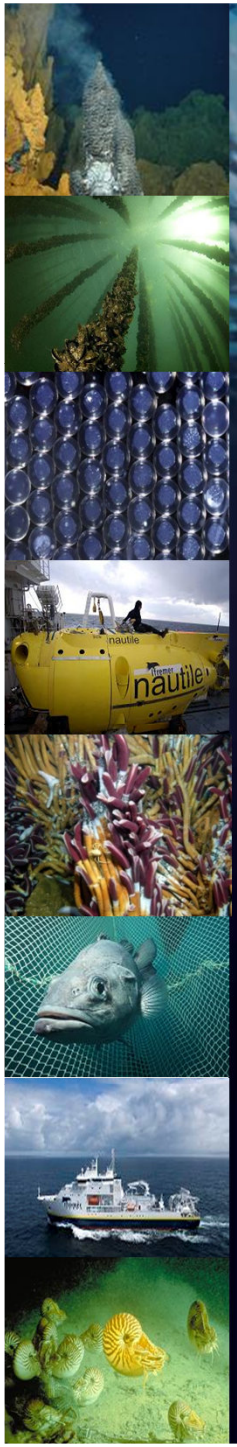


Management of events, samples, videos and data generated by deep-sea submersibles

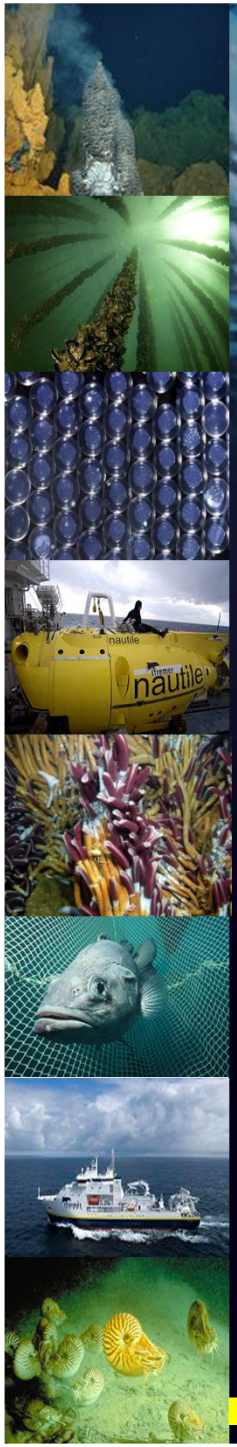
Catherine Borremans

Ifremer – SISMER

Centre Bretagne - ZI de la Pointe du Diable - CS 10070 - 29280 Plouzané, France

IMDIS 2013 - International Conference on Marine Data and Information Systems

Lucca (Italia), September 23-25, 2013



Outline Presentation

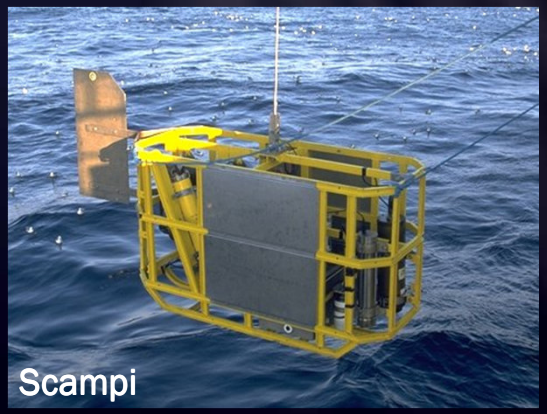
- The Submersibles
- Submersible Data & Users
- Submersible data management-Biocean
- Evolutions & New data flow
- Onboard software
- Back on land
- Focus on submersible videos
- International context

The Submersibles

Manned/Unmanned,
Propelled/Towed/
Autonomous vehicles


Cyana

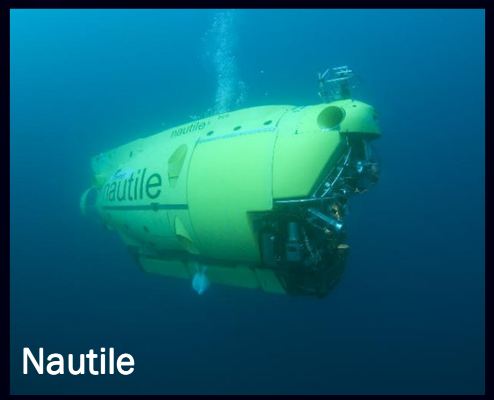

Mini ROV VideoRay


Scampi

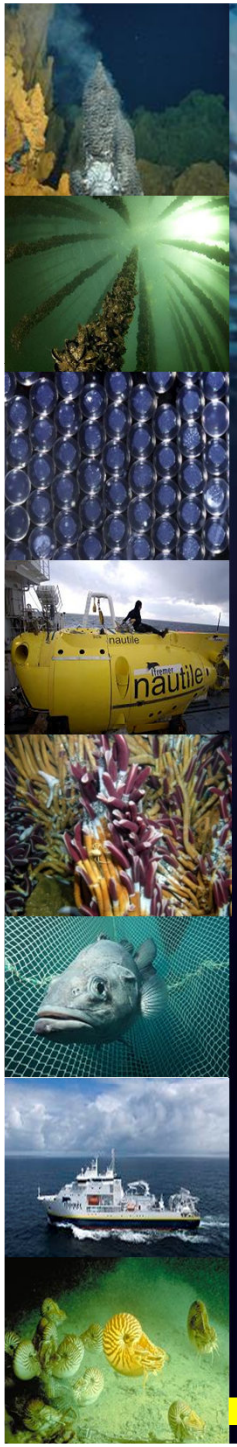

Sysif


SAR


ROV Victor 6000


Nautile


AUV IdefX



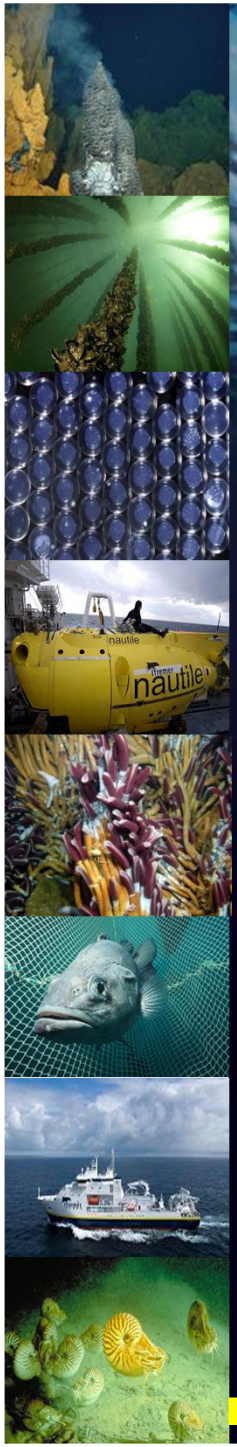
Submersible data

In situ/Raw data

- Positioning
- Micro bathymetry
- Seismic reflection
- ADCP
- CTD
- Images (video and stills)
- Measurements
- Observations
- Bio/Geo/Hydrological samples

Post-processing data

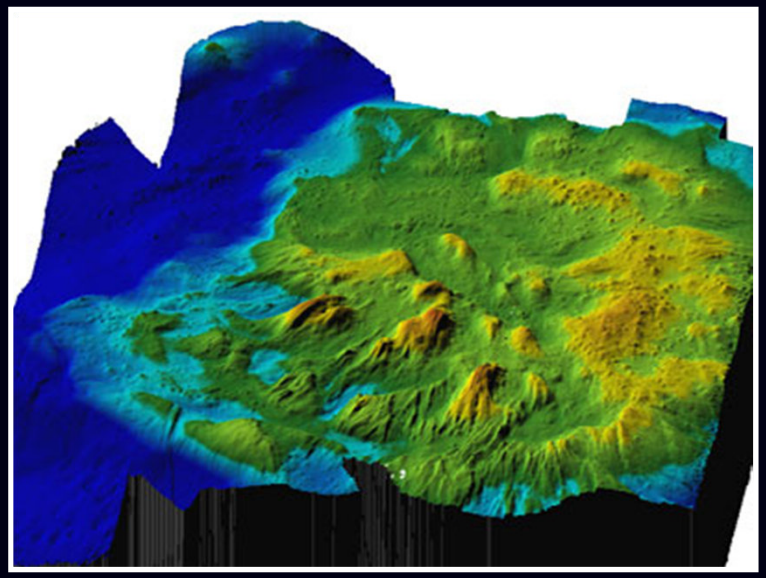
- Images and related observations
- Bio/Geo/Hydrological sample analyses



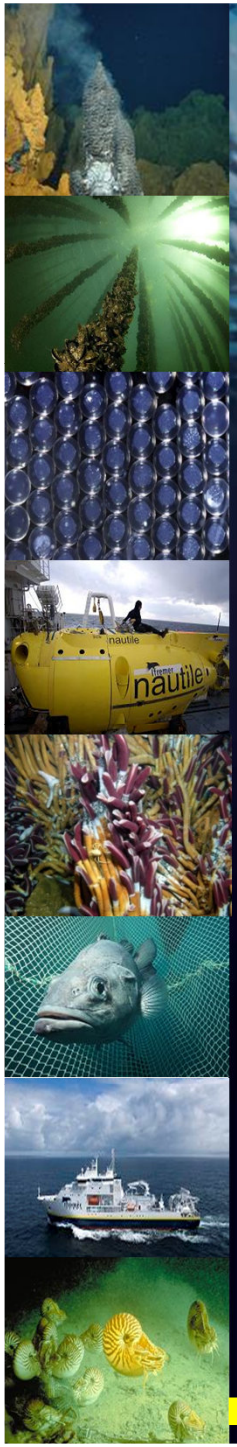
Submersible users

- Biologists/Ecologists
- Geologists

from Ifremer and from the international scientific community



Ifremer

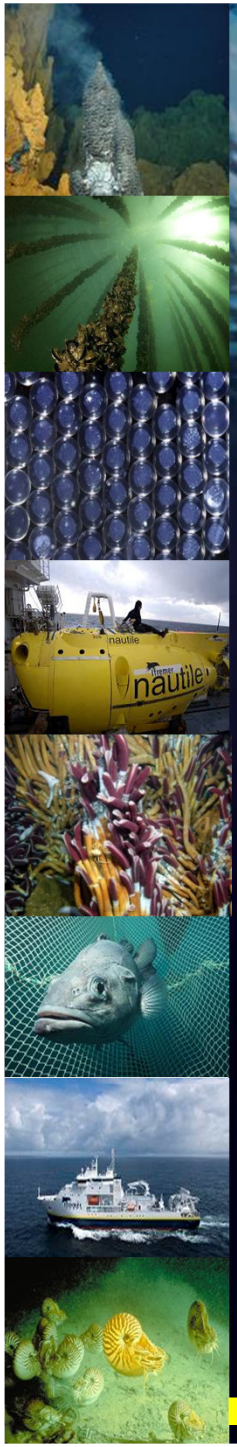


Submersible data management

Biocean

The data management system for deep-sea benthic ecological data from:

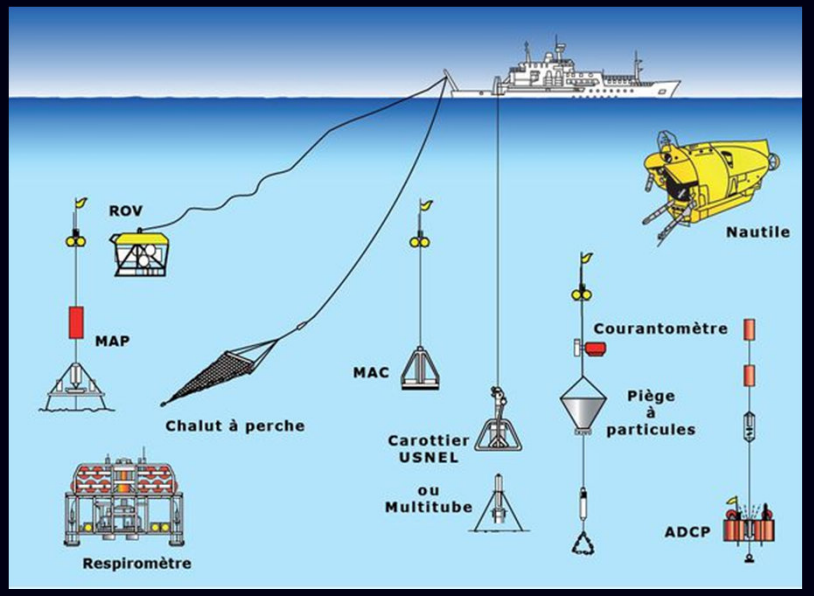
- Benthic sedimentary ecosystems
- Hot-vent ecosystems
- Cold-seep ecosystems
- Deep coral reef ecosystems
- Canyons



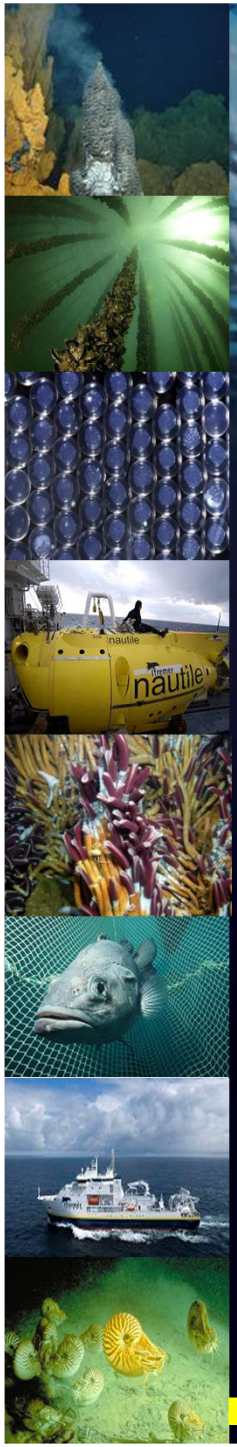
Biocean

Different data types mainly collected by research submersibles and multiple gear:

- Samples (biology, water, sediment) and analyses: specimens identification and definition of their living conditions
- Measurements (physics, chemistry)
- Images (stills)



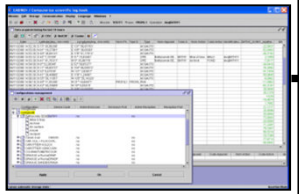
Biocean



REAL-TIME | **POST-PROCESSING**

On board ships

CASINO Acquisition of surface operations



ADELIE Acquisition of submarine operations

Alamer Cruise Log

Alamer Dive Log

« Echange Terre / Mer »
Data Import/Export

Data Files

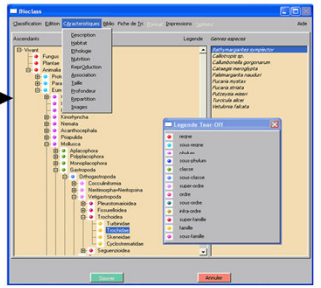
Metadata and Operations - Results
- Video stills
- Samples (fauna, water, sediments)
- Measurements
- Moorings

Back on Land

BIOCEAN Core Database
Relational Database (ORACLE)

GESCOL Collection Management

BIOCLASS Taxonomic Nomenclature Management



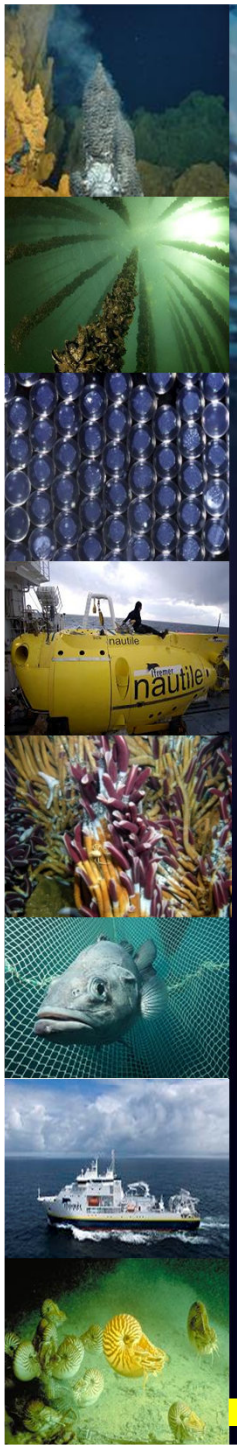
DONENV Environmental Data Capture

Water Sampling in the shrimps ATOS 2001 (Mid Atlantic Ridge - Rainbow)

Internet Access to data

http://www.ifremer.fr/isi/biocean
http://www.iobis.org

Ifremer

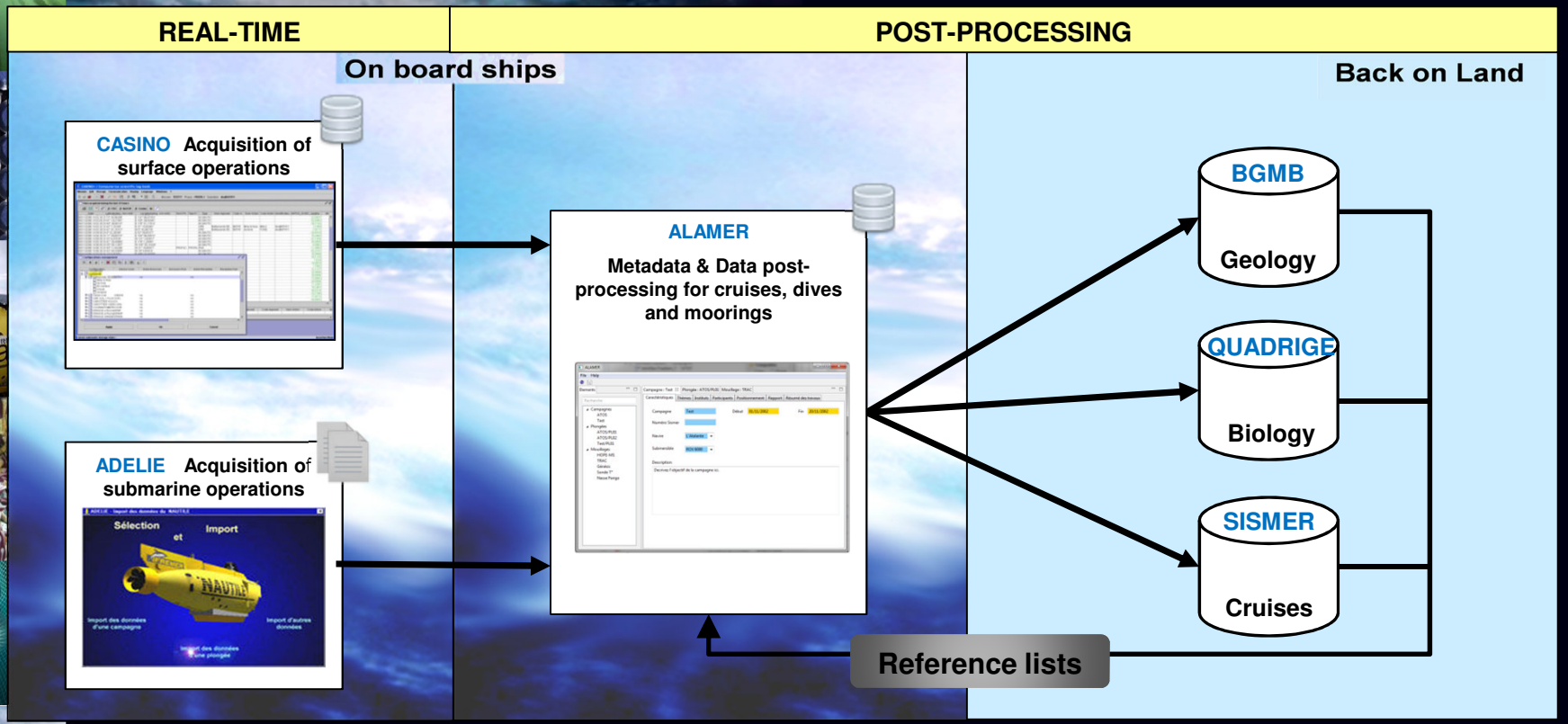


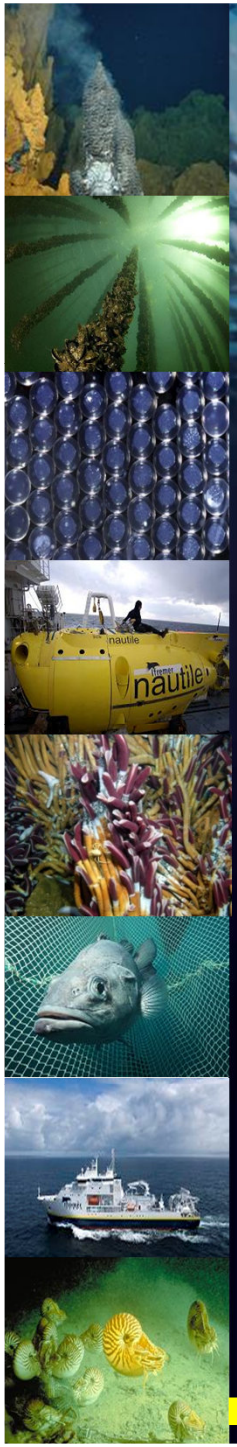
Evolutions

- New equipment and technologies: a huge increase in data volume (*e.g.*: video)
- Newcomers: geologists
- Obsolete information technologies: new functionalities needed

→ Biocean system to be renewed

A « new » data flow





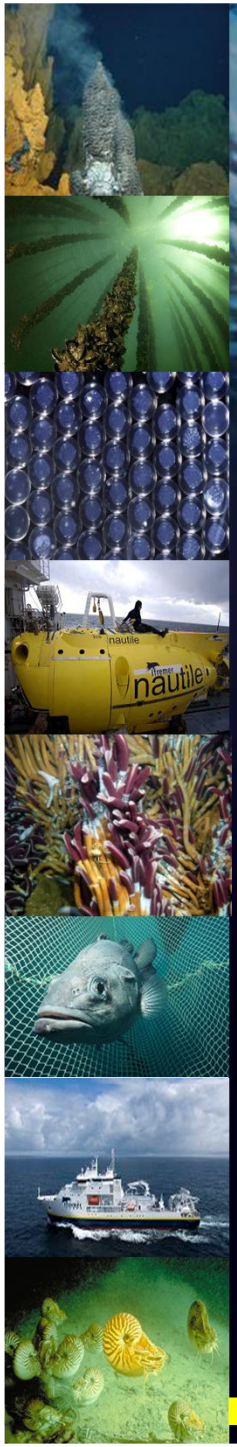
Onboard software: Alamer

Objectives

- Record and Report events (= operations)
  e.g.: moorings, cores, observations…
- Track samples

from cruises, dives and moorings

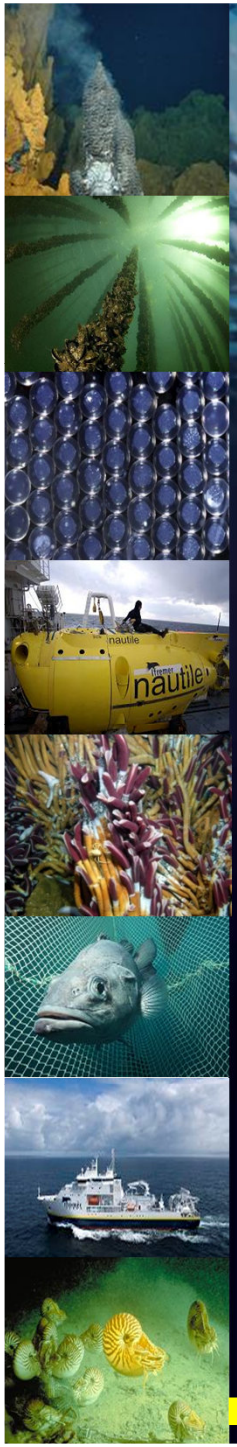
operated by biologists or geologists



Onboard software: Alamer

Functionalities

- Import reference data
- Import « real-time » surface and submarine georeferenced operations
- Formatting
- Description of results, samples, measures, stills
- Safeguarding
- Export



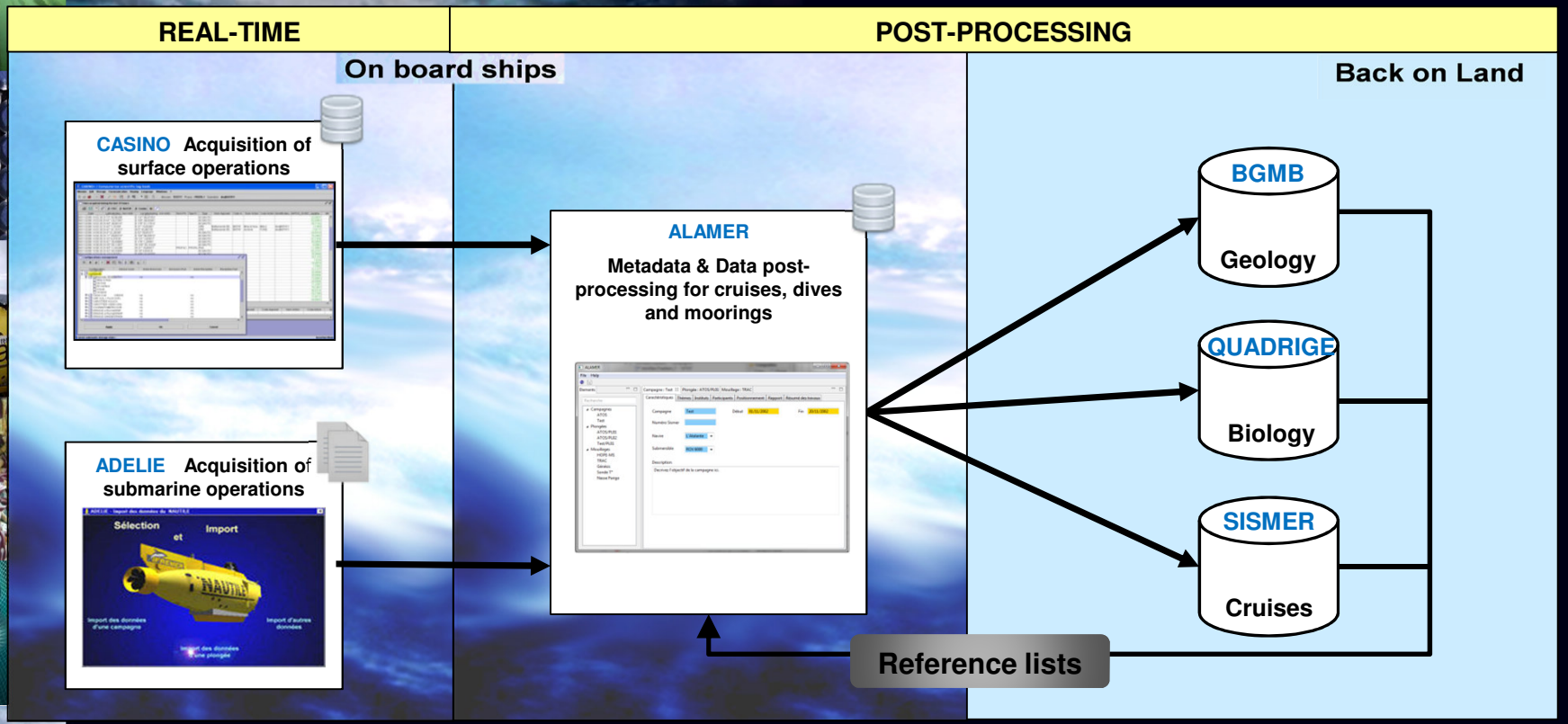
Onboard software: Alamer

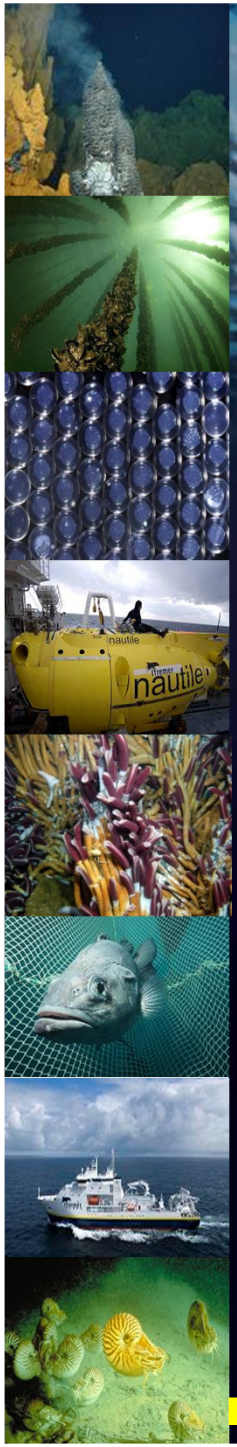
Technologies

- MySQL database
- Java+Eclipse RCP
- « Stand alone » application + « Web Services » layer
- Multiplatform
- Multilingual

→ To be used onboard both French and Foreign vessels

A « new » data flow





Back on land: dedicated databases

RAW DATA
direct from sensors and cameras
Positioning
Micro Bathymetry
Seismic Reflection
ADCP
CTD
Images (Video and Stills)

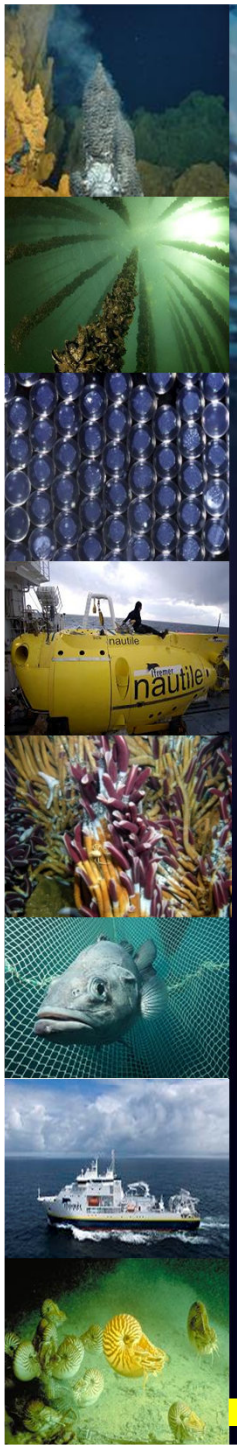
ALAMER
Cruise, Dives, Moorings, Operations
Bio/Geo/Hydro Samples
Measures
Stills

SISMER
CRUISES
GEOPHYSICS
PHYSICS-CHEMISTRY
VIDEO

QUADRIGE
BIOLOGY

BGMB
GEOLOGY

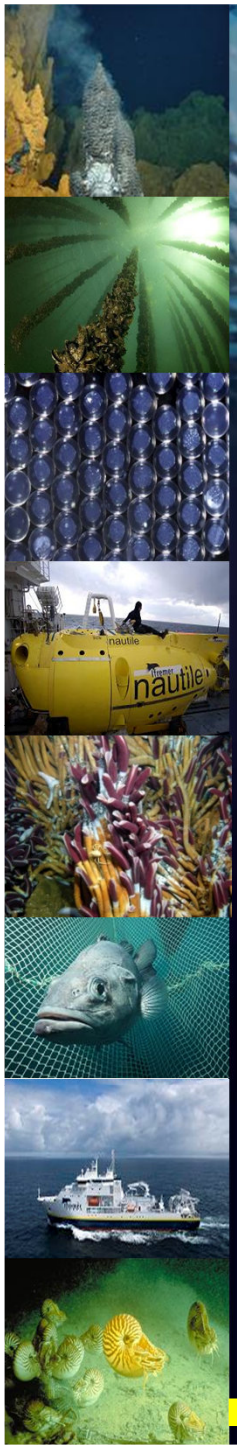
Back on land: dedicated databases



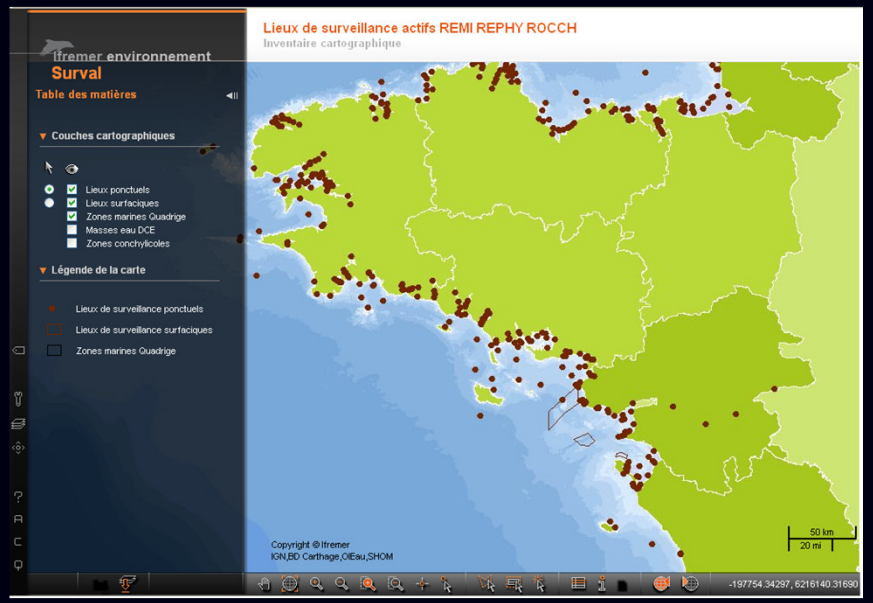
SISMER

National data banking activity covering the fields of marine physics, chemical, underway geophysics, video and general information on French oceanographic cruises and data sets.

Back on land: dedicated databases



QUADRIGE



Initially the operational information system for French coastal monitoring, to store and give access to raw biological and ecological data. It is expanding to other subjects and is becoming a more general biodiversity information system.

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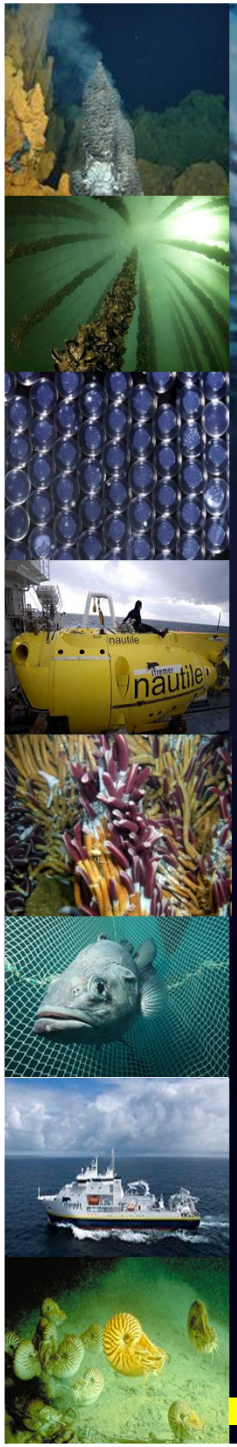
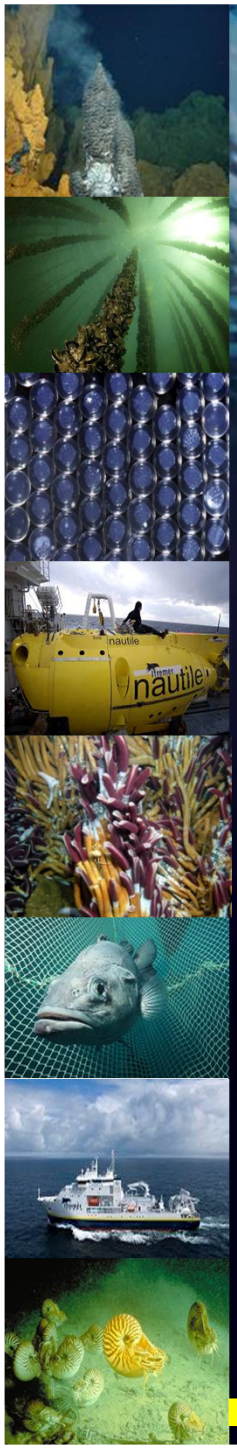


Back on land: dedicated databases

BGMB

The Marine Geological Database of Brest contains geological data related to samples and measures taken by the departments of Ifremer :

- observation and sampling stations: position, type of observation and sampling (submersible, drilling, dredging)
- descriptions of samples



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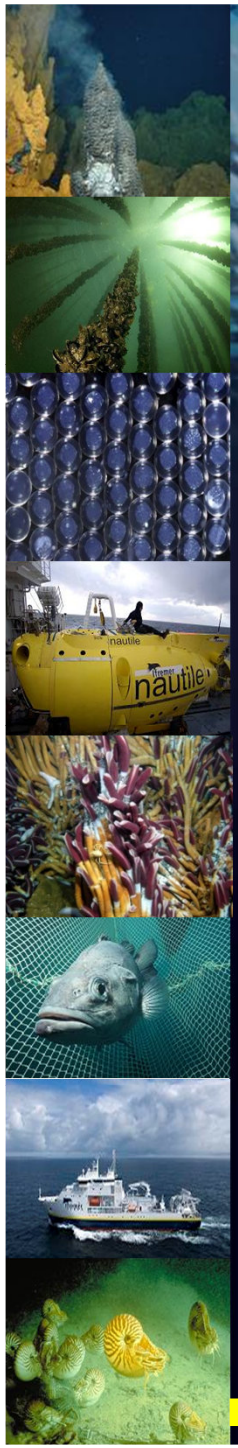


Focus on video data management

Data bank

SISMER

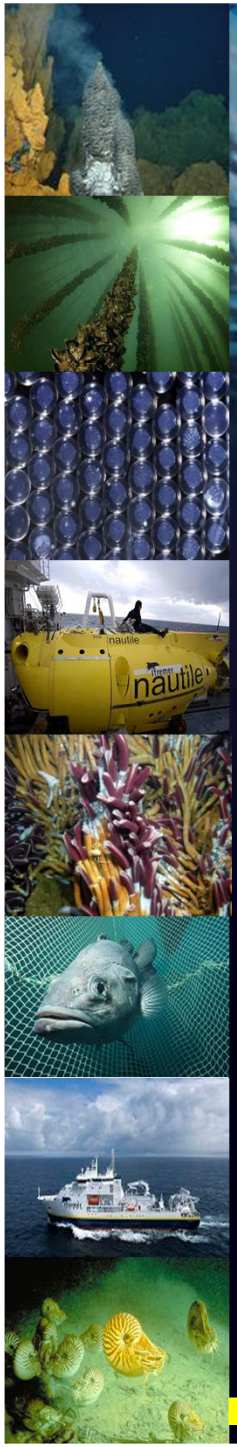
Context

Special data: volumes, formats, diffusion,…

Objective

To provide georeferenced video online:

search tool → selection of video files extracts → download



Focus on video data management

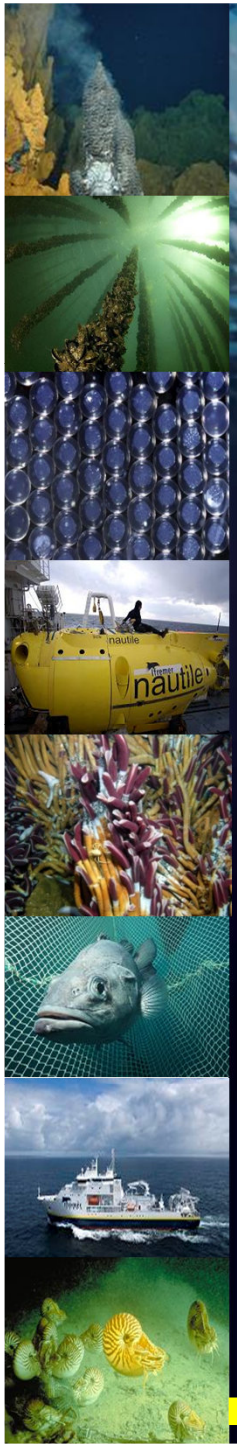
Technical needs

Management of both:

- a raw video file format for perennial high quality safeguarding (numerous)
- a compressed video file format version for web diffusion (to be defined)

Scientific oriented video indexing:

- metadata (cruise, location, time,…)
- inside events: observed taxa, geological features, anthropogenic impacts,…

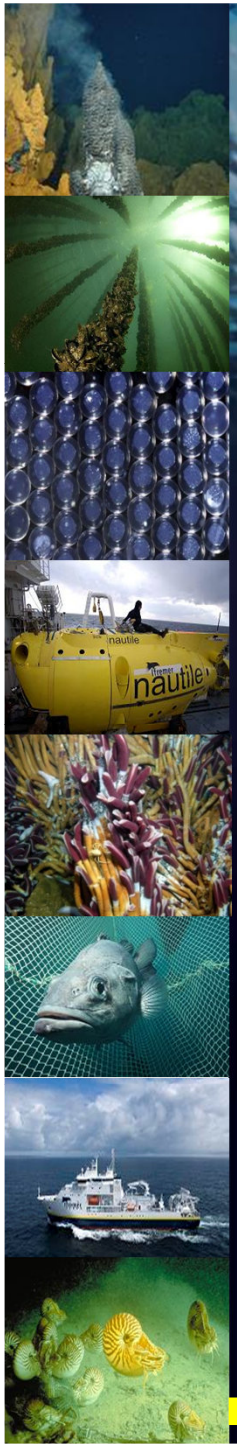


Focus on video data management

Project for the long term

To provide video related products and tools:

- automatic object detection (complex issue due to the submarine environment characteristics)
- picture enhancement (blur, light,…)
- video based automatic mosaïc generation



International context

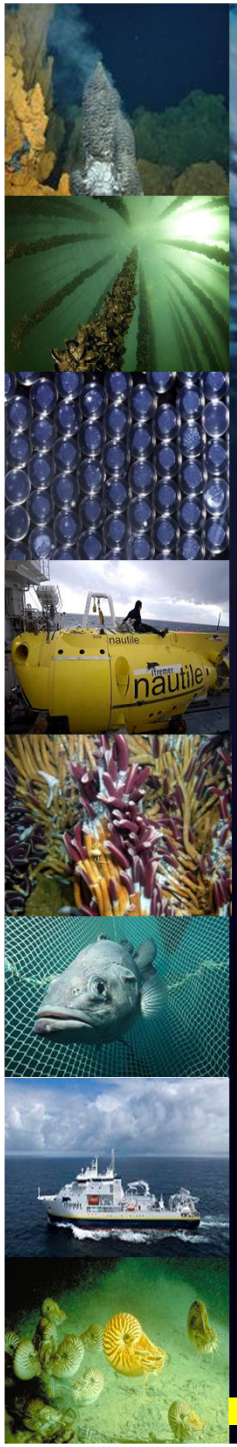
… or **INTEROPERABILITY** aspects

SeaDataNet and **OBIS**: use of common standards for oceanographic, environmental and taxonomic data + data connection

Eurofleets: towards a common metadata acquisition and transmission software – EARS

ODIP: input to development and implementation of standards on a global scale

International context



SeaDataNet

ODIP

EUROFLEETS

ALAMER

Cruise, Dives, Moorings, Operations

Bio/Geo/Hydro Samples

Measures

Stills

SISMER

CRUISES

GEOPHYSICS

PHYSICS-CHEMISTRY

VIDEO

QUADRIGE

BIOLOGY

OBIS – WoRMS

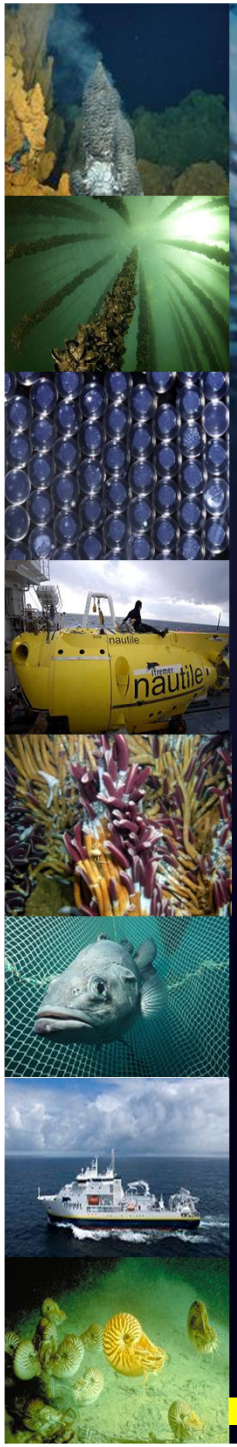
BGMB

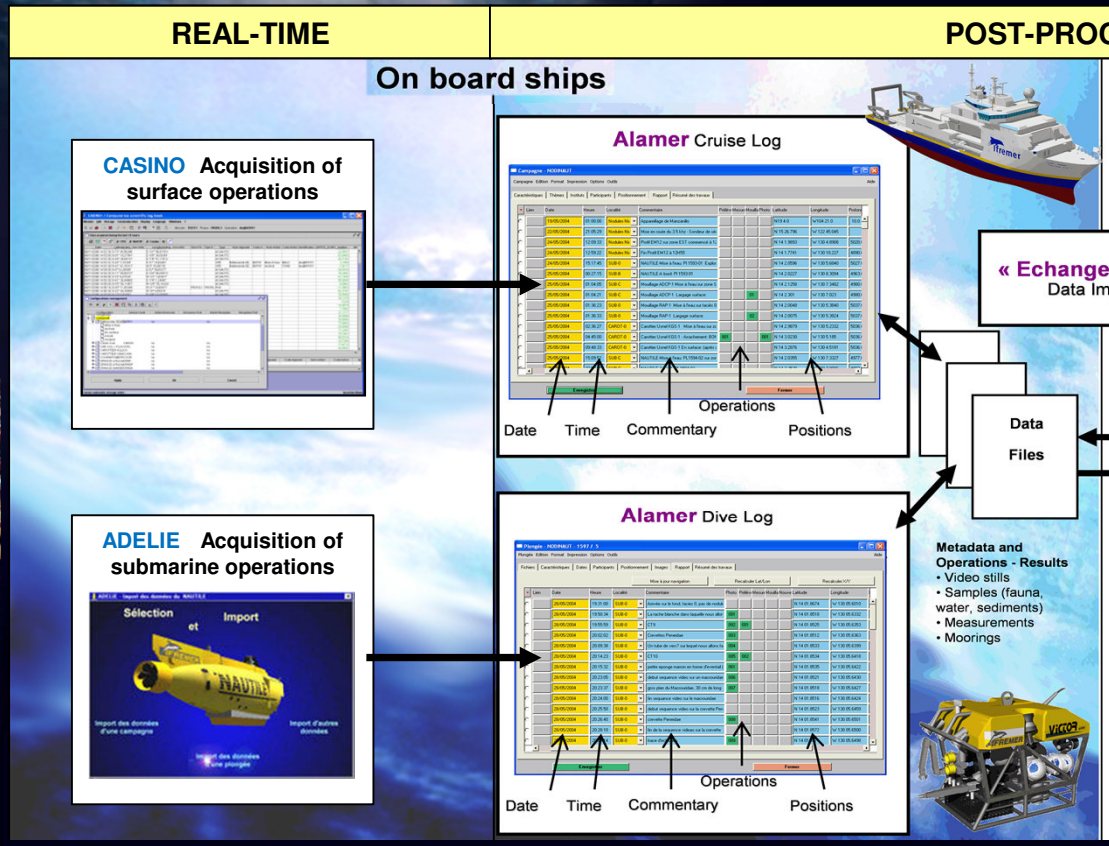
GEOLOGY

Ifremer

Conclusion - perspectives

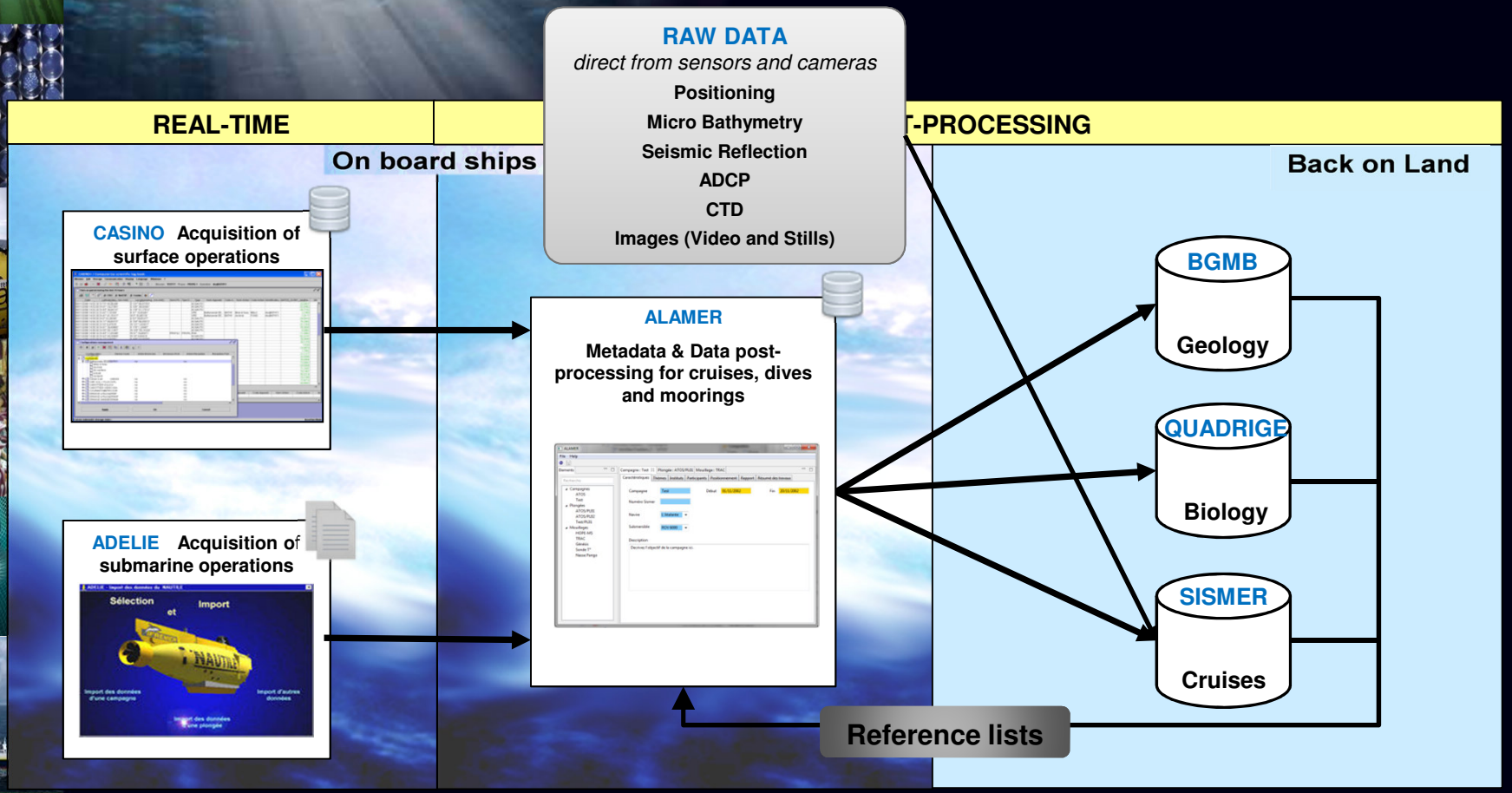
Past & Present

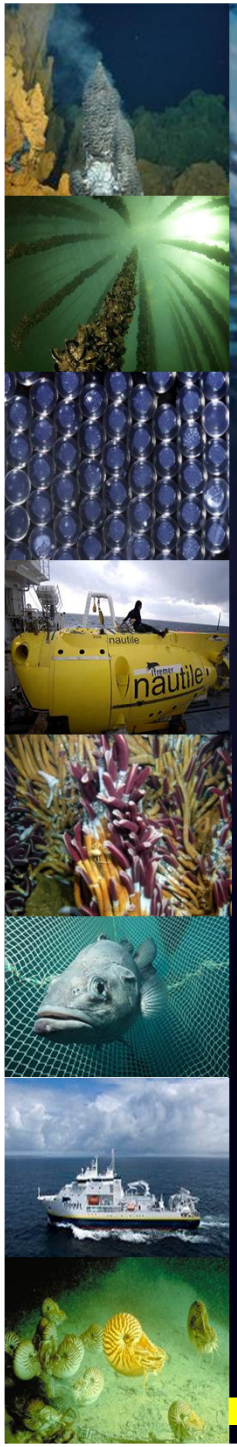




Conclusion - perspectives

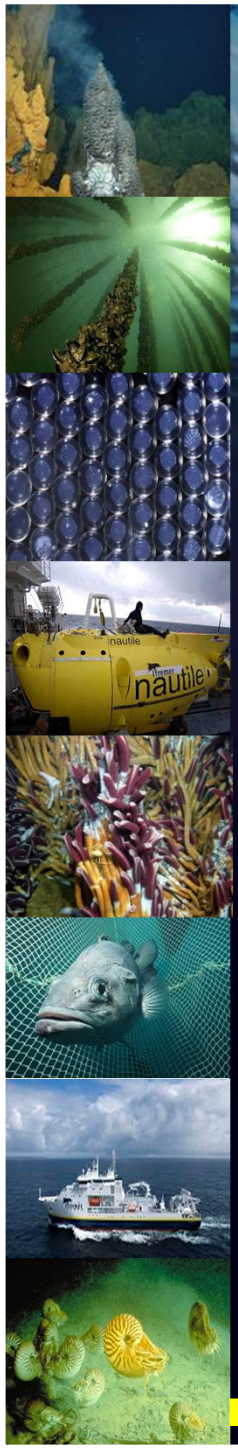
Present & Future





Aknowledgements

Loïc Petit de la Villeon (IDM-SISMER)
Gilbert Maudire (IDM)
Olivier Soubigou (NSE-ILE)
Marie-Paule Corre (NSE-ILE)
Jean-Marc Sinquin (NSE-ILE)
The « biologist » team (EEP-LEP)
The « geologist » team (GM-LGM)
…



Remarks and suggestions are welcomed !

Thank you for your attention

Contacts

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