

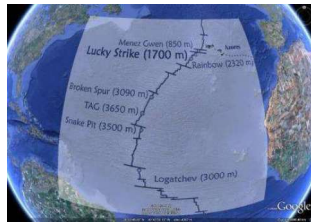
EMSO Azores Measurement of Dissolved oxygen

Pierre-Marie SARRADIN
Best practices
Brest / 12th october 2018

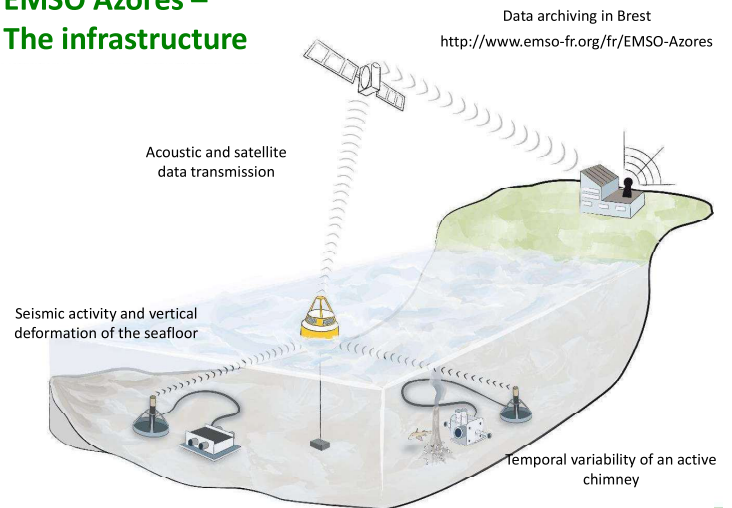


The EMSO – Azores Node

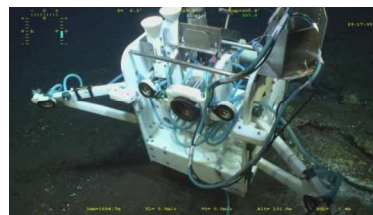
Understand the links between geological, physical and chemical processes and their effects on the dynamics of the hydrothermal fauna at different spatial and temporal scales at the Lucky Strike vent field



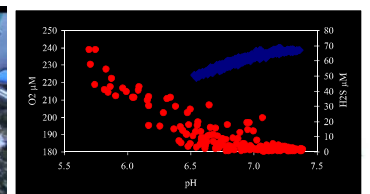
EMSO Azores – The infrastructure



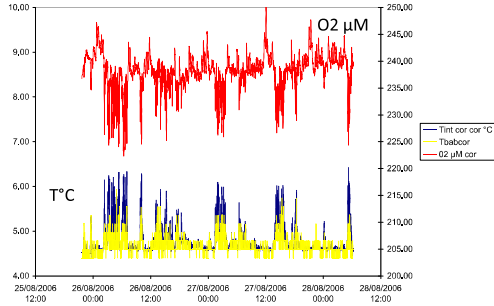
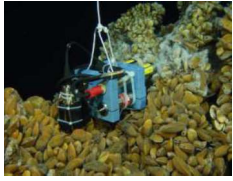
The TEMPO module



- Habitat characterization and evolution of a mussel assemblage
- Oxidic / anoxic transition area
- Temperature gradient



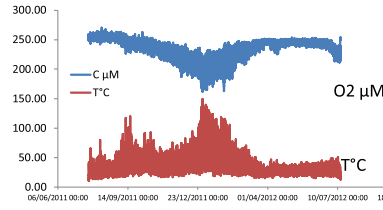
Oxygen measurement Andraea Optode



Optode 3830
Localised microcloration against fouling
Measurement period 30 sec
2 autonomous T probes

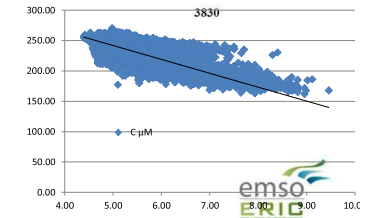


Observatory data - July 2011 to July 2012

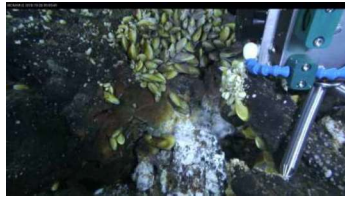


From 2011 to 2016
Laboratory calibration 2 points 0 and 100%
(no availability of fully calibrated optodes)

- Too large dispersion of the data**
- Limit of the temperature correction in a dynamic environment
 - Response time of the O₂ and Temperature sensors
 - Lag between the 2 sensors
- Work in progress ... Cathalot , Laes et al.



Data valorisation



Behavioural study of two hydrothermal crustacean decapods: *Mirocirus fortunata* and *Segonzacia mesantitica*, from the Lucky Strike vent field (Mid-Atlantic Ridge)

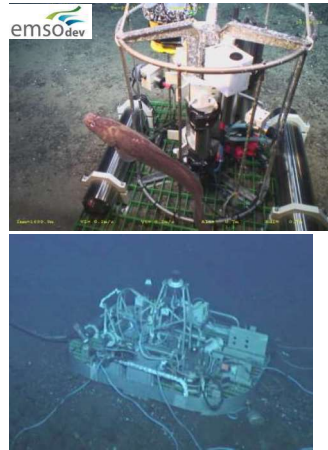
- Only temperature data is used
- Or
- The trend is used



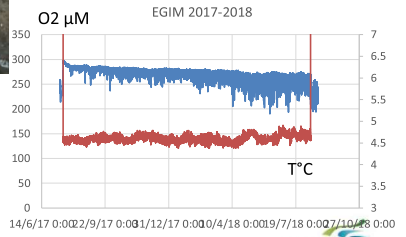
Biological and environmental rhythms in (dark) deep-sea hydrothermal ecosystems



SEAMON East and EGIM 2017-



- Calibrated optodes 4831
- <https://doi.org/10.17882/56501>
- Sensor data sheet
- Sensor test and specification
- Oxygen calibration report



SEAMON East and EGIM 2017- ...



New objectives

- Water column dynamics
- Oceanography mooring
- CTD deployments
- Winkler analysis



O₂ optodes

Data acquisition: state of the art of sensor knowledge, implementation and recommendations

Best practices:

- (1) Know your sensor!
- (2) Get to know your sensor in the lab first under controlled conditions.

Henry Billig
ICM, Basic Sea Research Institute Warnemünde

O₂ sensors

Types of sensors:

- self-heating—on-line, coded—autonomous, fixed—profiling, optical—autonomous, open—profiling

Types of applications:

- environmental monitoring, needed stability, time response, characterisation of the probe

Henry Billig
ICM, Basic Sea Research Institute Warnemünde

How do O₂ optodes work? — pO₂ probes

Dynamic luminescence quenching by O₂

All indicators are: Quenching = O₂ concentration (i.e., pO₂ per vol %)

Right But O₂ concentration around the luminescent chemical is a trace in seawater!

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