

Emerging technologies .../ Reshaping long-term observatories ...

Check out: South African Polar Research Infrastructure.

Key Topics:

- Long- and medium-term monitoring of:
 - SOTS ocean measurements
 - Macquarie Island Wildlife Program
 - Autonomous sea-ice ocean observatory
 - Southern Ocean spring bloom of phytoplankton
- South African Polar Research Infrastructure
- Reporting on within species genetic diversity
- DNA-based diet analysis.

Main Developments:

- Spring bloom of phytoplankton depends on light availability, temperature and grazing pressure.
- Highest temperature in February in Macquarie Island, seeing and overall increase and a recent spike in temperatures.
- Genetic diversity (it is at risk and is important for ecosystem resilience, not a consistent approach to reporting)
 - Genetic diversity can be used as a tool for management, but the genetic diversity within populations can be used to understand connectivity, whilst diversity of the individuals gives information about within-specific diversity.
 - More genetics diversity leads to better likelihood of survival and ecosystem resilience -> important to considering n the context of climate change.
- You can use DNA-based diet analysis to inform long-term monitoring.
 - Traditional outlook is a krill-dominates food web, but more and more, jellies, fish etc. are becoming important. But, difficult to get all of these scales.
- South African Polar Research Infrastructure (established in 2021)

Open Questions/Future Directions:

- On-ground resources are hard to get (e.g. in Macquarie Island), coordinated effort to get on-ground resources supported by long-term funding
- Investigating population drivers (e.g. fisheries, disease impacts) in a strategic manner.
- For spring bloom of phytoplankton, what is the balance of the dependence on the key factors (light availability, temperature and grazing pressure).
- More effort for a more consistent approach to monitoring genetic diversity.
- Methods to observe all scales of the food web (plankton -> jelly -> fish) over long terms.
- Regarding long term monitoring, should we focus on one-site or multiple sites (partly depend on species)
- Diversify key monitoring species away from krill.

