

Systematic Event Analysis of International Monitoring System Hydrophones to Identify and Categorize Hydroacoustic Sources

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In this study we aim at discriminating hydroacoustic sources by identifying on the one hand source typical signal features derived from event catalogues and by characterizing on the other hand waveform similarities using clustering analyses of raw hydroacoustic data. We make use of event bulletins derived from the application of the Progressive Multi Channel Correlation method on International Monitoring System hydrophone data and from Reviewed Event Bulletin (REB) entries with hydrophone stations involved. We apply a general source discrimination by quantifying signal parameters like frequency content, time duration, waveform shape and signal amplitude and categorize sources using previously identified signal properties from literature. We further compare the raw waveforms of International Monitoring System hydrophone data during time segments of event detections and apply clustering analyses to separate waveform families by their similarity to each other and to certain reference events. We also suggest to include additional information from propagation modelling, bathymetry and ocean conditions to explain the observed event signatures and to connect them to different hydroacoustic sources and source regions. We finally compare our results with other approaches on signal discrimination and classification and try to estimate the precision and sensitivity as well as general feasibility and usefulness of our method.

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Promotional text

Hydroacoustic source discrimination is performed by categorizing signal features from event catalogues and by clustering raw data to identify waveform similarities

Oral preference format

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