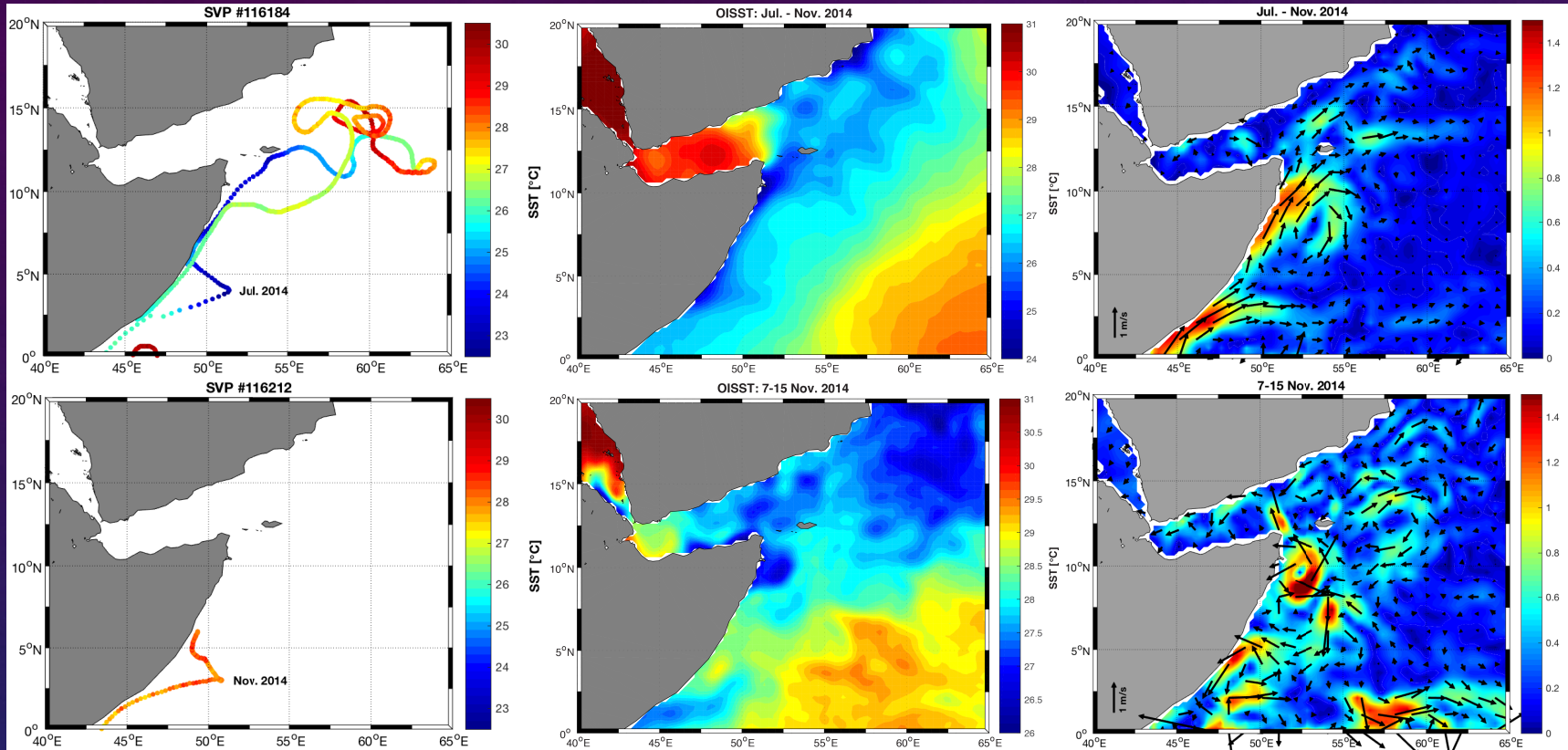
COASTAL UPWELLING



- Substantial upwelling in the coastal Somali Current region during the summer southwest monsoon
- Appearance of cold wedges, particularly near 5°N and 10°N



COLD WEDGES



- Northward Somali Current phase may extend beyond the summer southwest monsoon
- SST signature decays in less than one week

Drifters sample cold wedge around 3-4°N persisting into the inter-monsoon period

CONCLUSIONS

- Regular drifter deployments to maintain time series within the Somali Current system in recent years
- Analysis suggests/confirms connectivity of the near-surface circulation from the tip of Madagascar to the Great Whirl during the summer southwest monsoon
- Pronounced cold wedges observed near 5°N and 10°N that can persist into the inter-monsoon period
- Pressing need to develop a plan for future drifter deployments to sustain the current array in this climatically important region