

# Sound in the down-under sea

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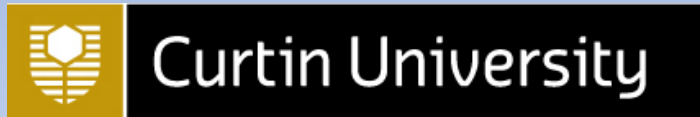
Chong Wei

Iain Parnum

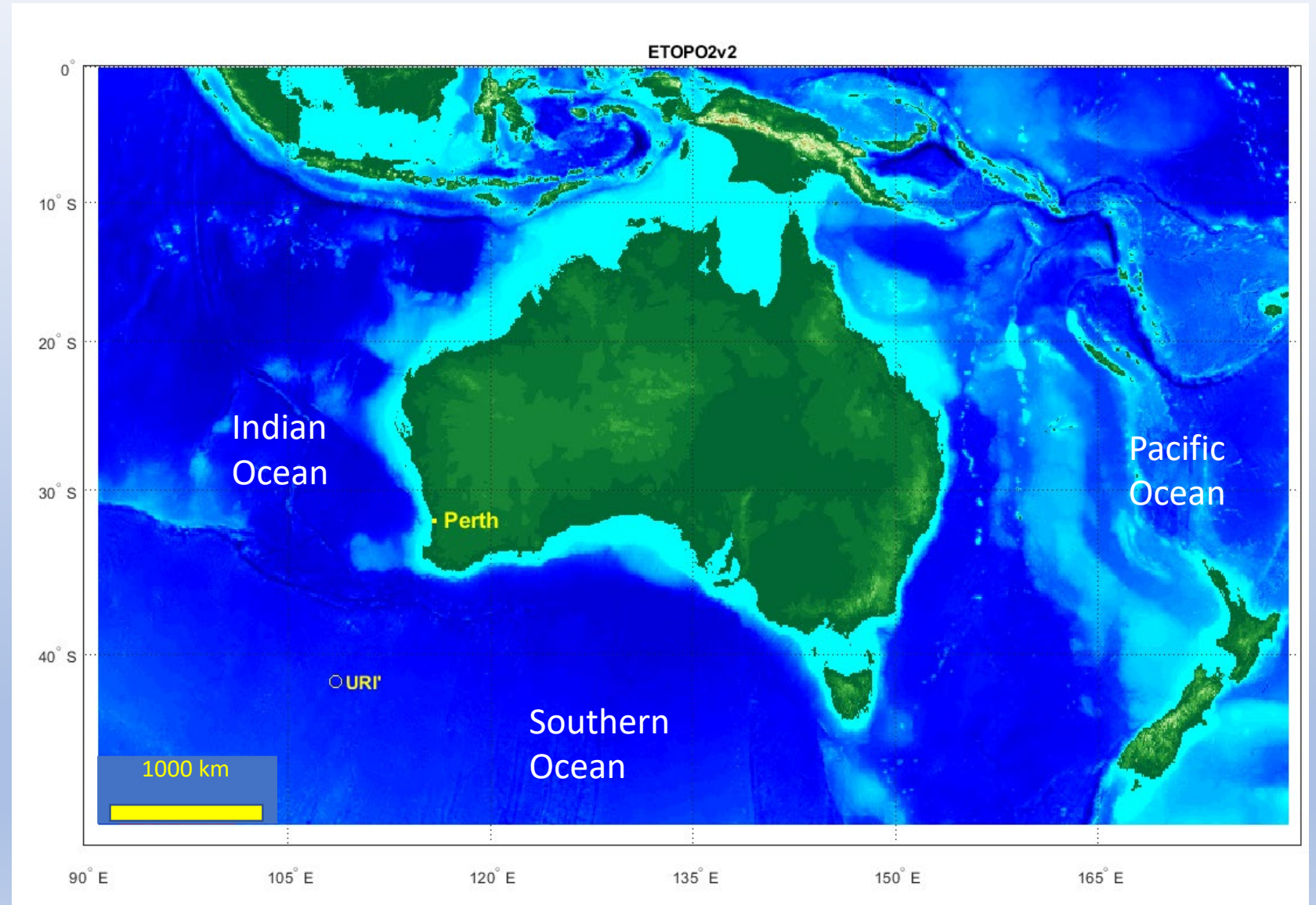
Dan Wilkes

et. al.

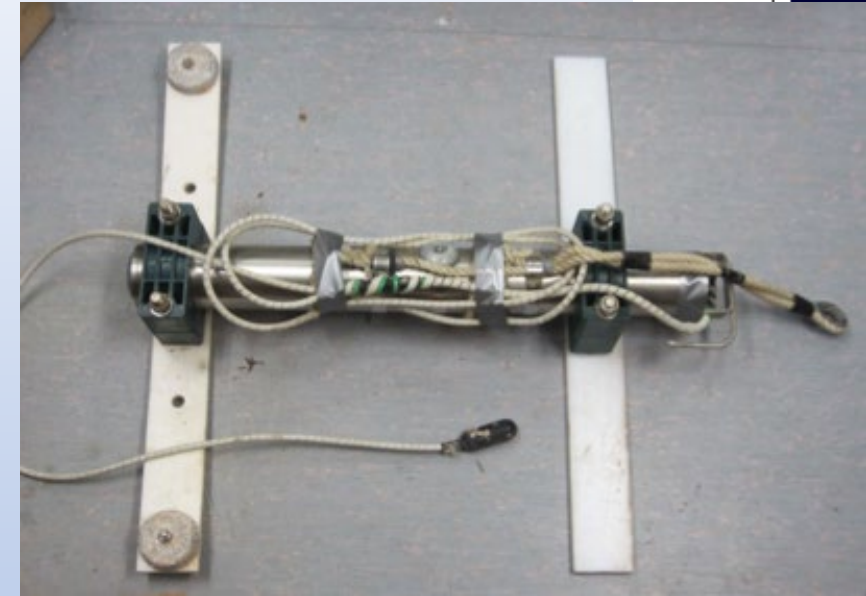
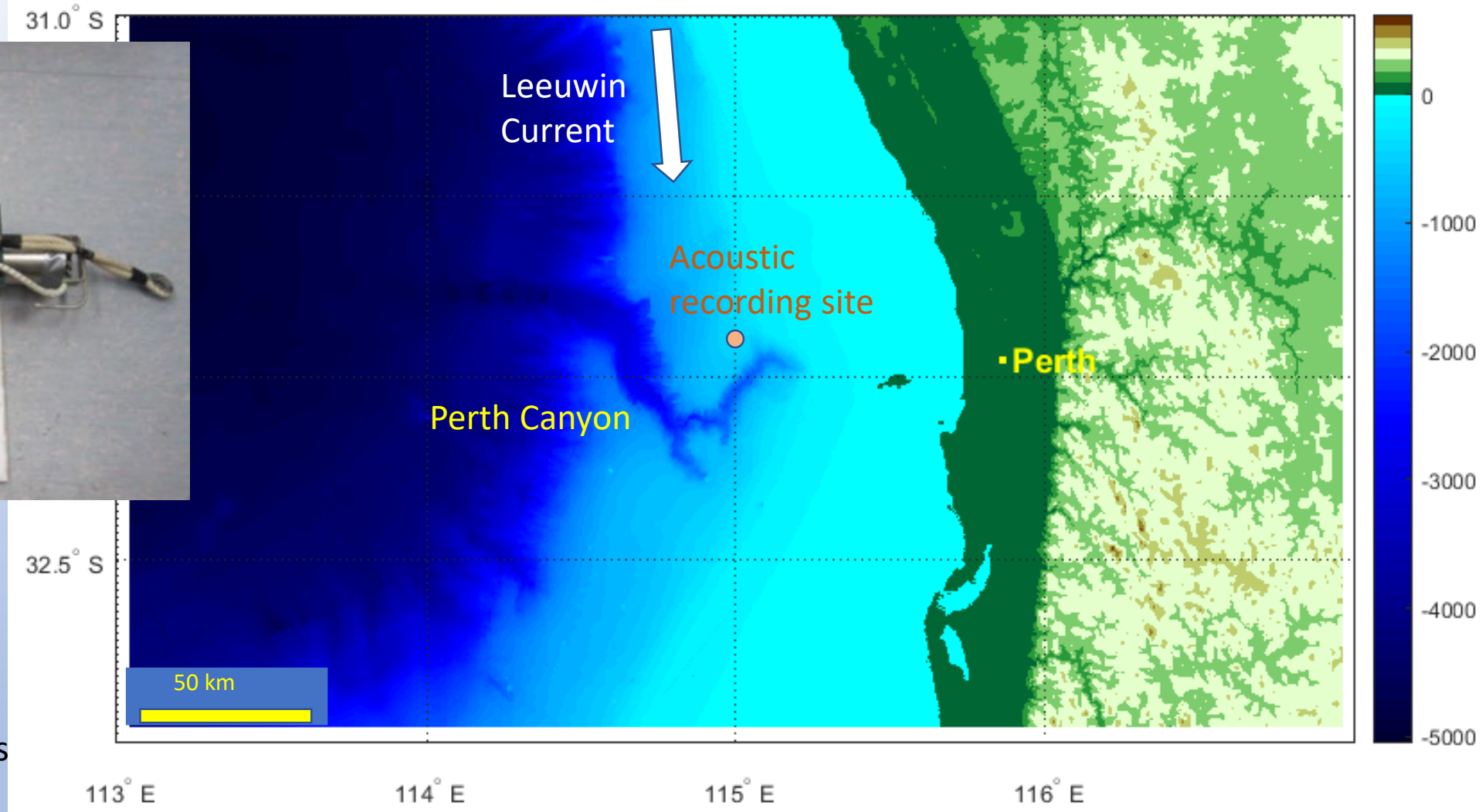
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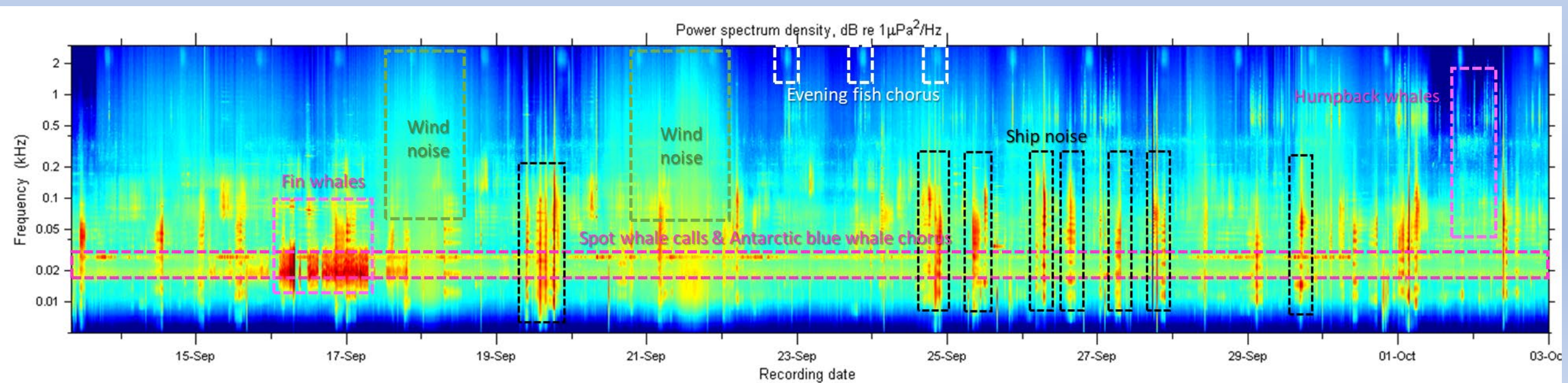
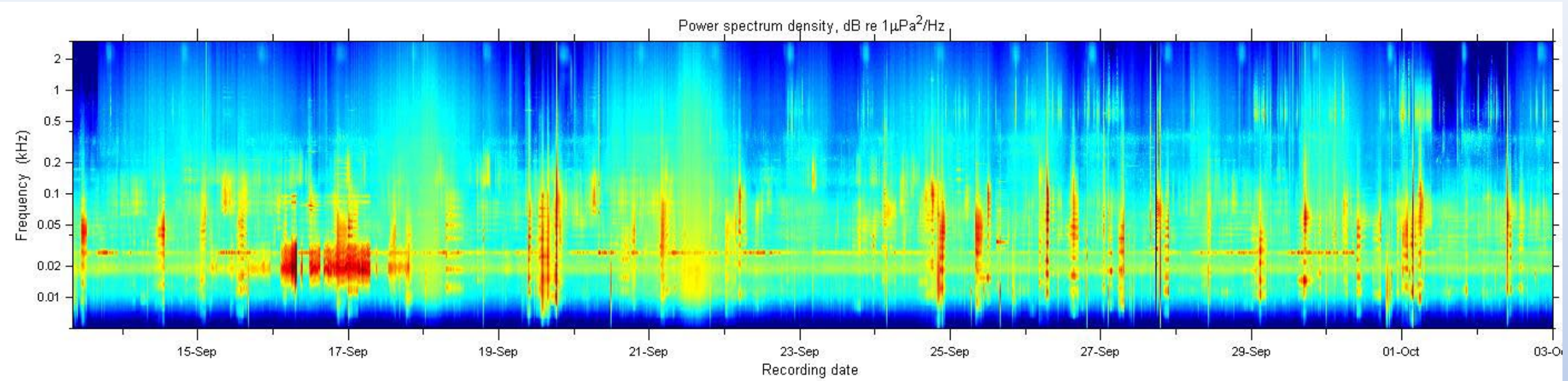
# Long term acoustic recordings from the Perth Canyon site

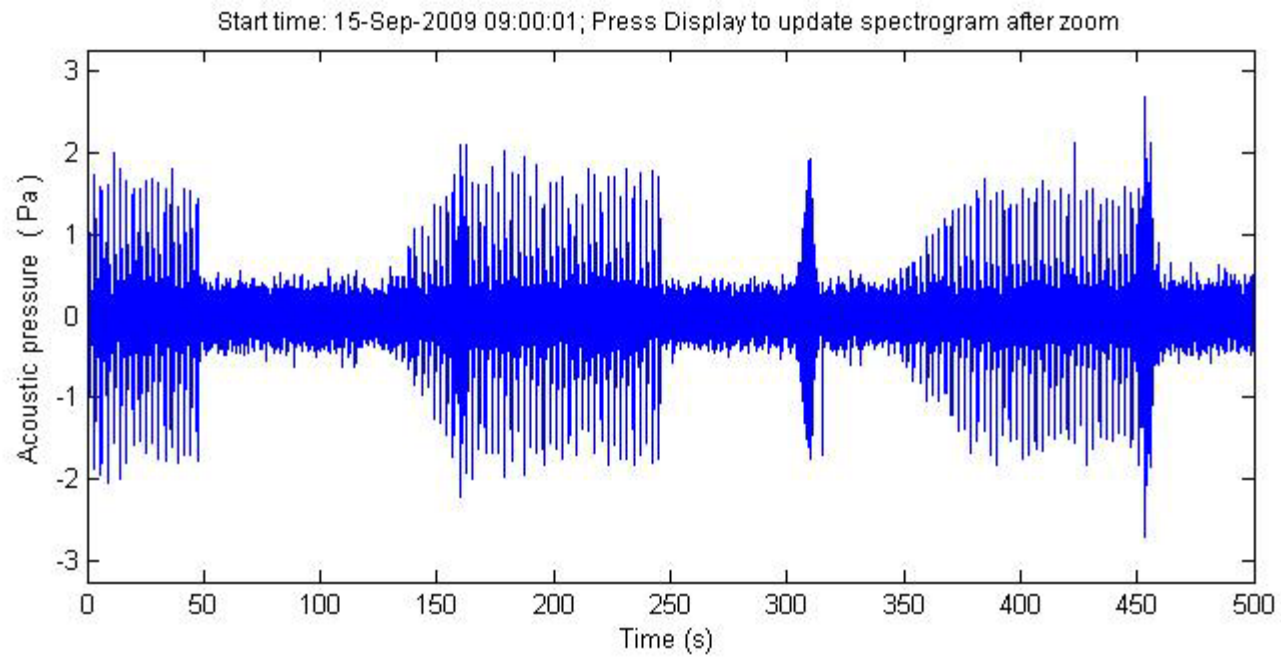


- Recorder deployed on the seabed for 6 to 12 months at a time.
- ~400 m water depth.
- Data retrieved on recovery.
- Near-continuous recordings from 2000 to 2018

- CMST has recorded underwater sound at many other sites around Australia, but this is our longest near-continuous monitoring site.
- Various funding sources, but mainly Australian Department of Defence and IMOS (Integrated Marine Observing System)
- Not currently active.

# Example 20-day spectrogram from the Perth Canyon

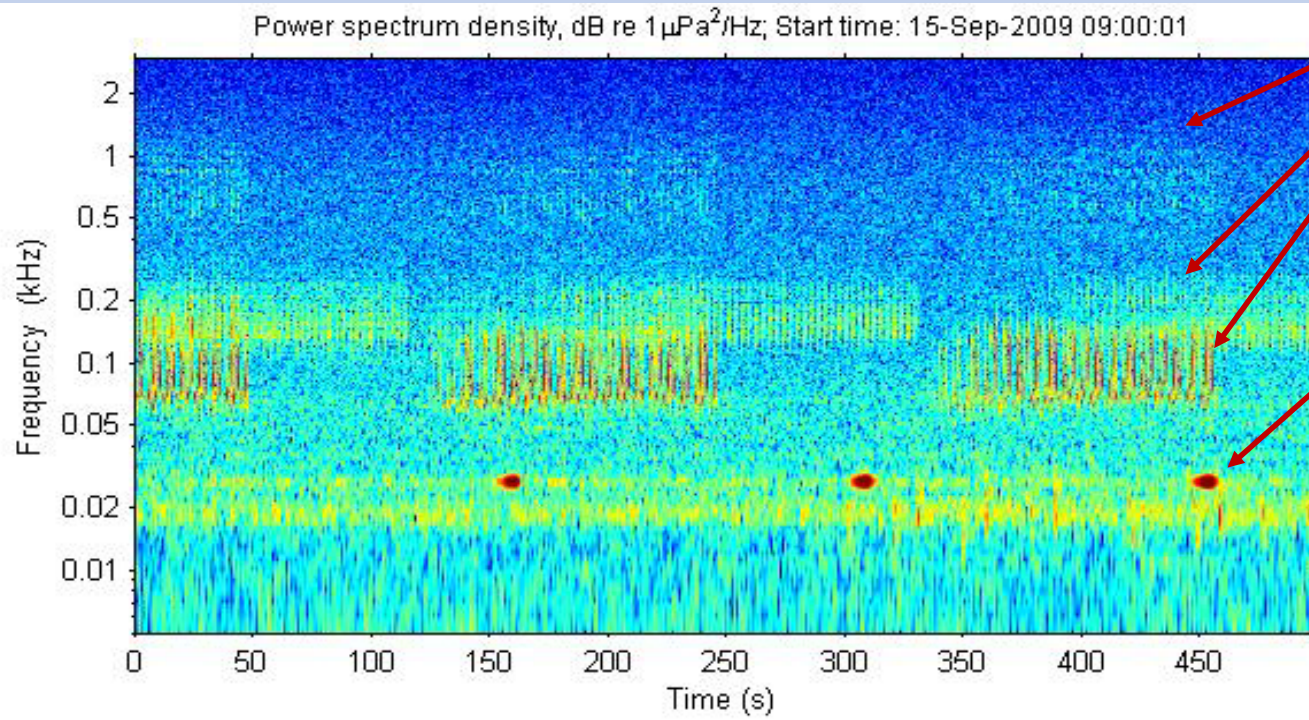




Normal speed



x 5

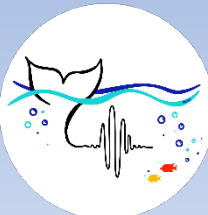


Wind noise

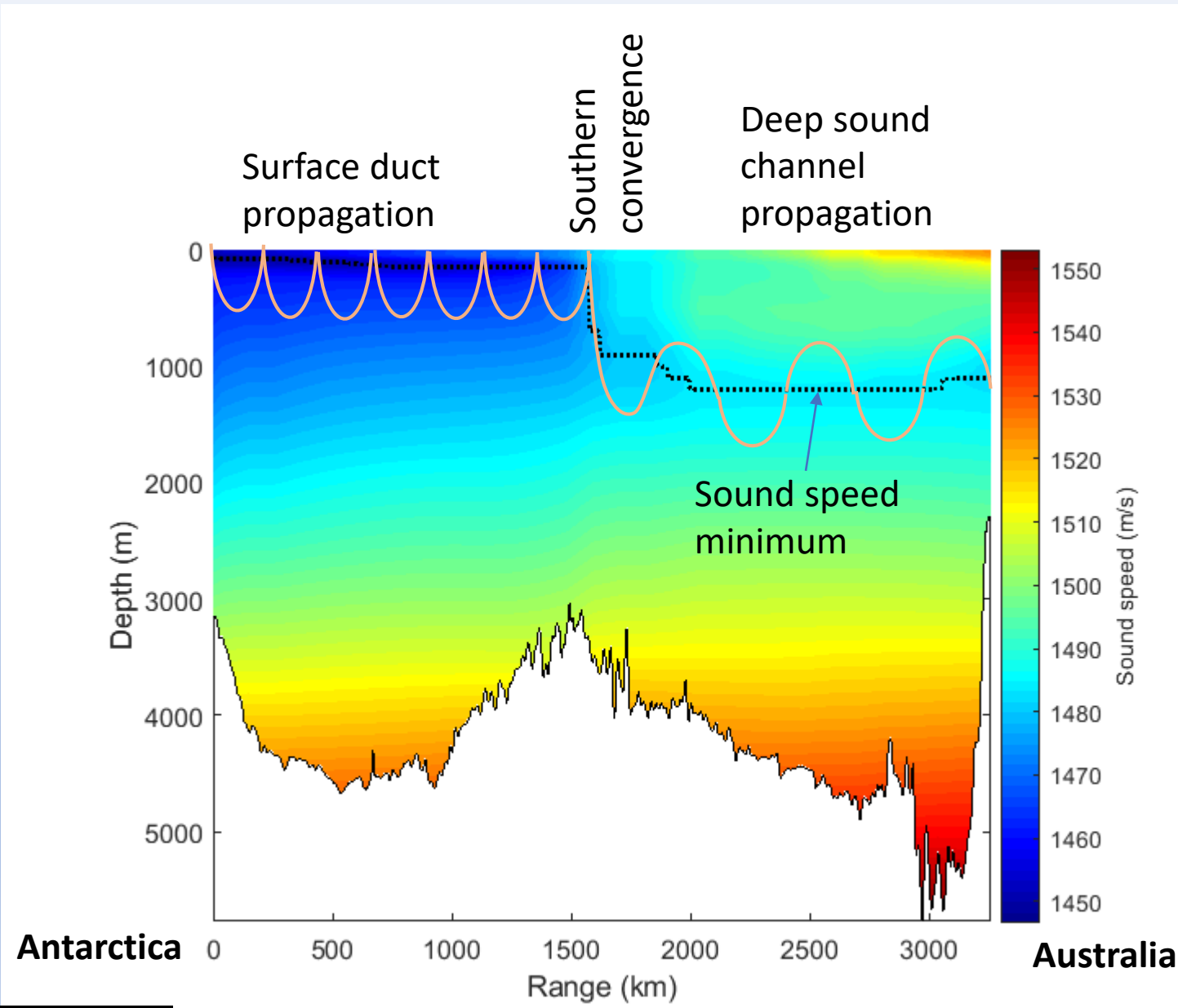
Fish calls

"Spot" call  
(unknown – probably a  
baleen whale)

Distant blue  
whales

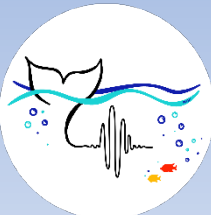


# Acoustic propagation between Antarctica and Australia



Sound from near-surface sources south of the southern convergence propagates efficiently to the Australian coast

- Ice noise
- Great whale calls?



# Ice Noise

Recorded off Australia!!

Gavrilov & Li, 2007, 2011 UAM Proc.

➤ Listen to climate change

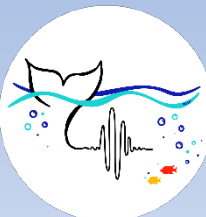
**singing icebergs**



Sped up x10

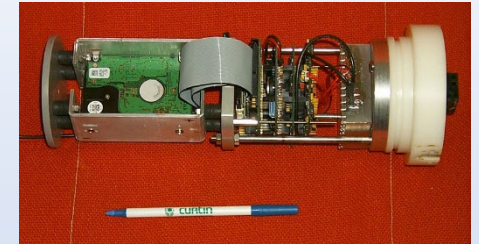
Amanderson2:

[https://commons.wikimedia.org/wiki/File:Blue\\_Icebergs\\_and\\_snowy\\_mountains\\_Neumaier\\_Channel\\_Coral\\_Princess\\_Antarctica.jpg](https://commons.wikimedia.org/wiki/File:Blue_Icebergs_and_snowy_mountains_Neumaier_Channel_Coral_Princess_Antarctica.jpg)



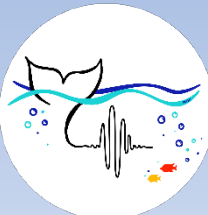
# Where from?

- 20 years ago, it had just become possible to build long-term underwater sound recorders that people like us could afford.
- Over time these devices have improved:
  - Cheaper, lighter, lower power consumption, much more data storage, higher sampling rates.
  - Readily available commercially from several manufacturers.
  - Accessible to a wider range of researchers.
- This has led to a huge increase in scientific knowledge about:
  - The animals that live in the sea and how they use sound
  - Other aspects of animal behaviour that can be studied by listening, e.g. migration patterns, social behaviour, spawning behaviour.
  - The sounds humans produce in the ocean and their impacts on marine animals.
  - Natural non-biological sources of sound in the ocean



# Where to?

- Technological improvements will continue, but deploying and recovering instruments in the ocean will remain difficult and expensive, as will permanent, cabled recording stations.
  - Improved satellite communications may help a bit
- There is already a huge amount of recorded data that is available for analysis
  - For example, 10 years of CMST's recordings, funded by Australia's Integrated Marine Observing System (IMOS), are available to anyone here:  
[portal.aodn.org.au](http://portal.aodn.org.au)  
(Search for Passive acoustic observatory)
- There is still a lot we don't know about the animals that live in the ocean and the environment is changing....
- Keep listening!





# A final word from mulloway in the Swan/Canning Estuary

*(Argyrosomus japonicus)*

A nocturnally active fish that spawns in the lower reaches of the Swan Canning Estuary in summer.

Highly prized by fisherman, hard to catch, but very noisy!

(Recording, Miles Parsons)



Image: <https://www.dpi.nsw.gov.au/>



Thanks for listening!

