

# « TROPHIMATIQUE » project: Sensors and Chemical *In Situ* analysers

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## SUMMARY

- 1) Introduction
- 2) Project Objectives
- 3) Experience in High Frequency Data collection
- 4) Floating Supports
- 5) Two levels measurements
- 6) Instrumentation
- 7) First results
- 8) Conclusion

## -1- INTRODUCTION

- *In Situ* High frequency measurements:  
An experience of 15 years,  
The ROSLIT network,
- Bay of Vilaine ? :  
A pilot zone for high frequency new developments,  
A zone of special scientific interest,  
Coastal monitoring, numerical models,
- «TROPHIMATIQUE» and « PREVIMER » Projects:  
Funding: ANR / PRECODD and Brittany  
Duration: three years,  
Three partners: I.A.V, nke, Ifremer

## -2- TROPHIMATIQUE PROJECT OBJECTIVES

- New designs for high frequency data collection,
- Validation of new criteria for E.W.F.,  
Three different water masses E.W.F: T27,C44,C45
- New designs and first uses of new sensors:  
Multi-parameter probe,  
Tele-Operated Water Sampler,  
Chemical *On Board* Analysers (CHEMINI):  
Nitrates,  
Silicates,  
Phosphates,  
Ammonium.

## -3- FEED BACK FROM *IN SITU* Experience

- MAREL « Bay of Seine » Network:  
An experience of 15 years,  
Some problems, but promising results,
- A reference for new developments :  
Evolution of technics and materials,  
Innovative solution:
  - simplify maintenance more easy,
  - size reduction,
  - flux analysis.
- « ROSLIT » project:  
Gathered experience of different networks,  
Coordination of the development new materiel,  
Assistance for studies and new geographical areas.

## -4a- FLOATING SUPPORTS (hundreds Kg)

- Tréhiguier Pontoon (*Water mass T27*):



## -4b- FLOATING SUPPORTS (ten Kg)

Ouest LOSCOLO Small Buoy (water mass C44):



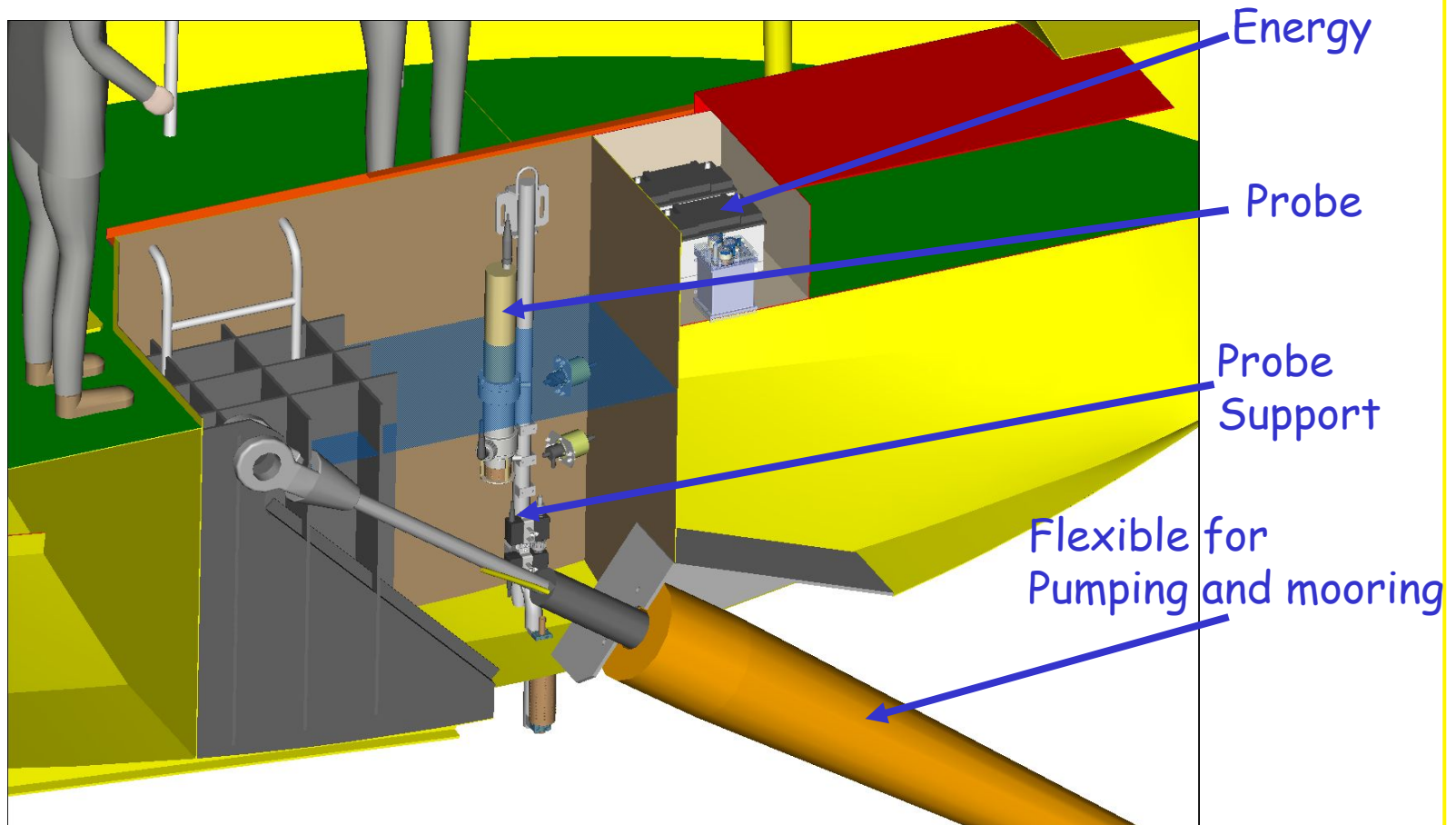
## -4c- FLOATING SUPPORTS (Ten tons)

- MOLIT buoy (water Mass C45):



## -5- TWO LEVELS WATER PUMPING

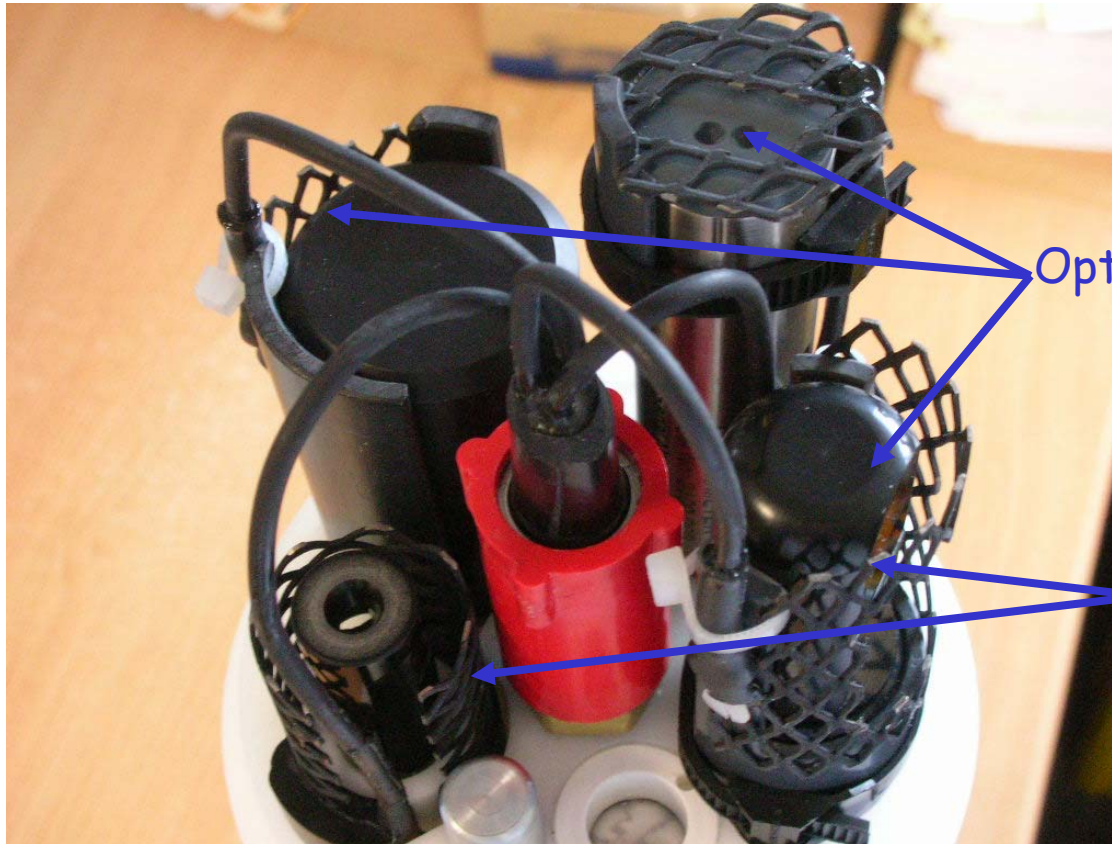
- An other approach (Bay of Seine):



ifremer

## -6a- NEW INSTRUMENTATION

### ➤ Multi-Parameter probe :

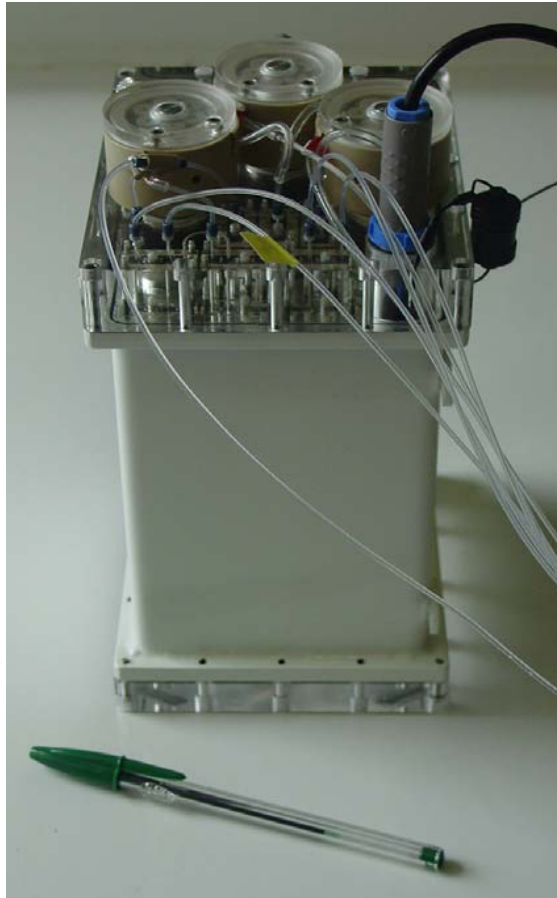


Optical sensors...

Anti-fouling protection grids

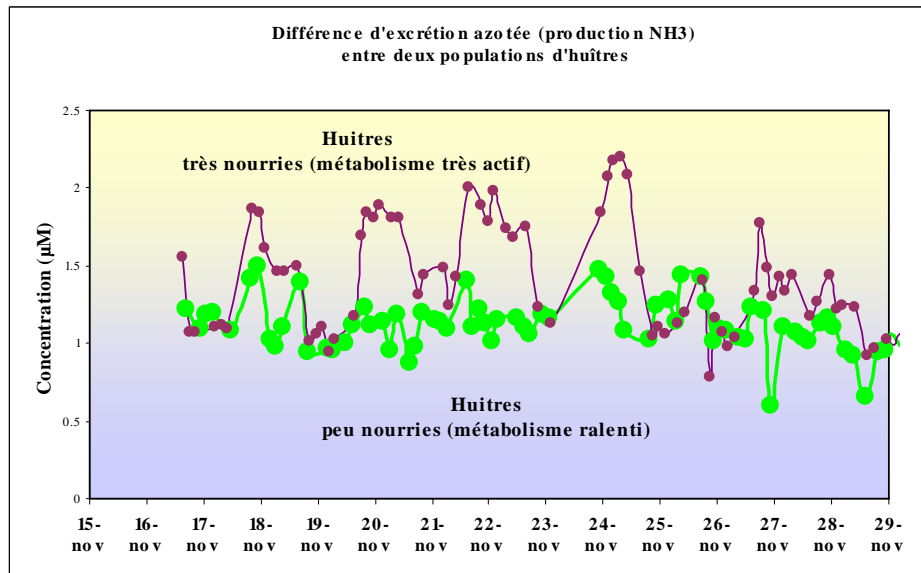
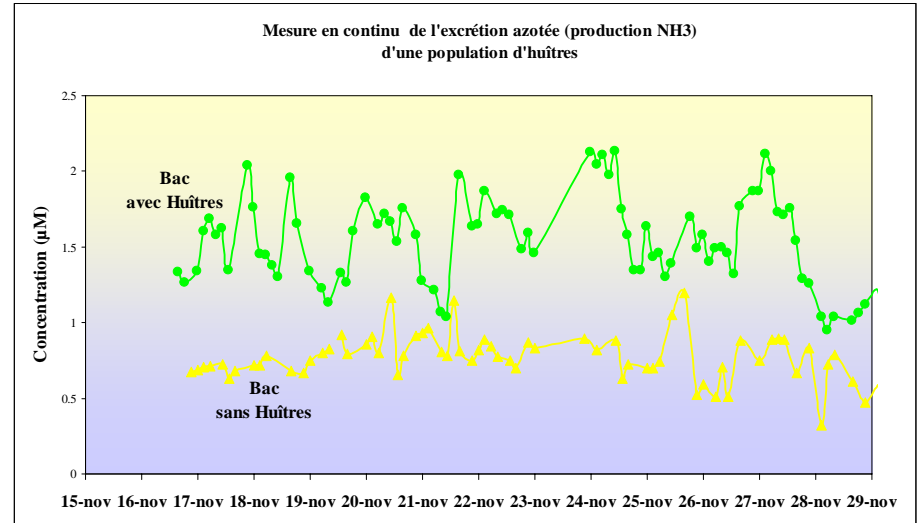
Design and conception by nke our industrial partner

## -6b- NEW INSTRUMENTATION CHEMINI: CHEMical MINIaturized analyser



- o Ammonium determination by flow injection with fluorimetric detection (FIA),
- o Surface version/deep sea version,
- o Excitation with LED centered at 370 nm,
- o Detection limit: 425 nm,
- o Integrated temperature stabilisation,
- o Range of measurements: 0 to 300  $\mu\text{mol/l}$ ,
- o Detection limit: 50 nmol/l,
- o Repetability:  $\sim 3\%$ ,
- o Measurement time: 8 minutes,
- o *In situ* calibration with onboard standards,
- o Totally autonomus.

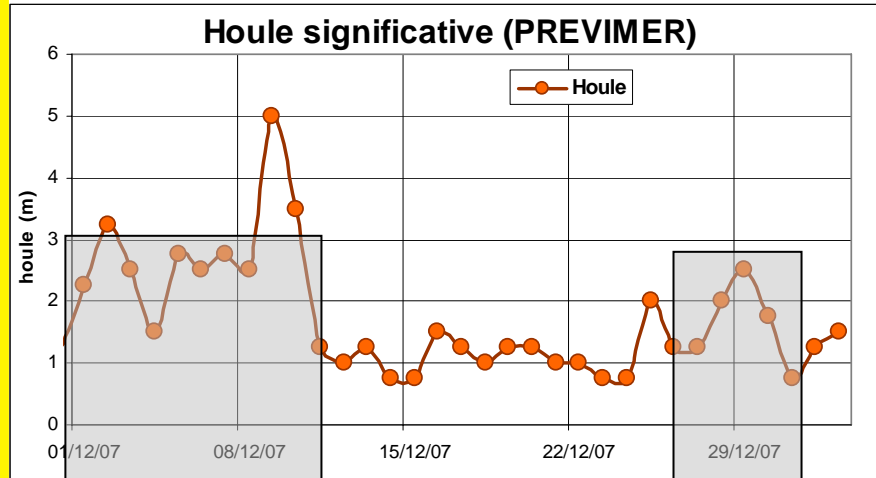
# -7a- FIRST RESULTS ( « Chemini » ammonium )



# -7b- FIRST RESULTS (Molit Buoy)

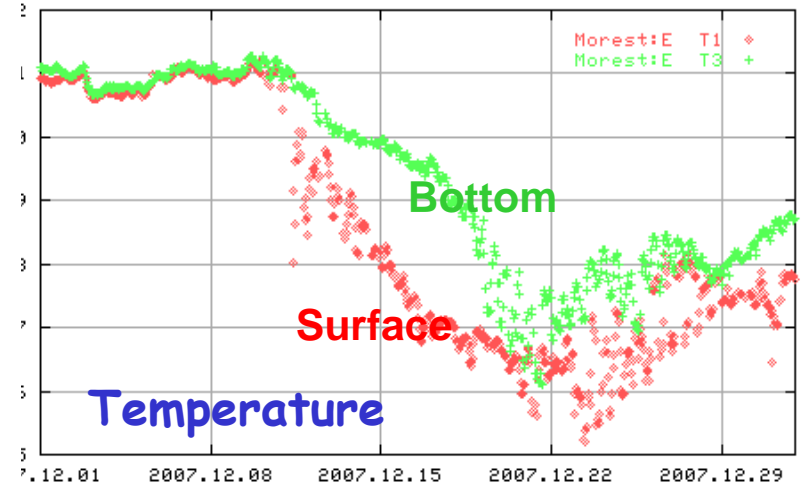
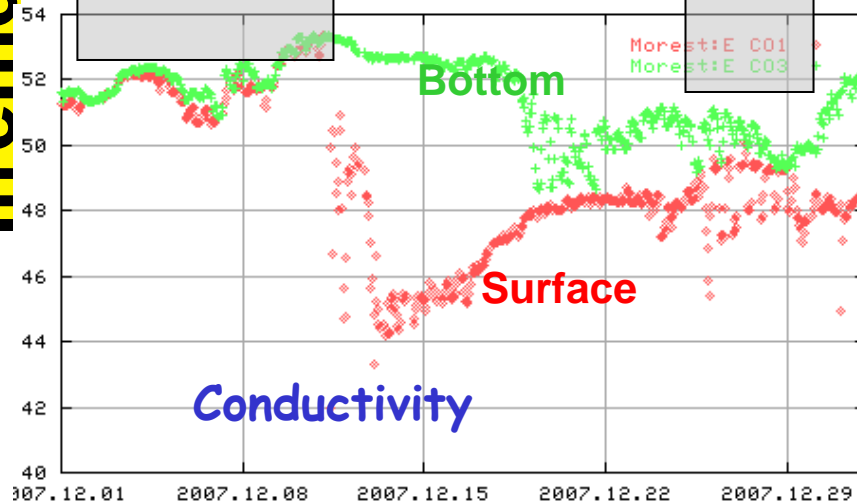
December 2007

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Stratifications:

- mechanisms (wave , tidal courant)
- biological consequences?



## -8- CONCLUSIONS

- New floating supports,  
Small buoys : less maintenance, less energy: low cost,  
Large Buoy: Easy access for maintenance, more resilient,
- Integrated sensors (multi-parameter probes) :  
New French High quality probe,  
Integrated anti-fouling protection,
- Chemical Analysers for nutrients « CHEMINI »:  
*In Situ* measurements with lab quality,  
Analysers ammonia : transfered to industry,  
Nitrates, silicates, phosphates: being tested in lab.

<http://www.ifremer.fr/difMareIviline/>

<http://www.ifremer.fr/difMareIstanne/>

<http://www.ifremer.fr/difMareIcarnot/>



Station Marel-Carnot

THANK YOU FOR YOU ATTENTION