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PROJECT ACRONYME : JERICO-S3
PROJECT NAME : Joint European Research Infrastructure for Coastal Observatories - Science, services, sustainability
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JERICO-S3 MILESTONE

Joint European Research Infrastructure network for Coastal Observatory
Science, Services, Sustainability

MS#, WP# and full title	JERICO-S3 MS.37 – WP7 - "WASP available for test-cases"
5 Key words	Phytoplankton, automated sampler, phytoplankton, DNA, nutrients
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→ **Please specify the type of milestone:**

- ❑ Report after a workshop or a meeting (TEMPLATE A)
- X Report after a specific action (TEMPLATE B) (test, diagnostic, implementation,…)
- ❑ Document (TEMPLATE B) (guidelines,...)
- ❑ Other (TEMPLATE B) (to specify) …….

Diffusion list			
Consortium beneficiaries	Third parties	Associated Partners	other

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1. Objectives

The main objective of subtask 7.3.3 in JERICO-S3 is to develop and deploy a Water Sample filtering and Preservation device (WASP) for automated filtering, fixation and preservation of water samples for further lab analysis. This device should enable high frequency sampling for essential ocean variables (EOVs) and other key coastal variables that are not otherwise easily assessed by sensor technology. For example, sampling of environmental DNA (eDNA) for taxon-specific quantification by qPCR or community profiling by metabarcoding, emerging contaminants, and biogeochemistry (nutrients). The first step in this subtask was to develop such a device for sample filtering and preservation for deployment on JERICO observing platforms. The demonstration of the WASP in subtask 7.3.3 was decided to be carried out on a FerryBox ship of opportunity, so specifications and operating protocols for the WASP were tailored for this type of deployment.

2. Implementation process

Through meetings and discussions with the WP7 team, several candidate devices were considered for subtask 7.3.3. Based on specifications and requirements for sampling types and quantities, it was decided to implement a modified version of a Mclane Particle and Phytoplankton Sampler (PPS) coupled with an ISCO refrigerated autosampler integrated into a FerryBox observing platform for collecting eDNA samples for quantification and metabarcoding, and inorganic nutrients, respectively.

3. Main report

The Mclane PPS was received and modified for use as a WASP onboard a FerryBox in May 2023 (Fig. 1). The modified version consists of a Mclane PPS unmounted from its deployment frame, power and communications cable rewired for integration with computer for external control, and filter holders and stream select valve altered to be able to be placed in a cooler/freezer box as well as a reagent bag for rinsing or preservative addition.

The WASP was ready for integration in NIVA´s Ferrybox on 1 May 2023. It was deployed on the FerryBox on board M/S Color Fantasy that operates between Oslo, Norway and Kiel, Germany and was tested during summer/fall of 2023 (Fig. 2). Some modifications and testing were carried out, after integration, with regards to filtration efficiency on membrane filters used for collecting eDNA, how to filter samples completely to near-dryness, and how best to preserve samples over time periods of hours to days.

Figure 1. Mclane PPS in its original configuration (from www. https://mclanelabs.com/phytoplankton-sampler/).

Figure 2. Modified Mclane PPS integrated in the Dometic CFX3-100 portable cooler/freezer.

4. Conclusion

The WASP has been made available for use in test and demonstration cases intended to be carried out in Q3/Q4 2024 and early 2025. The test cases will involve two deployments of the WASP with the M/S Color Fantasy FerryBox in which the WASP will collect samples for eDNA quantification and metabarcoding of phytoplankton and inorganic nutrients. Ground-truthing samples collected using conventional techniques will also be collected. Samples collected by the WASP and conventional techniques will be processed and analysed in the laboratory using the same protocols. The technical details of the WASP will be provided as part of deliverable D7.4, while the results of the demonstration will be reported in D7.9.