

Rocky Mountain Research Station Science You Can Use *(in 5 minutes)*

OCTOBER 2018



From Expensive to Efficient: New eDNAtlas Shares Nationwide Aquatic Species Information

Imagine that you could look online at interactive maps showing precisely where any species of fish, amphibian, or mussel occurs throughout the United States in streams, lakes, and ponds - all in one spot. The newly-released eDNAtlas turned this idea into an open-access [online reality](#).

New Tools for Land Managers

The eDNAtlas website and dynamic database tools allow the public, land managers, and researchers to access the results from samples of environmental DNA (eDNA), which is genetic material released by organisms into the environment. The samples taken from aquatic systems throughout the United States help determine local species occurrence. The eDNAtlas

was initially powered by a database of 8,000 samples that were collected in recent years through multi-agency partnerships with the National Genomics Center for Wildlife and Fish Conservation.

With many agencies and organizations that work on aquatics and fisheries issues rapidly adopting the use of eDNA sampling, thousands of new locations are sampled each year and the eDNAtlas will keep track of all of these. By providing and maintaining a comprehensive database, the project aims to minimize redundancy of effort among agencies and facilitate more data sharing, which ultimately saves time and money. For example, fisheries biologists can easily see where positive identifications of bull trout or Chinook salmon have been collected.



Dan Isaak, a Research Fish Biologist and project co-lead from the USDA Forest Service Rocky Mountain Research Station collects environmental DNA samples (Image: U.S. Forest Service).

MANAGEMENT IMPLICATIONS

- The new eDNAtlas website and dynamic database allows land managers, scientists and the public to access results from environmental DNA (eDNA) collected from aquatic systems throughout the United States.
- As agencies and organizations are rapidly adopting the use of eDNA, sampling thousands of new locations each year, this new eDNA tool aims to minimize redundancy and facilitate more data sharing, ultimately saving agencies and organizations time and money.
- The public, researchers, and land managers can download results from the website for dozens of species in different portions of the United States through a dynamic ArcGIS online mapping tool.
- Anyone interested, including land managers and citizen science campaigns, can contribute and participate in the collaborative project: <https://www.fs.fed.us/rm/boise/AWAE/projects/eDNAtlas/edna-atlas-contacts.html>.

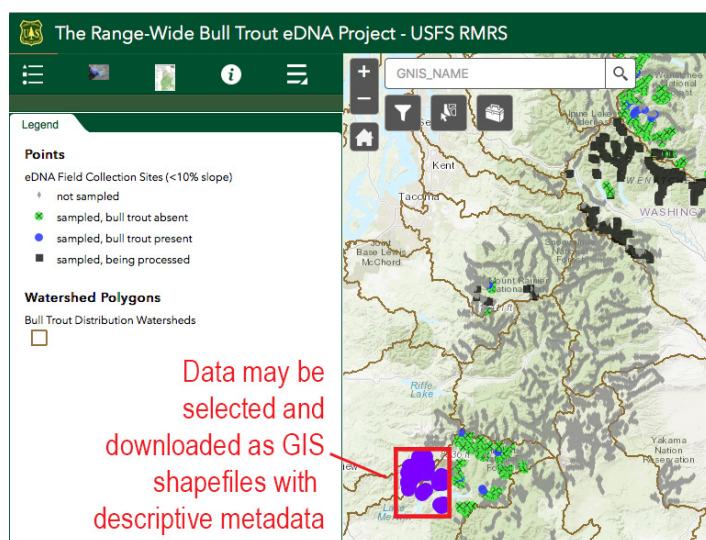


“The ‘live’ nature of the eDNAtlas allows it to continually grow as we get more samples and contributions from other organizations and citizen scientists,” said Dan Isaak, a Research Fish Biologist and project co-lead from the USDA Forest Service Rocky Mountain Research Station. “People care about streams, like their favorite fishing hole. This is an opportunity for them to learn more about those streams while helping us build this incredible product. Fisheries biologists, aquatic ecologists, and hydrologists can all benefit from using and contributing data. It is pretty exciting to see how fast the database has grown in just the last few years because the possibilities and efficiencies grow exponentially with the size of the database.”

How Do You Access and Contribute to the eDNAtlas Project?

The eDNAtlas website posts sample results only after stringent quality assurance procedures are met and permissions are obtained from data contributors. The public, researchers, and land managers can download results from the website for dozens of species, such as North American River Otter, Lake Trout, and Chum Salmon, in different portions of the United States through a dynamic ArcGIS online mapping tool. The tool provides information in geospatial file formats with full sets of complementary metadata.

The project website also includes extensive information about field data collection protocols, answers to frequently asked questions, who to contact



Example of information presented in the aquatic eDNAtlas Data mapper of field samples. In this case showing the status of bull trout samples (Image: U.S. Forest Service).

FURTHER READING

Air, Water, & Aquatic Environments Program eDNAtlas Project Page: www.fs.fed.us/rm/boise/AWAE/projects/the-aquatic-eDNAtlas-project.html

eDNA sampling: Not just for fisheries biologists anymore: www.fs.fed.us/rmrs/publications/edna-sampling-not-just-fisheries-biologists-anymore

Delineating climate refugia for native aquatic species with big crowd-sourced databases: www.fs.fed.us/rmrs/publications/delineating-climate-refugia-native-aquatic-species-big-crowd-sourced-databases

A protocol for collecting environmental DNA samples from streams: www.fs.fed.us/rmrs/publications/protocol-collecting-environmental-dna-samples-streams

if you are interested in collecting eDNA samples, information about the science underpinning the technique, and a national sampling grid that enables the design of efficient new surveys.

According to Mike Young, a Research Fisheries Biologist and project co-lead from the USDA Forest Service Rocky Mountain Research Station, the eDNAtlas “isn’t just a database for sharing recent results. It’s also linked to an archive of physical samples that can be revisited to ask questions about other species at any location that might become important. And as sampling continues across the country, it is becoming an invaluable repository of biodiversity information we can use to evaluate the status of species now and in the future.”

About the Project: The eDNAtlas project is led by the USDA Forest Service Rocky Mountain Research Station and the National Genomics Center for Wildlife and Fish Conservation, with grant funding from the National Fish and Wildlife Foundation Bring Back the Natives program.

Rocky Mountain Research Station researchers work at the forefront of science to improve the health and use of our Nation’s forests and grasslands. More information about Forest Service research in the Rocky Mountain Region can be found here: <https://www.fs.fed.us/rmrs/>



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