

EGU2020-18989

<https://doi.org/10.5194/egusphere-egu2020-18989>

EGU General Assembly 2020

© Author(s) 2023. This work is distributed under the Creative Commons Attribution 4.0 License.



A high capacity, automatic and small-volume water sampler

Núria Martínez-Carreras, François Barnich, Jean François Iffly, Oliver O'Nagy, and Andrei Popleteev

Luxembourg Institute of Science and Technology (LIST), Environmental Research and Innovation (ERIN) department, Esch-sur-Alzette, Luxembourg (nuria.martinez@list.lu)

Field deployable and portable automatic water samplers are common tools in hydrology. They allow the unattended collection of water samples at predetermined times or triggered by external sensors, reducing personnel labour and costs. Several automated water samplers have been described in the literature. However, the vast majority of these samplers are not commercialised and their use is very limited or restricted to research applications. We can broadly classify these samplers in three groups: in situ samplers, sequential precipitation samplers and siphon automatic samplers. The latest are commonly used by hydrologists, environmental monitoring agencies and in wastewater treatment plants. They were first patented and commercialized in the 1980s by Teledyne-ISCO (Lincoln, NE, USA). They use a peristaltic pump to transfer water into several containers. However, the siphon automatic samplers are large, heavy and typically collect a maximum of 24 samples of 0.5 or 1 L. Here, we present a new automatic water sampler that has a larger and variable storage capacity (from 64 to 400) of smaller containers (from 2 to 40 mL). We argue that for many applications large sample volumes are no longer required due to the improvement of chemical analytic techniques. Standard laboratory storage boxes are filled with standard laboratory containers and directly placed inside the sampler, reducing the processing time once the samplers are back in the laboratory. Containers remain always closed with a septum cap to prevent evaporation. The sampler allows tub rinsing between sample collection to prevent contamination and memory effects. It is portable, has a low-power consumption and is robust for its use under field conditions. We tested the prototype in the laboratory and in the field. We will present the sampler mechanical functioning, the results of the tests (e.g. sample preservation and memory effects) and the user-friendly interface to define sampling schemes.