

## Request for Proposal – Automation of Data Processing: Passive Acoustic Monitoring (PAM) Instruments

### Q&A – March 24, 2020

1. Is there any likelihood of changes in the RFP and project delivery schedule in the midst of the COVID-19 crisis?

OERA confirms that the due date for responses has not changed. OERA is open to discussions with the selected applicant(s) about project delivery schedule impacts due to COVID-19.

### Q&A – March 13, 2020

- 1- We request an extension in the submission for the PAM Proposal.  
OERA has decided to extend the Proposal due date of this RFP (Item 6, line 2) to March 27, 2020.
- 2- In the Objectives section it is said that the analyses should address frequency of detections, abundance estimation, and distribution relative to a tidal turbine. Could you direct us to any references on this, for instance, particular papers that you have in mind?

There are a number of papers that discuss the state of the art of detection, abundance estimation, and spatial distribution estimation of harbour porpoises using PAM in settings other than tidal channels. See Mellinger's review of cetacean PAM from 2007, which reviews older methods and is usually cited in newer publications: Mellinger, David K., et al. "An overview of fixed passive acoustic observation methods for cetaceans." *Oceanography* 20.4 (2007): 36-45.

- 3- Section Scope (e) states that the solution should improve the accuracy compared with existing algorithms. Would you be able to highlight which algorithms these ones are?

There are two types of detectors discussed in the literature: black box detection systems (e.g. CPOD, TPOD) and algorithms (e.g. Klinck, H., & Mellinger, D. K. (2011).

The energy ratio mapping algorithm: A tool to improve the energy-based detection of odontocete echolocation clicks. *The Journal of the Acoustical Society of America*, 129(4), 1807-1812.) to 'deep learning' with CNNs (Bhattacharya, P., Wulf, S., & Zölzer, U. (2018, November).

Detection of Harbour Porpoise with Low-Level Feature Extraction and Deep Learning Based Classification. In *2018 14th International Conference on Signal-Image Technology & Internet-Based Systems (SITIS)* (pp. 114-121). IEEE.).

Few papers discuss the performance of these algorithms in tidal passages, so proposed innovations are welcome.

- 4- How was the "data set obtained"? Deployment location? Time interval(s) measured? Sample rate? Instrument layout and deployment platform? Type(s) of hydrophone? Synchronization?

The applicant should assume the data was collected in a typical or standard fashion (e.g. data was collected on stationary, wide-bandwidth hydrophone(s), mounted to a subsea platform or structure).

If needed, explain in the proposal any implication that variance in these factors would have to the applicant's cost or workflow.

- 5- How does OERA/FORCE know that the "known porpoise detections" are the real thing? What methods were used to obtain these "known porpoise detections"?  
"Known porpoise detections" will be those manually detected by a trained analyst.  
As above, the applicant should assume the data was collected in a typical or standard fashion and if needed, explain any implications to cost or workflow in the proposal.
- 6- What is the current situation with software solutions and hardware for PAM?  
We expect the applicant to be knowledgeable in the current state of PAM hardware and software.
- 7- Do you have full data collection system infrastructure including sensors, historian systems database or you looking to update & build new one.  
Please refer to items 3. Scope of Work, and 4. Deliverables, which describe required project outcomes.
- 8- What will be the expected ideal result after machine learning algorithms implementation?  
Expected outcomes are described primarily in item 3. Scope of Work. The proponent should describe what achievements can be expected from the proposed workflow.
- 9- What is the budget for this project?  
We expect a competitive pricing but do not have a fixed budget. It's up to the applicant to provide a coherent workflow and methodology, demonstrate value for money and justify anticipated costs.
- 10- Do you have target figures for cost & time saving per month after implementing the ML?  
No.
- 11- Are the collected and stored data accurate and how do you measure its accuracy?  
The applicant should assume the data are sufficiently accurate for the purposes of this project.
- 12- Where do you normally store your data? Do you use the cloud (AWS, Azure or Google Cloud)?  
In an operational setting, data will be streaming to shore and will require immediate processing, either locally, or remotely. Data transfer to the cloud must show to be feasible and be justified. Data is currently stored on hard drives. Alternate data storage solutions will be considered.
- 13- The machine learning solution that we develop, we own its intellectual property, is this accepted for OERA?  
The applicant retains created IP subject to conditions to be discussed at the contracting stage.
- 14- We were wondering if OERA is going to provide the required annotated training data?  
OERA will provide a data set with known harbor porpoise detections, as stated in the RFP.
- 15- We are wondering if you are looking for an ad-hoc solution or a more sustainable package that allows to for the adaptation to e.g. different species, regions, with comparably little effort?  
This RFP targets harbor porpoise detections at a subsea platform in Minas Passage, Bay of Fundy.