

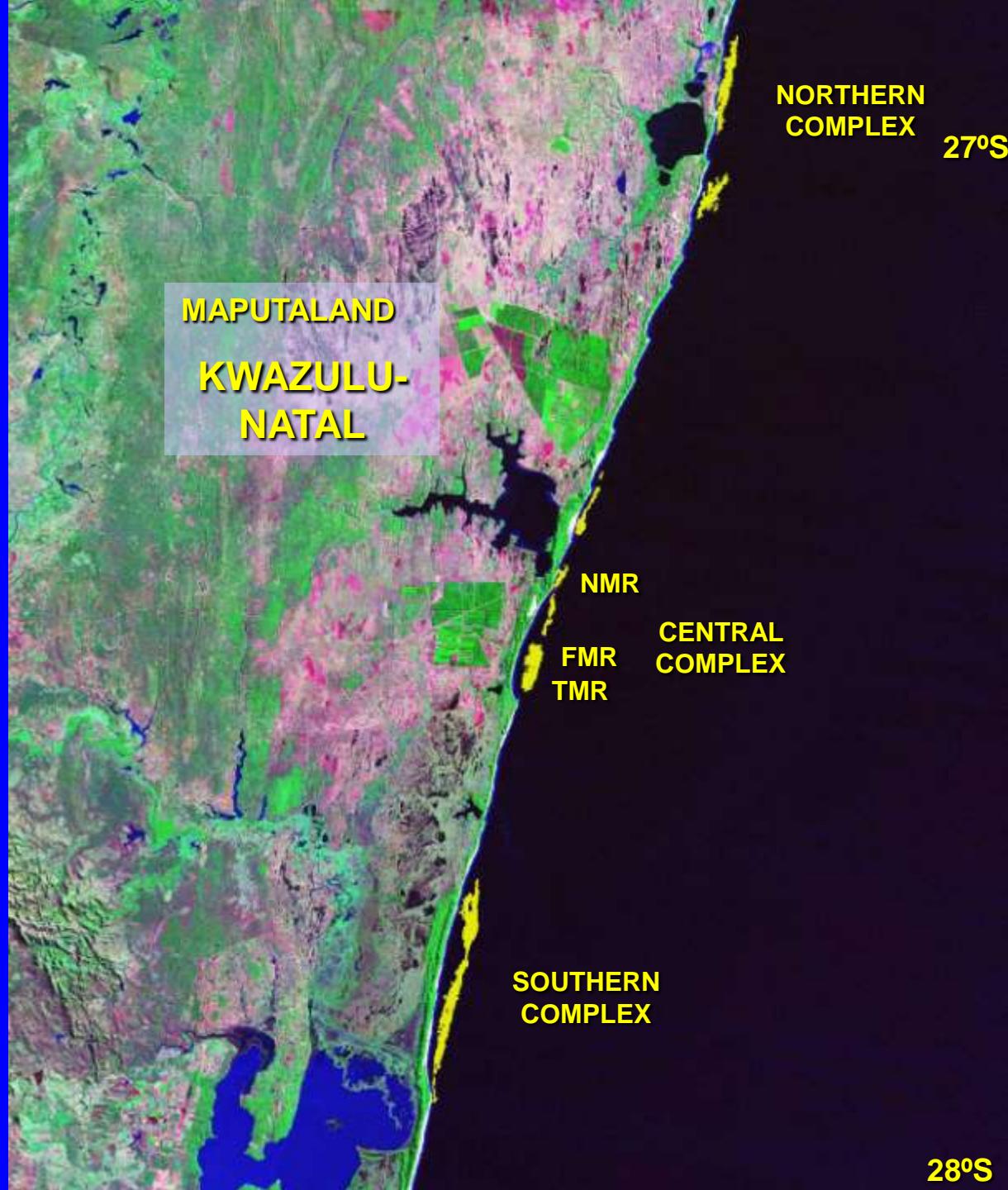
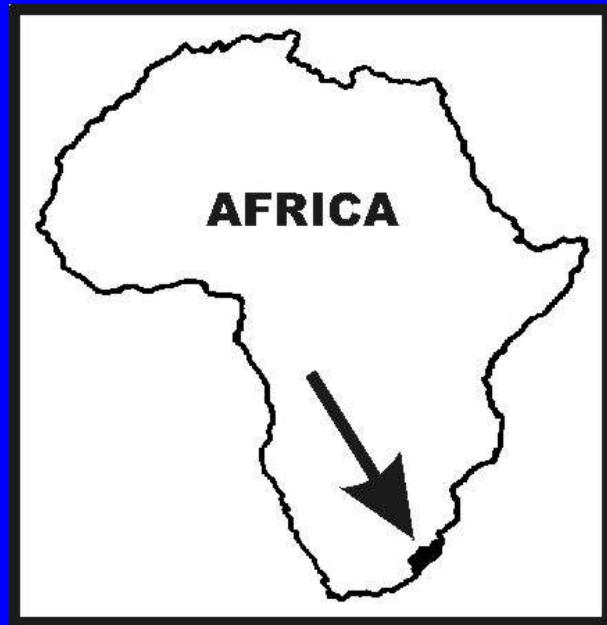
Southern African Coral Reef Monitoring and Research

Michael Schleyer

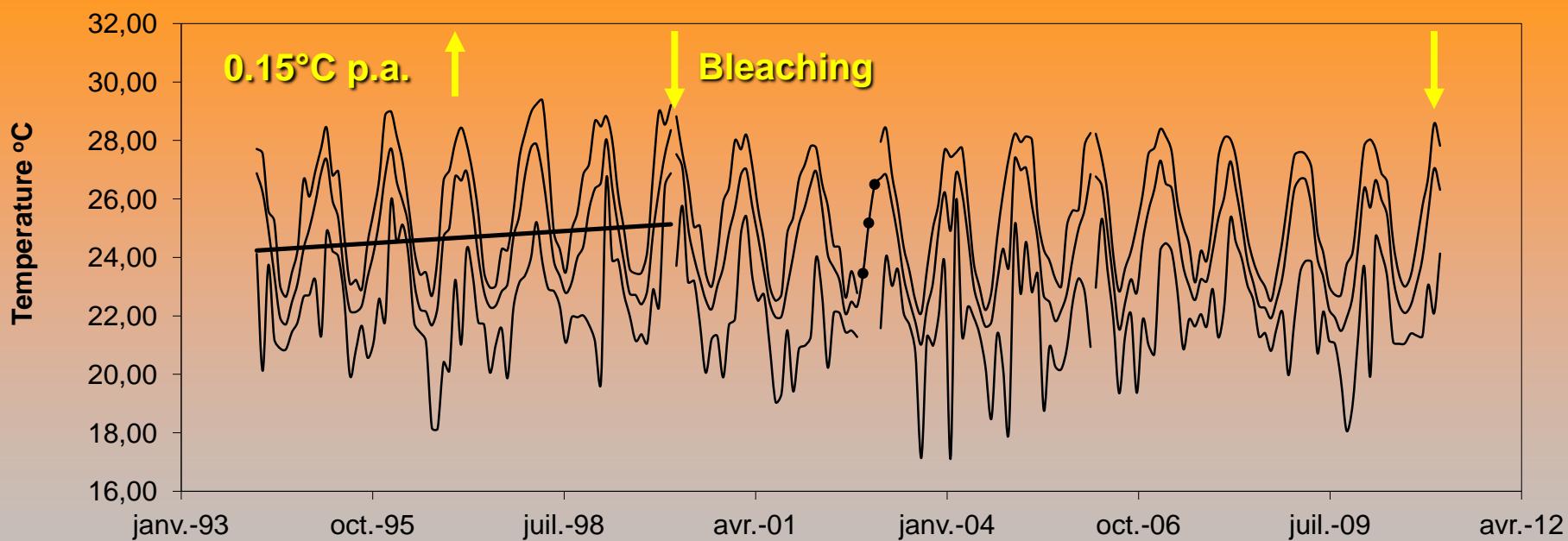
(& post-graduate students)

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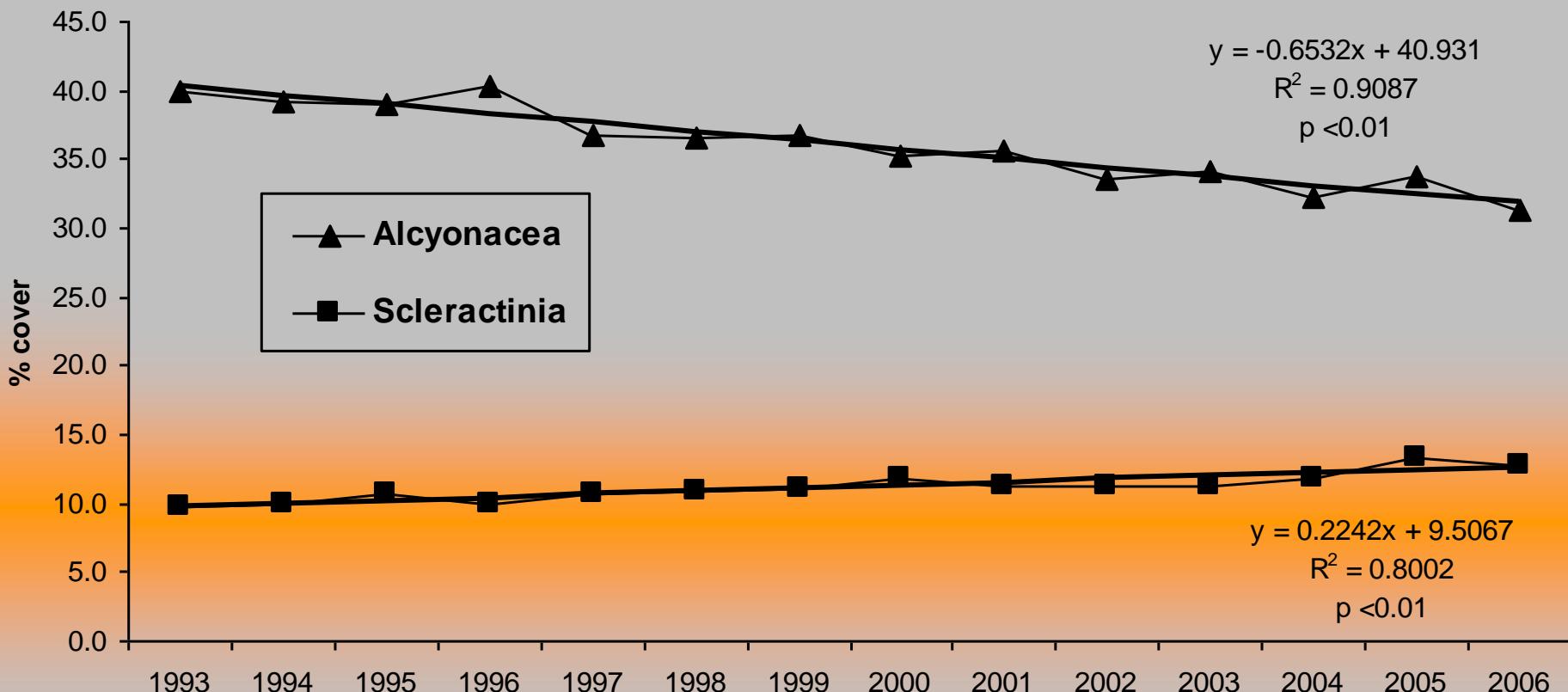


REEF MONITORING: (Annual since 1993)



Hourly temperatures

% Cover for all transects



MONITORING PARTNERSHIPS

- CORDIO (EA Office & Mozambique)
- EACRTF & GCRMN
- WIOMSA project on palaeoclimate & bleaching – East Africa

INTERNATIONAL EFFORTS

- WIOMSA projects on coral diseases & reproductive success vs Climate Change – Reunion & South Africa
- Biolave Project – successional colonisation on Reunion laval reefs of different age
- Biodiversity of soft corals on Mayotte reefs

ADVANCES & OUTPUTS

- M.H. Schleyer (2011) **Reef Ecosystems.** In: Nicola James & Juliet Hermes (Eds). **Insights into impacts of climate change on the South African marine and coastal environment.** South African Environmental Observation Network: Elwandle Node. pp 33-41.
- Schleyer, M.H. & Pereira, M.A.M. (in press). **Coral Reefs.** In: Bandeira, S. & Paula, J.P. (eds). **Ecology of Maputo Bay.**
- Schleyer, M.H. & Benayahu, Y. (in press). **Pre- and post-1998 ENSO records of shallow-water octocorals (Alcyonacea) in the Chagos Archipelago.** Marine Pollution Bulletin. doi:10.1016/j.marpolbul.2010.08.019

ADVANCES & OUTPUTS

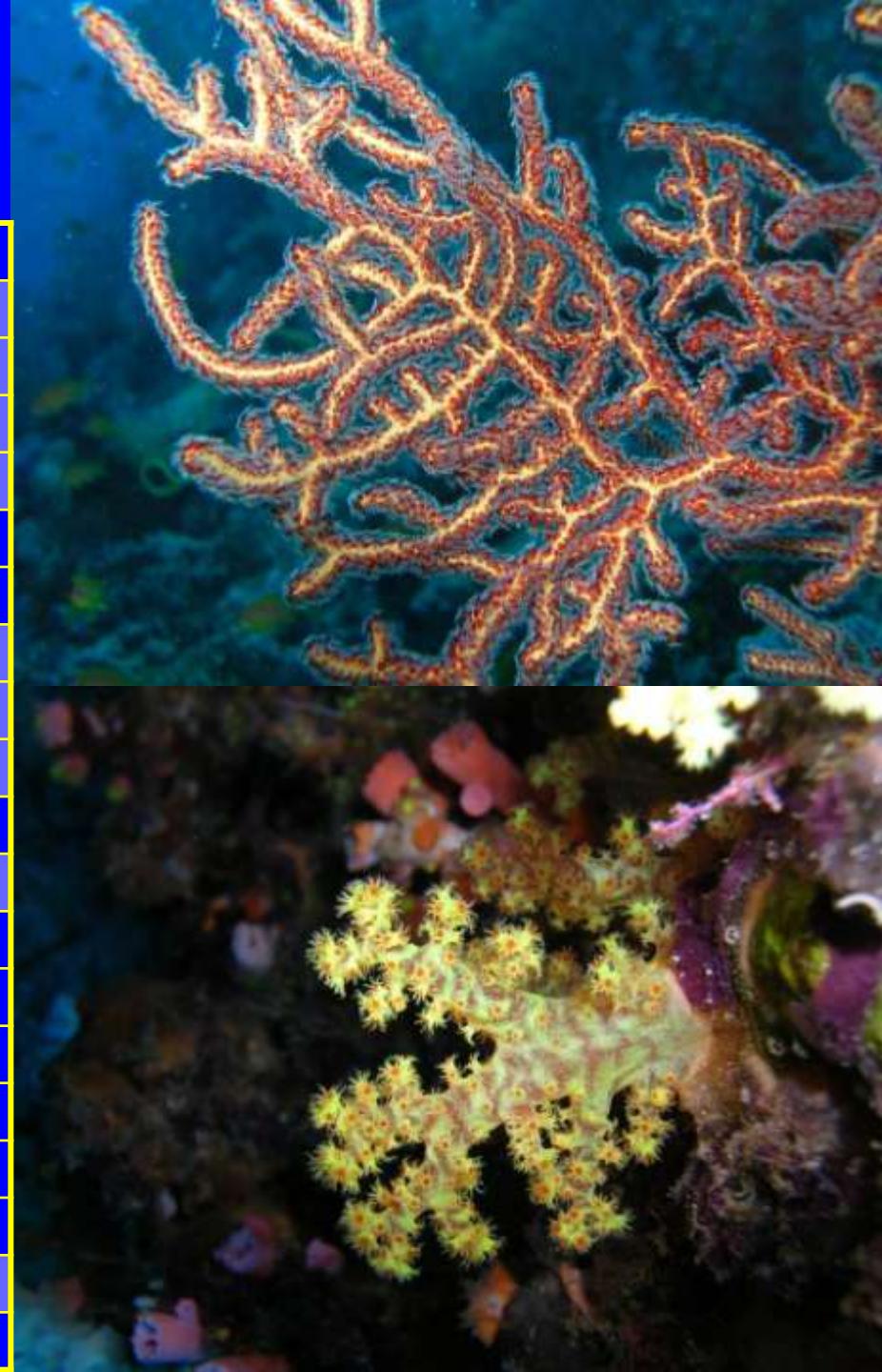
- C.R.C. Sheppard, B. Bowen, P. Carr, C.A. Chen, C. Clubbe, M. Craig, J. Eble, N. Fitzsimmons, M. Gaither, C-H. Gan, M. Gollock, N. Guzman, N.A.J. Graham, A. Harris, R. Jones, S. Keshavmurthy, H. Koldeway, C.G. Lundin, J.A. Mortimer, D. Obura, M. Pfeiffer, A.R.G. Price, S. Purkis, P. Raines, B. Riegl, A. Rogers, M.H. Schleyer, M.R.D. Seaward, A.L.S. Sheppard, J.Tamelander, J.R. Turner, S. Visram, C. Vogler, S. Vogt, J.M-C. Yang, S-Y. Yang, C.Yesson. (in press).
Reefs and islands of the Chagos Archipelago, Indian Ocean: Why it is the world's largest no-take marine protected area. Aquatic Conservation: Marine and Freshwater Research.

Chagos

1996

2006

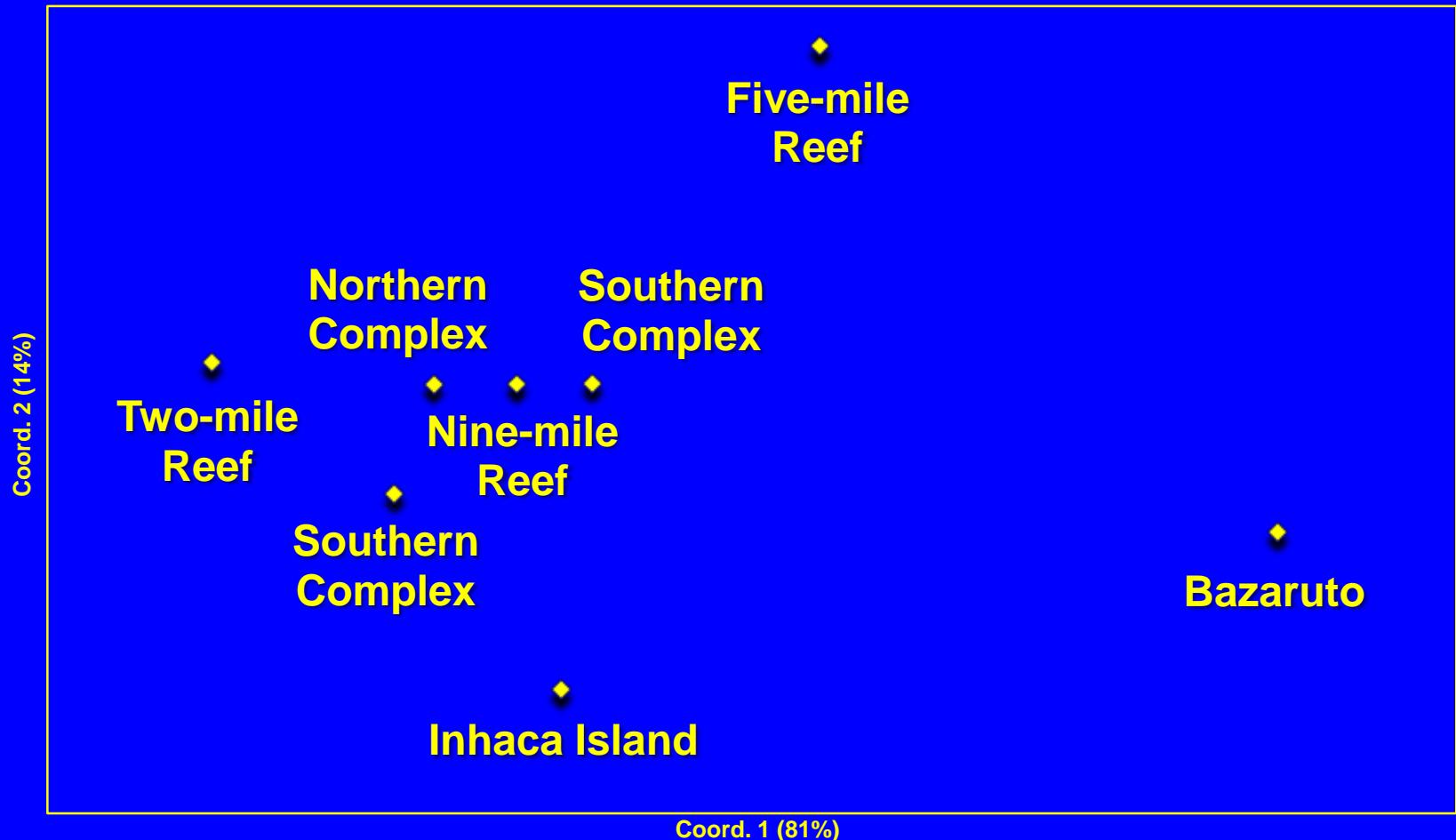
| | | |
|----|-----------------------|----|
| 3 | <i>Alcyonium</i> | - |
| 1 | <i>Capnella</i> | - |
| - | <i>Cladiella</i> | 2 |
| 4 | <i>Lobophytum</i> | 2 |
| 2 | <i>Sarcophyton</i> | 5 |
| 16 | <i>Sinularia</i> | 18 |
| 1 | <i>Anthelia</i> | 1 |
| 1 | <i>Cespitularia</i> | - |
| 1 | <i>Efflatounaria</i> | - |
| 1 | <i>Heteroxenia</i> | - |
| 2 | <i>Xenia</i> | 2 |
| - | <i>Carijoa</i> | 1 |
| 1 | <i>Clavularia</i> | 1 |
| 1 | <i>Tubipora</i> | 1 |
| 1 | <i>Chironephthya</i> | 1 |
| 1 | <i>Dendronephthya</i> | 1 |
| 1 | <i>Lemnalia</i> | 1 |
| 1 | <i>Nephthea</i> | 1 |
| - | <i>Scleronephthya</i> | 1 |
| 1 | <i>Stereonephthya</i> | 1 |



ADVANCES & OUTPUTS

- Macdonald, A.H.H. 2010. **Reef coral population genetics and the design of marine protected areas in the western Indian Ocean.** Ph.D. thesis, University of KwaZulu-Natal. 123 pp.
- Macdonald, A.H.H., Schleyer, M.H. & Lamb, J.M (in press). ***Acropora austera* connectivity in the south western Indian Ocean assessed using nuclear intron sequence data.** Marine Biology.

Genetic connectivity: 7 microsatellite markers in 7 populations of *A. austera*.

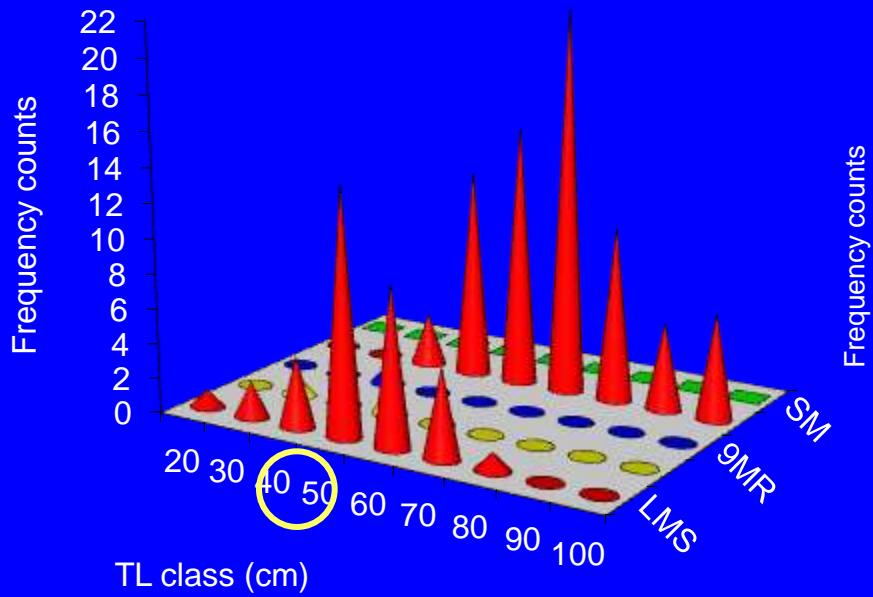


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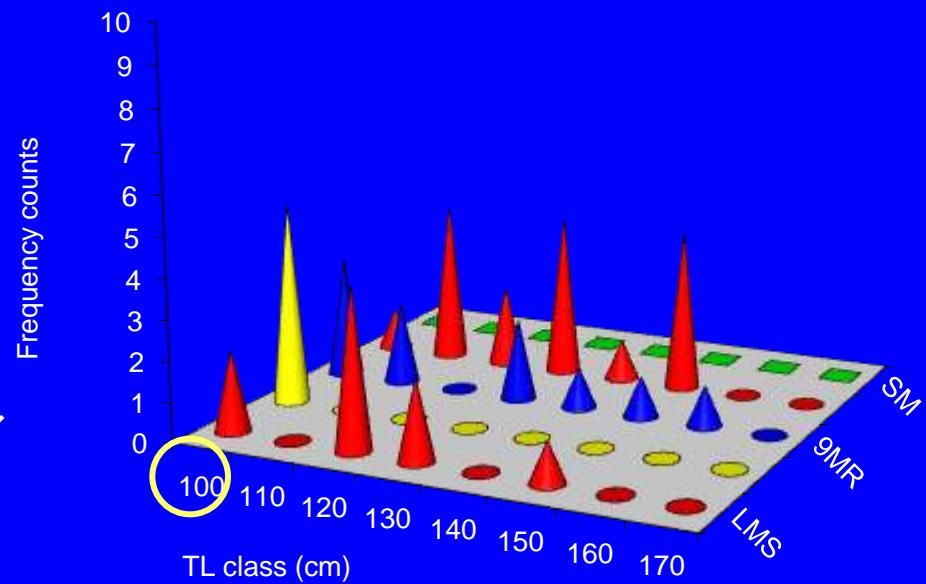
- Floros, C. 2010. **An assessment of fish communities on South Africa's coral reefs.** Ph.D. thesis, University of KwaZulu-Natal.

Reef predators

Game fish



No-take species



■ Sanctuary ■ Diving

□ Diving & fishing ■ Open

ADVANCES & OUTPUTS

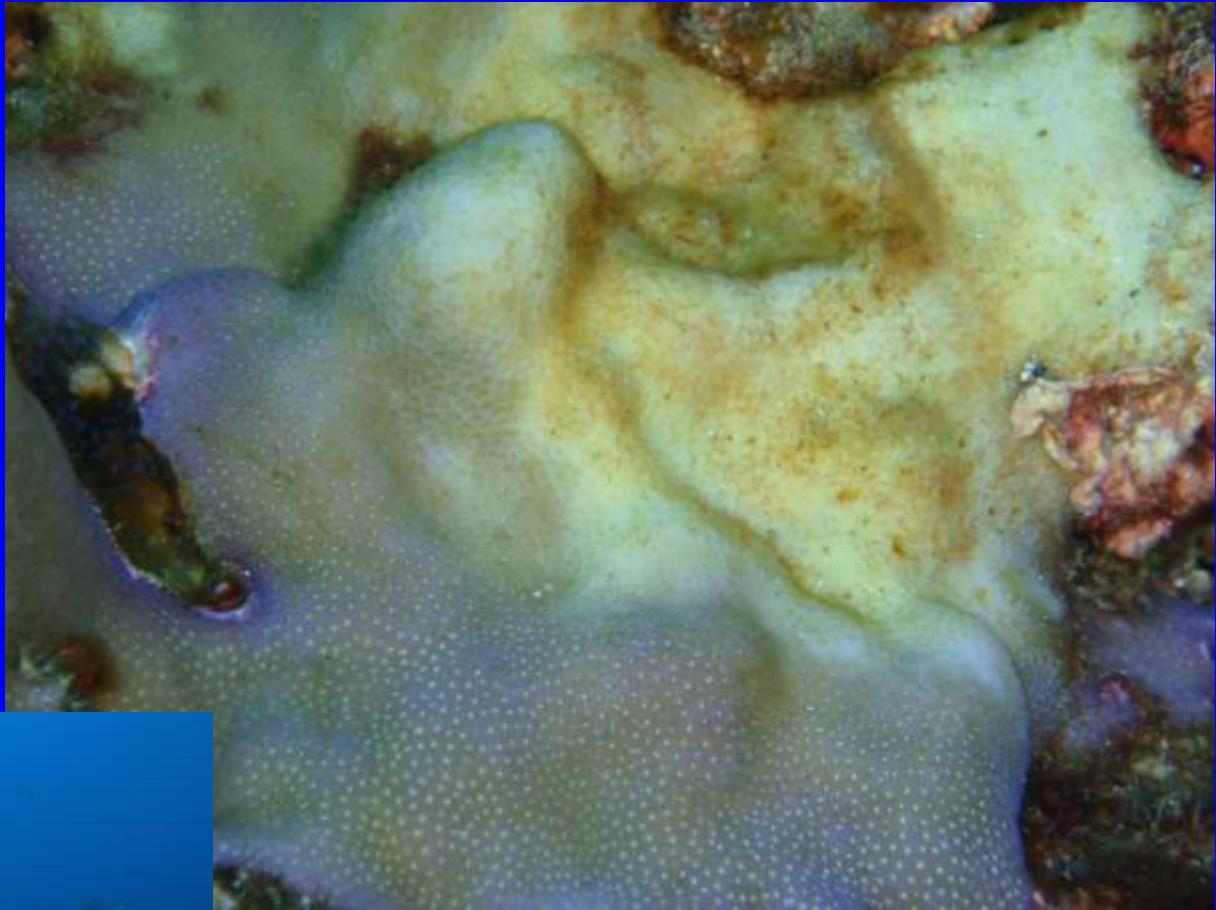
- Grimmer, A. (submitted). **Accretion versus bioerosion on the Maputaland reefs in South Africa – the major processes.** M. Sc. Thesis, University of KwaZulu-Natal.
- Hart, J.R. (submitted). **Coral recruitment on a high-latitude reef at Sodwana Bay, South Africa: Research methods and dynamics.** M. Sc. Thesis, University of KwaZulu-Natal.

ACCRETION vs OA ...

- $\Omega_{\text{aragonite}}$ diminishes from ~4.1 at equator
- Accepted lower limit of $\Omega_{\text{aragonite}}$ for coral accretion is ~3.1
- Mean $\Omega_{\text{aragonite}}$ at Sodwana = 4.36 ± 0.25 at dawn and noon (N=41)
- Attributable to bio-erosion, high carbonate sediments and their regular re-suspension, rather than 1° production

CURRENT STUDIES

Coral
diseases



Coral
recruitment

Reef economic valuation: Preliminary results for Sodwana Bay

| | |
|--|-------------------|
| Diving questionnaires | 521 (459 local) |
| Σ Dives p.a. 2008-2010 | 65 632 |
| Σ Diver spend (excl. travel costs) | €3.9M |
| Fishing questionnaires | 89 (saturated?) |
| Σ Fisher spend (excl. travel costs) | €4.5M |
| * Sediment: generated & retained | >€225M (TMR only) |

* Proxy for ecosystem services

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- Funding agencies: WIOMSA, MCM, NRF, WWF, SAAMBR
 - Mazda Wildlife Fund, BP (SA)
 - EKZNW, iSiMWPA
 - UNEP-WCMC
 - ORI staff