Shelf Sea Oceanography

Flinders Research Centre for Climate Adaptation and Animal Behaviour

**Problem:**
Physical oceanic processes play a fundamental role in shaping marine ecosystems of the coastal ocean and estuaries. Industrial pollution accompanying the “mining boom” is a severe threat to the health of South Australia’s marine environment. As a result, many marine species are threatened, including the iconic Giant Australian Cuttlefish. Knowledge of oceanic processes is essential for the proper management of our precious marine resources.

**Opportunity:**
Collaborative research projects with various industry partners (eg SA Water) industry and pure academic research (eg on coastal upwelling).

**Industry Contact:**
SA Water: Dr. Milena Fernandes, Milena.Fernandes@sawater.com.au, 7424 3895

**FU Contact:**
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**Research Ideas:**
- GPS drifter studies determining connectivity paths in various marine regions (eg Upper Spencer Gulf)
- Upwelling in submarine shelf-break canyons
- Coastal upwelling variability
- Physical oceanography of the Upper Spencer Gulf region

**Benefits:**
- Outcomes will inform Australia’s marine management strategies
- Outcomes will lead to a better understanding of the functioning of marine ecosystems underpinning a large range of interdisciplinary research programs

**Strategic Significance:**
- Contribute to a better understanding of oceanic processes shaping South Australia’s previous marine environment
- Strengthen the case for improved management of marine resources in Australia
Current Projects:

- Honours student Darren Cox (SA Water Honours Scholarship): Barker Inlet marine connectivity study using GPS drifters and hydrodynamic models (supervisor Jochen Kaempf)
- Honours student Patrick Sandeman: A hydrodynamic modelling study of the Bonney upwelling (supervisor Jochen Kaempf)
- Honours student Angus Hughes: Coffin Bay oceanography and flushing (supervisor Jochen Kaempf)
- Honours student Julie Guerin: A high-resolution modelling study of the dispersal of desalination brine in the Upper Spencer Gulf (supervisor Jochen Kaempf)
- MSc student Mukti Dono Wilopi: Identification of the Indian Ocean Dipole in ARGOS float measurements (supervisor Jochen Kaempf)
- PhD student David Gaetjens: The oceanography of the Great Australian Bight (supervisor Jochen Kaempf)
- Proposed ARC Linkage: Marine Connectivity Study in a Large Inverse Estuary