# Ocean Bottom Seismometer Data Quality Using MUSTANG

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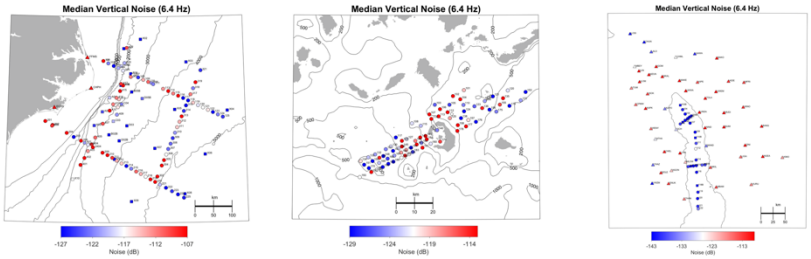
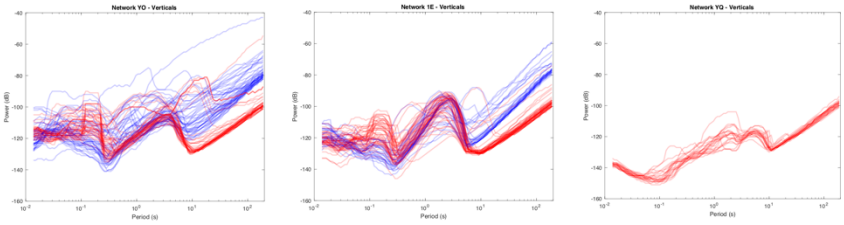
Data standardization and quality control at the U.S. Ocean Bottom Seismograph Instrument Pool has yielded many benefits. Archiving data in SEED format at the Incorporated Research Institutions for Seismology Data Management Center (DMC) has increased the discoverability and accessibility of ocean bottom seismology (OBS) data. Standard data format also encourages researchers to develop and share open source software to calculate instrument orientations or perform standard corrections on the data. This lowers the barrier to using OBS data and has resulted in significant growth and diversification of the OBS user community, evident in attendance at the biannual symposium. Data are also processed automatically to produce a set of useful metrics available through the DMC's MUSTANG service. The metrics can be used to quickly assess station performance after an experiment, identify instrumentation issues, aid researchers in pre-processing data for research-ready data sets, compare noise quality between different instrumentation or siting, and even perform a first-order orientation of the horizontal components. Looking at past experiments we can assess the performance of seismometers in distinct noise environments (open ocean, coastal, lake), varying water depths, different instrument packages or shielding, and look at seasonal trends in noise for planning future experiments. As we look to new innovations in OBS technology such as shielding, burial emplacement, and longer term deployments, it will be important to quantify improvement and fulfillment of requirements for future research targets such as GSN Oceans or SZ4D.




The maps above display the median PSD for each station, at a frequency of 6.4 Hz, over the entire recording period. Spatial differences in performance are revealed, such as higher noise in shallower waters. At 6.4 Hz the stations in Lake Malawi perform much better relative to the land stations deployed as part of this experiment.




RED = SIO BLUE = WHOI

The maps reveal spatial differences in the performance of stations not consistent with change in water depth, illustrated by the offshore shore-parallel line deployed in the ENAM experiment. To investigate further, we plot the median PSDs of the subset of short period OBS from the experiments above with red for SIO and blue for WHOI. There is a significant peak at ~6Hz for SIO stations in ENAM and PROTEUS, however no peak in the SEGMeNT stations. Environmental conditions or instrument configurations in this freshwater lake domain may be responsible for the noise difference, however further investigation is needed to isolate the source.