TA PROJECT REPORT

MultiNuD

- The completed and signed forms included in this package should be sent by email to jerico.ta@marine.ie and **jerico**-s3**@ifremer.fr** within **one month after the completion of the TA project** by the User Group Leader.
- **Refunding of the TA reimbursement to the user group will be processed as soon as these forms will be submitted**.
- The TA project report will be published in the JERICO-S3 website. The report, as well as other information collected with the attached forms, will be used to report to the European Commission.
- **Please note that any publication resulting from work carried out under the JERICO-S3 TA activity must acknowledge the support of the European Commission – H2020 Framework Programme, JERICO-S3 under grant agreement No.871153.**

1. Project Information

Proposal reference number[1]	21/1001601
Project Acronym (ID)[2]	MultiNuD
Title of the project[3]	In-situ parallel nutrient sensor deployments
Host Research Infrastructure[4]	OBSEA
Starting date - End date[5]	2021-07-22 - 2023-08-01
Name of Principal Investigator[6] **Home Laboratory** **Address** **E-mail address** **Telephone**	Matthew Patey National Oceanography Centre, European Way, Southampton, SO14 3ZH mpatey@noc.ac.uk +44 (0)23 8059 6622

2. Project objectives[7] (250 words max.)

In this project, we aimed to deploy lab-on-chip phosphate, silicate and nitrate in-situ sensors at the OBSEA coastal Observatory. We would collect a suite of laboratory-quality nutrient measurements over an extended period to produce a nutrient dataset with a temporal resolution that is unprecedented in the surface ocean.
While these prototype sensors had been deployed previously (e.g. in estuaries, rivers and low temperature (polar) waters, the coastal waters of the observatory offer environmental conditions that offer new challenges to the sensors. Specifically, we want to test three aspects that limit the capacity to deploy in-situ sensors in long-term moorings: reagent stability, biofouling, and low level performance.

3. Main achievements and difficulties encountered (250 words max.)[8]

The start of the project was delayed due to working restrictions at NOC and a large number of other delayed projects preventing work on this one. We sent the sensors to OBSEA in March

[1] Reference number assigned to the proposal by the TA-Office.
[2] User-project identifier used in the proposal.
[3] Title of the approved proposal. The length cannot exceed 255 characters
[4] Name of the installation/infrastructure accessed with this project. If more than one installations/infrastructures are used by the same project, please list them in the box.
[5] Specify starting and end date of the project (including eventual preparatory phase before the access).
[6] Fill in with the full contact of the Principal Investigator (user group leader).
[7] Write the short-term, medium and long-term objectives of the project. Use no more than 250 words.
[8] Describe briefly the main achievements obtained and possible impacts, as well as possible difficulties

2022 and they began work on integrating them into the observatory. OBSEA personnel created custom cables and a mounting bracket and wrote software to operate the sensors and retrieve results. This work was completed in June 2022 and two deployments were made in this month.

Unfortunately, changes to import and export procedures between the UK and Spain following Brexit resulted in large unforeseen costs to the project and €12 000 in VAT charges were paid when importing the sensors to Spain. This resulted in a large overspend on this project and we were unable to travel to oversee the deployments or repair or replace the sensors when they broke. OBSEA personnel were trained via video conference and successfully carried out two deployments. Unfortunately all the sensors failed on 6th July 2022 and no further data was collected.

Follow on funding was successfully requested from Jerico-S3 in the form of a follow on project (MultiNud 2), which has allowed us to send further sensors and personnel in 2023 in order to complete the planned work.

4. Dissemination of the results[9]

Once the follow on project has been completed we hope to include data from the deployments in a published article. We will acknowledge Jerico-S3 in any publication that includes the data.

encountered during the execution of the project. Use no more than 250 words.

[9] Describe any plan you have to disseminate and publish the results resulting from work carried out under the Transnational Access activity in JERICO -S3: scientific articles, books - or part of them -, patents, as well as reports and communication to scientific conferences, meetings and workshops. Highlight peer-reviewed publications. **Note that any publications resulting from work carried out under the JERICO -S3 TA activity must acknowledge the support of the European Commission – H2020 Framework Programme, JERICO -S3 under grant agreement No. 871153.**

5. Technical and Scientific preliminary Outcomes (2 pages max.)[10]

- OBSEA have physically integrated NOC sensors with the OBSEA platform and are able to operate the sensors remotely and retrieve data from them in near real time.
- Despite NOC personnel not being able to attend in person, OBSEA personnel were trained remotely to operate the sensors.

Chronologically, the main activities at the facility were:

18/3/2022	sensors reception
10-16/6/2022	buildiing cables and tests in lab
16/6/22	1st deployment obsea
22/6/2022	recovery from Obsea
29/6/2022	2nd deployment
06/07/2022	recovery from Obsea
2/8/2022	3rd deployment
07/09/2022	recovery from Obsea

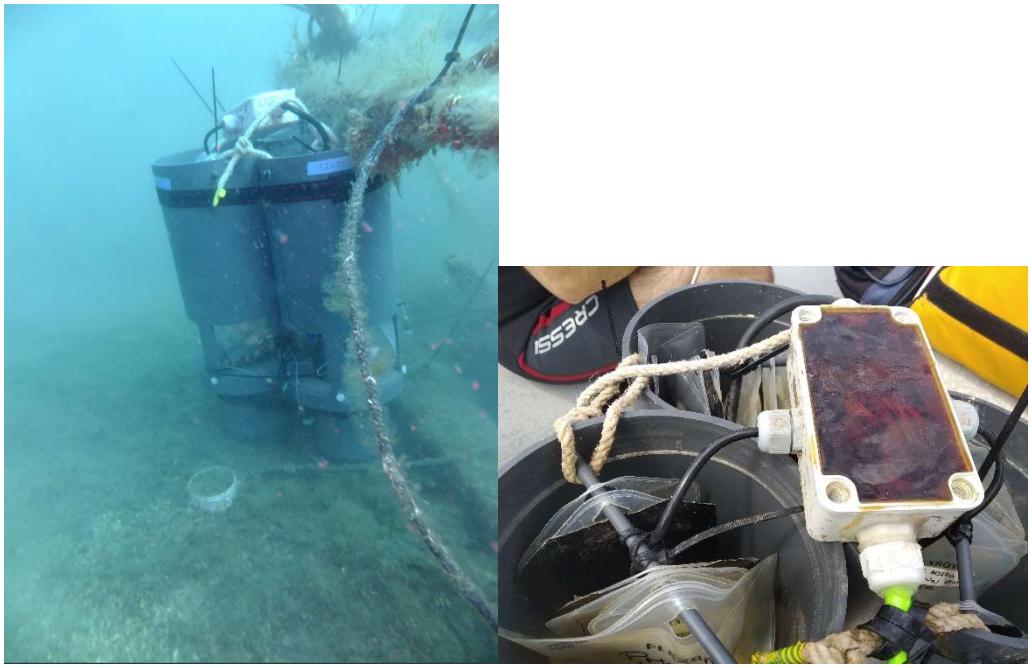
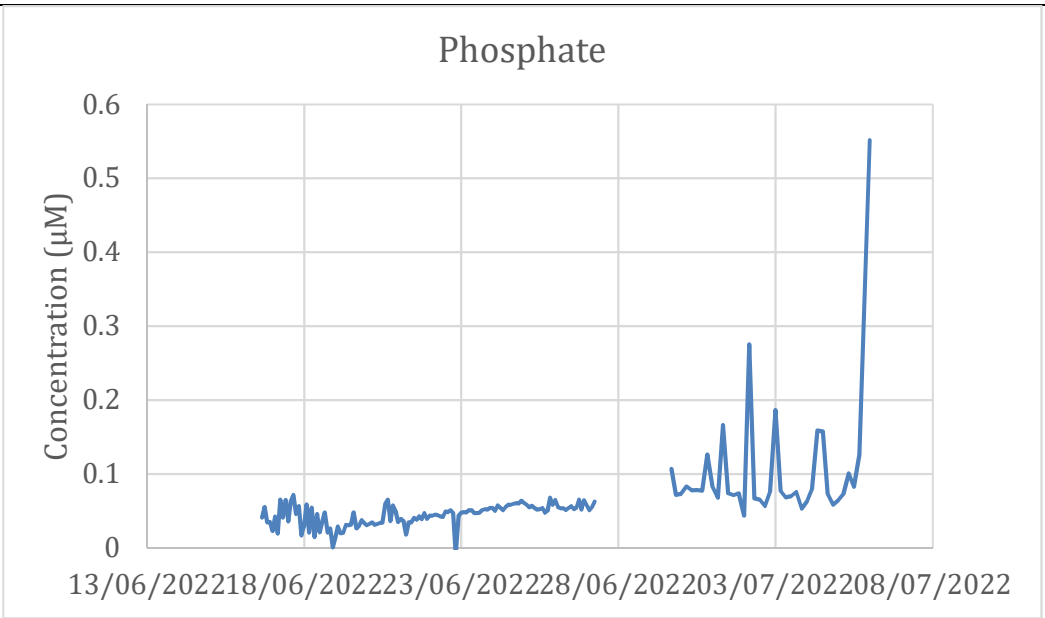


Figure 1. Integration of NOC sensors with OBSEA infrastructure.

[10] Describe in detail results and main findings of your experiment at the present stage.



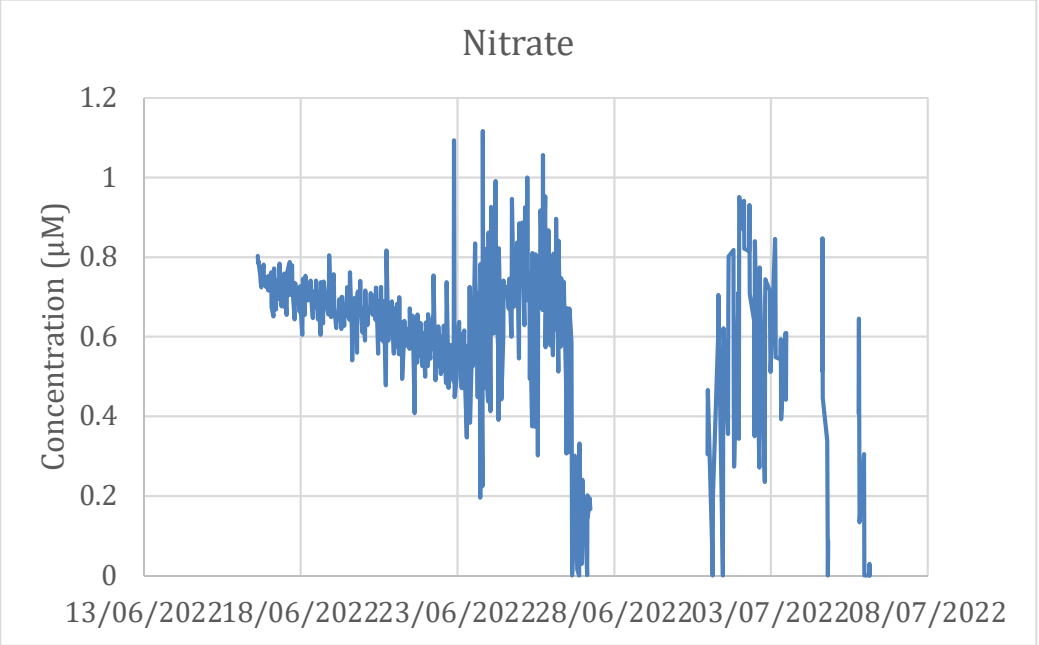


Figure 2. Preliminary data for nitrate and phosphate sensor showing about 2 weeks' data. A diurnal signal is apparent in the phosphate data during the last days of the second deployment.

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Southampton, 31/08/2023

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Location and date

Signature of principal investigator