# of trends in ocean noise determined from the CTBTO hydroacoustic stations, including during the 2020 COVID-19 lockdown period

Thursday, 1 July 2021 16:49 (15 minutes)

This paper describes the determination of long term and seasonal trends in deep-ocean acoustic noise measured at the CTBTO hydroacoustic stations, and the investigation of the potential for changes in noise levels in 2020 during the COVID-19 pandemic.

The analysis method uses a flexible model that incorporates terms that capture long-term trends in the data, seasonal variations and short-term serial correlations, together with associated uncertainties. The measured data originate from a number of the hydro-acoustic monitoring stations operated by the CTBTO and span up to a maximum of 17 years. The analysis here focuses on the data from Cape Leeuwin Southern Ocean), Wake Island (Pacific Ocean), and Ascension Island (Atlantic Ocean). The trend analysis is applied to time series representing aggregated statistical levels for four frequency bands to obtain estimates for the change in sound pressure level with associated coverage intervals. The features of the data are described, including the differences observed in the seasonal variation and the long-term trends, with the latter often exhibiting negative gradients.

An examination is provided of changes observed in the 2020 data compared to the expected values based on earlier years, with the discussion informed by data for anthropogenic sources of sound.

Promotional text

Trends from deep-ocean noise data are derived from CTBTO stations including assessment of "COVID quietening" in 2020. Influence of anthropogenic and global environmental (climatic) factors are described.

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Session Classification: T1.3 - The Oceans and their Properties

Track Classification: Theme 1. The Earth as a Complex System: T1.3 - The Oceans and their Properties