

SenseOCEAN- A successful marriage of industry and science

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Columbus 2nd annual conference

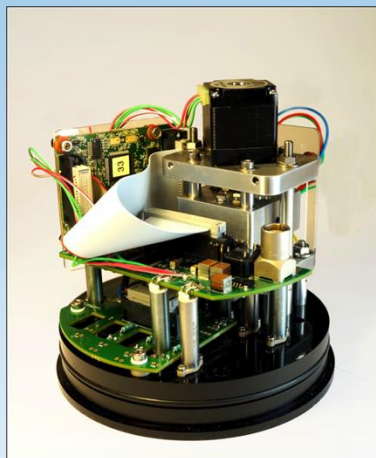
SenseOCEAN: Marine sensors for the 21st century



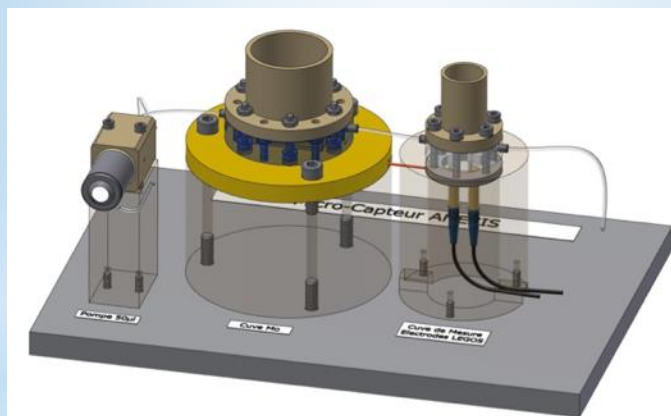
- In situ sensors to measure crucial biogeochemical parameters.
- Deployable on many platforms.
- Low cost & mass producible.
- Using a variety of sensor technologies.



Optode sensors mounted on CTD frame ready for deployment (image courtesy E. Fritzsche)



Lab on chip sensor (image courtesy OTE Group, NOC)



Silicate sensor prototype developed by CNRS (image courtesy CNRS)



Deploying sensors on an observatory system (Hypersub) in Helgoland (image courtesy A. Chennu)

Project Outline

- ◆ 12 Partners: 7 Academic and 5 SME
- ◆ Total budget €5.92 Million
- ◆ 48 months
- ◆ 43 Deliverables



SME Partners

NKE - Based in France, develop communication technology,
Provov floats

UNISENSE - Denmark. Started as a FP6 project at University of Aarhus

PYROSCIENCE - Set up as a spin out from the Technical University
of Graz

T.E. Laboratories. Republic of Ireland

Chelsea Technologies Ltd. UK

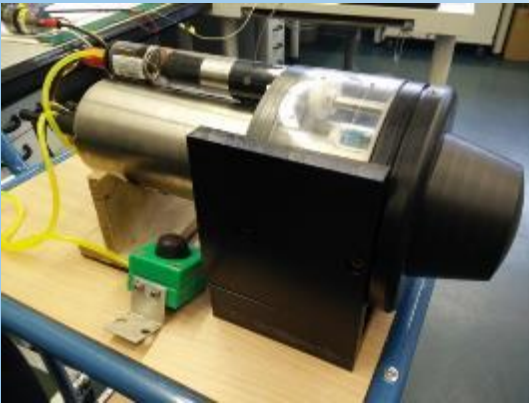
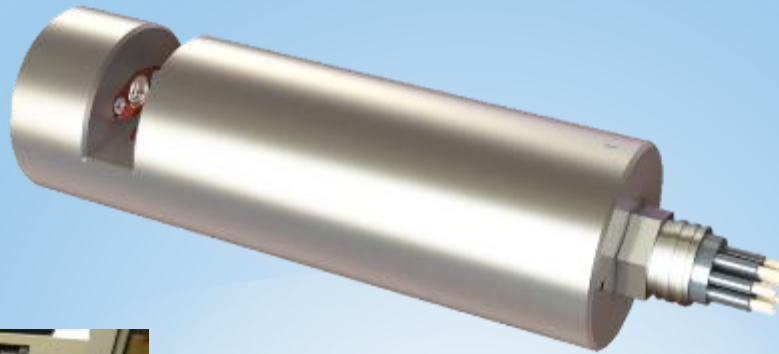


Project highlights

- Three products on the Market and selling
- All sensors have moved from TRL 1-5 to >6 some to 7-8
- New generation of optodes
- Cost reduced for all sensors by up to €1000 per unit
- 6 patents
- First lab on chip sensor deployed on an ARGO float
- Longest deployment of an FRFF in the Arctic

Project highlights

- Honorable mention in the ACT nutrient challenge
- Lab on chip sensor made it to finals of the X-Prize
- Full field deployments on multiple platforms
- The first deployment of a truly multiparameter marine system
- Standardized approach to data management being rolled out to
- State of the art manufacturing processes used

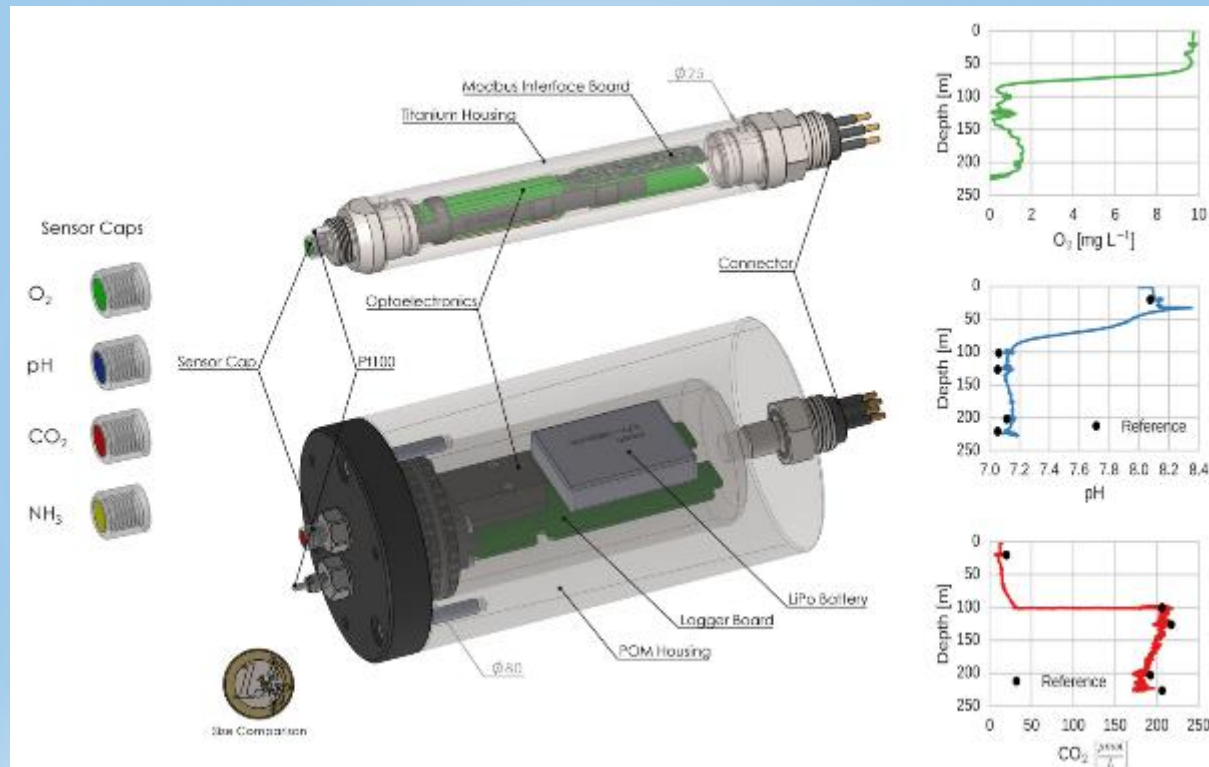


An FRRf system was fitted with a rotating front-cap to enable dark adaptation of phytoplankton before measurement (left). The instrument was deployed at 15m depth in an Arctic fjord to establish a long-term time series of in-situ measurements of algal photophysiology (right). Autonomous acquisitions were performed every 30 minutes, with the possibility to control the system remotely through the internet to modify parameters or download data.

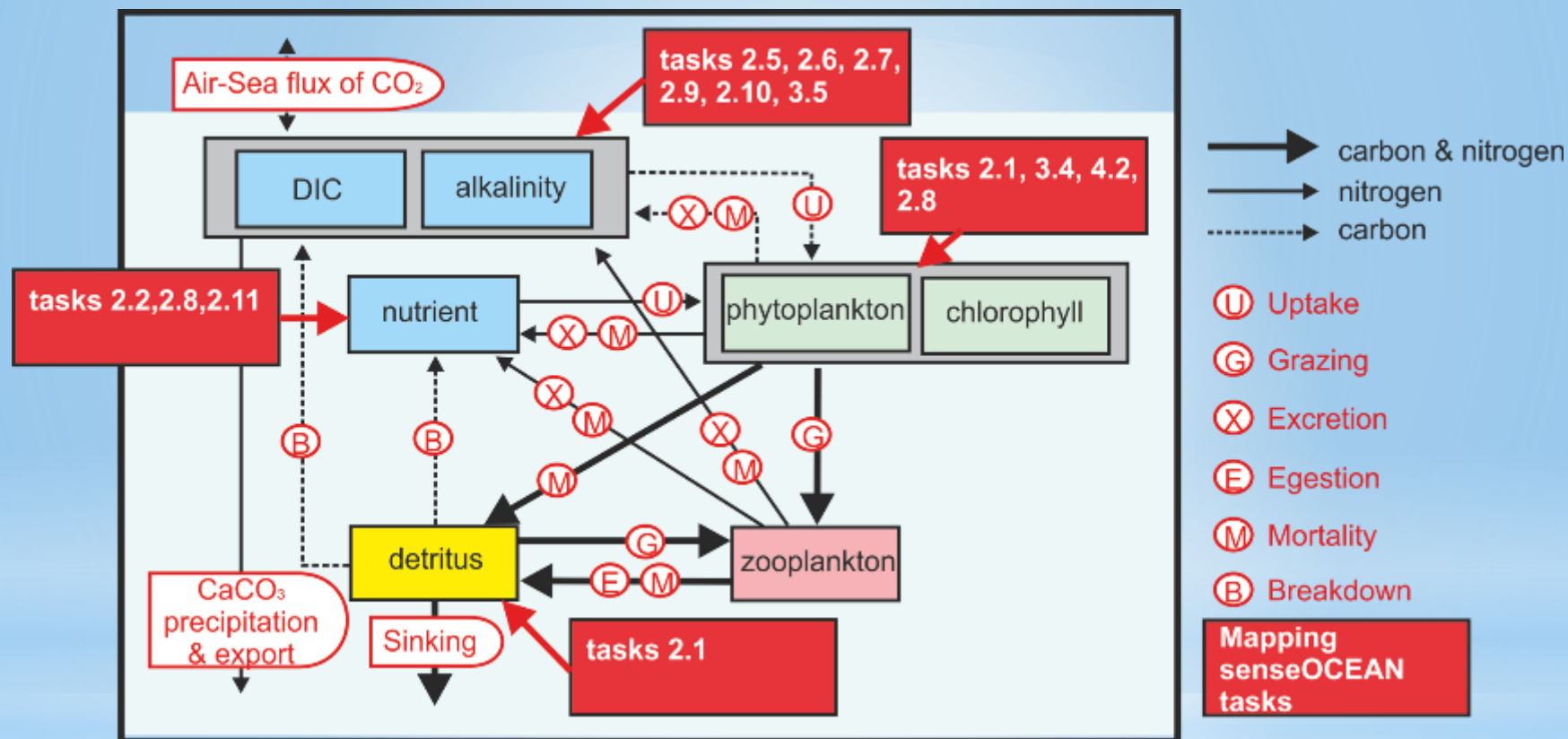


Field DataLogger Mini with a microsensor attached. 2 or 4 channel versions are available.

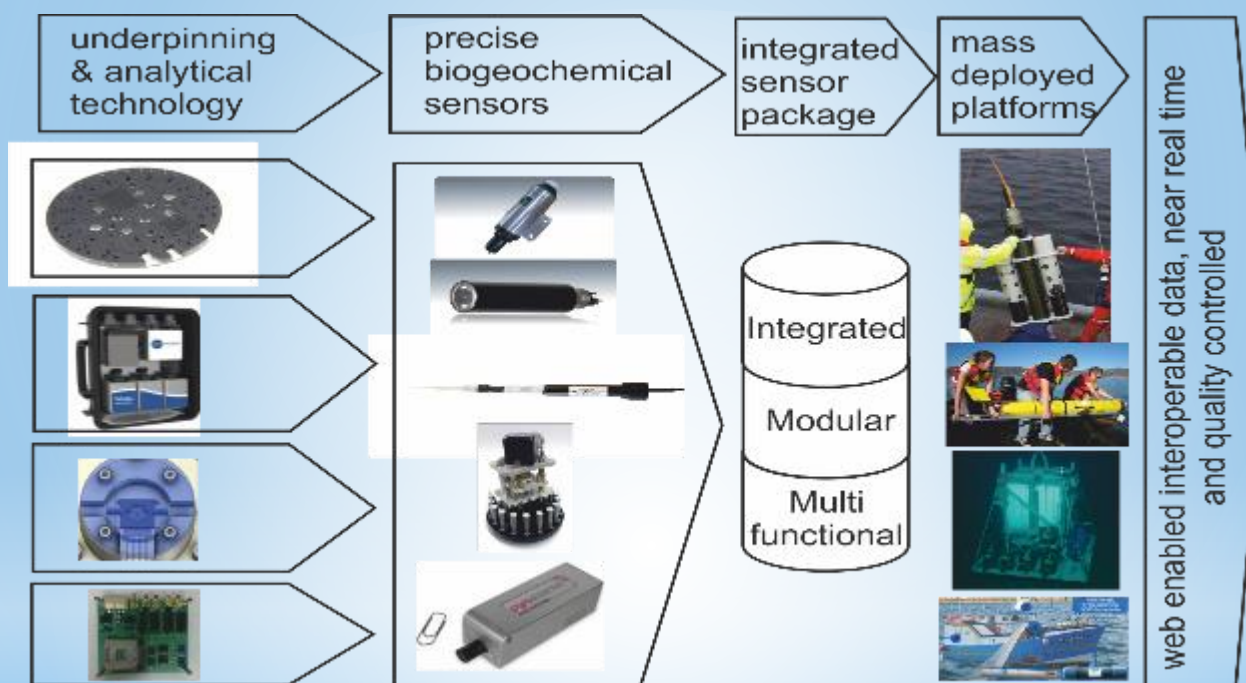
As part of the SenseOCEAN project, one of our partners, Unisense has developed and brought a product to market. The Field DataLogger Mini enables the use of all Unisense sensors in situ and it can be integrated with many external platforms. Sensors are easily connected and it is easy to set up, data is stored for export after the deployment. A customised version of the DataLogger has already been deployed in the Mariana Trench



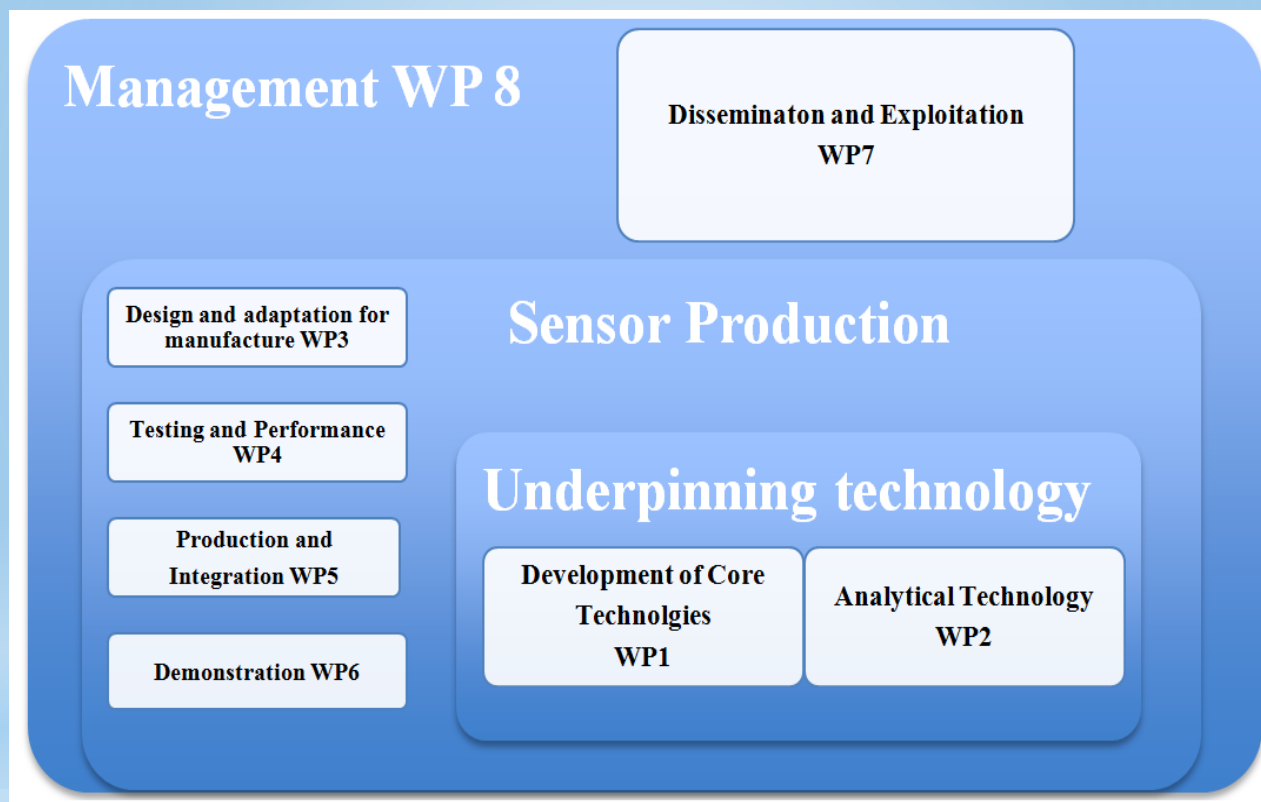
Deep water optode with MODBUS interface (middle, top), shallow water stand-alone optode (middle, bottom), exchangeable sensor caps for different analytes (left) and experimental results for profiles measured at the Gotland basin in the Baltic Sea (right).



SenseOCEAN Concept



Project Structure



Deployments

- ❖ Observatories
- ❖ Gliders
- ❖ AUV's
- ❖ Floats
- ❖ CTD's



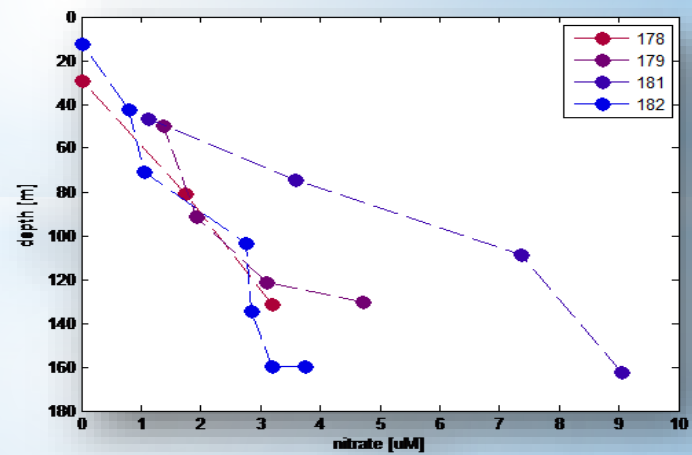
Optode sensors mounted on CTD frame ready for deployment (image courtesy E. Fritzsche)



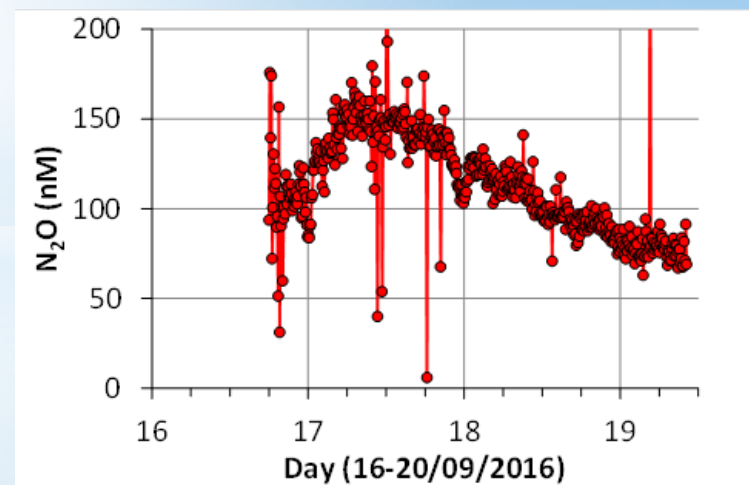
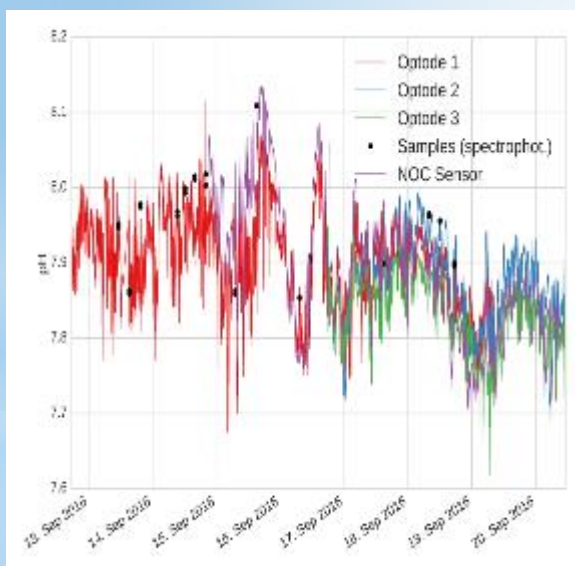
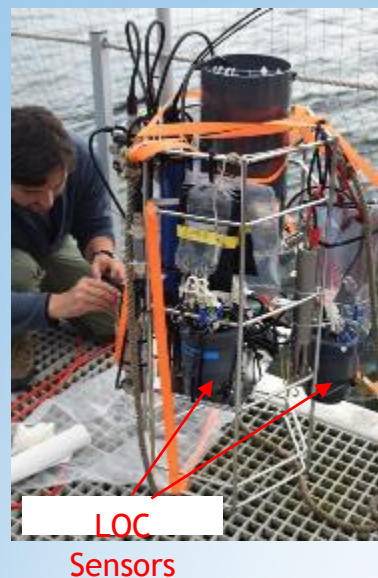
Deploying sensors on an observatory system (Hypersub) in Helgoland (image courtesy A. Chennu)



Biogeochemical ARGO TEST



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What is the secret to a happy (project) marriage?

- A shared vision
- A great partnership built on friendship and history
- A desire to make it work
- Money makes the world go around
- Market pull - partner push
- Luck.....

Thank you for your attention

Acknowledgements: All of the great SenseOCEAN partners. The EC for supporting this work and in particular Sigi Gruber DG Innovation who nurtured the Oceans of Tomorrow call.

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