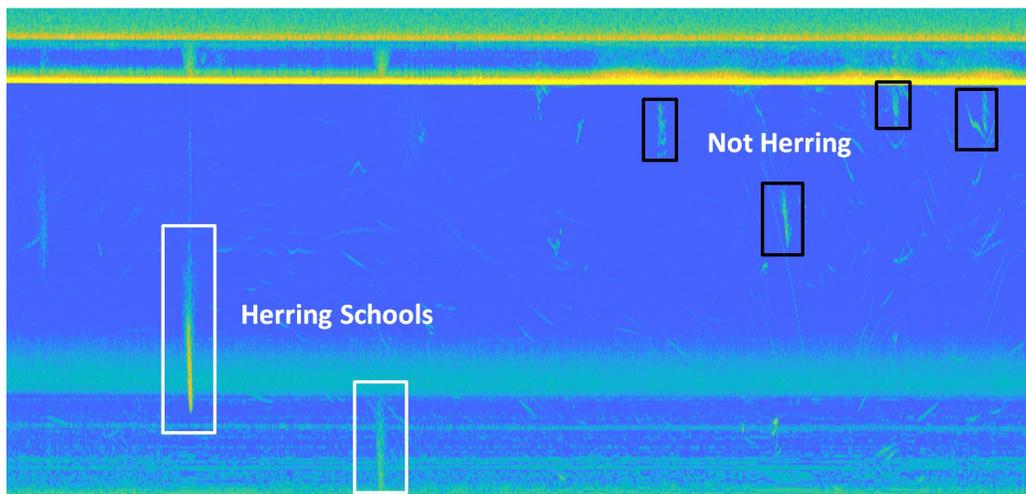


ASL Environmental Sciences Inc. (ASL), University of Victoria, and the Department of Fisheries and Oceans (DFO) recently completed the first phase of a collaborative research initiative to develop automated analysis tools for data collected by ASL's multi-frequency echosounder, the AZFP (Acoustic Zooplankton Fish Profiler). This phase of the research was funded by the Natural Sciences and Engineering Research Council (NSERC) through an Engage Grant. Following very promising results, the second phase of this initiative, co-funded by ASL and the NSERC Engage Plus Program, is now underway.

The research project is led by Professor Alexandra Branzan Albu from the Electrical and Computer Engineering Department of the University of Victoria in collaboration with DFO and ASL experts. The AZFP data for this research, along with expertise in the areas of fisheries acoustics and echogram interpretation were provided by Dr. Stéphane Gauthier of DFO. The AZFP provides high temporal and spatial resolution acoustic backscatter. Through this collaborative research, we focus on developing methods and systems to automatically classify backscatter from AZFP data. Dr. Albu and her team bring their expertise in computer vision and machine learning to help solve today's challenges in environmental monitoring with the ever-increasing data availability and the need for automation. Typically, AZFP data analyses rely on manual interpretation and visualization methods. The systems developed during the project will automate techniques to remove background noise, select regions of interest, and classify them into relevant target classes, such as herring schools. Detection algorithms have been tested on 100 echograms to date containing 145 instances of schools of herring. Further development and testing will use echograms from a broader range of environmental conditions. We also plan to expand the automated analysis to backscatter from other target classes, such as salmon and zooplankton.

In October 2019, preliminary results were presented at the Machine Learning Workshop during the PICES 2019 Annual Meeting in Victoria, BC. Our most recent paper has been accepted to a workshop at the Conference on Neural Information Processing Systems (NeurIPS) in Vancouver, BC. The title of the workshop is "Tackling Climate Change with Machine Learning".



A sample AZFP echogram showing regions of interest and classification results based on Machine Learning.