



National Environmental  
Science Program

MARINE BIODIVERSITY *hub*



## CSIRO white shark research

April 2016

CSIRO Oceans & Atmosphere

NSW DPI, UTAS, AIMS, SARDI, Flinders Uni, UTS, Fisheries WA, IMOS

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## Current research focus

### Long-term components:

- **Biology (age, growth, reproduction)**
- **Movement patterns (when they go and when)**
- **Population structure – how many populations?**
- **Where and how to count them (is it possible?)**

**Develop and trial new technology and techniques with partner agencies**

### Main current focus:

**Develop ways to estimate population size and trends across Australasian region**

**Understand movement patterns and habitat use**





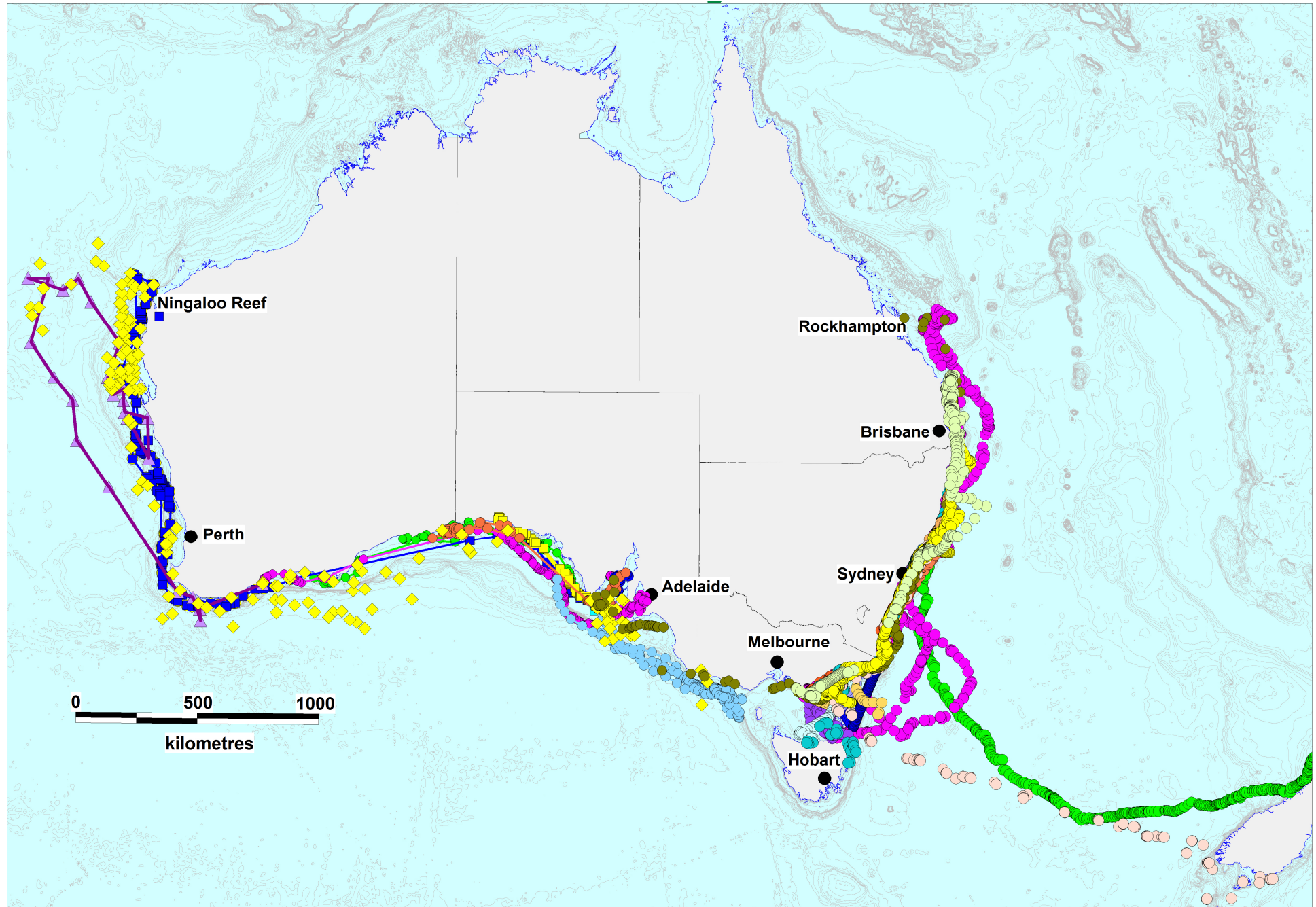
# Tagging white sharks close to shore in NSW

**Movie**

**Long-term collaboration with NSW DPI (2007-2015)**

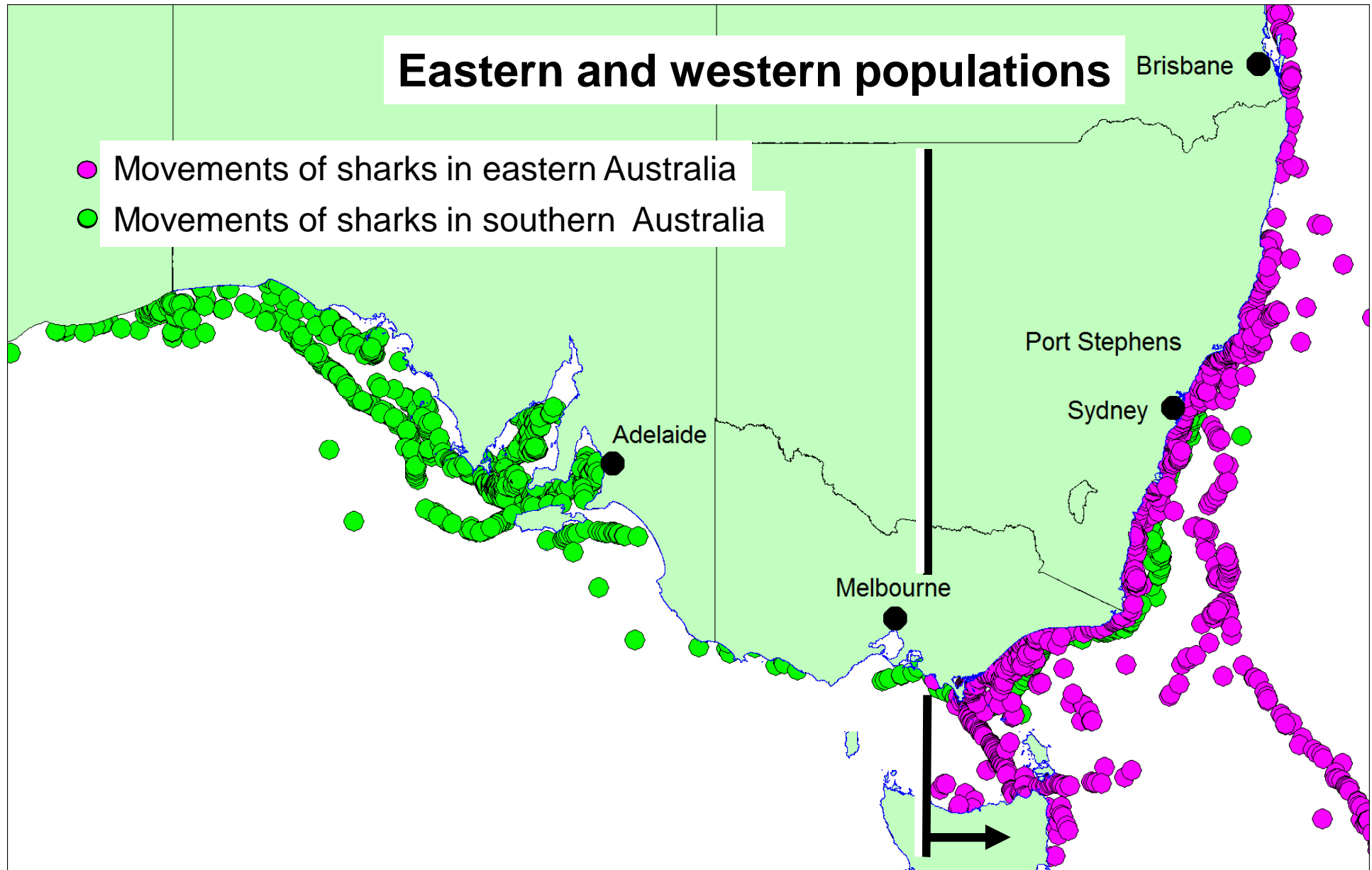
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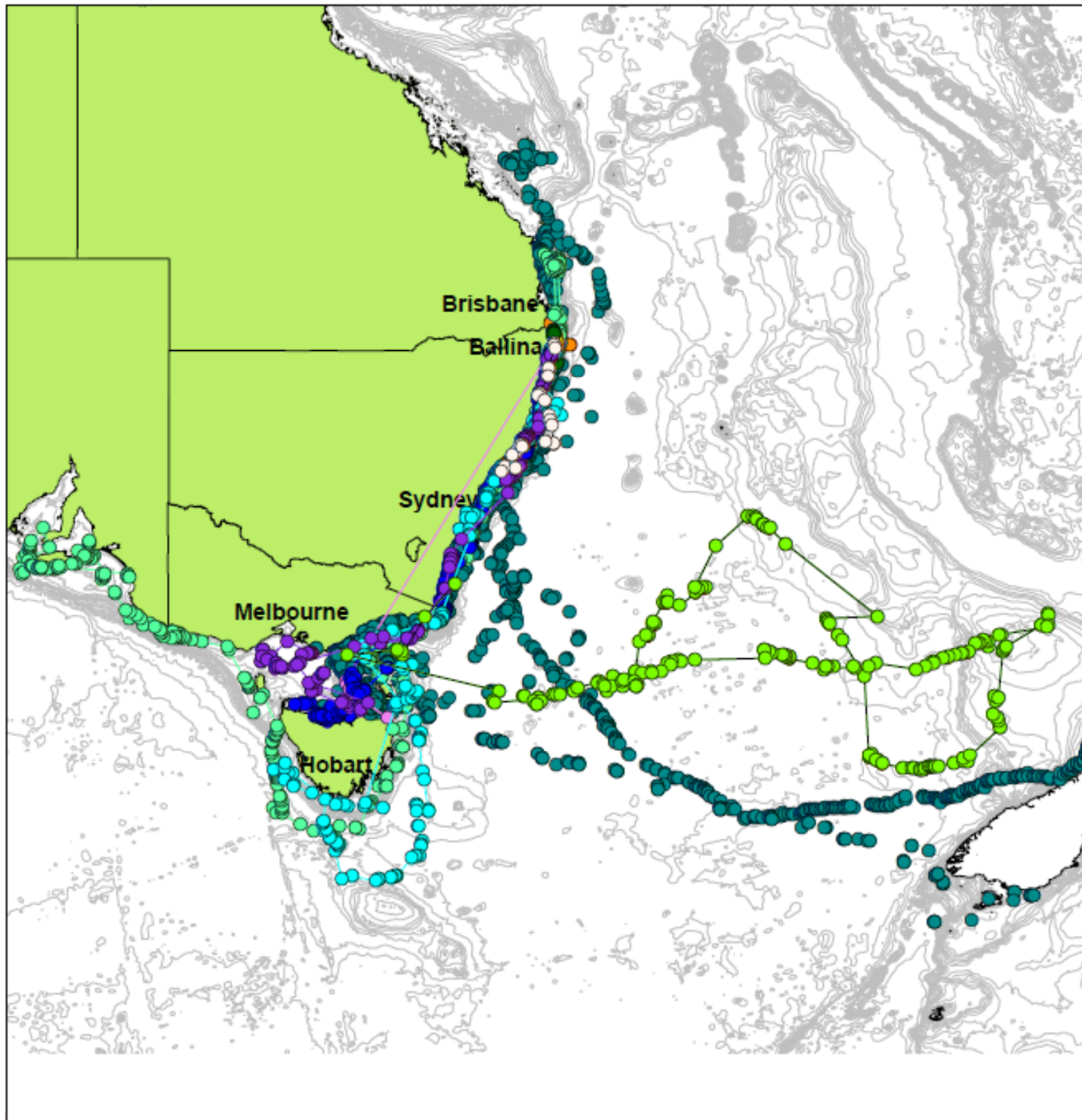
# Movement patterns – satellite tracking





## Population structure – Australia (genetics + tags)





All previously tracked  
white sharks

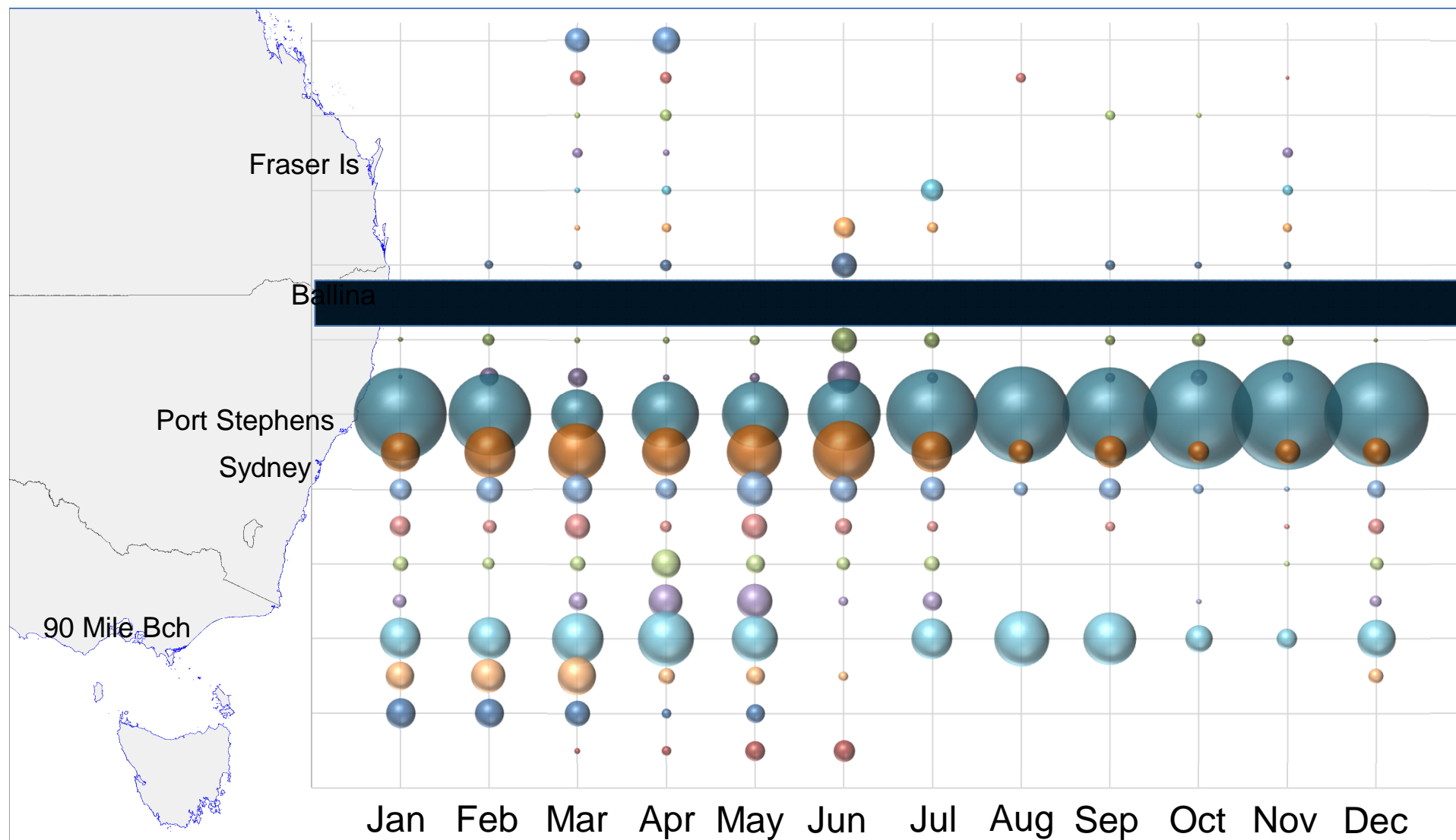
Mainly confined to  
east coast + NZ

GBR to Tasmania

Ballina-tagged  
sharks – nothing  
unusual about their  
movements..

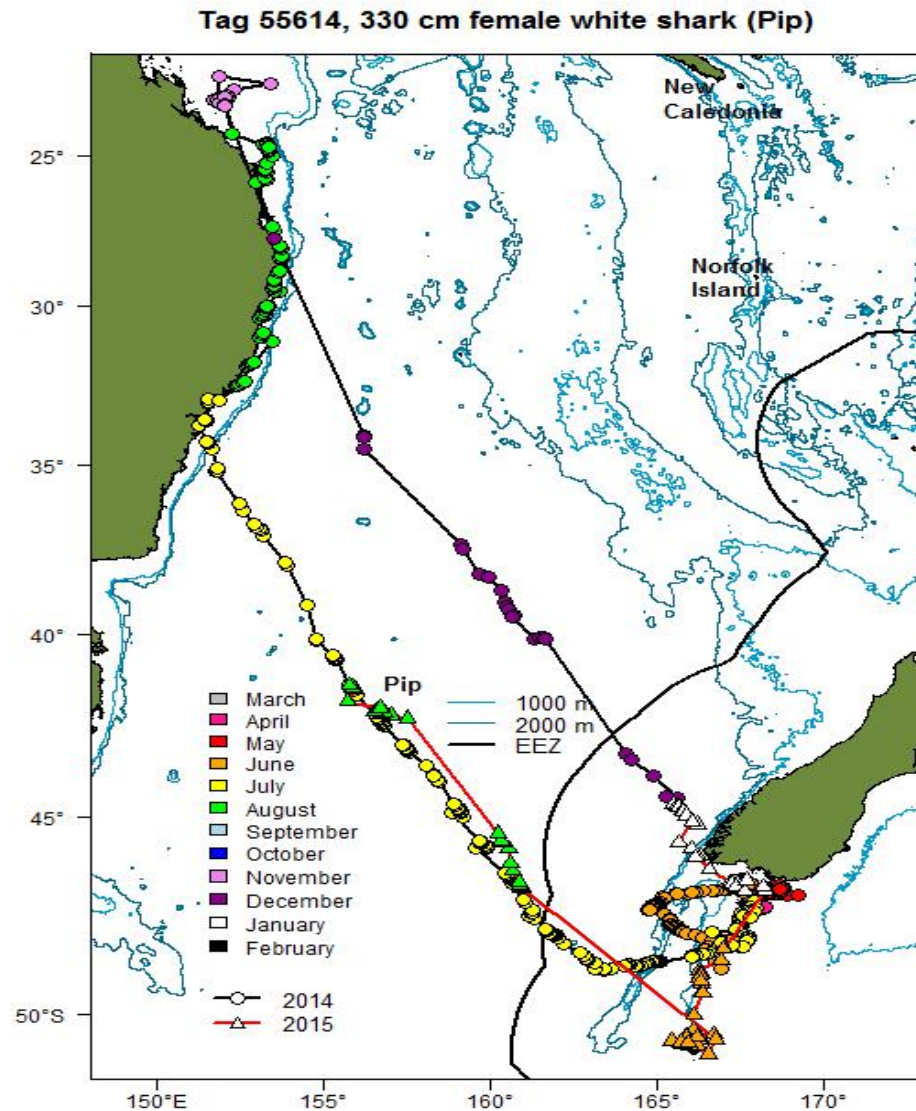


# East Coast – monthly distribution



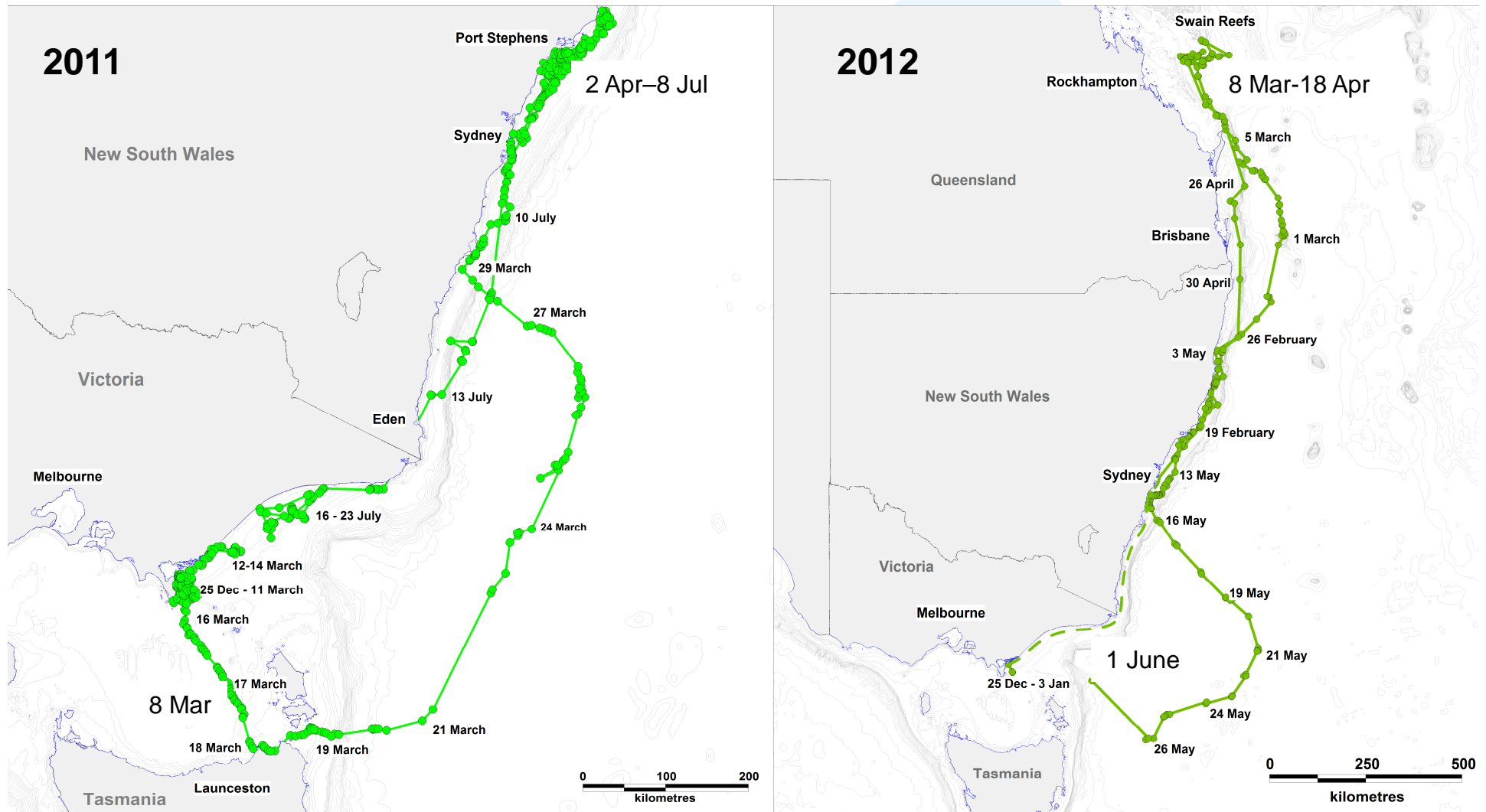


# Sharing white sharks with New Zealand

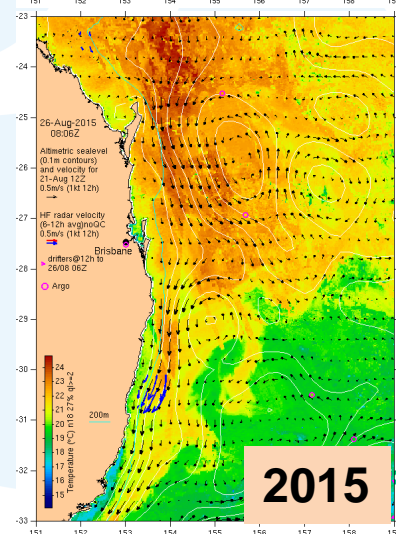
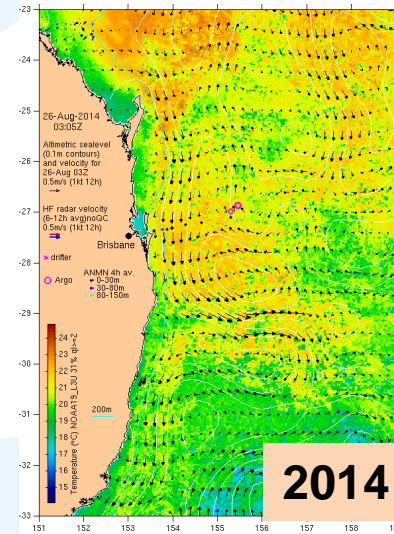
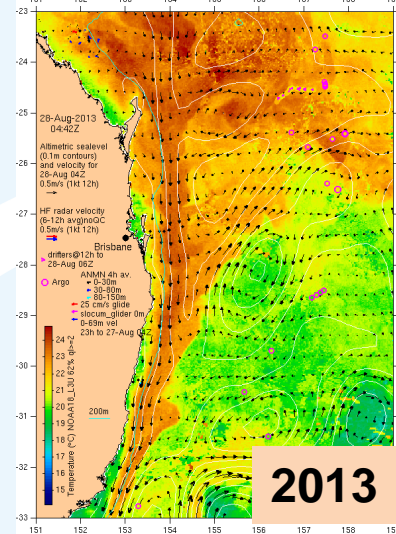
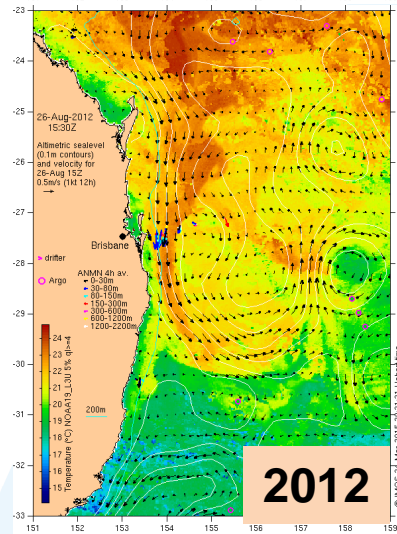
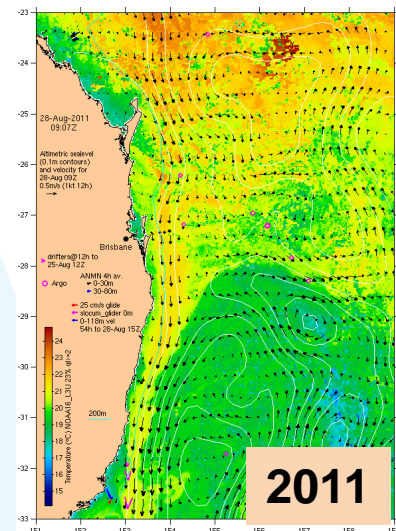
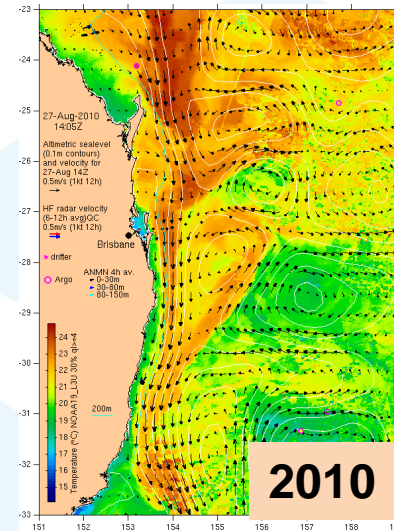
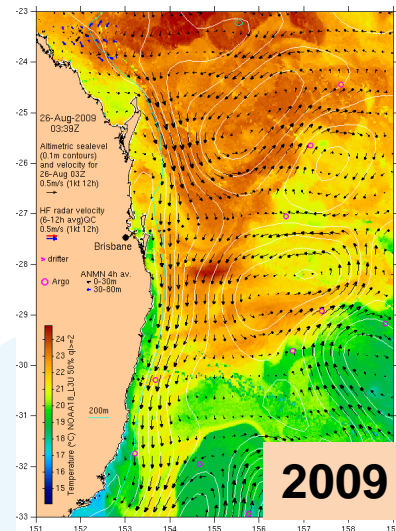
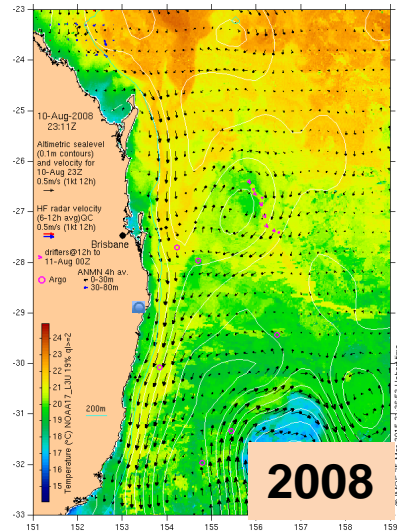


White shark tagged in New Zealand  
NIWA + DOC

# Individual movement can vary between years

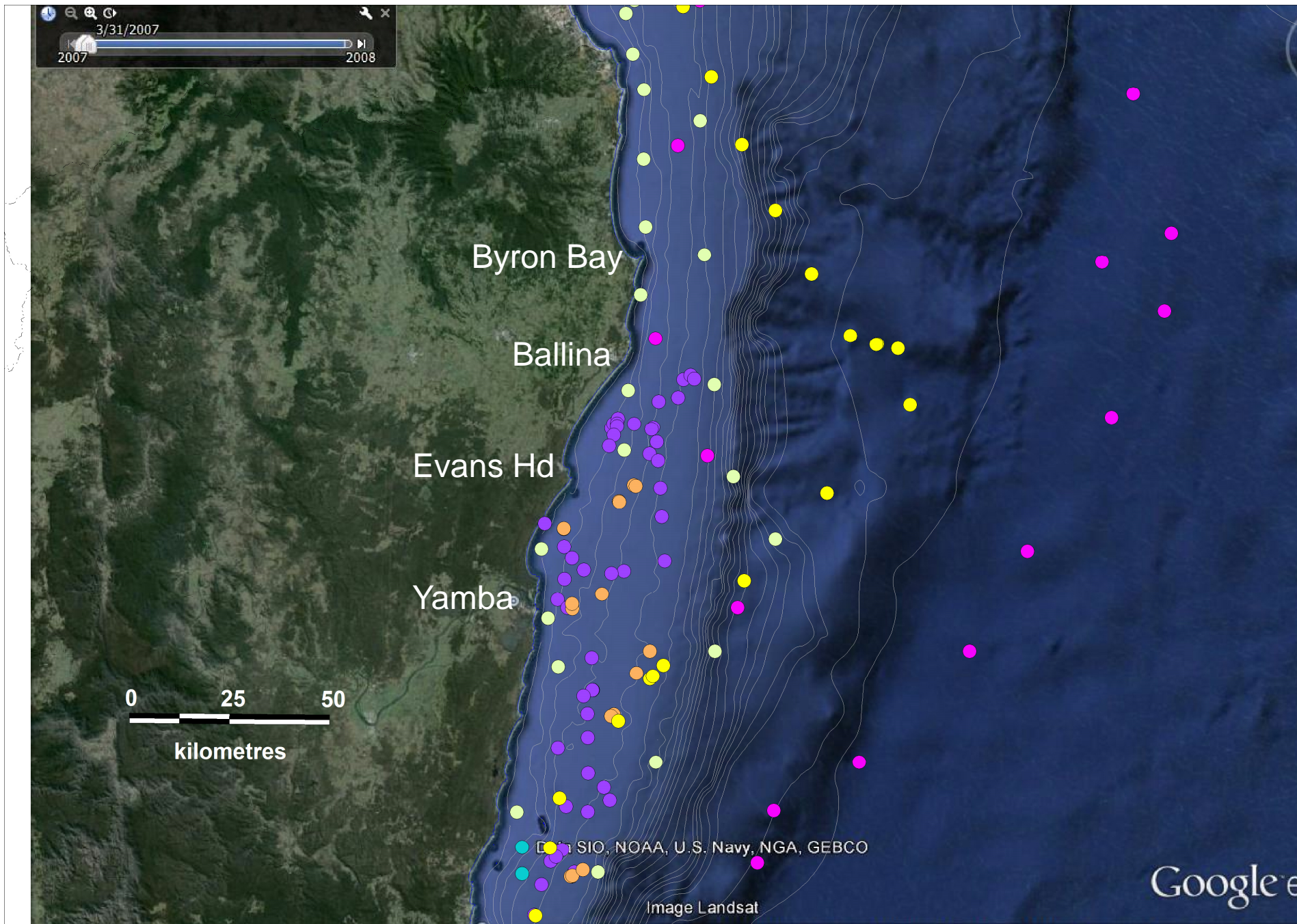


# Sea surface temperatures 2008 - 2015



Every year is different

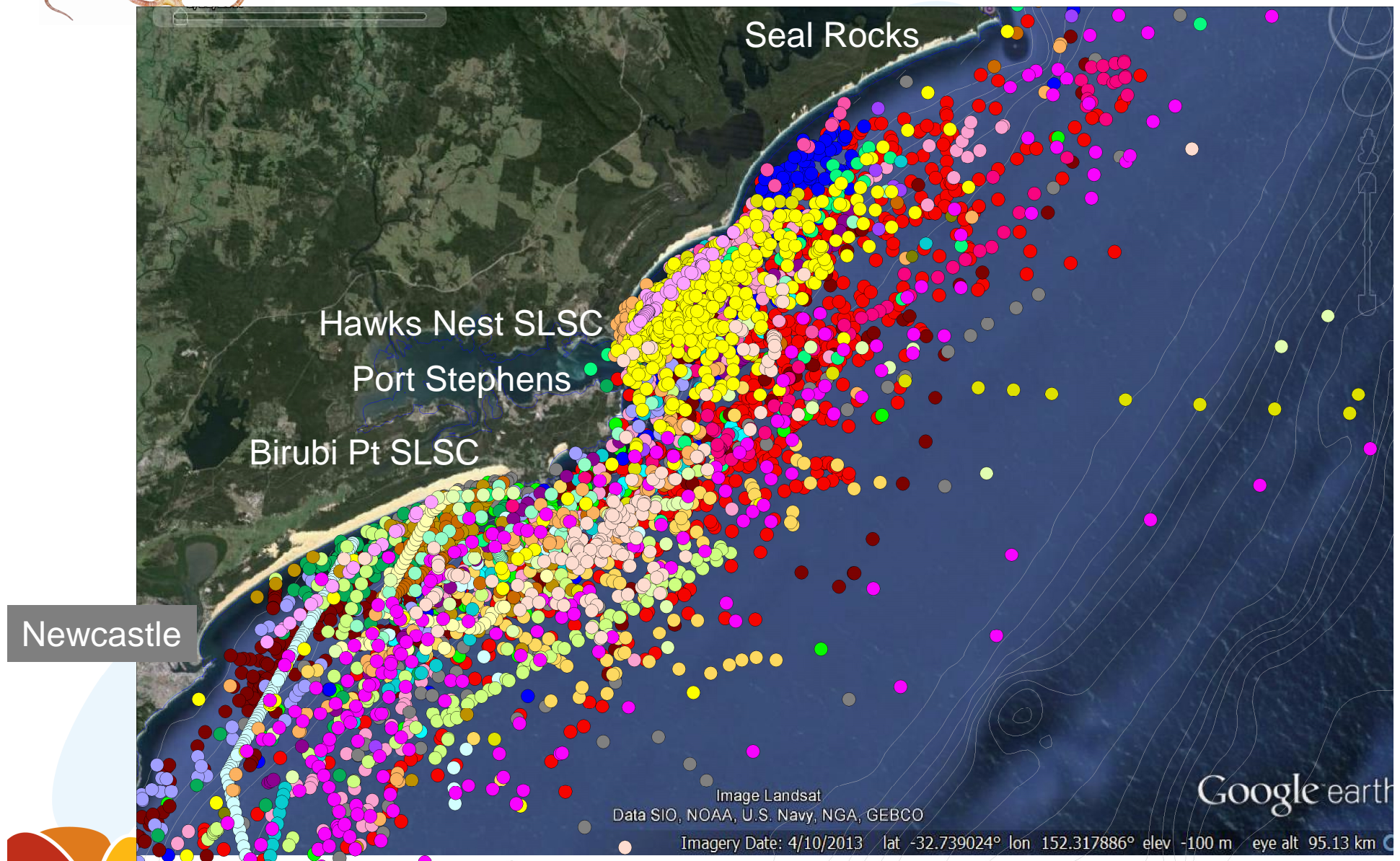








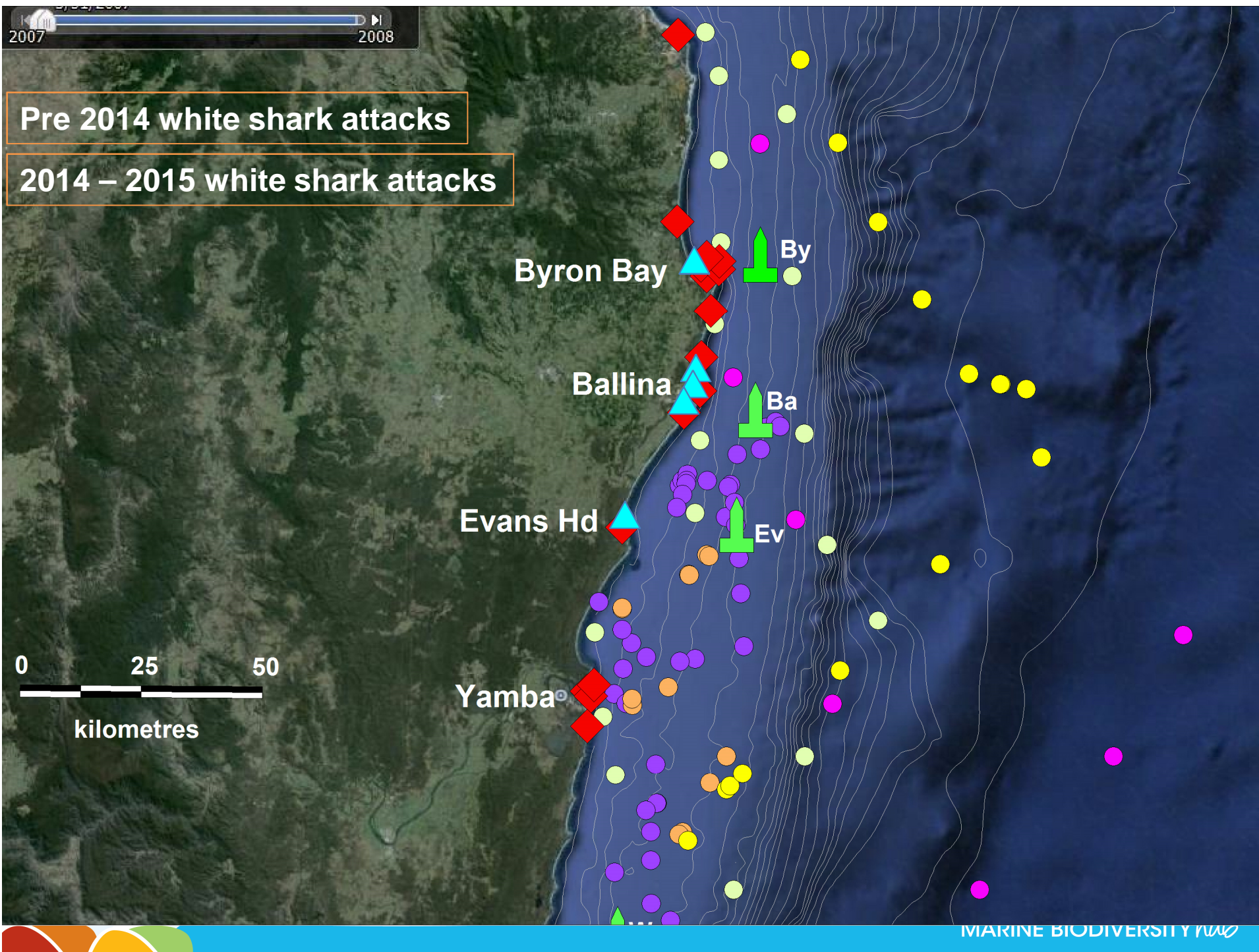
## Port Stephens coastal nursery area





Pre 2014 white shark attacks

2014 – 2015 white shark attacks







**2.3 m male white shark**



# Seeing sharks close to shore



**Sharks not always easy to see**

**Sharks not always in depths where you can see them**





# What commonly happens when sharks and people meet?



A blue-tinted underwater scene featuring several large sharks swimming. One shark is prominently in the foreground, swimming towards the left. Another is in the upper center, and a third is on the right, partially visible. Several smaller fish are scattered throughout the water. The text is overlaid on the left side of the image.

**But how do we count them?**

**Unfortunately, there are no conventional ways  
to do so....**



Who's your daddy? – or mum..



DNA fingerprinting of sharks



Every shark has (or had) two parents – natural genetic tag

MUM + DAD

MUM + DAD

MUM + DAD

What percentage of the population is related?

Small population – more sampled juveniles will be related

Large population – few sampled juveniles will be related



## Current and future research

- Finalise estimates of east coast population size
- Establish ways to monitor trend
- Estimate 'western' population size – national scale estimates of total abundance







**Thank you**

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