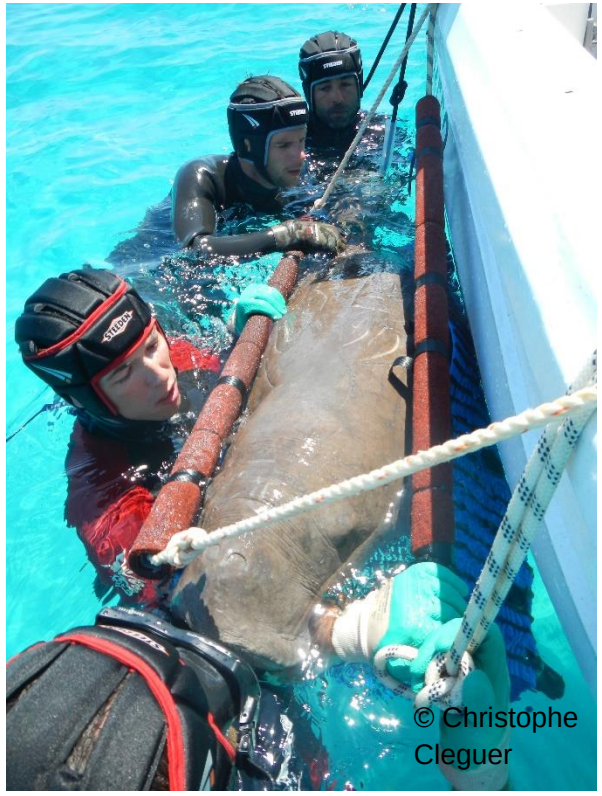
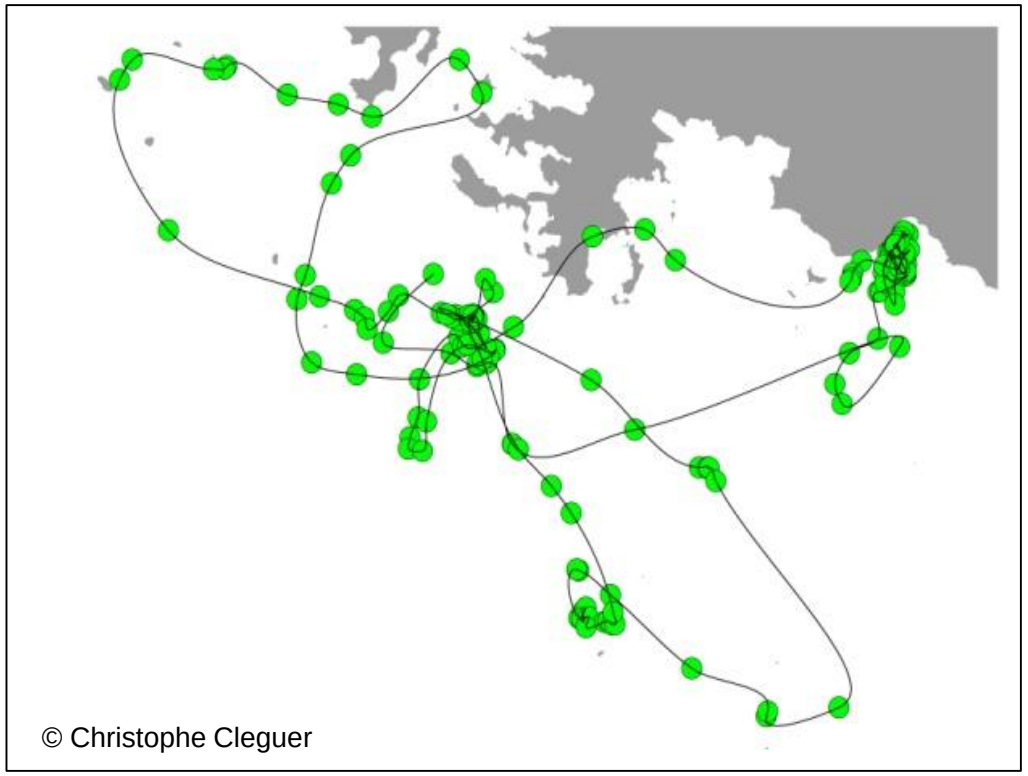




Dugong movements
Current knowledge and tracking tools

Christophe Cleguer & Helene Marsh

Dugong tracking

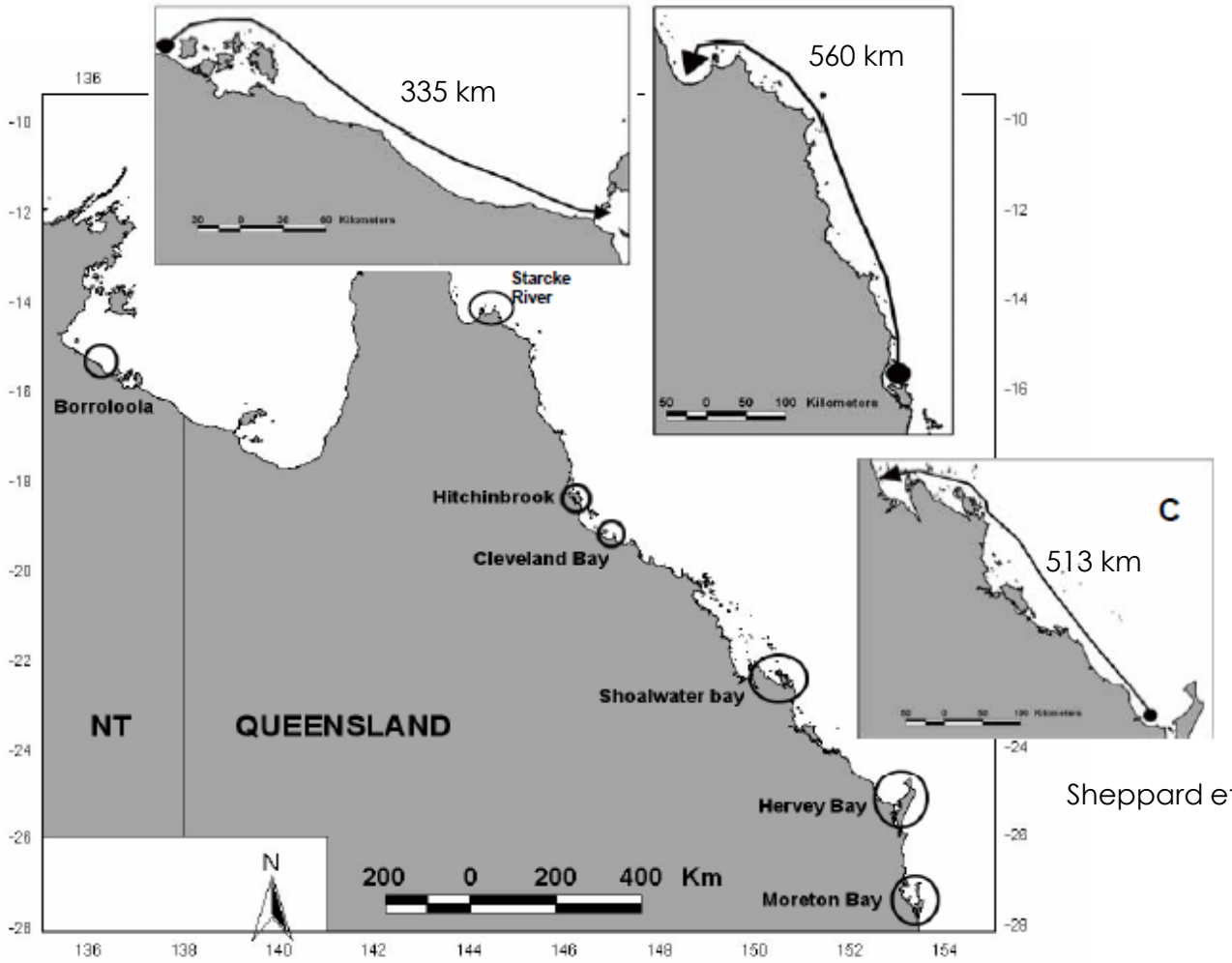
What do we know about dugong movements?

How can telemetry studies help dugong management?

Which tool for which question ?

Dugong movements are individualistic and heterogeneous

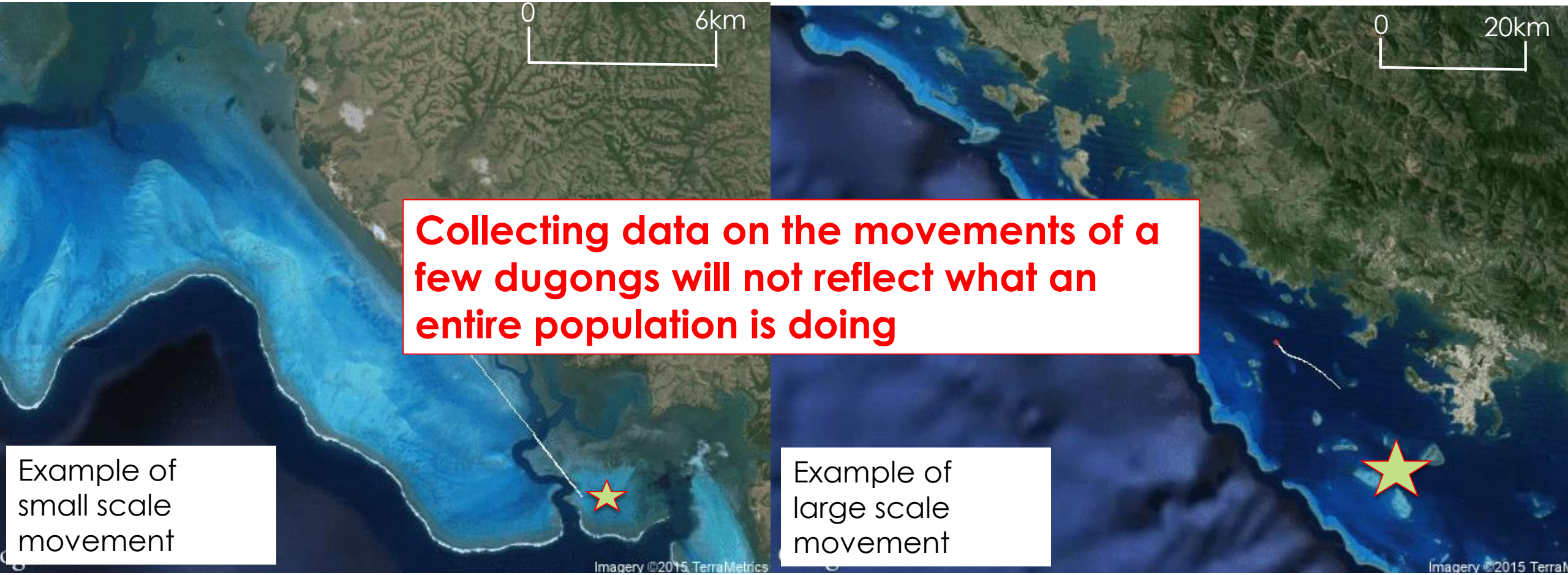
Australia



Sheppard et al. (2006)

Dugong movements are individualistic and heterogeneous

New Caledonia



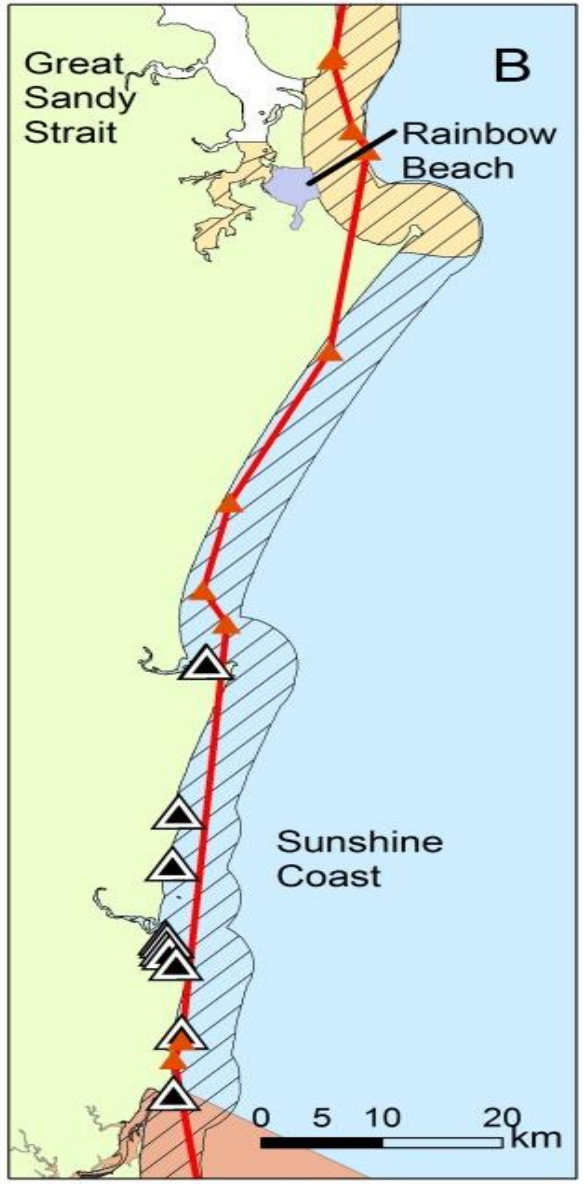
Collecting data on the movements of a few dugongs will not reflect what an entire population is doing

Example of small scale movement

Example of large scale movement

Dugongs use different pathways to travel

Example of coastal movements



Dugong track

Shark nets

Zeh et al. (2016)

In some regions dugongs use unexpected paths

Three dugongs tracked in New Caledonia used the fore reef shelf outside the lagoon to travel from one bay to another.

- Position of tracked dugong 1
- Position of tracked dugong 2
- Position of tracked dugong 3

Cleguer (2015)

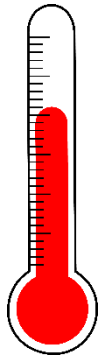
Why do dugongs move?

Feeding

© what-when-how.com

Mating

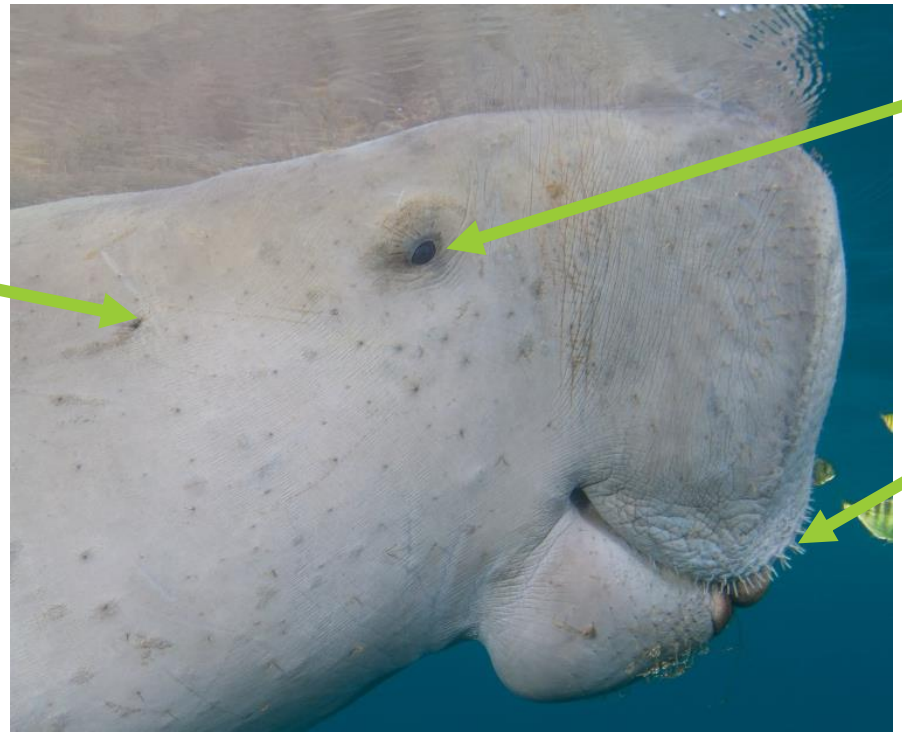
Sheltering from rough seas



© Google image

Thermoregulating

Dugongs have considerable capacity for orientation. But what sensory cues do they use?



A combination of cues?

Dugong tracking

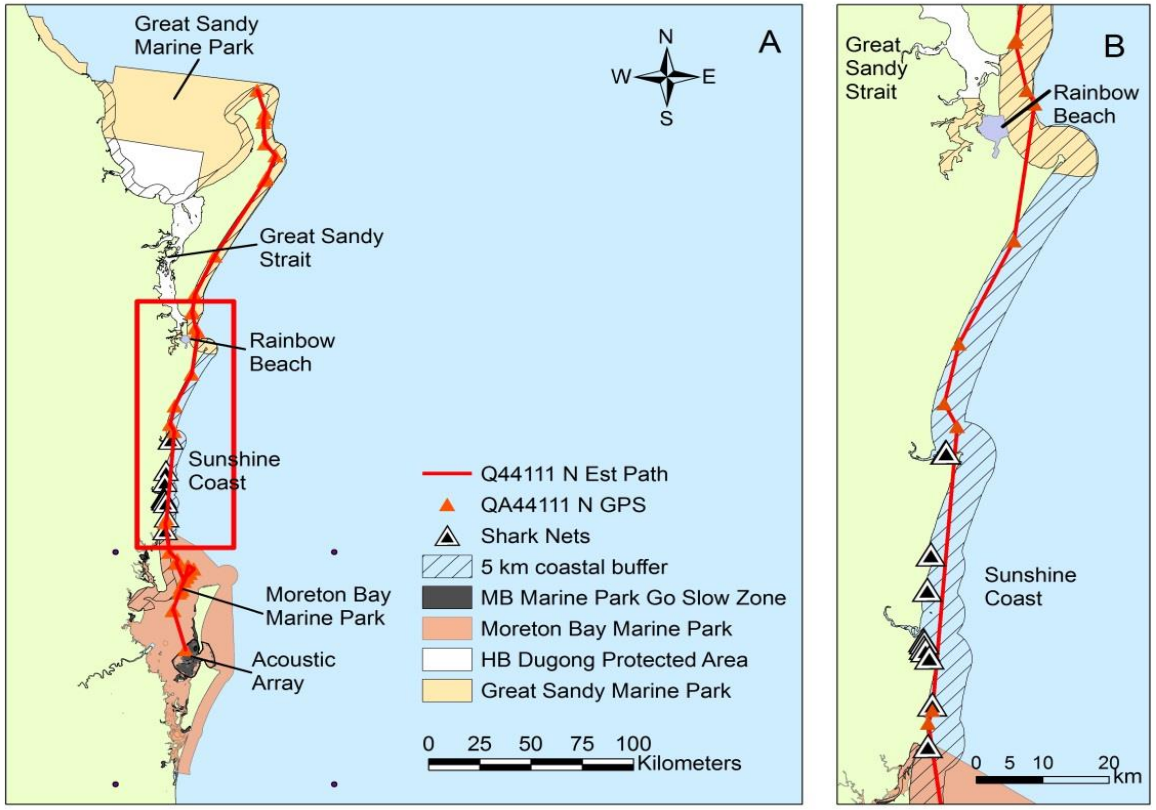
What do we know about dugong movements?

How can telemetry studies help dugong management?

Which tool for which question ?

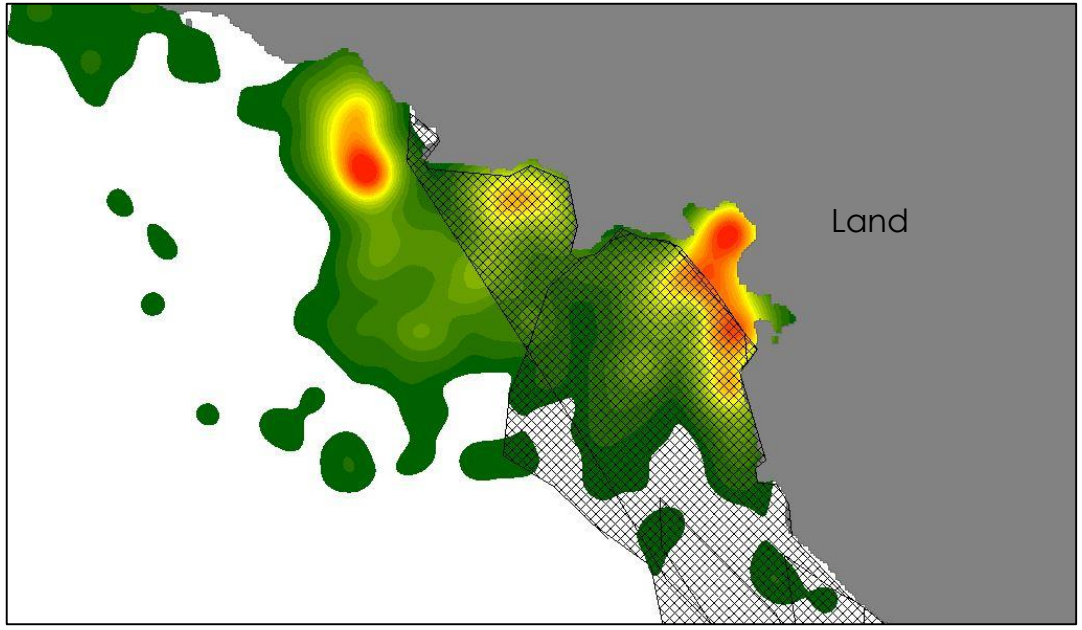
Identifying areas where there is a risk of entanglement in nets

In movement corridors



Zeh et al. (2016)

In areas of high use



Use by tracked dugongs

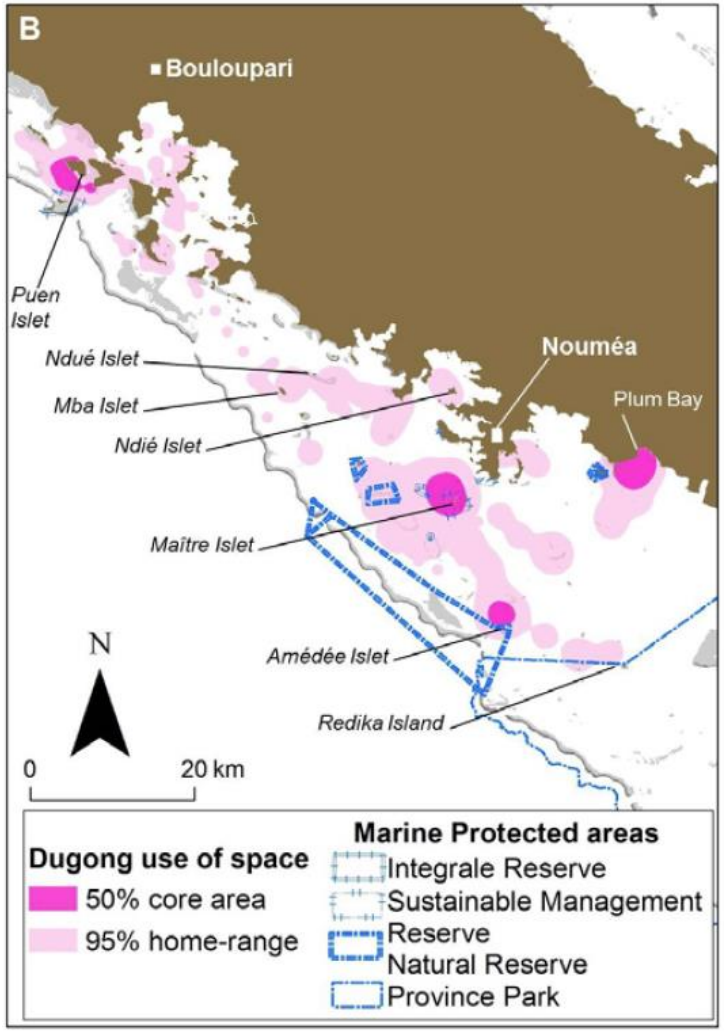
High

Low

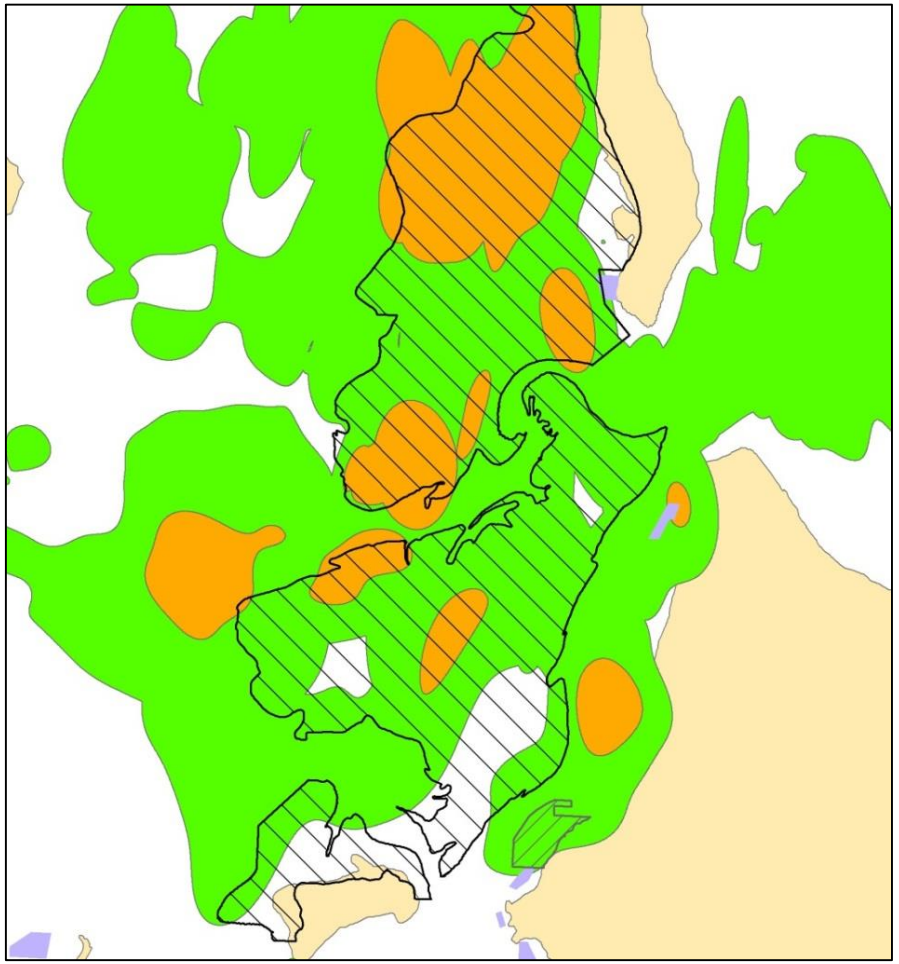
Net fishing

Cleguer (Unpublished)

Identifying mismatches between MPAs and core areas of dugong use



Cleguer (2015)



Zeh (Unpublished data)

- There is a risk risk to the dugong population and your reputation of dugong death during capture or tracking
- Not appropriate if population size is small
- Dugongs are difficult to safely capture in areas other than shallow clear waters
- Tracking dugongs require high expertise (catching – tagging – veterinary advice)

Dugong tracking

What do we know about dugong movements?

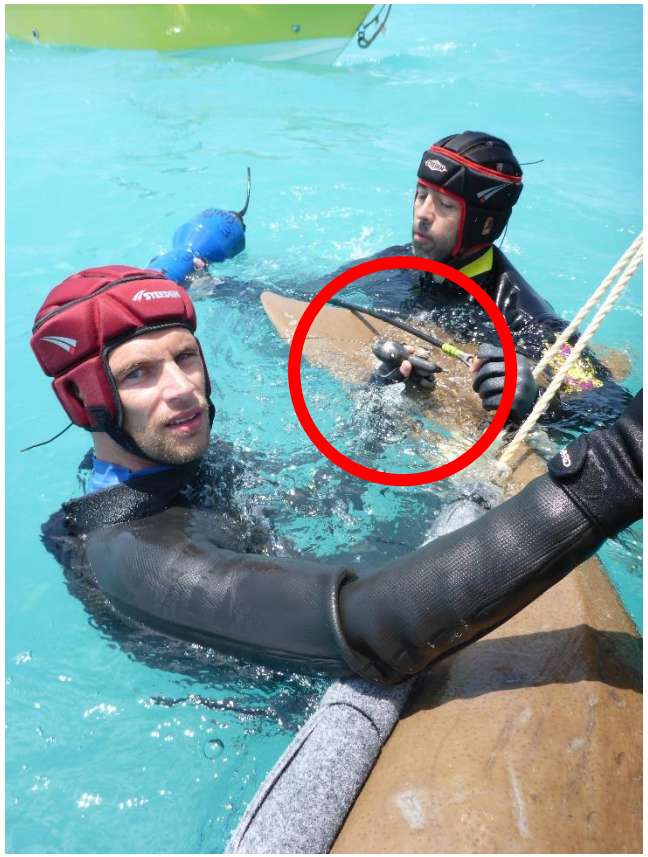
How can telemetry studies help dugong management?

Which tool for which question ?

Tools currently used to track dugongs

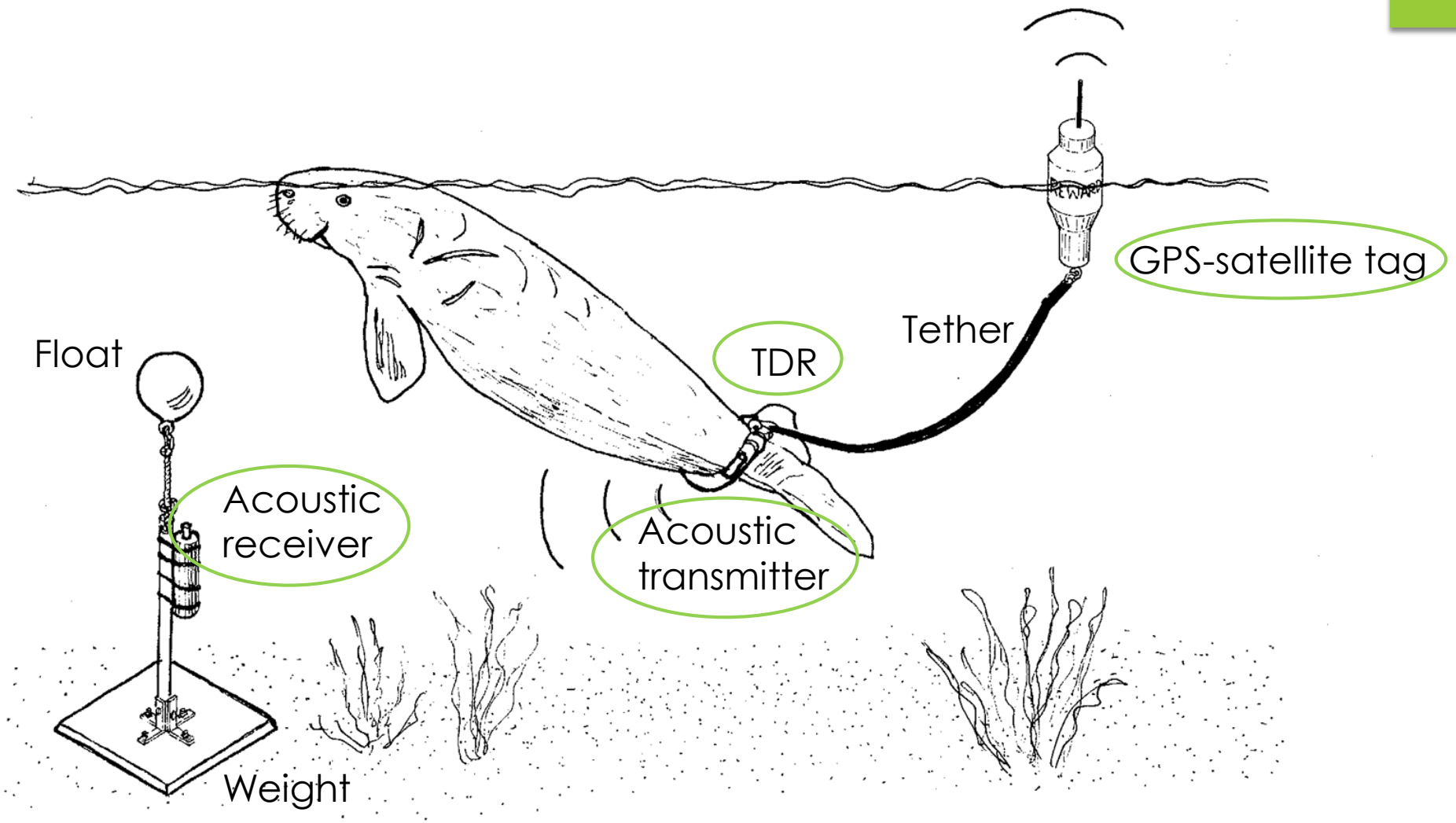
GPS-satellite tags
Horizontal data

Acoustic tags
Horizontal and vertical data



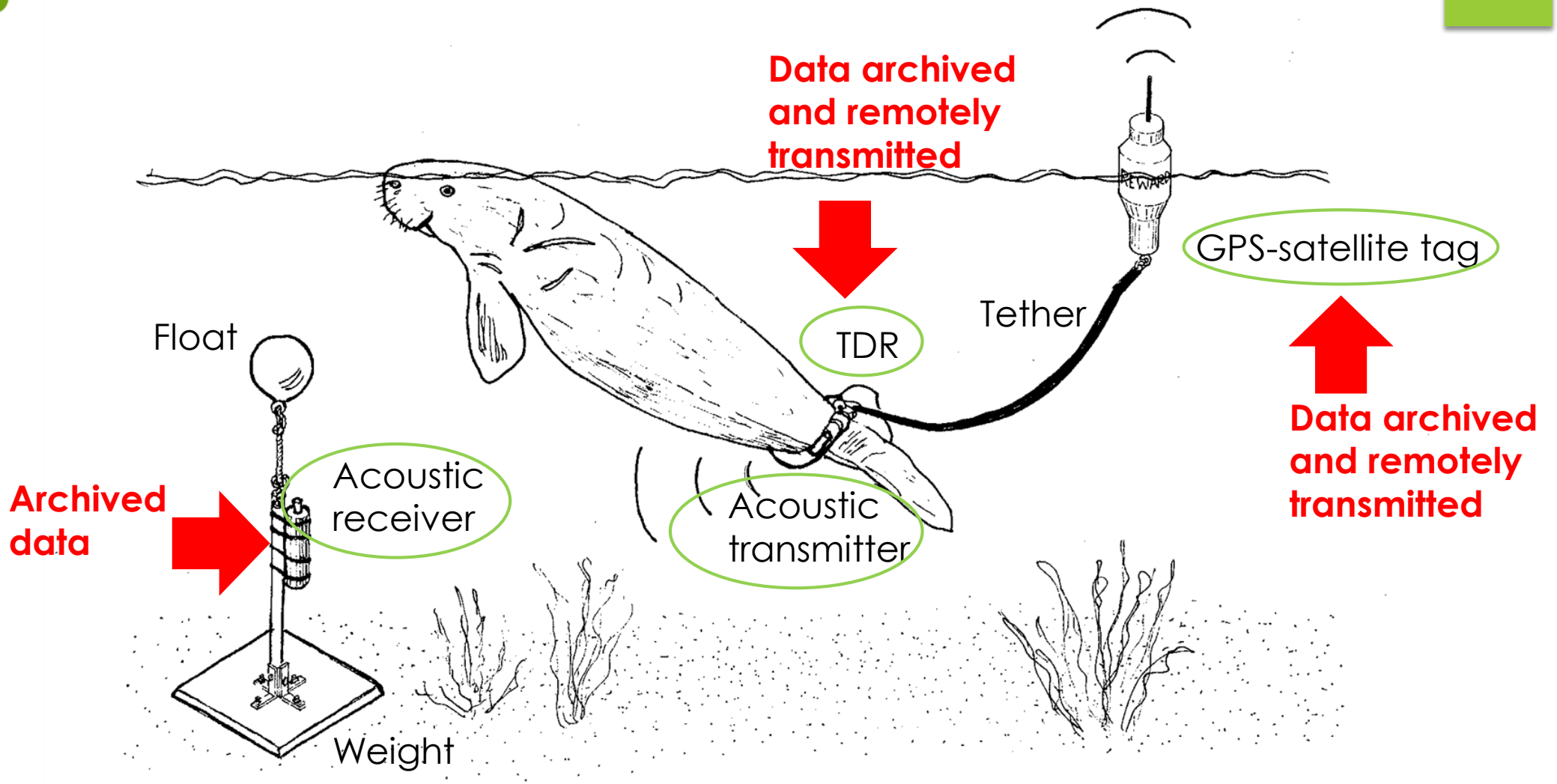
Time depth recorders
Vertical data

Tools currently used to track dugongs



Drawing – Dan Zeh

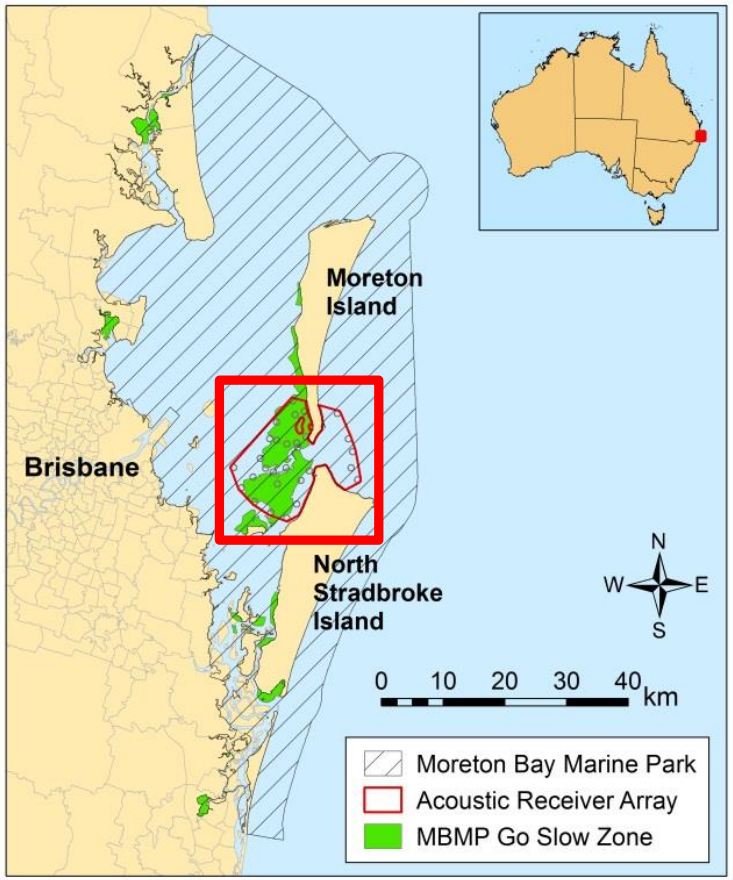
Tools currently used to track dugongs

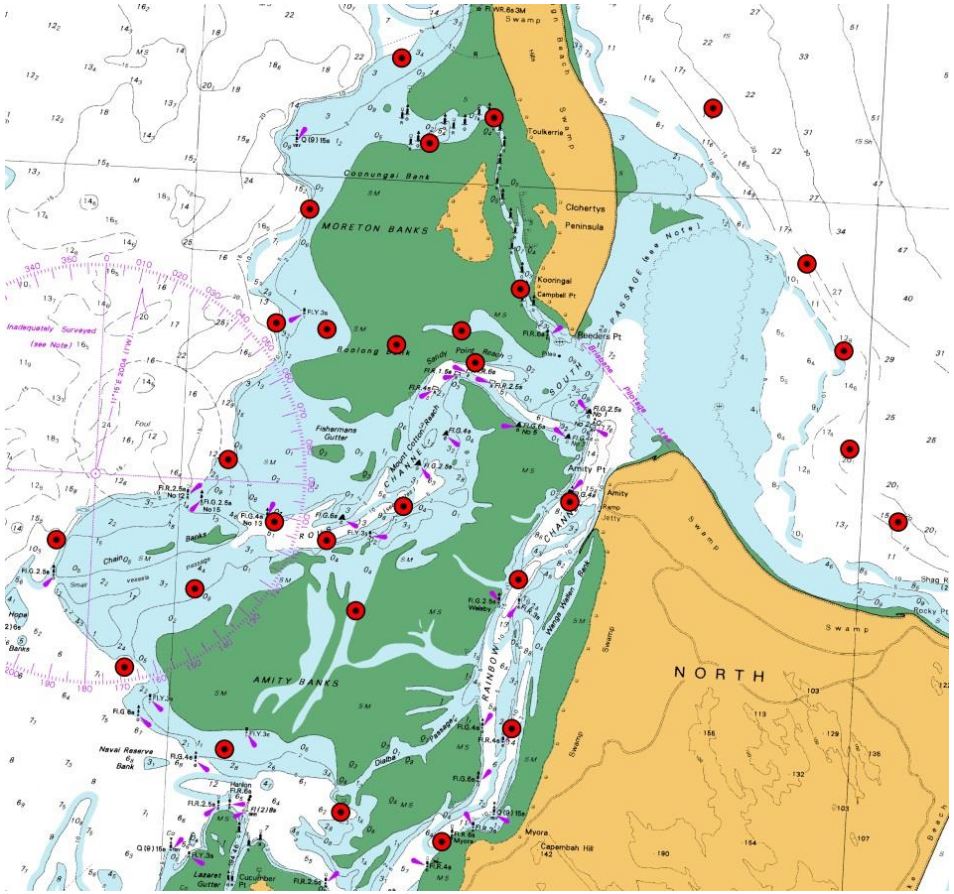


Drawing – Dan Zeh

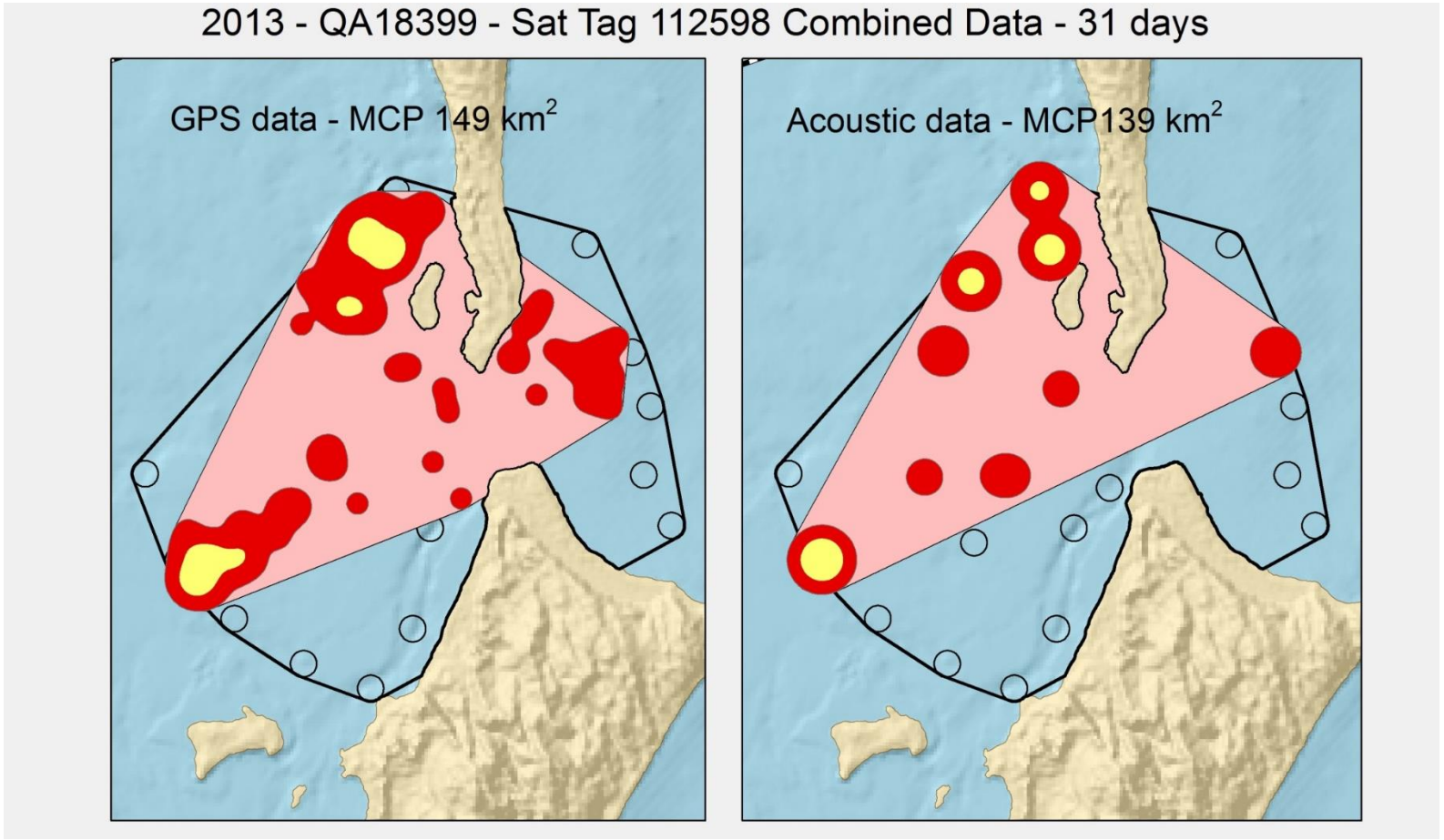
GPS-satellite versus acoustic tracking: the Moreton Bay case study

Dan Zeh et al. (2015)





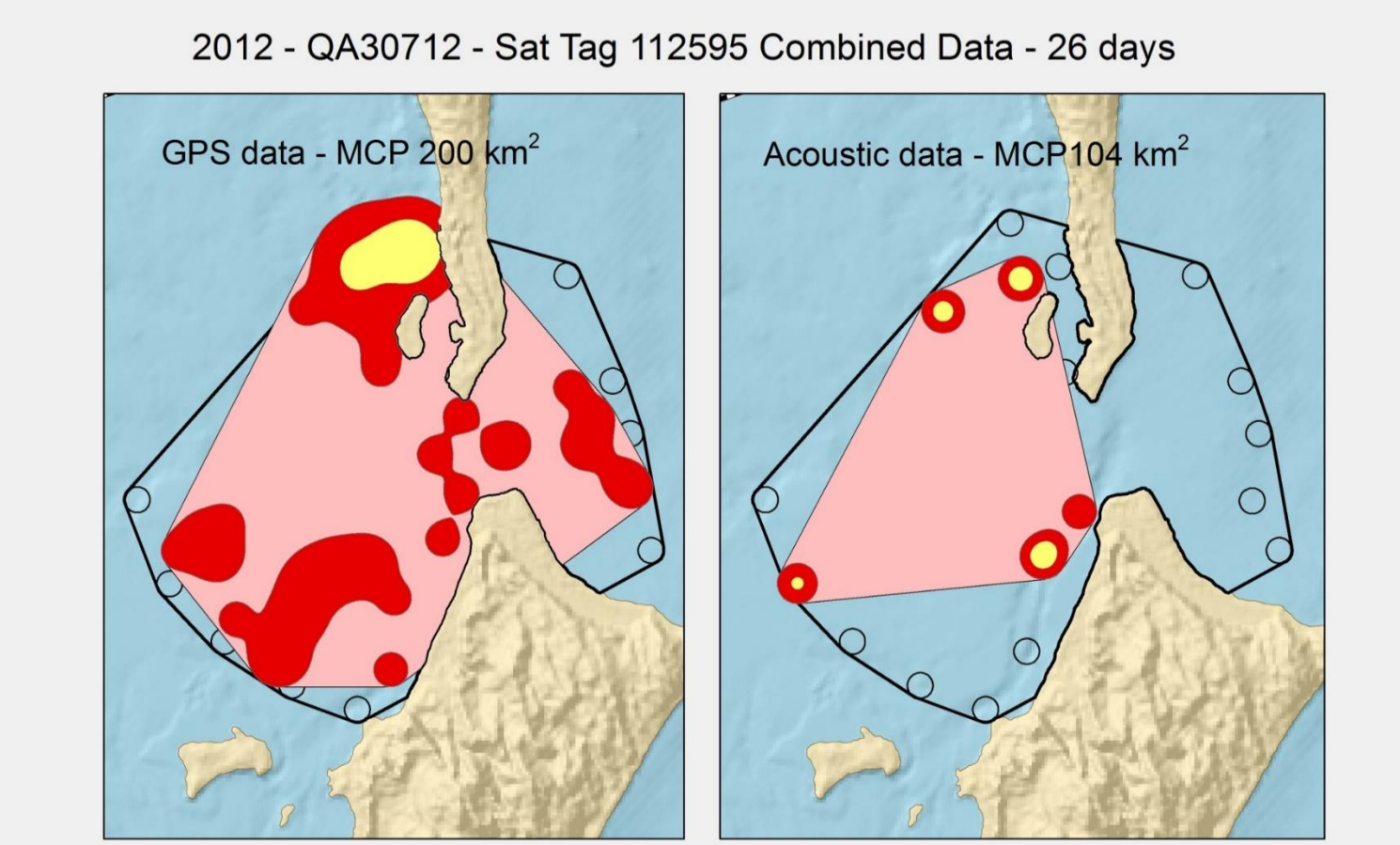
GPS-satellite and acoustic tracking can provide very similar information for some animals…



Zeh et al. (2015)

Home range comparisons juvenile female

… but not all animals



Zeh et al. (2015)

Home range comparisons subadult male

Some animals moved far beyond the acoustic array

Data on dugong movement outside of the acoustic array could only be picked up by GPS-satellite tags

Zeh et al. (2016)

So which technique is more appropriate ?

It depends on your research question!

	Acoustic	Satellite
Spatial scale	Local	Variable
Duration of tracking	Years	Months
Transmitter costs	Cheap	Expensive
Costs associated with deployment and data Upload	Depend on circumstances	

Conclusions

- Tracking dugongs can help to better understand their spatial ecology and support conservation and management actions.
- But under some circumstances capturing and tracking dugongs can be dangerous.
- Which tool to use really depends on your research questions.