



# Great Lakes Decadal Science Plan 2022 Great Lakes Science Forum

David Burden, International Joint Commission  
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# Changes and Challenges



- ~ 50 years later
- major improvements, but system is responding to new challenges
- despite their size – surprisingly fragile systems



# Need for a Great Lakes Science Plan

- More scientific information leads to wiser management and restoration decisions
- U.S. Great Lakes Restoration Initiative and Canada's Great Lakes Protection Initiative have provided needed investment towards restoring the system and correcting past problems but there has not been a re-assessment of science needs or programs for > 20 years
- New pressures are affecting the ecosystem and regional economies. Communities across the basin are looking for solutions to respond to new pressures along with pressures yet to be identified.
- It is critical that we collect the needed information and understanding to forecast change, mitigate impacts, and restore and preserve the Great Lakes ecosystem.



# Understanding Leads to Change

Cannot restore, protect or forecast the future unless you  
*know how it works*

Exploration &  
Process studies

+ Data + Models → Policy »

Restoration  
Protection  
Sustainability

Forecasting our future



# Binational Decadal Science Plan for the Great Lakes

IJC Science Advisory Board



A Comprehensive Science Plan for a Decadal Scale,  
Binational Program of Great Lakes Research

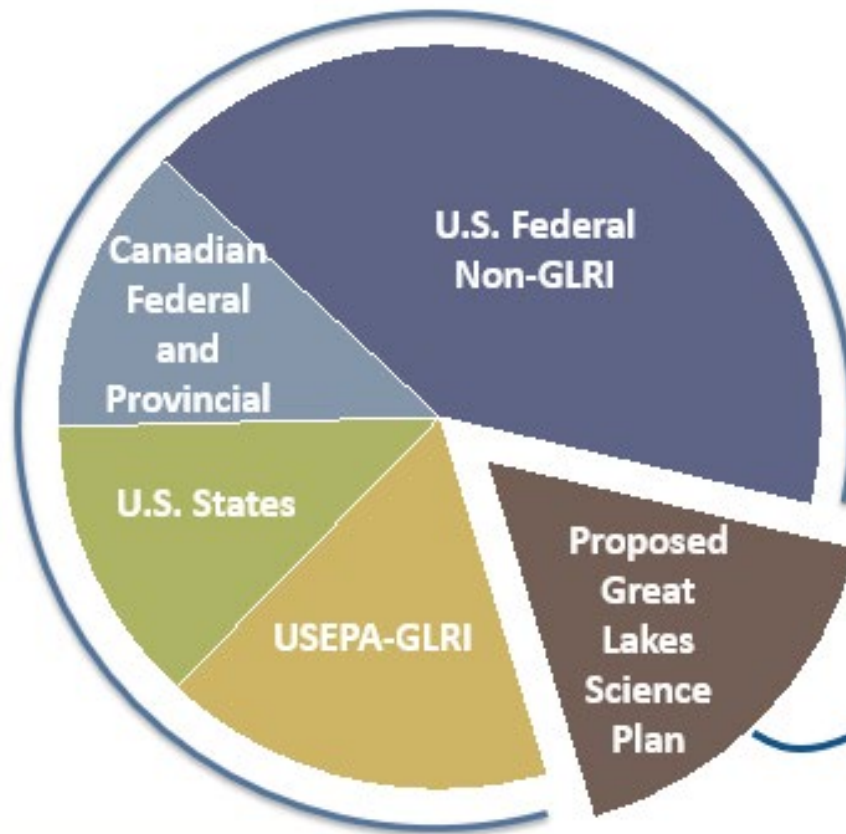
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LimnoTech  
A Watershed Science Company

# Science Investments for the Great Lakes



Current Great Lakes Annual Research and Monitoring Budget is \$250 million including:

- U.S. Federal non-GLRI
- GLRI
- U.S. States
- Canadian Federal and Provincial

Funding for science gaps:

- Long term monitoring & Early warning systems
- Ecosystem & Climate
- Workforce development
- Forecasting & Prediction
- Resilience & Adaptation
- Human Health Impacts



## Science Gaps & Needs

- How will **climate change** affect the Great Lakes ecosystem?
- What happens in the lakes during the **winter**?
- How are chemical cycles and food webs changing due to **invasive species and changing contaminant loads**
- How can harmful **cyanobacteria blooms** be eliminated; also **dead zones** and macroalgae?
- How can **modern scientific techniques and tools** be applied most effectively?
- How can the lake-related needs of **underserved groups** be met more effectively?
- How can **ecosystems and the services they provide** be quantified, restored, protected, and managed more efficiently and sustainably?



## Draft Investment Priorities

1) Recruit and train new scientists and engineers from the technician to senior scientist levels



2) Address critical gaps in the understanding of the ecosystem e.g, a Winter Research Initiative to understand what is happening during the least understood, most under-sampled, and fastest changing time of the year





## Proposed Investment Priorities (cont'd)

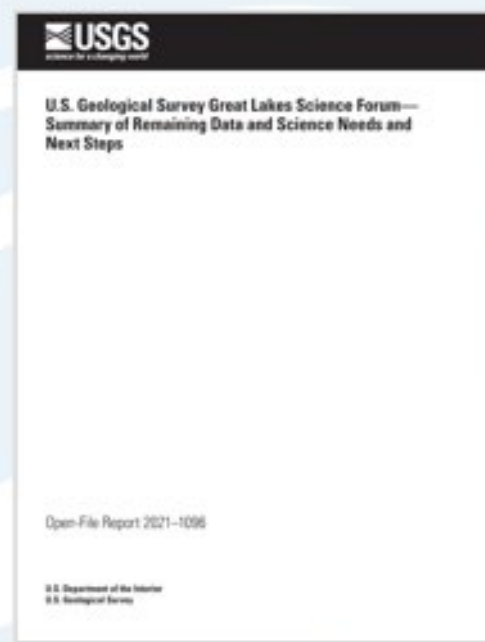
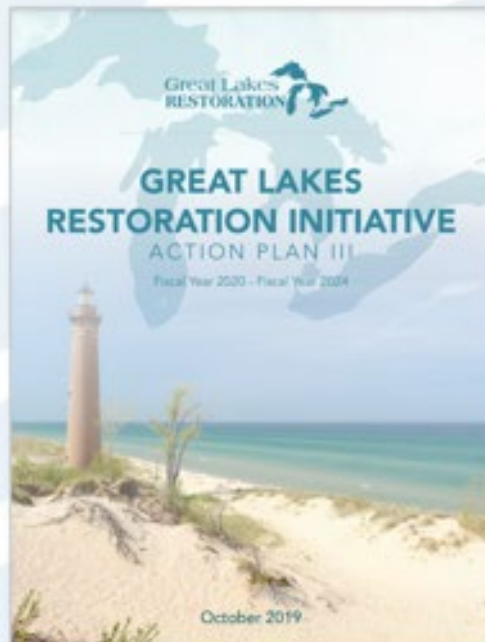
3) Develop and implement the research and monitoring infrastructure including, a backbone of long-term monitoring stations and programs, data management, and high-resolution model forecasting systems.



4) Establish Centers of Excellence to advance interdisciplinary science inquiry to support management, policy and economic decision-making



# Drivers and Guidance



Patterned after ocean plans, linked to regional plans

