

Report 12/10/13

Great Lakes Advisory Board



Recommendations to the
Great Lakes Interagency
Task Force on the
Development of the
FY2015-2019 Great Lakes
Restoration Initiative
Action Plan

November 2013

Table of Contents

Cover Photo: NASA

Image taken August 24, 2013, of a "whiting event" [on Lake Ontario](#), wherein warmer temperatures and changes in pH cause the suspension of calcium carbonate. ~~The patterns in Lake Ontario were originally mistaken for an algae bloom, providing a reminder that policy decisions must be based on our ever-evolving understanding of this fragile ecosystem.~~

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Advisory Report on the FY15-19 Great Lakes Restoration Initiative Action Plan**Executive Summary**

The Great Lakes Advisory Board (Board) recommends that the Federal Interagency Task Force (IATF) take a balanced approach that will result in achieving the maximum ecosystem improvements under the next generation of the Great Lakes Restoration Initiative (GLRI). The General Recommendations for the FY15-19 Action Plan are:

- Retain the current five Focus Areas, with refinements as recommended in this Report.
- Emphasize prevention, protection and sustainability as much as restoration, in keeping with the Great Lakes Water Quality Agreement.
- Continue investing a large majority in on-the-ground and in-the-water activities that have direct ecological benefits for the ecosystem.

The specific recommendations in response to the Charge Questions for the FY15-19 Action Plan are:

- Acknowledge and plan for the impact a changing climate is having on the Great Lakes ecosystem without allowing GLRI to become a climate change program by:
 - Assuring that work under the Action Plan helps the Great Lakes ecosystem become more resilient, and
 - Design GLRI projects to account for the effects of climate change.
- Retain the three priorities for on-the-ground and in-the-water action-oriented projects, including:
 - Projects that expedite Area of Concern (AOC) delisting,
 - Projects to prevent the introduction of new Aquatic Invasive Species (AIS) ~~while controlling existing AIS~~, and
 - Projects that target phosphorus reductions where needed most ~~while and ensuring~~ that conservation practices have a lasting long-term, sustainable effects.
- Use and strengthen the Lakewide Action and Management Plans (LAMPs) under the Great Lakes Water Quality Agreement to ensure stronger coordination, communication, and consultation on a larger, lake-by-lake scale when making funding decisions.
- Encourage, but do not require, GLRI matching resources while retaining the goal of encouraging investments based on impact rather than the size of grants.
- Create incentives to track economic benefits information in conjunction with individual projects and the GLRI collectively.
- Promote environmental justice through the meaningful involvement and fair treatment of all people regardless of race, color, national origin, or income.
- Integrate and advance scientific indicators, monitoring, and assessment into projects to measure progress, employ the principles of adaptive management, and communicate results from GLRI investments.

Advisory Report on the FY15-19 Great Lakes Restoration Initiative Action Plan**Background**

This Board report is designed to guide the Federal agencies' investment decisions to build upon the successes to date while supporting increasingly successful restoration of a vibrant Great Lakes ecosystem and economy.

The Board was named to advise the Federal government on matters related to the protection and restoration of the Great Lakes. In 2009, President Obama proposed and Congress funded the GLRI. In February 2010, the IATF released the FY10-14 GLRI Action Plan to prioritize the efforts funded under the GLRI. On March 6, 2013, Council on Environmental Quality Chair Nancy Sutley announced the White House's commitment to a renewed GLRI, covering fiscal years 2015-2019. To assist in the development of a FY15-19 GLRI Action Plan, Acting U.S. Environmental Protection Agency Administrator and Great Lakes Federal Interagency Task Force (IATF) Chair Bob Perciasepe announced the appointment of the first-ever Great Lakes Advisory Board (Board).

Specifically, the Board provides advice and recommendations on:

- a. Great Lakes protection and restoration policy.
- b. Long-term goals and objectives for Great Lakes protection and restoration.
- c. Annual priorities to protect and restore the Great Lakes that may be used to help inform budget decisions.

In appointing the Board's members, IATF Acting Chair Perciasepe stated:

The scientists, business leaders, public servants, and representatives of non-profit organizations who make up the Advisory Board will help us build upon the successes we've already seen and move forward into the next phases of Great Lakes restoration and protection.

The IATF Chair and the participating federal agencies identified five Focus Areas:

- 1) Cleaning up toxics and areas of concern;
- 2) Combating invasive species;
- 3) Promoting nearshore health by protecting watersheds from polluted run-off;
- 4) Restoring wetlands and other habitats; and
- 5) Ensuring accountability, education, monitoring, evaluation, coordination and collaboration.

Because the need far exceed the resources available, the Board is charged with providing guidance to the 16 affected federal agencies for setting priorities to get a maximum return on investment in ecosystem improvement. This advice must be provided in a manner that is transparent and equitable to all stakeholders within the Great Lakes Basin.

Advisory Report on the FY15-19 Great Lakes Restoration Initiative Action Plan**Charge Questions**

The IATF provided six specific “Charge Questions” (later revised to seven questions for clarity) to guide the work of the Board. This report is organized around those seven questions as listed below:

(1) Climate change impacts and adaptation are not explicitly included in the Action Plan. Should the connection between the Action Plan focus areas and the protection of the Great Lakes from the impacts of climate change be expressed more clearly in the next Action Plan? If so, how?

(2) In FY13, the federal agencies emphasized investments on three priority subjects: (A) expediting AOC cleanups, (B) reducing nutrients in priority watersheds, and (C) preventing the establishment of invasive species, particularly Asian carp. Should we keep or modify these three priorities?

(A) If we keep the priority to expedite AOC cleanups, should we continue to balance our investments in efforts so we are completing all management actions to take some AOCs off the cleanup list soon while continuing to invest in AOCs that may not be taken off the cleanup list for several years?

(B) The federal agencies have targeted three watersheds for accelerated nutrient reduction work: (a) Maumee River/Western Lake Erie, (b) Lower Fox River/Green Bay, (c) Saginaw River/Bay watersheds. If we keep the current priority to reduce nutrients in targeted watersheds, should we also continue to focus conservation activities to have a stronger impact in some sub-watersheds of these three watersheds? Or should we disperse our conservation activities so they may have a wider geographical impact (but potentially weaker impact across sub-watersheds)? How can we improve participation of key landowners in conservation programs in these watersheds?

(C) If we keep the current priority on invasive species, should we target our GLRI investments at a few specific species? Or should we address other invasive species, too, and if so, which ones? How do we strike the right balance between investing in the control of invasive species already in the Great Lakes and preventing new invasive species from entering them?

(3) How should the next Action Plan provide better guidance on the selection and prioritization process for restoration projects outside of AOCs?

(4) Should the next Action Plan give priority:

(A) To activities that leverage non-GLRI funding, where applicable, enabling GLRI funding to do more?

(B) To large-scale restoration projects (\$3-10 million) that are less likely to ever be realized without GLRI resources?

(5) Should the GLRI track jobs created or sustained through GLRI projects?

(6) Should the GLRI promote environmental justice and support disadvantaged communities?

(7) Should scientific indicators developed by the International Joint Commission or other official processes be considered for refining Measures of Progress or other aspects of the GLRI Action Plan? If so, how should indicators be taken into account in the next GLRI Action Plan?

Advisory Report on the FY15-19 Great Lakes Restoration Initiative Action Plan**Recommendations**

The Board discussed all seven questions as a group then divided into seven working groups to develop responses. The full Board discussed the drafts before developing this report. The following represents the consensus of the Board, with noted exceptions.

Charge Question 1: *Currently climate change impacts and adaptation are not explicitly included in the Action Plan. Should the connection between the Action Plan focus areas and the protection of the Great Lakes from the impacts of climate change be expressed more clearly in the next Action Plan? If so, how?*

Work under the GLRI Action Plan must proceed with protection and restoration projects that help reach the goal of making the Great Lakes ecosystem more resilient to climate change. However, the GLRI Action Plan and resulting ~~restoration, protection and maintenance~~ projects should not focus exclusively on climate change. Nor should a new and separate Focus Area be created to address climate change. Instead, GLRI project sponsors should encourage the incorporation of climate change adaptation practices into GLRI projects during the development process.

The Board acknowledges the impact of climate change and agrees with the scientific consensus, as expressed in multiple reports, that climate change is occurring¹ and is impacting the Great Lakes. Thus, the GLRI Action Plan must acknowledge that climate change, and the resulting changes to local meteorology, can compromise the long term effectiveness of the restoration work being done through the GLRI. To ensure the long-term viability of any specific restoration project, the GLRI awarding agency should consider whether each proposed project is likely to survive the impacts of climate change. This is best done during the project selection process. This emphasis on adaptation under GLRI is appropriate and entities proposing specific projects should be rewarded for clearly defining the resiliency of a given project within the proposal. The Board recognizes that climate change mitigation is also important, but is better addressed elsewhere.

Climate change implications should be taken into account when setting the goals and objectives of the Action Plan, when developing the GLRI Request for Proposals, and making award decisions. ~~During the competitive grants process, points could be awarded to those projects that include pertinent and measurable climate adaptation actions. However, projects that do not or cannot include climate adaptation actions should remain eligible for GLRI funding.~~

¹ For example, the International Panel on Climate Change and the National Fish, Wildlife, and Plants Climate Adaptation Strategy. The latter is a product of the U.S. Environmental Protection Agency, Geological Survey, Forest Service, Bureau of Reclamation, Bureau of Land Management, Army Corps of Engineers, National Oceanic and Atmospheric Administration, Bureau of Land Management, National Park Service, Council on Environmental Quality, Bureau of Indian Affairs, Great Lakes Indian Fish and Wildlife Commission, and others. It expressly states that it is designed to build upon and complement the Great Lakes Restoration Initiative. This could suggest buy-in among many jurisdiction and agencies.

Advisory Report on the FY15-19 Great Lakes Restoration Initiative Action Plan

Charge Question 2: *In FY13, the federal agencies emphasized investments on three priority subjects: (A) expediting AOC cleanups, (B) reducing nutrients in targeted watersheds, and (C) preventing the establishment of invasive species, particularly Asian carp. Should we keep or modify these three priorities?*

The Board recommends that the IATF agencies retain the three priorities for on-the-ground action-oriented projects, including:

- 1) Projects that expedite delisting of Areas of Concern (AOC's) closest to completion and create momentum for delisting other AOCs,
- 2) Investments primarily in the prevention of new Aquatic Invasive Species (AIS), especially Asian carp, ~~while continuing to fund work to control existing AIS,~~ and
- 3) Phosphorus reductions where needed most while working to ensure conservation practices have ~~a lasting~~long-term, sustainable effects/results.

The Board recommends the GLRI continue investing a large majority in on-the-ground and in-the-water activities that have direct ecological benefits for the ecosystem.
~~The Board recommends that a fixed percentage of future funding should target the three priority subjects, with a preference for on the ground restoration projects and projects not required under traditional permitting and enforcement. The Board recommends that between 60 and 75% of the available funding be designated for these on the ground projects. (THERE NEEDS TO BE MORE DISCUSSION ABOUT WHETHER OR NOT TO HAVE A FIXED PERCENTAGE, AND IF SO, WHAT IT SHOULD BE).~~

Priority should be given to projects that: 1) leverage non-GLRI funding, 2) provide long-term, cost-effective reductions and remediation, *and* 3) build upon existing Federal and state regulatory requirements. GLRI funds should target remediation of legacy problems, mitigation of existing problems and prevention of new problems. GLRI funds should not be used to offset funding challenges in programs like Superfund, the Clean Water Act, or state programs. Projects associated with permitting, enforcement, ~~research,~~ and ~~new-existing regulatory~~ programs should rely on traditional funding sources. The IATF agencies should encourage innovative technologies but should not fund their development nor the approval process which should be left to the states and Federal programs not funded by GLRI.

Finally, there needs to be sufficient monitoring and assessment to determine the effectiveness of funded projects. This should be done by encouraging monitoring as part of ~~all~~ restoration projects and leveraging existing monitoring programs. This recommendation applies to the entire GLRI.

Charge Question 2(A): *If we keep the current priority to expedite AOC cleanups, should we continue to balance our investments so we are completing all management actions to take some AOCs off the cleanup list soon while continuing to invest in AOCs that may not be taken off the cleanup list for several years?*

The Board recommends the IATF agencies give priority to projects that expedite AOC delisting. First priority should be given to projects that can be delisted most rapidly. Projects that can eliminate specific impairments should be given secondary priority.

Advisory Report on the FY15-19 Great Lakes Restoration Initiative Action Plan

Projects that can show documented progress toward longer term delisting should be given tertiary priority. Projects should be distributed geographically throughout the Great Lakes basin. ~~Projects outside of AOCs should be funded that can demonstrate a significant ecosystem improvement return on investment and with the written approval of the Regional Administrator.~~

Comment [GU1]: Richard Stewart seeks clarification: This new ending sentence may need some modification unless everyone (including the EPA) is clear what is meant by Geographical distribution.

Charge Question 2(B): *The federal agencies have targeted three watersheds for accelerated nutrient reduction work: (i) Maumee River/Western Lake Erie, (ii) Lower Fox River/Green Bay, (iii) Saginaw River/Bay watersheds. If we keep the current priority to reduce nutrients in targeted watersheds, should we also continue to focus conservation activities to have a stronger impact in some sub-watersheds of these three priority watersheds? Or should we disperse our conservation activities so they may have a wider geographical impact on the three priority watersheds (but potentially weaker impact across sub-watersheds)? How can we improve participation of key landowners in conservation programs in these watersheds?*

The GLRI should continue to give priority to sustainable projects that emphasize near-shore health and nonpoint source pollution prevention to reduce phosphorus runoff in the Saginaw Bay, Western Lake Erie (including Lake St. Clair), and Green Bay watersheds. Projects should be given priority if they include a plan or a funding source for long-term operation and maintenance of the constructed project. Agricultural interests continue to play a major role in the reduction of nutrients, but urban areas are important, as well. The Board recommends funding projects in drainage areas with the highest phosphorus and sediment loadings, first in the three areas highlighted above, and then in other areas of the Great Lakes

Comment [GU2]: Jim Ridgway agrees with proposed edits by Bill Haf.

Comment [GU3]: Steve Galarneau comments: When I distill down what is being proposed I hear that:

1. All Federal agricultural programs should have an environmental and sustainable component to them so that we do not have conflicting programs – sometimes even within the same agency. It strikes me that this is not unlike the climate change component that we want all GLRI projects to consider going forward – climate change resiliency and sustainable.
2. The NPS component is the largest challenge facing us now and we have been at it for a long time with limited success.

Please let me know if my “read” is correct.

Bill is correct about the lack of agricultural practices that are installed and maintained. For the Lower Fox nutrient management is the single best tool in the arsenal but it is also the hardest to verify and the management practice that is often the most frequently discarded based on commodity costs and other outside stressors. The fact of the matter is that with soil test P levels as high as they are in portions of the Lower Fox Basin the only viable long-term solution to water quality is to reduce the soil test P values. I agree lots of money has been spent in the basin on nonpoint practices; however, I am not sure if the water quality monitoring data can be used to say that the program has been ineffective. While it is true that practices may not have been maintained it is also important to point out that many of the conventional practices such as conservation tillage and buffers are really not that effective at reducing phosphorus loads when the soil test P is very high. It took time for the soil test values to get so high and there will be a lag in water quality. For example, as an analogy, I have heard it said that even if we stopped carbon emissions the temperature will still go up before it starts coming down. I think that you would agree that this same phenomenon applies to the phosphorus loadings.

~~This section below needs further discussion because of a possible inconsistency with another recommendation~~

The highest priority should be given to projects in watersheds where regulatory tools have been utilized to prioritize and assure progress. Funding priority should be given to projects in communities that demonstrate a commitment to implement comprehensive conservation farm plans that are sustainable and perpetual, augment watershed programs that are effectively using all available regulatory tools, including having an approved TMDL and/or numerical criteria for nutrients. ~~These comprehensive conservation plans will sustainable programs should include implementation of nutrient management plans state and local policies and ordinances that become the permanent process that drive the installation, inspection, monitoring, and reporting on long term BMP performance. Specific tools include Nutrient Management Plan implementation and compliance.~~ (e.g., NRCS 590 provisions include waterways, concentrated flow channels, buffer strips, installation, fertilizer and manure spreading rates that lead to field phosphorus of less than 35 ppm, and soil erosion cropping systems).

~~The Board recommends that The IATF agencies should will work cooperatively to establish a more effective means of to ensuring that agricultural producers who receive Federal benefit from commodity [programs] and/or insurance subsidy program[s, benefits] must comply with comprehensive conservation farm plans including all provisions of NRCS 590 nutrient plans that include regular inspection certification of the 590 implementation and maintenance.~~

Advisory Report on the FY15-19 Great Lakes Restoration Initiative Action Plan

Charge Question 2(C): *If we keep the current priority to prevent invasive species from becoming established, should we target our GLRI investments at a few specific species? Or should we address other invasive species, too, and if so, which ones? How do we strike the right balance between investing in the control of invasive species already in the Great Lakes and preventing new invasive species from entering them?*

The Board recommends that the IATF agencies continue to utilize GLRI funding for preventing Asian carp from reaching the Great Lakes as a top priority, preventing the introduction of other new invasive species be secondary, and controlling other, established invasive species should be a lower priority.

The Board supports stronger ballast water regulations and enforcement, focused on preventing the introduction of invasive species. These costs should not be funded by GLRI.

U.S. federal, state, Canadian federal and provincial ballast water regulations should be uniform in requirements and enforcement for vessels entering the Great Lakes system from the ocean.

Charge Question 3: *How should the next Action Plan provide better guidance on the selection and prioritization process for restoration projects outside of AOCs?*

The Board recommends strengthening and expanding the use of the Lakewide Action and Management Plans (LAMPs) and other collaborative processes to ensure stronger coordination and communication for prioritizing non-AOC restoration work on a lake-by-lake basis or other appropriate scale.

The cumulative effects of multiple projects should be managed at a spatial scale larger than that for individual projects. In most cases, the appropriate scale is the individual Great Lake. Regional as well as basin-wide evaluations are also appropriate for addressing some impairments. The Board concludes that LAMPs under the U.S.-Canada Great Lakes Water Quality Agreement provide the appropriate mechanisms. However, the LAMP program must be revitalized and strengthened to assure that programs are sufficiently up-to-date and focused to guide prioritization. The process to re-energize LAMPs will require re-engaging the multiple partners and increasing their access to the large data sets and spatial mapping tools that can aid the development of more holistic approaches.

The Board recommends that the LAMP process provide States, tribes, cities, non-governmental organizations and other key partners a project review-and-comment role in future GLRI project selections. Under this approach, the states and other partners do not make the selection table but provide critical context for projects – such as alerting the review team of other issues around a project.

The Board also supports additional efforts to improve communication and collaboration among states, tribes, municipalities, local communities, and the federal agencies charged

Advisory Report on the FY15-19 Great Lakes Restoration Initiative Action Plan

with carrying out the GLRI with specific focus on priority-setting, federal work, implementing programs, grants, and evaluating opportunities to leverage resources.

Charge Question 4: *Should the next Action Plan give priority:*

Charge Question 4(A): *to activities that leverage non-GLRI funding, where applicable, thereby enabling the GLRI funding to do more?*

The Board recommends that federal agencies encourage, but not require, non GLRI matching resources where permissible. The Board recognizes that for many grantees, matching GLRI investments is difficult, if not impossible. Thus, requiring matching funds would disqualify otherwise worthy projects. Furthermore, requiring a match as an eligibility requirement creates a built-in advantage for well-resourced applicants.

However, the Board concludes that projects that are able to bring additional federal and non-federal funds to the restoration effort can leverage the GLRI resources to facilitate major investments in Great Lakes restoration. Prioritizing projects that leverage non-GLRI resources helps accelerate projects that non-federal agencies and private organizations have targeted as priorities. Projects that supplement GLRI funds with other funding sources are also more likely to create partnerships that improve project effectiveness, establish long-term mechanisms for sharing outcomes, and create or enhance a sense of community.

The Board recommends that in-kind contributions such as equipment and services be considered eligible match when determining the extent to which a project leverages non-GLRI resources. In addition, efforts expended prior to grant award should be considered eligible if the effort is well documented and specific to the project specific planning and preparatory activities.

Charge Question 4(B): *to large-scale restoration projects (\$3-10 million) that are less likely to ever be realized without GLRI resources?*

The Board recommends that investments that have the greatest potential for achieving measurable improvements to the Great Lakes ecosystem should be given priority regardless of their dollar value. High priority projects may have whole-lake or multi-lake impacts and create or contribute to significant impact by addressing multiple stressors in smaller geographic regions or generating data, models, or other project outcomes that are applicable to multiple projects.

The project prioritization process enacted by the sponsoring federal agency should encourage projects that maximize positive impact by incorporating creative mechanisms for addressing protection and restoration at various scales. Larger projects are encouraged to partner with smaller project teams and thereby make the overall effect both impactful on the ground and supportive of localized efforts.

Question 5: *Should the GLRI track jobs created or sustained through GLRI projects?*

Advisory Report on the FY15-19 Great Lakes Restoration Initiative Action Plan

The Board recommends that the selection process encourage tracking appropriate economic benefits, including jobs and other economic indicators. Where appropriate, GLRI investment decisions should promote economic outcomes as well as social and environmental outcomes. The next Action Plan should expressly encourage projects that can identify economic and social benefits and opportunities in affected regions or communities in addition to environmental project outcomes.

Comment [CD4]: Simone asks for clarification about "encourage tracking"

There is an inherent potential for job creation in GLRI projects that lead to a significant improvement in the Great Lakes ecosystem, because it is so closely tied to the health of the regional economy. However, the Board concludes that job creation should not be included as an eligibility requirement because it would disqualify meaningful projects that otherwise offer significant potential for ecosystem improvement.

The Board recognizes that tracking and quantifying the economic impact of a GLRI project can be expensive, time-consuming, and subject to uncertainty. Therefore, the Board does not support requiring individual project teams—often limited in expertise and capacity—to track economic impacts during or after project completion. Individual project teams cannot be expected to track economic impacts, during the project or after project work has been completed. To address this concern, project teams should be allowed and encouraged to use a minor portion of their GLRI funds to track the appropriate metrics and demonstrate economic impact as one of their project outcomes. Alternatively, IATF agencies should engage regional economic development personnel to participate in documenting economic benefit.

Comment [CD5]: Simone asks for clarification about "appropriate metrics"

Comment [CD6]: Simone asks for clarification about "regional economic development personnel"

IATF agencies should provide specific guidance on the selection and use of conventional economic indicators. Because the Board recognizes that the economic impact of GLRI projects may not be measurable for years or even decades, it ~~The Board~~ encourages the agencies to consider assessing the economic impact of the GLRI program as a whole. ~~The Board recognizes that the economic impact of GLRI projects may not be measurable for years or even decades.~~

Comment [CD7]: Simone asks for clarification about this first sentence in the paragraph.

Charge Question 6: *Should the GLRI promote environmental justice and support disadvantaged communities?*

The Board recommends that the project selection process promote environmental justice by incorporating incentives for projects that enlist meaningful involvement, include an Environmental Justice (EJ) assessment, a community action component, a process to identify and capture scalable and replicable elements, includes EJ principles, provide meaningful involvement and fair treatment of all people regardless of race, color, national origin, or income.

The Board recommends that grant scoring/ranking provide incentives that facilitate the engagement of environmental justice communities. The GLRI funding opportunities should encourage partnerships with organizations that are truly based in communities impacted by the restoration activities.

Comment [CD8]: Simone asks for clarification about "provides incentives that facilitate"

Comment [CD9]: Simone asks for clarification about what "truly based" means

The Board encourages the IATF agencies to identify clear ways that the GLRI projects incorporate environmental justice concerns and communities. The responsibility for inclusion and transparency is greatest in communities that have shouldered a

Comment [CD10]: Simone asks for clarification about what "clear ways" entail.

Advisory Report on the FY15-19 Great Lakes Restoration Initiative Action Plan

disproportionate amount of contamination and the negative health impacts of environmental pollution.

Toxic hot spots that lead to the identification of the 43 Areas of Concern (AOC) are often in urban areas where there is a legacy of industrial pollution and sometimes continuing pollution. As a result, the restoration projects eligible for GLRI funding overlap with many issues of concern to environmental justice communities and communities of color. Fish consumption advisories and drinking water contamination pose special problems for communities that depend on the lakes and their tributaries as a source of protein through subsistence fishing. Many native tribes rely on fishing in the Great Lakes and their tributaries for cultural as well as economic reasons. These communities often face challenges and barriers associated with meaningful involvement and adequate representation.

Integrating environmental justice into the GLRI has many benefits, including compliance with relevant federal policies.²

Charge Question 7: Should scientific indicators developed by the International Joint Commission or other official processes be considered for use in refining Measures of Progress or other aspects of the GLRI Action Plan? If so, how should indicators be taken into account in the next GLRI Action Plan?

The Board recommends the use of ~~the IJC~~ scientific ecosystem indicators ~~along with developed by the International Joint Commission (IJC 2012) and others in~~ continued efforts to integrate ~~the~~ indicators with monitoring and assessment to track progress, evaluate projects, and communicate the results from GLRI investments.

~~Under the leadership of the IJC, a workgroup with broad representation from scientific and policy leaders from the academic, government, non-government, and private sector communities developed a set of ecosystem indicators that were released in October 2013. These indicators should serve as the basis for monitoring, assessing, evaluating, and communicating the results of GLRI investments.~~

~~The Board recommends that the Great Lakes community adopt these indicators as a common currency for progress and success on the Great Lakes. They Measures of progress (as currently used in GLRI reporting) are useful to ensure that appropriate milestones exist for all GLRI project activities. However, local ecosystem monitoring also is needed to determine whether specific restoration actions indeed are resulting in improved ecosystem condition. At the level of overall Great Lakes, integrative indicators of lake-wide ecosystem health such as the proposed IJC indicators are critically important for their ability to track both improvement and degradation over time. To the extent~~

² E.g., Executive Order 12898 on “Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations” focuses federal attention on the environmental and human health conditions in minority and low-income communities with the goal of achieving environmental justice. It is also intended to promote nondiscrimination in federal programs affecting human health and the environment and to provide minority and low-income communities with access to public information on, and an opportunity for public participation in, matters relating to human health or the environment.

Advisory Report on the FY15-19 Great Lakes Restoration Initiative Action Plan

feasible, the GLRI should contribute to this continuing development of an appropriate suite of Great Lakes indicators, including both chemical and biological indicators.

It is important to note the distinction between monitoring progress of specific restoration actions addressing a diversity of issues, and measuring overall lake condition with a modest number of ecosystem indicators. To measure progress of specific GLRI projects, site- and project-specific monitoring may also be called for. Recognizing the complexity of evaluating GLRI effectiveness, and the on-going status of development of Great Lakes ecosystem indicators, the Board strongly recommends that the GLRI and IATF identify a process to improve its monitoring of progress within the lake ecosystems. Improvements in monitoring will help significantly in prioritizing investments, evaluating programs, making adjustments to increase their effectiveness, and communicating with the broader public and opinion leaders about the health of the Great Lakes. ~~Where there are existing mechanisms to deliver information to users and the public, they should be utilized. If additional ones are necessary, they should be developed.~~

Great Lakes Advisory Board

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