

A letter from the CEO

Reflecting on the past year, it becomes evident that 2023 has been nothing short of remarkable for the Great Lakes Observing System (GLOS) and the entire Great Lakes ecosystem. Significant advancements in technology, coupled with increased funding and attention, have elevated the capabilities of our observing system, fostered greater research collaboration, and fortified our network of partnerships.

Assuming the role of CEO (in August 2023) has been a privilege, and my involvement has deepened my appreciation for GLOS' mission. Having previously served on the Board of Directors, I was familiar with the organization's ongoing efforts. However, immersing myself in the day-to-day operations and engaging with our dedicated staff and partners has amplified my enthusiasm for the immense potential of GLOS and the impact we can collectively achieve.

Throughout 2023, GLOS continued its progress in supporting Great Lakes community resilience. The Seagull platform continued to deliver reliable, real-time lake data from our esteemed partner providers, showcasing a considerable increase in active winter observation platforms. Notably, the Smart Great Lakes initiative made significant strides by fostering impactful collaborations with educators and lawmakers.

These accomplishments stand as a testament to the dedication and hard work of our exceptional staff and the unwavering support received from our Board of Directors, NOAA, the IOOS Association and Regional Associations, and all those who contribute their time to the betterment of the Great Lakes and their surrounding communities.

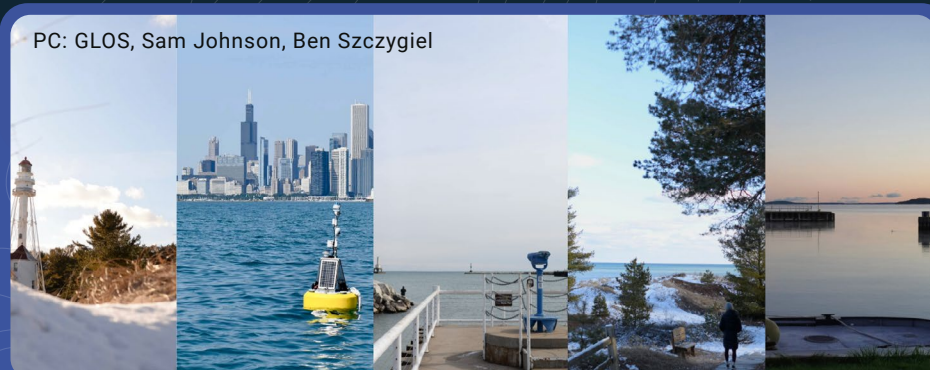
We look forward to more opportunities with new partners in 2024. Our focus remains on advancing our ongoing projects, amplifying our outreach and educational efforts, and expanding our observational footprint to further enhance our understanding of the Great Lakes ecosystem. We remain committed to advancing the preservation and sustainable management of the Great Lakes for generations to come.

Thank you for your ongoing support as we sail into another year of meaningful progress and collaboration.



Sincerely,
Jennifer Boehme

Jennifer K. Boehme

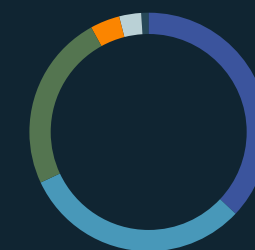


2023 Financials

Program Revenue:
\$3,483,000

Expense Breakdown:

- Personnel 37%
- Grants and Contracts 31%
- IT Services 24%
- Office Operations 4%
- Travel and Meetings 3%
- Capital Equipment 1%



Great Lakes Observations

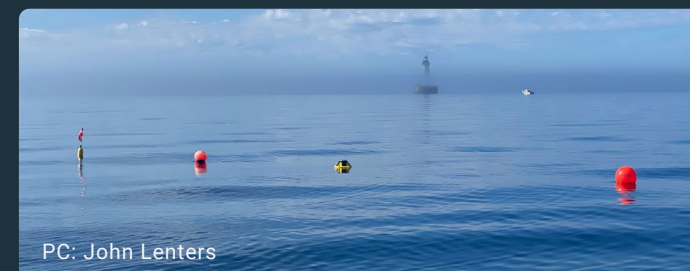
BIL funding refurbished platforms and added new observations

Over the past year, several organizations around the Great Lakes were able to refurbish and/or add additional observing capacity thanks to funding GLOS received from the **Bipartisan Infrastructure Law** (BIL). These upgrades and additions will help with our ability to monitor coastal conditions and improve the resiliency of the observing system.

Many observing platforms, such as buoys and meteorological towers, rely on instrumentation that is aged and, in some cases, have exceeded their operational life. BIL funds provide dedicated funding focused on repairs and upgrades, allowing every tax dollar to be better leveraged.

Winter observations

The 2023 field season was unique. In the past, buoys got deployed in the spring, recovered in the fall, and then there was a real-time observing void in the winter. GLOS is helping to change that and create a second field season that runs through the winter. Additionally, GLOS has partnered with **Michigan Tech University** (MTU) and the **Upstate Freshwater Institute** (UFI) to deploy over-winter buoys that report in near real-time to Seagull. These 6 buoys are located near or at existing summer buoy locations, creating 6 year-round datasets.



Notable upgrades include updated weather stations, brand new buoy superstructures, temperature sensors, and water quality monitoring equipment, as well as improved data loggers and modems for better data communication.

Examples of new observing capabilities include a state-of-the-art underwater glider, carbon dioxide sensors to expand the suite of water quality sensors in the Great Lakes, and winter designated buoys.

2023 Annual Impact Report




Helping connect people to the water


GLOS provides end-to-end data services that support science, policy, management, and industry in the U.S. and Canada.





What is GLOS?

2023 brought many changes to GLOS. New leadership, new staff, and new partners. Thus, we have been repeatedly answering this question, while continuously asking ourselves this question. The Great Lakes Observing System is...

 A **network** of observers (federal and non-federal) publicly sharing data through an IOOS certified data management platform.

 A **conduit** for Great Lakes information and education that prioritizes public accessibility.

 A **facilitator** for real-time and historical data, it supports public health protection, navigation safety, climate and ecosystem forecasts, and wise natural resource management.

 A **provider** of data services. Helping the Great Lakes overcome information gaps and access to data. GLOS works to advance the underlying technology and improve its application.



PC: GLOS

GLOS Board

- Thomas Rayburn, Chair
- Pete Giencke, Vice Chair
- Mary-Claire Buell
- Leon Carl
- Aaron Fisk
- Stephanie Gandulla
- Heather Stirratt



PC: Jeffrey Houghton

GLOS Staff

- Jennifer Boehme, Chief Executive Officer
- Becky Pearson, Chief Operations Officer
- Tim Kearns, Chief Information Officer
- Sneha Bhadbhade, Senior Advisor
- Shelby Brunner, Observing Technology Manager
- Josephine Grimaudo-Cacciatore, Financial Manager
- Samuel Johnson, Communications Specialist
- Katie Rousseau, Smart Great Lakes Liaison
- Joe Smith, Cyberinfrastructure Engineer

Network, conduit, facilitator and provider

These are a few of the describers applied to GLOS by our staff. This year allowed for GLOS to demonstrate its role in all of these capacities and more.

We are happy to serve our users and partners in these roles and we are excited to grow in each of these areas in the coming year.

Seagull's first full year in production

GLOS worked closely with software partners **Spindance** and **DIG** to enhance the platform, adding many new features, fixing bugs, improving performance, adding new datasets, and increasing stability, scalability and our Cloud footprint. GLOS looks forward to continuing to enhance, expand and improve the platform for a wide range of communities. **Expect to see even more platforms, more features and growth in Seagull in the future!**

Scan to try Seagull!

GLOS also added new support for **'nested Seagull'**, a feature of the platform that allows an organization to have their own private 'view' into Seagull, complete with organizational branding, user permissions, geospatial extents and stylized icons.

2023 Seagull statistics

260 platforms • 60 unique data providers • Enjoyed 99.8%+ uptime

 seagull.glos.org

 **2,000+ free Seagull accounts**
Up from 300 user accounts in 2022

Peak of nearly 30,000 active users in season
Average from May through October

 **5 million page views in season**
May through October

20,000 monthly active users in season
Average from May through October

 **340K page views off-season**
November through April

4,000 monthly active users off-season
Average from November through April

Lakebed 2030

In 2023, GLOS took on primary leadership for the benefit of the Lakebed 2030, the wide range of stakeholders and the championing entities with congressional influence. The Lakebed 2030 initiative remains committed to comprehensive and high resolution underwater exploration for the entirety of the Great Lakes.



Major advancements throughout 2023 include:

GLOS authored a document, Governance Model for Lakebed 2030, citing GLOS as the coordinating leader for Lakebed 2030 with partners **NOAA** and **Northwestern Michigan College**. The current progress and draft of the document was presented at the **Lakebed 2030** conference in Traverse City in September, 2023.

GLOS supported Congresswoman Lisa McClain's office with subject matter expertise to assist them with the drafting and review of the legislation text for the Great Lakes Mapping Act, planned to be introduced into Congress in early 2024. This legislation is seeking \$200M in new appropriations from the government to conduct high resolution and comprehensive mapping of the Great Lakes. GLOS is positioned in the draft legislation as a coordinating body within IOOS that would assist with survey planning, data processing, product generation and data sharing.

The Crowd Sourced Bathymetry project (CSB), led by GLOS and contracted vendor Orange Force Marine continues. There are now over **2 dozen vessels** outfitted with equipment and data transmission capabilities for this type of bathymetric data.

GLOS made limited progress on the prototype communication layer for CSB visualization. Dubbed the **'hex map'**, this data layer portrays area of coverage and no coverage at varying data densities as it pertains to CSB data in the Great Lakes.

GLOS intends to advance this development in 2024 and include this layer into Seagull, or a nested Seagull, as part of the Lakebed 2030 data sharing goals.

Indigenous Great Lakes Network gains momentum



PC: Ruth Duncan

 Trent University

In 2023, GLOS continued to support the **Indigenous Environmental Institute at Trent University** as they embarked on Phase 2 of the project, Towards Consideration for an Indigenous Led Smart Great Lakes Initiative. This project created opportunities for relationship building between Great Lakes-based Indigenous communities and organizations participating in research and data collection across the lakes. A series of four virtual workshops attended by representatives from over **21 Indigenous communities and organizations** focused on the challenges of research, monitoring and data governance. As a result of the workshop discussions and growing relationships, there was interest in the development of an **Indigenous-led Smart Great Lakes Initiative**. The project also included the planning of an in-person gathering of Indigenous communities and organizations to explore the strategic development of an **Indigenous-led Great Lakes network**. This in-person gathering was held in mid-October, with **over sixty people from 26 Tribes, Nations and Indigenous communities** who connected through ceremony, small groups and shared meals.