

**SCIENCE AND INFORMATION SUBCOMMITTEE  
OF THE GREAT LAKES ADVISORY BOARD**

**RECOMMENDATIONS for INCORPORATING DURATION/LONGEVITY  
INTO GLRI PROJECT SELECTION**

**September 30, 2016 (draft)**

**Executive Summary**

The Science and Information Subcommittee (SIS) of the Great Lakes Advisory Board (GLAB) has been asked for its advice on how to incorporate duration/longevity considerations into GLRI proposal selection. The SIS appreciates the importance of the Measures of Progress (MOPs) in the GLRI action plans. MOPs track actions taken towards specific objectives and help satisfy accountability requirements imposed by Congress and the Office of Management and Budget. MOPs that measure program outputs have a critical role in demonstrating the tangible results of the GLRI investments, which is necessary to sustain support for the program over time. Making the linkage from MOPs that measure outputs to ecological benefits (outcomes), ideally at a large scale and over a long timeframe, is extremely challenging. The SIS applauds efforts by GLRI-funded agencies to find ways to identify and fund projects that may have long-term benefits not easily captured in annual MOP reporting.

This report is intended as guidance from the GLAB to the Interagency Task Force (IATF) as GLRI-funded agencies search for ways to ensure that GLRI investments have the greatest possible long-term benefit to the Great Lakes. The report includes a number of specific recommendations that we believe will assist the agencies as they consider long-term ecological benefits in project selection, and hopefully will help achieve those benefits in the long run.

The report and recommendations are based on discussions within the SIS and reviewed by the GLAB, informed by charge questions presented by the agencies. The SIS formed subcommittees around each of the charge questions and reviewed select proposals/projects, and provided an examination of whether and how “longevity/duration” considerations have been incorporated into a select group of past projects that were funded in whole or in part by the GLRI program.

The charge questions ask for input on how “longevity and duration” considerations can be incorporated into the GLRI program. For purposes of this report, we propose that “duration” refer to the length of the project (essentially the project period) and “longevity” refer to when the benefits will be achieved and how long the benefits will last. For instance, a fish barrier may take 3 years to build (duration), and its benefit may be achieved immediately upon completion and last 30 years (longevity).

**Summary of recommendations**

- A forum should be established to identify new MOPs that measure long-term ecosystem outcomes and the long-term ecosystem benefits to be achieved by the GLRI program investments and to complement the current MOPs. (Recommendation 1.1)
- Establish consistent language for GLRI program documentation that includes direct measures or surrogates that track overall progress toward long-term ecological benefits. (Recommendation 1.2)

- Where feasible, incorporate duration and/or longevity requirement into the MOPs in Action Plan II, and incorporate explicit duration and longevity considerations into the MOPs in Action Plan III (2020-2024). (Recommendations 1.3 and 2.1)
- Require applications to include a brief monitoring plan that could be used to demonstrate progress toward and achievement of project outcomes. (Recommendations 1.4, 3.2)
- Identify specific project evaluation criteria that characterize particular long-term benefits to be achieved by the GLRI program and create a scoring rubric or “check list” to use in identifying projects that deserve extra consideration on the basis of duration and longevity. (Recommendation 3.1)
- Require applicants to estimate when project outcomes are expected to materialize, how long they are expected to last, and how they pertain to the long-term Great Lakes ecosystem restoration goals and MOPs in the Action Plan. Guidance should be developed to ensure some consistency. (Recommendation 4.3)

***Charge Question 1: What are the most significant kinds of challenges that can impede the duration or longevity of ecosystem benefits from GLRI-funded actions, and how should they be addressed in GLRI processes?***

GLRI-funded projects as discrete grants are typically short-term in nature, rarely going beyond a three-year period. By contrast, restoration expenditures (whether made through GLRI or some other program) generally are intended to achieve beneficial, long-term ecological outcomes. The SIS believes that the central challenge in addressing the duration or longevity success of GLRI-funded projects is the definition and measurement of the long-term ecological benefits that are achieved individually or collectively by GLRI-funded projects.

The SIS strongly supports what we understand to be the main premise underlying the charge questions: although valuable as a reporting tool, most MOPs do not quantify actual ecological benefits. Virtually all of the current MOPs measure program outputs<sup>1</sup> because they track progress toward an interim objective (e.g., acres of habitat protected), not the ultimate desired program outcome (i.e., improvement of the Great Lakes ecosystem). Most of the MOPs are “process measures,” that measure either project parameters or progress toward a focus area objective,<sup>2</sup> and not “outcome measures,” which measure progress toward a desired ecological goal.

To address these challenges, there is a need to identify and define desired long-term ecosystem benefits to be achieved by the GLRI program, and to establish MOPs or -new metrics that measure the extent to which GLRI investments achieve, or are expected to achieve, those long-term ecological outcomes. The establishment of new MOPs or metrics to address longevity of the ecosystem benefits is a complex and important goal and will require more effort and data on the current programs MOPs, thus SIS was unable at this time to articulate the MOPs.

---

<sup>1</sup> The term “output” means an environmental activity, effort, and associated work products related to an environmental goal or objective, that will be produced or provided over a period of time or by a specified date. The term “outcome” means the result, effect or consequence that will occur from carrying out an environmental program or activity that is related to an environmental or programmatic goal or objective.

<sup>2</sup> For purposes of this document, “focus area objectives” are the objectives listed for each focus area on page 4 of GLRI Action Plan II.

Recognizing that this approach would create better linkages between the long-term ecosystem benefits, MOPs, and the projects funded under the GLRI, the recommendations include.

**Recommendation 1-1:** The IATF should convene a forum of IATF personnel who participate in GLRI funding decision-making to identify and define MOPs that can be used to measure progress toward long-term ecosystem benefits, to the extent feasible. These MOPs should be outcome-oriented, with specific endpoints that can be used as surrogates to directly track progress toward long-term ecosystem goals. The MOPs could specifically reference the long-term goals established for the Great Lakes ecosystem (e.g., “fish safe to eat,” “water safe for recreation,” “safe source of drinking water”).<sup>3</sup>

**Recommendation 1-2:** Forum participants might develop high-level guidance for all GLRI funding programs that describes what is expected of individual applicants in their proposals and reporting. Consistent language for GLRI program documentation is needed across GLRI funding programs that enables the IATF to better track overall progress toward long-term ecological benefits. Specific recommendations regarding the content of GLRI program documentation are included in response to Charge Question 4.

**Recommendation 1-3:** MOPs that explicitly incorporate duration and longevity considerations should be incorporated into GLRI Action Plan III (2020-2024). We acknowledge the difficulty of tracking progress toward long-term goals within the 5-year planning cycle, but ideally the MOPs in Action Plan III will include those that are directly related to ecosystem benefits in addition to MOPs focused on process.

Lack of GLRI funding for monitoring is an over-arching issue, as it may take decades (beyond the grant period) to demonstrate that ecosystem benefits have been realized. The availability of funding for monitoring pre-implementation baseline conditions, post-implementation adaptive management, and in some instances longer-term post-project conditions should be considered for projects implemented under GLRI.<sup>4</sup> In addition, project proposals should be required to identify whether an existing federal, state, or local monitoring or assessment program is being used to track restoration progress.

**Recommendation 1-4:** A brief monitoring plan for demonstrating progress toward and achievement of project outcomes should be included in all project proposals. This monitoring may not necessarily be done as an explicit part of the project (in fact the duration of the project likely will not allow it), but the monitoring approach should be articulated by the applicant. The plan should include standardized metadata: what is being monitored, how frequently, where monitoring should occur, how long into the future it will continue, who will do it, and to whom data and other results will be reported. Wherever possible, GLRI funding programs should include funding request language and scoring criteria that encourages applicants to consider incorporating or piggybacking onto existing federal, state, and local monitoring efforts.

---

<sup>3</sup> The long-term goals were carried over from the first GLRI action plan and incorporated into Action Plan II on page 3.

<sup>4</sup> See, for example, 2016 Sustain Our Great Lakes Request for Proposals Evaluation Criteria: “Evaluation and Maintenance - Monitoring: Project includes a plan for monitoring progress during and after the proposed project period to track project success and address new challenges and opportunities. Long-term sustainability: Project will be maintained to ensure benefits are achieved and sustained over time; plans described in the proposal include how future funding will be secured to implement necessary long-term monitoring and maintenance activities.”

The SIS recognized that success of future monitoring is contingent upon support for this activity until the outcome is achieved. Support for existing data collection and sharing repositories, e.g. the Great Lakes Observing System (GLOS), is essential for those projects which have monitoring that is amenable to data archiving in GLOS. Without support for data archives that are readily accessible by all Great Lakes residents then the ability to effectively communicate outcomes for such projects would be highly constrained.

The SIS identified a number of additional challenges that can impede the longevity of ecosystem benefits. The Laurentian Great Lakes are a system undergoing change from population growth, land use change, species invasions to climate change and other stressors. It is clear that any number of challenges exist, each with a set of specific factors playing a role in the changes seen in the Great Lakes system. The nature of each problem affects how long the problem may persist but may be multi-faceted.

Taking phosphorus (P) for example: in some cases, the rates of P change may be rapid such as with dreissenid mussels, which profoundly changed biogeochemical processing of P in the Great Lakes. By contrast, P export by rivers may decline more slowly than expected in certain watersheds due to legacy storage.

Of all the additional challenges that may impede the longevity of ecosystem benefits, *climate change* may be the most challenging, with potential long term impacts on the ecosystem that may even negate any ecosystem benefits achieved by GLRI investments. For example, the warming of Lake Erie could create the situation where warmer hypolimnetic waters hold less oxygen, oxygen consumption rates are increased, and prolonged mixing in spring prior to thermal stratification creates a shallower hypolimnion. All these factors would contribute to a greater extent of hypoxia, even if primary productivity in the lake was reduced through successful GLRI-funded P reduction efforts.

Multiple stressors may impede system recovery when only one stressor is ameliorated. Management actions may decline in effectiveness over time, for example, if an invasive plant adapts to control measures. Climate change, land-use change and population pressures may degrade management actions. These challenges may vary by focus area and objective.

These challenges and multiple stressors are indicative of the Great Lakes ecosystem's complexity; hence, it is imperative that long-term monitoring plans be developed (and funded) to ensure ecosystem benefits are being realized, and if not, use the monitoring information to make the appropriate course corrections.

**Charge Question 2: *For which of the GLRI measures of progress is the duration or longevity of ecosystem benefits from a GLRI-funded action most critical?***

Not all MOPS are created equal. Many track the progress towards achieving the specific focus area objectives ((toxics, invasives, non-point pollution, habitat and education/monitoring); some are more appropriate for tracking project process and not long term objectives per se. The SIS advises that duration/longevity will be equally important with respect to outcomes within each of the focus areas and did not prioritize these (toxics, invasives, non-point pollution, habitat) . The metrics (New MOPs) used should attempt to track progress toward the longevity of the achievement. For example the removal of “Beneficial Use Impairments” as a measure is directly related to ecosystem health objectives, and longevity must be considered (eg swimmable/fishable/drinkable).. Tracking the methodologies and field methods used by GLRI

projects is helpful but not related directly to an ecosystem goal, and thus it is less critical to have a longevity measure associated with it.

In addition to monitoring some projects will require maintenance in order to continue to achieve benefits. Thus it is also important and critical in some cases to have long-term maintenance programs as part of GLRI-funded projects designed to achieve focus area objectives, in order to sustain this longevity. Maintenance programs are critical to ensuring that outcomes last beyond the project duration.

It may not be feasible to apply a project longevity standard to all of the current MOPs. The MOP that tracks the removal of Beneficial Use Impairments (BUI) or the de-listing of Areas of Concern (AOC), for example, essentially tracks progress toward a final long-term outcome because all benefits are achieved for the foreseeable future once BUI removal or de-listing has occurred.

Moreover, duration/longevity is less important with respect to MOPs that merely track project parameters. For example, the MOP that tracks the number of projects that block the entry of invasive species to the Great Lakes ecosystem tracks progress toward an interim invasive species goal (blocking pathways), but does not directly demonstrate progress toward the associated focus area objective (preventing the introduction of new invasive species). Longevity is still important to this MOP, because the effective use of GLRI funds will block the pathways permanently, or at least over the long term, but duration/longevity is difficult to incorporate with respect to this MOP because it tracks only the number of projects. The MOP that counts the number of invasive species control technologies similarly is difficult to evaluate in terms of its long-term ecological benefit.

***Recommendation 2-1:*** The IATF should strive to include duration and/or longevity considerations when using or interpreting the MOPs and new metrics in Action Plan II. None of the MOPs in Action Plan II currently include longevity or duration endpoints and current MOPs are more often output oriented. It is most important to incorporate (where feasible) duration/longevity requirements into additional new metrics that track progress toward the achievement of focus area objectives or ecological outcomes, and less important to incorporate duration/longevity into MOPs that only track project parameters (outputs).

***Charge Question 3: How should the duration or longevity of ecosystem benefits be considered when comparing various proposals for GLRI funding?***

The SIS has very limited information about the current project selection process, making it difficult to specify how to add on scoring criteria for duration/longevity. We recognize that EPA provides scoring criteria in their requests for funding. However, other GLRI-funded agencies may not. A consistent scoring rubric that is used across GLRI funding programs could be helpful.

***Recommendation 3-1:*** In conjunction with the Recommendation 1-1, a group of agency personnel tasked with better defining long-term ecological benefits associated with MOPs should identify a few specific project evaluation criteria that characterize projects with particular long-term benefits. This could allow construction of a scoring rubric or “check list” that helps identify projects deserving of extra consideration on the duration/longevity basis.

The total cost to achieve, monitor, and maintain an ecosystem benefit will often extend well beyond the timeframe of an individual GLRI-funded project. Many projects will require continuous, meaningful maintenance expenditures (e.g., incentives to maintain farming practices, repeated treatment of invasive species). Others may require little maintenance (e.g., dam removal to reconnect a tributary). Project proposals should include cost estimates for achieving project outcomes over a long-term timeframe and how they will be addressed beyond the grant period.

**Recommendation 3-2:** To satisfy concerns over monitoring and maintenance issues, applicants should be asked, at a minimum, to address the following questions in project proposals: (a) Will the completed project be self-sustaining or require on-going maintenance (and if the latter, for how long, at what cost effort, by whom, etc.)? (b) What is the anticipated response time following project completion for the identified ecosystem benefits to be realized? Responses should be clearly explained in detail and be well-defended.

**Charge Question 4: *What level and type of documentation on the duration or longevity of ecosystem benefits should accompany GLRI funding proposals?***

Applicants may not be able to provide precise, detailed answers regarding longevity/duration in project proposals and final reports, but a requirement to address the longevity/duration issue would be useful. Efforts to acknowledge uncertainties and risks should be viewed as a positive. Definitions of longevity and duration as part of the funding agency guidance recommended above will be needed.

**Recommendation 4-1:** GLRI project proposals should be required to define project success in terms of both outputs and outcomes, and specifically state the long-term Great Lakes ecosystem restoration goal(s), focus area, and MOP being targeted. The applicant should not be required to perform an evaluation of project success, but should articulate in the proposal what success means for the individual project and the achievement of GLRI Action Plan MOP.

**Recommendation 4-2:** If feasible, applicants should be required to define project success in terms of short, medium and long-term project outcomes. We define short term as occurring within the project funding cycle (1-2 years); medium term as occurring within the Action Plan funding cycle ( $\leq 5$  years); and, long term as occurring over a longer time period than a single Action Plan ( $>5$  years). This information could be used as assessment criteria during the GLRI proposal review process.

**Recommendation 4-3:** GLRI project proposals should be required to estimate when project outcomes are expected to materialize and how long they are expected to last. They should include a rationale for their estimates. Requiring applicants to include a description of what long-term ecological success looks like in their project proposal (e.g., by asking them to estimate how long invasive species will be controlled after the proposed project is completed) would make it easier for the agencies to compare project proposals in terms of duration and longevity.

**Recommendation 4-4:** Applicants for GLRI funding should be required to follow a standard format at the proposal stage and the final report stage to ensure consistency of reporting. Relevant data could then be accessed across all GLRI projects for each GLRI focus area or MOP. Final reports should include an explicit statement describing how

duration/longevity will be evaluated beyond the grant period, or a statement explaining why this expectation did not apply.

**Recommendation 4-5:** Grantees should be required to develop a fact sheet for each GLRI funded project. (The fact sheet could be developed at the beginning of the project and updated at the end of the project). The fact sheets could identify project outputs and outcomes, target focus areas and MOPs, and expected and (at the end of the project) realized ecosystem benefits, as well as funding sources, partners, etc. The fact sheet and the final report could be posted on appropriate agency websites and linked in the reporting database that EPA may be maintaining.

**Charge Question 5: *Are there any models or other tools that the GLAB would recommend for estimating the duration or longevity of ecosystem benefits from GLRI-funded actions?***

Depending on the type of project, models may be helpful. Established long-term monitoring programs may be another approach (e.g., National Coastal Wetland Assessment Program; federal, state or local established long-term monitoring programs).

**Recommendation 5-1:** If technically feasible and reasonable under the Eagles Reporting System, the GLRI tracking system should include a coding field that provides information related to duration and longevity reporting and approaches used by applicants and/or GLRI funding agencies, thereby building a library of useful approaches.

**Recommendation 5-2:** Ecosystem benefits should be valued, and the long-term value of these benefits should be considered when prioritizing projects and making funding decisions. There are a variety of tools to assess the relative value of ecosystem benefits; such benefit assessments should be included in project proposals and the proposal review process. Cost-benefit analysis, nonmarket valuation techniques (e.g., contingent valuation, travel cost), and other methods are potential and acceptable approaches. In order to facilitate consistency and comparability, the IATF should identify the approach they see as most useful for projects in each focus area.

It should be recognized that cost-benefit analysis is most useful when comparing two or more alternatives for achieving the same goal. For example, which strategy, A, B, or C, is the most cost-effective way of reducing inputs of P into a water body? One could appropriately use metrics such as P-removed/\$ to compare such projects. If one's goal is to restore as much coastline habitat as possible, the metric acres-restored/\$ might also be useful. Cost-benefit analysis is less useful when comparing projects with different goals. The more different the goals are, the more difficult it is to use the tool. For example, is it better to use GLRI funds to implement a P-reduction project or a restoration project. Quantifying that decision becomes much more difficult.