Abstract Submitted
for the 4CF17 Meeting of
The American Physical Society

Using Machine Learning to Accurately Predict Ambient Soundscapes KATRINA PEDERSEN, BROOKS BUTLER, KENT GEE, MARK TRANSTRUM, Brigham Young University — The ability to accurately characterize the soundscape, or combination of sounds, of various areas is valuable to the United States military and the National Park Service. It also holds weight in areas such as epidemiology and ecology. We attempt to use machine learning to correctly predict ambient sound levels throughout the contiguous United States. Our data set consists of roughly 500 training sites, where various acoustic metrics, such as overall daytime L50 levels and frequency band levels, have been obtained. We also have roughly 115 geospatial features, which include distances to the nearest roads or airports, and the percentage of industrialization or forest in a specific area. Selecting useful and physically significant features is an important step in the process of creating a good model. Feature importance measures, such as the Gini importance, help guide feature reduction. Ideally, the feature importance rankings will have physical significance and vary depending on which acoustic metric we have created the model for. We discuss the results and process of feature reduction on our model.

Katrina Pedersen
Brigham Young University

Date submitted: 20 Sep 2017 Electronic form version 1.4