Sound in the ocean: Why is it important and how are humans contributing to it?

Dr Sophie Seeyave

Partnership for Observation of the Global Oceans (POGO)

What makes sound in the ocean?

BIOLOGICAL SOUND
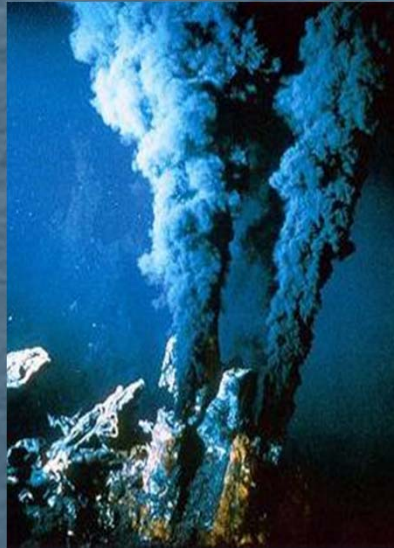
Marine mammals (whales, dolphins...)

Fish

Shrimp

Listen to examples: http://www.dosits.org/audio/agsummary/

What makes sound in the ocean?
OTHER NATURAL SOURCES

Rain

Earthquakes

Hydrothermal vents

Waves

Ice movement

Listen to examples: http://www.dosits.org/audio/agsummary/

What makes sound in the ocean?

HUMAN SOURCES

Oil and gas exploration / production (air guns)

Pile driving

Wind farms
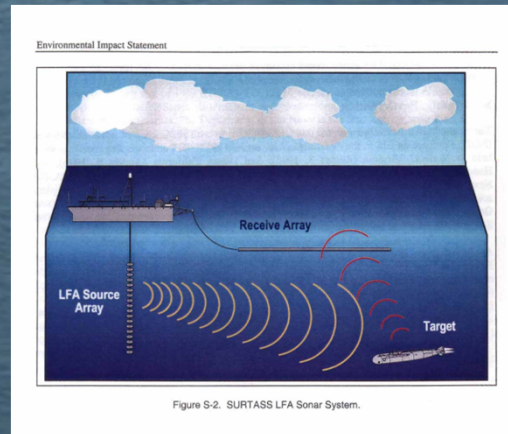
Sonars

Ships

Listen to examples: http://www.dosits.org/audio/agsummary/

What are the implications for marine organisms?

- Sound travels over very large distances, whereas light is rapidly absorbed with depth.
- Many marine organisms, particularly mammals, use sound for communication, orientation, locating prey, etc…
- There is evidence that anthropogenic sound has been increasing with the increase in global economic activity.

Evidence of increasing man-made sound
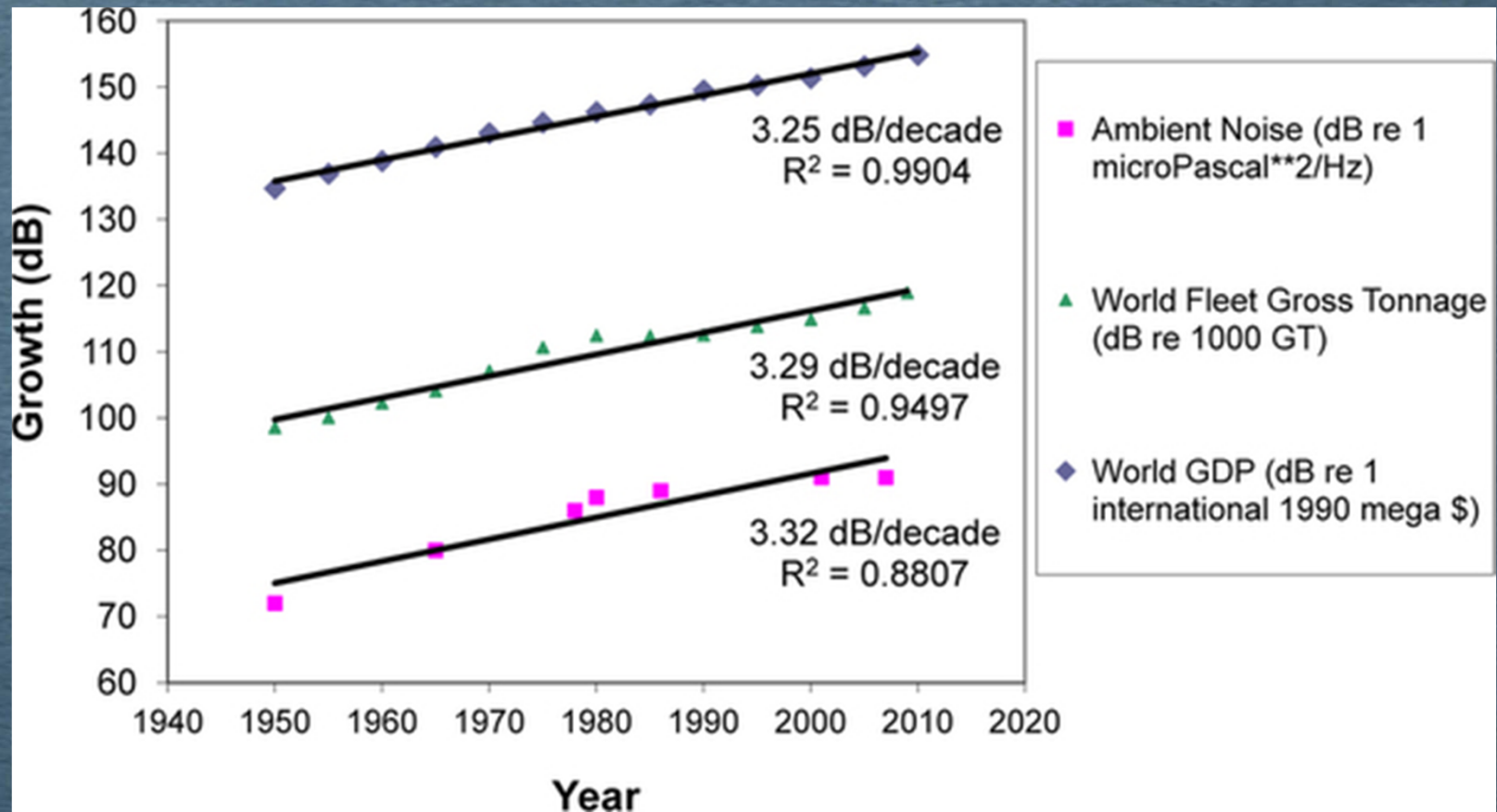
Frisk, G.V. (2012). "Noiseonomics: The relationship between ambient noise levels in the sea and global economic trends", Nature Scientific Reports 2, 437.

How does sound affect marine animals?

Sound produced by humans can have negative effects on marine animals, by:

- Masking the sounds produced by animals for communication or other purposes (can have repercussions on reproduction).

- Disorientating/confusing them and causing them to become stranded (e.g. military sonars).

- Causing avoidance response and change in migration routes.

- Causing direct injury.

A very striking example

What are the unknowns?

- Effects of anthropogenic sound on <u>all</u> marine species.
- Chronic vs acute effects.
- Are these effects significant?
- How do these translate to the population level?
- What are the cumulative effects of different sources of sound?

International Quiet Ocean Experiment

- Sponsored by POGO and SCOR
- New programme set to last a decade
- A comprehensive study of sound in the ocean and its effects on marine life
- Innovative approach of *removing* sound rather than adding it
- Technological innovation, use of observing systems
- Emphasis on public outreach and "crowd sourcing" (using the public to gather data).

Web links

www.ocean-partners.org

www.dosits.org

www.iqoe-2011.org

Thank you