



National Environmental
Research Program

TROPICAL ECOSYSTEMS *hub*

History and status of crown-of-thorns starfish on the GBR

Hugh Sweatman

Australian Institute of Marine Science



Australian Government



AUSTRALIAN INSTITUTE
OF MARINE SCIENCE

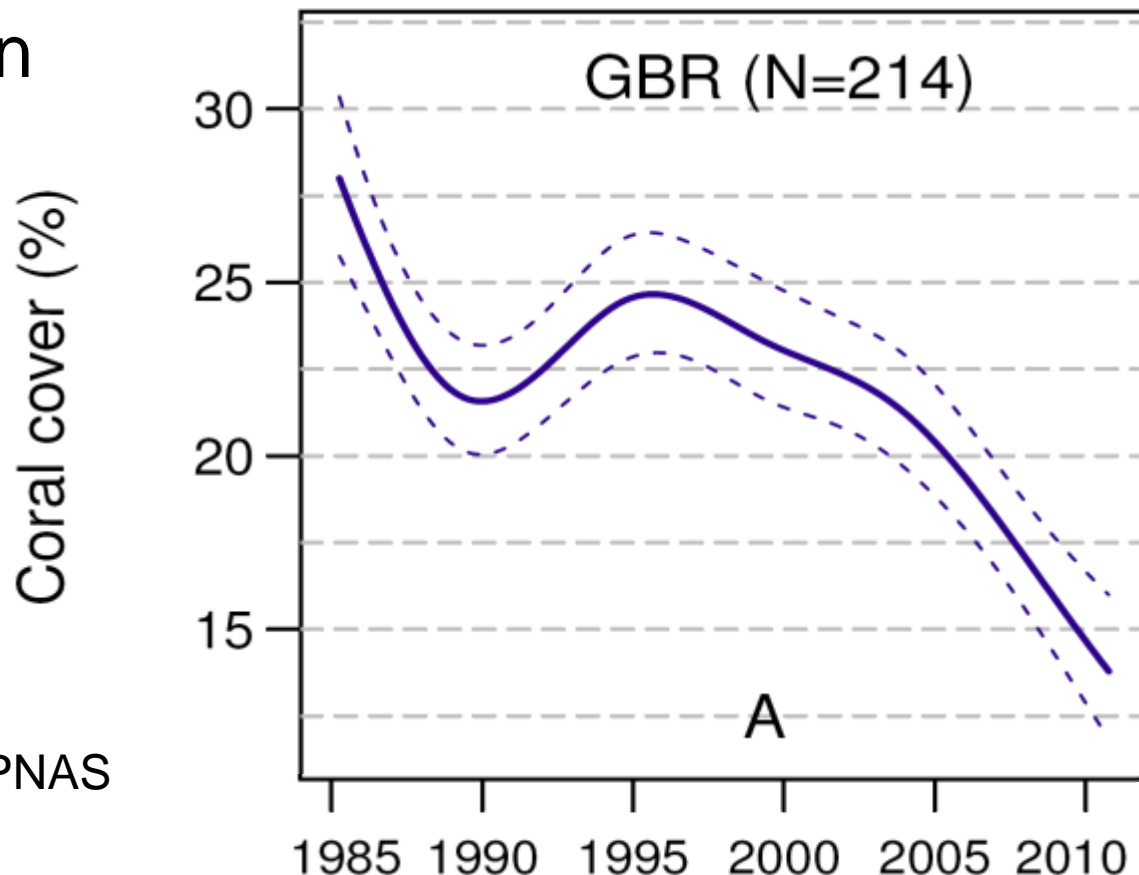
Forum Title:

Drivers of Biodiversity on the GBR, COTS Outbreak Dynamics and Population Control



WHY ARE CROWN-OF-THORNS STARFISH IMPORTANT?

- Live coral cover on reefs of the GBR estimated from manta tows, 1985 - 2012



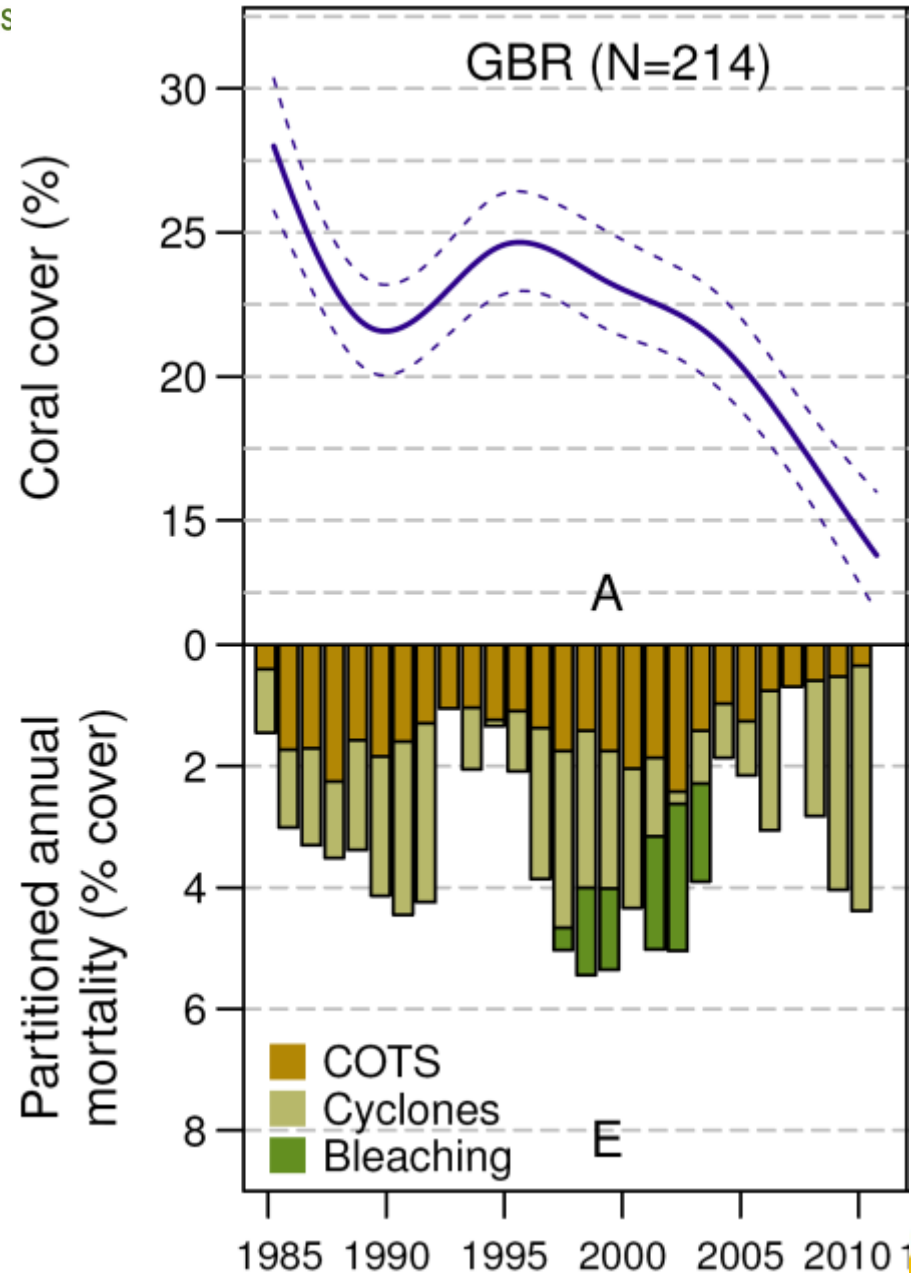
From De'ath et al 2012, PNAS



WHY ARE CROWN-OF-THORNS STARFISH IMPORTANT?

- 42% of overall mortality was due to crown-of-thorns starfish
- Crown-of-thorns starfish caused a greater proportion of the mortality in the central (48%) and southern (47%) GBR

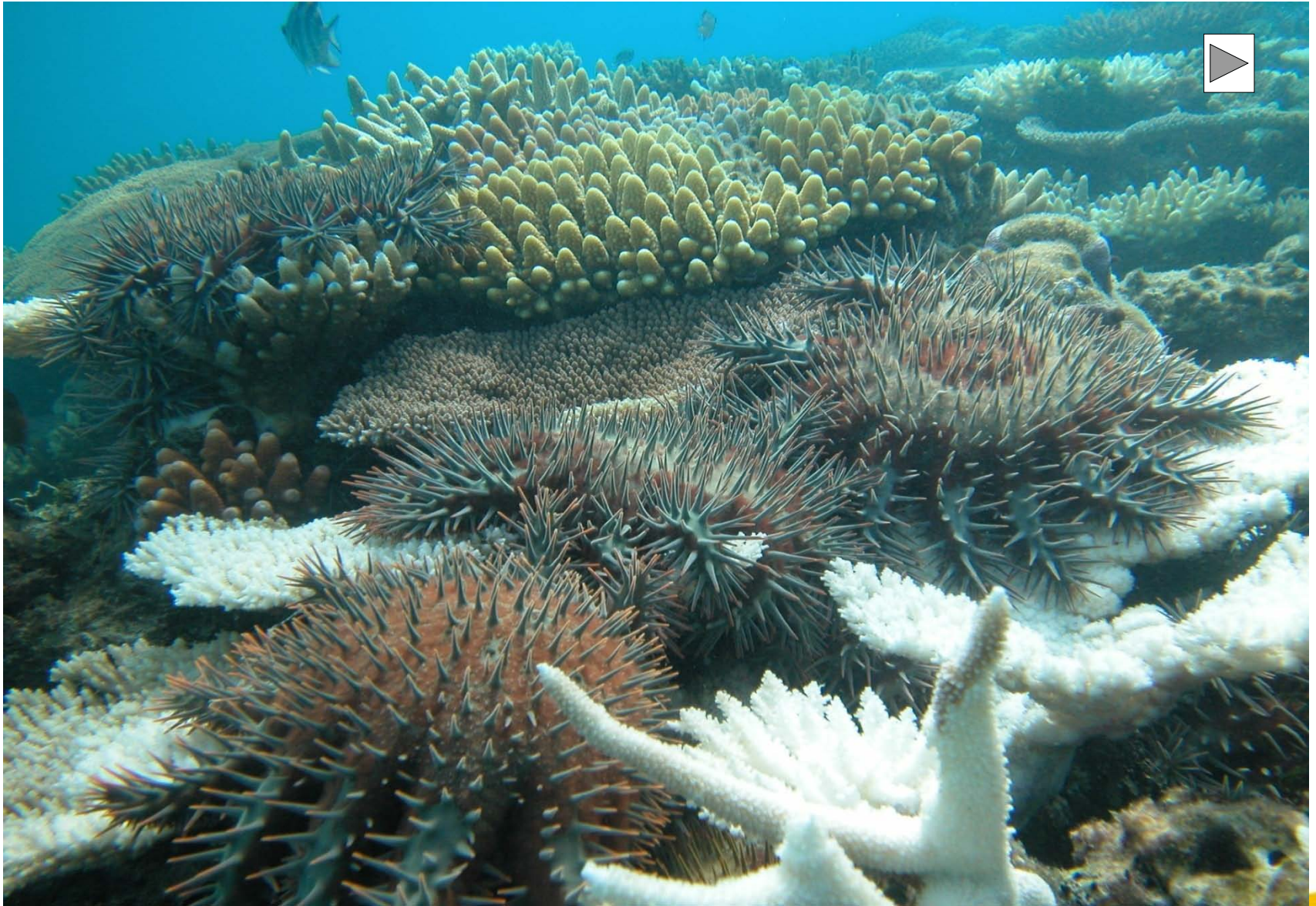
From De'ath et al 2012, PNAS





HISTORY

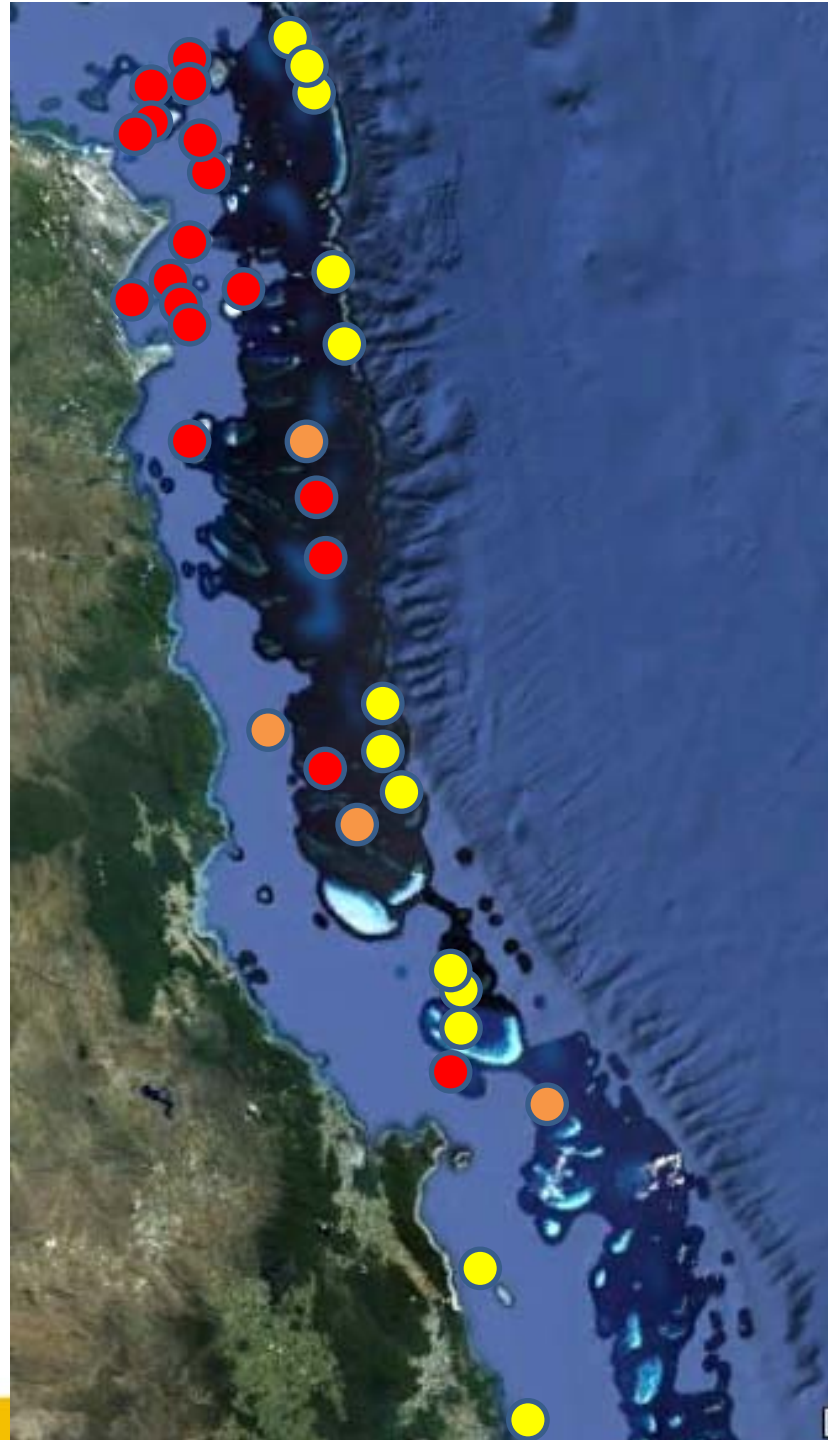
- Geological evidence - COTS “always” present on GBR
- Oral history – Pearl shell & Trochus divers recall large numbers on individual reefs going back to 1930s
- Three recorded “waves” of outbreaks
 - 1966 - 1974
 - 1979 - 1991
 - 1994 – present (few relic outbreaks on reefs south of Mackay)
- Wave no. 4? - 2010 - present





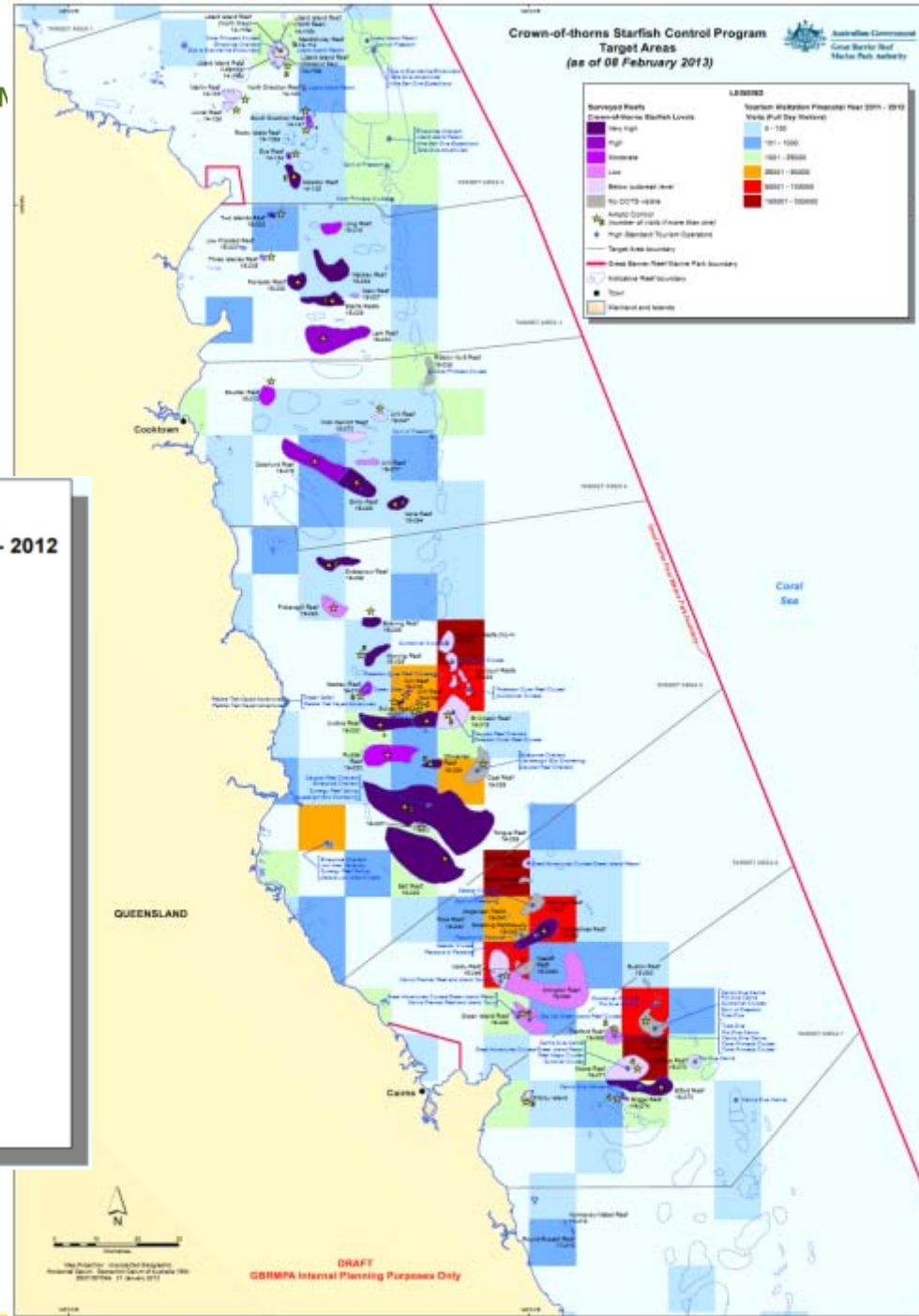
AIMS MANTA TOW SURVEYS LIZARD IS TO CAIRNS 2012-13

- Low density of starfish
- Some starfish
- Outbreak densities





GBRMA-AMPTO-QPWS SURVEYS 2013



LEGEND

Surveyed Reefs

Crown-of-thorns Starfish Levels

- Very high
- High
- Moderate
- Low
- Below outbreak level
- No COTS visible

Tourism Visitation Financial Year 2011 - 2012 Visits (Full Day Visitors)

- 0 - 100
- 101 - 1000
- 1001 - 25000
- 25001 - 50000
- 50001 - 100000
- 100001 - 300000

Ampto Control
(number of visits if more than one)

High Standard Tourism Operators

Target Area boundary

Great Barrier Reef Marine Park boundary

Indicative Reef boundary

Town

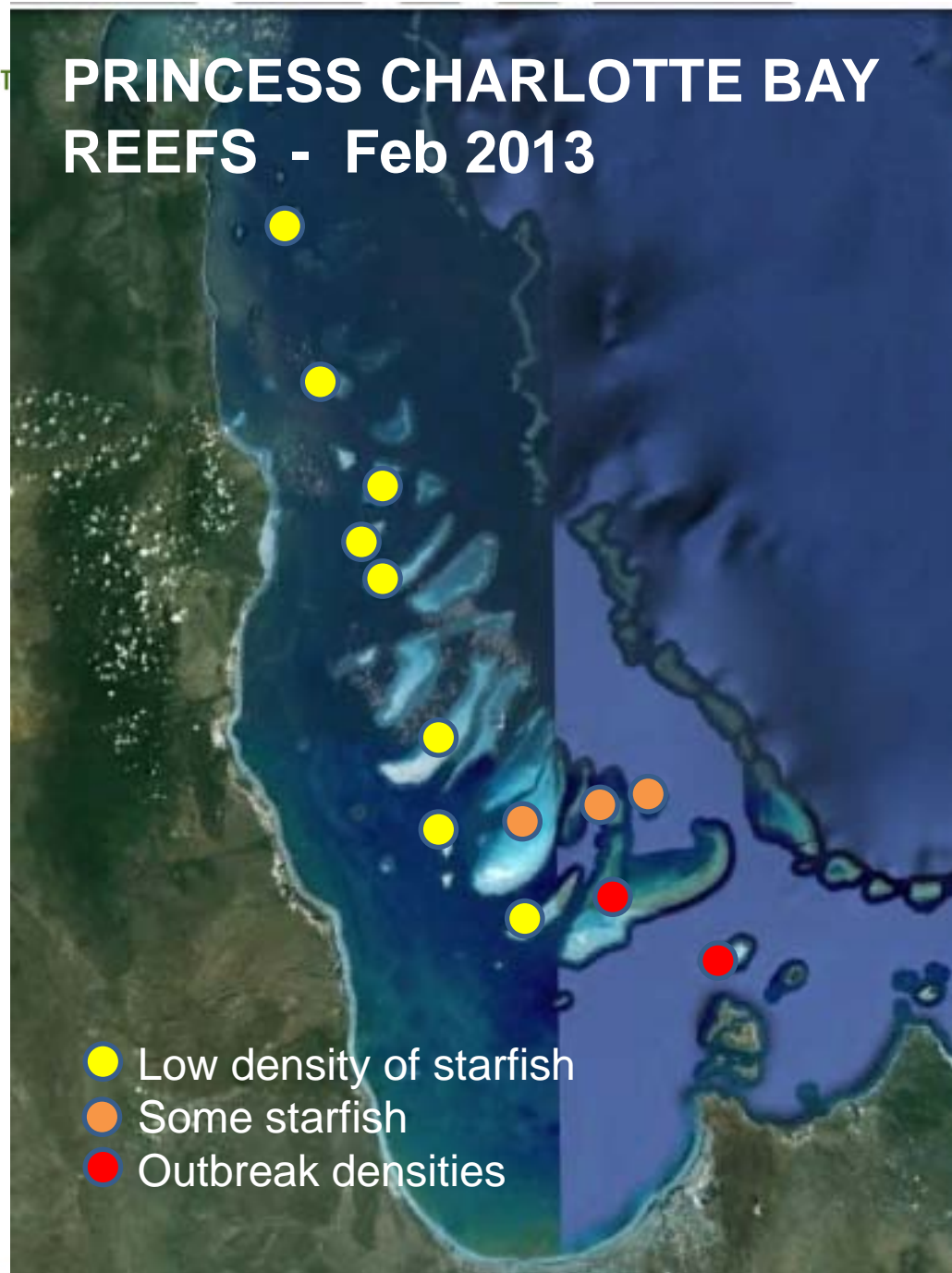
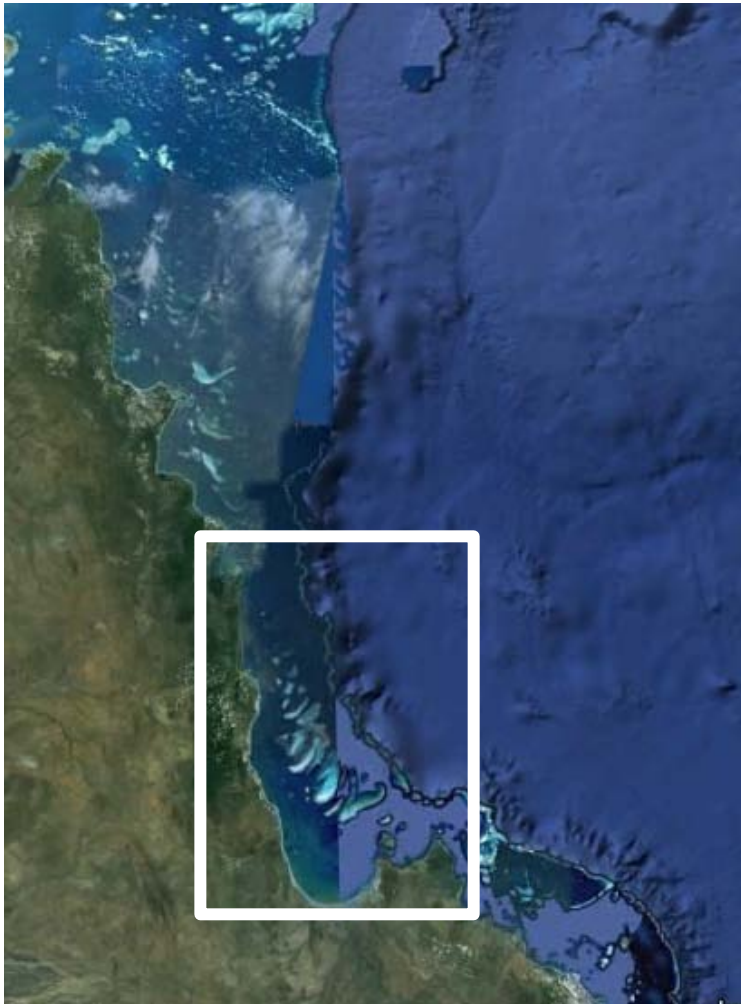
Mainland and Islands



DRAFT
GBRMPA Internal Planning Purposes Only

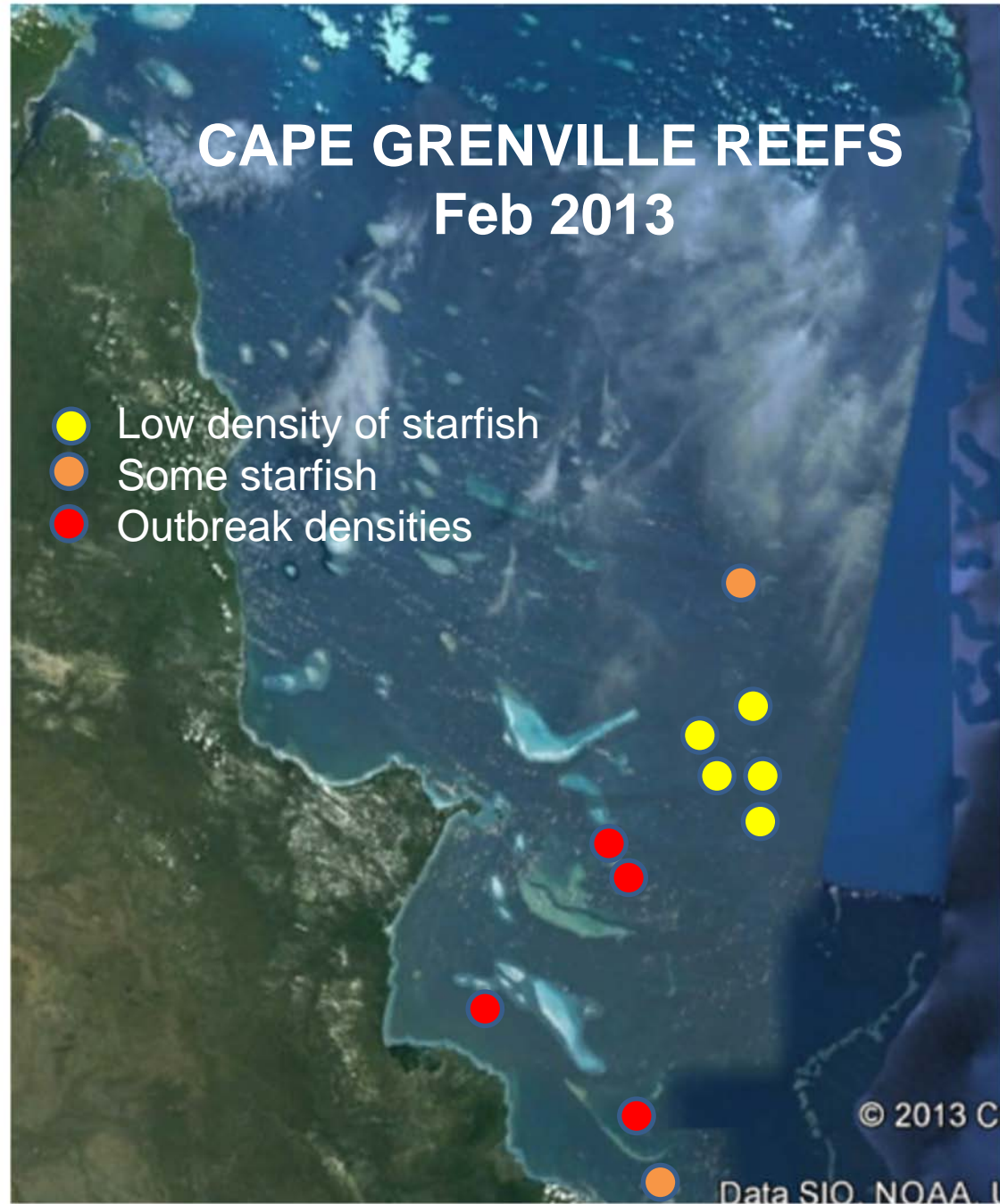


N. GBR SURVEYS - 1





N. GBR SURVEYS - 2





QUESTIONS

- Why do outbreaks seem to originate around 14 30' S (~Lizard Is)?
- Will the swathe of damage from TC Yasi act as a fire break?



THANK YOU

Hugh Sweatman – h.sweatman@aims.gov.au

The AIMS Long-term Monitoring Program has been supported in part by the CRC Reef, and the Australian Govt's MTSRF & NERP programs.

Thanks to Chris Briggs & Chris Jones for the maps of the GBRMPA-AMPTO-QPWS survey data