

Research in Ningaloo Marine Park

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Marine Science Program

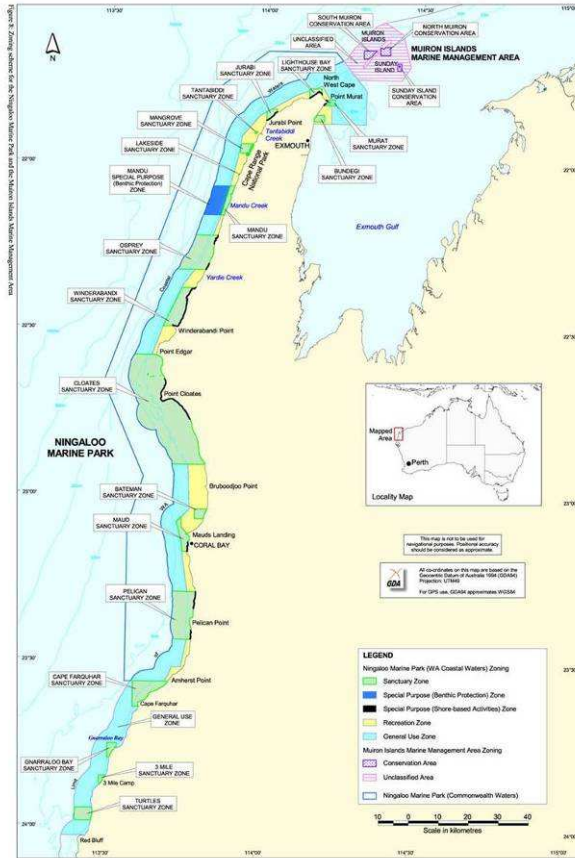
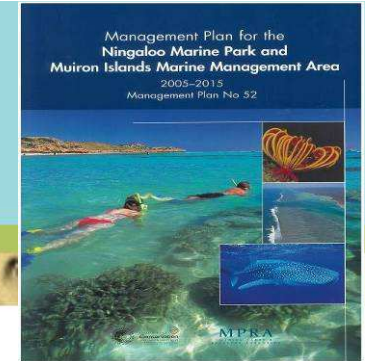


Department of
Environment and Conservation



western australian
marine science institution

Background: Research at Ningaloo



Premier released draft NMP management plan in 2004 and provided \$5 million for research

“Improve the scientific underpinning for the conservation and management of Ningaloo Marine Park”

Research Program: WAMSI Node 3, CSIRO *Wealth from Oceans* National Research Flagship, AIMS, industry

\$30M+ over five years on management related research



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WAMSI Node 3 – Managing and Conserving Ningaloo

Best practice management and underpinning science

Inventories – *What is out there, how much and where?*

Baselines – *What is the current ‘natural’ population, distribution?*

Processes – *What are the natural and human pressures?*

Prediction – *Is biodiversity protected? If pressures increase?*

**Science program based on research needs
identified in the NMP Management Plan**



WAMSI Node 3 Science Plan – Ningaloo Marine Park

- Geomorphology and hydrology – Curtin
- Oceanography- physical and biological – UWA
- Deep water habitats and benthic communities WAM, AIMS
- Biodiversity (abundance, distribution, habitat use)– fish, sharks, invertebrates CSIRO, UWA, AIMS
- Monitoring reef health – AIMS
- Effects of fishing (target species, trophic levels) – CSIRO, AIMS, ECU
- North West Marine Research Inventory – CSIRO



**25 Research Projects/sub-projects,
~60 scientists**

\$5M WAMSI; >\$10M research partners



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Curtin
University of Technology

National Research
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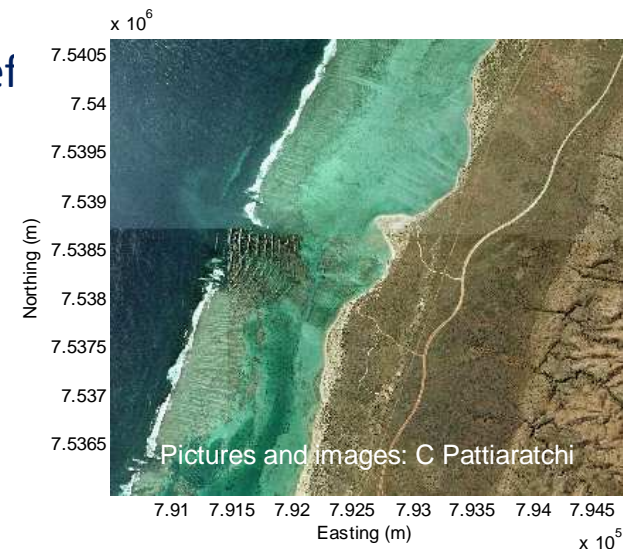
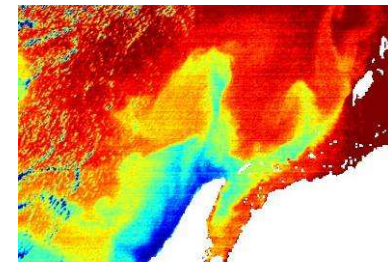
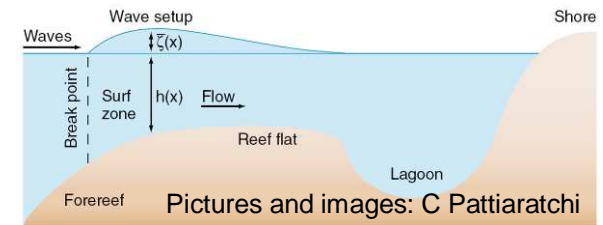


Physical Oceanography

C. Pattiaratchi, UWA

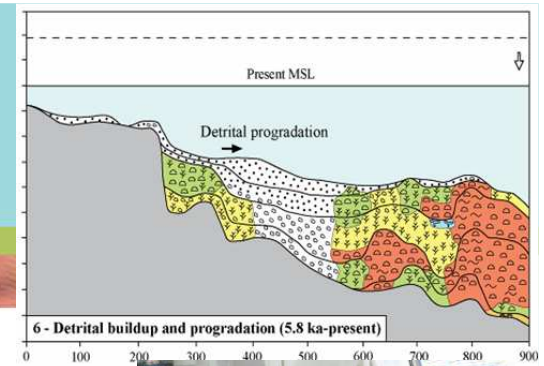
Findings

- Water circulation in the lagoons is related to offshore wave height driven across the reef flat
- Flushing rate of a lagoon ranges from 2 to 25 h (median 6 h)
- Summer winds and cold water upwelling protect the reef from coral bleaching
- Oceanic waters influence nutrient dynamics and reef health



Geomorphology and sediments

L. Collins, E. Twiggs, Curtin

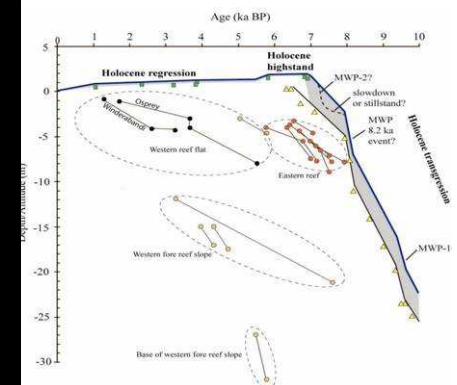
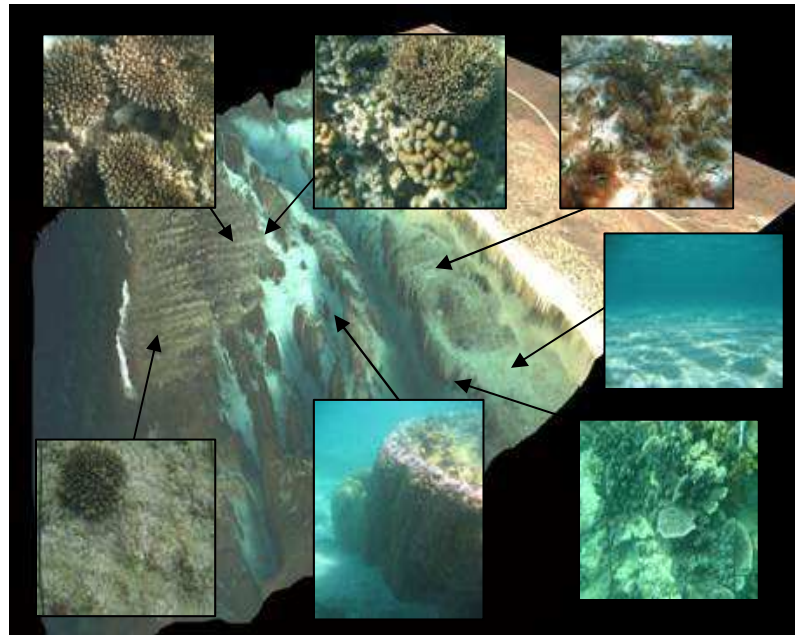
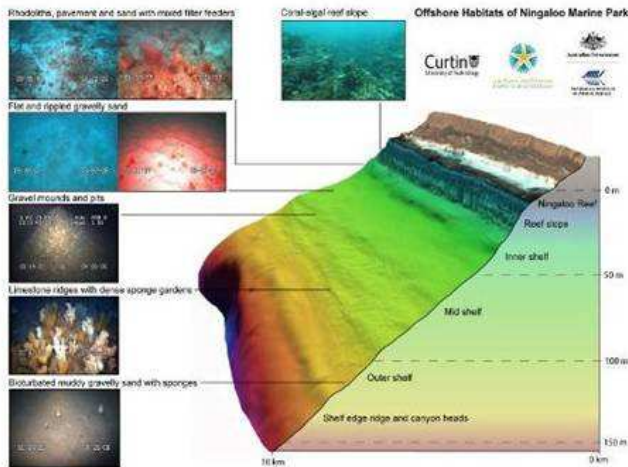


Findings

- Underlying geomorphology influences sea floor communities in deep and shallow waters.
- Deep water features may be links between the coastal groundwater system and the ocean.
- We can trace the evolution of the reef, including response to past environmental change.



All Photos and images courtesy of E Twiggs, Curtin

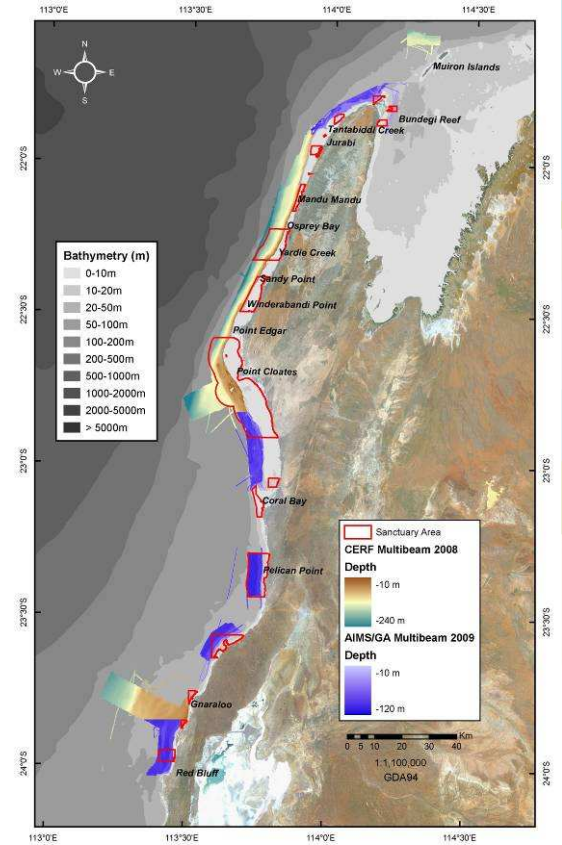


Deepwater communities

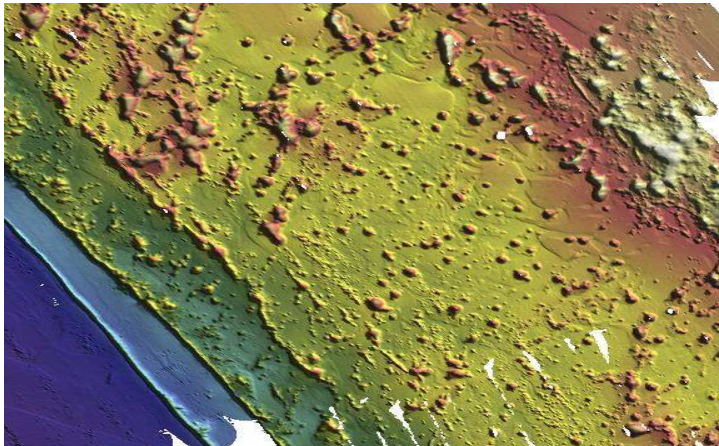
A Heyward, AIMS

Techniques

- Acoustic mapping
- Towed video
- Benthic sleds



All pictures and images: A Heyward, AIMS

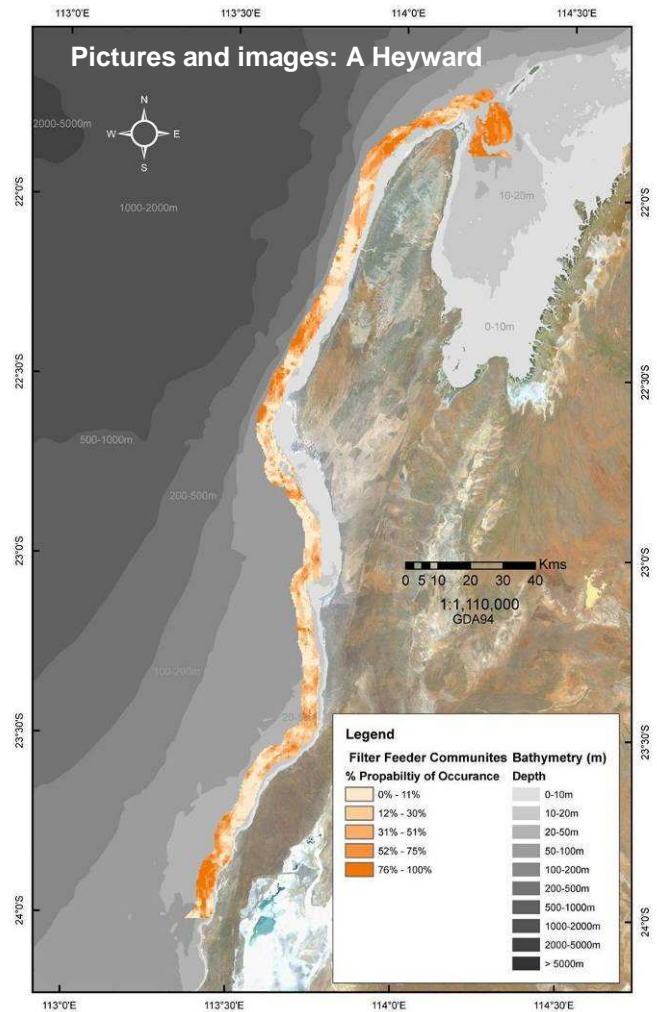


Deepwater communities

A Heyward, AIMS

Findings

- 618 benthic invertebrate species, many new to science
- Significant filter feeder communities and sponge gardens
- Physical environment linked with patterns in biodiversity



Sharks and rays

J Stevens, CSIRO

Research techniques

- Surveys – long line, underwater census
- Acoustic tags and tracking
- Satellite tracking

Findings

- Shark and ray populations are diverse and reasonably healthy
- A new species of ray possibly endemic to WA was found
- Some tiger sharks are transient and travel as far as Indonesia
- There is some bycatch mortality from recreational fishing



The distribution and biodiversity of benthic

Ben Fitzpatrick, Dr Euan Harvey, UWA



Video clip copyright Ben Fitzpatrick



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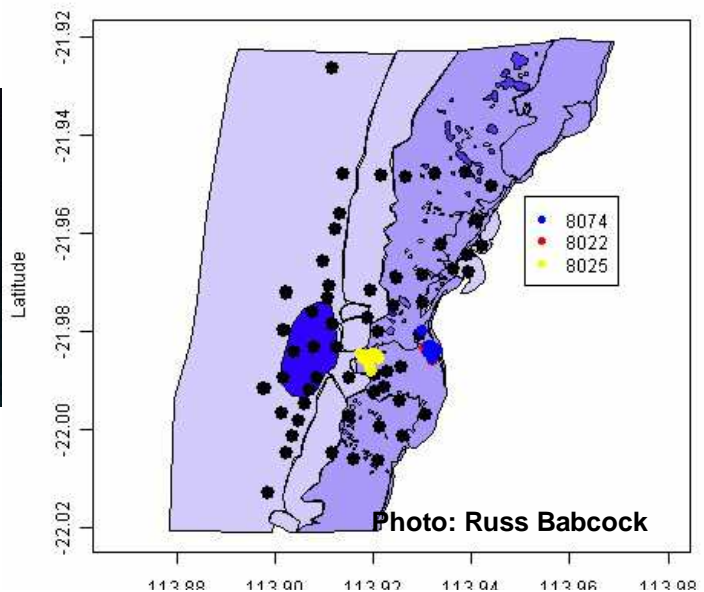
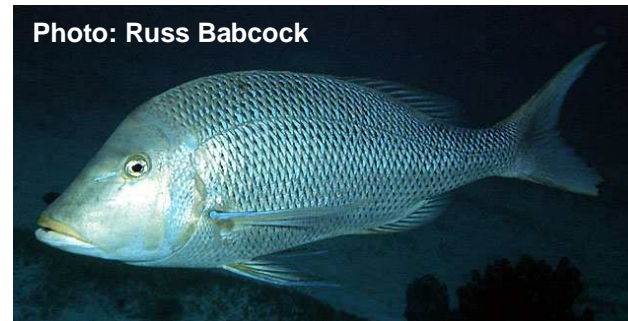
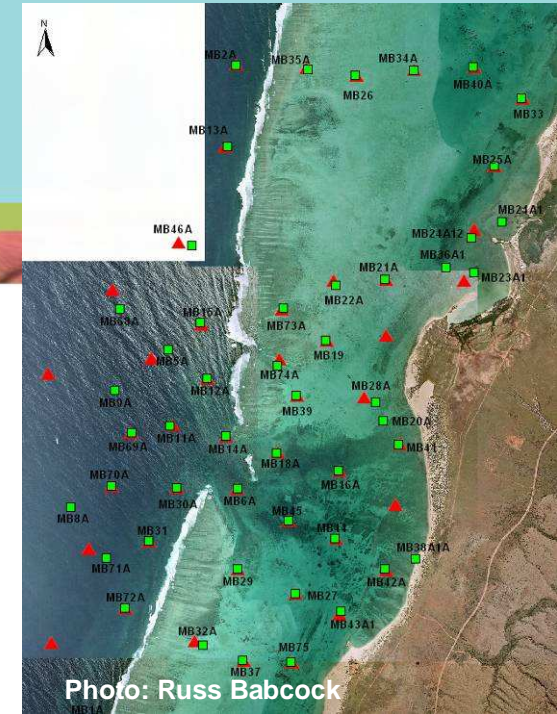
Fish tagging and tracking

Russ Babcock, Rich Pillans, CSIRO

300 fish tagged, 17 species

Findings

- Some key species have small home ranges
- Even pelagic species may use relatively small areas of reef
- Key habitat areas for foraging and spawning have been identified



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THANK YOU



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Photo: Lynnath Beckley

