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THE DEEP SEA SPY SYSTEM

Building a marine images annotation database from participative science

Session 1
Data services and tools in ocean science

Barcelona, Spain
5-7 November 2018

OVERVIEW

Introduction

The annotation system – *Deep Sea Spy*

The data management

The query system – *DSS Request*

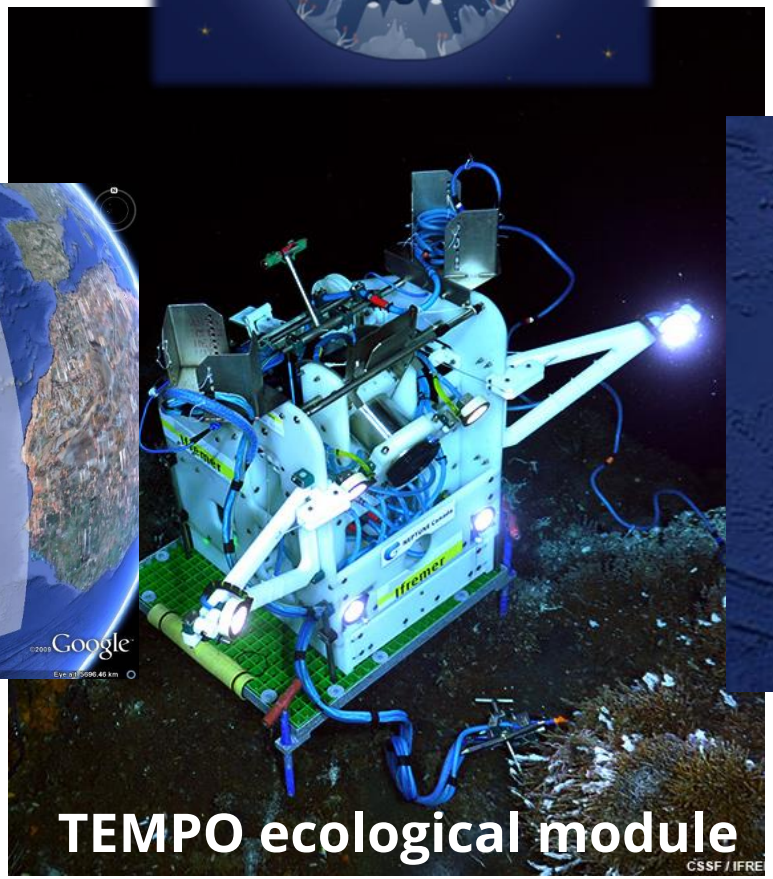
Perspectives

Seafloor observatories

EMSO-Azores
2010-…

Mid-Atlantic Ridge
Tour Eiffel, Lucky Strike (1700 m)

Imagery
2 min/6 hrs/365 days



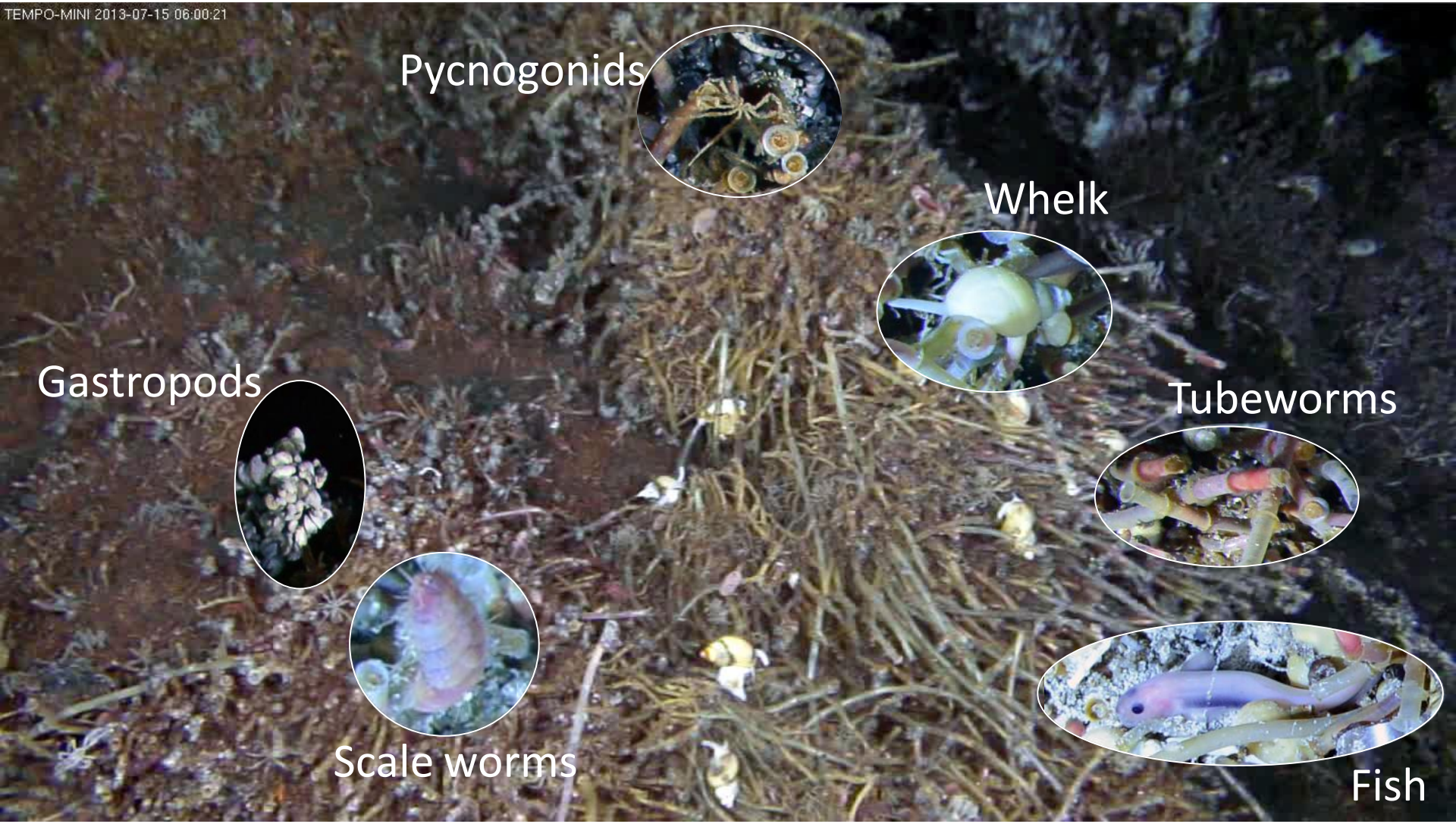
TEMPO ecological module

Ocean Networks Canada 2011-…

Juan de Fuca Ridge
Grotto, Main Endeavour (2200 m)

Imagery
20 min/4 hrs/365 days

Annotate visible inhabitants



Annotate visible inhabitants

Imagery archive

780 video hours/year…

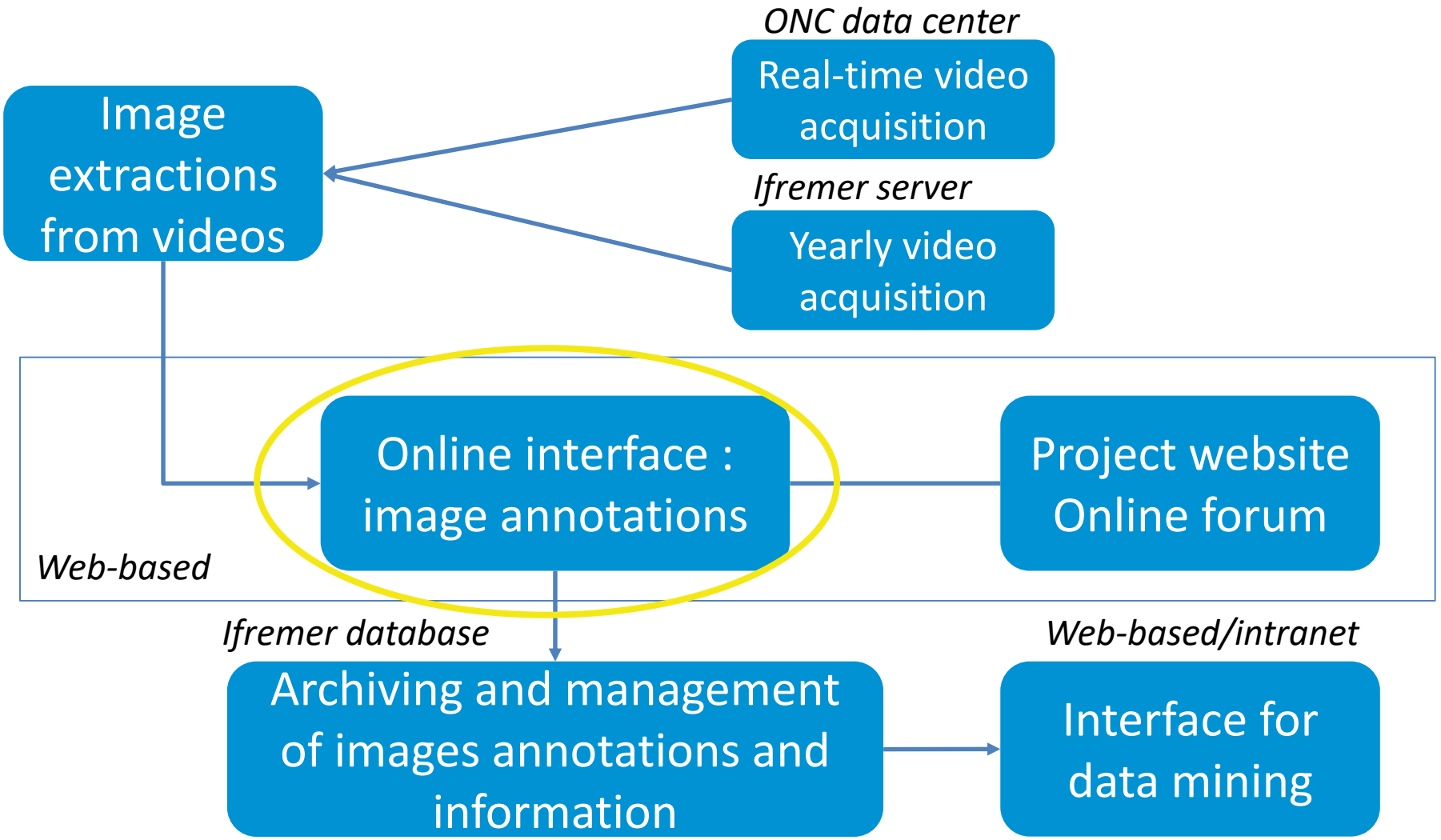
> 5000 video hours (> 10 Tb)

20 work hours to annotate **1 video hour**

…more than 11 years to annotate the present whole dataset
(which increases every year) !

To proceed such a video archive scientists need the help of citizen

Development of a citizen science project

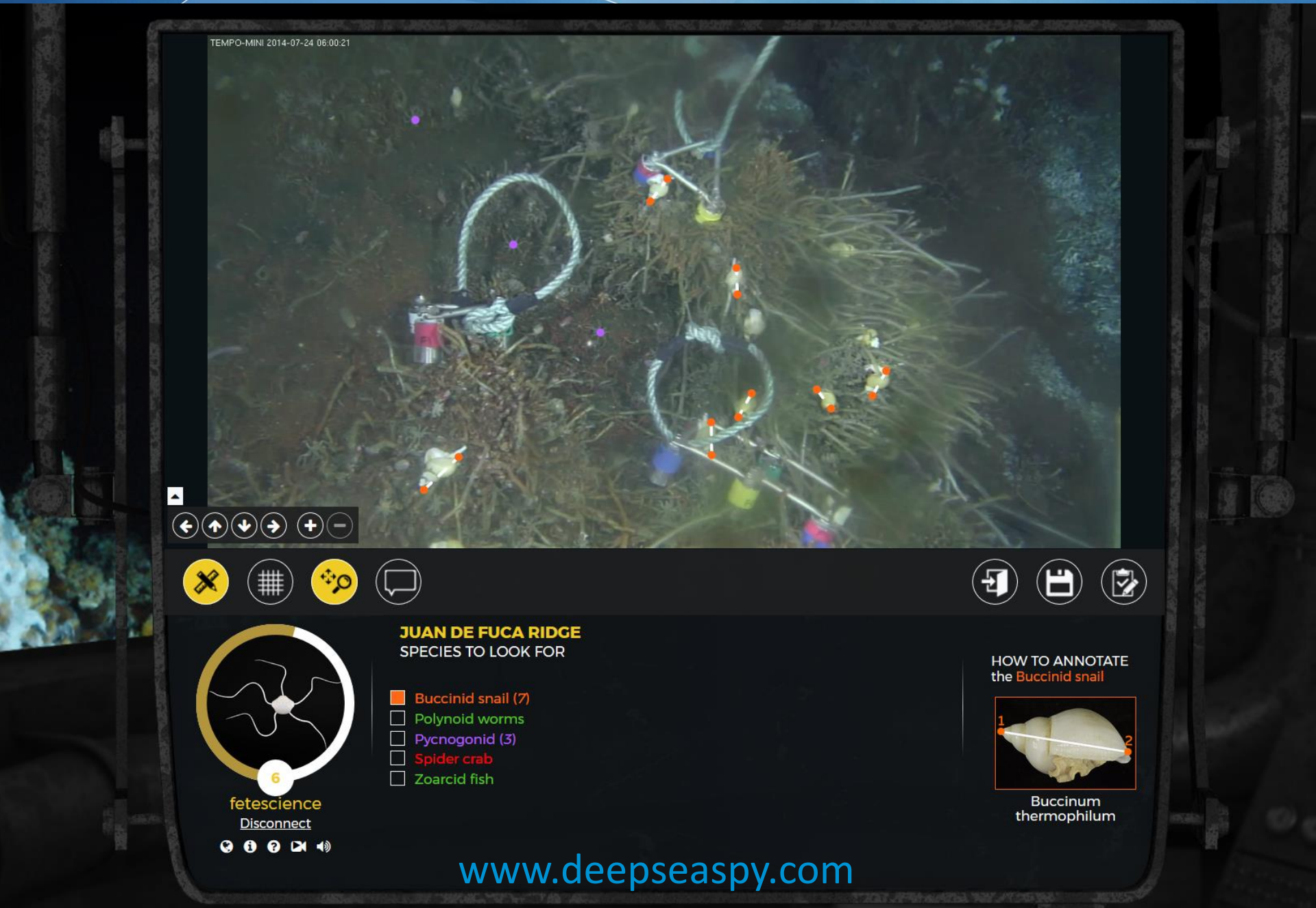


A web-based application to annotate species

- A web-based software for manual image processing that will help gather useful information for scientists
- A fun and engaging interface to raise awareness among the general public to deep-sea ecosystems

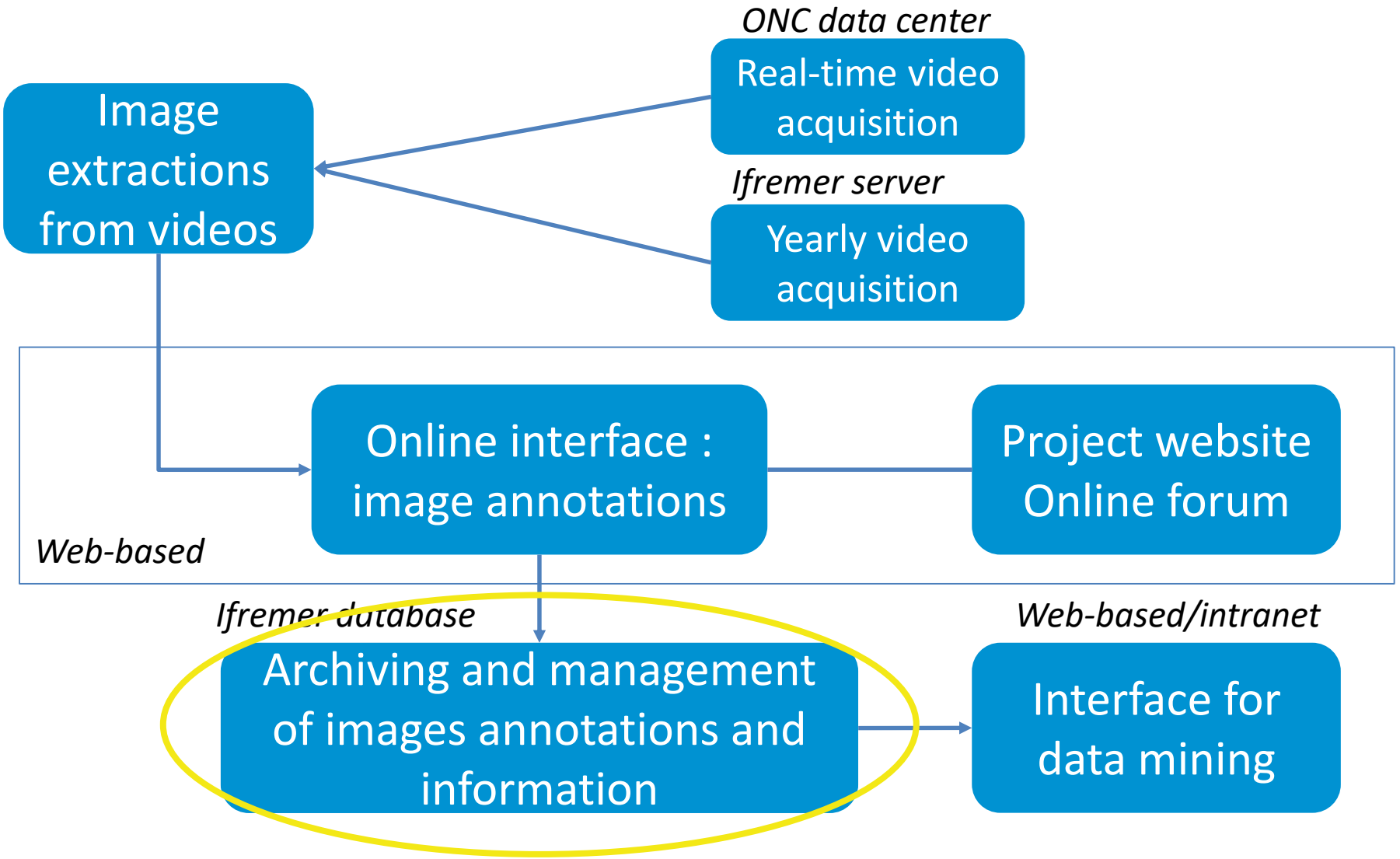
→ **Available online (internet)**
→ **Built as a game**
→ **Tutorial**
→ **Levels (and virtual rewards)**
→ **Data stored in pixels**

The annotation system – *Deep Sea Spy*



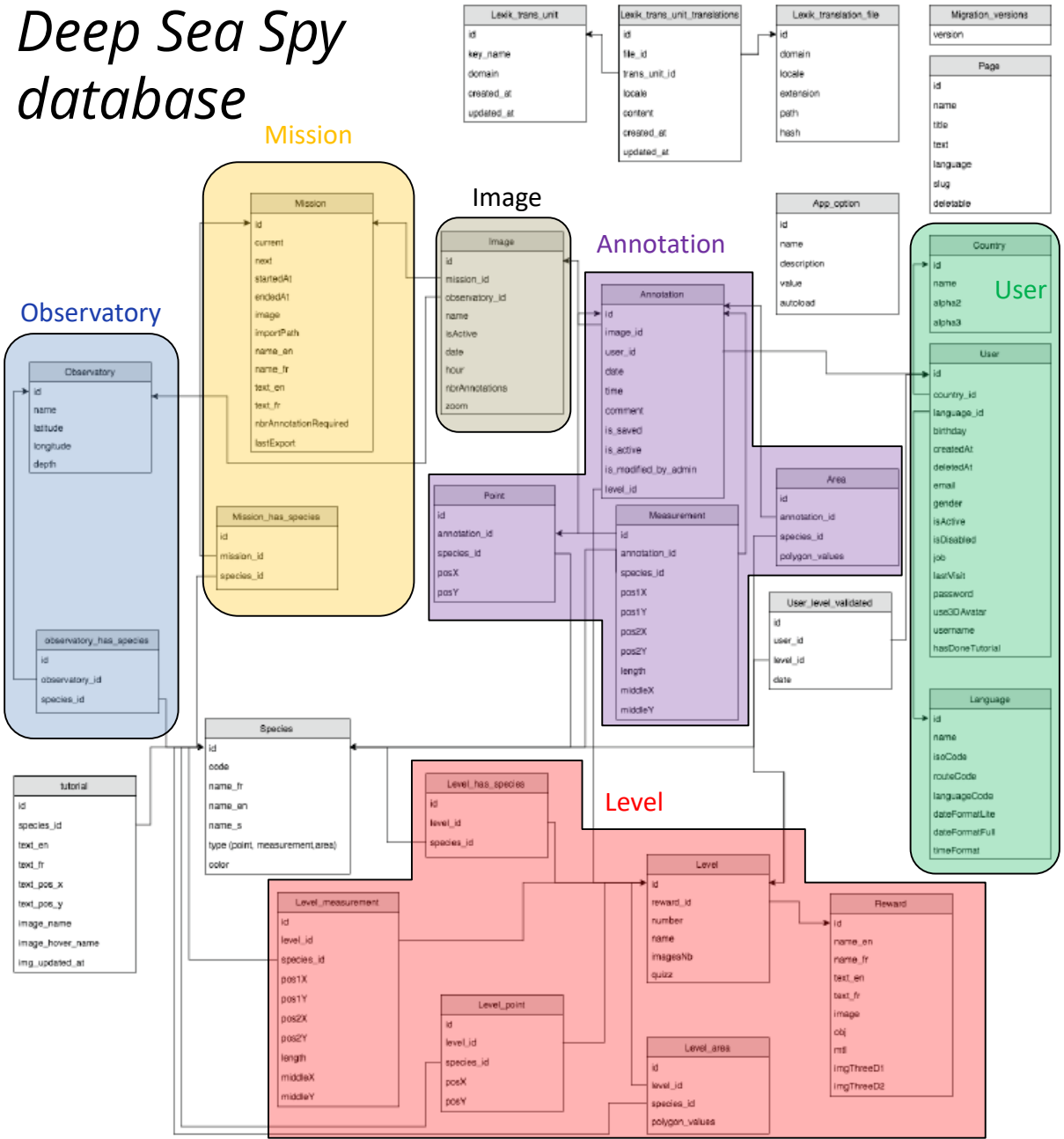
www.deepseaspy.com

Development of a citizen science project

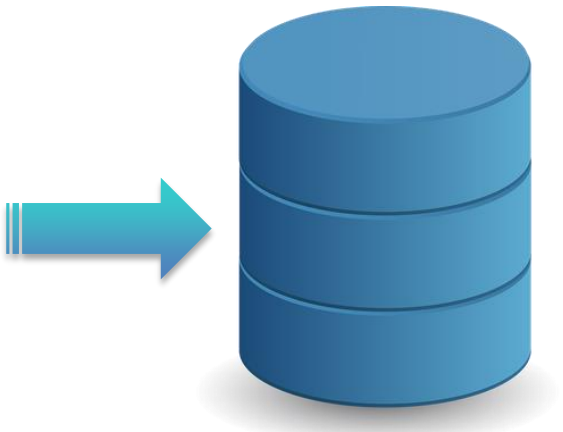


The data management

Deep Sea Spy database

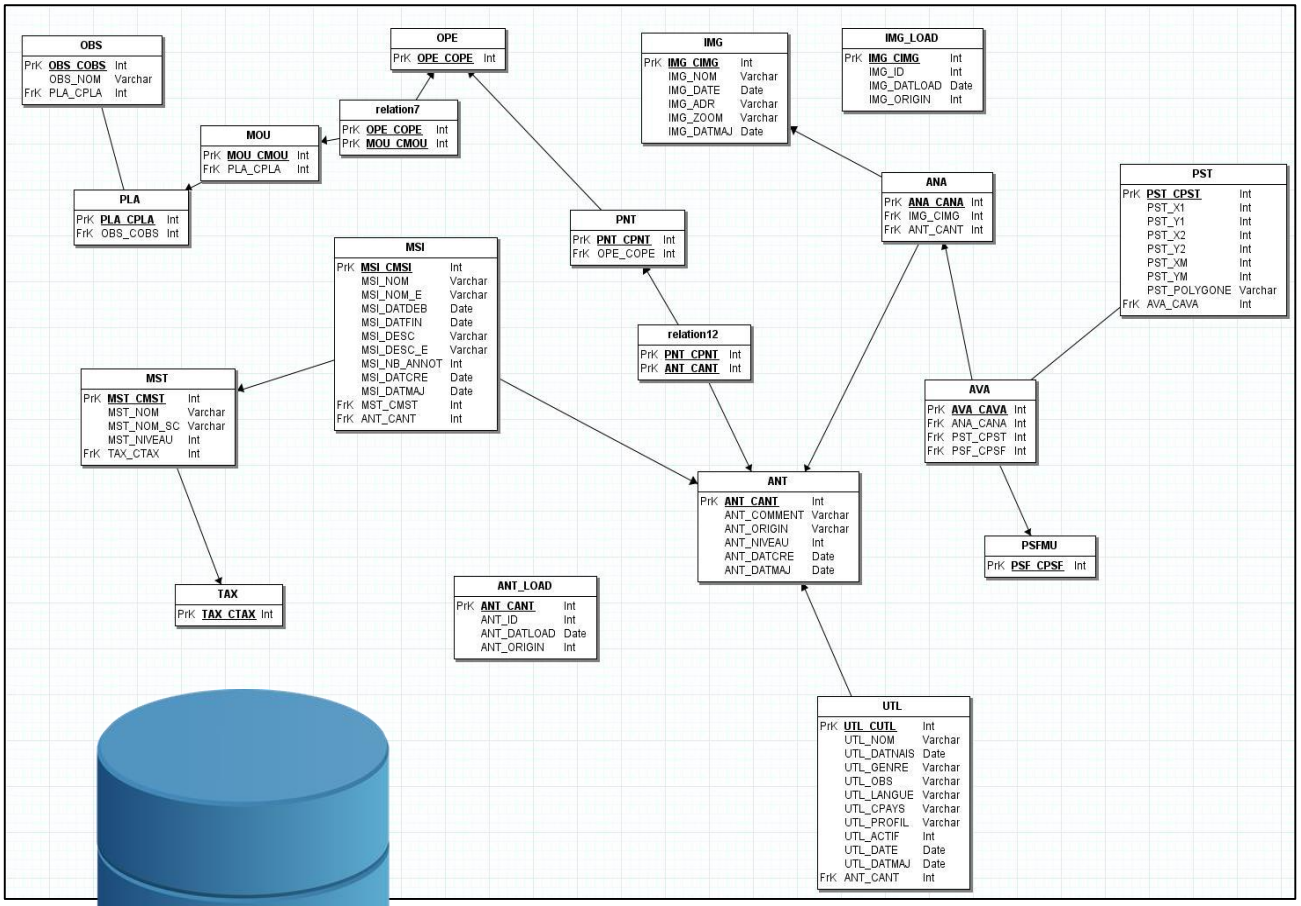


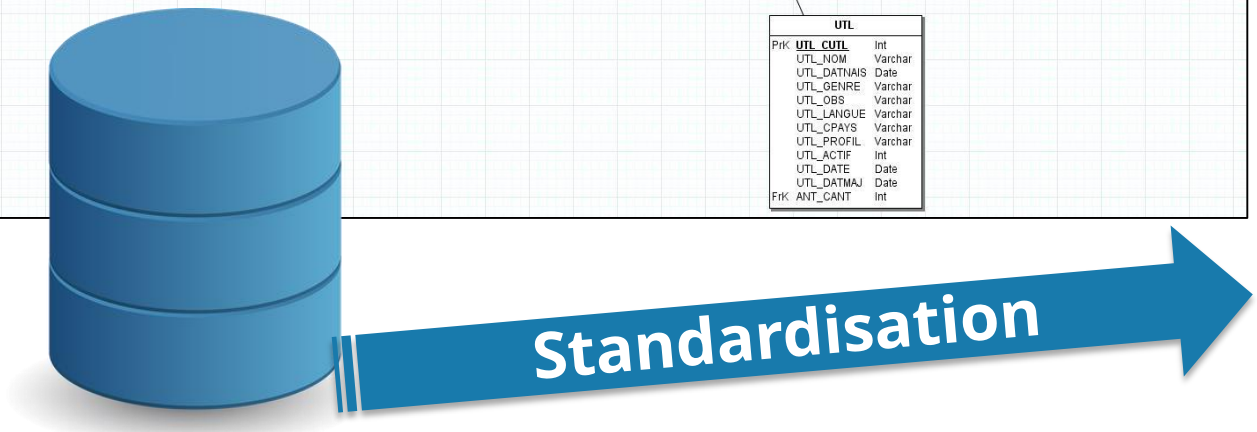
Citizen Science & Imagery Data



Ifremer central database

The data management





Ifremer central database

Citizen Science & Imagery Data

- **Taxonomy**

Ifremer/WorMS

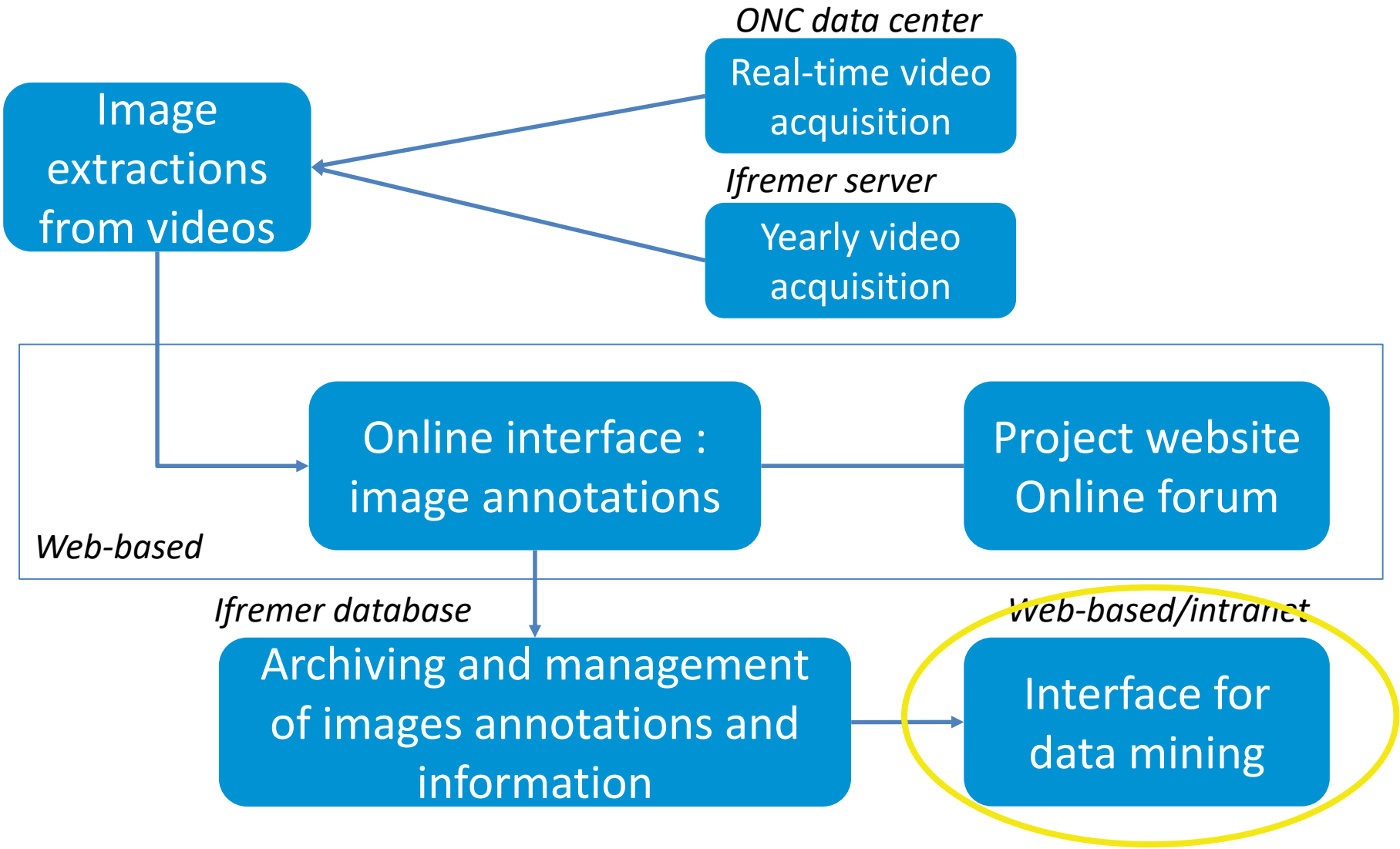
- **Parameters**

SeaDataNet P01 vocabulary library

LGPIXEL1

Length (in digital image) of biological entity specified elsewhere

Development of a citizen science project

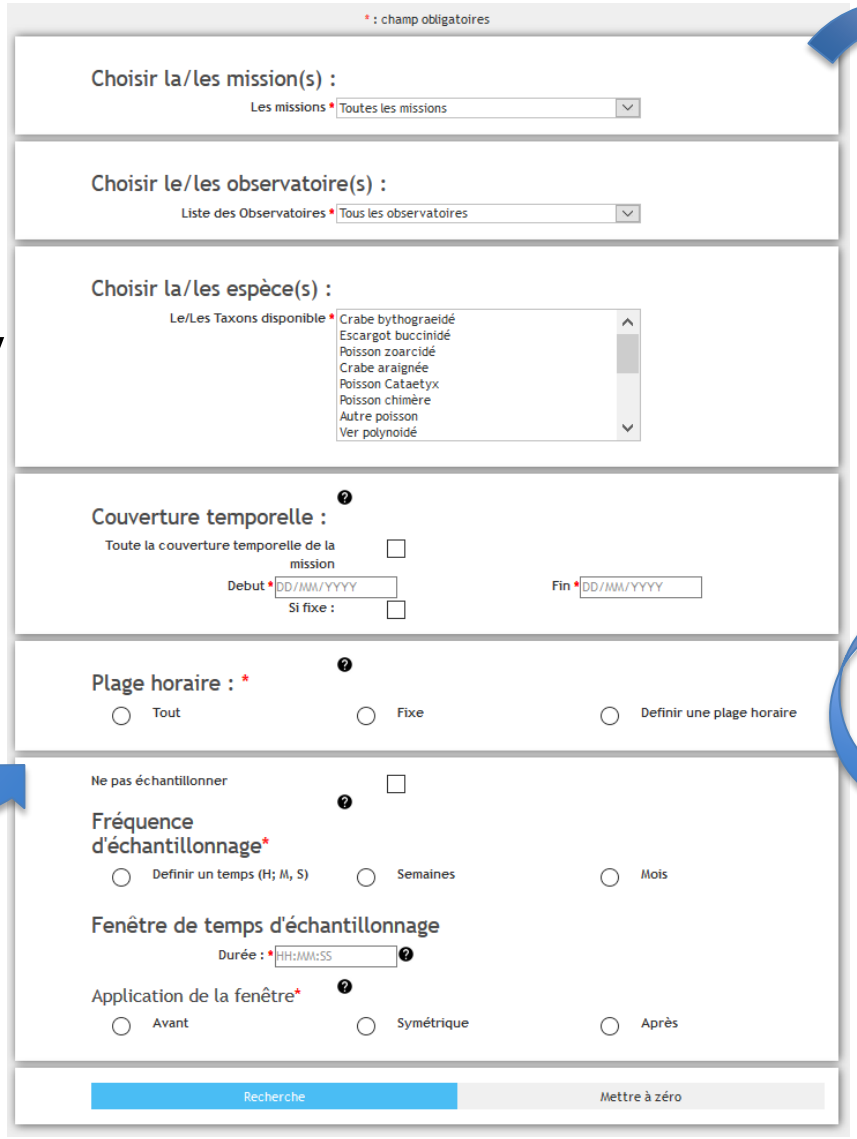


The query system – *DSS Request*

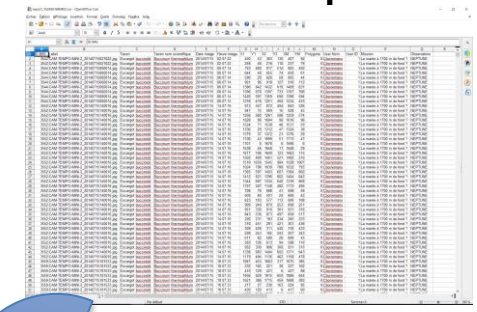
A web-based application to search DSS data

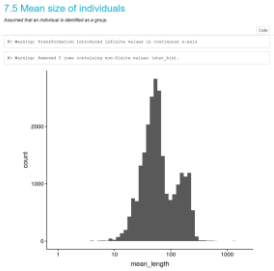
Selection :

- Mission
- Observatory
- Time
- Species



CSV file export





R import & further statistical analyses

(habitats mapping, ecological studies…)

Perspectives

- Thanks to the resulting Deep Sea Spy database, help improving the algorithms necessary to produce accurate automated species detection in imagery using a machine learning approach

- Share the system with other Ifremer imagery data types (coastal environment, fisheries…)

- Take advantage of elasticsearch features to enhance searching and exploring the Deep Sea Spy dataset (through DSS Request)

- Aim at later uptake of imagery data by an international data infrastructure ?

Thank you to all the colleagues
who contributed to this project…

… and thank you all for your attention!