



Effects of harmful algal blooms on sharks and rays

*Charlie Huveneers, Kristian Peters, Mick Drew, Danny Brock,
Lauren Meyer, Chloe Roberts, Shauna Murray*



Brevetoxins in sharks and rays (Chondrichthyes, Elasmobranchii) from Florida coastal waters

Leanne J. Flewelling · Douglas H. Adams ·
Jerome P. Naar · Karen E. Atwood · April A. Granholm ·
Sheila N. O'Dea · Jan H. Landsberg

Aquatic Toxicology 99 (2010) 351–359



Contents lists available at ScienceDirect

Aquatic Toxicology

journal homepage: www.elsevier.com/locate/aquatox



Neurochemical alterations in lemon shark (*Negaprion brevirostris*) brains in association with brevetoxin exposure

Dong-Ha Nam^a, Douglas H. Adams^b, Leanne J. Flewelling^c, Niladri Basu^{a,*}

Science of the Total Environment 857 (2023) 159602



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Michelle L. Edwards^{a,*}, Adam M. Schaefer^{a,b}, Malcolm McFarland^a, Spencer Fire^c,
Christopher R. Perkins^d, Matthew J. Ajemian^a



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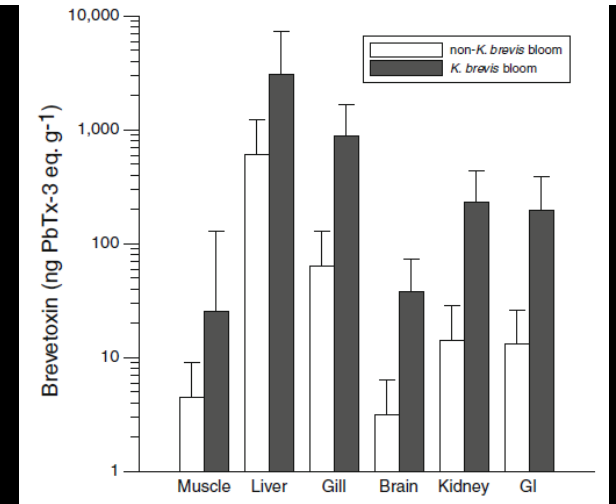
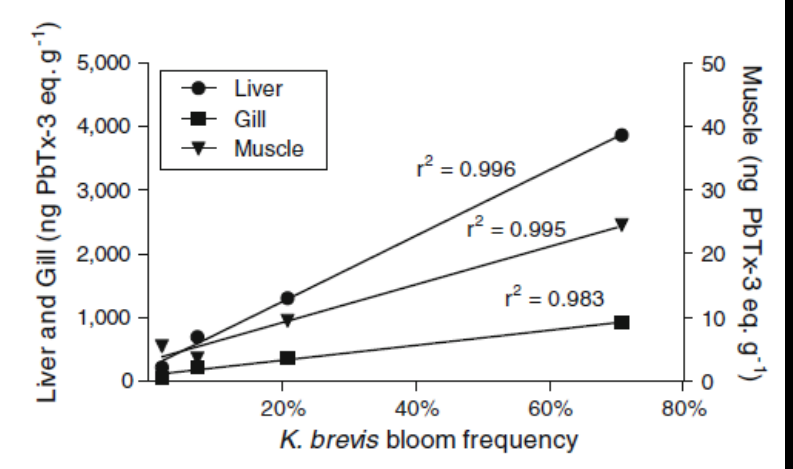
Leanne J. Flewelling · Douglas H. Adams ·
Jerome P. Naar · Karen E. Atwood · April A. Granholm ·
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strong relationships between the frequency of red tide blooms and average brevetoxins in elasmobranch tissues

brevetoxin accumulation in **live** and **red tide-killed** elasmobranchs is common during *K. brevis* blooms and non-bloom periods

Presence of brevetoxins in the absence of documented *K. brevis* blooms —————> undetected blooms?

brevetoxins in embryos raises questions about effects on reproductive success





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BREAKING

Serious crash blocks traffic on major expressway

Messenger

Mount Gambier

Dozens of dead sea animals found ashore at Eight Mile Creek in the state's South-East

Dozens of dead sea creatures have been discovered washed ashore at Eight Mile Creek in the state's South-East, puzzling both locals and authorities.

Jessica Dempster

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January 11, 2024 - 5:58PM

The Messenger

3 Comments

A large, dead shark is lying on its side on a sandy beach. The shark's body is light-colored with a pattern of darker spots. Its head is in the foreground, showing its mouth and fins. The beach is covered with seaweed and other debris. In the background, the ocean is visible under a clear sky.

Brevetoxins in sharks and rays (Chondrichthyes, Elasmobranchii) from Florida coastal waters

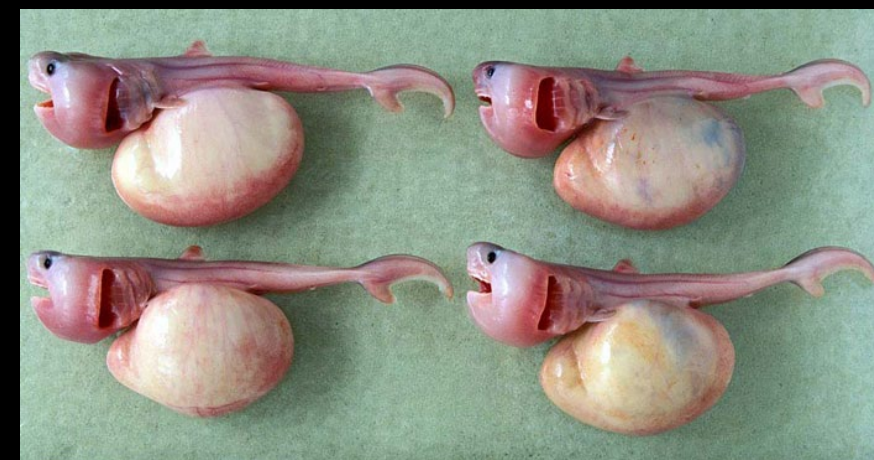
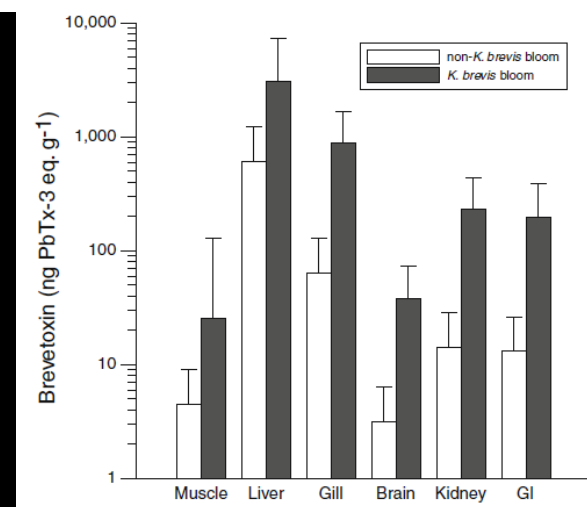
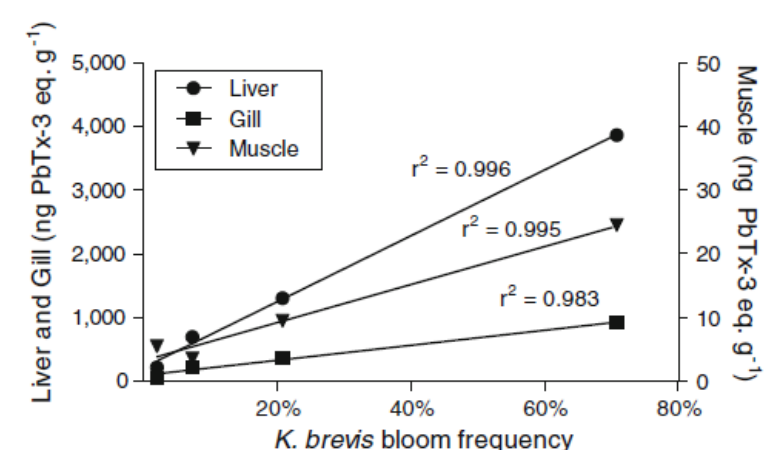
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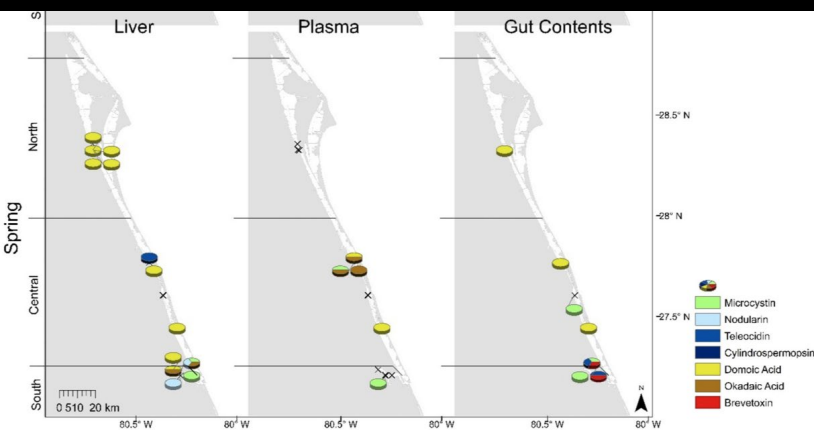
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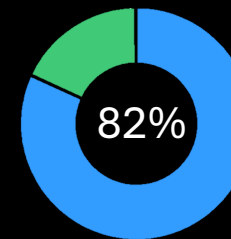


Detection of numerous phycotoxins in young bull sharks (*Carcharhinus leucas*) collected from an estuary of national significance

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disruption of key neurochemical enzymes and receptors → causing sub-clinical effects



with one or more phycotoxins (microcystin, nodularin, teleocidin, cylindrospermopsin, domoic acid, okadaic acid, and brevetoxin)



highest concentrations in gut content

→ dietary exposure = important mechanism of toxin transfer



80+ countries

800+ participants

SHARKS INTERNATIONAL

A large group of people, mostly young adults, are posing for a group photo in front of a modern building with a glass facade and a central entrance. The group is arranged in many rows, with some people sitting on the ground in the front and others standing behind them. Many of the people are wearing blue lanyards with badges. The building behind them has a prominent glass entrance and is flanked by greenery. The sky is clear and blue.

SRI LANKA 2026

~30 devil ray strandings in the Mediterranean

20 so far this spring: Experts confused over unusual manta ray strandings on Spanish beaches

ARCHIVED ARTICLE -

Experts are investigating why these endangered marine animals are turning up dead along the Mediterranean coast in such high numbers



Marine biologists and conservationists are expressing growing concern over an unusually high number of manta ray strandings this spring along [Spain's](#) Mediterranean coast. Twenty specimens of *Mobula mobular*, a species classified as endangered, have been found beached in Catalonia, [Valencia](#), [Andalucía](#) and the Balearic Islands.



Event in progress



SA Marine Mortality Events 2025 - 2026

About

Members  683

Data gathering for South Australian major marine mortality events. This project is set to automatically add marine vertebrates and macroinvertebrates annotated 'dead' from Feb 2025 onwards.

While some unrelated records are

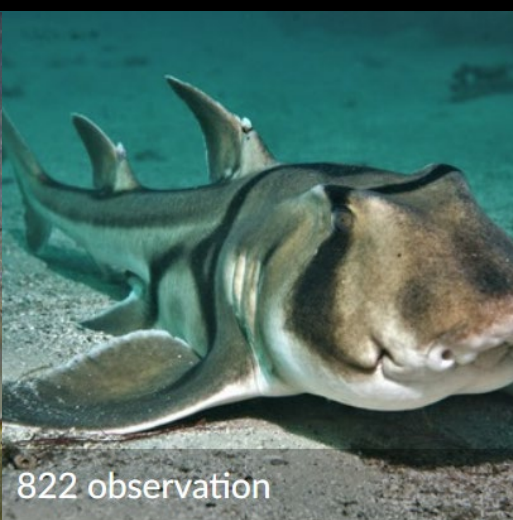
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 [Project Journal](#)



2352 observation

Southern Fiddler
Trygonorrhina dumerilii



822 observation

Port Jackson Shark
Heterodontus portusjacksoni



504 observation

Western Shovelnose Ray
Aptychotrema vincentiana



235 observation

Short-tail Stingray
Bathytoshia brevicaudata



52 observation

Southern Eagle Ray
Myliobatis tenuicaudata

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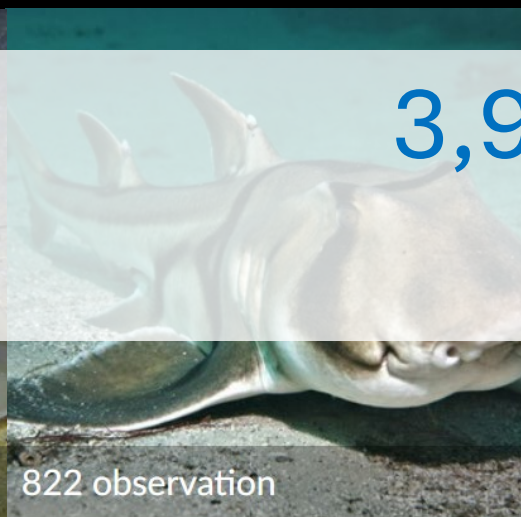
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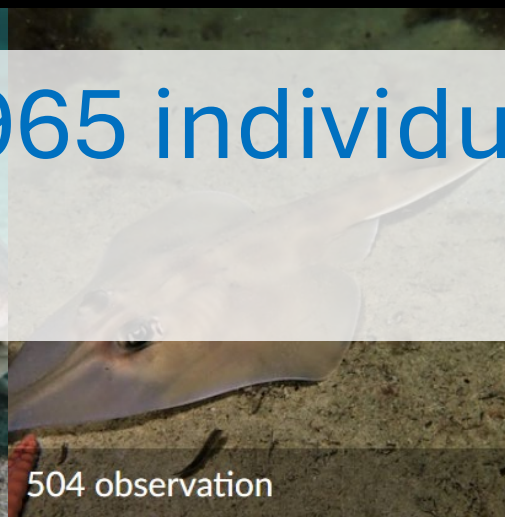
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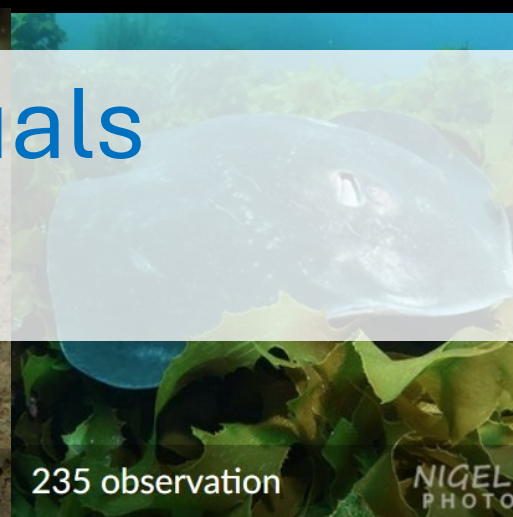
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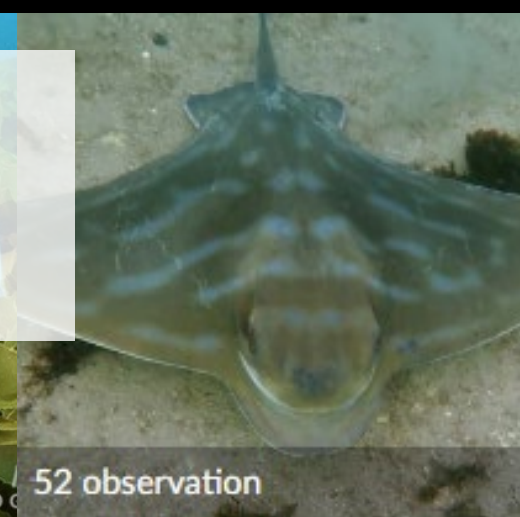
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3,965 individuals

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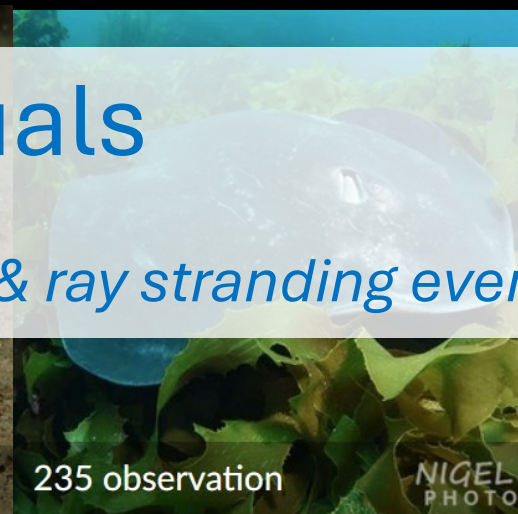
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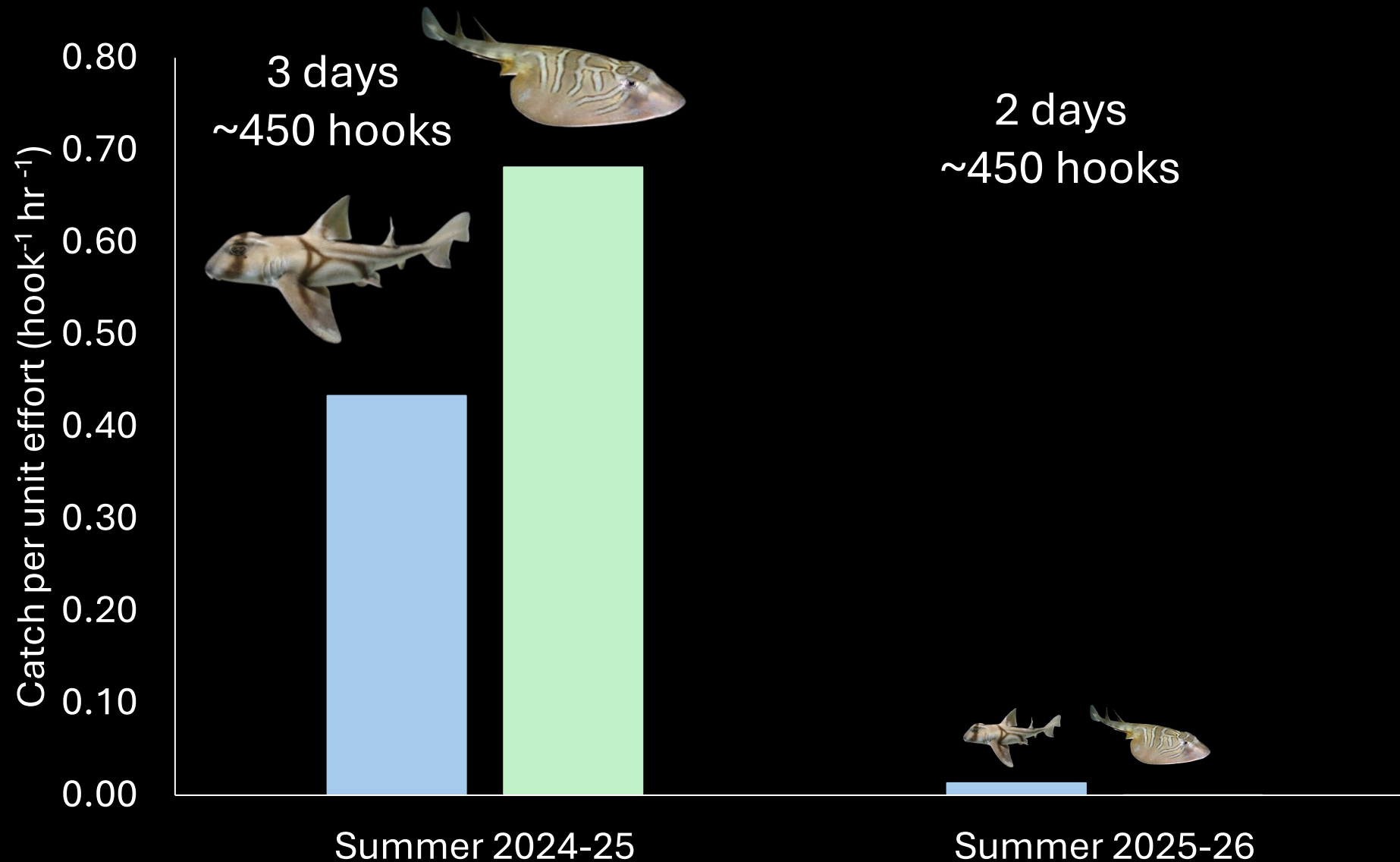
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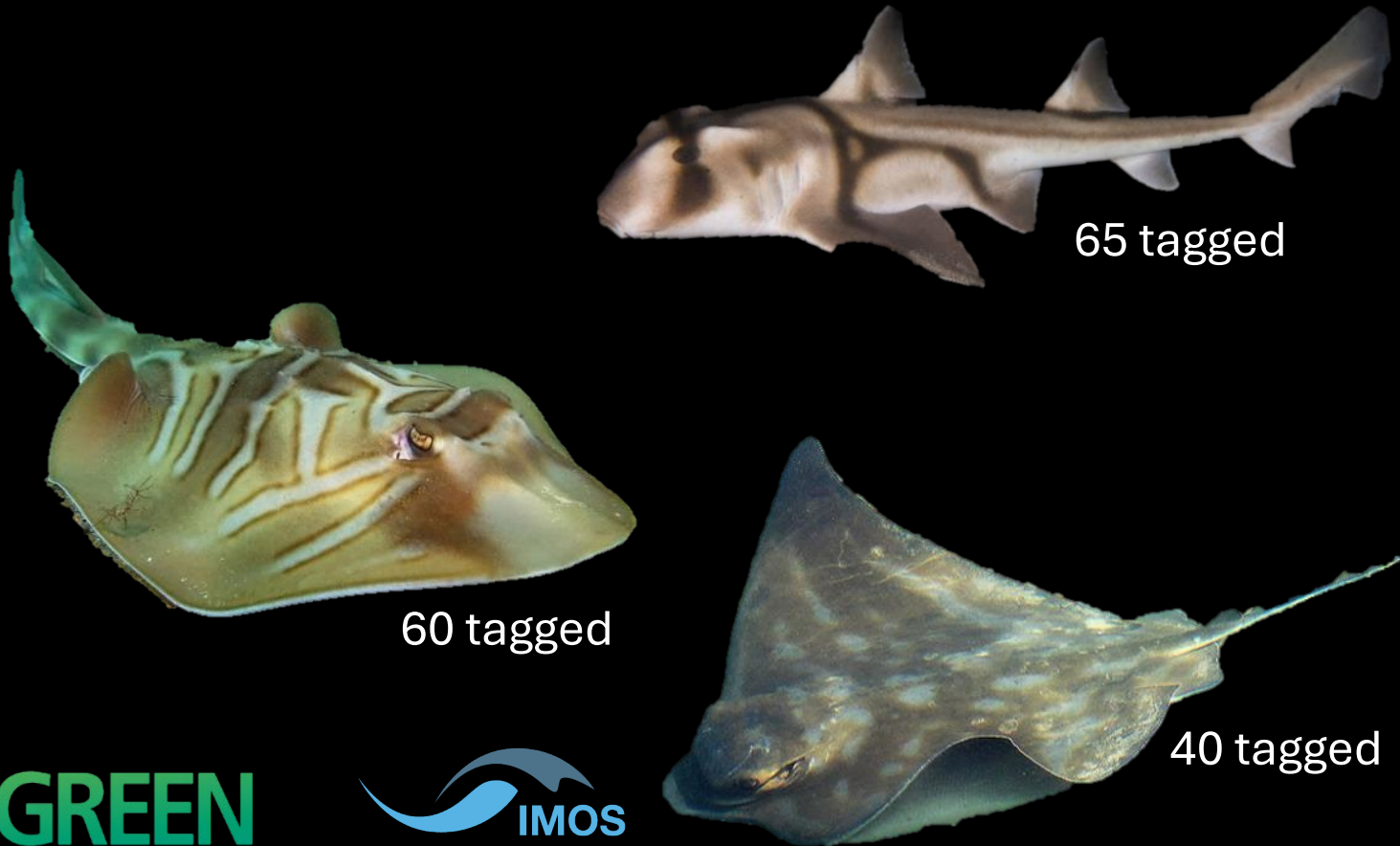
130 times more than the largest shark& ray stranding event

Fisheries-independent & dependent survey



same with
prawn trawl
bycatch

Acoustic tracking along Adelaide metro beaches



65 tagged

60 tagged

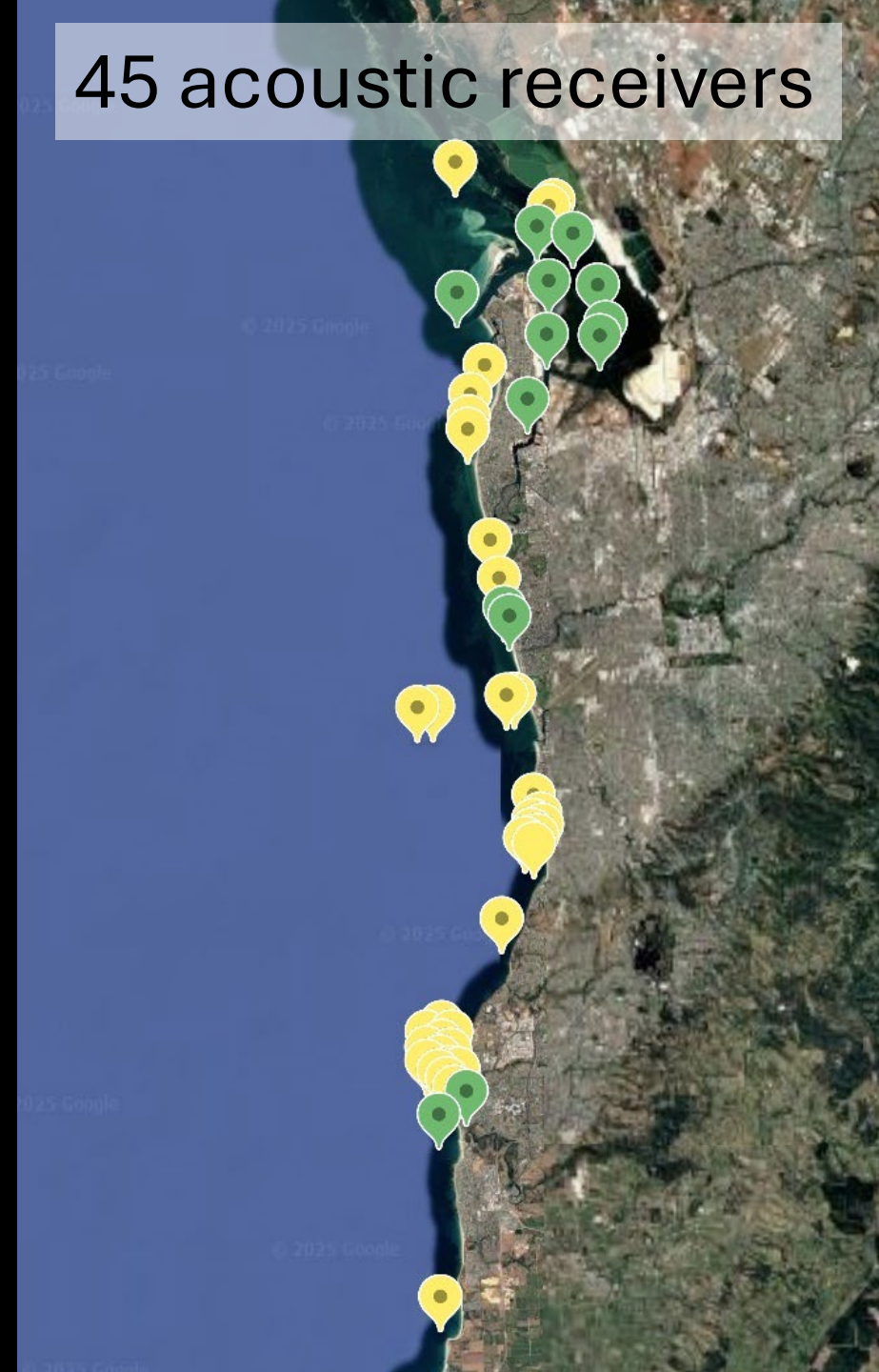
40 tagged

**GREEN
ADELAIDE**

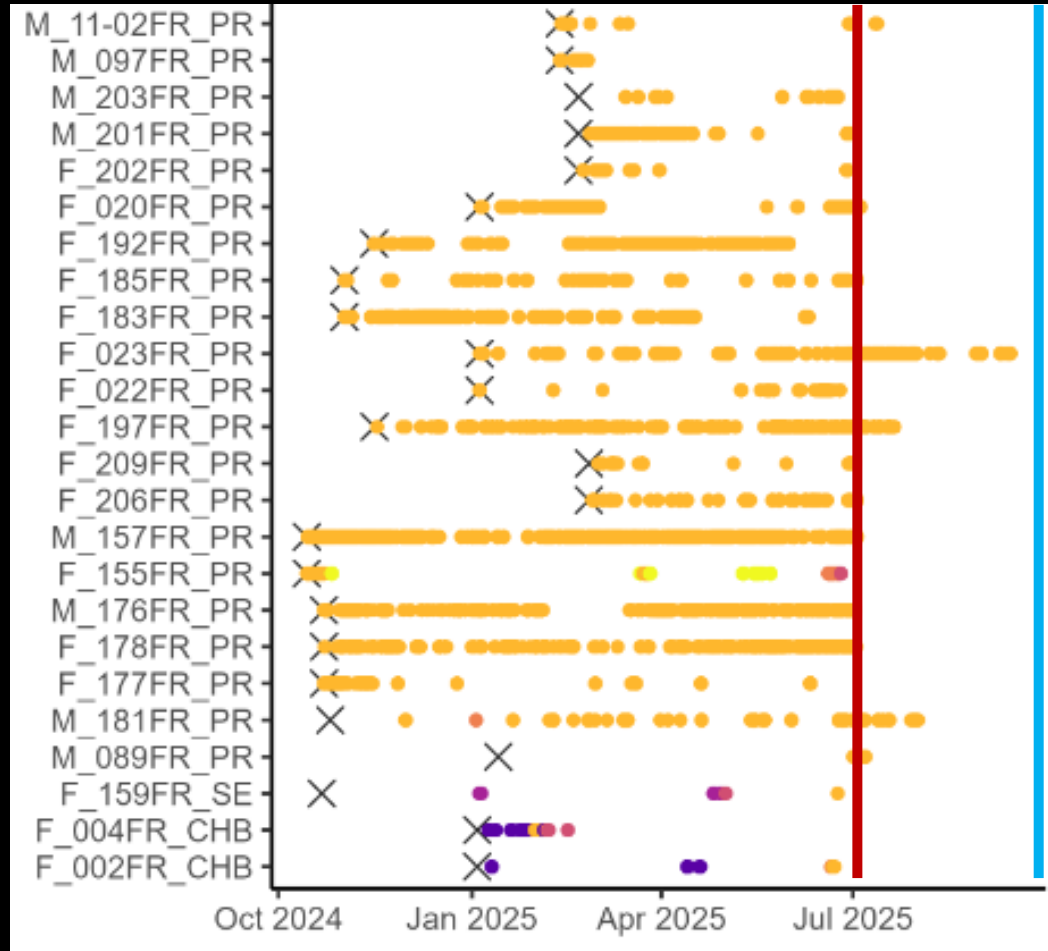


Integrated Marine
Observing System

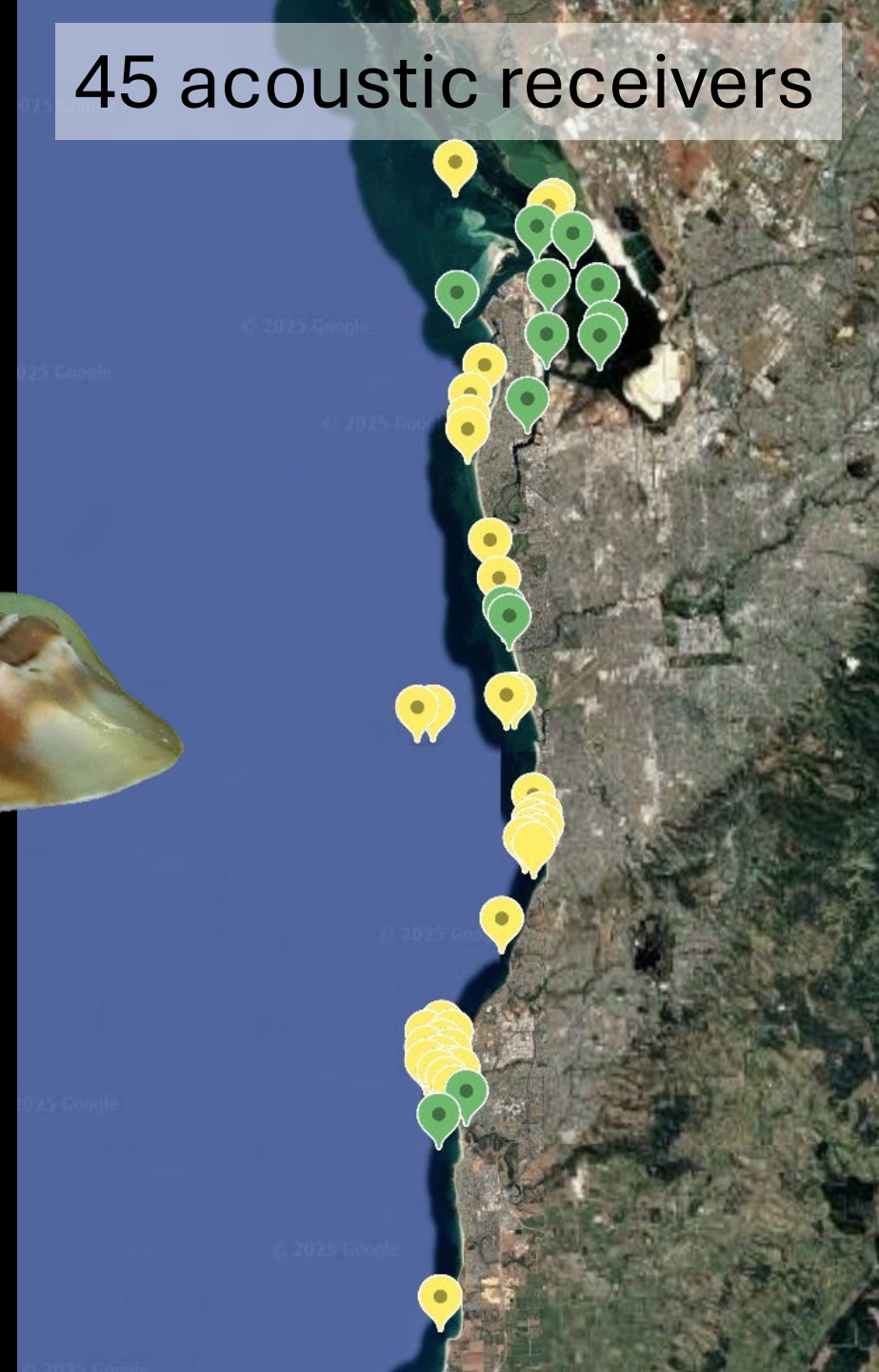
45 acoustic receivers



Acoustic tracking along Adelaide metro beaches



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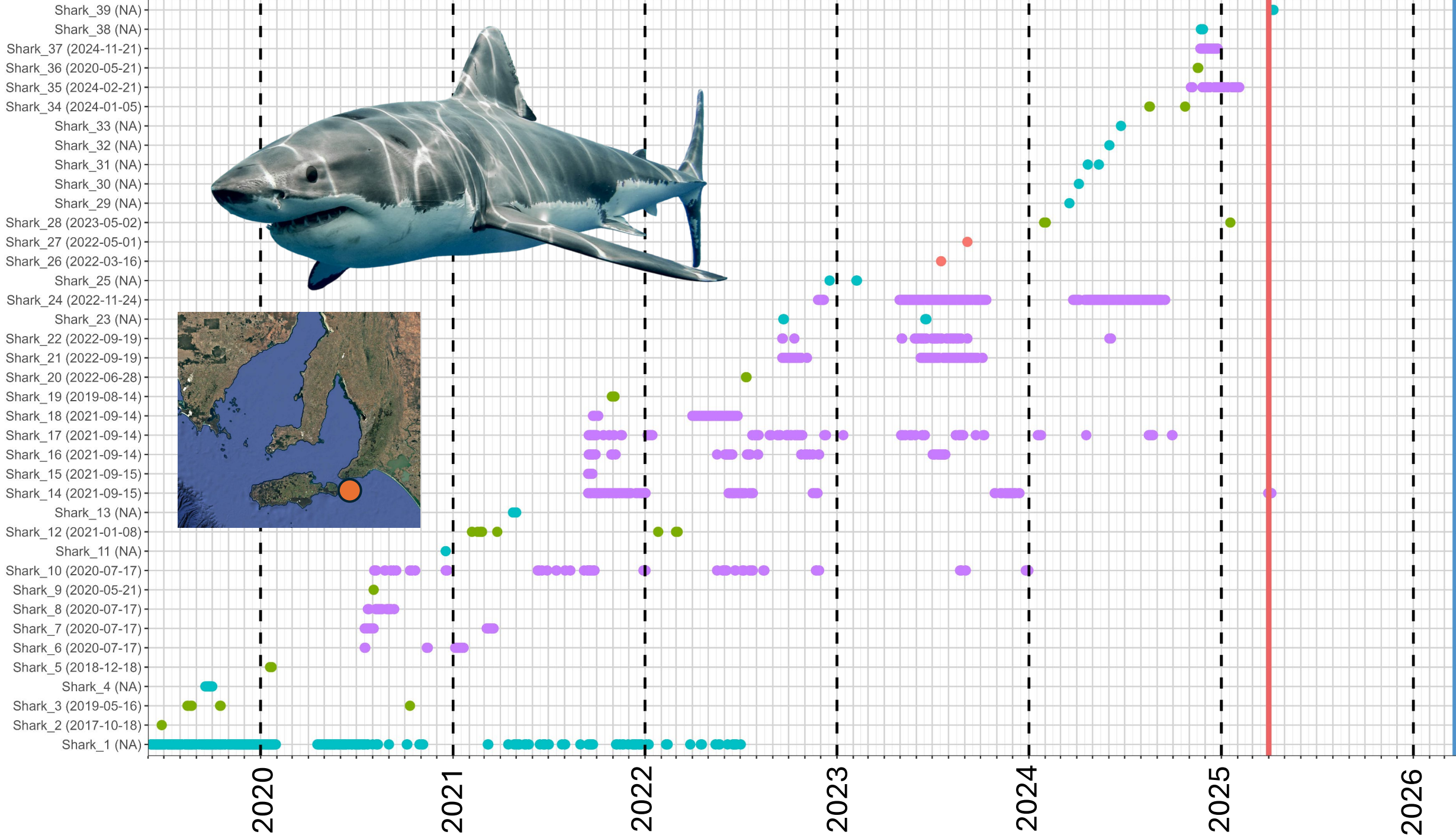


9 white shark mortalities

brevetoxins in gill or liver tissue



Shark ID



Egg case survey

Horseshoe Reef, Lasseter Reef, Edithburg



Priority species

- Coastal stingaree
- Cobbler wobbegong
- Pygmy thornback skate
- Southern fiddler ray
- Western shovelnose ray
- White shark
- Port Jackson shark
- Melbourne skate
- Rusty carpetshark
- Gulf catshark
- Varied carpetshark
- Smooth stingray
- Australian angel shark
- Coffin ray
- Western shovelnose stingaree
- Bronze whaler



Harmful Algal Blooms

Marine Biodiversity Risk, Impact Assessment,
Recovery and Restoration Priorities

Synthesis Report

Five Expert Workshops held in Adelaide in 2025

Prepared for the South Australian Department for Environment and Water

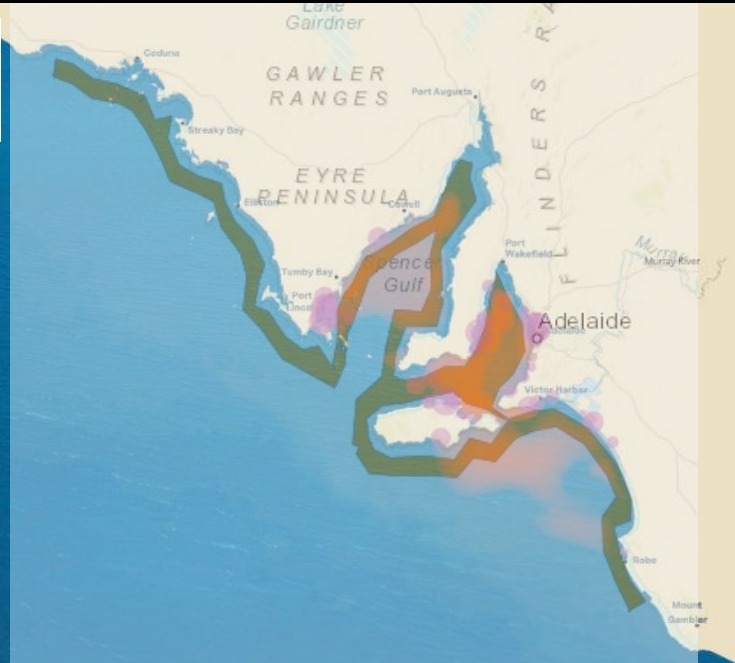
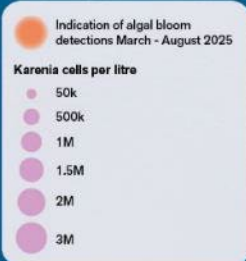


local depletion vs. species-level impacts

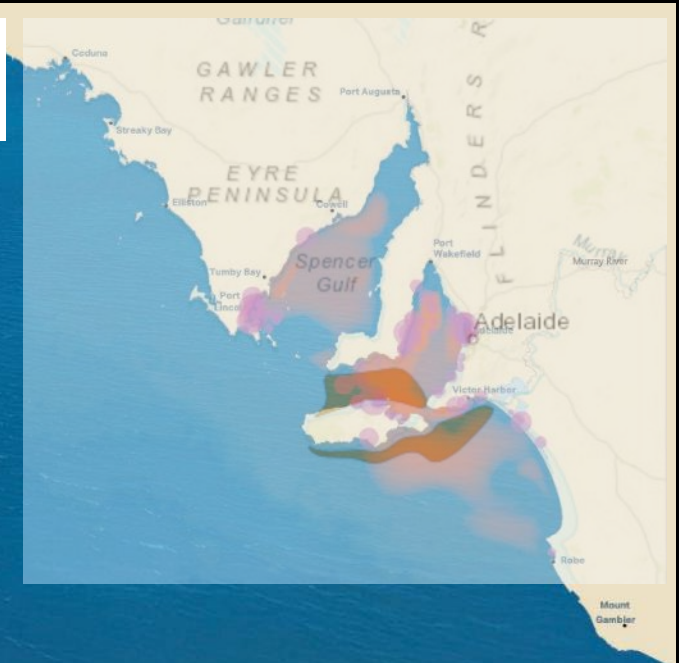
endemic, low abundance, threatened, range-restricted species



Coastal Stingaree *Urolophus orarius*

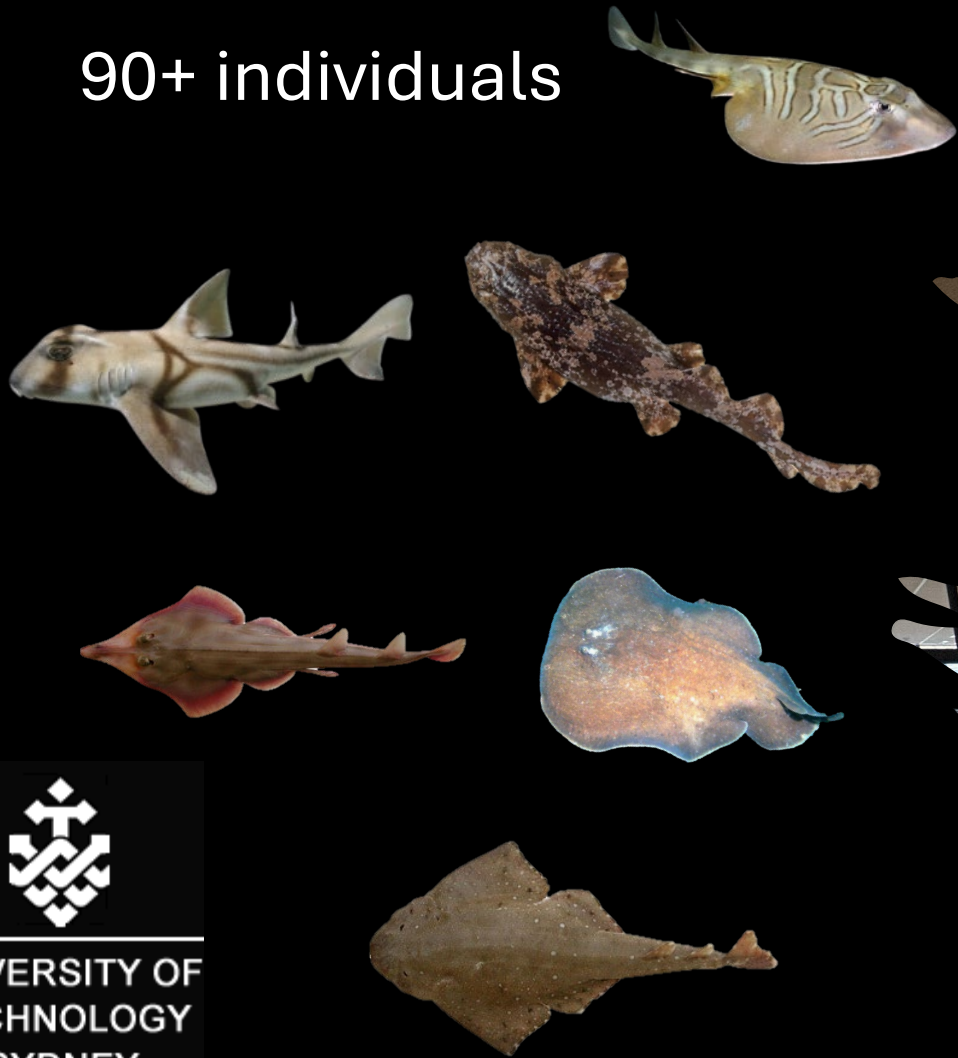


Pygmy Thornback Skate *Dentiraja flindersi*



Toxin analyses

90+ individuals



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Serious crash blocks traffic on major expressway

Messenger

Mount Gambier

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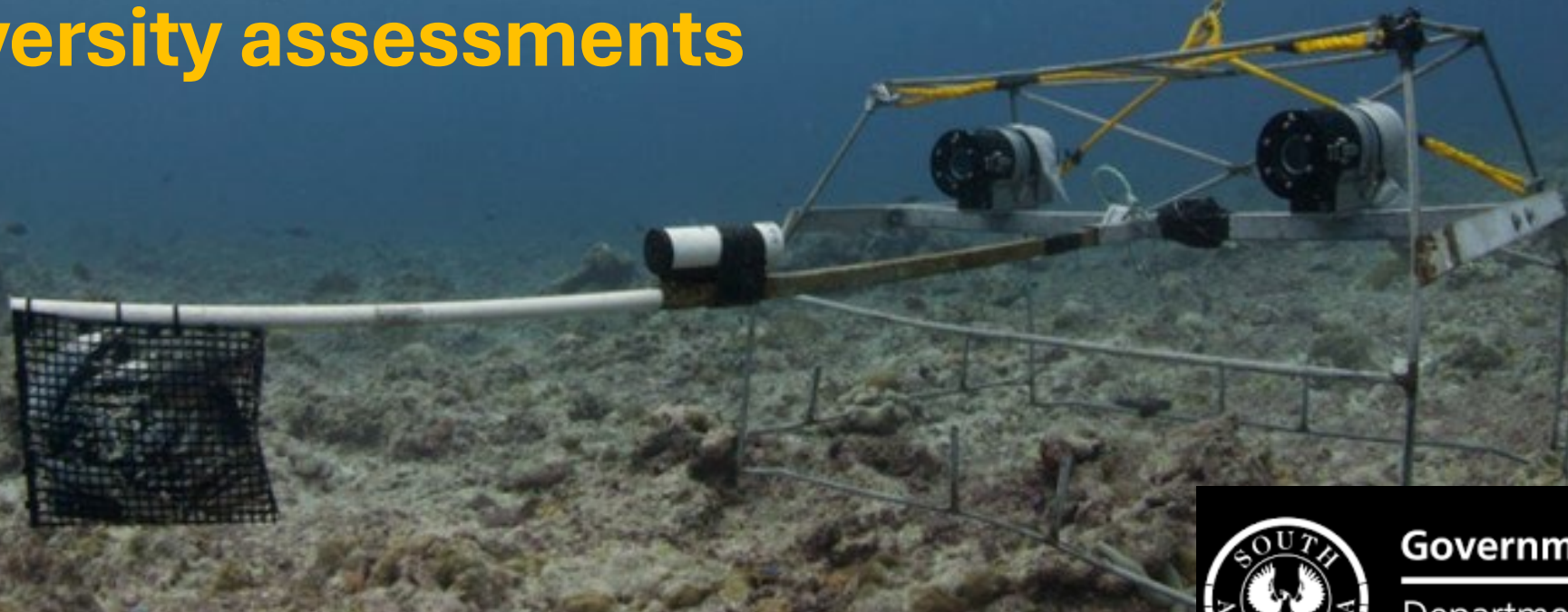
January 11, 2024 - 5:58PM

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A large, dead shark is lying on a sandy beach, its body partially covered in seaweed. The shark's head is in the foreground, showing its mouth and fins. The beach is wide and sandy, with scattered seaweed and debris. In the background, the ocean meets the shore under a clear sky.

Biodiversity assessments



Government of South Australia

Department for Environment
and Water

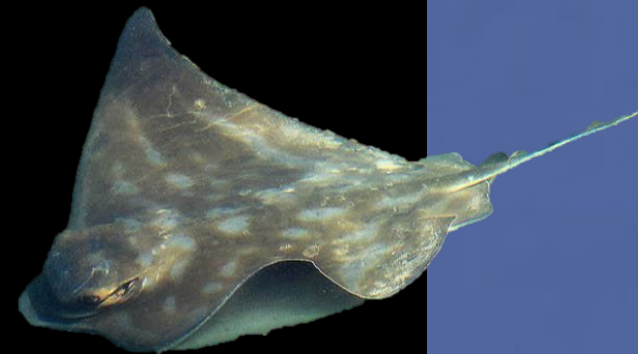
Acoustic tracking along Adelaide metro beaches

residency, space use, displacement

change-point analysis (behavioural change vs death)

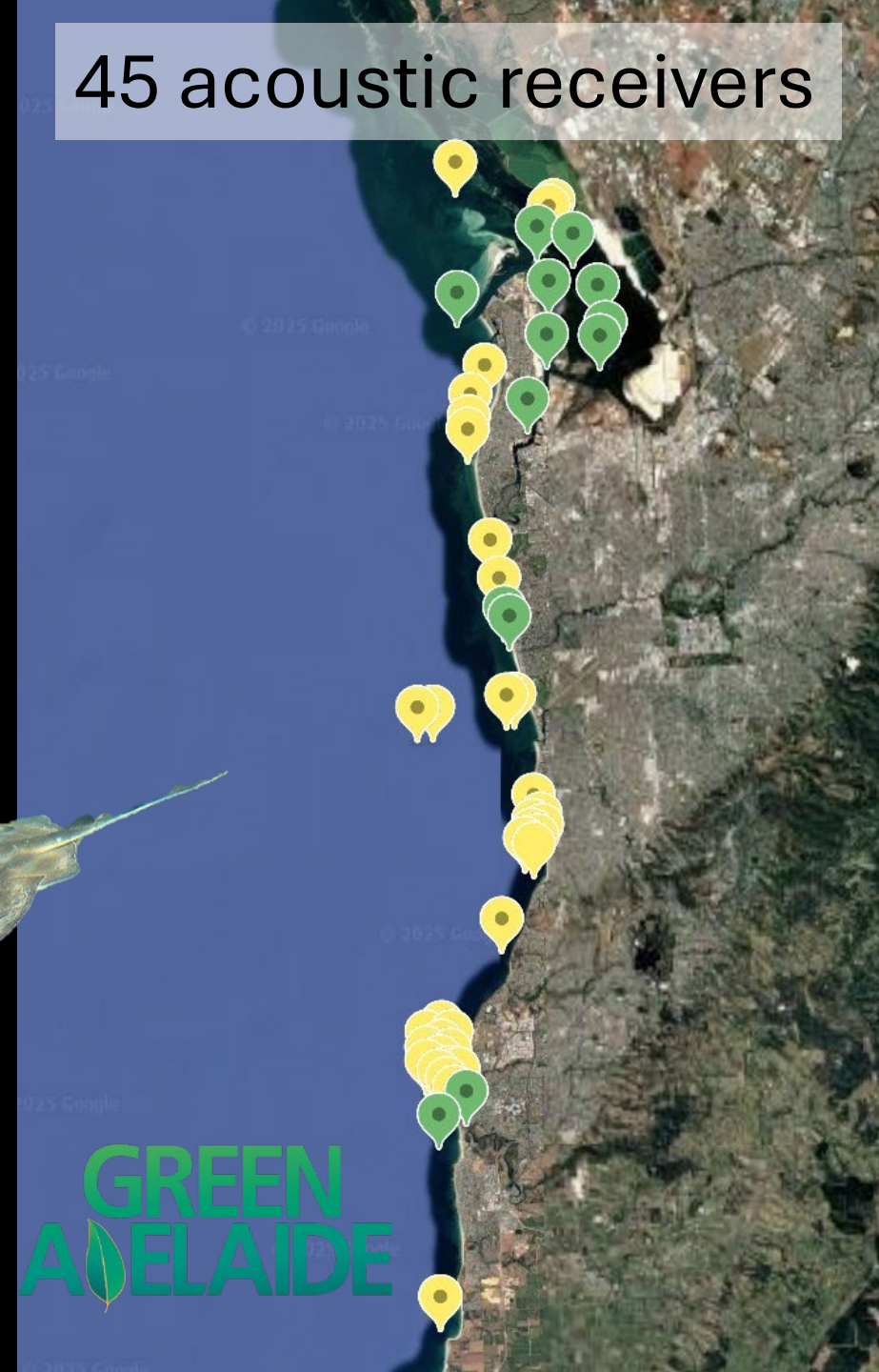
emigration & immigration

monitoring recovery and rewilding



 **IMOS**
Integrated **Marine**
Observing System

45 acoustic receivers



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ADELAIDE



Release of captive Port Jackson sharks

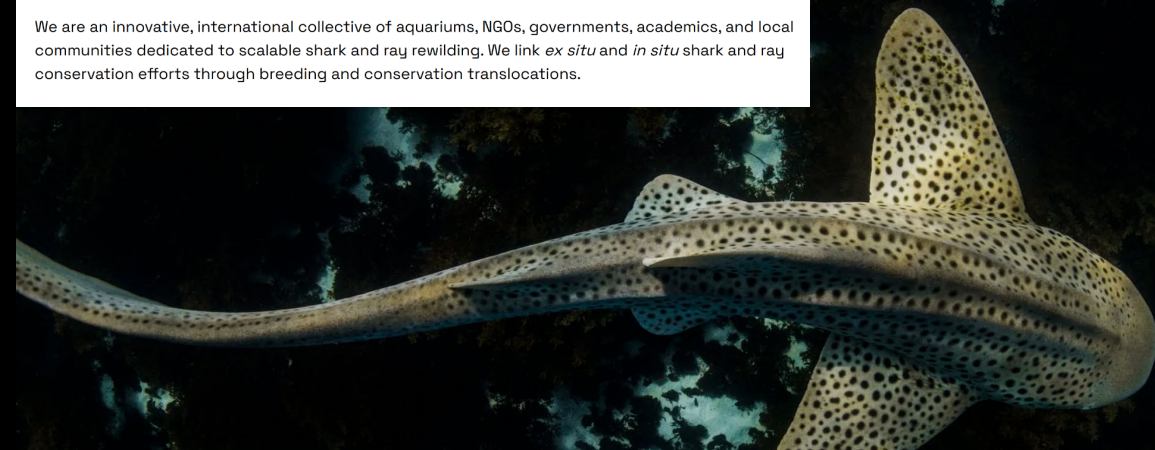
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Our Mission

We are an innovative, international collective of aquariums, NGOs, governments, academics, and local communities dedicated to scalable shark and ray rewilding. We link *ex situ* and *in situ* shark and ray conservation efforts through breeding and conservation translocations.





Take home messages

Largest shark & ray mass mortality

Mechanisms unknown

Impact unknown, but severe

**Concerns for local depletion, threatened species,
and endemic, range-restricted species**