

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

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Partnership for Observation of the
Global Oceans (POGO)



What makes sound in the ocean?

BIOLOGICAL SOUND



Marine mammals
(whales, dolphins...)



Fish



Shrimp



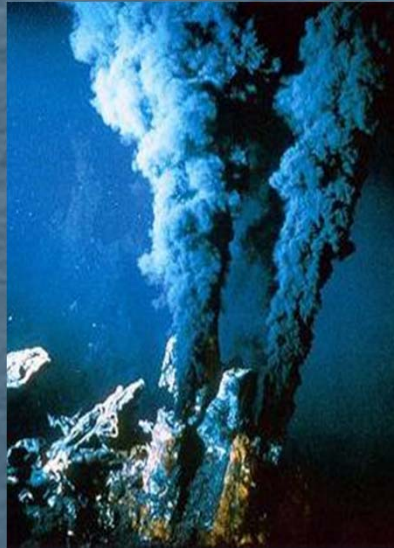
Listen to examples: <http://www.dosits.org/audio/agsummary/>

What makes sound in the ocean?

OTHER NATURAL SOURCES



Rain



Hydrothermal vents



Earthquakes



Waves



Ice movement

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What makes sound in the ocean?

HUMAN SOURCES



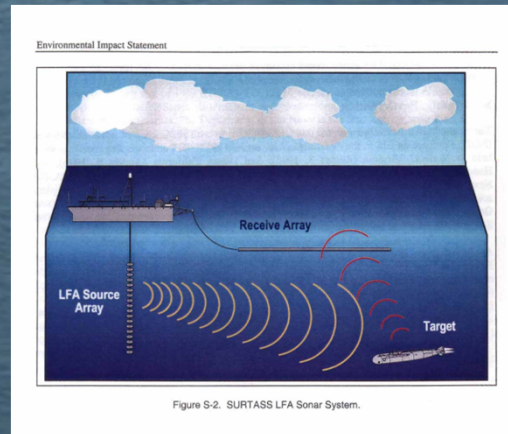
Oil and gas exploration /
production (air guns)



Pile driving



Wind farms



Sonars



Ships

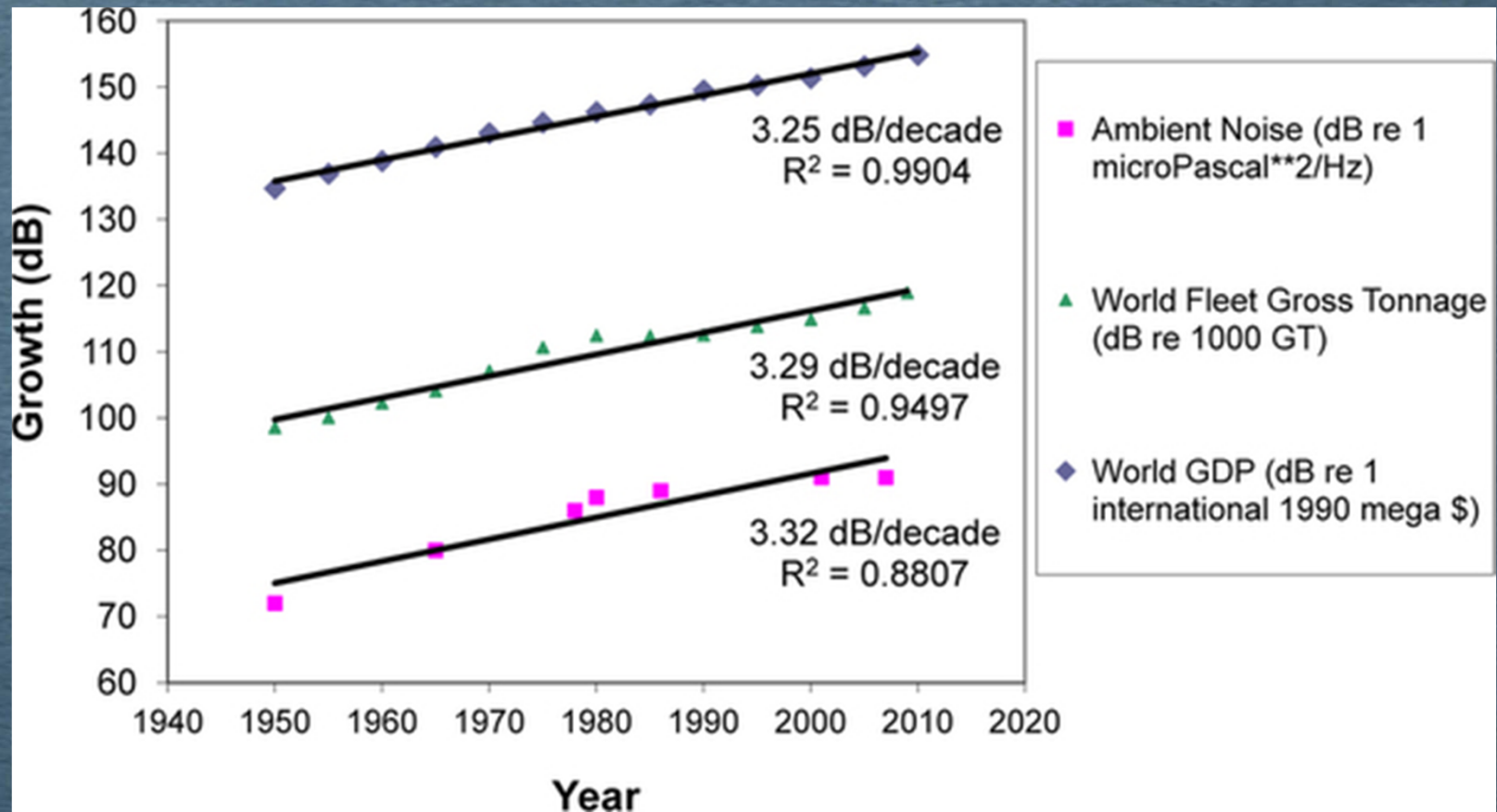
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What are the implications for marine organisms?

- 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). "Noiseconomics: 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



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BY MICHAEL MCCARTHY, ENVIRONMENT EDITOR | MONDAY 07 APRIL 2008

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INDEPENDENT PARTNERS

What are the unknowns?

- Effects of anthropogenic sound on all 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

