

Considerations for multi-disciplinary approaches to understanding Global Change in Algoa Bay

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Human activities are significantly altering the environment, more so than ever before in the history of the human-environment relationship

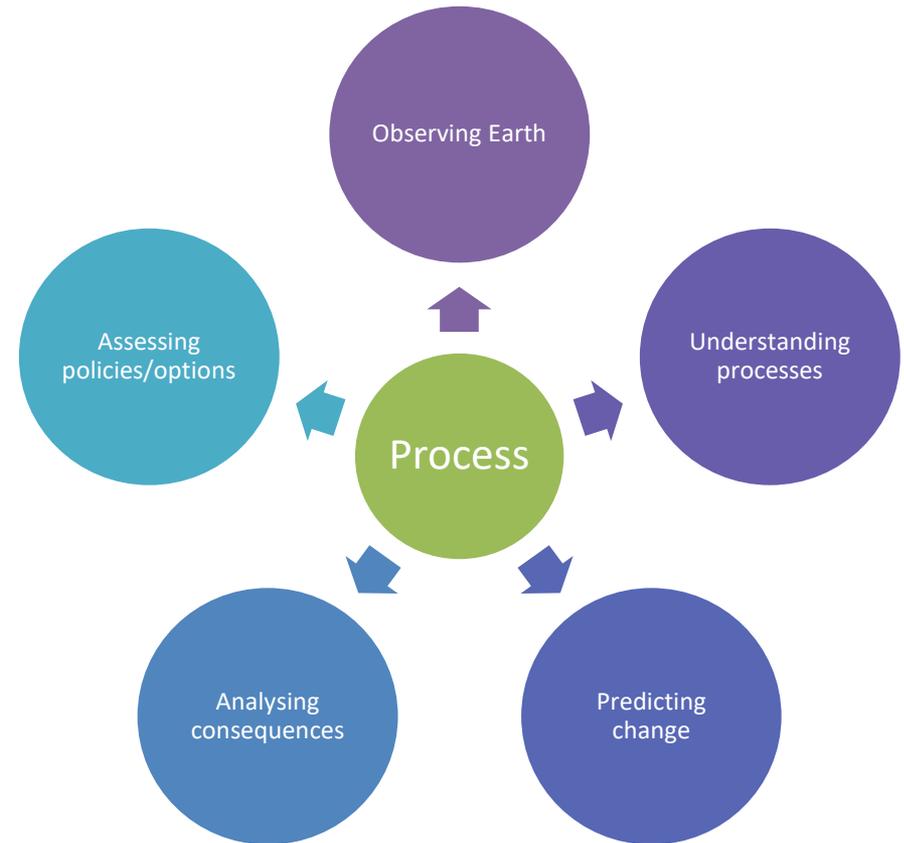
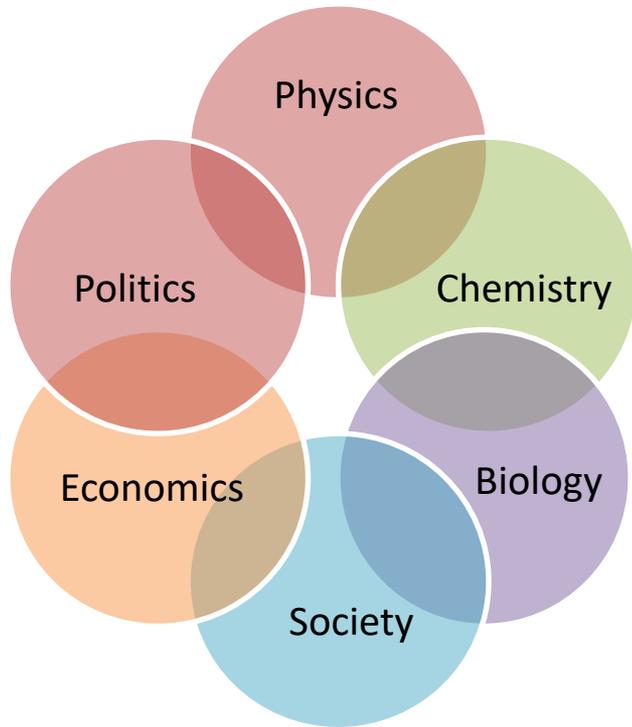
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- The proof in support of Global Change is definitive, the body of evidence growing year upon year, the great majority of which culminates into similar upward trajectories signifying anthropogenic changes beyond natural variability.

Understanding the Earth System's response to anthropogenic forcing is a complex problem extending beyond the cause-effect approach, involving consideration for multiple modes of natural variability coupled with human-driven effects at multiple scales

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Global Change Research asks questions related to how drivers of environmental change impact biological systems, including human systems across scales



What is our potential for contributing to the understanding of Global Change from a regional perspective?



Clive Chamberlain



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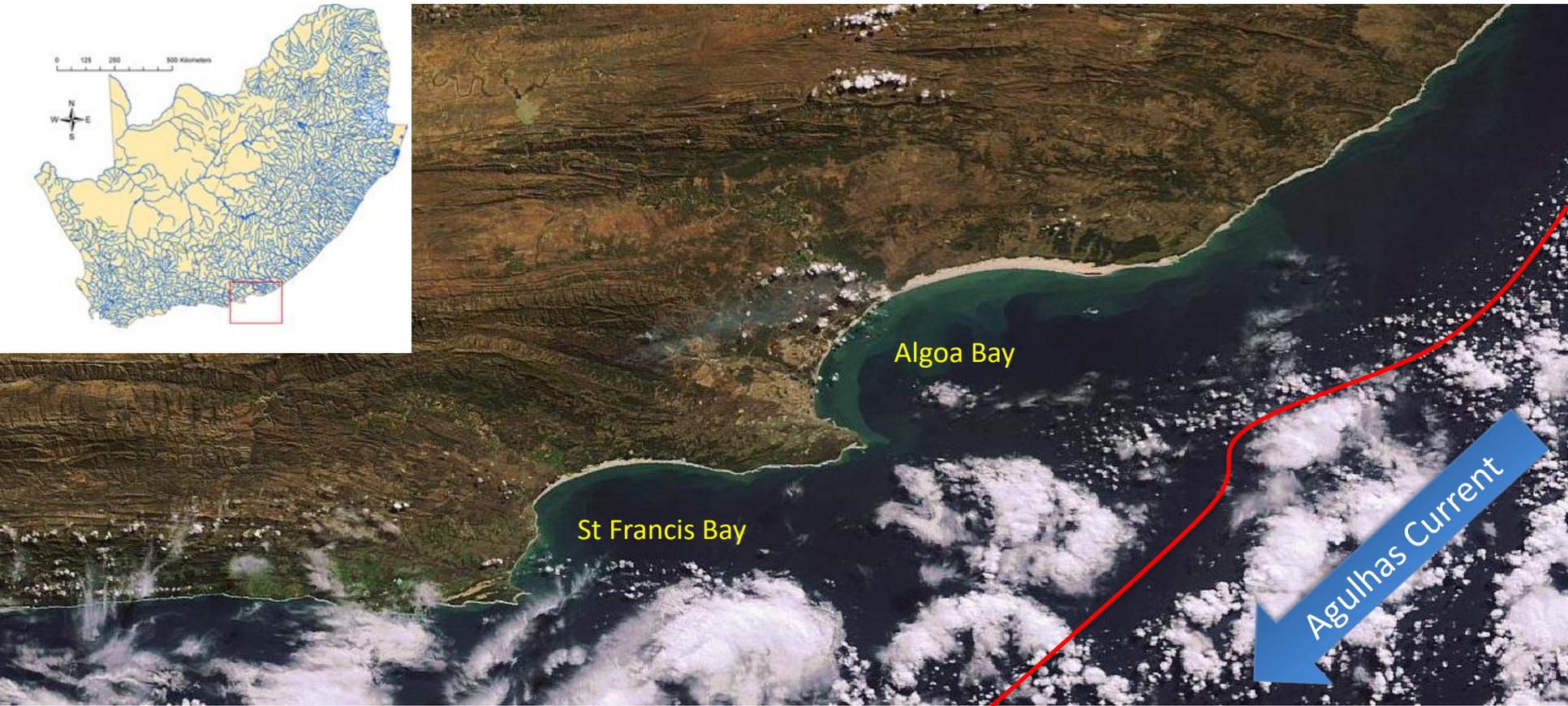


Craig Miller



Raggy Charters

Interesting and complicated oceanography owing to the regional climatology and its location relative to the Agulhas Bank and Agulhas Current

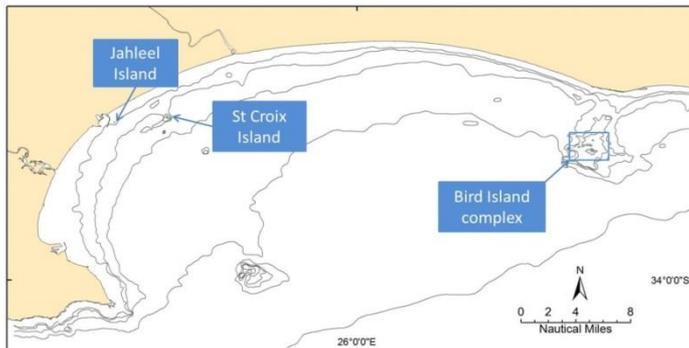


- Largest western boundary current in the world
- Narrow, swift, strong and warm
- Influences global weather due to heat and salt transfer into Atlantic Ocean

Variety of habitats: biodiversity hotspot (NBA, 2011)



Unique, peritidal Tufa Stromatolite Colonies



Algoa Bay is a productive ecosystem, more so than exposed coasts west and east of the region



Stephanie Plön



Stephanie Plön



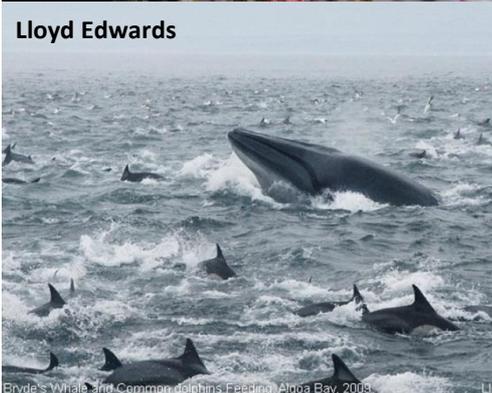
Shirley Parker-Nance



Matt Dicken



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Lloyd Edwards

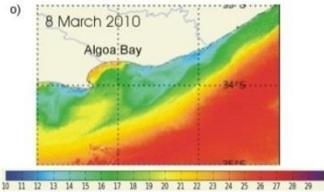


Lloyd Edwards



Strong history of research strengthened by a multitude of active projects across disciplines and scales

Coastal Oceanography



Ocean-scale processes

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Biogeochemistry

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Pelagic Ecosystem Dynamics

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Vulnerable species



Unique Ecosystems



Estuaries



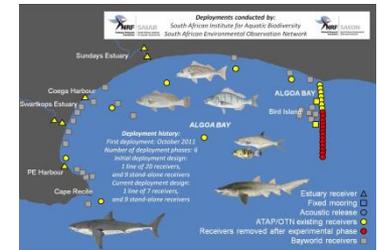
Marine Protected Areas



Marine Apex Predators

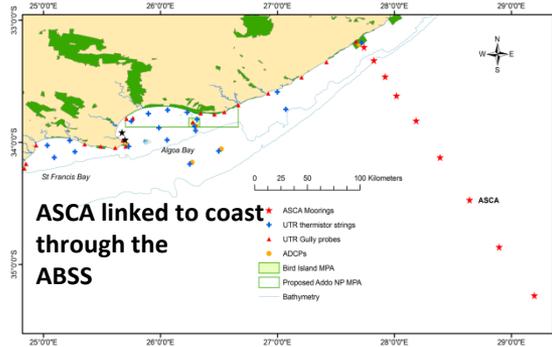
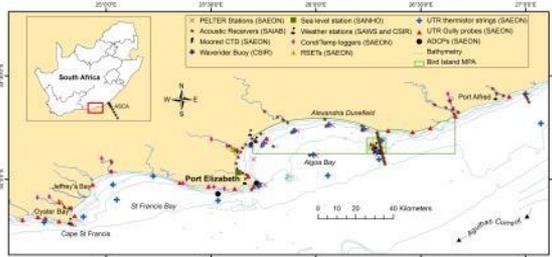


Fish biology/ecology/movement science



Cowley et al. (2015) ATAP status report (2011-2014). SAIAB, South Africa. 22pp

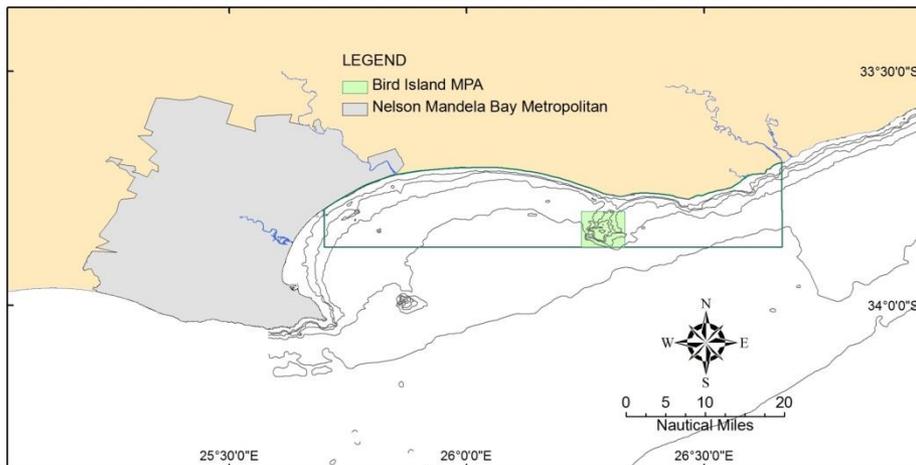
Research supported by substantial government investment in infrastructure and human capital



Vibrant Socioeconomic Environment



- NMBM population = 1,5 million
- Two major harbours, PE & Ngqura
- Commercial fisheries include pelagic (sardine), demersal, line fish, crayfish and squid
- 2 million tourists visit Algoa Bay annually
- 4th most moderate climate in the world
- Water sports capital of SA
- Eco-tourism: Bottlenose dolphin capital of the world, declared a Mission Blue Hope Spot (1 of 6)
- Conservation focussed: AEMPA gazetted by DEA in 2016



A regional system subjected to an array of extreme phenomena of interest to Global Change Research



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*Amended

- In the context of extreme phenomena are included those impacting on the region's coastal ecosystems, which of late have become of great interest to local scientist.
- These include but are not limited to:
 - Agulhas Current intrusions and prolonged warming events
 - El Niño Southern Oscillation (ENSO)
 - Sea-level rise and storm surges
 - Large Solitary Meanders also known as “Natal Pulses”
 - Harmful Algal Blooms causing widely spread red tides



science
& technology

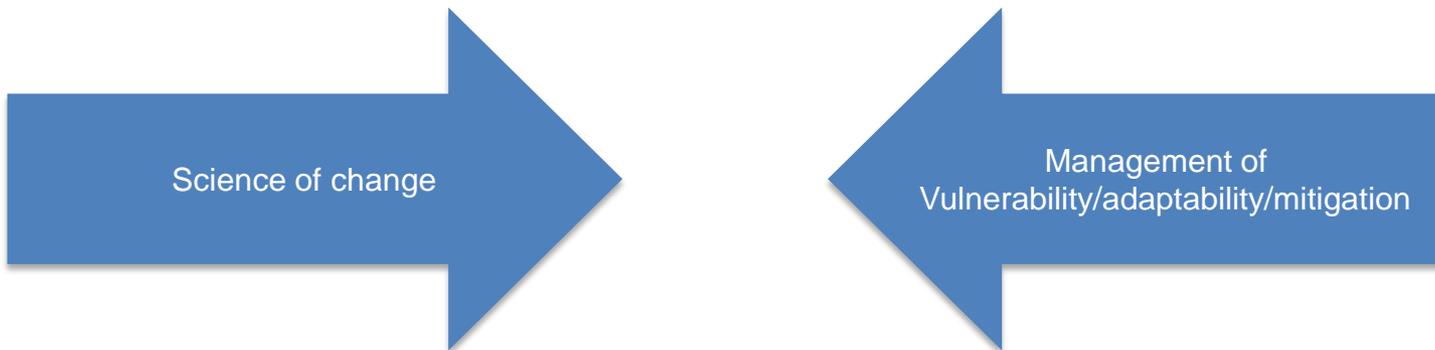
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As a community we are well poised to make a substantial contribution towards understanding regional scale Global Change in the coastal environment

If we are to enhance knowledge on Global Change problems across the board, we need to:

- Identify and overcome barriers to collaborative, multi-disciplinary research in order to develop questions lying at the forefront of Global Change research
- Identify appropriate drivers of change to ensure we are adequately observing change in patterns, processes and ecosystem functioning as and when it happens
- Build and foster partnerships across academic disciplines and between academia and the public/industry/government:
 - Cost of impact on ecosystem services
 - Qualify and understand public/industry/government perceptions
 - Vulnerability and adaptability (and their barriers) in the social context
 - Open channels for shared knowledge: science-to-society / society-to-science



Institute for Coastal and Marine Research Global Change Theme



Objective is to facilitate dialogue, networking and collaboration among and between disciplines concerned with Global Change research.

Goal is to attain a collective understanding of natural and anthropogenic change and how this impacts coastal and marine systems and human communities dependent on them.



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*ICMR, Global Change Theme Workshop
25 November 2016
Bridging the natural-social sciences divide*

- Aim was to address an expressed need to improve the trans-disciplinary research landscape within ICMR
- Challenges/reasons for divide between natural-social sciences were identified and possible solutions explored
- Emphasis was placed on a need to:
 - improve communication channels across the board,
 - develop relationships through frequent and inclusive interaction
 - produce new ideas culminating into real multi-disciplinary research proposals, projects and outputs inline with a common goal to improve our understanding of Global Change



Stephanie Plön

Thank you



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