ningaloo outlook

BHP CSIRO

Shallow reefs

Damian Thomson, Melanie Trapon, Anna Cresswell,
Chris Doropoulos, Emma Westlake, Jo Myers

Ningaloo Outlook – A partnership between BHP and CSIRO

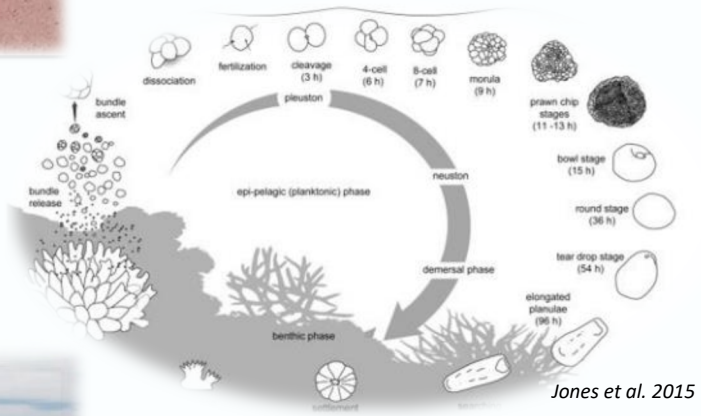
WESTERN COASTAL/OCEAN & ATMOSPHERE
www.csiro.au

CSIRO

Ningaloo Outlook is a BHP-CSIRO Industry-Science Marine Research Partnership investing A$5.4 million over five years to gather new knowledge on the Ningaloo reef and its important ecological values

Ningaloo 1974

Townsville 1991



Jones et al. 2015

Ningaloo 2015

AIMS 2003

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Overall objectives

1. Provide annual assessment of the status of key ecological values at Ningaloo i.e. corals, fish

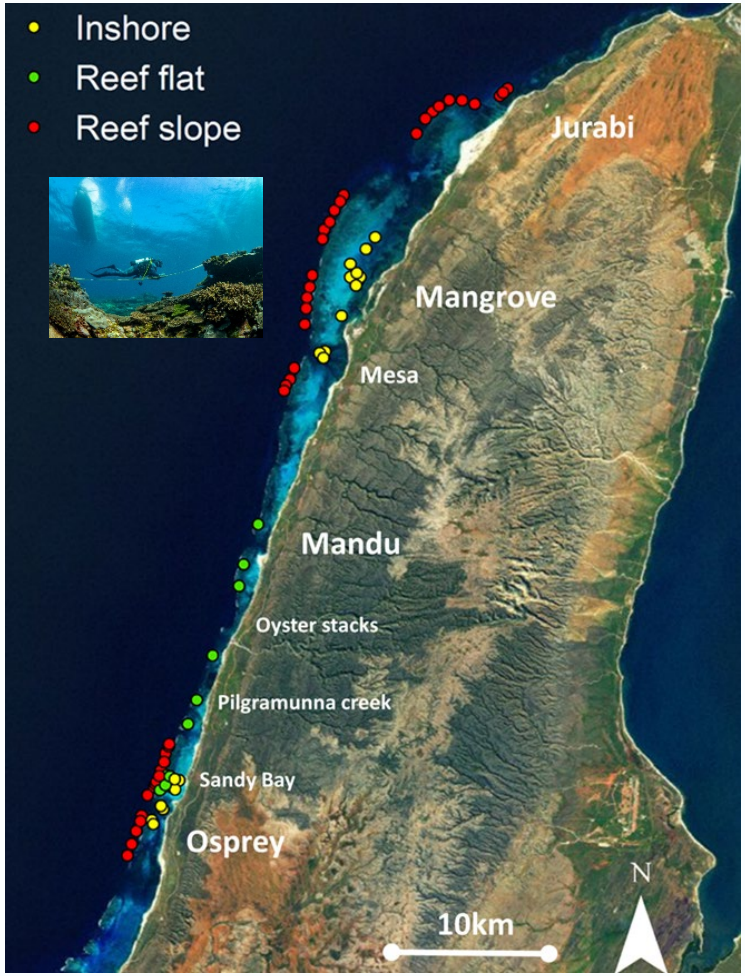
2. Community engagement

2019 achievements

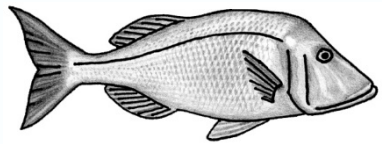
1. Extend datasets on reefs: fish, corals
2. Improve estimates of rates of reef growth and bio-erosion
3. Investigate depth influences on early stage communities
4. Community engagement

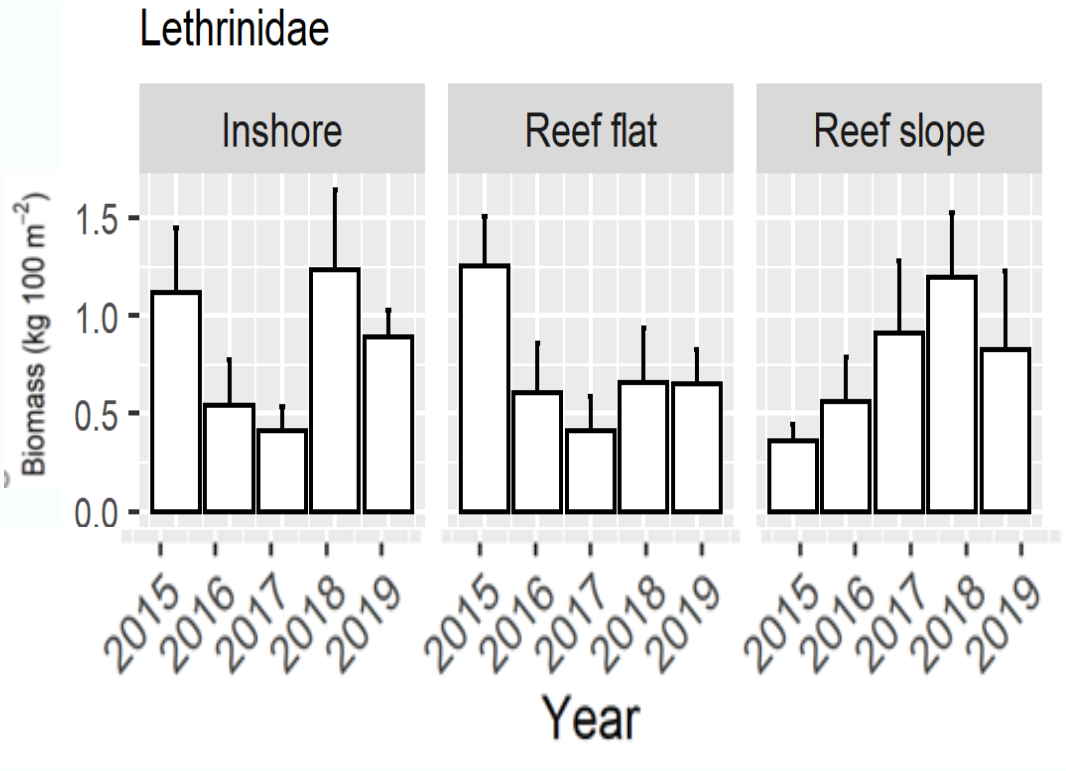
1) Reefs

- Annual surveys
- 70-75 sites
- Underwater Visual Census (UVC)
- 25 & 100 m transects
- 3D habitat models



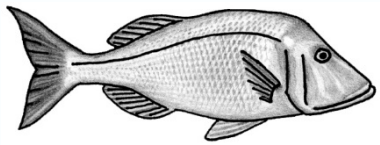
1) Reefs: fish





https://research.csiro.au/ningaloo/outlook/research-outputs/

1) Reefs: fish



Contents lists available at ScienceDirect

Biological Conservation

journal homepage: www.elsevier.com

Disentangling the response of fishes to recreational fishing over 30 years within a fringing coral reef reserve network

Cresswell A.K.[a, b, c, *], Langlois T.J.[a, c], Wilson S.K.[c, d], Claudet J.[e, f], Thomson D.P.[b], Renton M.[a, g], Fulton C.J.[h], Fisher R.[c, i], Vanderklift M.A.[b], Babcock R.C.[c, j], Stuart-Smith R.D.[k], Haywood M.D.E.[j], Depczynski M.[c, i], Westera M.[l], Ayling A.M.[m], Fitzpatrick B.[n], Halford A.R.[o], McLean D.L.[c, d, i], Pillans R.D.[j], Cheal A.J.[i], Tinkler P.[p], Edgar G.J.[k], Graham N.A.J.[q], Holmes T.H.[d]

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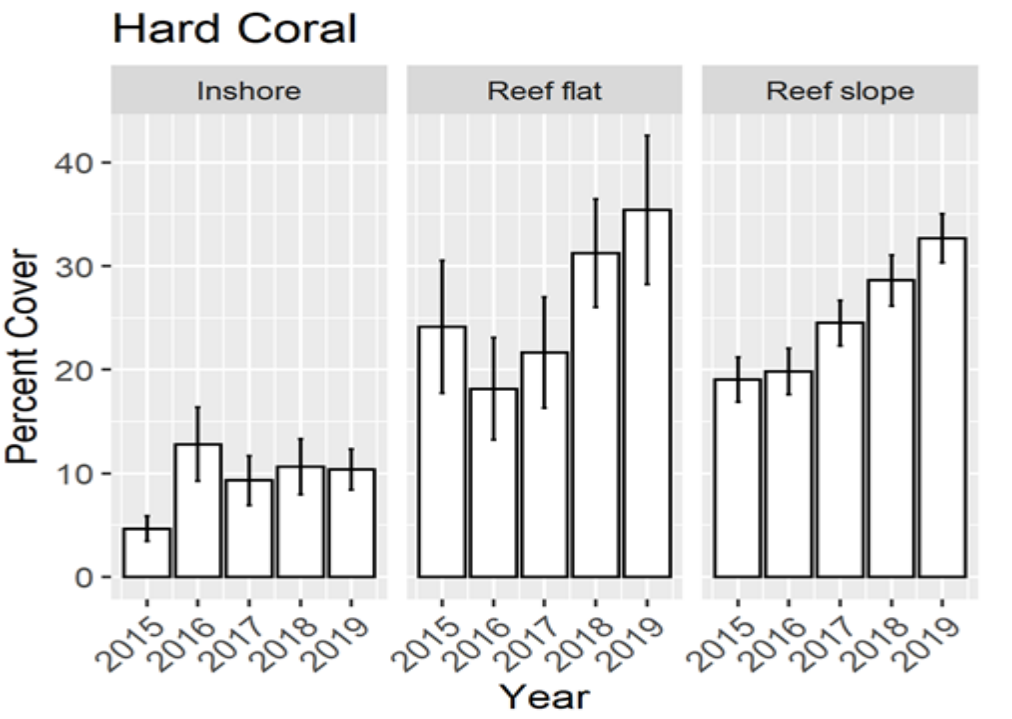
1) Reefs: corals and other benthic groups



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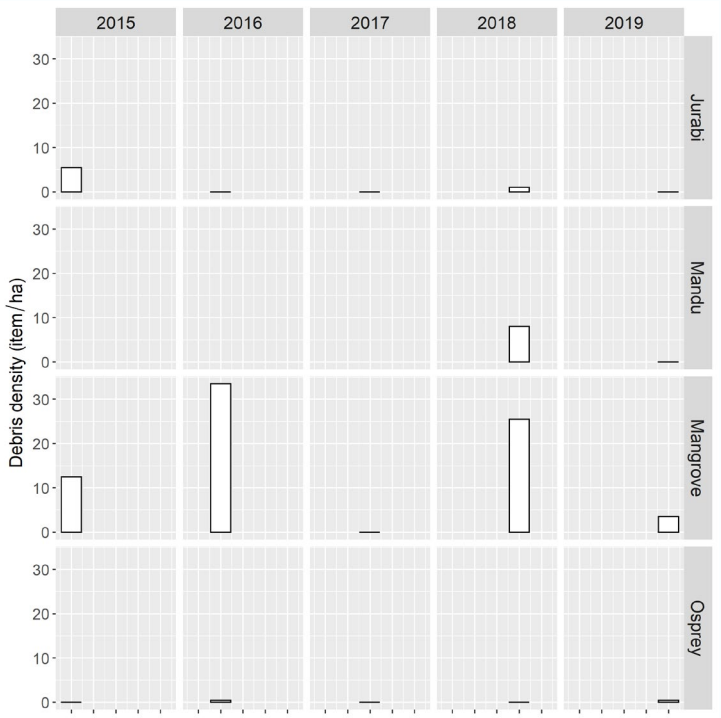
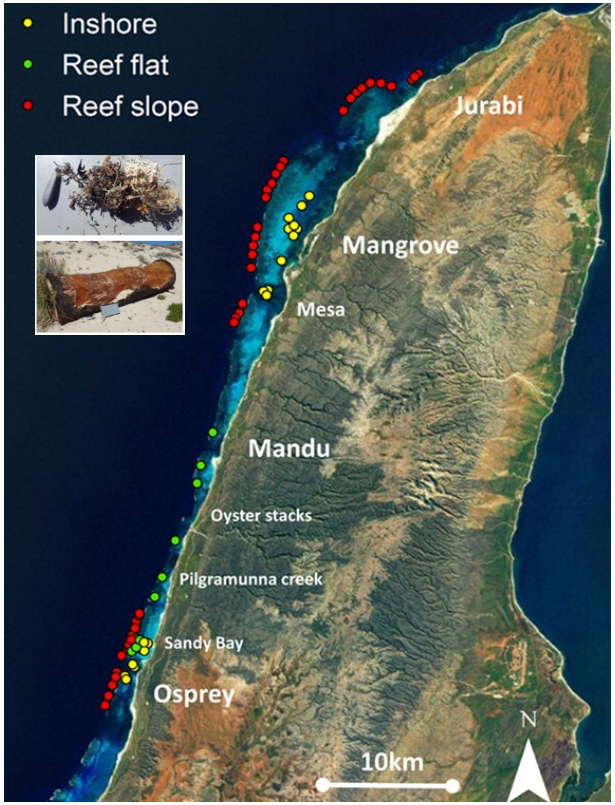
1) Reefs: macro-debris

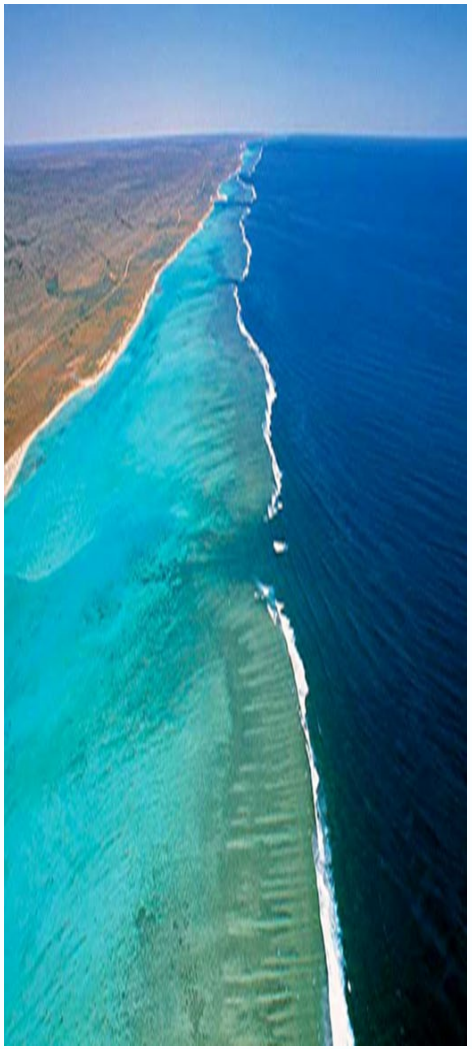




https://research.csiro.au/ningaloo/outlook/research-outputs/

2) Improved estimates reef growth and erosion

- Positive carbonate budgets essential for the maintenance of corals reefs
- Declines in coral cover, structural complexity and fish abundance linked to negative budgets
- Prolonged negative budgets may render reefs incapable of keeping pace with predicted sea-level rise

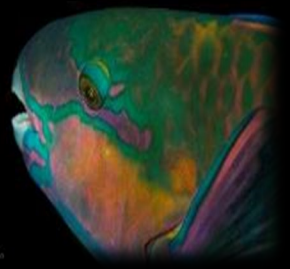


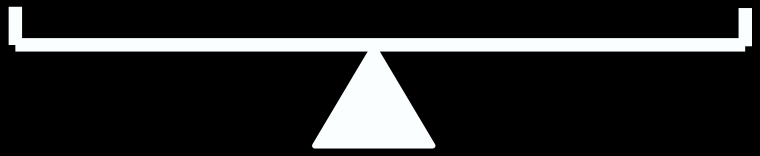
Life on the Slope | Damian Thomson

2) Improved estimates of reef growth and erosion

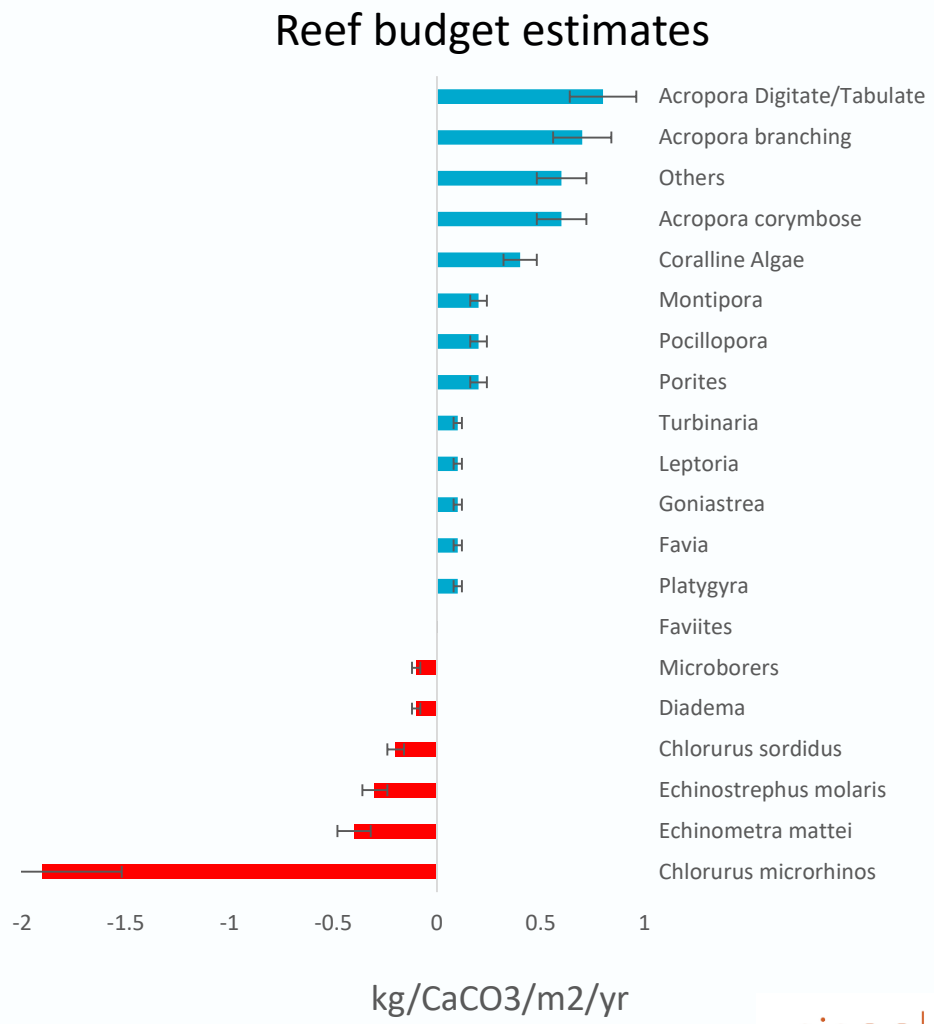
Reef growth

Erosion



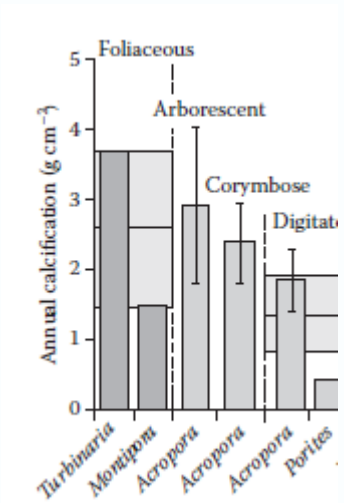


2) Improved estimates of reef growth and erosion



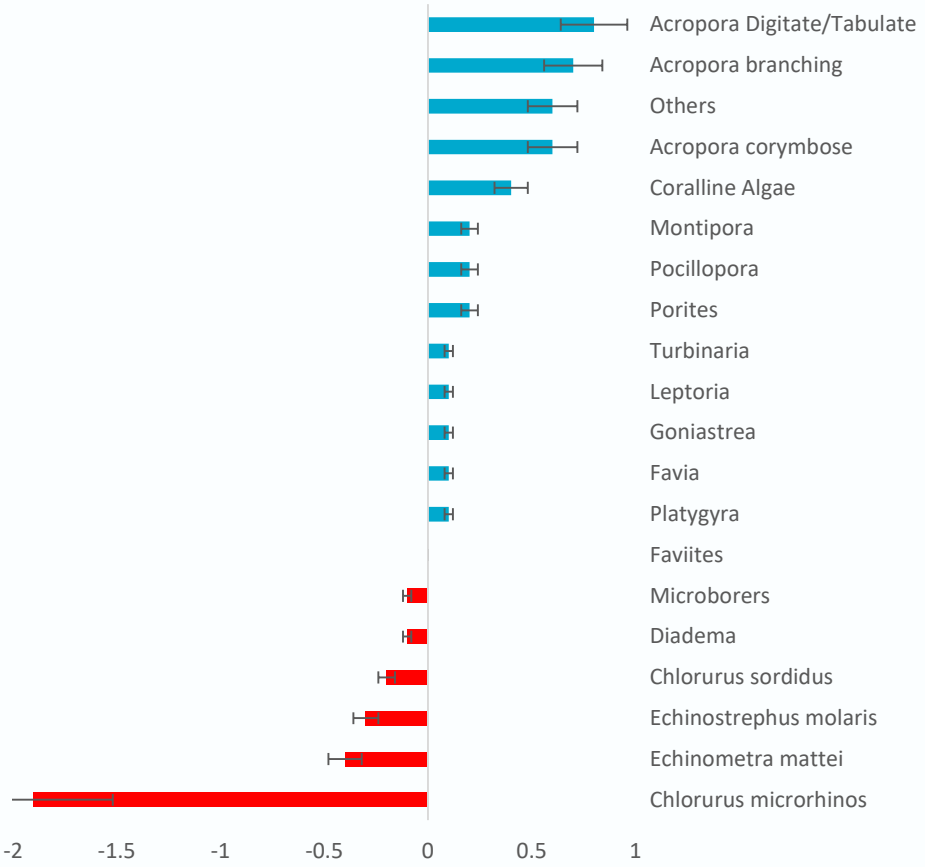
2) Improved estimates of reef growth and erosion

- Acropora



Pratchett et al. 2015

Reef budget estimates

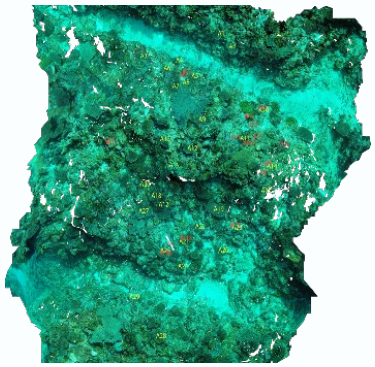


kg/CaCO3/m2/yr

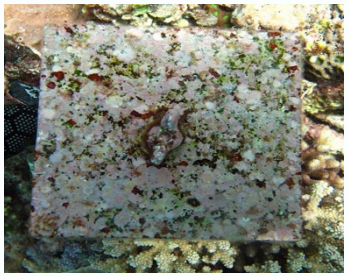
2) Improved estimates of reef growth and erosion

1) Tagged corals
n= 178

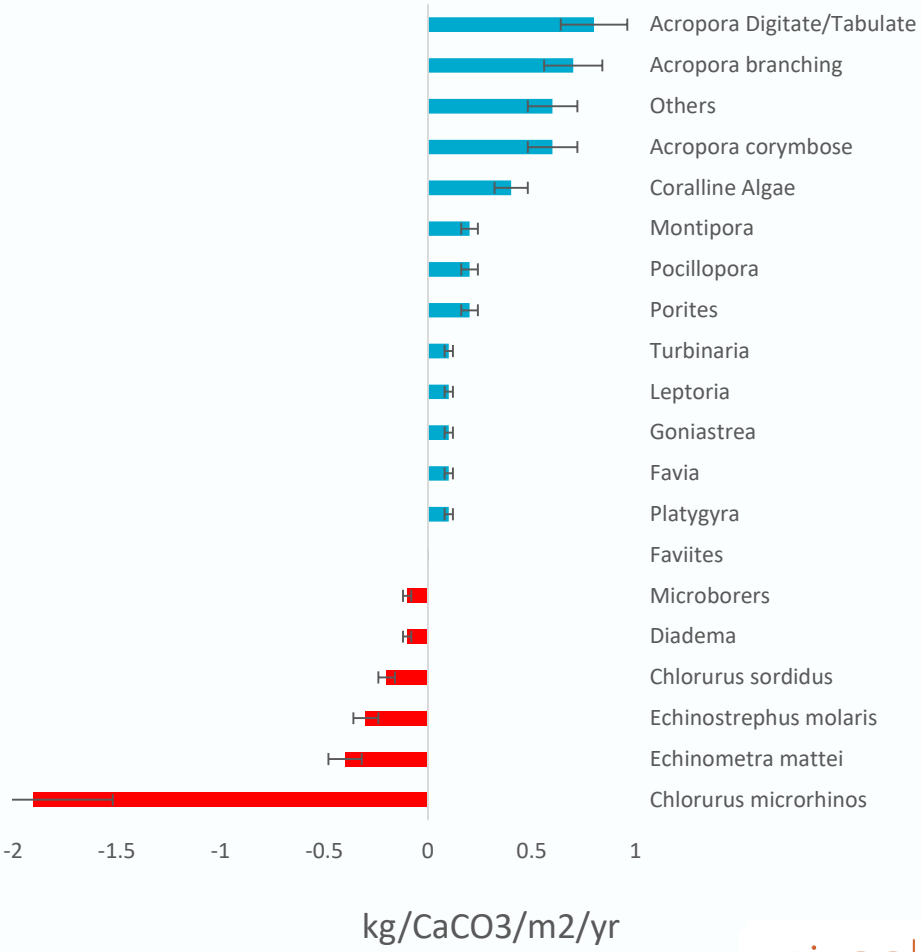
2) Habitat meshes
n = 485



3) CCA growth
n= 120



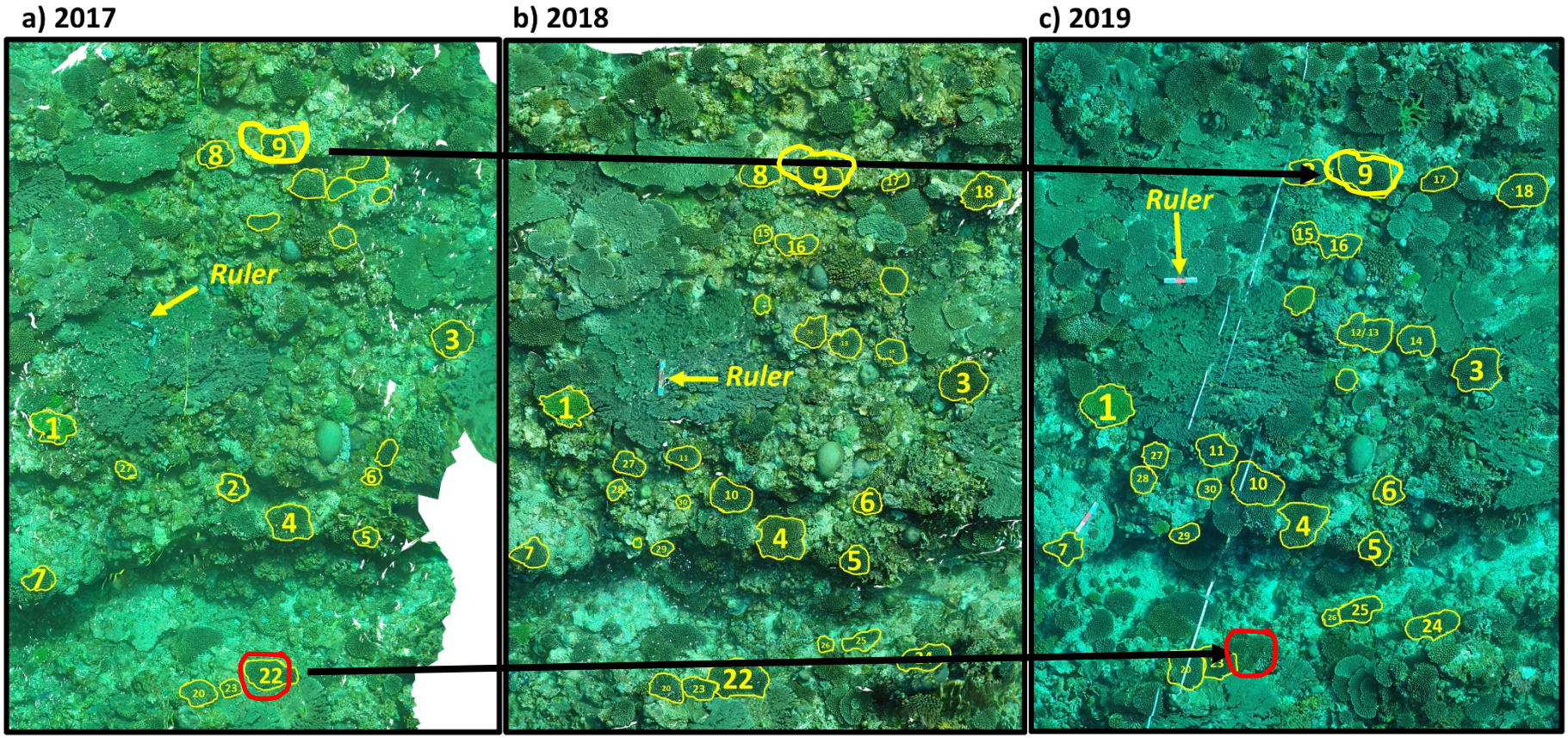
Reef budget estimates



2) Improved estimates of reef growth and erosion

Growth

Death / mortality



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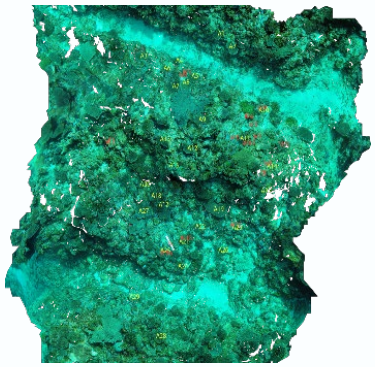

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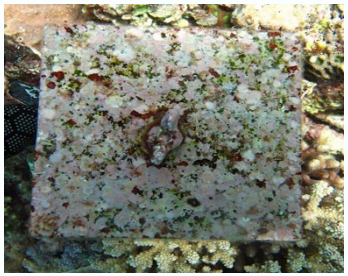
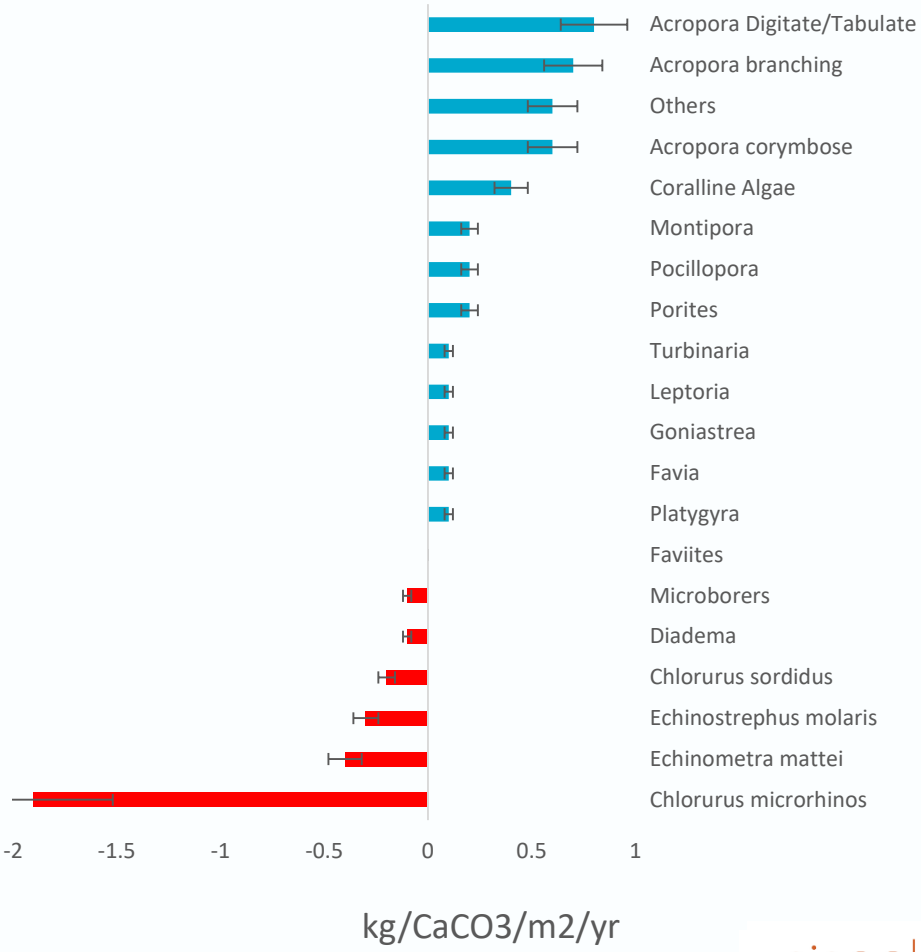


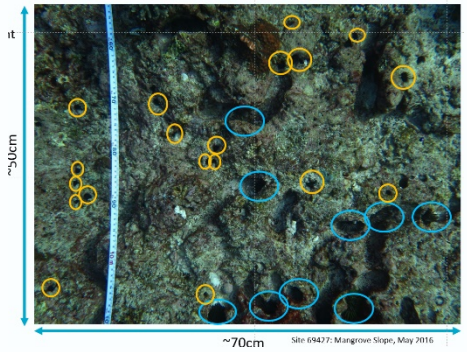
Reef budget estimates



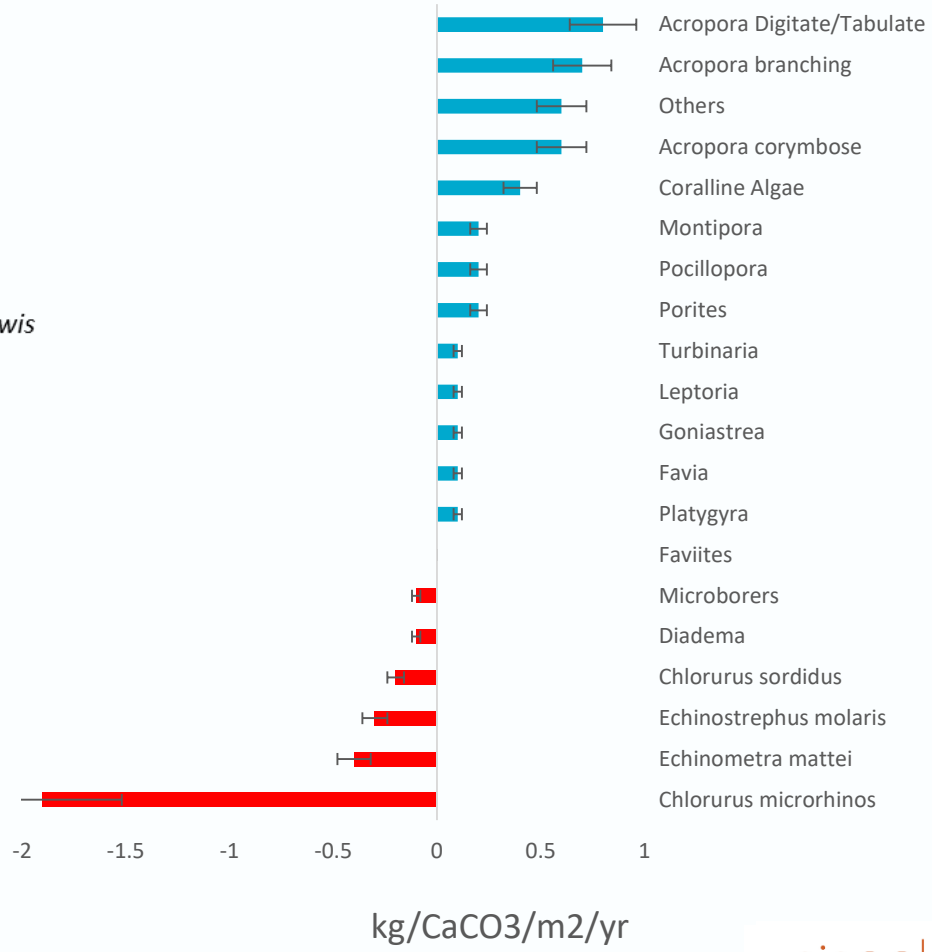
2) Improved estimates of reef growth and erosion

1) Parrotfish
n = 210

2) Urchins



Reef budget estimates



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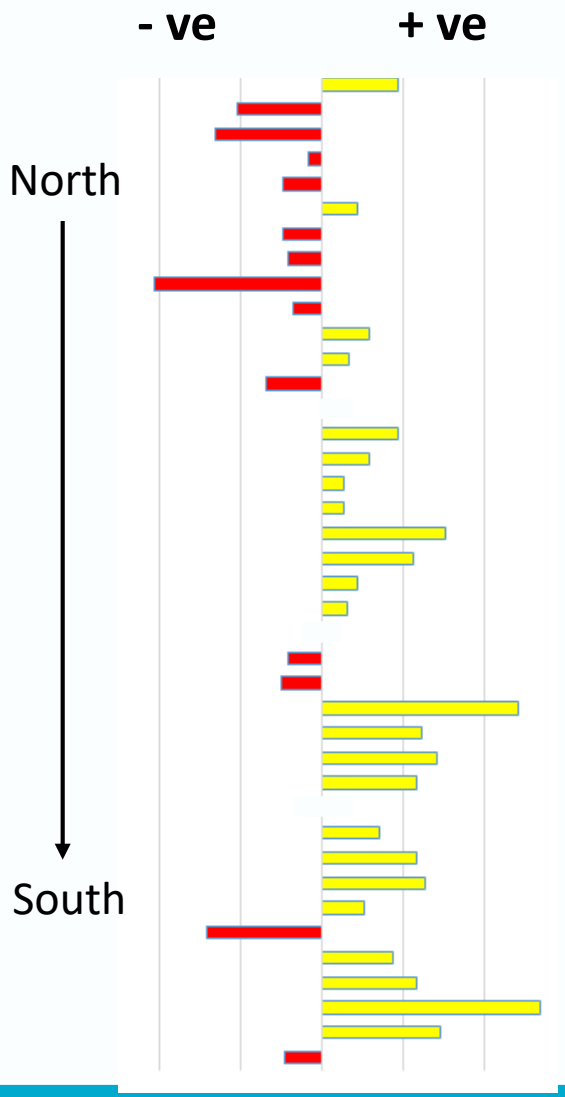
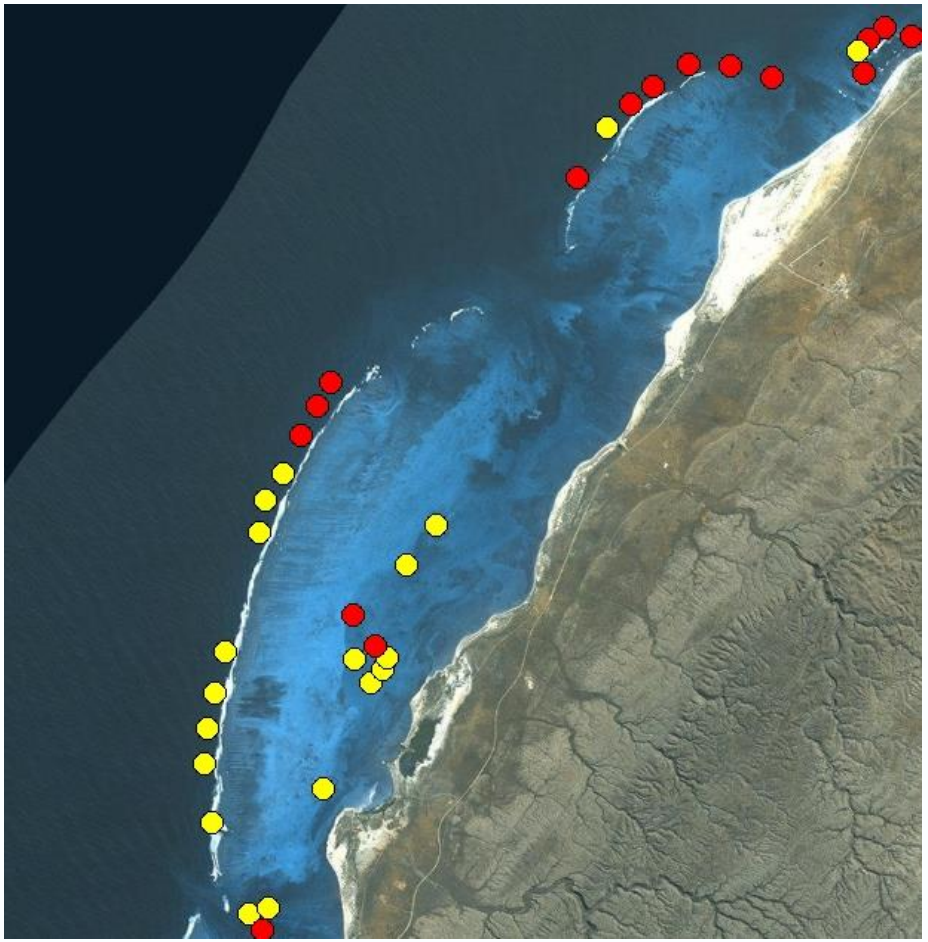
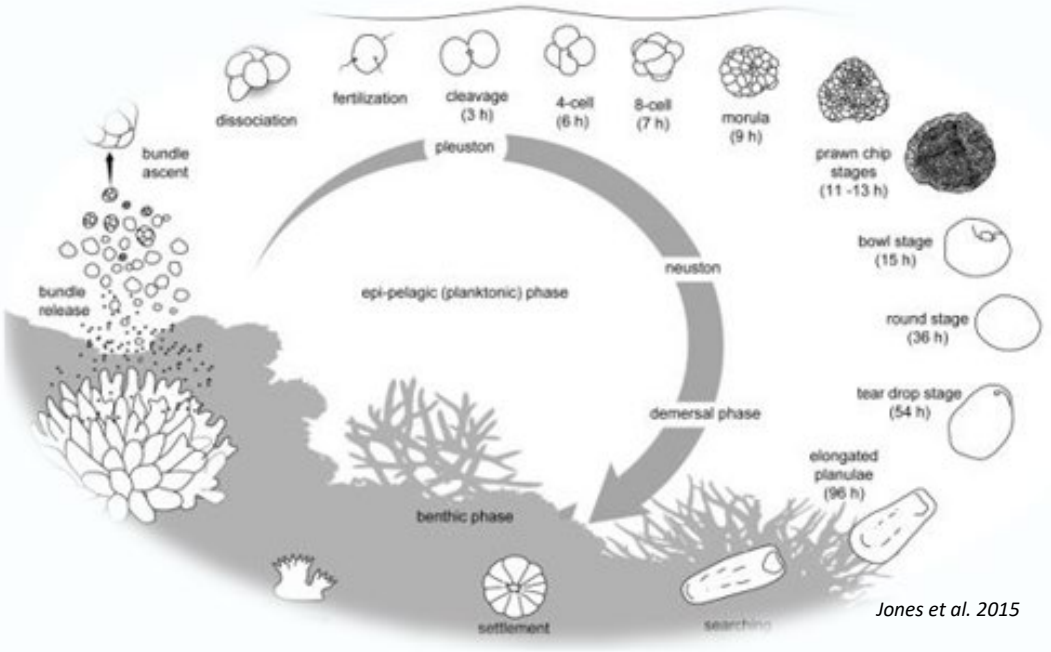




3) Depth influences on early stage communities



Jones et al. 2015

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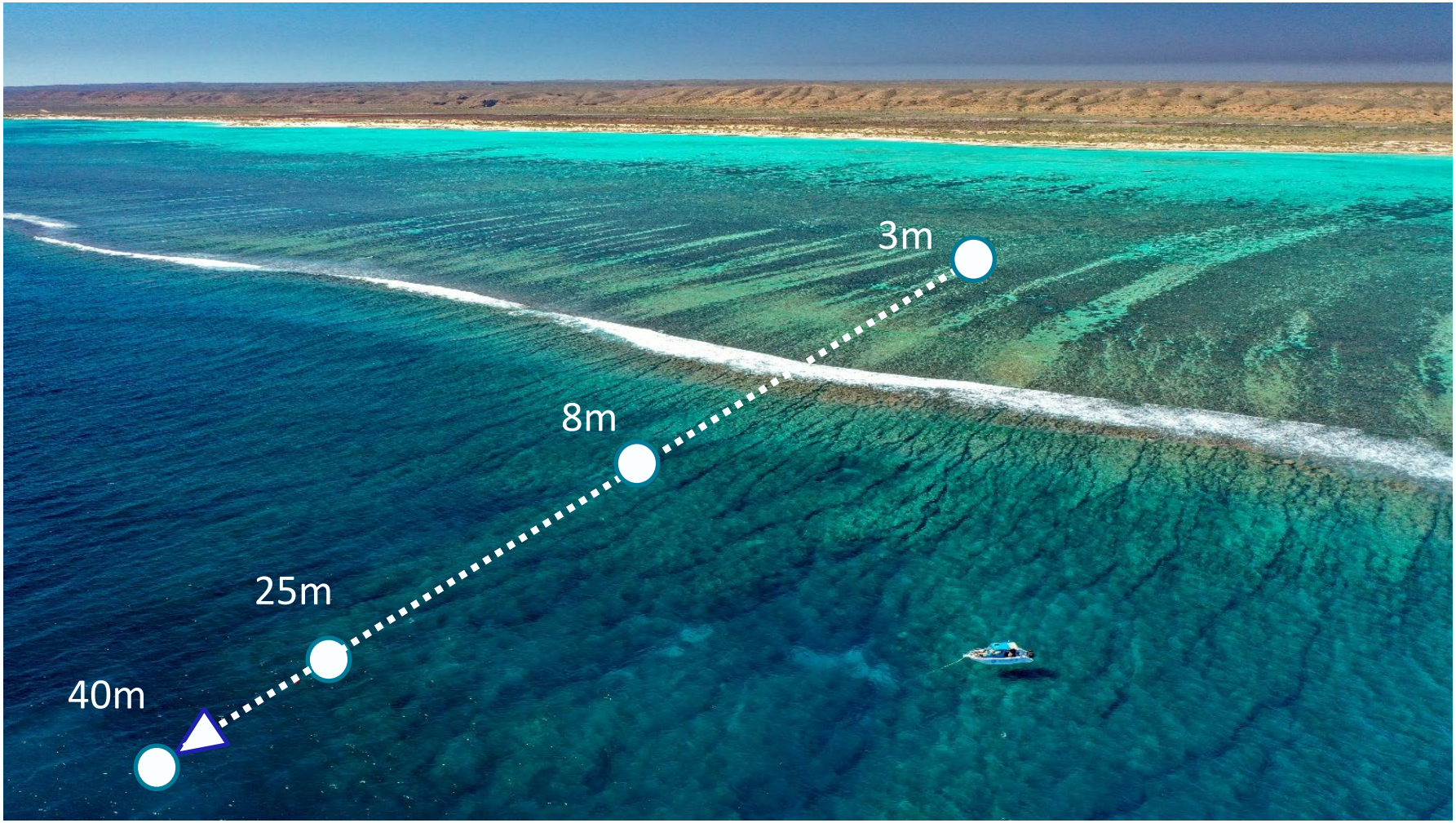
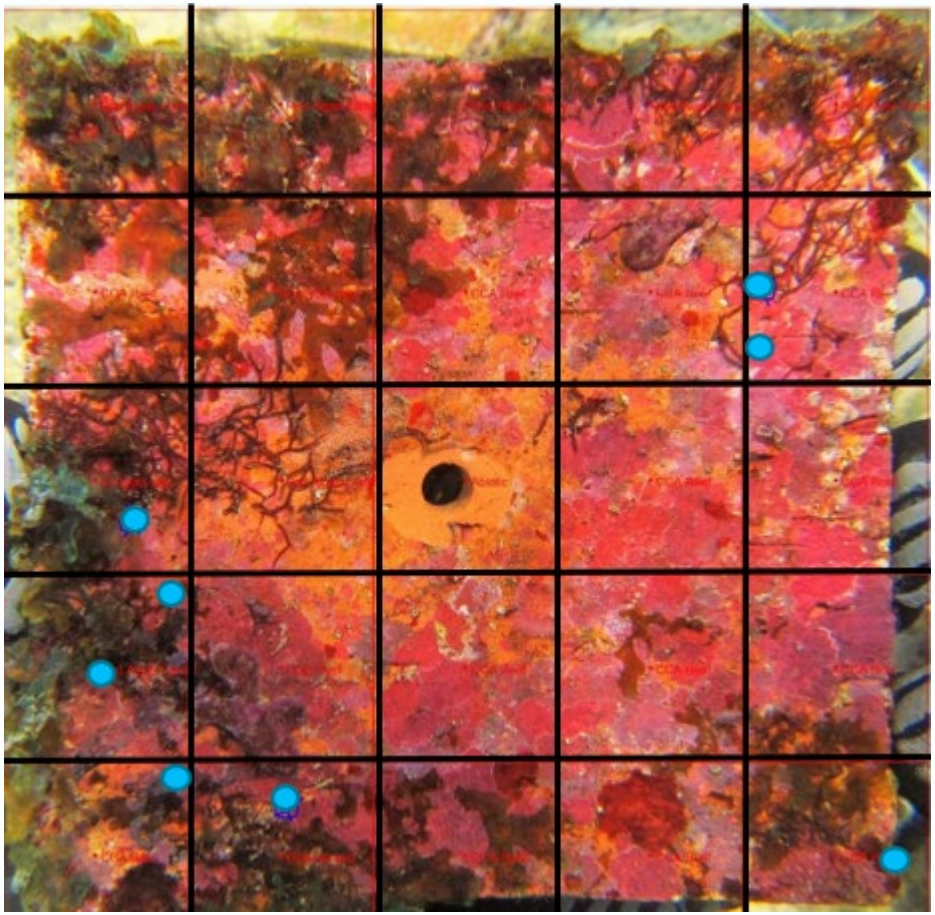


3) Depth influences on early stage communities

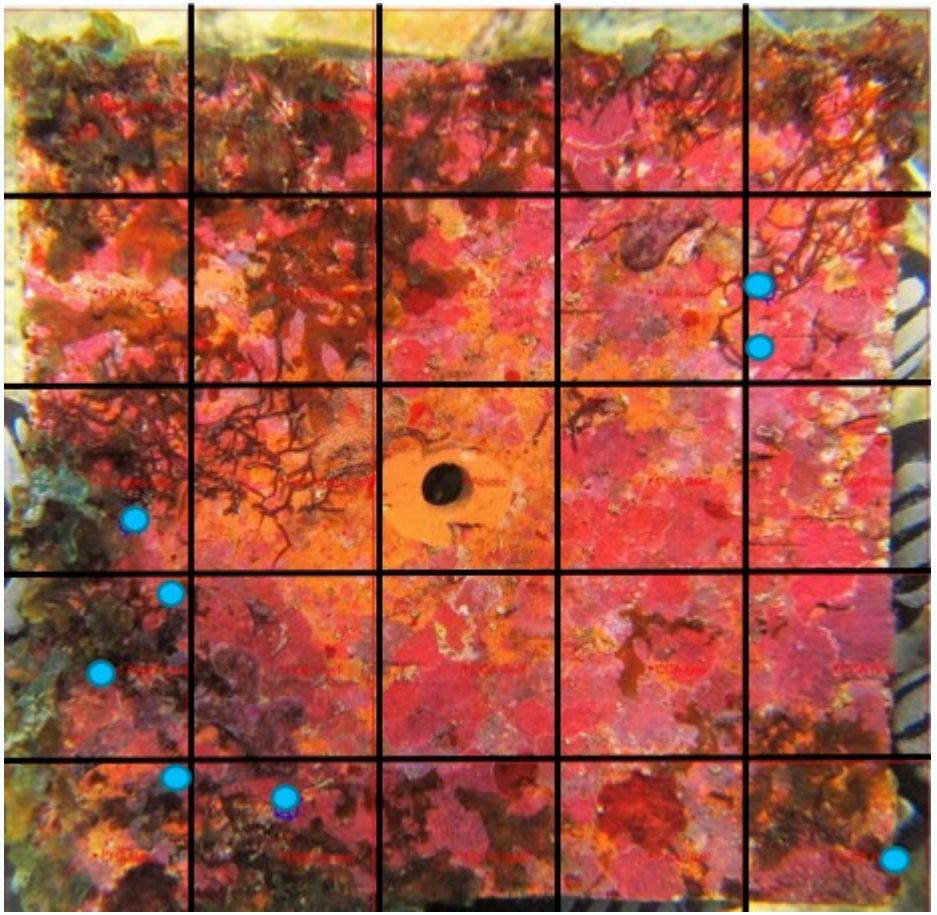
- Percent cover of invertebrates and algae visually estimated
- Coral settlers mapped
- Tested 17 substrate types and 5 physical attributes



3) Depth influences on early stage communities

Biological
- Crustose coralline algae
- Red algae

Physical
- Depth
- Light



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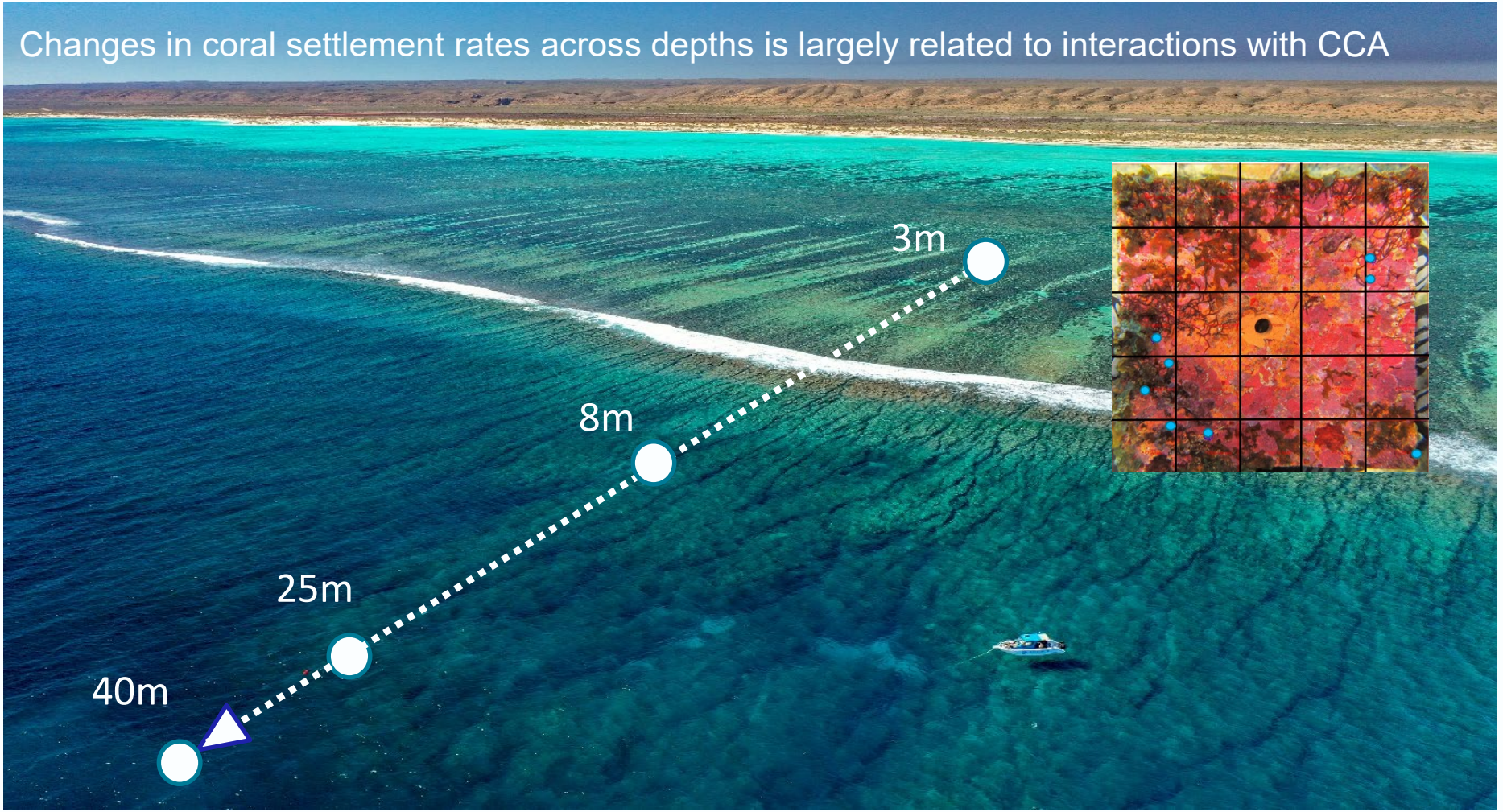
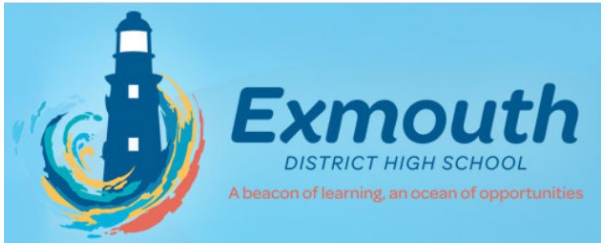


4) Community engagement

Partners



Shallow reefs

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Department of Biodiversity, Conservation and Attractions

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Exmouth DISTRICT HIGH SCHOOL
A beacon of learning, an ocean of opportunities

CALTEX

POTSHOT HOTEL • RESORT

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DELIVERING TO CORAL BAY, ONSLOW, KARRATHA

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THE UNIVERSITY OF WESTERN AUSTRALIA

Cape Conservation Group Inc.

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Conclusions

1) Extending datasets fish, corals, debris

2) Improve estimates of rates of reef growth and bio-erosion

3) Better understanding of early colonisers and depth

4) Community engagement

Thank you!

Acknowledgements

- BHP-CSIRO Ningaloo Outlook Partnership
- Exmouth school and teachers
- DBCA colleagues
- Margaret Miller for data wrangling
- Jim Gunson for wave model
- The extended Outlook team

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