



### At a Glance

The EPA-ORD laboratory in Duluth, MN is recognized as a leader in advancing scientific knowledge and expertise concerning the effects of stressors on freshwater resources of the Great Lakes and across the US. The laboratory contributes to the local economy in Duluth and the surrounding region, and staff are active participants in the local community.

**Science:** EPA scientists in Duluth are leaders in predicting and assessing the potential effects of chemicals, excessive nutrients, invasive species and land use changes on the health of US water resources including the Great Lakes. These scientists are leaders in developing New Approach Methods for the rapid assessment of chemical risk to aquatic organisms and new methods for assessing ecosystem health, both of which use advanced molecular technologies in the laboratory and field. One example is early detection of invasive species by testing for DNA shed by these organisms in water and sediment samples. This practice is an efficient and cost-effective means of helping to mitigate or prevent the damage of an invasive species.

**Community Engagement:** Each May, Duluth staff take part in River Quest to educate students on the impact and activity of people on Lake Superior and the St. Louis River Corridor. This program has reached 30,000 students since 1993. Staff routinely visit local schools to teach about aquatic resources in the region and participate in school science fairs. Scientists also often serve as guest lecturers and advisory panelists at local colleges and universities.

**Economic Impacts:** Annually, \$7.8 million in payroll and \$7.7 million on contracts, grants, and supplies are injected into the local economy, supporting local jobs and spending as workers buy goods and services in the community.

#### Did you know?

- In addition to federal scientists, the laboratory provides 108 jobs including post-doctoral researchers, student contractors, and facility staff.
- The laboratory has unique and valuable capabilities to grow and hold a large variety of freshwater animals for use in scientific studies.
- The laboratory generates chemical toxicity data for freshwater organisms.



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### Duluth Laboratory Impacts by the Numbers

Duluth (St. Louis County), MN		
<b>176</b> Total jobs at the laboratory	<b>\$15.5 million</b> Annual payroll, contracts, grants, etc. from lab to local economy	<b>68</b> Federal jobs on-site
<b>21%<sup>1</sup></b> Percent of U.S. fresh water supplied by the Great Lakes	<b>39</b> Post-doctoral, student, and visiting researchers on-site	<b>0</b> Potential net water usage at the lab due to conservation
<b>5 counties, 2 states</b> Where Duluth lab employees live		

<sup>1</sup><https://www.epa.gov/greatlakes/facts-and-figures-about-great-lakes>



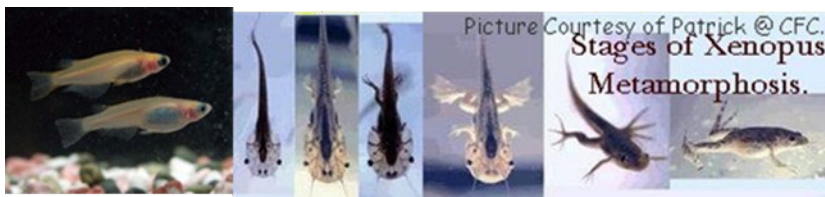
The Duluth research facility is home to the EPA Office of Research and Development's Great Lakes Toxicology and Ecology Division. It is located on 13 acres adjacent to Lake Superior and occupies 90,138 sq ft of laboratories, offices, and support operations. Originally constructed in 1967 for the Department of Interior as the National Water Quality Laboratory, the Duluth campus became part of EPA in 1970.

### **Mission and Science Facilities**

Scientists at Duluth provide leadership in freshwater toxicology and ecology with a goal of predicting and assessing the effects of stressors on the aquatic resources of the Great Lakes and the US and describing how changes in those resources affect the well-being of humans. The Duluth facility has unique capabilities, including the ability to grow multiple freshwater species for toxicity testing. A few examples of the research conducted are summarized below.

### **Assessing the Effects of Chemicals on Aquatic Species**

Duluth scientists have developed methods to assess the amount of chemicals in freshwater and sediment. Using their unique freshwater culture and testing systems, scientists can determine the effects of exposure to these chemicals on multiple freshwater species.



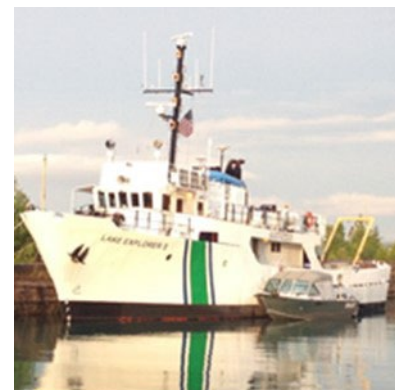
### **Evaluating Chemical Safety**

In June 2016, Congress adopted significant reforms to the Toxic Substances Control Act (TSCA) mandating that EPA review existing and new chemicals for toxicity to humans and wildlife. Duluth scientists have developed tools to allow EPA to screen, prioritize, and assess chemical hazards to support more efficient regulatory decisions. One approach is called Adverse Outcome Pathways, which is a way to link molecular interactions of a chemical with higher level organism and even population level impacts. This approach can be completed rapidly and

cost effectively for large numbers of chemicals. In comparison, traditional tests would require more time, expense, and animal life.

### **Protecting and Restoring the Great Lakes**

Taken together, the five Great Lakes contain 21% of the world's surface fresh water, forming the largest body of fresh water in the world. Research and development at the Duluth laboratory includes monitoring, assessing and predicting the condition of Great Lakes waters and coastal systems. Scientists are working on approaches for early detection of invasive species not native to the Great Lakes. Once introduced, they can spread rapidly, adversely affecting ecosystems and ultimately the economy, health, and well-being of the people that rely on the system for food, water, and recreation. Prevention is the most cost-effective approach to minimizing the damages of invasive species, so early detection is essential.



The Great Lakes Restoration Initiative (GLRI) was launched in 2010 to accelerate efforts to protect and restore the Great Lakes. The Duluth laboratory has provided critical scientific support for this effort. By partnering with the Minnesota Pollution Control Agency, the laboratory has been instrumental in providing data, analytical expertise and guidance to remove "Beneficial Use Impairments" in the St. Louis River areas of concern in Duluth, MN and Superior, WI. These areas represent the largest and most complex of the 43 legacy pollution sites identified in the GLRI, and the partnership supports Minnesota in meeting its target dates.

Scientists at the Duluth laboratory have developed methods for measuring ecological, public health, economic and social benefits of remediation and restoration of contaminated sites. Cleaning up sites and revitalizing Great Lakes communities ensures that future generations can enjoy this unique national treasure.