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The IMS Hydroacoustic Monitoring Network: Achieving permanence

Andrew Forbes, Georgios Haralabus, and Patrick Grenard
Comprehensive Nuclear-Test-Ban Treaty Organisation, Vienna, Austria

An International Monitoring System (IMS) network or hydrophone- and seismometer-based sensors has been established over a period of ten years by the Comprehensive Nuclear-Test-Ban Treaty Organisation (CTBTO) to monitor the global ocean for compliance with the Treaty. Six of the IMS monitoring stations use triplets of hydrophones cabled to shore, designed to provide continuous acoustic data in real-time via satellite data links to an International Data Centre in Vienna, Austria. Maintaining timely data availability is challenging, due to the vulnerability of cabled systems to ship-anchoring and fishing activities nearshore, and to natural events such as underwater landslides. Lead-times of two or more years are required for underwater systems repairs, so the CTBTO is currently exploring possibilities for temporary replacement hydrophone nodes to maintain continuous data availability. It is conceivable that national or international ocean observatories currently being established for scientific purposes could provide auxiliary hydroacoustic data to fill gaps in CTBTO's IMS coverage. Synergistically, it is possible that IMS hydroacoustic stations could act as auxiliary data sources for scientific ocean observatories. This paper presents the current status of the IMS hydroacoustic network, details its performance to date, discusses possible solutions to persistent data outages and proposes a synergistic engagement with the scientific ocean observatory community.