# H13N-1194 eDNA Sampler: A Field Programmable and Customizable Auto-sampler for eDNA

📅 Monday, 9 December 2024

🕐 13:40 - 17:30

📍 *Hall B-C (Poster Hall) (Convention Center)*

## Abstract

Organisms leave traces of DNA as they move through their environments. Extracting this trace DNA is known as environmental DNA (eDNA) sampling, providing a non-invasive, rapid, and sensitive way to detect and quantify species. Traditional eDNA sampling involves manually filtering water, which is labor and cost-intensive for remote locations. Moreover, commercial solutions are expensive and require a field operator. The PolyWAG eDNA sampler project aims to offer an affordable, open-source, remotely deployable, fully automated, and customizable alternative. The system can run up to 24 inline filter units, supporting various conditions, including pressure, time, and volume limit. The pump delivers a maximum flow of 400 mL/min while solenoid valves separate each inline filter to minimize cross-contamination. Ethanol is currently used to preserve DNA at the end of each sample state. However, we are exploring the use of Longmire solution for future testing due to issues with airline transportation. Data acquired during operation, including filtered volume, is stored on a microSD card in CSV format for easier export and analysis. A web application and local Wi-Fi system provide an intuitive UI for in-field programming, real-time sensor updates, scheduling tasks, and operations. Preliminary tests show successful deployment in waters of varied turbidity, sampling 500 mL+ of water with effective sample preservation and minimal cross-contamination. The system has been deployed in Alaska, working mostly as intended, and we are currently awaiting the results. Future work includes testing Longmire solution effectiveness and further field testing to optimize performance. The PolyWAG eDNA Sampling System, estimated at $6000 each, offers a cost-effective solution for remote eDNA sampling. Additionally, these samplers are available for seasonal rental, making them an even more flexible option for various research needs.
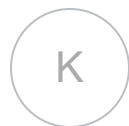
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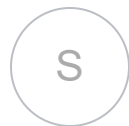
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