BOUNDARY CURRENTS WORKSHOP

June 05, 2023, 9:00 - 13:00 SAST

Location: Peter Stoker Centre, Department of Forestry, Fisheries and the Environment (DFFE) East Pier Building, V+A Waterfront, Cape Town, South Africa.

Format: Hybrid

Registration: Registration

As part of the OCG-14 Meeting, the OCG, South African Weather Service (SAWS) and AtlantOS team is hosting a Boundary Currents workshop that will focus on setting priorities for Observing System Experiment (OSE) / Observing System Simulation Experiments (OSSE) and analysis thereof for the observation and monitoring of the Agulhas Current (the pilot region designated for the Boundary Current Co-Design Exemplar) with applications to improve marine heatwave and tropical cyclone forecasts and the understanding of the effects on ecosystem health.

Conveners:

Tammy Morris: Tamaryn.Morris@weathersa.co.za
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Background:

Understanding the global climate system, how it interacts with large ocean circulation systems which drive short term weather systems, and longer term climatic drivers such as El-Nino, are critical to forecasting the changes humankind should expect given climate change. Boundary Currents are critical underlying drivers that border ocean basins and can be either highly energetic, contributing to the global climate system, or productive and rich in fisheries, critical to food security globally. To do this, global climate centers make use of coupled-climate models, ingesting near-real time ocean observations in order to represent in reality the state of the physical ocean, and using this information, forecast the impacts on the global climate systems. This is done for short term weather forecasting, but also into the future such as those models employed by the Intergovernmental Panel for Climate Change (IPCC). Western Boundary Currents (WBC) play a crucial role by interconnecting ocean basins and transporting volume, heat and salt. Yet the majority of WBCs are undersampled, particularly in the Southern Hemisphere. Thus, if as a society we

hope to understand and mitigate against global climate change, we need to holistically understand the global climate, its dynamics, drivers and influences.
By the same token, understanding Eastern Boundary Currents (EBC), synonymous with upwelling systems which drive fisheries, is required to protect coastal communities reliant on subsistence techniques of food security, as well as global fisheries, is of paramount importance as we face a future of more people on Earth than the natural capacity can sustain. Arguably, more research has gone into understanding EBCs given their importance to global food security, but very few are sustainably monitored for changes in the long term. An additional consideration with EBCs is that of understanding biogeochemical parameters in conjunction with physical parameters to provide a baseline for sustained observations, given the complexity of the fisheries these current systems support.

Session objectives and Expected outputs:
Through the GOOS Co-Design Project, the Boundary Currents Exemplar will focus on the Agulhas Current as a pilot region to initiate a sustained ocean observing system within a developing region. From the value chain developed for Boundary Currents, one of the first objectives is to determine where best to place ocean observing systems, which observation infrastructure (fixed vs. Lagrangian), frequency of observations, etc. In addition, recent literature has shown how WBC in particular intensifies marine heatwaves and tropical cyclones, increasing risks to lives and livelihoods. One method of determining this objective is through OSE's (data denial) and OSSE's (data simulation). Working with the UN Ocean Decade endorsed programme, SynObs, this workshop will look at the analysis of SynObs experiments within the Agulhas Current and work towards a common goal of understanding what observations will be required to ensure a sustained and effective Agulhas Current observing system.

Agenda

Timing: 9:00 - 13:00 SAST
Location: Peter Stoker Centre, Cape Town, South Africa.

9:00 - 9:15	Welcome and Co-design Programme overview [Ann Zinkann]
9:15 - 9:30	Introduction of Boundary Currents Exemplar [Tammy Morris]
9:30 - 9:45	Observing the Agulhas Current - what do we know [Tarron Lamont]
9:45 - 10:00	The LACCE project [Cristina Russo]
10:00 - 11:00	Questions and Discussion [Moderator: Tammy Morris] - What are the challenges in terms of observing the Agulhas Current? - What is required by the modeling community in terms of in situ observations of the Agulhas Current and adjacent coastal regions?
11:00 - 11:15	**COFFEE BREAK**
11:15 - 11:45	How to OSE/OSSE [SynObs - Elizabeth Remy]
11:45 - 12:45	Discussion and planning [Moderator: Ann Zinkann] - Analysing the SynObs OSE/OSSE output for the Agulhas Current - Potential ocean observing initiative to test OSE/OSSE idea? - Links to other activities e.g., Digital Twins of the Ocean
12:45	Way forward and actions [Tammy Morris]
13:00	**Adjourn**