Outline:

* More details about eDNA
  + Where it can derive from
  + How long it lasts
  + Etc
* Flaws with current devices/why ours is better
* What the devices is capable of
  + High level overview on how it functions

eDNA can derive from mucus, feces, gametes, and carcasses [1]. Many things can be learned once this DNA is put through sequencing. eDNA can be used to determine what species are present in an area the biodiversity of an area, and if any invasive or endangered species are present [2]. eDNA sampling provides scientists and researchers a non-invasive, rapid, cost-effective and sensitive way to detect and quantify species in many environments.

Traditional sampling of environmental DNA (eDNA) consists of manually filtering water, which is labor and cost-intensive for remote locations. Furthermore, commercialized solutions are either expensive or require a field operator to function.

The eDNA sampler we have developed is a water sampling device that collects DNA samples via 47mm filter holders and provides a non-invasive, safe and autonomous means of DNA collection.

The sampler can hold 24 of these filter holders and they are designed to be easily replaced and reusable.

A browser application is used for real-time monitoring, scheduling tasks, and data logging for time, pressure, flow, and filtered volume. In addition, the sampler design is openly published, modular and is being constantly tested to help us optimize our software and hardware to give us the best results.

Having worked on multiple iterations of the sampler, we have decided to go with a 9-step sampling sequence that helps reduce cross contamination significantly.

Recent tests have also revealed that the sampler is capable of sampling 100~150ml of water through 0.45-micron filters with an accuracy of ±10%. As a result, we have a machine that can be deployed for an extended period, while being completely autonomous in terms of sampling at a cost around $6000 per sampler.