

Listening to the Ocean

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Sound is used to study underwater phenomena. The speed of sound at first decreases with depth, but then increases, due to a combination of temperature and pressure variations. The minimum speed occurs at the SOFAR channel. Sound in the ocean tends to travel along this channel.

The world's oceans contain a number of hydrophones. Autonomous hydrophones collect and store data, which is retrieved once per year. Real-time hydrophones are connected to land, and return data continuously.

Types of noise include wave noise, biological noise, ship noise, and T-waves from underwater earthquakes.

The SOFAR channel may be used by marine mammals to communicate over large distances.

Hydrophone arrays in the Atlantic, Pacific and Indian oceans help monitor the nuclear test ban treaty. They also monitor seismic events, marine animal populations, and other ocean noise.

Dr. Tolstoy played whale sounds at 20X normal frequency so that they could be heard by the human ear.

The US Navy mid-range SONAR (~3kHz) has been associated with whale beachings.

Airgun noise can damage whales. International agreements exist on safety radii and intensities.

Hydrophones can pinpoint new lava flows that ships can reach quickly. Bacteria have been found in these flows. There may be a large sub-crust biosphere that we know little about.

More information can be found at:

<http://www.ridge2000.org/>
<http://www.noaa.gov/ocean.html>