



## **Global Infrasound Association Based on Probabilistic Clutter Categorization**

Nimar Arora (1) and Pierrick Mialle (2)

(1) Bayesian Logic, Inc., Union City, CA, United States, (2) CTBTO, IDC, Vienna, Austria (pierrick.mialle@ctbto.org)

The IDC advances its methods and continuously improves its automatic system for the infrasound technology. The IDC focuses on enhancing the automatic system for the identification of valid signals and the optimization of the network detection threshold by identifying ways to refine signal characterization methodology and association criteria. An objective of this study is to reduce the number of associated infrasound arrivals that are rejected from the automatic bulletins when generating the reviewed event bulletins. Indeed, a considerable number of signal detections are due to local clutter sources such as microbaroms, waterfalls, dams, gas flares, surf (ocean breaking waves) etc. These sources are either too diffuse or too local to form events. Worse still, the repetitive nature of this clutter leads to a large number of false event hypotheses due to the random matching of clutter at multiple stations. Previous studies, for example [1], have worked on categorization of clutter using long term trends on detection azimuth, frequency, and amplitude at each station. In this work we continue the same line of reasoning to build a probabilistic model of clutter that is used as part of NETVISA [2], a Bayesian approach to network processing. The resulting model is a fusion of seismic, hydroacoustic and infrasound processing built on a unified probabilistic framework.

### References:

- [1] Infrasound categorization Towards a statistics based approach. J. Vergoz, P. Gaillard, A. Le Pichon, N. Brachet, and L. Ceranna. ITW 2011
- [2] NETVISA: Network Processing Vertically Integrated Seismic Analysis. N. S. Arora, S. Russell, and E. Sudderth. BSSA 2013