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Seismometers to Supplement the IMS Hydrophone Network

A hydrophone station in the International Monitoring System (IMS) network can breakdown which can result in reduced monitoring coverage. Seismic data may be used to mitigate this reduction. Here, two examples of how seismic data can be used for the detection, location and characterisation of hydroacoustic signals are presented. In the first of these, signals from a series of underwater explosions near Florida are analysed. Bubble pulses characteristic of underwater explosions are identified at seismic stations in the United States and the estimated explosion depths and yields are shown to be consistent with published ground-truth information. In the second example, we assess the proportion of T-phases recorded on IMS hydrophones from seismic disturbances published in the Reviewed Event Bulletin (REB) that are observed on nearby seismometer stations at Ascension Island and Diego Garcia. At Ascension Island, seismometer stations record around 20% of hydrophone detected phases published in the REB. At Diego Garcia, the seismometer detection capability is lower due to the Chagos-Laccadive Ridge blocking some signal propagation paths.

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Track Classification: Signal processing techniques for hydroacoustic event detection and evaluation