


MARINE BIODIVERSITY hub
National Environmental Research Program

27.08.13
CMST Seminar Series

Peering into the deep blue


Development and application of a midwater video system to monitor pelagic wildlife


 **THE UNIVERSITY OF WESTERN AUSTRALIA**
Achieve International Excellence


Phil Bouchet - PhD candidate
Centre for Marine Futures
UWA Oceans Institute & School of Animal Biology
20878483@student.uwa.edu.au


Roadmap


- 1 Setting the scene
- 2 Modelling predator hotspots
- 3 Adapting demersal techniques ...
- 4 ... to the pelagic environment
- 5 5 recent expeditions
- 6 What next?


 **National Environmental Research Program**
MARINE BIODIVERSITY hub


 **THE UNIVERSITY OF WESTERN AUSTRALIA**


 **AUSTRALIAN INSTITUTE OF MARINE SCIENCE**


 **CSIRO**


 **Australian Government**
Geoscience Australia


 **CHARLES DARWIN UNIVERSITY**


 **UTAS**

 **MUSEUM VICTORIA**

 **ZSL**
LIVING CONSERVATION

 **FONDATION TOTAL**

 **BLUE MARINE FOUNDATION**

 **Australian Government**
Department of Sustainability, Environment, Water, Population and Communities

①

O' wildlife, where art thou?!



①

Ocean co-use conflicts

MailOnline

News

[Home](#) | [News](#) | [U.S.](#) | [Sport](#) | [TV&Showbiz](#) | [Female](#) | [Health](#) | [Science](#) | [Money](#) | [RightMinds](#) | [Coffee Break](#) | [Travel](#) | [Columnsists](#)
[Home](#) | [A-Z](#) | [Headlines](#) | [Pictures](#) | [Most read](#) | [More from](#) | [Login](#)

Heartbreaking images of Blue Whale struck dead by ship as it slept

- Body of majestic blue whale found floating on surface of Indian Ocean off southern tip of Sri Lanka
- Gaping wound shows the horrific point of impact with the bow of the ship - leaving the gentle giant's tail fin in tatters
- Experts want to highlight blue whales' plight in a bid to reduce ship strikes

By DAILY MAIL REPORTER

PUBLISHED: 21:28 GMT, 10 May 2012 | UPDATED: 11:24 GMT, 11 May 2012

[Facebook](#) | [Twitter](#) | [Google+](#) | [LinkedIn](#)

344 130 views

These heartbreaking images show the body of a majestic blue whale fatally injured as it slept in a busy shipping lane. It was spotted floating near the surface of the Indian Ocean off the southern tip of Sri Lanka.

A gaping wound shows the horrific point of impact with the bow of the ship - leaving the gentle giant's tail fin in tatters.



© Tony the Narwhal Media

Disturbing sight: The body of this blue whale was found floating in the Indian Ocean near Sri Lanka after being struck by a ship as it slept

Tangled whale off Rottnest tagged ahead o

PerthNow May 17, 2011 2:50PM 19 comments



RESCUE: A whale tangled in net lines. (Picture: Supplied Source: f

A SATELLITE tag has been successfully attached to i

Rottnest Island, enabling authorities to plan its rescu

The Department of Environment and Conservation plans t

humpback, overnight.

If weather conditions have improved tomorrow, the DEC is

was spotted by a recreational boater north of Bathurst Lig

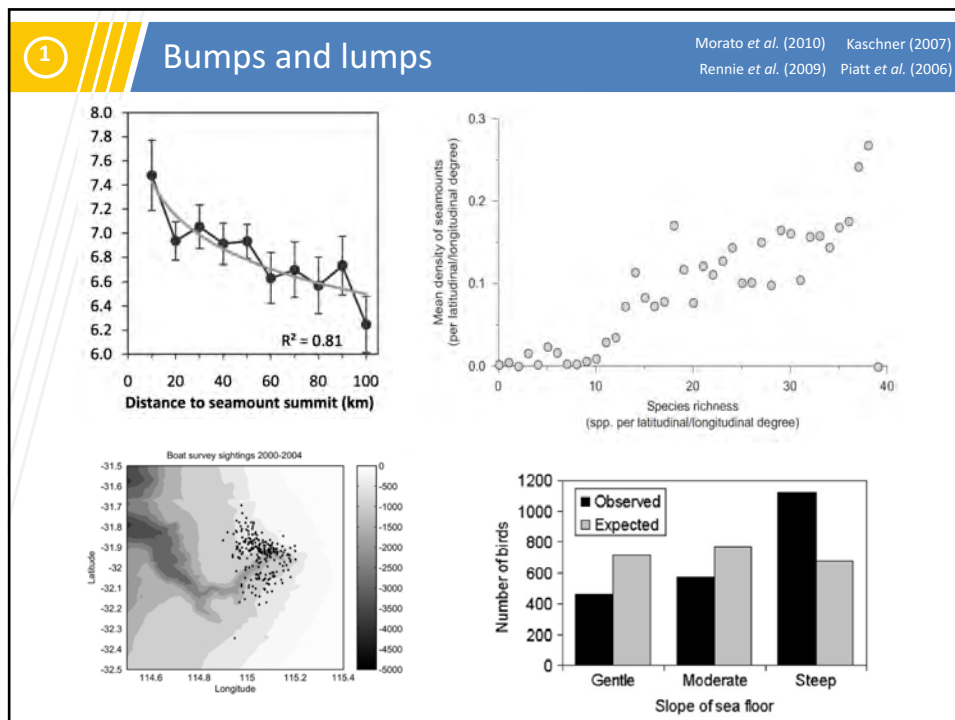
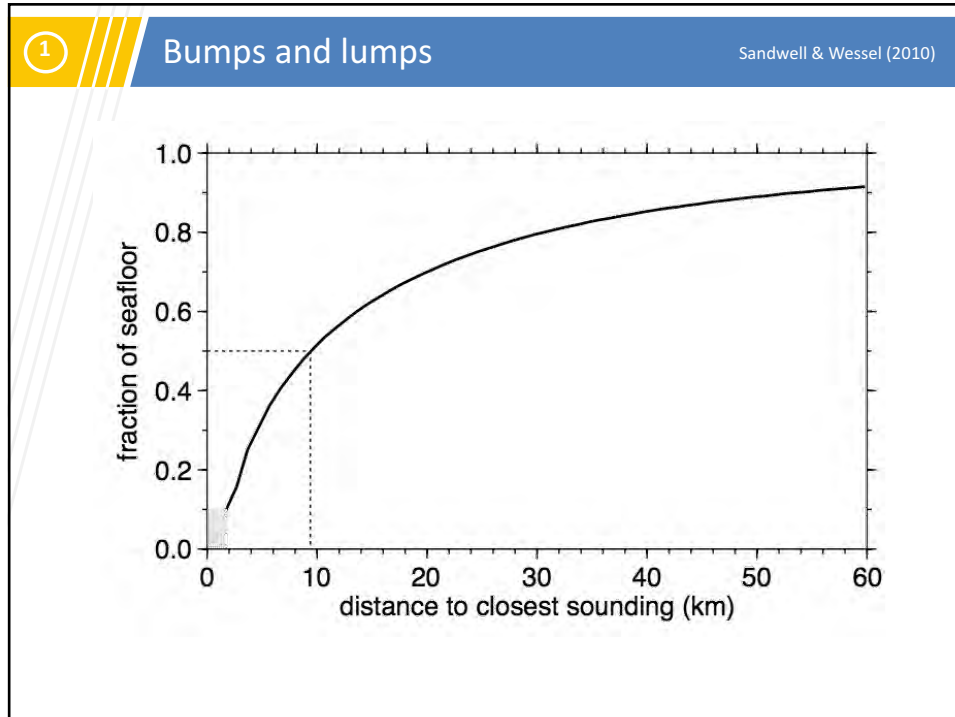
A DEC rescue team had planned to cut the whale free this

rethink on how to save the stricken animal.

Whales - predominately humpbacks - began their norther

this year with confirmed sightings off Rottnest in March, w





2

Modelling predator hotspots



■ Hotspot: **Biodiversity**

Methods: Baited camera surveys + fisheries modelling

Model species: Pelagics



■ Hotspot: **Abundance & distribution**

Methods: Visual boat-based surveys

Model species: Pelagics



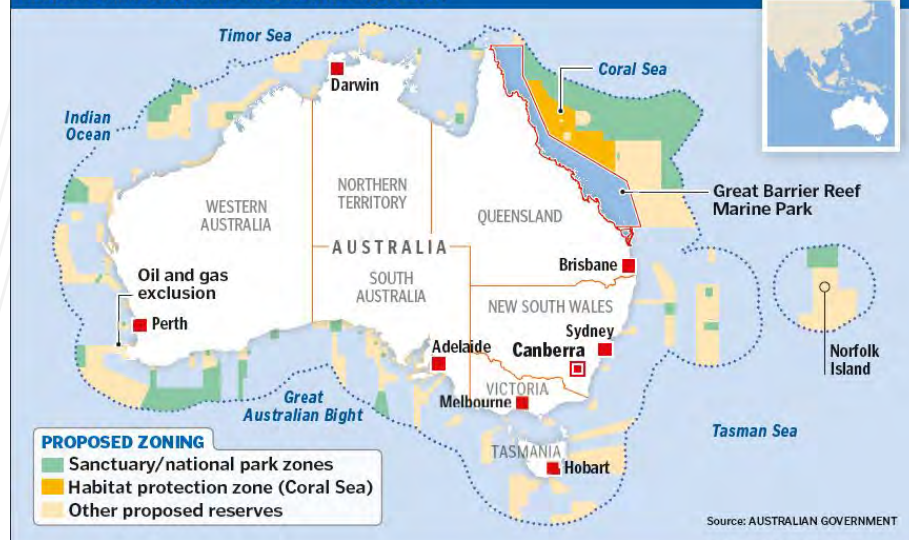
■ Hotspot: **Movement & activity**

Methods: Satellite telemetry

Model species: Pygmy blue whales + SES

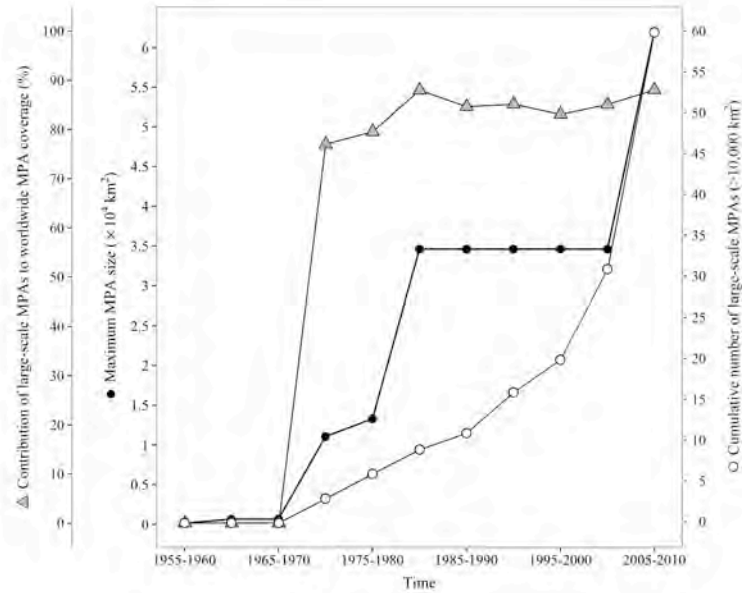
Marine spatial planning

■ AUSTRALIA'S MARINE NETWORK PROPOSAL



Large-scale protected areas

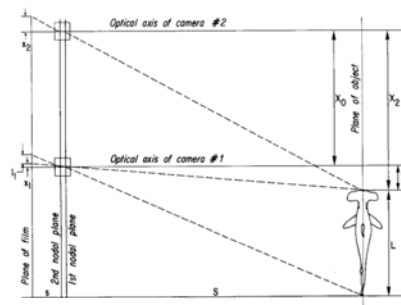
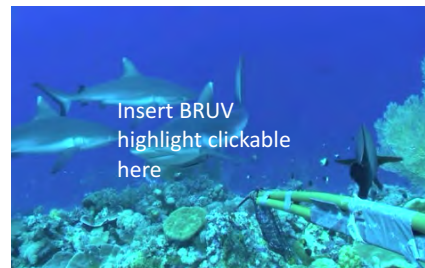
Letessier, Bouchet & Meeuwig (in review).



3

From demersal ...

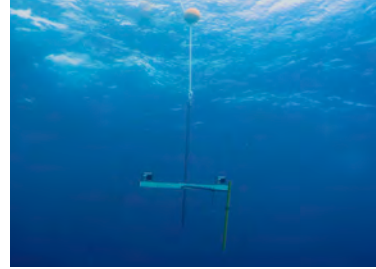
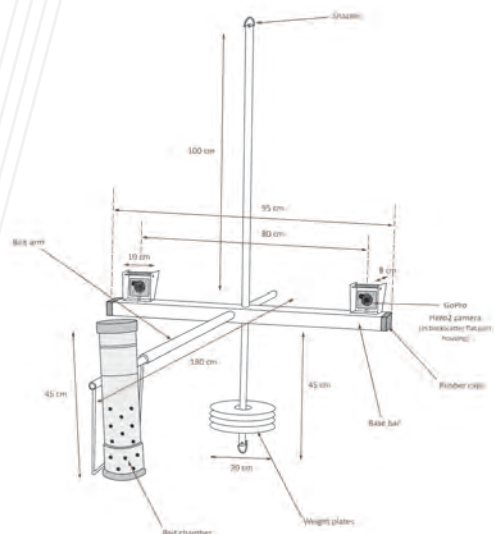
- Non-extractive
- Cost-effective
- More efficient than diver surveys
- Accurate data on community composition & structure, sp. richness, biomass, stock health & recruitment, MaxN
- Free-standing (no operator)
- Wide range of sampling depths (up to 1000 m) and habitats
- High quality footage
- Accurate length measurements regardless of user experience



Klimley et al. (1983)

4

... to pelagic baited camera systems



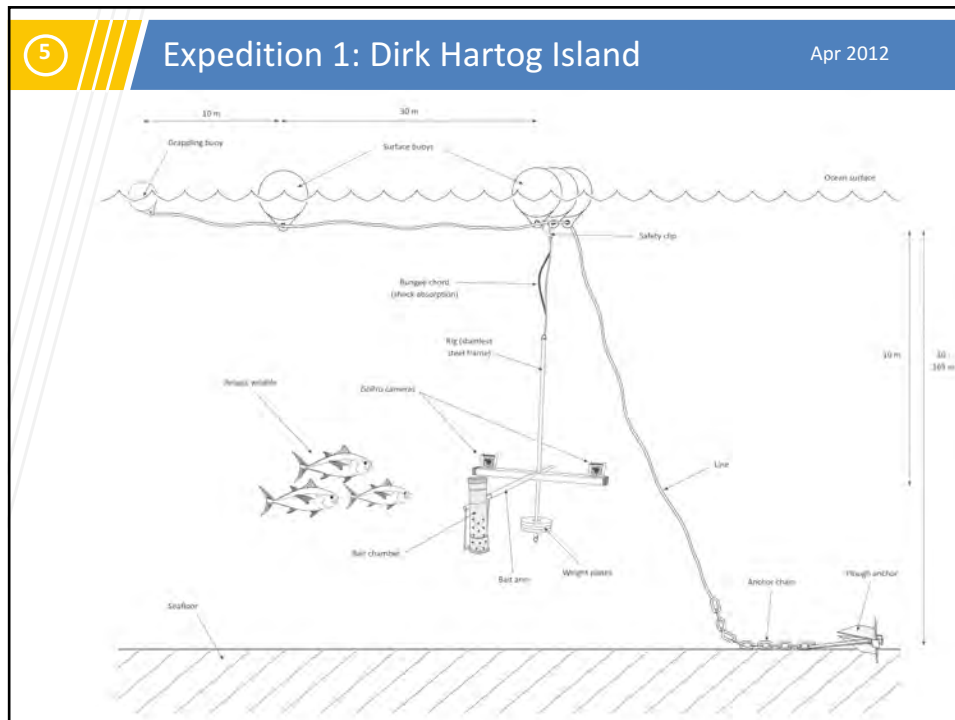
- Stackable
- Portable
- Lightweight ($\approx 12\text{kg}$)
- Quick to (dis)assemble
- Off-the-shelf materials
- Various design configurations (drifting, anchored etc.)
- Low-cost (\$ XXXX)

5

Expedition 1: Dirk Hartog Island

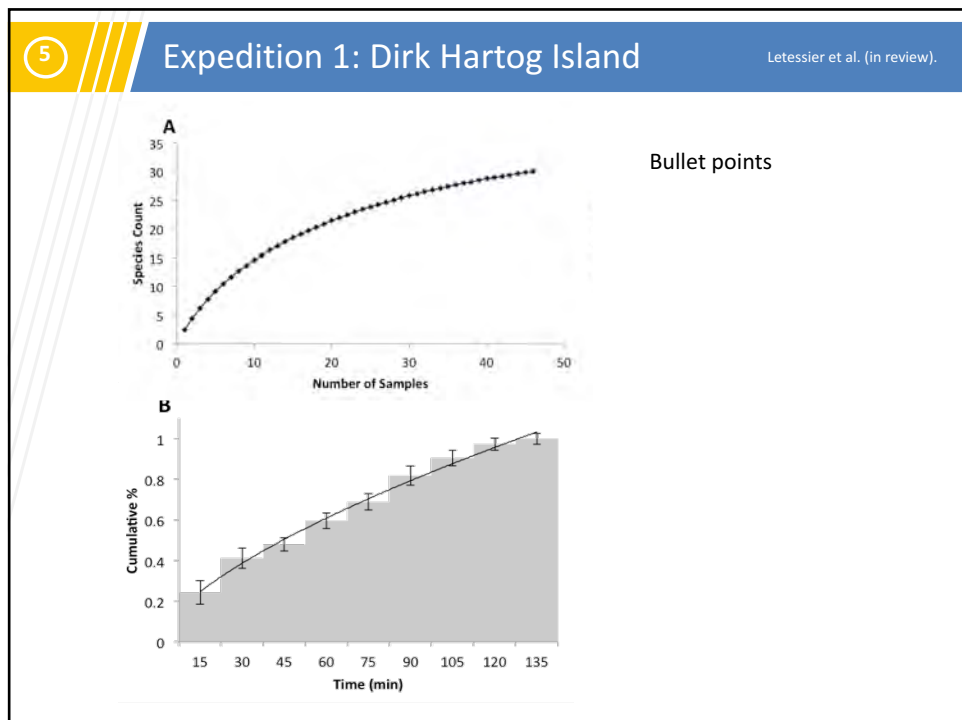
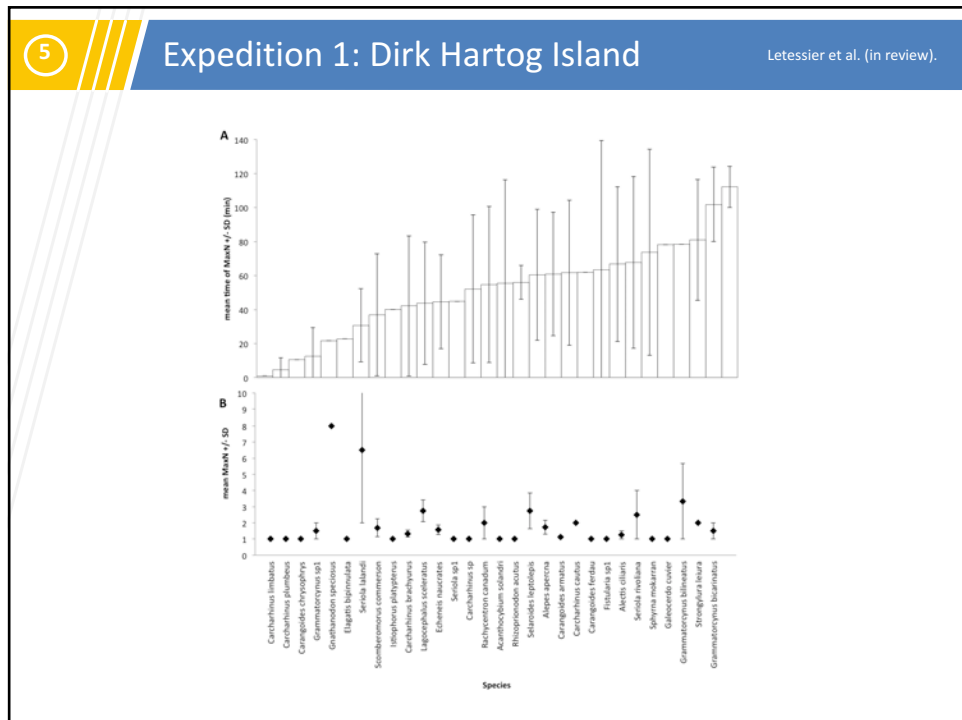
Apr 2012

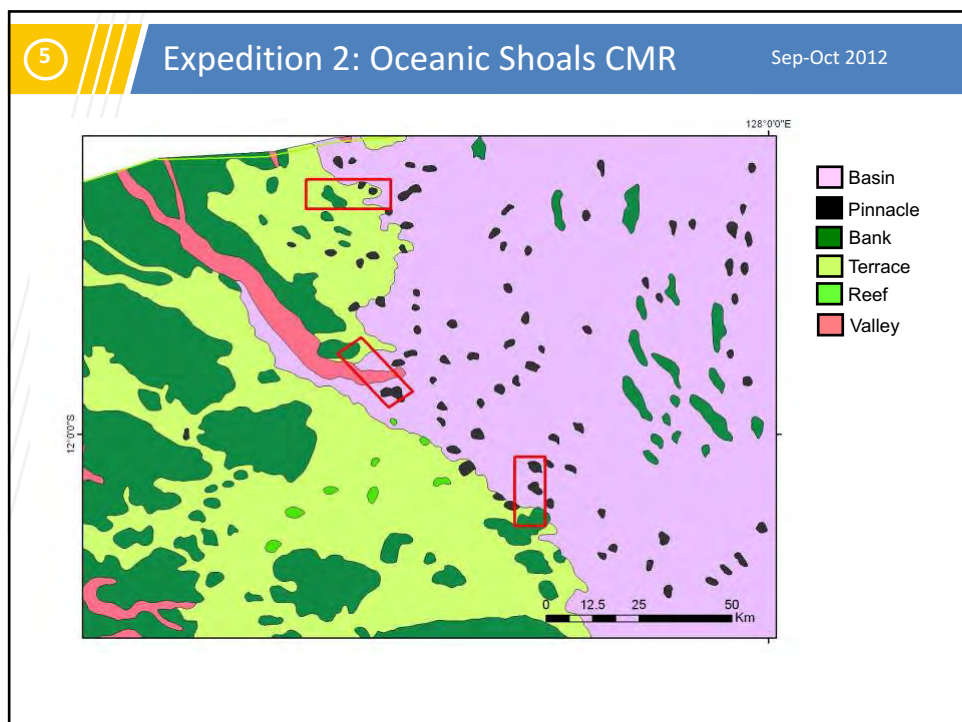
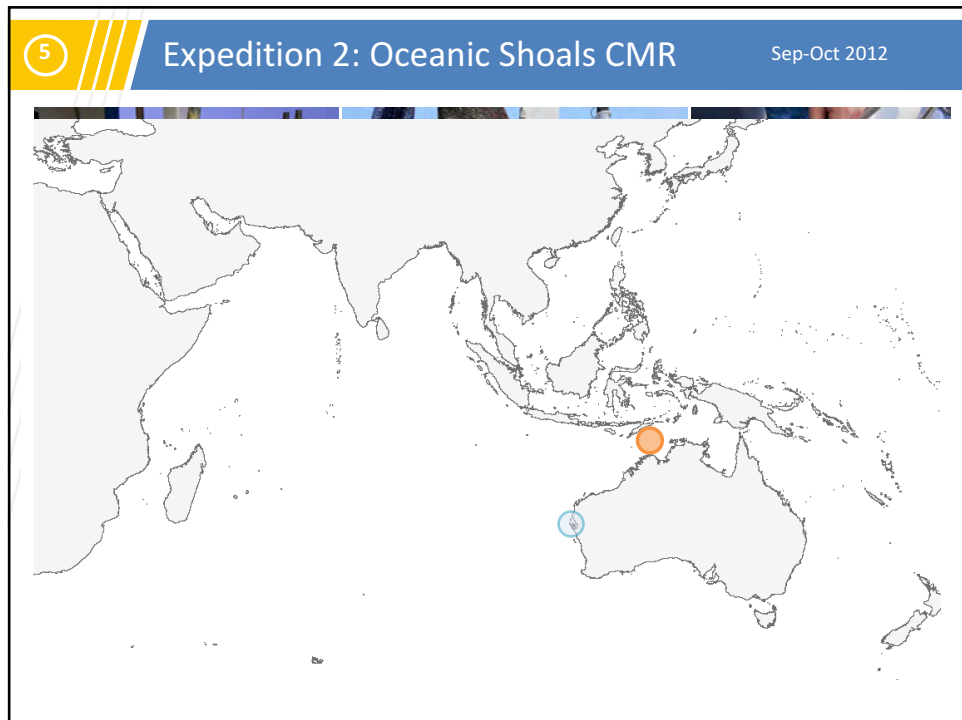




5 Expedition 1: Dirk Hartog Island Apr 2012

FOOTAGE +
deployment
timelapse?





Expedition 2: Oceanic Shoals CMR Sep-Oct 2012

Grid 1 - 38 stations


Grid 3 - 40 stations

- 117 stations
- 760 hours of footage
- SPECIES COUNTS

5

Expedition 2: Oceanic Shoals CMR

Sep-Oct 2012



5

Expedition 2: Oceanic Shoals CMR

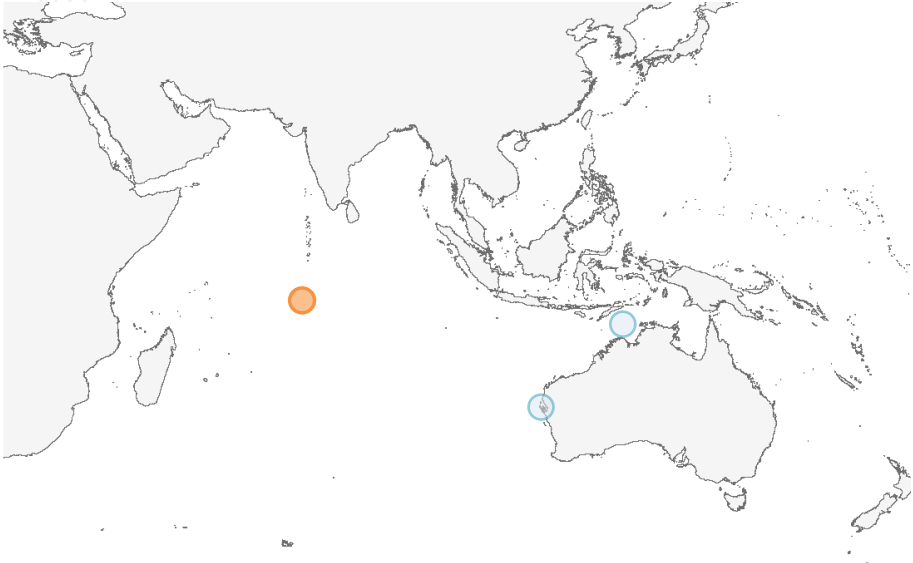
Sep-Oct 2012

FOOTAGE

5

Expedition 3: Chagos (BIOT)

Feb & Dec 2012



5

Expedition 3: Chagos (BIOT)

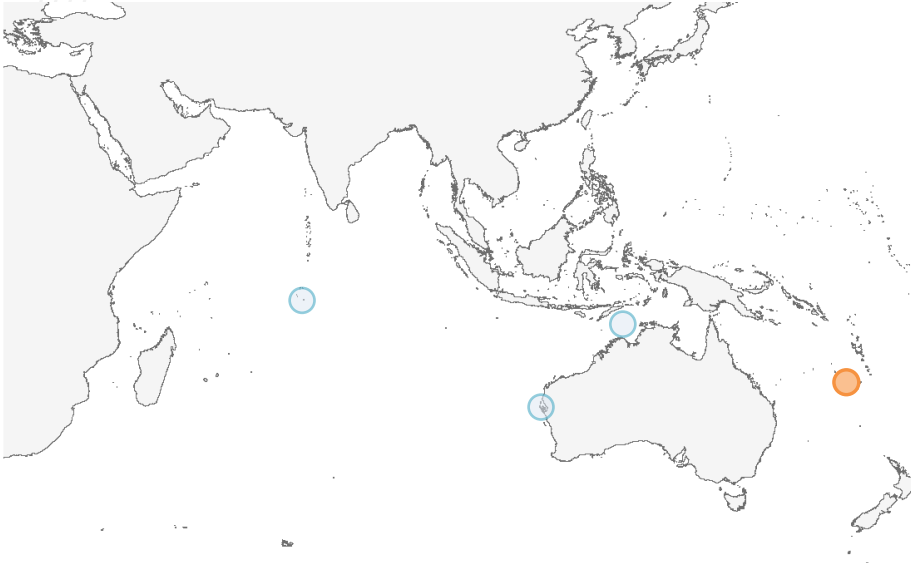
Feb & Dec
2012

FOOTAGE
CHAGOS

5

Expedition 4: New Caledonia

Oct 2012



A map of the Indian Ocean region, including the eastern coast of Africa, the Middle East, Southeast Asia, and Australia. Four locations are marked with circles: three light blue circles and one orange circle. The light blue circles are located in the Indian Ocean near the east coast of Africa, in the Andaman Sea near Sumatra, and in the Timor Sea near Australia. The orange circle is located in the Pacific Ocean near the Philippines.

5

Expedition 4: New Caledonia

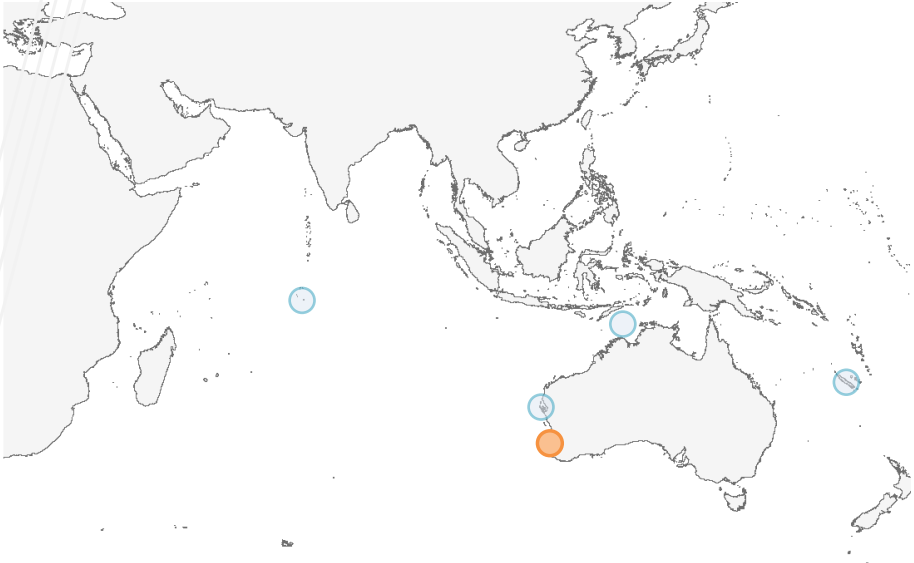
Oct 2012

FOOTAGE
CHAGOS

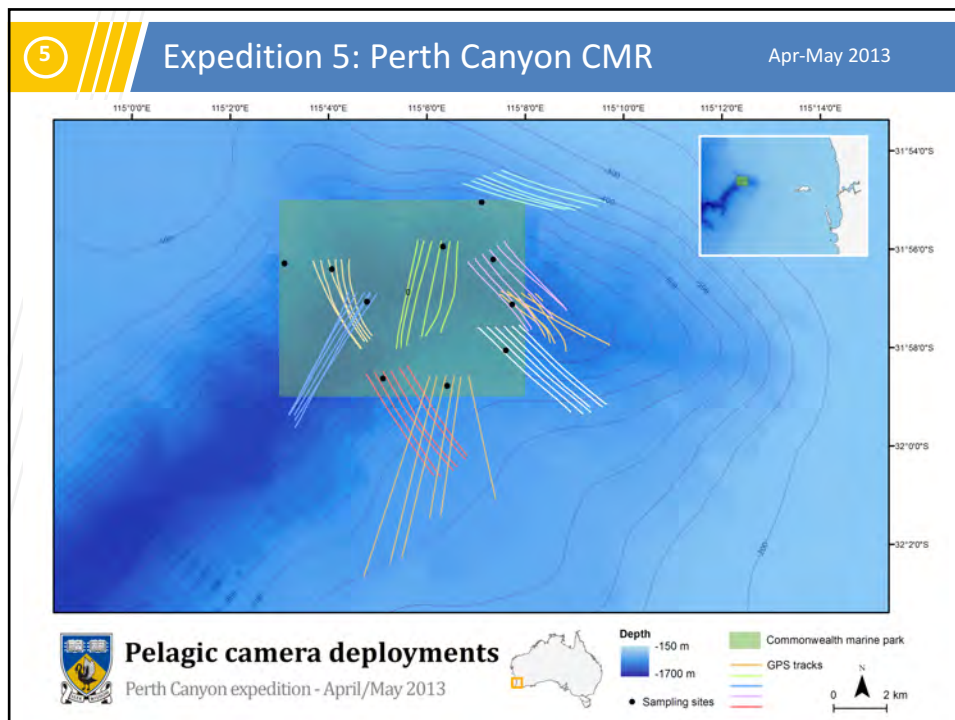
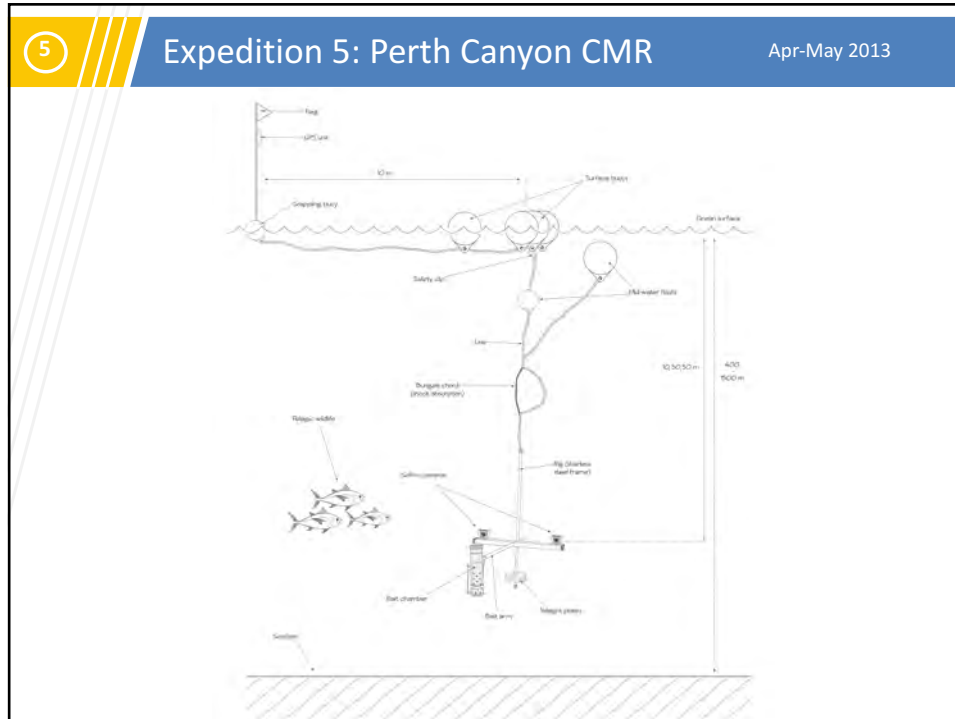
5

Expedition 5: Perth Canyon CMR

Apr-May 2013



A map of the Indian Ocean region, including the eastern coast of Africa, the Middle East, Southeast Asia, and Australia. Four locations are marked with circles: three light blue circles and one orange circle. The orange circle is located off the southwestern coast of Australia, near Perth. The other three light blue circles are located further east in the Indian Ocean, near the Indonesian archipelago and the East African coast.



5

Expedition 5: Perth Canyon CMR

Apr-May 2013

FOOTAGE PERTH CANYON

6

Future directions

Acknowledgements

Supervisors

Prof. Jessica Meeuwig
Centre for Marine Future
Oceans Institute
University of Western Australia



Dr Chandra Salgado Kent
Centre for Marine
Science & Technology
Curtin University of Technology



**Mr Curt and
Mrs Micheline Jenner**
Centre for Whale Research



Prof. Anya Waite
School of Environmental
Systems Engineering
University of Western Australia



Scholarships

Scholarship for International Research Fees (SIRF)

UWA Postgraduate Award (UPAIS)

UWA Top-up scholarship

Acknowledgments

UWA: Tom Letessier, Lloyd Groves, Robert Sanzogni, Gabrielle Cummins, David Tickler, Gabriel Vianna, Luciana Ferreira, Fernando Garcia-Solis Marchant, Suzanne Hodge

Shark Bay: Prue and Anthony Vaughn, Lewis Fasolo, Kirsty Kemp, Matthew Gollock, Lucille Chapuis.

Oceanic Shoals: All NERP partners

Chagos & NC: Heather Koldewey, Rudy Pothin, Laurent Vigliola, Jean-Baptiste Jubel, Martin Cox, Philip Boersch-Supan, Andrew Brierley.

Perth Canyon: John Horwood, Sébastien Agulhon

The Master and Crew of the RV Solander, The Pacific Marlin, L'Amborela, L'Alis

Questions?

ADD PICTURE

DIGI – Automated processing in Matlab

