Need for a Great Lakes Decadal Science Strategy

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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 Strategy

- 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.

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 Strategy for the Great Lakes

IJC Science Advisory Board

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

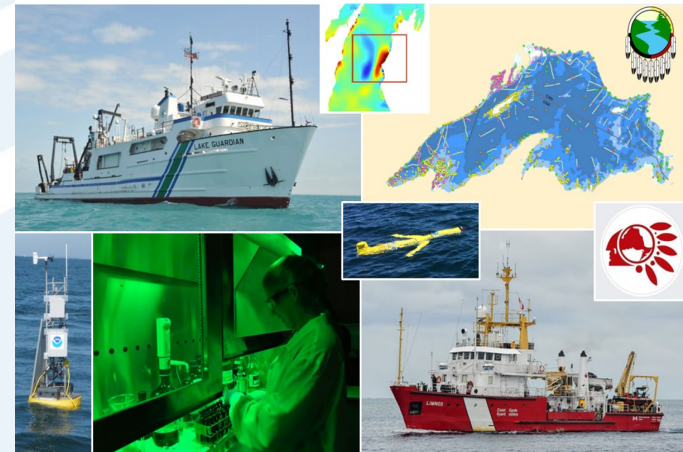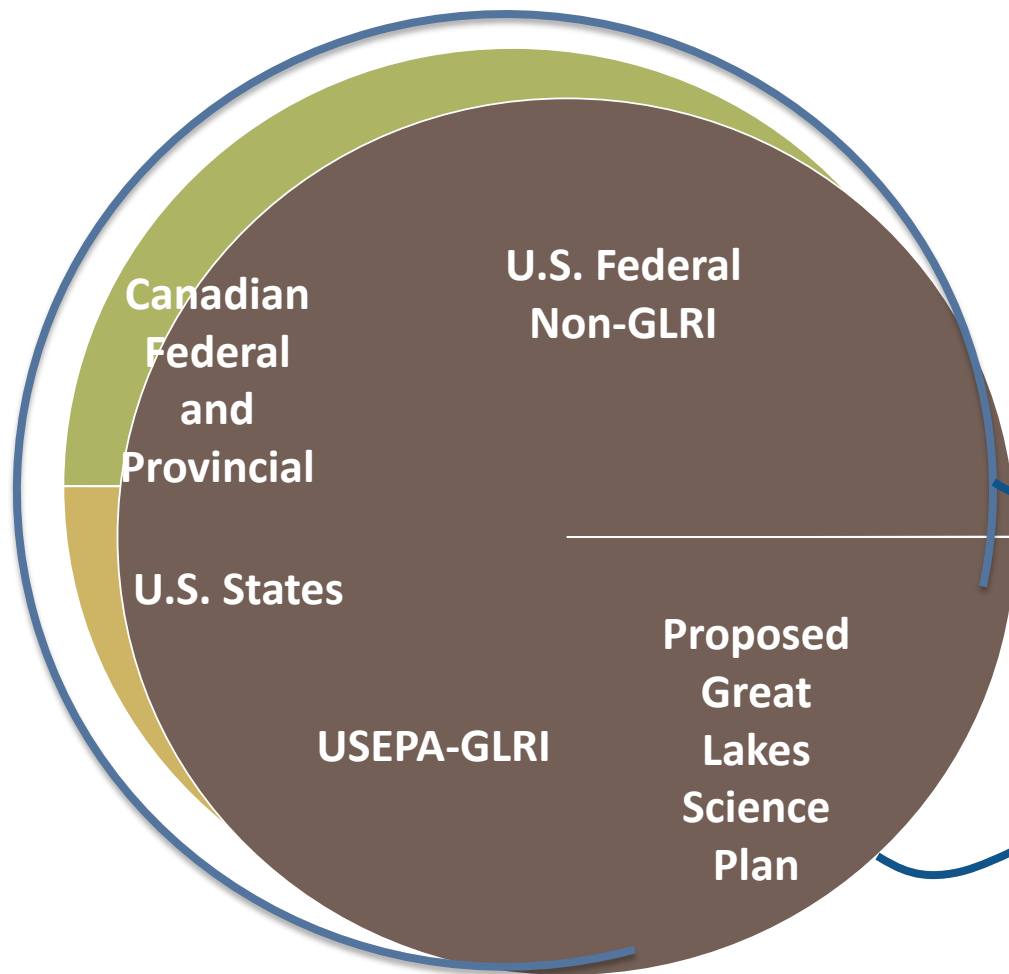January 21, 2022

Prepared for: International Joint Commission
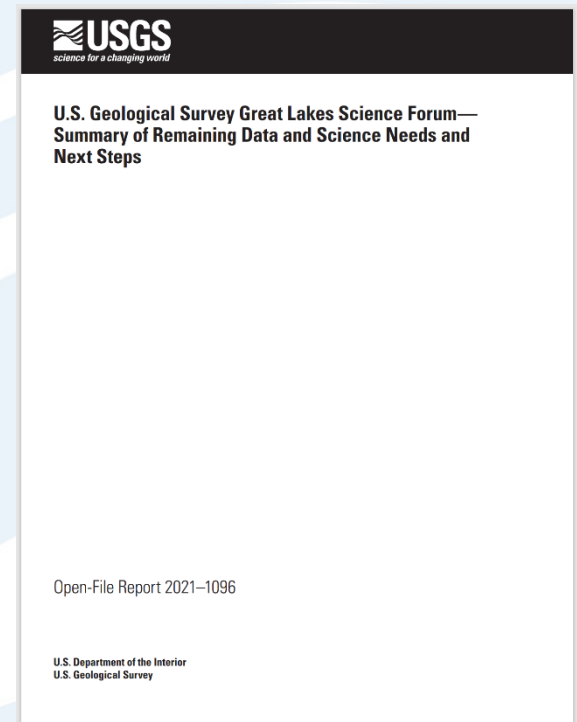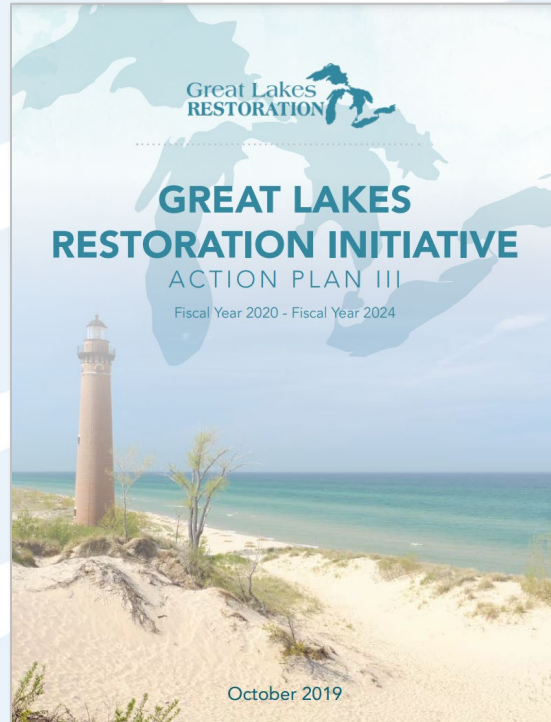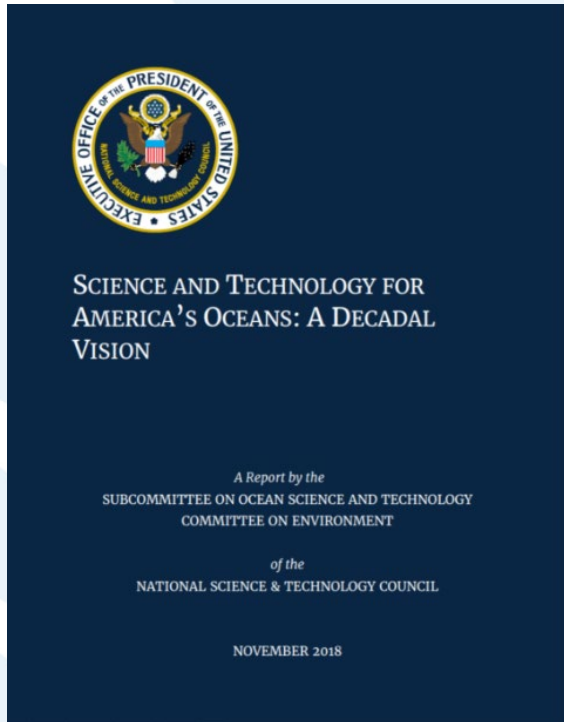
Patterned after ocean plans, linked to regional plans

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

Pie chart labels:
- Canadian Federal and Provincial
- U.S. Federal Non-GLRI
- U.S. States
- USEPA-GLRI
- Proposed Great Lakes Science Plan

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

- **Recruit and train required scientists and engineers**

- **Research and monitoring infrastructure including, a backbone of long-term monitoring stations and programs, data management, and high-resolution model forecasting systems.**

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

- **Data Management capacity to support and advance research and monitoring**