

# OSmOSE

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# (Underwater) Passive Acoustic Monitoring

**Principle** : extracting information from the underwater soundscape (biophonic , geophonic, anthropogenic)

## Monitoring applications

- distribution and abundance of species
- sea surface wind speed and rainfall
- human activities in protected areas

# (Underwater) Passive Acoustic Monitoring

**Principle** : extracting information from the underwater soundscape (biophonic , geophonic, anthropogenic)

## Monitoring applications in GOOS (Global Ocean Observing System)

- distribution and abundance of species → **Ocean Health**
- sea surface wind speed and rainfall → **Climate change**
- human activities in protected areas → **Monitoring Threats**

Yet no **Ocean Sound Essential Ocean Variable** for the moment! But at last an « implementation » plan [1] ..

# OSmOSE project

- Core team located in Brest and Paris (France), started in 2018
- Staff - 11 people (for 2024-2025) :
  - 2 permanent assistant prof
  - 2 software engineers
  - 3 researcher engineers
  - 4 Phds



Flore Samaran  
Assistant Professor



Dorian Cazau  
Assistant Professor



Maëlle Torterotot  
Research engineer



Julie Béesau  
Research engineer



Mathieu Dupont  
Research engineer



Gauthier  
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Software engineer



Elodie Morin  
Software engineer



Mathilde Michel  
PhD student



Anatole Gros-  
Martial  
PhD student



Pierre-Yves  
Raumer  
PhD student



Gabriel Dubus  
PhD student

# OSmOSE project

## Objectives

- Pushing forward FAIR principles in PAM
- Integrating PAM applications into larger ocean observing programs → [MSFD](#) , [Ocean Sound EOV](#)

## How we get there ?

- Developing FAIR tools : [OSEkit](#) and [APLOSE](#)
- Deploying “operational” services at [Datarmor](#) / IFREMER
- Initiating collaborations & joining consortiums (eg [EcoinfoFAIR](#), [SoL](#), [bioDCASE](#), [GLUBS](#))

# Annotation tool : APLOSE

## General

- Started in 2017 ; since 2023 full time software developer
- Web-based application using pre-computed tiles [1]
- Open source / Dockerized / TypeScript and PostgreSQL

## Motivations

- standardization through centralization
- high accessibility
- keeping our hand on scientific codes
- larger multi-sensor and temporal context
- AI (human-in-the-loop)

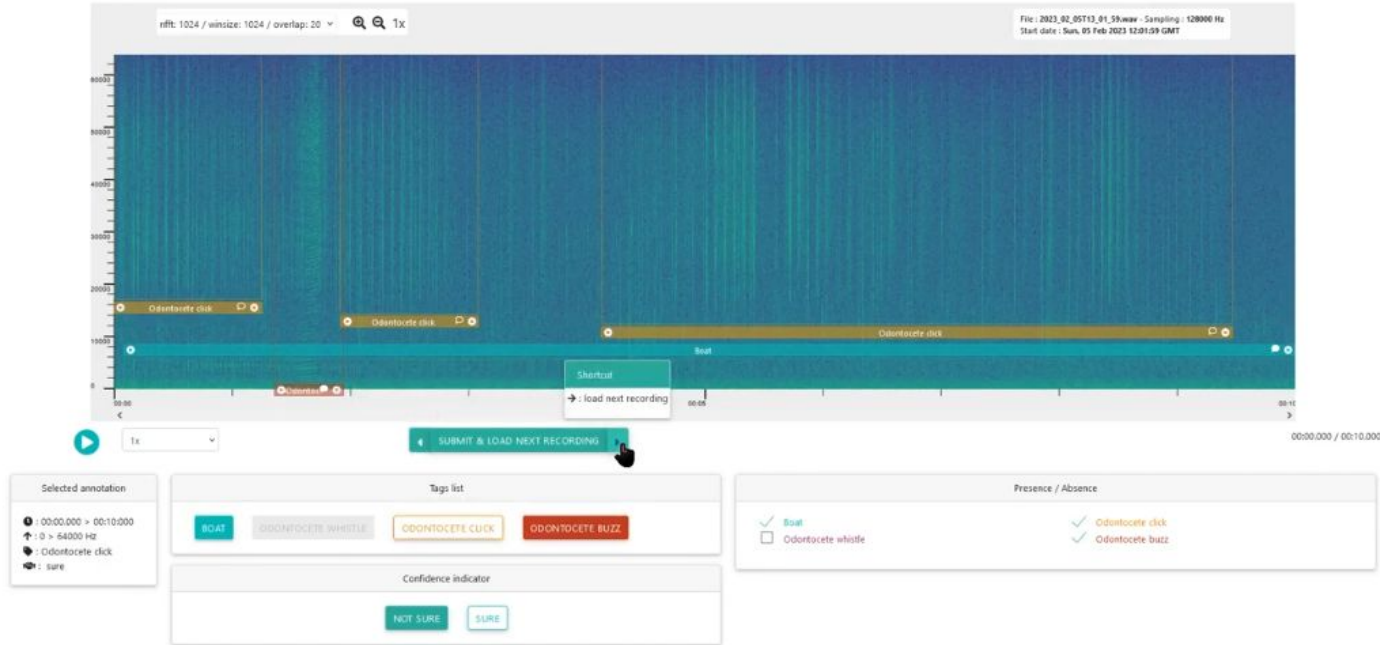


# Annotation tool : APLOSE

APLOSE

Annotator User Guide

BACK TO CAMPAIGN



[Demonstration and Documentation](https://osmose.ifremer.fr/app/)  
(<https://osmose.ifremer.fr/app/>)

Classical features à la Audacity

Special features : comment and confidence index / strong and weak annotation mode / double-check model evaluation

# APLOSE : use cases

## Two deployments

- main instance on Datarmor
- second instance deployed at [France Energies Marines](#)

## Building large scale annotated sound database (→ benchmarking framework)

- number of annotated samples / annotators ~ 200 k / 159
- number of classes / campaigns ~ 46 / 56

## Participative science, training

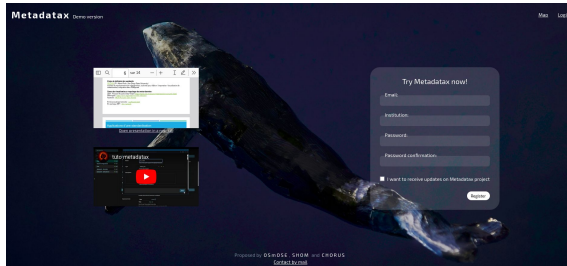
- collaborations with [Astrolabe Expeditions](#), [Miraceti](#)
- average number of annotators : from 1 to 28 annotators (5 on average)

## Research questions around inter-annotator variability [1]



# APLOSE : related metadata standardization efforts

- Consortium at national scale : ENSTA B, SHOM, FEM, Chorus, Sorbonne [1]
- First operational metadata schemata → implementation of [Metadatatx](#)



Metadatatx (demo)

Site administration

METADATATX	
Map	Change
Institutions	+ Add Change
Projects	+ Add Change
Deployments	+ Add Change
Channel configurations	+ Add Change
Files	+ Add Change
Equipment - Recorders	+ Add Change
Equipment - Hydrophones	+ Add Change

Recent actions

My actions  
None available

<https://osmose.ifremer.fr/projects>

