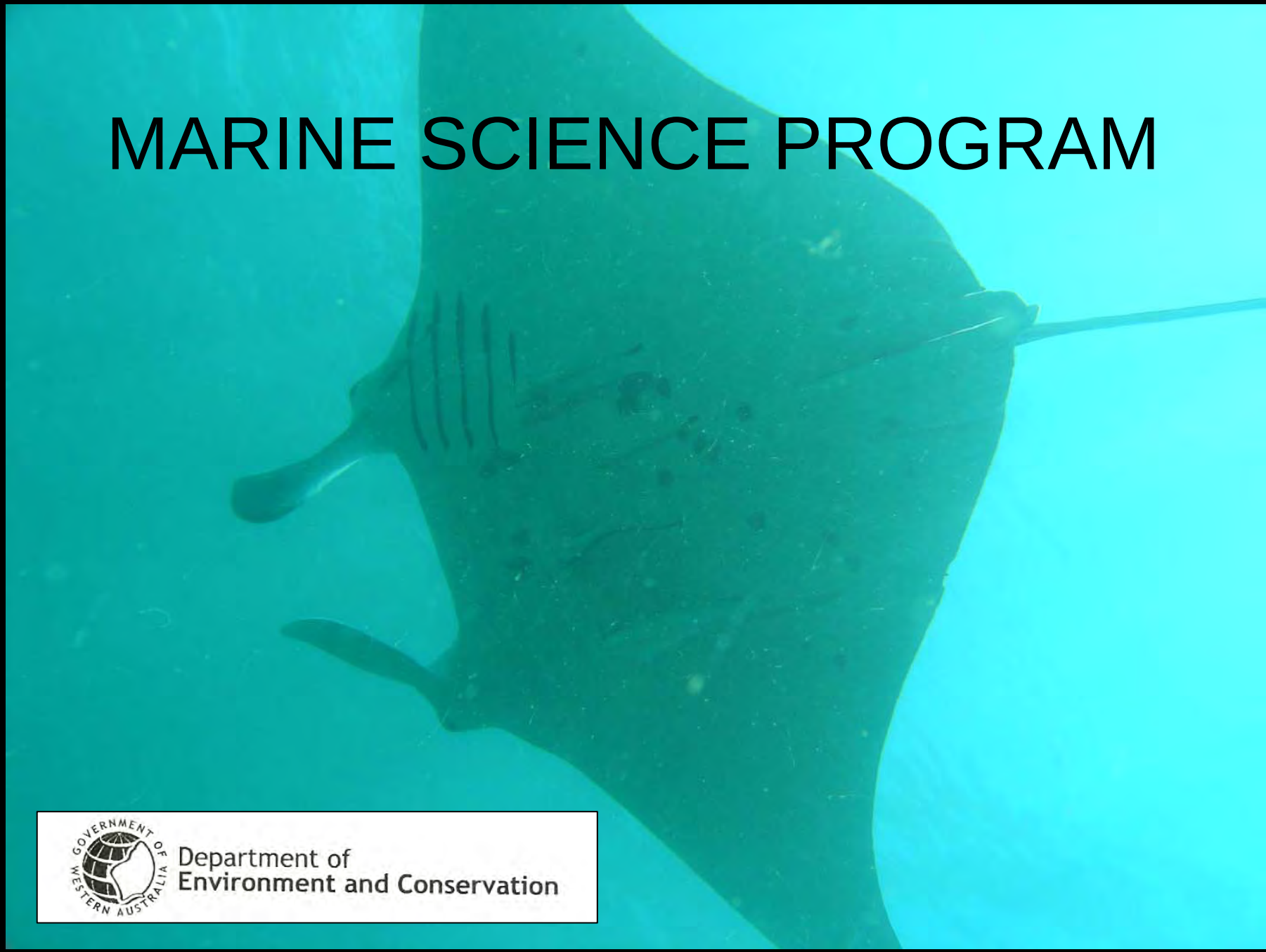
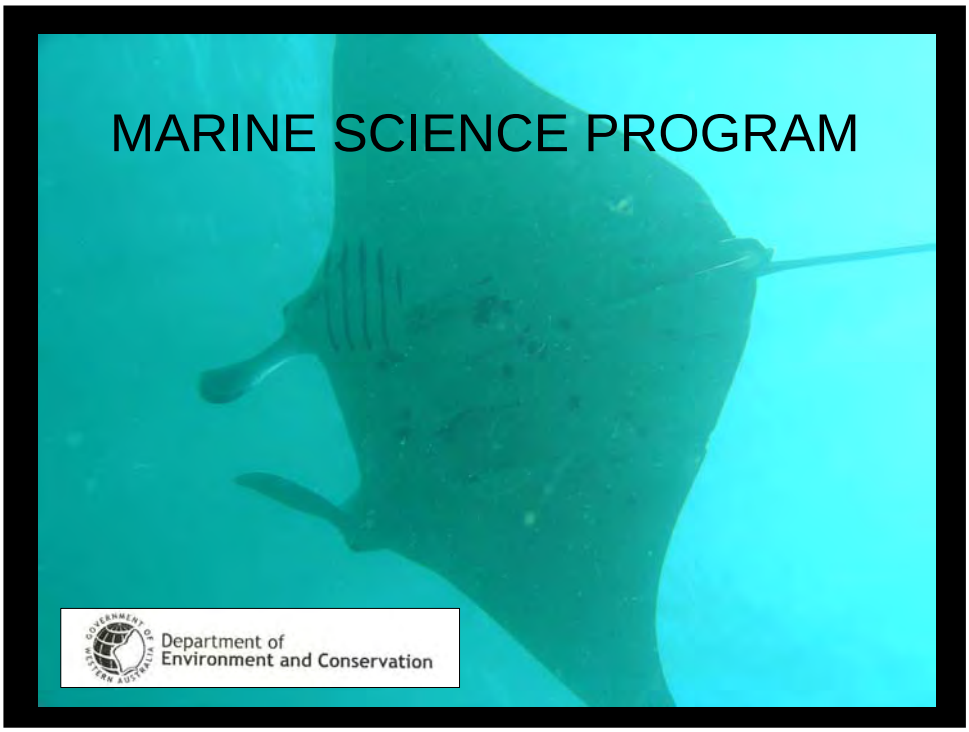
MARINE SCIENCE PROGRAM



Department of
Environment and Conservation



Good morning…

My name is Shannon Armstrong from CALMS new Marine Science Program.

Just a bit of background on some recent changes to that have been made to CALM.

CALM's Marine Conservation Branch has split into the Marine Policy and Planning Branch and the new Marine Science Program.

The Department of Conservation and Land Management has merged with the Department of Environment to form the Department of Environment and Conservation.

The recognition that good science must inform management if WA's marine biodiversity is to be successfully conserved has been the motivation behind the creation of DEC's new Marine Science Program.

There is a need to reduce the uncertainty of environmental decision making by it up with a strong research capacity.

MARINE SCIENCE PROGRAM

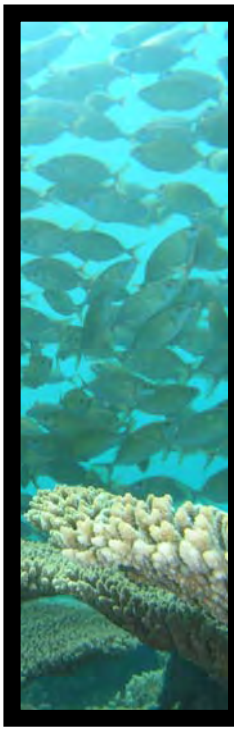
Aim is to co-ordinate a collaborative and strategic approach towards marine science and management in WA

In order to provide a strong scientific foundation for the management of WA's marine environment

The MSP will take the lead role in DEC's participation in:

- The Western Australian Marine Science Institute (WAMSI), including the Ningaloo Research Program

- Establishing and delivering strategic collaborations with marine science providers; universities, AIMS, CSIRO, other agencies, industry and community groups



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The Western Australian Marine Science Institute which is endowed with $21 million dollars of State Government Funding for strategic and collaborative marine science projects to be undertaken by AIMS, CSIRO, DEC, Dept of Fisheries and other relevant institutions to enhance the management of Western Australia's marine environment.

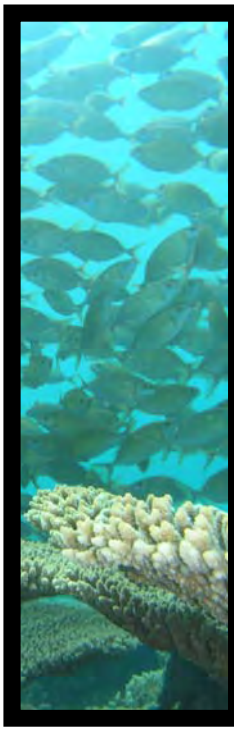
The NRP forms the major component of WAMSI node 3: Managing and conserving the marine state: Best Practice management and underpinning science. A $5 Million dollar state initiative aimed at determining the information needed to ensure sustainable management of Ningaloo Marine Park.

The MSP will also ….read from slide

The MSP will focus on ecological and social marine science:

- research
- monitoring
- science communication and education

To identify management changes required to maintain the conservation of our State's unique marine biodiversity



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To identify management changes required to maintain the conservation of our State's unique marine biodiversity

Concentrating on

•Research

•Monitoring

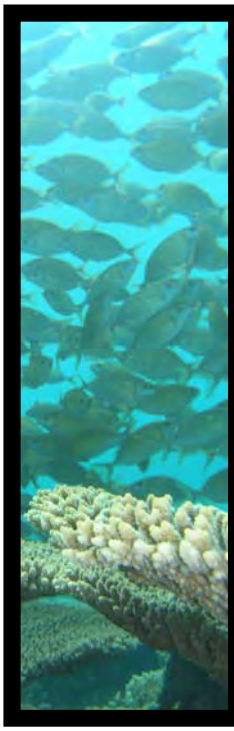
•Science communication and education

And…co-ordinate biophysical and social surveys and research needed to identify and plan for new MPA's, develop marine policy and for regional marine planning

To do this…

MSP has funding to:

- Undertake marine science
- Undertake collaborative projects with external science providers
- Commission research and monitoring as required
- Support postgraduate student projects with MSP seed funding



To do this…

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- Undertake marine science
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•Undertake marine science – by coordinating and carrying out research and monitoring in cooperation with regional CALM staff

•Undertake collaborative research projects with external science providers such, such as universities, AIMS and CSIRO

•Read from slide…

MSP Priorities in 2006 / 07:

- A review of historical, current and proposed marine research and monitoring programs in WA

BIBLIOGRAPHY OF MARINE SCIENTIFIC RESEARCH RELEVANT TO THE NINGALOO MARINE PARK AND ADJACENT WATERS

Prepared by
Shannon J. Armstrong
June 2006

Update of last report prepared by
K.P. Bancroft and J.A. Davidson
November 2000

MARINE SCIENCE PROGRAM
SCIENCE DIVISION
DEPARTMENT OF CONSERVATION AND LAND MANAGEMENT

CURRENT AND PROPOSED MARINE RESEARCH PROJECTS RELEVANT TO THE NINGALOO MARINE PARK AND ADJACENT WATERS

Prepared by
Shannon J. Armstrong
June 2006

MARINE SCIENCE PROGRAM
SCIENCE DIVISION
DEPARTMENT OF CONSERVATION AND LAND MANAGEMENT

MSP Priorities in **2006 / 07** cont ...

- Marine biodiversity mapping and monitoring studies at …

Montebello/Barrow Islands

Jurien Bay Marine Park

Metro Marine Parks

MSP Priorities in 2006 / 07 cont ...

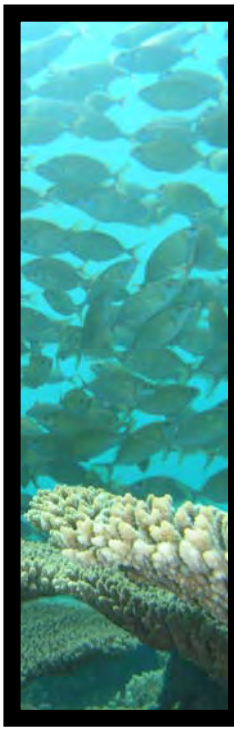
- Develop marine science plans for the proposed marine conservation reserves

  Dampier Archipelago

  Cape Preston area

  South-West Capes region

  Walpole / Nornalup Inlet



MSP Priorities in 2006 / 07 cont ...

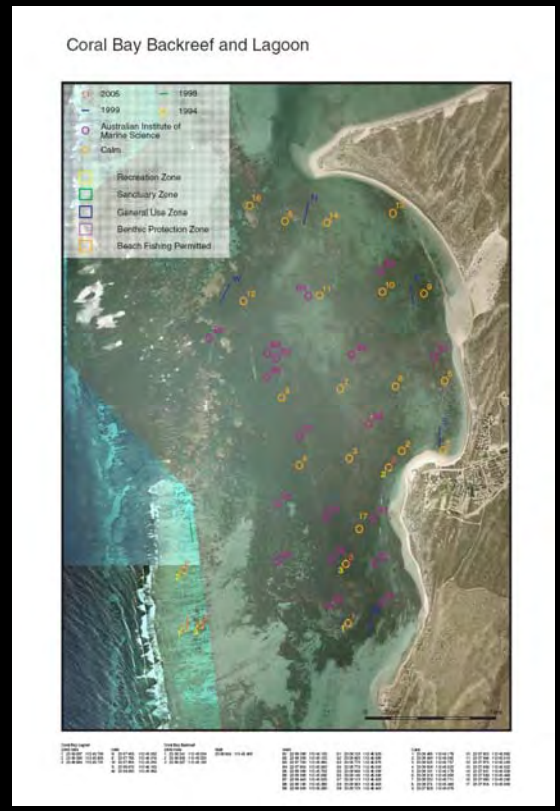
- Develop marine science plans for the proposed marine conservation reserves

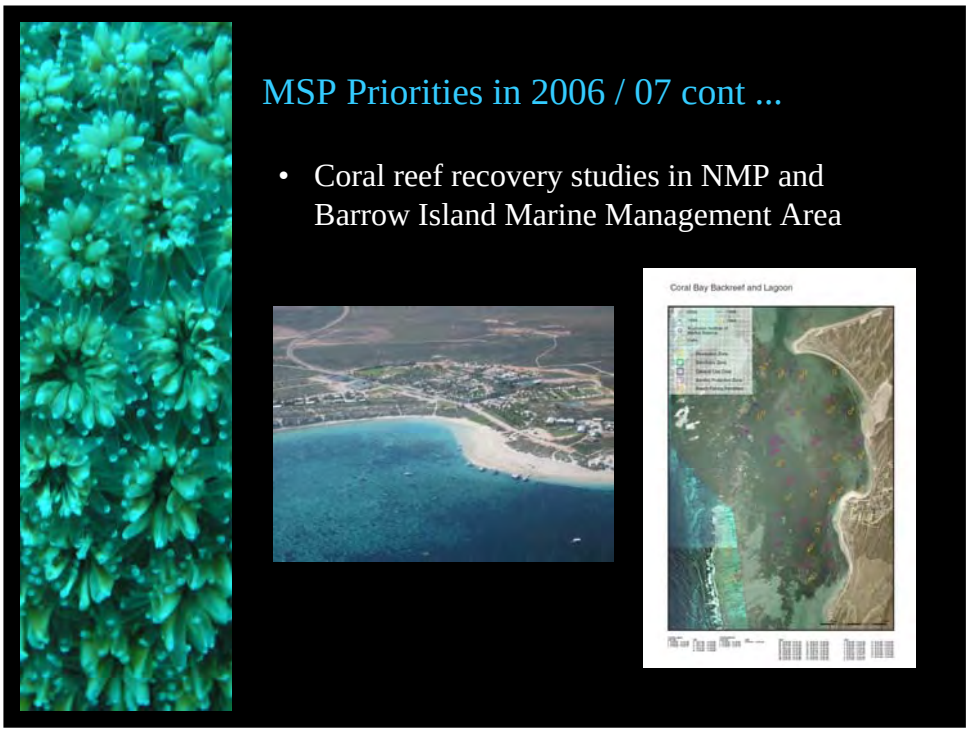
  Dampier Archipelago
  Cape Preston area
  South-West Capes region
  Walpole / Nornalup Inlet

We will also be developing marine science plans for proposed marine conservation reserves at the…

MSP Priorities in 2006 / 07 cont ...

- Coral reef recovery studies in NMP and Barrow Island Marine Management Area

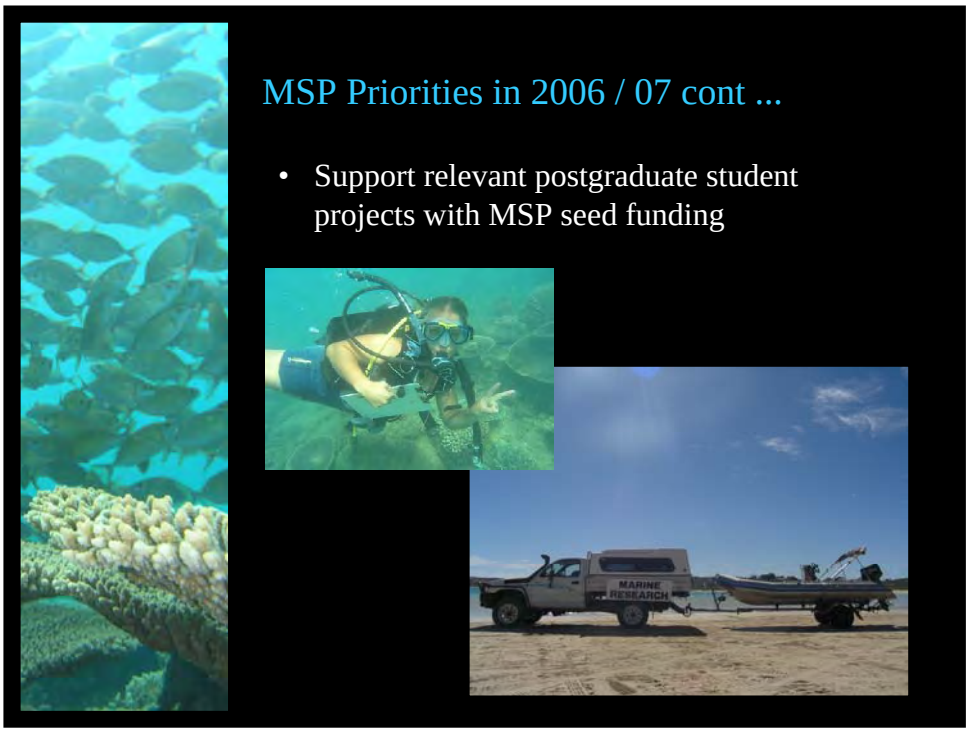




We will be researching the recovery of coral communities from the coral spawn anoxic bleaching events that occur periodically at Coral Bay and occurred in 1991 at Dugong Reef, Barrow Island. We will be looking for similarities in coral reef structure and community composition between Coral Bay and Dugong Reef to shed light on the impact of these important events that have the potential to control the community structure of shallow water coral reefs in Western Australia.

MSP Priorities in 2006 / 07 cont ...

- Support relevant postgraduate student projects with MSP seed funding

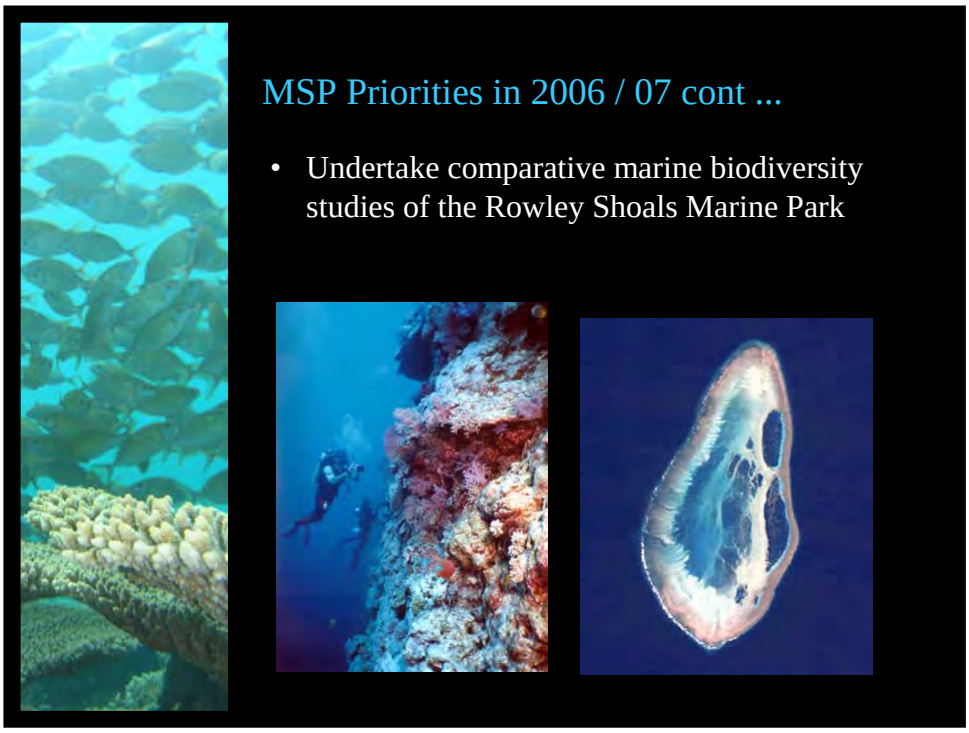


For example Fiona Webster's project on the effect of algae, herbivores and nutrients on the settlement and survival of coral.

And Mark Westera's project which will quantify the composition and size of fish populations in and outside management zones within the proposed Capes Marine Park. The study will continue once the management regime is put into place in order to identify changes to fish populations which will assist in gauging the success of management framework.

MSP Priorities in 2006 / 07 cont ...

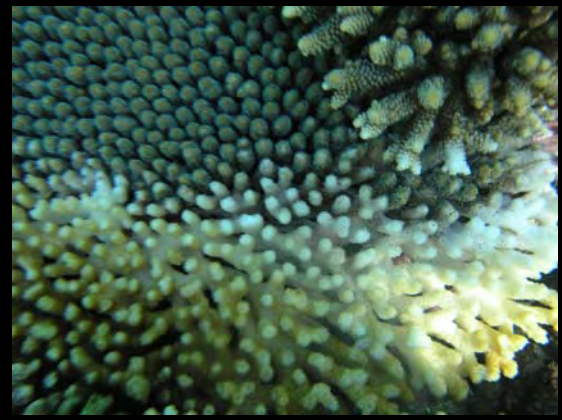
- Undertake comparative marine biodiversity studies of the Rowley Shoals Marine Park

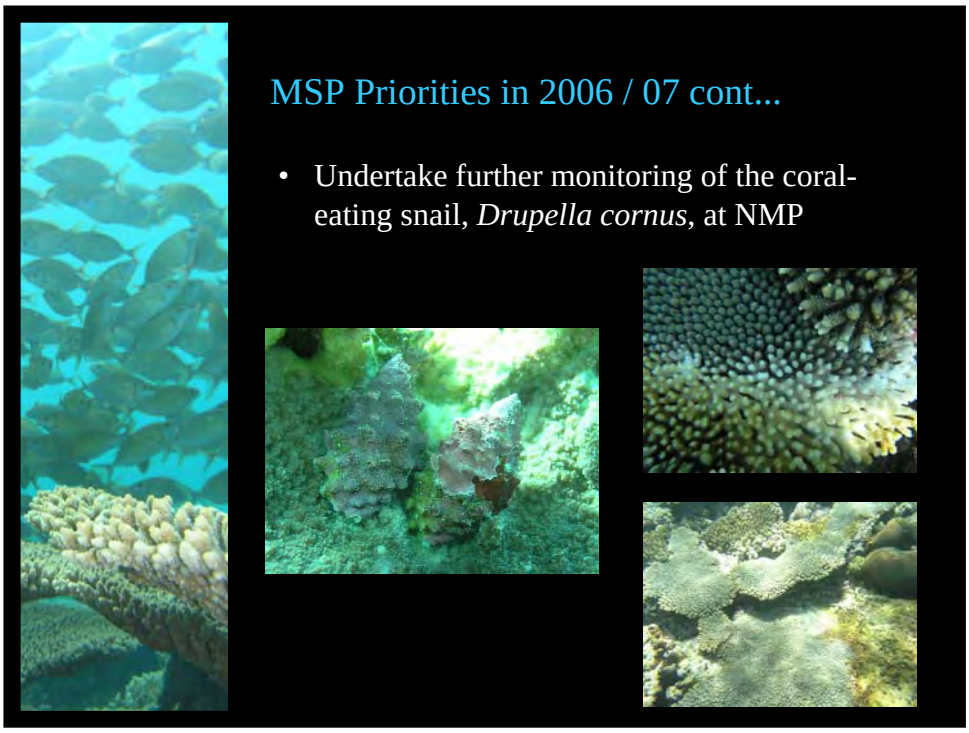


Mermaid Reef and the two atolls of the Rowley Shoals (Clerke and Imperiuse) are similar in biological and biogeographic terms, yet for the past five years they have experienced different management regimes and levels of protection from fishing. To determine if these different management regimes are apparent in the marine communities at each shoal we will be surveying the abundance of selected fish and invertebrate species that have been historically targeted by recreational, commercial and illegal fishing activities. Data collected will also act as a baseline for the long-term monitoring of lagoonal fish and invertebrate communities, in line with the data needs for marine park management outlined in DEC's Rowley Shoals Marine Park Draft Management Plan.

MSP Priorities in 2006 / 07 cont...

- Undertake further monitoring of the coral-eating snail, *Drupella cornus*, at NMP



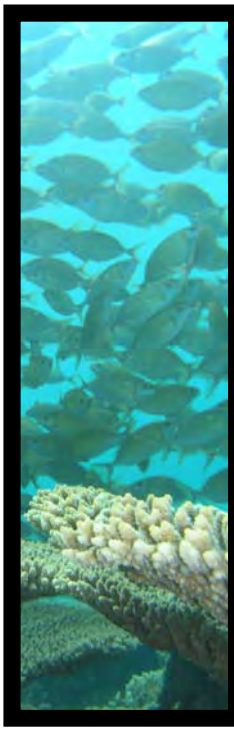


The first project to be tackled by the Marine Science Program will be further monitoring of the corallivorous gastropod '*Drupella cornus*' at Ningaloo Marine Park. I will be the leader of this project which brings me to a good opportunity to inform you of my background. In 2005 I completed my honours which focused on establishing a cost effective yet precise method for monitor *Drupella* populations at Ningaloo Reef. I then used this method to survey the abundance and distribution of *Drupella* at 13 study locations at Ningaloo. The project was supported and funded by CALM as it addressed high priority issues that are outlined in the Management Plan for the Ningaloo Marine Park and Muiron Islands Marine Conservation Area.

Drupella monitoring program

Background:

- *Drupella* are a corallivorous gastropod of the muricidae family
- caused significant devastation to Ningaloo Reef in late 80's early 90's
- found else where in the world such as Japan and Philippines
- reason for outbreaks at Ningaloo is not known



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corallivorous gastropod / Muricidae family.

feed on the living polyps highly modified radula.

similar scale Crown of Thorns Seastars on the GBR.

Drupella termed Western Australia's version of the Crown of Thorns.

late 1980's and early 1990's.

Reef surveys in 1989 revealed that coral cover in the back-reef zones of Ningaloo had been reduced by more than 75% in two thirds of the entire reef tract due to the feeding activities of *Drupella*.

Japan and the Philippines / extreme densities/ loss of coral smaller than a hectare / returned to normal densities / corals recolonize

Unlike the examples in Japan and the Philippines Drupella at Ningaloo did not return to normal densities and between 1982 and 1987 coral cover had been reduced to less than 10% along 100km of the reef.

elsewhere in the world / attributed to extensive reef siltation resulting from either coastal development activities followed by heavy rainfall or from abnormal storm events.

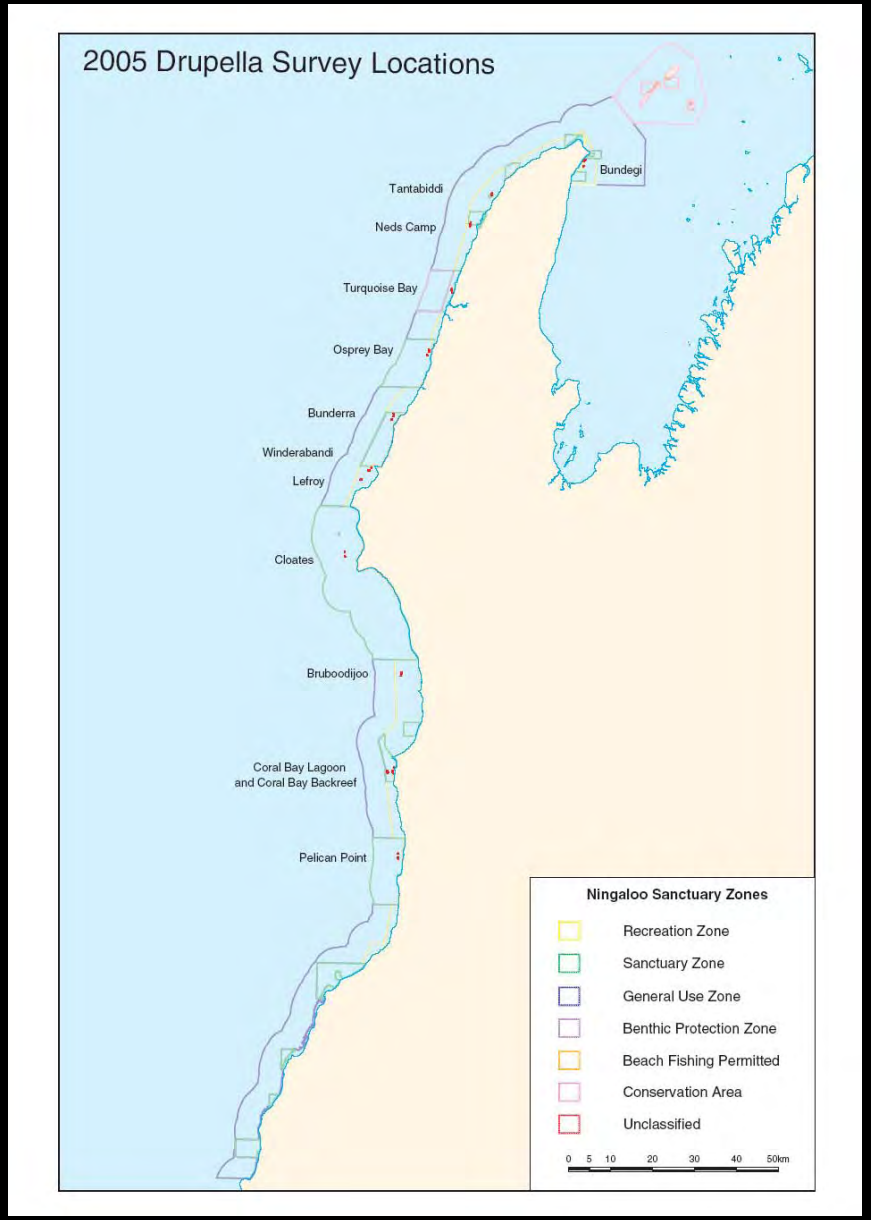
increased nutrients / stimulated phytoplankton growth / increased food 4 Drupella / enhanced survival and settlement.

Ningaloo less than 300mm rainfall / no major coastal development activities

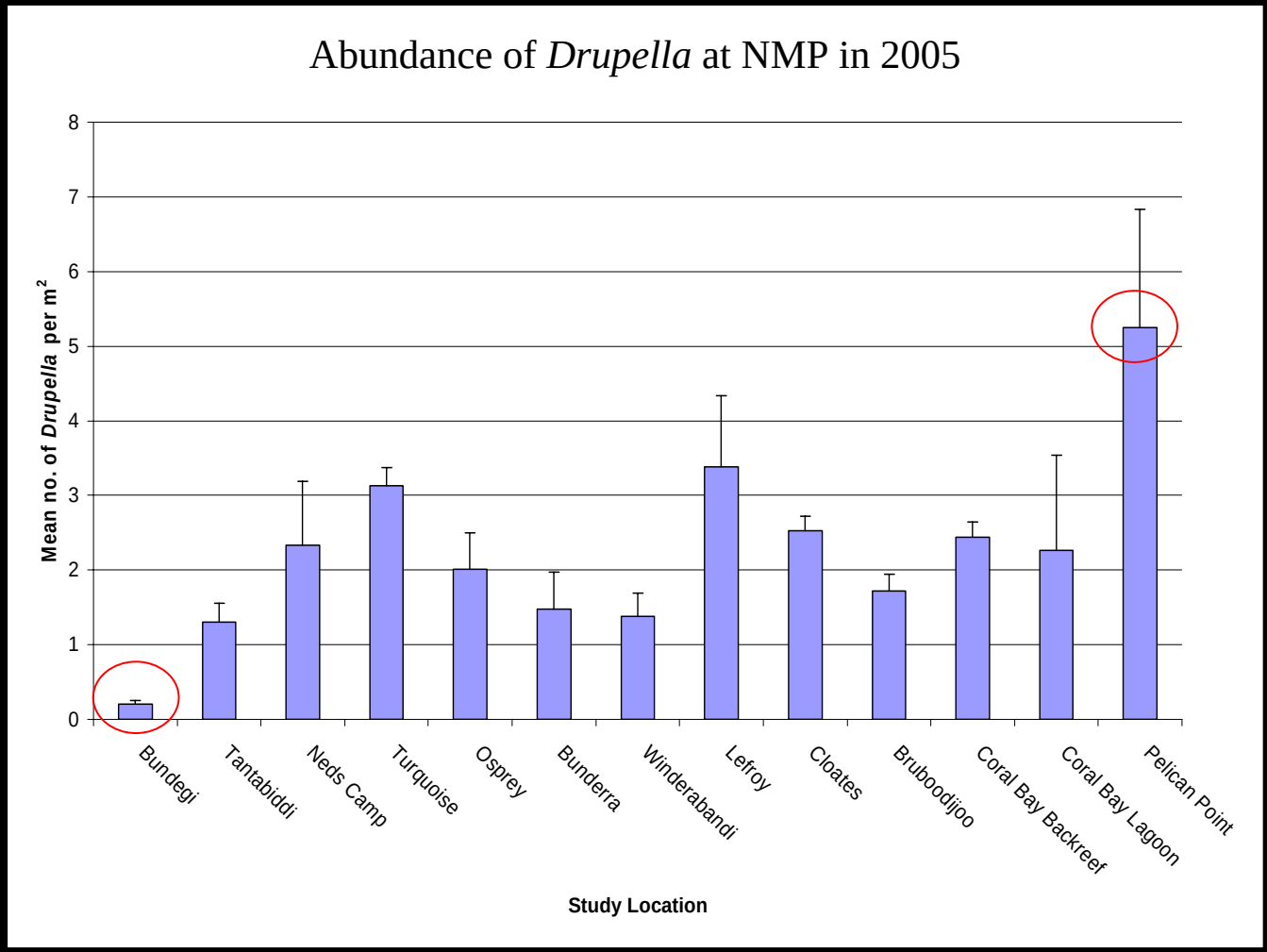
unlikely / outbreaks / result of heavy rainfall, increased siltation or pollution from agriculture or industry.

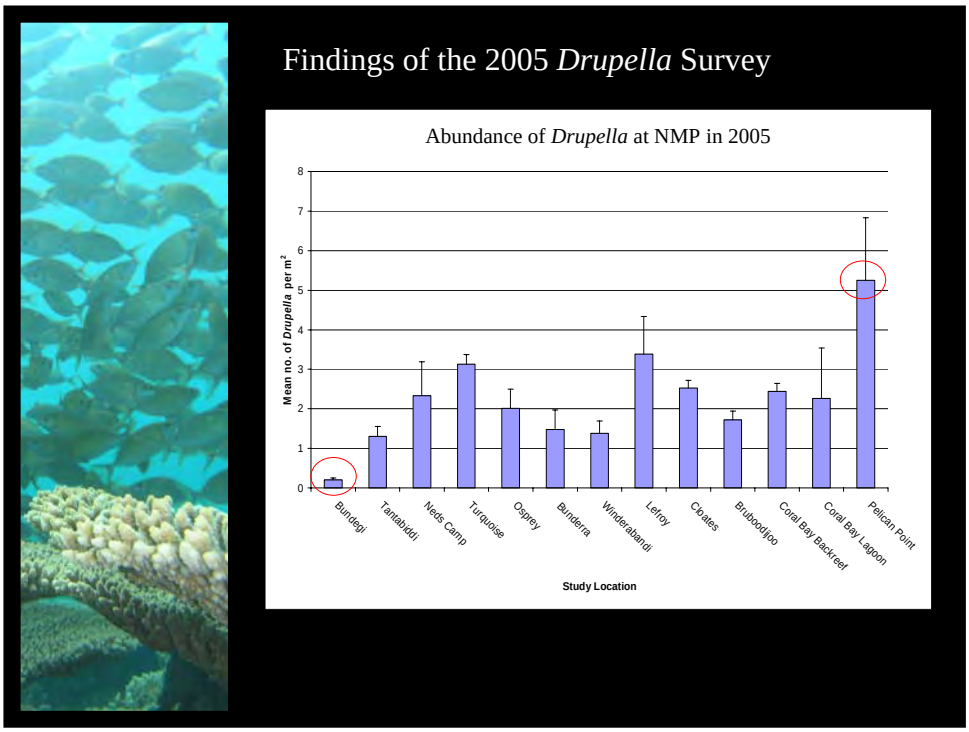
changes water quality / originate further north / southerly flowing Leeuwin

The 2005 *Drupella* survey locations



Findings of the 2005 *Drupella* Survey

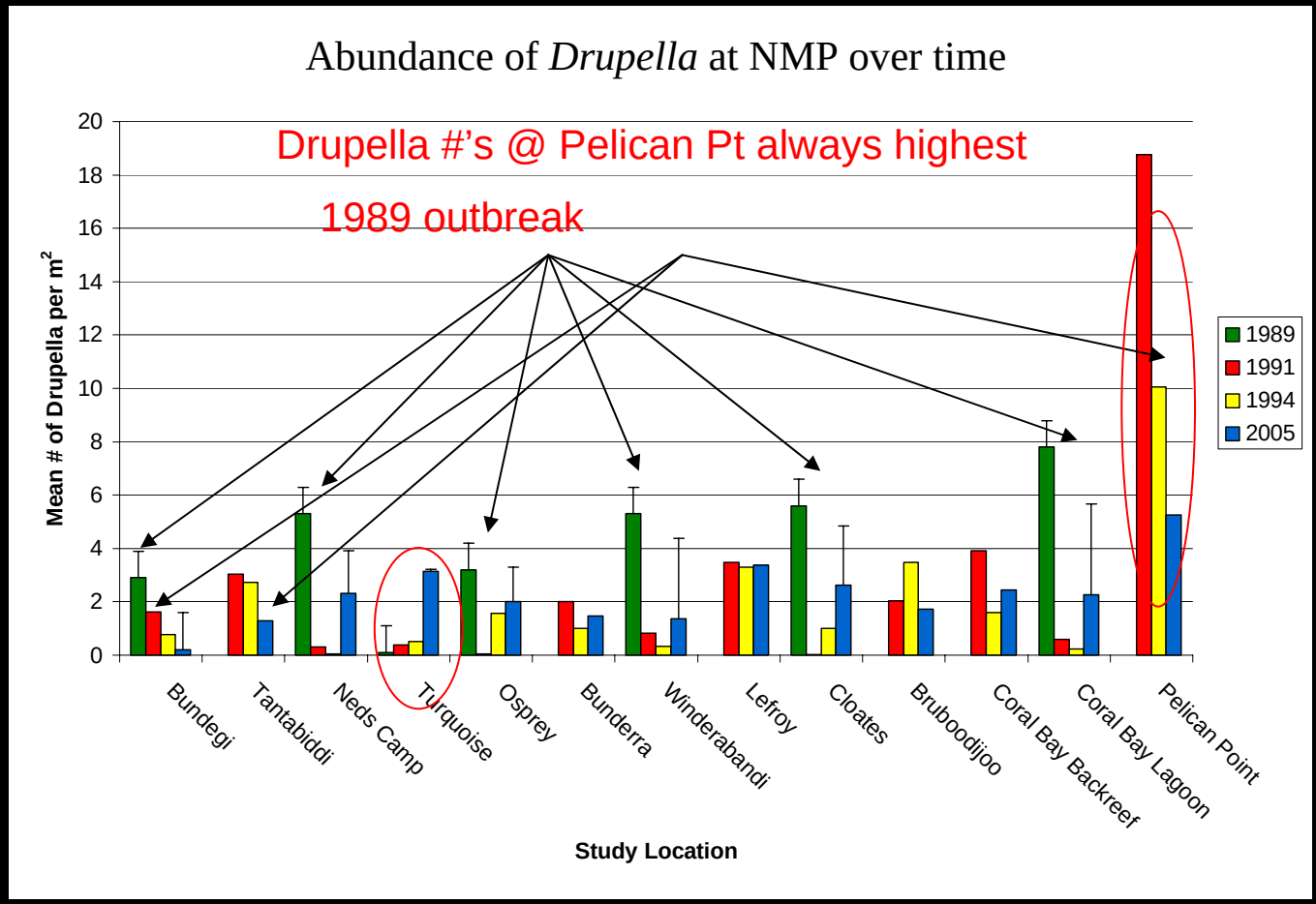


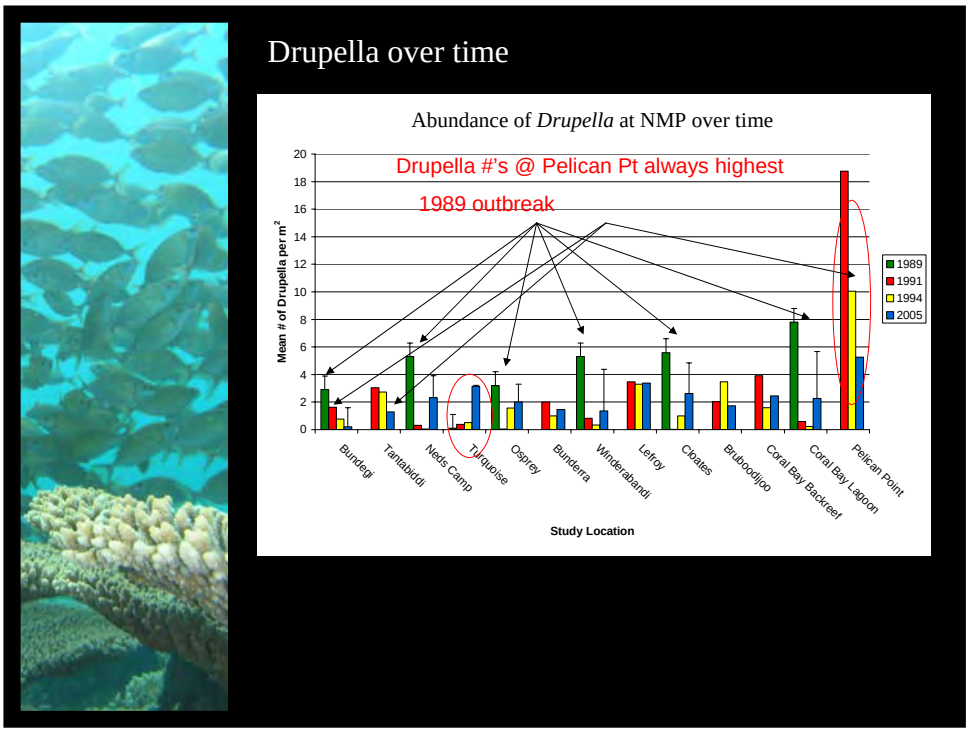


Highest Abundance / Pelican Point / 5 *Drupella* msq
The highest % cover of live hard coral / Pelican Point / 53%
Drupella + live hard coral % cover / consistently high at Pelican Point
Acropora plate coral / Drupella's most preferred prey/ highest at PPT / 39%

Lowest abundance / Bundegi / 0.2 *Drupella* msq
Low LHC 27%
prefered prey / Acropora plate coral / low at 8% cover
Cyclone Vance

Drupella over time





1989 outbreak

since then lower numbers of *Drupella* have been recorded.

Pelican Point always highest

•18 snails per msq recorded in 1991

•LHC also consistently high / 80% cover recorded in 1991

Patterns

• Abundances of Drupella have decreased consistently over survey years at Bundegi, Tantabiddi and Pelican Point.

• In contrast to this Drupella numbers at Turquoise Bay have increased consistently over survey years

• Overall, It appears that Drupella numbers have decreased since 1989

• Presently, Drupella numbers are not in outbreak proportions

The 2006 *Drupella* survey locations

Pelican Point

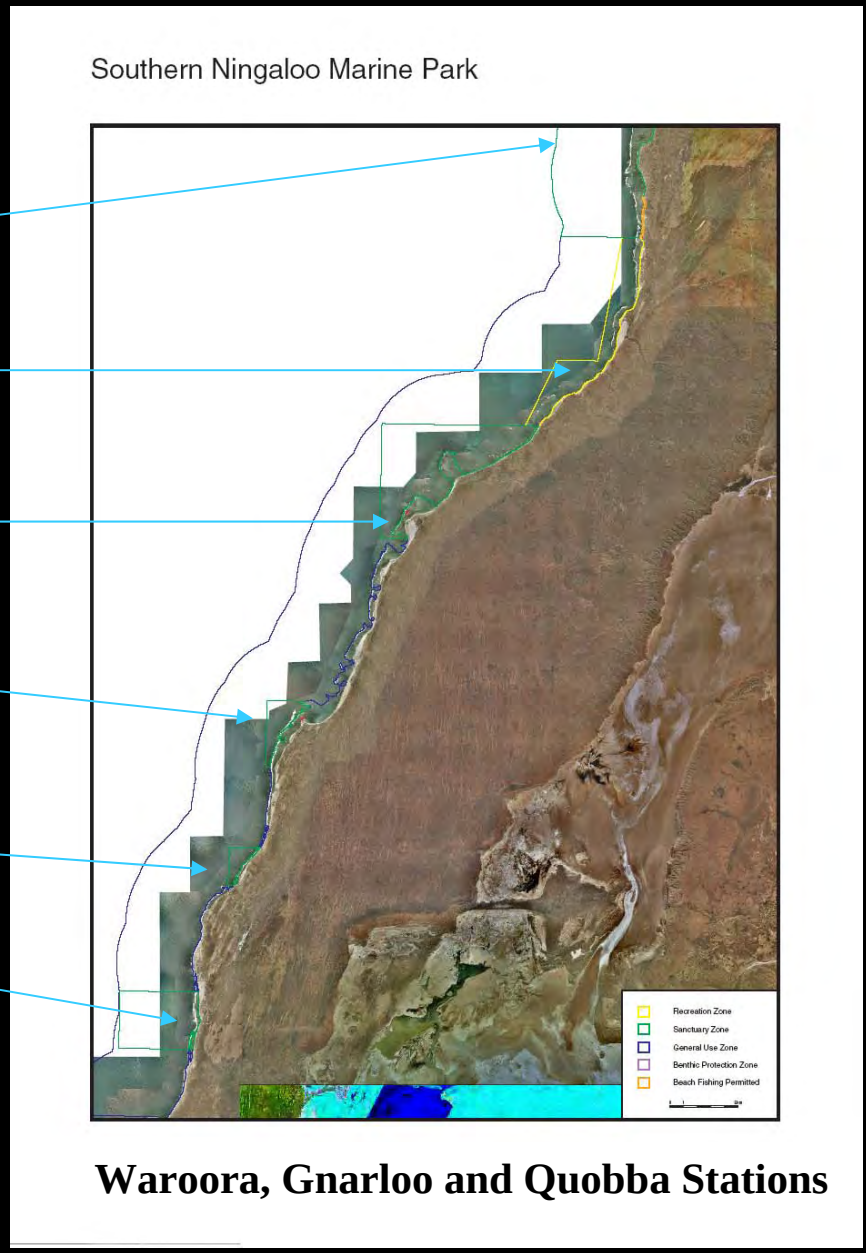
Amherst Point

Cape Farquarh

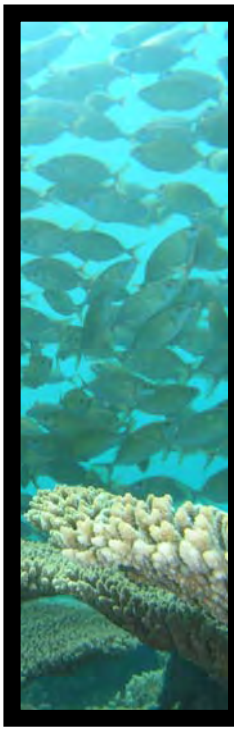
Gnarloo

3 Mile

Turtles



Waroora, Gnarloo and Quobba Stations



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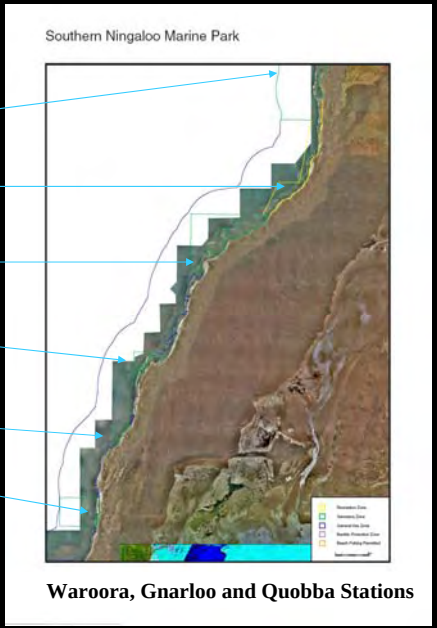
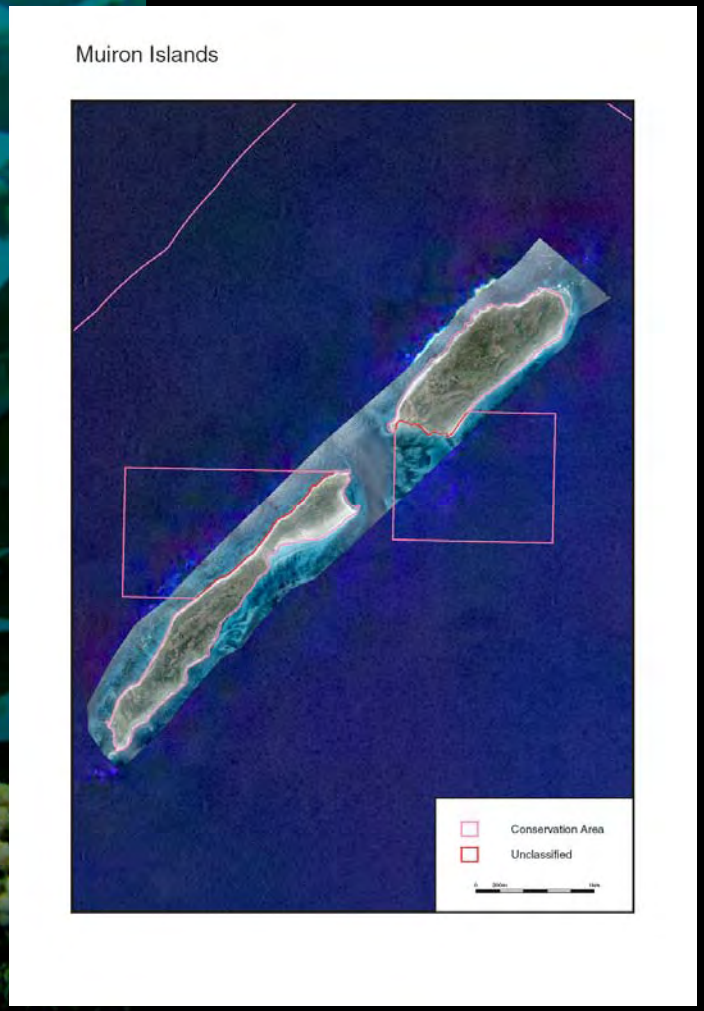


Waroora, Gnarloo and Quobba Stations

The 2006 *Drupella* survey locations, cont …



Muiron and Sunday Islands marine conservation areas

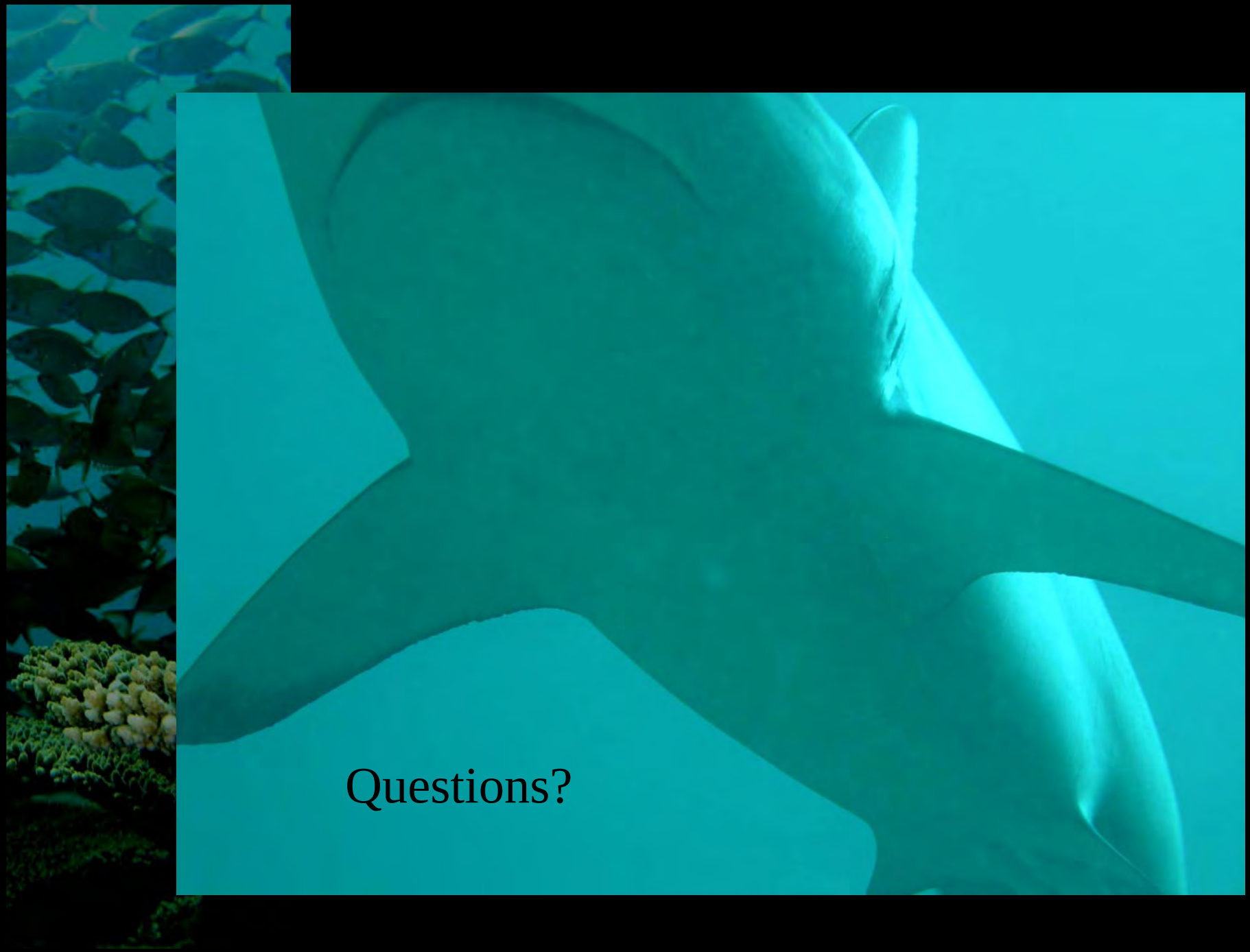
Opportunities….

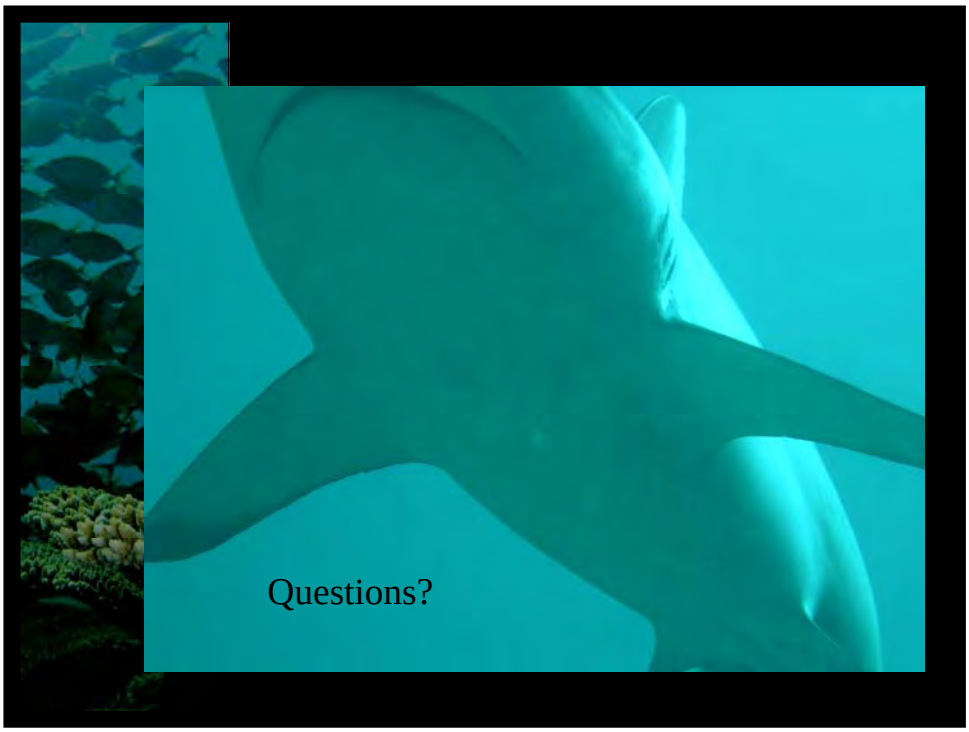
The MSP will be expanding to accommodate 20 to 30 FTE's within the next few years

Young Marine Scientists Program will provide pathways for rewarding careers within DEC

As a new emerging branch of DEC we currently have only four employees so over the next few years we hope to expand to accommodate around 20 to 30 full time employees.

Several young marine scientists will be employed by the Marine Science Program over the next couple of years, with rewarding careers likely to be available.


Questions?



If any of you are interested in volunteering for any of the projects I have mentioned or can see yourself working with the Marine Science Program in the future please come and see me after.

Any questions?