

Digest

#07

February 2024

ResilienTogether is one of 25 Flood and Coastal Resilience Innovation Programme (FCRIP) projects funded by DEFRA. These aim to demonstrate how practical innovative actions can work to improve resilience to flooding and coastal erosion.

These digests highlight learning from ResilienTogether. They document learning captured during the project which can be used by schemes and organisations across the country.

Water quality measurement: Automated Samplers

A comparison of automated water quality samplers and the differences in features and specification



ResilienTogether

ResilienTogether is creating a Smart Catchment using innovations in technology and practices to reduce flood risk, enhance the water environment and improve community resilience in the Pix Brook catchment in the face of climate change.

Available Autosamplers:

The automated samplers available are summarised here, followed by a detailed comparison into the specifications of each sampler and the key things to look out for when selecting an autosampler.

What have we learnt?

This digest draws from the SuDS-specific water quality monitoring section of the *Pix Brook Catchment: A review of available technologies* report, prepared by the University of Exeter for ResilienTogether. It summarises the differences between the available automated samplers that could be used for the Pix Brook.



Bühler 3010, 4011, 4411 Stationary automatic water sampler

- Refrigerated
- Fixed site



Bellflow ORI Refrigerated autosampler

- Refrigerated
- Fixed site



Bellflow P6 Maxx/ Mini Maxx

- Insulated
- Portable



Endress & Hauser Liquistation CSF48

- Refrigerated
- Fixed site



Endress & Hauser ASP Station 2000 RPS20B

- Insulated
- Fixed site



HACH AS950 All Weather Peristaltic Sampler

- Fixed site - Refrigerated or
- Portable - insulated



TELEDYNE ISCO BLZZRD Portable Refrigerated Sampler

- Insulated
- Portable



TELEDYNE ISCO 5800 Sequential/ Composite Sampler - MCERTS

- Insulated
- Fixed or Portable



XYLEM ProSample Portable Samplers

- Insulated
- Portable



TELEDYNE ISCO 6712 Portable Sampler (MCERTS)

- Insulated
- Portable



Bellflow Efconomy MCERTS

- Refrigerated
- Fixed site



Endress & Hauser Liquistation CSF28

- Refrigerated
- Fixed site



University of Exeter

Acknowledgement:

Thank you to Daisy Dudderidge (UoE) for her research on water quality monitoring.

If you want to find out more about this topic, please get in touch with us at ResilienTogether.project@Centralbedfordshire.gov.uk

Table 1: Specification for each automated sampler

Type of autosampler	Portable	Refridgerated	Insulated	Battery powered	Mains Power	Number of bottles	Min depth (mm)	SDI-12
Bellflow Efconomy MCERTS	✗	✓	✗	✗	✓	1-24	not stated	✗
Bellflow ORI Refrigerated autosampler	✗	✓	✗	✗	✓	1-24	not stated	✗
Bühler 3010, 4011, 4411- Stationary automatic sampler	✗	✓	✓	✗	✓	1-24	12	✗
Bellflow P6 Maxx/ Mini Maxx	✓	✗	✓	✓	✗	1-24	not stated	✓
Endress & Hauser Liquistation CSF48	✗	✓	✗	✓	✓	1-24	13	✗
Endress & Hauser Liquistation CSF28	✗	✓	✗	✗	✓	1-24	13	✗
Endress & Hauser ASP Station 2000 RPS20B	✗	✗	✓	✗	✓	1-24	13	✗
HACH AS950 All Weather Peristaltic Sampler	✓	✓	✓	✗	✓	not stated	not stated	✗
TELEDYNE ISCO 5800 Sequential/ Composite Sample/ 6712 Portable Sampler - MCERTS	✓	✗	✓	✓	✓	1-24	9	✓
TELEDYNE ISCO BLZZRD Portable Refrigerated Sampler	✓	✗	✓	✓	✓	1-14	10	✓
XYLEM ProSample Portable Samplers	✓	✗	✓	✓	✗	1-24	10	✓

What to look for in an automated sampler

Fixed-site vs Portable - The autosampler can either be fixed in one permanent location or be portable. See Learning Digest 05 for more details.

SDI-12 - The communication protocol SDI-12 facilitates data exchange between an autosampler and sonde. By employing SDI-12, the autosampler gains the ability to instruct a sonde to capture measurements at specific intervals, thereby ensuring a comprehensive and synchronised approach to water quality assessment.

Battery powered or mains power - Is there access to mains electricity or will the sampler be in a remote location and better powered by battery?

Number of bottles - A greater number of bottles gives the ability to increase sample frequency.

Refrigerated vs insulated - The choice between a refrigerated autosampler and one with insulation depends largely on the specific parameters of interest and the conditions of the sampling site. A refrigerated autosampler is essential when dealing with parameters highly sensitive to temperature fluctuations, such as biological parameters like chlorophyll. Refrigeration ensures that these measurements remain stable and accurate. Insulated autosamplers, on the other hand, are suitable for parameters that are less temperature sensitive.

Table 1: Shows a comparison of the features that each automated sampler researched has.

Choosing an automated sampler

Ultimately, the choice of autosampler should consider project goals, site accessibility, and the desired level of automation versus manual control in the field, as well as the logistical aspects of sample testing for different parameters.