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GSN Seismometers as Temporary Replacements for Hydrophone Stations

The requirement for essential maintenance to be carried out on the Comprehensive Nuclear-Test-Ban Treaty Organization (CTBTO) hydrophones means that data from some of these stations may be unavailable for substantial periods of time. In this study we examine the possibility of using seismometer stations located on nearby islands as temporary replacements. To do this, hydrophone station recordings of T-phases for seismic disturbances published in the Reviewed Event Bulletin are compared with the recordings at nearby seismometer stations. A comparison of the signal-to-noise ratios (SNRs) for these data from a five-year period shows that many of the T-phases recorded on the CTBTO hydrophones are detected in the 2-6 Hz passband at seismometers located on Ascension Island and Diego Garcia. At higher frequencies the detection capability at Ascension Island is hindered by the presence of high frequency noise, while at Diego Garcia signals above 8 Hz are rarely detected. The absence of high frequencies suggests that while T-phases recorded on nearby seismometers may potentially be used to detect and locate seismic sources when nearby hydrophones are unavailable, source identification by observation of the bubble pulse or high frequency signals diagnostic of an underwater explosion will not be possible.

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