

## INFORMATION TECHNOLOGY, TRANSPARENCY, AND POSITIVE CHOICES

### POSSIBLE PROJECT IDEAS

The Fund is interested in supporting projects that use information technology to help shape behaviors in ways that generate beneficial effects for the physical<sup>1</sup>, chemical<sup>2</sup>, and biological integrity<sup>3</sup> of the basin's ecosystem.

The following is an illustrative list of what project teams might do. Depending on how they are designed and executed, they may or may not ultimately fit our funding criteria. This list is not a specification sheet, a desired product list, or in any way meant to constrain what applicants should consider proposing. Please consider this as a starting point for what teams might propose doing with new information technology or innovative applications of current technologies to improve ecosystem health. Do not be bound by the handful of ideas listed below.

**Water metering** programs that affect the timing and amount of water use. Projects could: link residential and commercial users to real-time meters and pricing information, to test how customer demand is shaped; test “curtailment” programs that, for a financial incentive, stop uses during periods of high demand and/or high sensitivity to releases; track agricultural products grown without irrigation or without artificial drainage, verify the physical integrity improvements achieved and produce a label that allows consumers to select water positive products.

**Wet weather monitoring/management** programs that: link collective user activities or land use changes to CSO/SSOs release reductions and in-stream impacts; or, test the performance of agricultural practices and cropping decisions on groundwater and surface water levels to identify incentives for farmers to “grow water”.

**Build-out scenario systems** that explicitly and visually represent the water-impacts of developing to the limits of planning and zoning codes or other “rules.” The project would represent the aggregate effects of

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<sup>1</sup> Physical integrity refers to the pattern of water and sediment movements that are sufficient to support the biological community native to the aquatic system. This means that water is at the right place at the right time, and in the right amounts.

<sup>2</sup> Chemical integrity means that the waters of the Great Lakes are virtually free of toxic chemicals, that humans and wildlife are virtually free of bioaccumulating chemicals, and the Lakes are not impaired by excess nutrients.

<sup>3</sup> Biological integrity refers to the full complement of biota native to the waters of the Great Lakes, living in balance with one another and the environment.

development upon built (sewers, water supplies) and green infrastructure (streams, rivers, wetlands, coastlines) to illustrate the differential impacts of various systems of incentives and disincentives. Actors would be able to better identify, build, and execute projects that consider the collective, aggregate impacts of their land-use decisions (or development management systems) on ecosystem health.

**Infrastructure visualization software** that forecasts the ecological impacts (i.e. long-term drainage, soil permeability, changes to instream flow patterns) of public infrastructure projects through their entire lifecycle, testing climate scenarios and the growth consequences of public investment.

**Electronic registries** that measure and verify the positive ecological impacts of innovative actions, such as green infrastructure development or water conservation programs. Projects could showcase leaders and report on the environmental consequences of their actions, thereby creating an incentive to replicate or improve such actions.

**A publicly available expert system for permit applicants** that provides ecosystem positive treatment technologies for a set(s) of dischargers in the basin could be developed to complement the regulatory and public involvement practices currently required by law. This could include participation from public NGOs, regulators, and dischargers.

**Purchasing programs** that identify “clean practices/practitioners” and make them available to buyers and sellers throughout a product’s value chain. For example, “clean/water-friendly” biofuels could be identified based on the growers’ practices. Additionally, the basis for existing certifications/labels could be promoted through mobile or internet technologies for products already known to be environmentally superior.

**Electronic delivery/solicitation of fish advisories** could be made available on mobile devices to inform consumers at the point of purchase or consumption based upon state-specific pollutant criteria.

**An ecological early warning system** for the Great Lakes. This project could develop a prototype “immune” system that generates automatic warnings of potential ecological harm and engages/manages/deploys methods to mitigate or eliminate the detected threat.

**Real-time energy impact monitors** that use dispatch data to show the real-time environmental consequence of energy generation. For example, a project could identify the energy-related emissions

associated with water withdrawal, delivery, and treatment and track the ecological consequences of the emissions reductions achieved through water conservation programs.

**A clean packaging system** where all shipping containers are verified to be free of invaders. This system would make it easy to comply with existing laws and allow shippers/carriers to differentiate themselves as Great Lakes-compatible.

**A clean shipping system**, such as one that allows brokers, agents, and shipping managers to choose clean vessels based on routes, risks, and management measures. The project could include ship tracking, management oversight/reporting, risk modeling, and “certification”.

**An interactive website for the purchase of live organisms** that allows consumers to select products from those vendors that have adopted “safe trade” practices. Such practices might consider: safe transport, safe disposal, bar coding, and point of purchase information. The project could utilize web data bases, data-mining throughout the value chain, and a certification system for “best practices”.

**A citizen’s based invasive species alert network** that equips individuals with GPS enabled phone cameras linked to digital identification databases. Participants would be able to take photos, automatically download species information, and simultaneously update publicly available first responder networks and/or digital maps.

**Port alert network** that allows port operators to link digital images of incoming ships with the ecological and human health conditions associated with the ship’s travel history, onboard treatment equipment, chemical profile of the ship’s ballast tanks, and the cargo history. This network could also include managers of public water supplies and the range of first responders for human health threats.