

1 Abstract:

2 Scientists are always looking for quick, cost-effective, accurate and ideally non-invasive ways of
 3 researching specific environments and species. Environmental DNA, eDNA, is an ideal way of
 4 researching aquatic environments ~~and species. eDNA can be used~~ to determine what species
 5 are present in an area, the biodiversity of an area, and if any invasive or endangered species
 6 are present. Traditional sampling of environmental DNA (eDNA) consists of manually filtering
 7 water, which is labor and cost-intensive for remote locations. Furthermore, commercialized
 8 solutions are either expensive or require a field operator to function. ~~The~~ PolyWAG eDNA
 9 sampler system is a water sampling device that collects DNA samples via 47mm filter holders
 10 and provides a non-invasive, safe and autonomous means of eDNA collection. The sampler can
 11 hold 24 filter holders and they are designed to be easily replaced and reusable. A browser
 12 application is used for real-time monitoring, scheduling tasks, and data logging for time,
 13 pressure, flow, and filtered volume. In addition, the sampler design is openly published, modular
 14 and is being constantly tested to help us optimize our software and hardware to give us the best
 15 results. ~~Having worked on multiple iterations of the sampler, we have decided to go with a 9-~~
 16 ~~step sampling sequence that~~ helps reduce cross contamination significantly. ~~As a result, we~~
 17 ~~have a machine that~~ can be deployed for an extended period while being completely
 18 autonomous ~~in terms of sampling at a cost~~ around \$6000 ~~per sampler~~.

* We have built an eDNA sampler that
 improves on existing technology by Our ...