



# Hermann 'Harry' Luyt

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- BSc, Hons—Geoinformatics, Stellenbosch University
  - MSc, PhD (ongoing)—Oceanography, University of Cape Town
  - Research interests: Ocean modelling & forecasting, data assimilation
  - General interests: Craft beer & whisky, photography, surfing, movies and reading.
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**National  
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# PhD research

## “Forecasting SSTs through assimilating along-track SSTs into a regional HYCOM model of the Agulhas and Benguela Currents”

- South Africa possess no operational ocean forecasting system
- Previous efforts have been made, motivating this research
- Many marine industries would benefit from this system:
  - Fisheries, search & rescue, offshore mining, disaster management
- System uses HYCOM at  $1/10^\circ$  with Ensemble Optimal Interpolation (EnOI) assimilation scheme

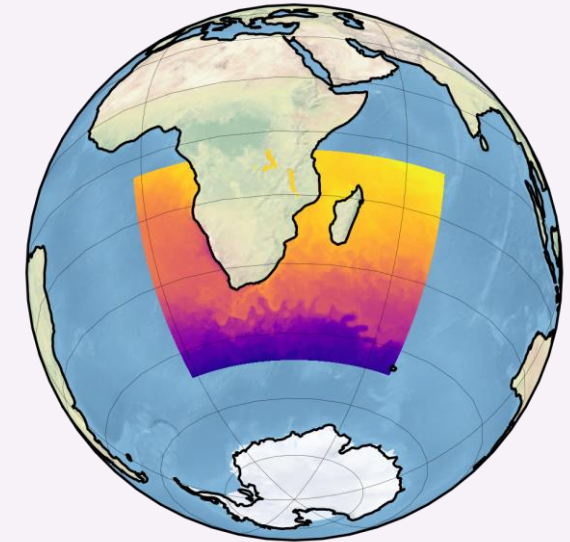


Figure: Model domain



# PhD research

- The model exhibits a warm bias in upwelling zones (MSc)
- Assimilating only gridded SST results in degraded forecast
- We propose to assimilate along-track SSTs to try improve forecast (no interpolation or smoothing)

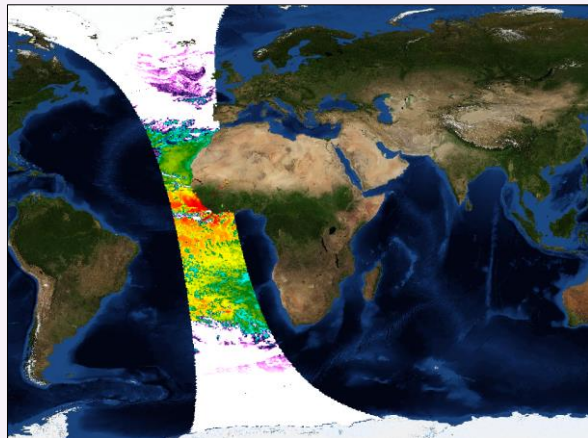


Figure: Along-track radiometer SSTs

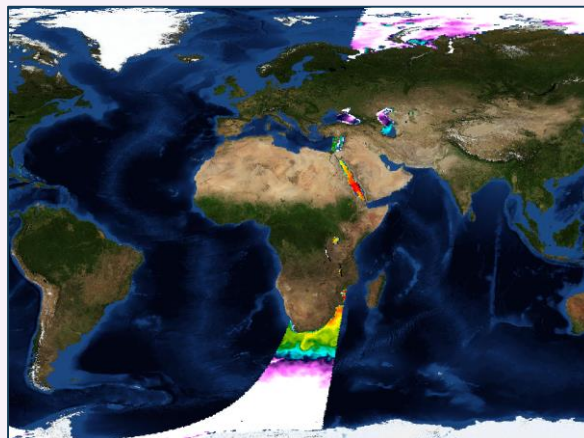


Figure: Along-track microwave SSTs

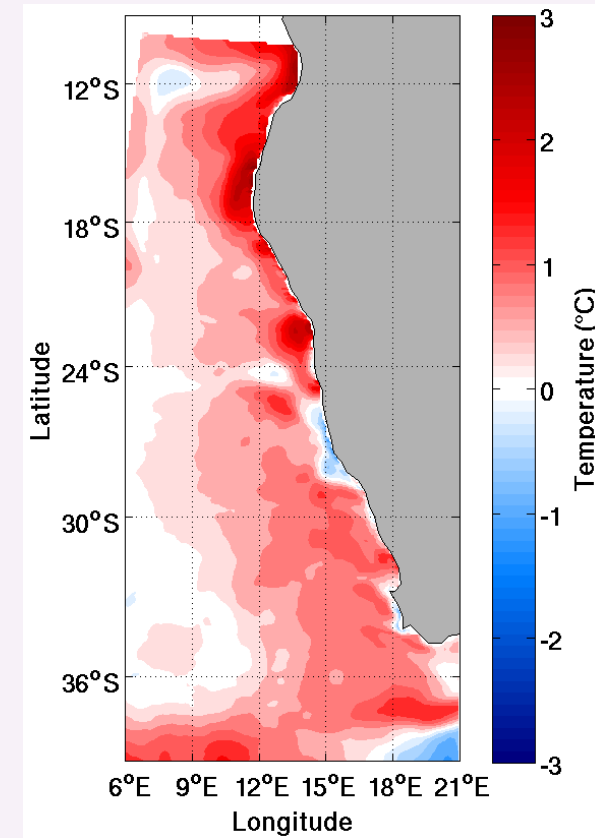


Figure: Model warm bias along African south-west coast.



# Future PhD plans

- Assimilate SSTs (along-track or gridded) in combination with SLAs
- Assimilate surface velocities from SAR and/or coastal high frequency radar
- Test potential for using Ensemble Kalman Filter (EnKF) assimilation scheme over EnOI

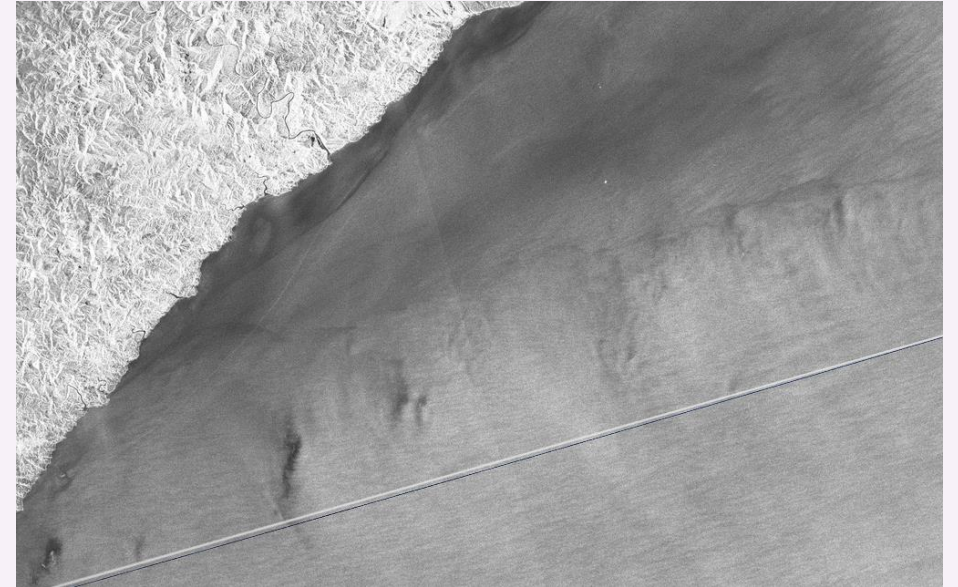


Figure: SAR surface roughness, South African East Coast



# TRIATLAS interdisciplinary objectives

- Forecasting and gaining a better understanding of the physical drivers of the ecosystems will fall primarily under WP1 (Physical drivers of ecosystems) which will then feed into WP5 (Synthesis)
- Both WP1 and WP5 (CT1) feed into CT3 (Climate and marine-ecosystem prediction, uncertainty and assessment of sustainability)

