



# ODE

## Ocean Data Explorer

***Speaker : Paul Nguyen Hong Duc***

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# INTRODUCTION

PALAOA = 96 kHz / 16 b / PCM

~ 6 Tb / yr !

Satellite imagery

Mobile PAM :  
gliders, ARGO  
profilers

Weather  
buoys

No physics models to  
couple underwater /  
above water vectors

**Many Earth Obs vectors, Data ...  
yet too few merging with PAM**

Visual surveys

Oceanographic  
models

Genetics and  
stranding

No multi-modal  
machine learning  
framework

# BRIEF OVERVIEW OF OTHER PLATFORMS



bioacostica

TheCornellLab 

Ecosounds

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# ODE ARCHITECTURE - FRONT END



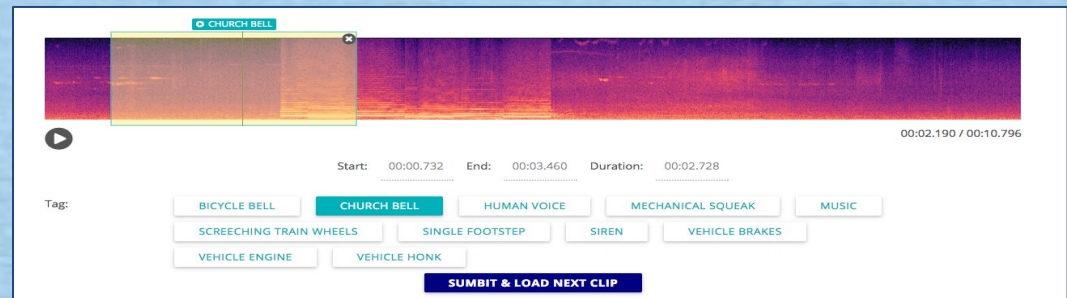
Web Portal

## Objectives

- **Multi-user labelling interface** to standardize and share labels
- Cross-calibration and -validation and create **multi-modal ground truth**

## Work

- In progress
  - In the short-term, having a labelling interface (e.g. crowd audio annotator (Cartwright et al., 2017))



# ODE ARCHITECTURE-INGESTER-MIDDLEWARE

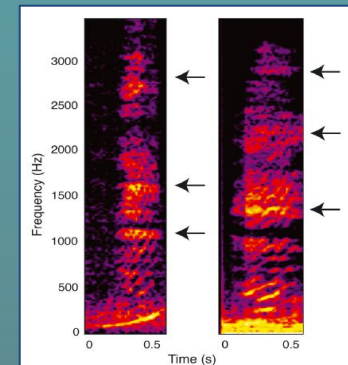
## Ingester - Middleware

### Objectives

- Larger interpretation framework to explain variability
- Cross-calibration and -validation and create **multi-modal ground truth**

### Work

- ElasticSearch for ocean data merging
  - highly scalable search engine
  - dedicated tools for spatio-temporal range requests
- Indexing scheme
  - format organization in json (field names, units)



# ODE ARCHITECTURE-BACKEND

Backend

## Objectives

- Automate basic content report and summary metrics (e.g spectrograms)
- Intensify model testing

## Work

- Distributed storing & analytics : **Hadoop / Spark**
- Interoperable HPC language software : **Scala / Python**
- Optimizing computations at low-level
- Signal processing theory (e.g how to aggregate time series with different time granularities?)





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# ODE ON DATARMOR - WORK IN PROGRESS

Achieved work

Short-Term

Mid-term

Long-term

- Used resources:  
Work space: 1 To

- User cases:
  - Code snippets to try Spark

- Resources:  
Work space:

- Several To
- User cases:
  - Computing spectrograms
  - Merging different environmental variables

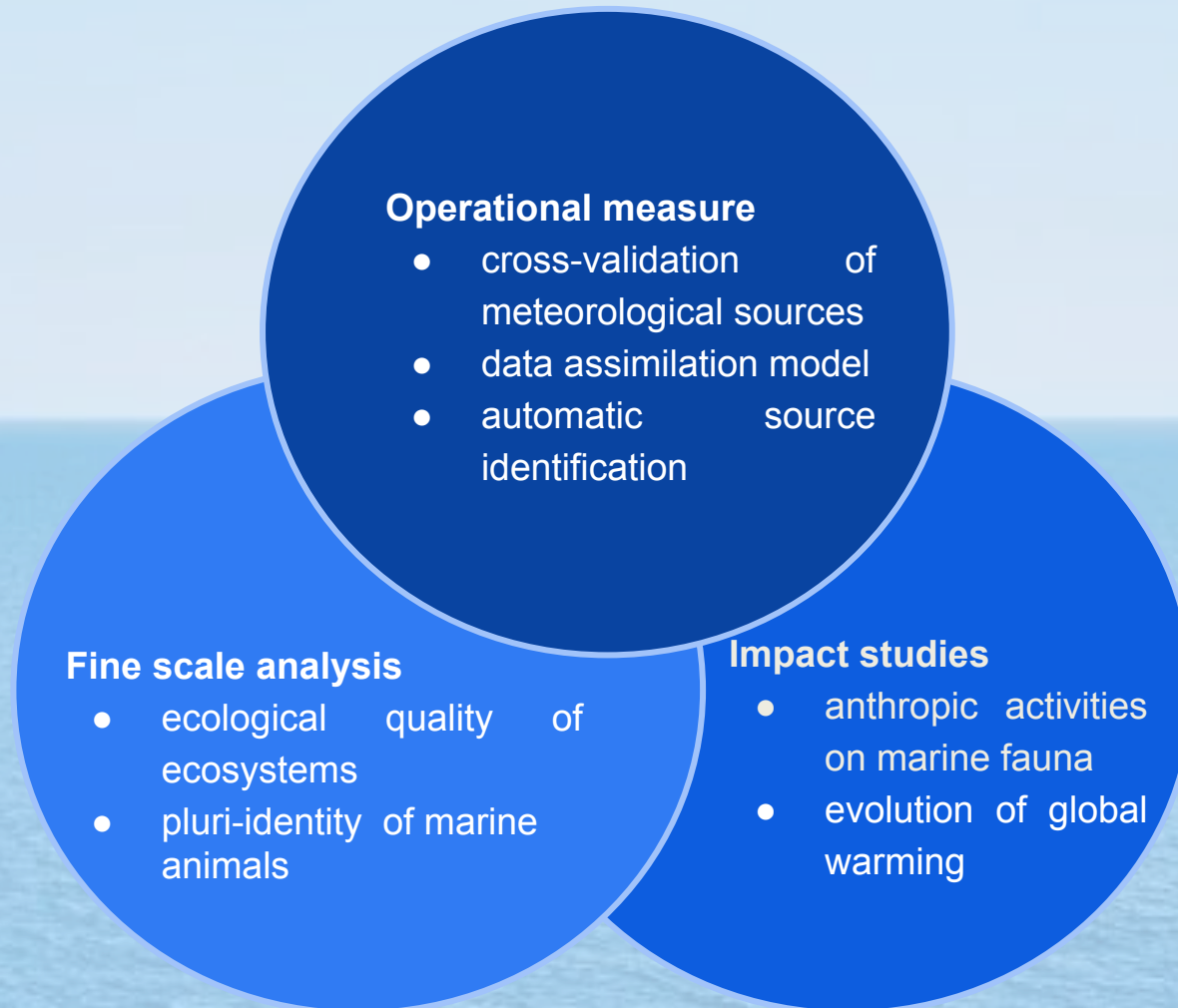
- Resources:  
Work space:

- Several To
- Web server
- User cases:
  - Acoustic event detection with heuristic methods
  - Labelling on website

- Resources:  
Work space:

- Several To
- GPUs for ML
- Web server
- User cases:
  - Matching different variables with underwater acoustic events
  - Classifying acoustic events

# ODE ON DATARMOR-APPLICATIONS



# TAKE-AWAY MESSAGES

## Sustainable reconciliation with Research through ODE

- **Dedicated platform + Web interface + Collaborative working environment**
  - connecting research outputs (state-of-the-art tools and expertise) to end-user needs
  - involving end-user for: i) building their features, ii) feature generation
  - **Open source** codes
- **Method Benchmarking**
  - bringing transparency into on-the-shelf and on-board PAM tools
  - certification tool on method performance
- **Centralized dedicated platform**
  - **permanent updating of operational services** with research innovation
- **Mutualizing data and material resources with research**
  - long-term investment with multi-usage of resources
  - Development of multi-applications *in-situ* measurement platforms (*Resource sharing and co-located multi-modal measurements*)

# CONCLUSION

Thank You for your attention!

Feel free to ask questions

# Core team



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