

Some thoughts on the collection and extraction of samples for eDNA analysis

Jeff Bowman, Scripps Institution of Oceanography

1. What is meant by eDNA?

eDNA has meant *extracellular* DNA since at least 2006. More commonly used now to denote *environmental* DNA, but it is important to be clear as the methods are distinct.

Within environmental DNA it is important to define the targets of interest: metazoans, protists, bacteria, virus + phage.

BREVIA

Extracellular DNA Plays a Key Role in Deep-Sea Ecosystem Functioning

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MOLECULAR ECOLOGY

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Towards next-generation biodiversity assessment using DNA metabarcoding

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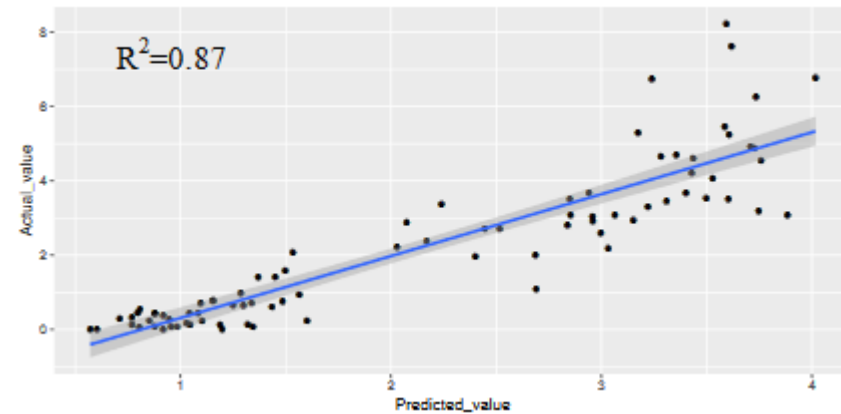
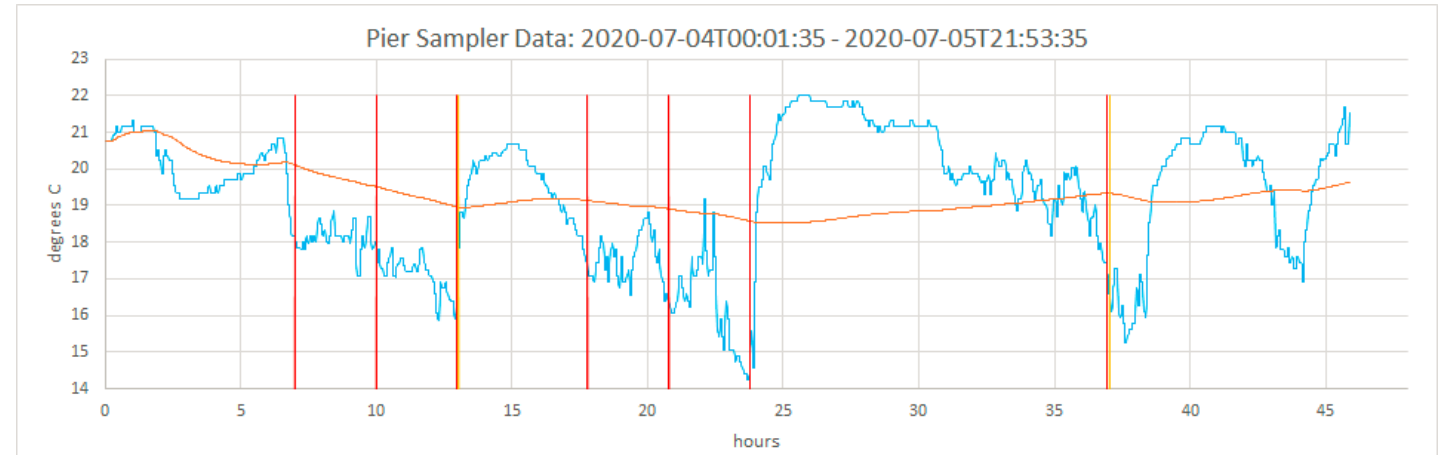
UC-eLinks

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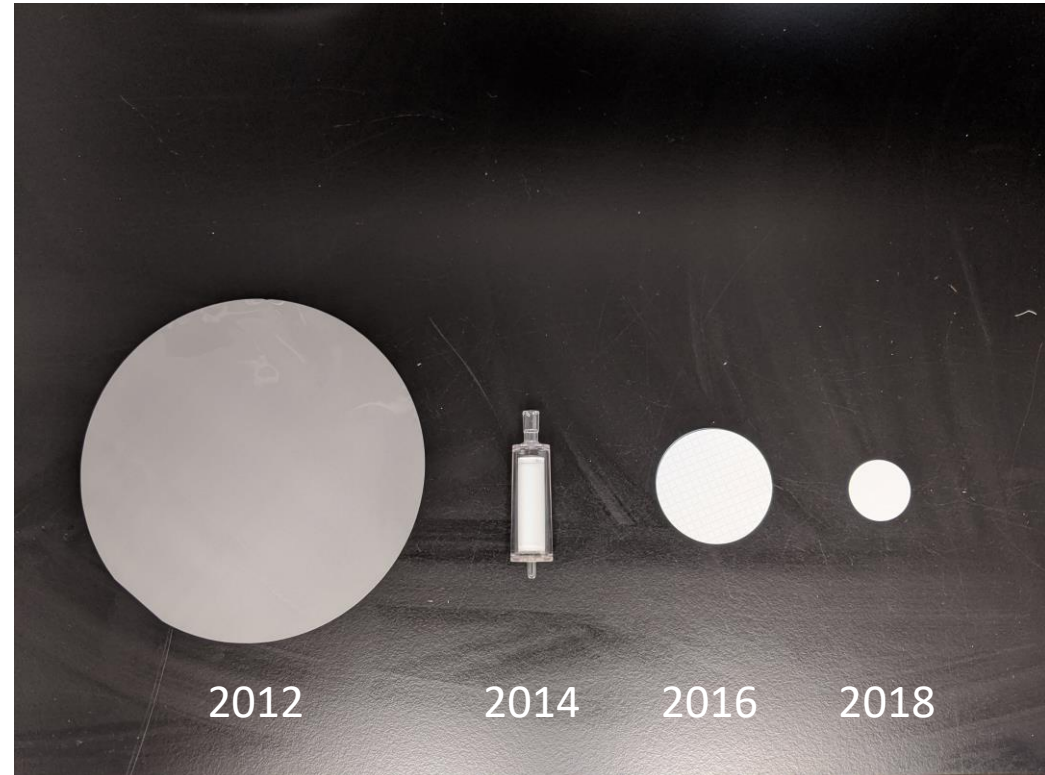
1. What is meant by eDNA?
2. Think *big sample numbers*. To capture natural variability and leverage modern analytical techniques you need hundreds of samples, maybe more.



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1. What is meant by eDNA?
2. Think *big sample numbers*. To capture natural variability and leverage modern analytical techniques you need hundreds of samples, maybe more.
3. An ideal extraction strategy would:
 1. Be fast
 2. Minimize handling
 3. Minimize cost
 4. Minimize sample volumes



Our optimization is based on small sample volumes captured on small format filters. This works great for bacteria and phytoplankton.

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100 ml (coastal bloom) to 1000 ml (open ocean)*



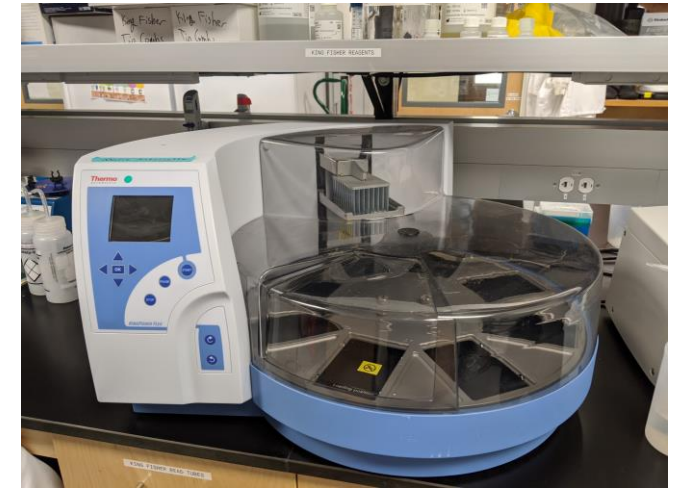
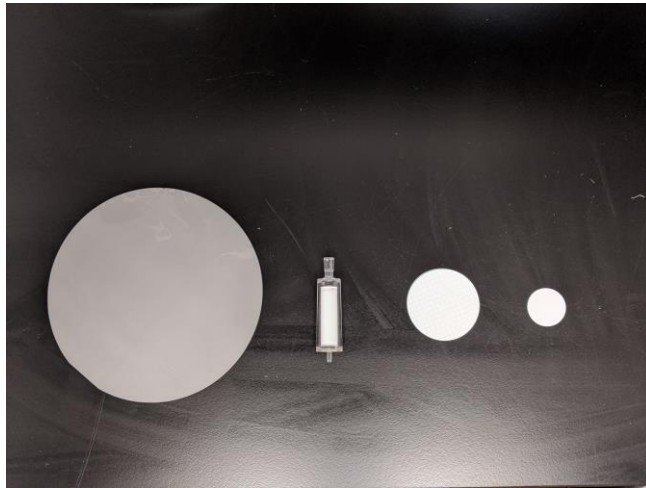
25 mm 0.2 micron Durapore filter



Bead beat (KingFisher MagMax)



Automated Extraction (KingFisher Flex + MagMax)



*Method has worked well down to 1 ml for high-biomass, inhibitor-rich samples