



National Environmental
Research Program

Dugongs and Turtles in Torres Strait and the Great Barrier Reef: The Big Picture



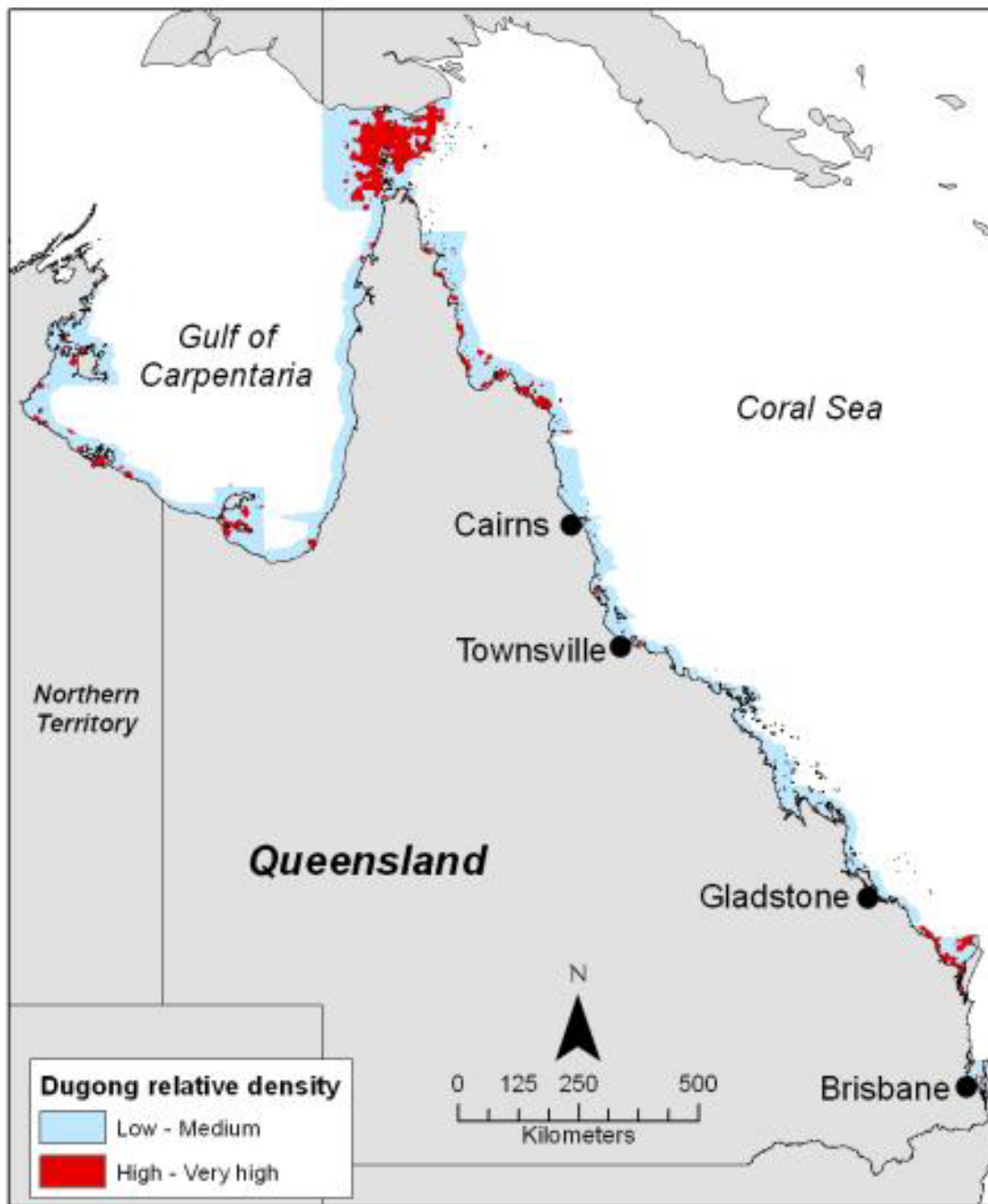
Helene Marsh

NERP Tropical Ecosystems Hub Marine Wildlife Team:
Mark Hamann and Helene Marsh

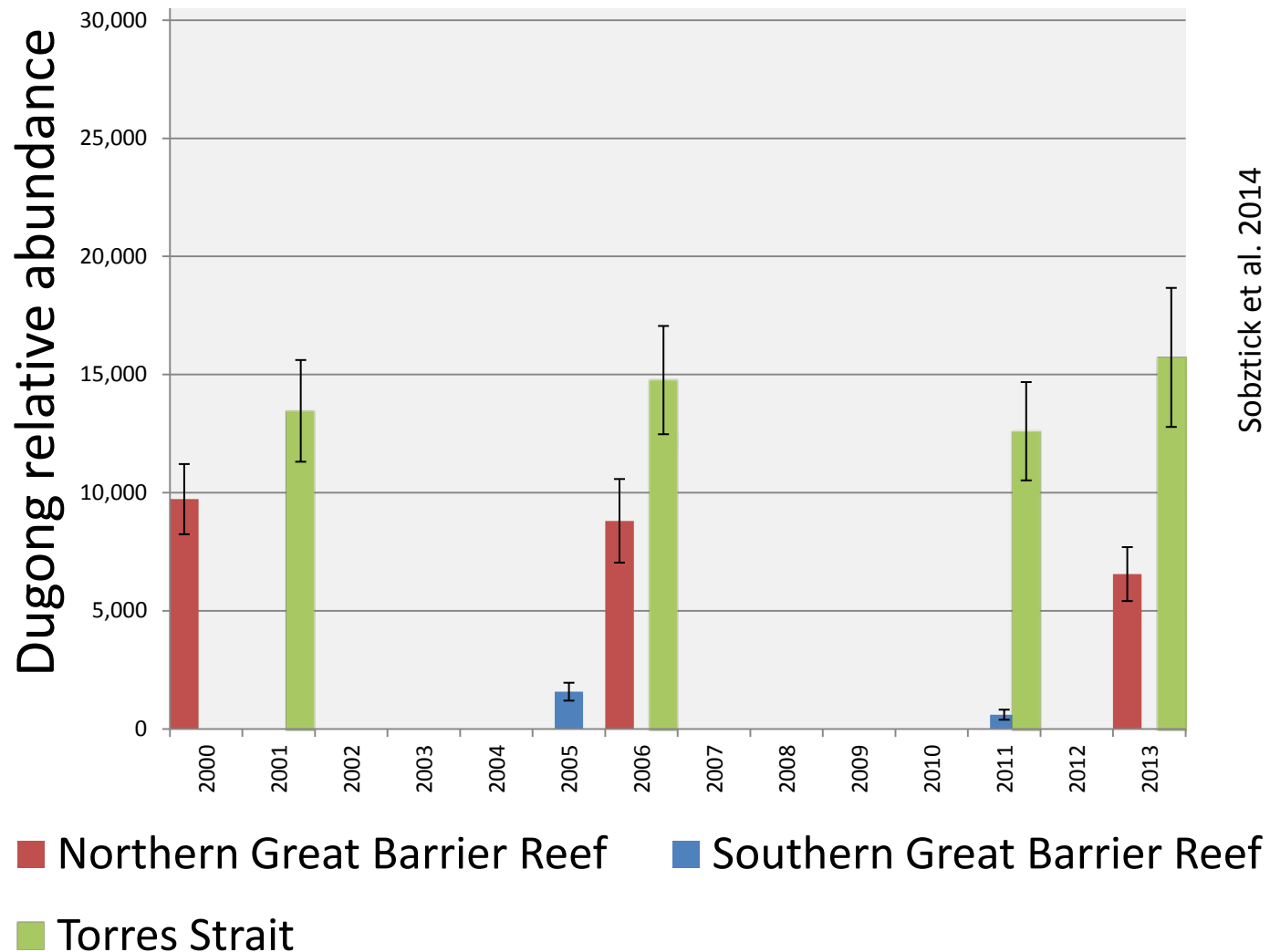
Assisted by:

Aurelie Delisle, Alana Grech, Christian Gredzens, Julia Hazel, Helen Penrose, Shane Preston, Takahiro Shimada, Susan Sobotzick, Natalie Stoeckl, Felecia Watkin and **TSRA team**

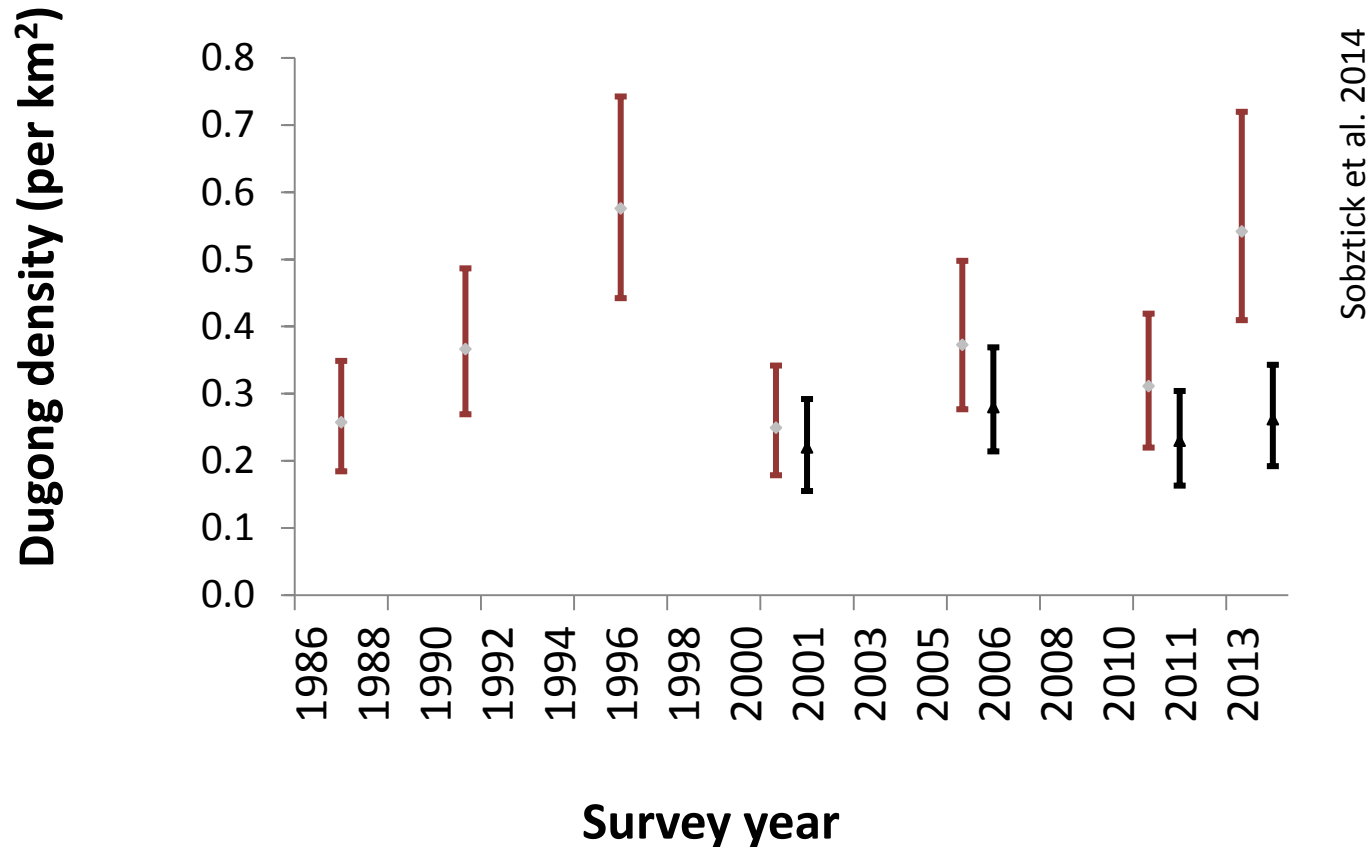
The area of high dugong density in Torres Strait much greater than anywhere else in Qld (and the world)



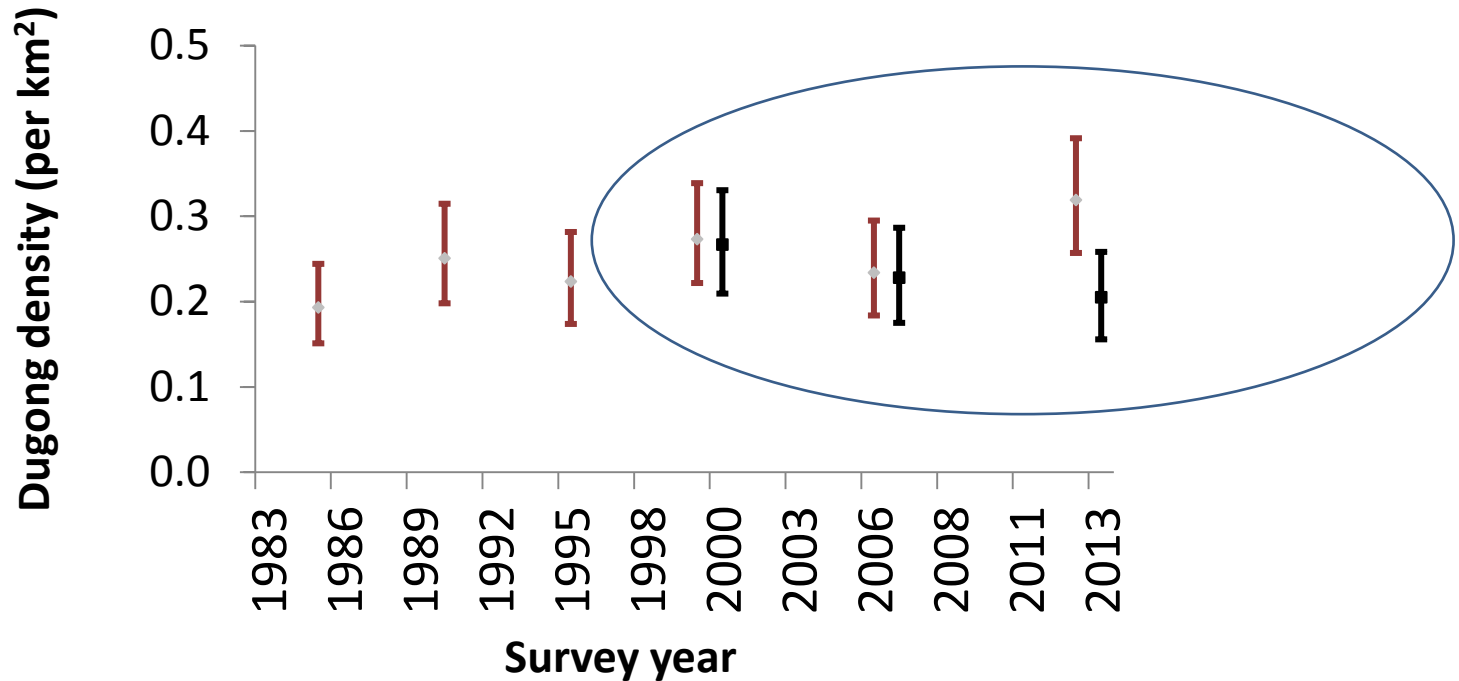
Torres Strait is the dugong capital of Queensland (and the world)



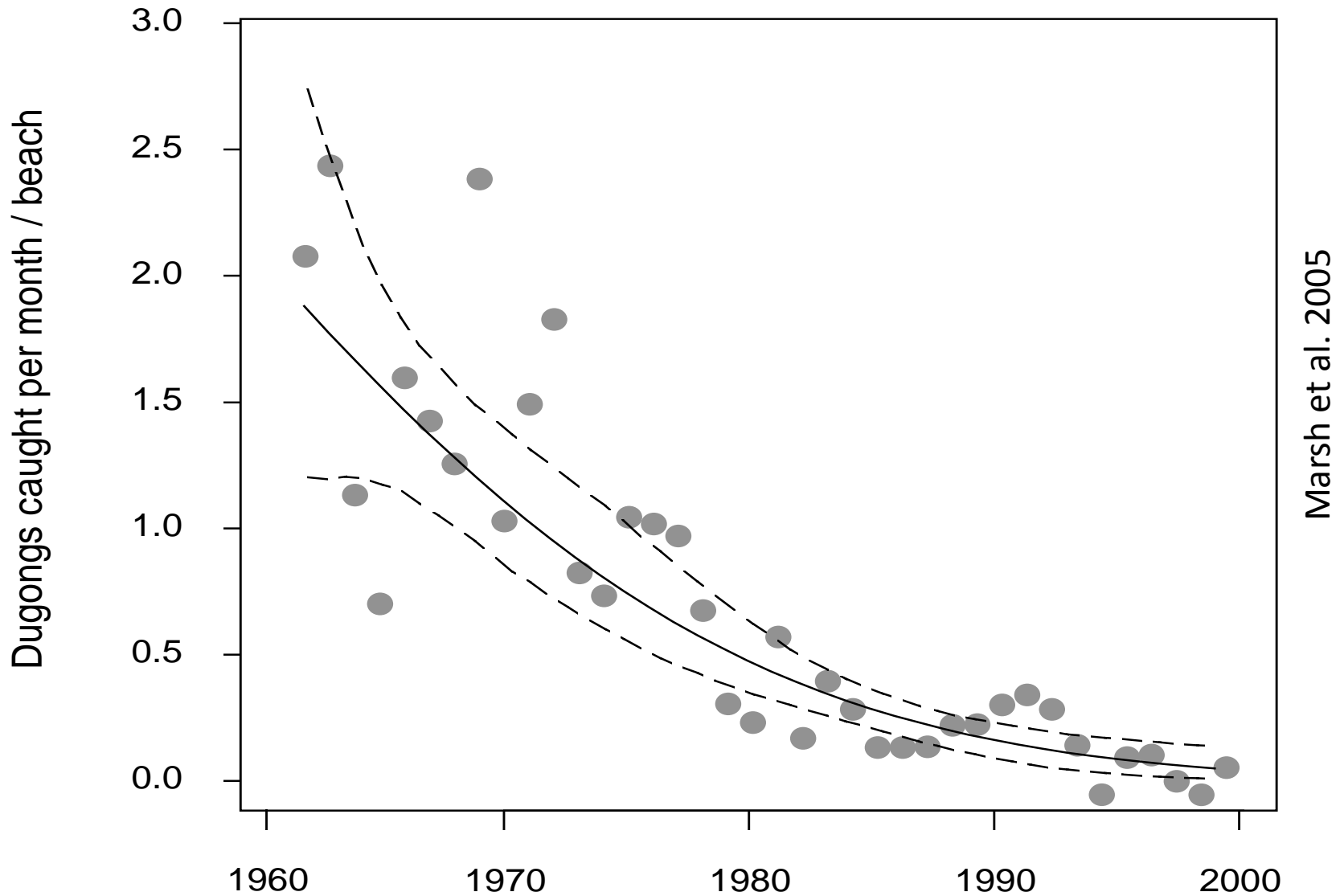
No evidence of decline in dugong density in Torres Strait since surveys began in 1980s



Recent suggestion of decline in NGBR not statistically significant but worrying

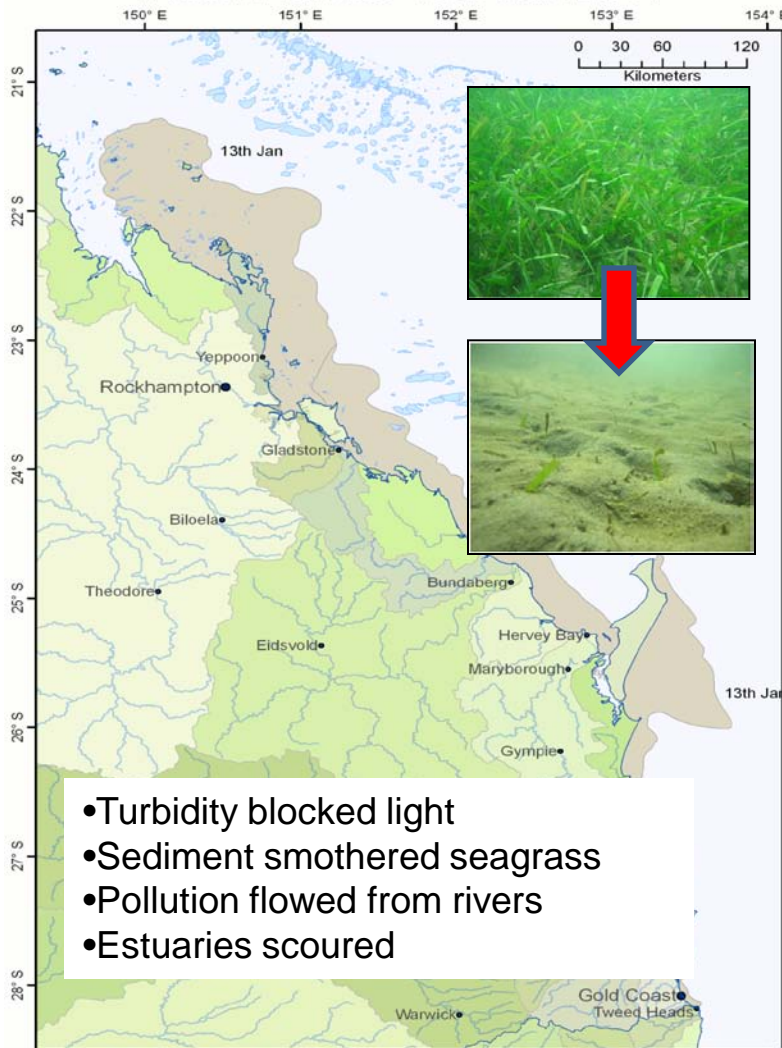


SGBR long-term decline



Extreme weather events of 2010/11

Flood Plumes 13th Jan 2011

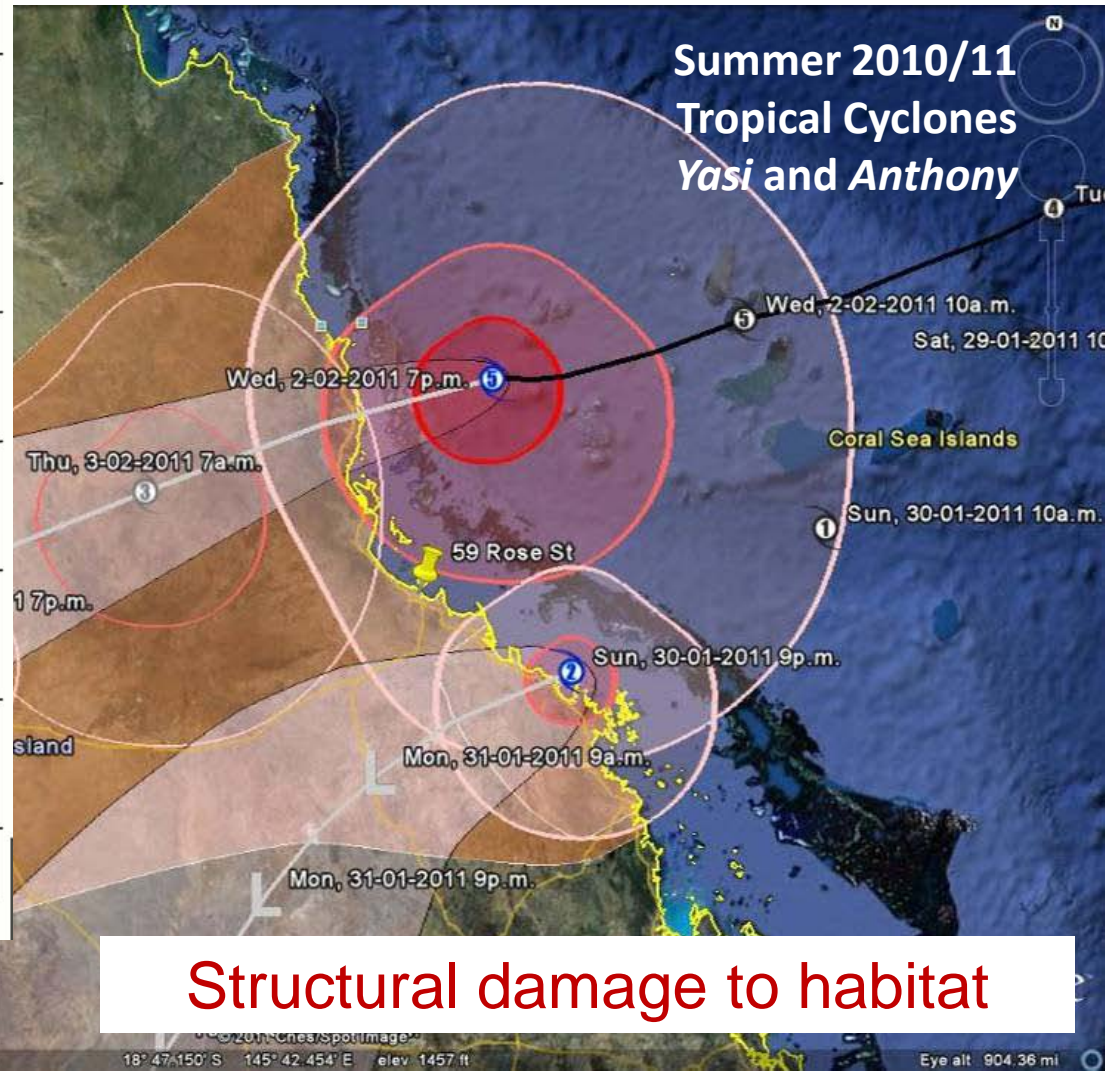


- Turbidity blocked light
- Sediment smothered seagrass
- Pollution flowed from rivers
- Estuaries scoured

Produced 7/2/2011, Licence: CC-BY-2.0, Data: Flood plumes (JCU), GBR Features (GBRMPA), Topo 2.5M (GA), River Basins (GA), More info: e-atlas.org.au/content/qld-flood-plumes-2011

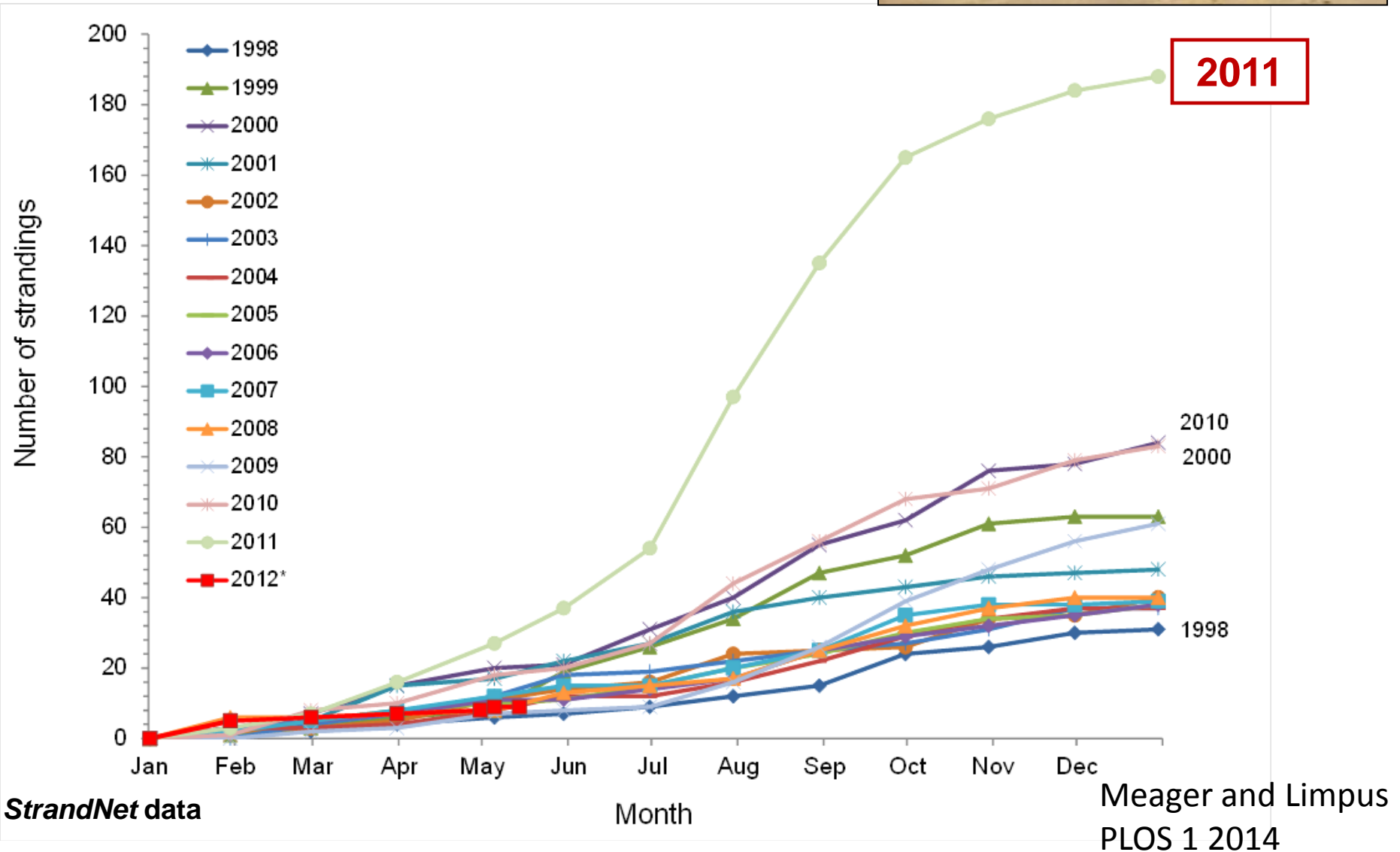
Supplied by Mark Read

2010-2011 Summer variable along coast Flood plumes impacting inshore

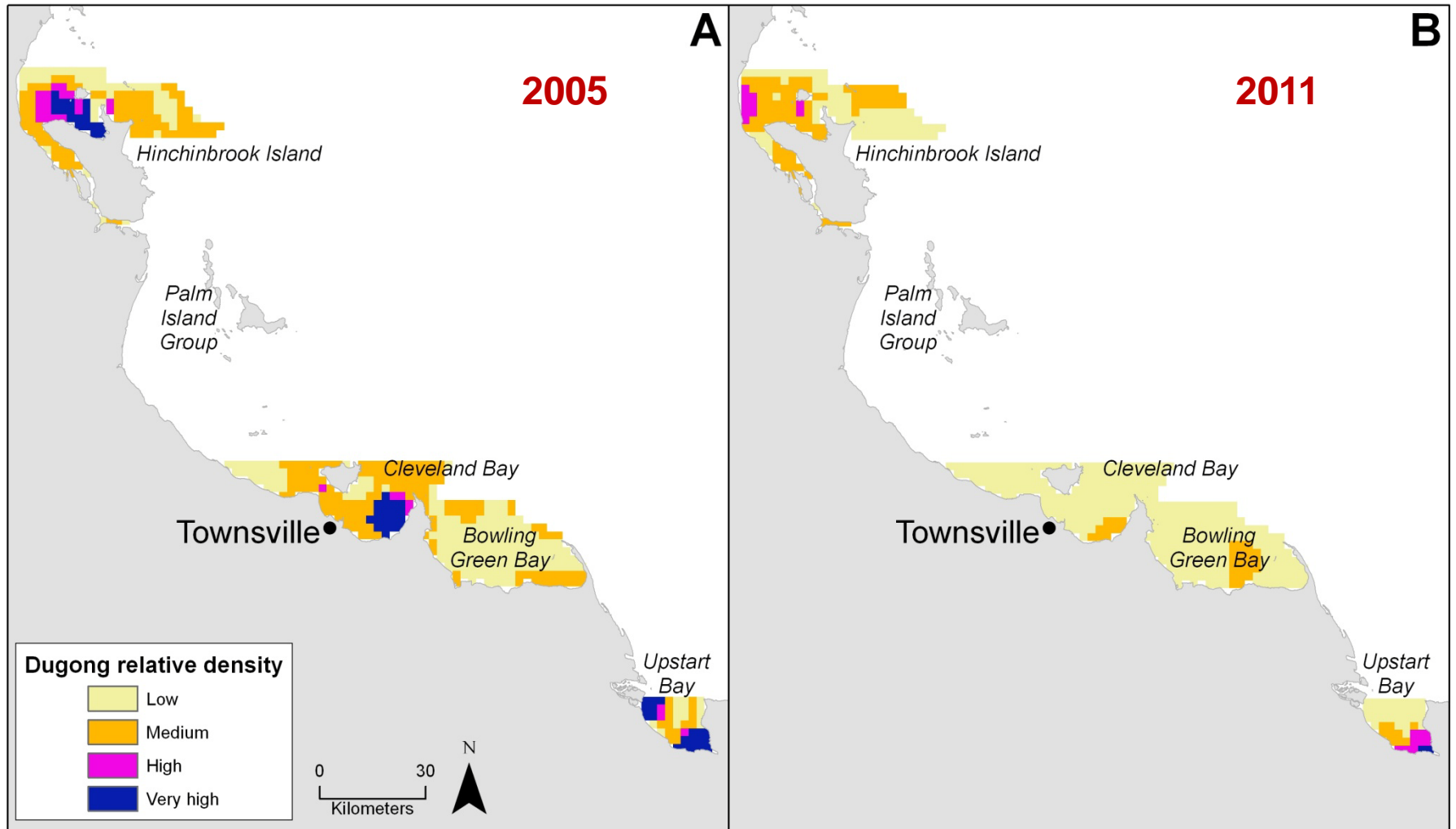


Structural damage to habitat

SGBR cumulative mortality: dugongs

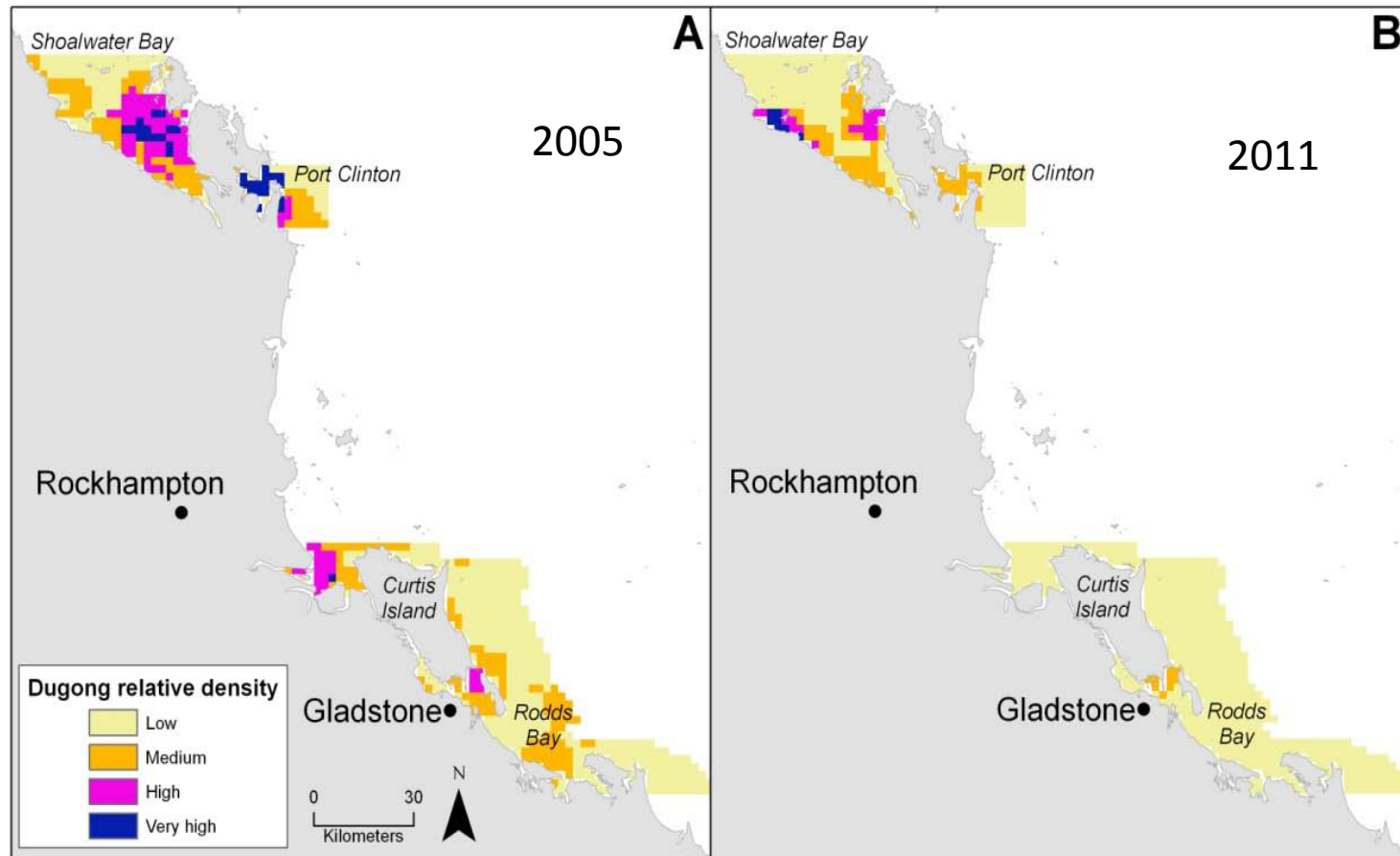


Dugongs died, moved from SGBR and stopped breeding



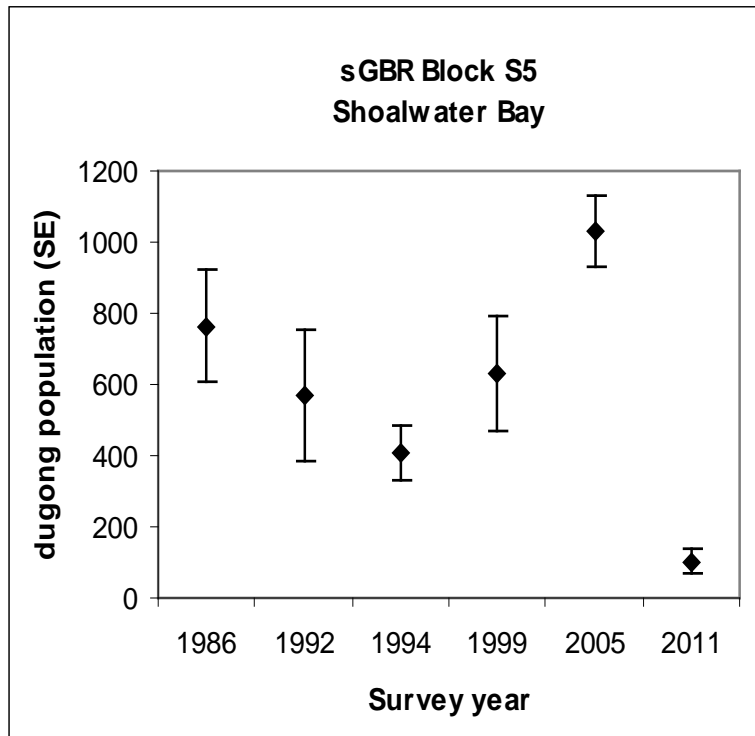
Spatial models from aerial surveys see Sobczick et al. (2012)

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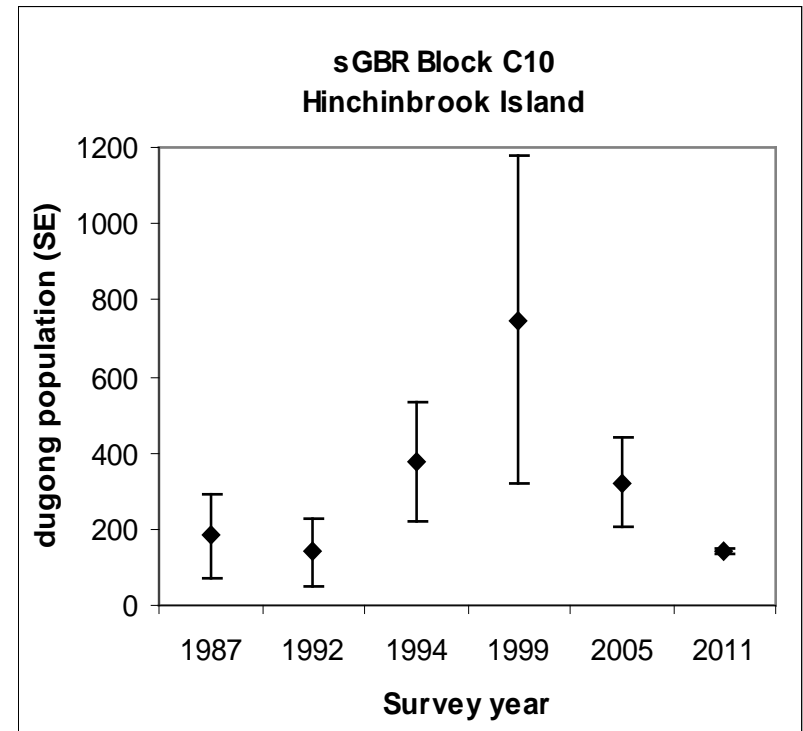


Spatial models from aerial surveys see Sobczick et al. (2012)

Dugong numbers down at hotspots in SGBR in 2011



Sobtzick et al. (2012)



Some anecdotal evidence of return

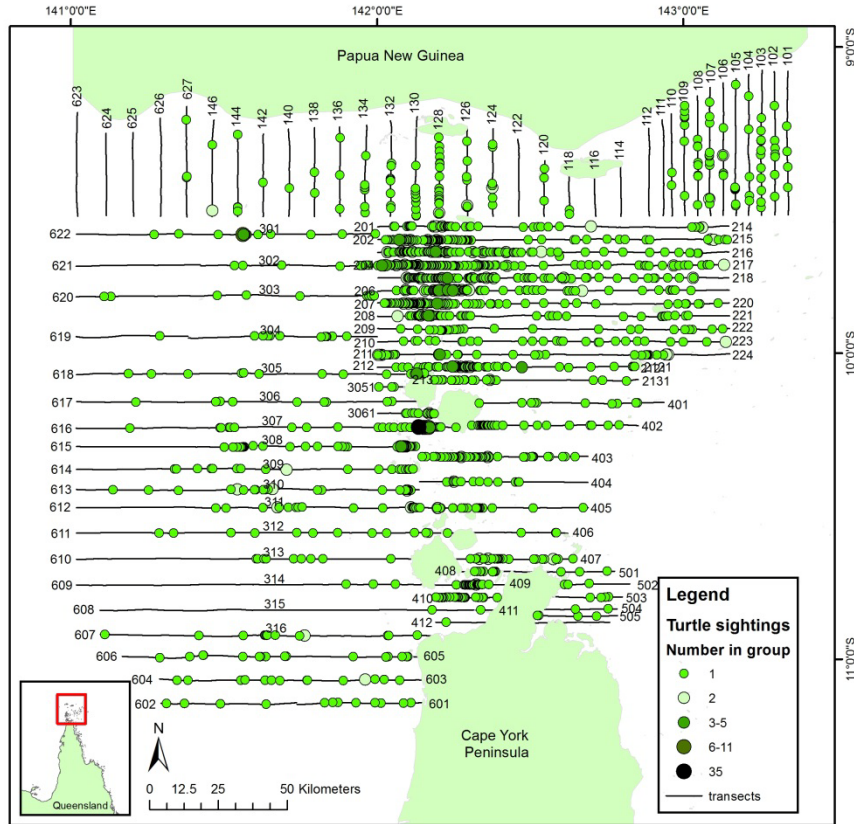
Trends in status of dugong population in Torres Strait is much better than GBR

Results for most recent in time series of aerial surveys

	SGBR (2011)	NGBR (2013)	Torres Strait (2013)
Relative abundance (since 2000)	worst	worst	best
Relative density (since 2000)	worst	worst	best
% calves (since 1980s)	worst	worst	best

Sobztick et al. 2014

Large green turtle population in western and central Torres Strait



Aerial survey sightings of turtles November 2013

**Estimated abundance
turtles in survey area
= $\sim 617,000 \pm \text{s.e.}$
 $\sim 84,000$ of which 97%
estimated to be greens**

NGBR green turtles: Torres Strait

Rookeries have normal hatching rates and nesting success

Juvenile recruitment <<< expected –Raine Island recruitment failure

Bramble Cay TS – cover of remote cameras



Dauar (near Mer) – nesting beaches

Green turtle futures: SGBR and NGBR stocks

Population in SGBR healthy
(~3% annual increase) QDEHP data

Urban coast largely SGBR stock
e.g. Low Isles— 95% greens from SGBR stock

Long-term concerns for NGBR stock (NGBR and Torres Strait)
- Raine Is recruitment failure



Contrasting regional prognoses for dugongs and green turtles

	Torres Strait	NGBR	SGBR
Dugongs			
Green turtles			

Torres Strait site of ancient turtle and dugong hunting culture

Dugong bone mound:

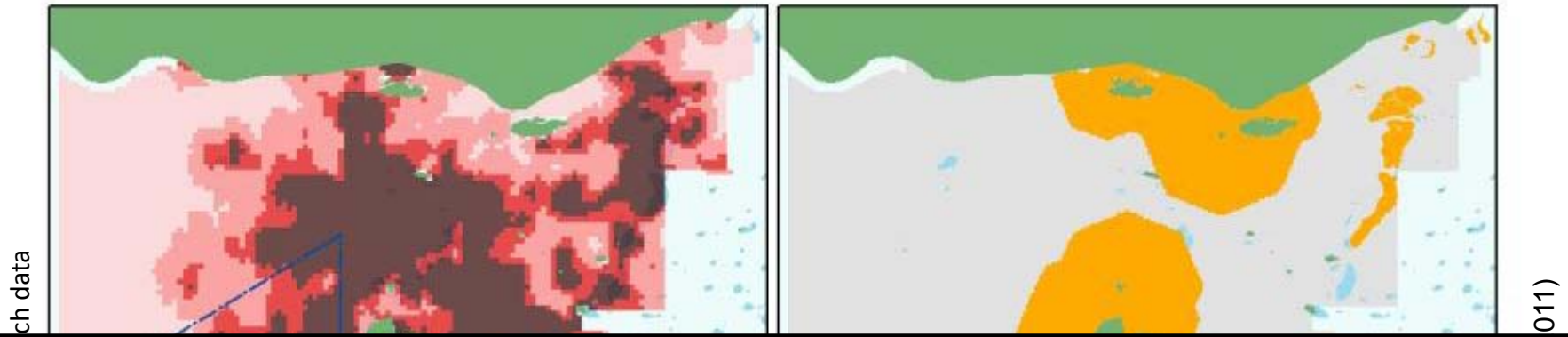
McNiven and Bedingfield (2008)

Remains of 10,000-11,000 dugongs
hunted between c. 1600 and c. 1900AD.

**6,000 year
Torres Strait turtle hunting culture**



Hunting does not occur in most of the high density dugong or green turtle habitats in Torres Strait (or NGBR)



Most hunting in Torres Strait and NGBR in
~7% high density dugong areas; ~10% high density turtle
areas
due to
geography, gear restrictions, logistics, low incomes
and high fuel prices

areas not hunted

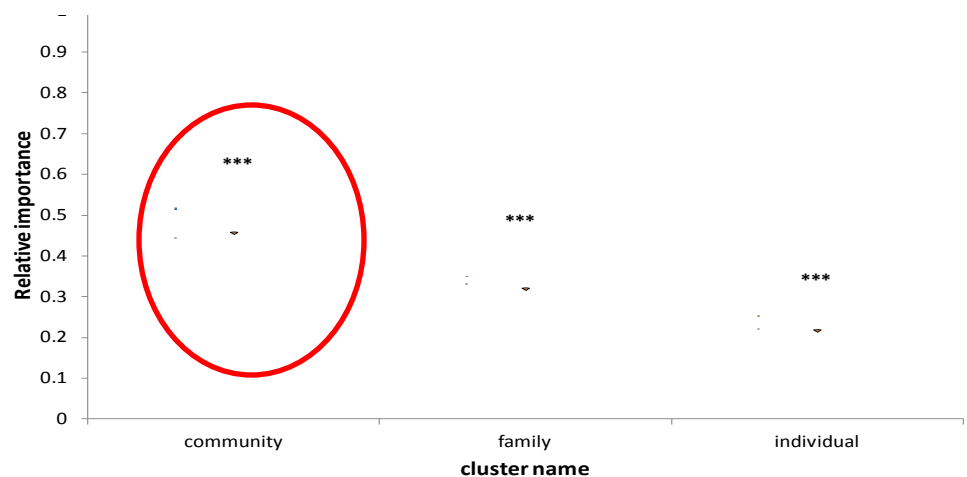


Cultural benefits of turtle and dugong hunting more important than food or status in Torres Strait

Community/Cultural	Family/Food	Individual/Status
Islan Pasin (customary way of life)	Food for home consumption	Shows skills of the hunter
Keeps tradition	Fresh food	Shows strength of the hunter
Keeps culture	Tasty food	Prestige
Sharing	Cost-effective practice	Health
Teaching the kids		
Unity of the community		
Spiritual connection to the sea		
Food for ceremonies		
Shows knowledge of the hunter		
Essence of being an Islander		

Delisle 2012

Data: Aurelie Delisle



Benefits of dugong and green turtle harvest to Islanders in Torres Strait

- Gross market benefits of dugong and green turtle harvest = ~8% of Islander household income
- Community/cultural benefits are 'worth' more than 8% of household income.
- Gross benefits (market and non-market) of the Torres Strait Indigenous dugong and green turtle harvest exceeds 16% of household income

Gross benefits of hunting approximate proportion of income spent by average Australian on mortgage repayments

Export of meat from Torres Strait unlikely to be sustainability problem

- Dugong and turtle <1% annual meat consumption of Queensland mainland Diaspora
- Average per person per year:
 - 125 – 450g dugong
 - 160 - 580 g turtle
- Used for home consumption and ceremonies
- If can't source meat from Torres Strait – Islanders seek legally from SGBR TOs

Policy implications of research:

Sharing of turtle and dugong meat between remote communities and Diaspora reduces pressure on SGBR stock





Policy implications of research:

Given overwhelming importance of cultural values associated with dugong and green turtle harvest,

increased income from subsidizing store-bought meat (beef, lamb, chicken etc) in outer Islands

could result in more money for fuel, enabling an increase in hunting effort

Fuel subsidy for Islander fishers likely to have same effect

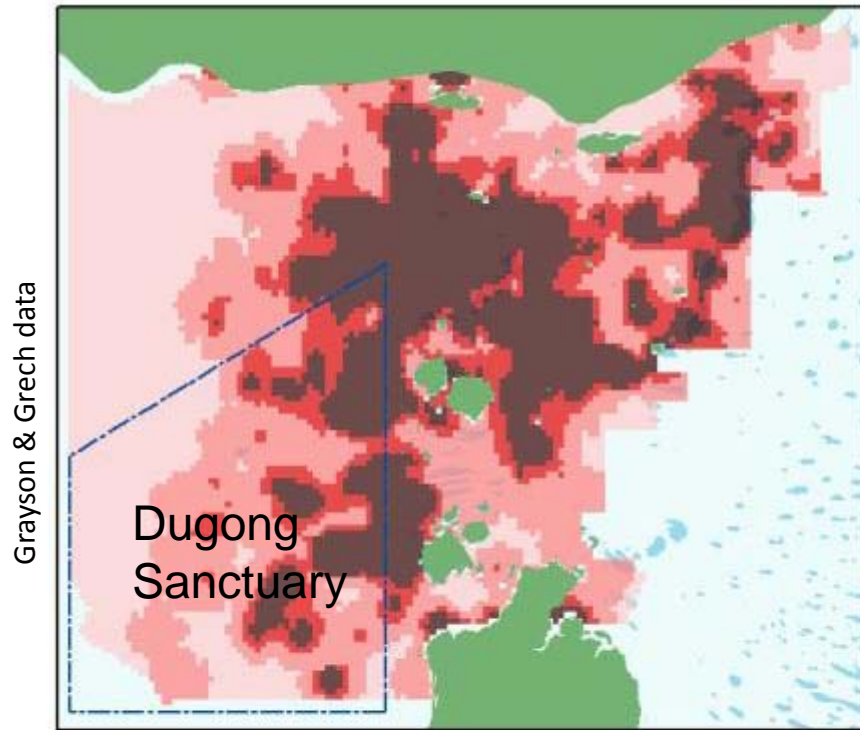
Policy implications of research

Restoring Raine Island as green turtle nesting habitat must be priority



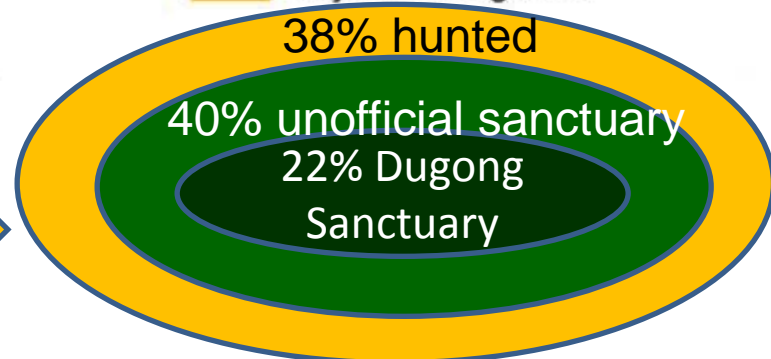
Preventing swale deaths of breeding females could largely offset Torres Strait harvest

Policy implications of research: Defined take /no-take areas = tractable hunting management



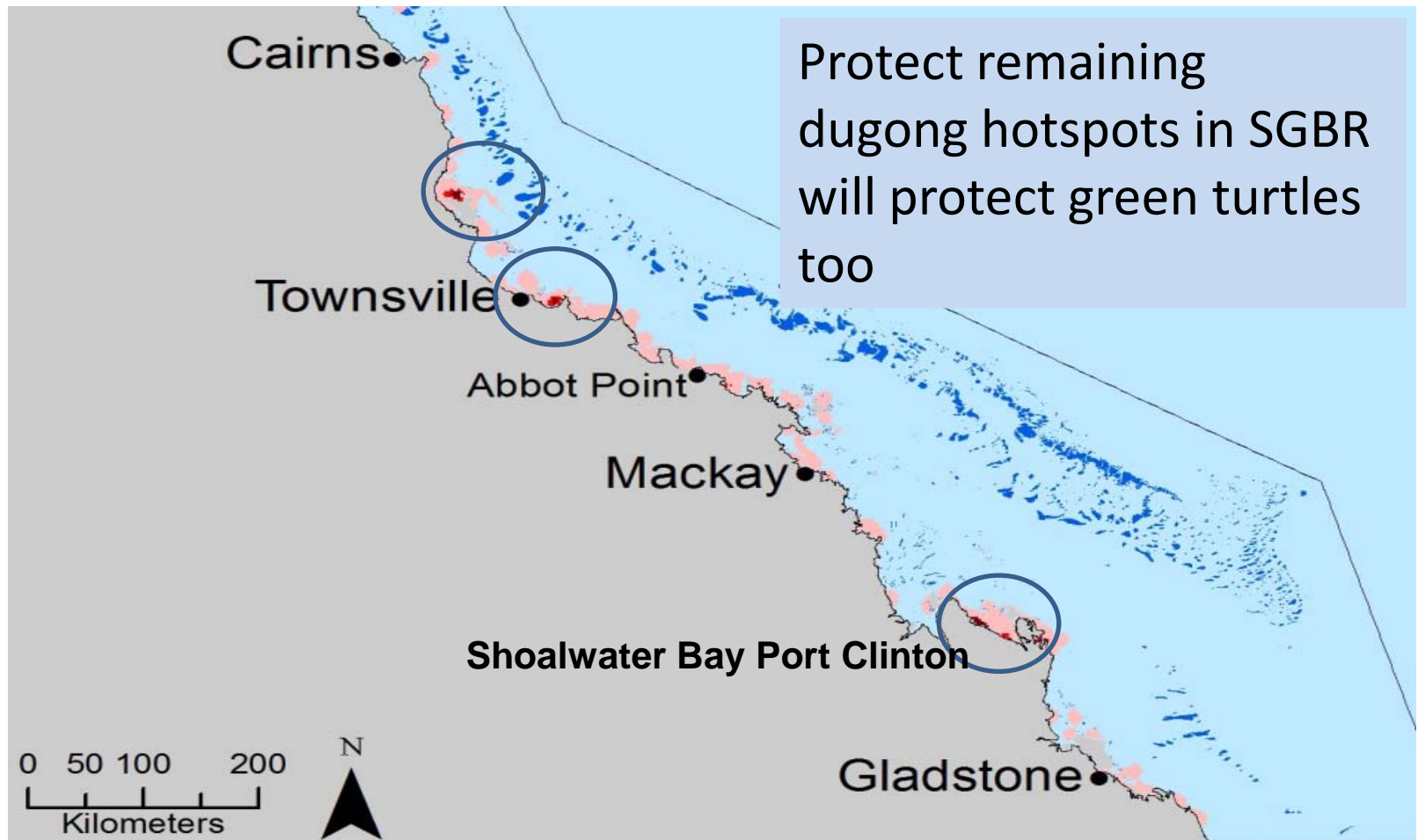
Grayson (2011)

62% of high density dugong areas not hunted
Community based management in hunted areas



Policy implications of research

Further protection required for dugongs in SGBR



Policy responses must be tailored to needs of different regions and species

	Torres Strait	NGBR	SGBR
Dugongs			
Green turtles			



Questions ?



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