



# Valuation of the Great Lakes Fisheries and Aquatic Ecosystem Services Virtual Workshop

## WORKSHOP SUMMARY REPORT

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### SUBMITTED TO

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# Table of Contents

<b>Executive Summary</b> .....	<b>3</b>
<b>Introduction</b> .....	<b>5</b>
<b>Session 1: Welcome and Introduction</b> .....	<b>7</b>
<b>Session 2: Setting the Stage and Great Lakes Context</b> .....	<b>8</b>
DR. LYDIA OLANDER, DUKE UNIVERSITY .....	8
DR. AMANDA HOLMES, FISHTOWN PRESERVATION SOCIETY .....	9
DR. SETH MOORE, 1854 TREATY AUTHORITY .....	9
MATT DEMILLE, ONTARIO FEDERATION OF ANGLERS AND HUNTERS.....	10
DR. WILLIAM TAYLOR, MICHIGAN STATE UNIVERSITY .....	10
SESSION 2: PANEL DISCUSSION.....	11
<b>Session 3: Preparing to Advance the Conversation</b> .....	<b>13</b>
<b>Session 4: Research Gaps and Priorities</b> .....	<b>14</b>
<b>Session 5: Socio-economic Research Methods</b> .....	<b>16</b>
DR. VIC ADAMOWICZ, UNIVERSITY OF ALBERTA.....	16
DR. BONNIE KEELER, UNIVERSITY OF MINNESOTA .....	17
ROB SOUTHWICK, SOUTHWICK AND ASSOCIATES.....	18
DR. PATRICK LLOYD-SMITH, UNIVERSITY OF SASKATCHEWAN .....	18
DR. LISA COLBURN, NOAA FISHERIES.....	19
SESSION 5: PANEL DISCUSSION.....	19
<b>Session 6: Identifying Next Steps and Recommendations</b> .....	<b>21</b>
CAMERON DAVIS, GEI CONSULTANTS .....	21
VANCE BADAWEY, MP, CO-CHAIR OF GREAT LAKES TASK FORCE .....	22
IDENTIFYING NEXT STEPS: BREAKOUT GROUP DISCUSSIONS .....	22
<b>Session 7: Aligning on Priority Recommendations</b> .....	<b>24</b>
<b>Where to Go from Here?</b> .....	<b>26</b>
STEP 1: CREATE A COMMUNITY OF PRACTICE .....	26
STEP 2: IDENTIFY THE “HOME” AND BUSINESS MODEL FOR THE COMMUNITY OF PRACTICE.....	26
STEP 3: FACILITATE THE ONGOING WORK OF THE COMMUNITY OF PRACTICE .....	27
<b>Appendix A – Workshop Participant List</b> .....	<b>28</b>
<b>Appendix B – Agenda</b> .....	<b>31</b>
<b>Appendix C – Workshop Materials</b> .....	<b>37</b>

**TABLE OF FIGURES**

Figure 1: Steps to create and maintain a Community of Practice .....4  
Figure 2: Session 1 Word Cloud .....7  
Figure 3: Session 2 Presenters and Panelists .....8  
Figure 4: Session 5 Presenters and Panelists ..... 16  
Figure 5: Session 6 Presenters and Panelists ..... 21

# Executive Summary

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The Great Lakes fisheries and aquatic ecosystems play a critical role in the social, cultural, and economic well-being of the region. The health of these Great Lakes resources are directly connected to the quality of life of those who depend on them for the full range of multi-faceted benefits. To further understand the significance and value of the Great Lakes fisheries and aquatic ecosystem services to key stakeholders and decision-makers, a collaborative effort brought together academia, Indigenous peoples, industry, government agencies, non-governmental organizations, and civil society through a [virtual workshop](#) in the spring of 2021. Workshop organizers included the Great Lakes Fishery Commission (GLFC), The Nature Conservancy (TNC), Michigan Sea Grant, the International Joint Commission (IJC), University of Guelph, Council of Great Lakes Region, and Michigan Tech University (MTU).

## How can we better understand and express the social and economic values of the Great Lakes?

The workshop focused on better understanding how to determine and express the social, cultural, and economic values of the Great Lakes fisheries and ecosystem services to help shape a more accurate, complete, and compelling narrative about how the fisheries and aquatic ecosystems relate to the region's ecology, communities, and people's lives and livelihoods. The workshop featured presentations and panel discussions with experts in fisheries and aquatic ecosystem services valuation, as well as breakout group discussions and plenary discussions. During the workshop, participants explored:

<p>Various types of <b>valuation methods</b> (both for fisheries and for ecosystem services), their benefits and limitations, and considerations for communication to different audiences.</p> 	<p>The current <b>state of knowledge</b> and key data and knowledge gaps relating to the valuation of the Great Lakes fisheries and ecosystem services.</p> 	<p>The importance of understanding and communicating the social, cultural, and economic value of the Great Lakes <b>to inform decision-making</b>.</p> 
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## Key Themes and Takeaways

The workshop yielded a number of themes to consider in charting a path forward, including:



### Holistic valuation

Multiple knowledge systems and use of non-market valuation techniques (that capture Indigenous, cultural, recreational, and other social values) are needed to gain a holistic understanding of the full range of values and impacts experienced by stakeholders and communities.



### Stronger coordination

A community of practice is needed to coordinate and undertake meaningful and comprehensive research, share data, and develop communication strategies to ensure that socio-economic data demonstrating the full value of the Great Lakes are gathered and provided to relevant decision-makers throughout the Great Lakes basin.



### Communication to decision-makers

The story of the integrated values of the Great Lakes needs to be told. To catalyze action and responsible management, it is essential that the valuation of the Great Lakes is communicated to policy-makers and decision-makers in all levels of governments in an accessible, meaningful, and integrated way.

### Next Steps

Building on the ideas that surfaced through the workshop, elements of a path forward began to take shape that would “assist the research and management community to come together to increase the understanding and ability to measure and communicate the value of Great Lakes fisheries and aquatic ecosystem services to key audiences.” The goal of this path forward is to support and justify increased investment in and collaboration around addressing high-priority socio-economic research gaps.

During the workshop, a strong case for a **community of practice** emerged as a way to break down silos and improve collaboration among experts, policy-makers, decision-makers, funders, and other interested communities to generate enthusiasm, interest, and a shared vision. Figure 1 depicts three basic steps to initiate and mobilize this community of practice.

Underpinning such a community of practice is a preliminary set of **key principles** that may guide the community’s design, vision, and work:

- **Leadership:** Appropriate designation and support for an initial group of “champions” is needed to test the concept of the community of practice and secure resources to move the initiative forward. Sustained leadership will be core to ensuring accountability of the community over time.
- **Commitment:** An expression of willingness to support and participate in a community of practice is required from researchers, funders, interested communities, and governments to sustain the work of the collaboration over time.
- **Holistic:** Central to the success of this community of practice is the need to elevate and prioritize valuation studies and approaches that recognize the full range of social, cultural, recreational, and economic values. This also includes the need to incorporate diverse worldviews into the work of the community of practice, incorporating both Indigenous knowledge and western science.



Figure 1: Steps to create and maintain a Community of Practice

# Introduction

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On April 12 – 14, 2021 a virtual workshop was held for the purpose of bringing together experts to identify major gaps in knowledge about socio-cultural factors and values that are critical for improving the understanding of socioeconomic impacts of Great Lakes fisheries and aquatic ecosystems. The workshop was also designed to help participants identify the research methods needed to fill these gaps. This workshop was the result of a collaborative effort supported by many organizations including Great Lakes Fishery Commission (GLFC), The Nature Conservancy (TNC), and Michigan Sea Grant, as well as in-kind contributions provided by the International Joint Commission (IJC), University of Guelph, Council of Great Lakes Region, and Michigan Tech University (MTU).

The workshop objectives were to:

- Identify core values and concerns of key stakeholders related to socio-economic values of the Great Lakes fisheries and ecosystems;
- Align on a general framework for assessing gaps and priorities in socio-economic research;
- Align on socio-economic research gaps and priorities;
- Develop a common understanding of the appropriate research methods for filling those gaps; and
- Align on immediate and long-term actions for most effectively addressing research gaps and priorities.

Workshop organizers hoped that input from the workshop participants would bring attention among legislators/policy makers, funding agencies, researchers, resource managers and other stakeholders to the need for coordinated efforts to fill key research gaps, all designed to enhance a better understanding of the social and economic values of fisheries and the aquatic ecosystems. In turn, this increased appreciation is hoped to improve the overall state of fisheries and ecosystems within the Great Lakes basin and inform and increase public and private investments to rehabilitate and protect these resources.

Workshop participants came from a range of sectors including academia, Indigenous peoples, industry, government agencies, non-governmental organizations, and civil society. Additionally, the workshop planning team<sup>1</sup> was present to assist with workshop leadership and support. Appendix A contains a full list of workshop participants. Stratos Inc. was engaged to facilitate and provide the virtual technical support for the workshop.

Over the course of the 3-day workshop, participants (ranging between 60 and 75 individuals per day) took part in six sessions. The sessions involved a combination of presentations, panel discussions, and breakout group discussions used for the purpose

## Key Workshop Components:

- Session 1: Welcome and Introduction
- Session 2: Setting the Stage and Great Lakes Context
- Session 3: Preparing to Advance the Conversation
- Session 4: Research Gaps and Priorities
- Session 5: Socio-economic Research Methods
- Session 6: Identifying Next Steps and Recommendations
- Session 7: Aligning on Priority Recommendations

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<sup>1</sup> The Workshop Planning Team is made up of a contingent of staff from IJC, GLFC, TNC, University of Guelph, and MTU.

of achieving workshop objectives (Appendix B contains the full workshop agenda).

The following report provides an overview of the remarks, discussion highlights, and key recommendations that emerged from the workshop. The full digital recording of the workshop and presentations delivered throughout the workshop are available on the workshop website: <https://www.greatlakesvaluation.stratos-sts.com/>.

## WORKSHOP CONTEXT

Great Lakes commercial and recreational fisheries are socially, culturally, and economically significant to the region. The contribution of these fisheries to the regional economy has been estimated to be more than \$7 billion annually. However, there is a perception that Great Lakes fisheries are undervalued and underappreciated by key stakeholders and decision makers. There is a belief that fundamental data and knowledge is lacking on how these fisheries impact peoples' lives and livelihoods. Furthermore, there is a lack of appreciation for the value of broader aquatic ecosystem services, which extend beyond valuable habitat provided for fish and other aquatic species. These natural systems are essential for maintaining water quality, shoreline protection, biodiversity, and many other factors that influence the overall health of the Great Lakes and the quality of life of those who depend on them for economic, social, cultural, and recreational benefits. The lack of appreciation for these resources can partly be seen by declining budgets of state, provincial, and federal fisheries management programs, and the loss of aquatic habitat throughout the Great Lakes basin.

The body of research that contributes to comprehensive socio-economic assessments of the Great Lakes fisheries and ecosystem services is sparse. To date, existing research has largely focused on specific restoration activities, the impact of invasive species, changes in nutrient inputs, recreational fishing activities, and potential changes in fishery management strategies. However, there has been:

- No synthesis of these studies to identify gaps;
- No proactive effort to prioritize the research and data needed to quantify various dimensions of Great Lakes fisheries more accurately; and
- Minimal progress on how to improve the ability to communicate this information more effectively to key audiences and policy makers.

To better understand the value and appreciation of the Great Lakes fisheries and aquatic ecosystem services, a coordinated and collaborative research effort focused on filling critical information gaps on the socio-economic value of these fisheries and ecosystems is needed. Such research would help shape a more accurate, complete, and compelling narrative about how these resources and their uses impact the region, communities, and people's lives and livelihoods.



## Session 2: Setting the Stage and Great Lakes Context

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Session 2 was designed to help participants develop a common understanding of value of fisheries and ecosystems, understand different ways to measure those values, and identify the biggest gaps in data and knowledge regarding these Great Lakes resources. Dr. Scott Sowa, Great Lakes Director at TNC, described the purpose of Session 2 and introduced each presenter (Figure 3). A brief summary of each presentation is noted below (refer to the workshop [website](#) to access copies of each presentation).

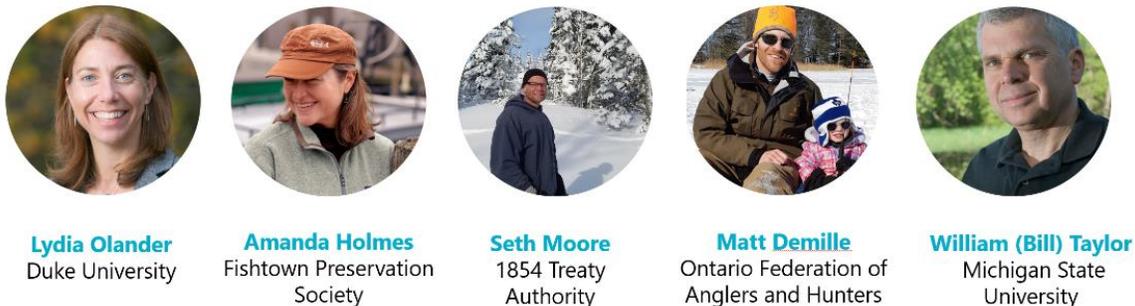


Figure 3: Session 2 Presenters and Panelists

### Dr. Lydia Olander, Duke University

#### Incorporating the Value of Ecosystem Services into Natural Resource Decision Making

Dr. Olander presented on the importance of incorporating the value of ecosystems into natural resource decisions as a way to provide a broader context of how to make connections between nature and people. She also emphasized the different ways such information could be used. Highlights of her presentation include:

- Ecosystem services are benefits people receive from nature including through the provisioning of goods/products produced by ecosystems, regulating of natural processes by ecosystems, and cultural non-material benefits like spiritual connections.
- Ecosystem services values can be identified through intrinsic values (which are hard to measure), instrumental and/or relationship values (e.g. willingness to pay), and/or economic impact (e.g. jobs).
- While monetization can help put concepts or information into comparable units and facilitate communication to people and decision-makers, there can be discomfort putting value on nature, as attempting such value could exclude some important services that are more difficult to value, could be expensive, and could be at odds with cultural beliefs. Moreover, such monetary valuations are not always trusted.
- Alternatives to monetization include exploring preferences (e.g. through a survey) and using benefit-relevant indicators (BRI) which can lean on cultural perspectives to change the way ecosystem services are considered in resource management.

- Ecosystem services can be used for communicating the value of natural systems or management actions (e.g. a survey of landowners), planning projects (e.g. mapping and conceptual scenario modelling), and evaluating projects/programs outcomes (e.g. monitoring and assessments).

## Dr. Amanda Holmes, Fishtown Preservation Society

### “The Last Fisherman” Fishtown and the Value of Commercial Fishing

Dr. Holmes shared her story of Fishtown to illustrate the value of the Great Lakes from the perspective of a unique coastal community. Highlights of her presentation include:

- Fishtown, located in Leland, Michigan, is a commercial fishing and heritage tourism site that has faced and survived many changes, pressures, and challenges (e.g. environmental threats; policy changes; etc.).
- In 2007, the Fishtown Preservation Society (FPS) invested \$2.7M and purchased properties on the site including boats, commercial fishing licenses, and historic shanties, most of which are rented to small businesses an adaptive re-use that has helped to preserve the structures and the place. More recently, the FPS has begun spending \$3.6M in infrastructure improvements to remedy damage from high water. While such an investment exceeds the value of the actual commercial fishery, the outlay is indicative of the cultural value of Fishtown.
- Preservation efforts often focus primarily on physical infrastructure, which notably excludes the perspectives and experiences of people living and working in these areas. Fishtown preservation efforts recognize this tendency and have been developed to emphasize both the cultural values and the physical infrastructure in the ongoing restoration (e.g. through sharing stories such as that of Bud, Pentwater’s last commercial fisherman).
- Fishtown now has recreational dockside angling and charter fishing, but commercial fishing is what makes it particularly unique. In Leland and in a dwindling number of communities across the Great Lakes, commercial fishermen are an underappreciated cultural resource, as well as an untapped management resource, as they have a generational and deep understanding of the fishery and their communities.

## Dr. Seth Moore, 1854 Treaty Authority

### Environmental, Social, and Climate Justice: Applied Ecosystem Health Research on the Grand Portage Indian Reservation

Dr. Moore shared his thoughts about the value of the Great Lakes from the perspective of Indigenous coastal communities. Highlights of his presentation include:

- The Grant Portage Indian Reservation is within the 1854 ceded territories, where both subsistence and native fishing occur.
- Ojibwe culture parallels ecosystem health through principles such as: seventh generation planning, oneness of nature and humanity, and the right to hunt, fish, and gather. Inherent in this culture is the right to non-toxic foods and waters upon which Indigenous Peoples can subsist.

- Indigenous People in the US are the only people in the country with recognized rights to clean air, clear water, clean food, and a clean environment through their treaty rights. However, through an environmental abrogation of treaty rights, Indigenous Peoples are being disproportionately vulnerable to climatic, social, and environmental justice issues (including in relation to biodiversity).
- Fish biomass in the Great Lakes has decreased by more than 80 percent, with biological effects from dosing, pharmaceuticals, and contaminants of concern (CoCs) causing harmful and unjust impacts to Indigenous communities.
- Scientific research is one “path to justice” to address systematic social, environmental, and climatic issues.

## Matt DeMille, Ontario Federation of Anglers and Hunters

### Setting the Hook: Fishing for the True Value of Recreational Angling

Mr. DeMille spoke to the value of the Great Lakes from the perspectives of recreational users. Highlights of his presentation include:

- People are motivated to fish recreationally for reasons beyond the pure fun of it. These motivations include social time with others, heritage/tradition, an escape, a connection to nature, food security, a profession, an identity, and an experience.
- Information about the economic value of recreational fishing is indispensable in efforts to promote policies and actions that protect and improve the Great Lakes.
- Recreational fishing is undervalued, as it is not considered a commercial commodity; it is disconnected from the everyday reality of non-anglers. Often, people only think about the value of fish as food, instead of the range of values offered by recreational fishing, such as culture, human health, social/intrinsic, and economic benefits.
- An up-to-date comprehensive and binational economic valuation of recreational fishing is needed. Such analyses should explore environmental, health, and intrinsic values. Additionally, a sector-specific methodology, which pushes beyond traditional economics, and which helps to confidently communicate the full value of recreational fishing, is required. Together, this information and approach would increase the value of the Great Lakes fisheries and garner improved public support and government investment.

## Dr. William Taylor, Michigan State University

### The Changing Face of Great Lakes Fisheries and their Ecological and Socio-economic Consequences

Dr. Taylor provided an overview of the current state of knowledge, gaps, and challenges in valuation of the Great Lakes fisheries. Highlights of his presentation include:

- With post-WWII globalization came higher incomes, more leisure time, earlier retirements, more automobiles, better transportation infrastructure, more efficient fish capture and preservation methods, and increased demand for fish products. This large socio-economic change also led to growing negative impacts on the Great Lakes.

- Over time, water quality degradation, industrial pollution and contaminants, municipal waste, deformities and reproductive problems, and fish harvest further affected the valuation of, and participation in, the fisheries.
- The Sea Lamprey invasion, which devastated the Great Lakes fisheries, was an existential threat to the Great Lakes fisheries; the lamprey problem affected all Canadian and U.S. fishers and Indigenous Peoples. The threat partially motivated the establishment of the Great Lakes Fishery Commission in 1955 as a way to address the sea lamprey invasion from a binational perspective, but also to devote more attention to science and cross-border collaboration.
- In recent years, the number of fishing license holders in the Great Lakes has been steadily decreasing, which can negatively impact on Great Lakes investment and policy development. An integrated approach to considering the future of fisheries must be prioritized; such an approach should consider recreational fishing, commercial fishing, the role of aquaculture, and the role of a sense of place.

## Session 2: Panel Discussion

Following the Session 2 presentations, Dr. Jenny Apriesnig, Assistant Professor of Economics at MTU, invited the presenters to join a moderated panel discussion. Perspectives and advice as shared in the discussion have been synthesized here:

### Information/Data Gaps

- There is a common desire for a more **comprehensive assessment** of the Great Lakes fisheries and ecosystem services.

### Approaches/Methodologies

- Great Lakes stakeholders should be exploring **post-pandemic recovery beyond quantitative economics** to include mental health, social interactions, outdoor activities, and environmental stewardship.
- Work is being done to develop metrics and methods **for quantifying social and economic benefits** at various scales in an effort to facilitate better communications about the Great Lakes fisheries and ecosystem values.
- Efforts are underway to **expand benefit-cost analyses (BCA)** and **bring in more environmental and social values** to the policy discussion (e.g. Biden executive order on regulatory reform and a project by the US Army Corps of Engineers to address requirements under the Principles Requirements and Guidelines on Water Resources).
- There is a difference between the existential value and the intrinsic value of indirect ecosystem services. Different stakeholders and communities may have different values. It is important to be able to **disaggregate values** to understand those differences.
- At times **marginal value** may be more meaningful than total value to be able to attribute management action to environmental outcomes.

### Collaboration/Engagement

- There are multiple approaches and ways of knowing that apply to fisheries and ecosystem valuation and management and engaging with different experts and stakeholders using **a diversity of engagement approaches** will be necessary. This task could be developed through systems mapping and/or a visioning approach with multiple scenarios being explored.
- Recreational anglers and commercial operators can identify impacts to the Great Lakes fisheries and ecosystems through their practical, lived experiences, and observations and further **contribute to science and stewardship**.
- **Trust** among all sectors and stakeholders is important and needs to be long-term to allow for better respect and ability to work together.

### Communications

- There is a need to work with communications and marketing experts to be able to **tell the story** of the Great Lakes including using both qualitative and quantitative techniques and speaking explicitly to the issue of uncertainty.
- It is important to think through the **lens of human and environmental rights** to allow for non-toxic environmental conditions. The Great Lakes can provide climate resiliency, and such a conversation would emphasize the value of ecosystems.

## Session 3: Preparing to Advance the Conversation

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Dr. John Livernois (University of Guelph) and Philippa Kohn (TNC) presented the results of a pre-workshop survey and literature review. Livernois' and Kohn's presentation outlined common understanding of the participants' collective knowledge, priorities, and questions, and identified the shared baseline understanding of the current state of knowledge and key research gaps related to valuation of the Great Lakes fisheries and ecosystem services. The workshop [website](#) contains the survey results, literature review, and the related presentations.

Perspectives as shared in the subsequent plenary discussion have been synthesized below:

- It is essential to **focus conversations and support research dissemination** to effectively reach both the public and decision-makers. Communication efforts must consider audiences, messages, and metrics and should involve communications specialists.
- The impact of economic analyses on decision-making is **not always clear** especially aggregate studies.
- Economic impact studies (and data) are different from valuation studies (and data). Valuation studies are aimed at helping decision-making and showcasing how the benefits and costs change based on a set of options by **determining relative values**.
- It has been helpful to express valuation and economic impact numbers in terms of well-known **infrastructure projects** (e.g. the costs of algal blooms being compared to the costs of the new Windsor-Detroit bridge and the Trans-Canada pipeline).
- It is important to make sure that **ongoing, broader societal impacts** are considered, rather than just the initial impacts of the capital investments, so that a more comprehensive picture can be conveyed to decision-makers.

# Session 4: Research Gaps and Priorities

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Through breakout group discussions, participants were encouraged to build on the presentations and discussions from Session 3 and have discussions around the following three themes:

- Audiences and associated messages / metrics.
- Socio-economic research and data gaps for fisheries.
- Socio-economic research and data gaps for aquatic ecosystem services.

Perspectives and advice as reported back in plenary have been synthesized here:

## Audiences and Associated Messages and Metrics

*Question: What audiences are the most important to reach and what are the best “messages” to reach key audience with the best “metric” for communicating that message?*

- **Various levels of government:** Engage various levels of governments and communicate the importance of the need to invest in the Great Lakes. The best metric for this is factual data, describing the economic contributions at jurisdiction-specific levels.
- **Indigenous community:** Recognize the Indigenous community as a key audience. Their values should be reflected in the messaging (e.g., recognizing/creating value for future generations).
- **Policy-makers/funders:** Communicate with policymakers and funding sources about the value of investing in the Great Lakes to secure their funding support.
- **Community of practice:** Target workshop participants through sharing information regarding coordination of efforts, research, data, communication strategies, priority needs, etc. This will allow more opportunities for dialogue and improve communication/coordination tools.

## Fisheries – Socioeconomic Research and Data Gaps

*Question: What are the most critical gaps and/or priority areas of research for understanding and communicating the values of Great Lakes fisheries?*

- **Case studies:** Need to perform research that better relates to what decision-makers need including case studies that demonstrate how socio-economic data were used by decision-makers at various spatial scales (local, state, basin).
- **Urban fisheries value:** Establish a greater understanding of urban fisheries.
- **Cultural values:** Understand the value of fisheries beyond just market value (e.g., cultural importance).

## Aquatic Ecosystem Services – Socio-economic Research and Data Gaps

*Question: What are the most critical gaps and/or priority areas of research for understanding and communicating the values of Great Lakes aquatic ecosystem services?*

- **Multiple knowledge systems:** Use a trans-disciplinary approach to reduce gaps in research. This includes incorporating different knowledge systems (e.g., traditional ecological knowledge).
- **“Big picture”:** Establish and communicate big picture data and information.
- **Bridging the gap:** Bridge data gaps between fisheries and broader ecosystem services.
- **Non-market valuations:** Produce more current and detailed studies; rely less on older benefits transfer and more on non-market valuation.
- **Land influences:** Include land influences in research and data instead of just aquatic influences to gain a more holistic understanding of the state of the Great Lakes.
- **Target research to audience/user values:** Understand the audience - research the audiences’ values to inform decision-making around environmental resource management in the Great Lakes and propose solutions that align with their values.

# Session 5: Socio-economic Research Methods

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Session 5 focused on helping participants to have a shared understanding of the different types of ecosystem service valuation methods, when they should be used, their limitations, what types of information they produce, and how well they are received by different audiences. The session included analysis of use-and-benefits studies and data visualizations.

Dr. Marc Gaden, Communications Director and Legislative Liaison at GLFC, described the purpose of Session 5 and then introduced each presenter. A brief summary of each presentation is noted below (refer to the workshop [website](#) to access copies of each presentation).



Figure 4: Session 5 Presenters and Panelists

## Dr. Vic Adamowicz, University of Alberta

### Economic Valuation Methods

Dr. Adamowicz provided an overview of economic valuation methods with a focus on monetary values and methodologies. Highlights of his presentation include:

- Economic analysis can be used to support decision-making regarding policy changes and/or investment decisions (e.g. Benefit Cost Analysis), to measure/assess the monetary value of damages to ecosystems (e.g. Natural Resource Damage Assessment), to illustrate the “size” of economic activity (e.g. Economic Impact Analysis), and to evaluate the “economic sustainability” of systems (e.g. Natural Capital Valuation Methods).
- Economic valuation attempts to measure the human well-being and benefits (or cost) that results from the system/service being valued. Whether it is non-market valuation or market valuation, economic valuation comprises the basis for benefit-cost analysis. Economic impact is a measure of the quantity of economic activity (such as expenditures and employment) associated with an event or activity. These two approaches are different types of analyses that serve different purposes; they should not be mixed.

- Non-market values can be separated into use values (e.g. recreation, angling, property values) and non-use (or passive) values. Non-market valuation methodology assumes that values are reflected in the choices people make. Non-market use values can be inferred by observing choice behavior. Non-use values can be elicited through conversations and structured interviews and surveys.
- Ecosystem service valuation recognizes the linkages between natural sciences (e.g. ecology, hydrology, epidemiology) and social sciences (e.g. economics, human dimensions). For example, a project/policy results in changes in the ecosystem, which causes changes in ecosystem services/health endpoints, and in turn leads to changes to human behavior and human well-being.
- Various valuation methods exist including recreation demand analysis (e.g. travel cost models), property value analysis (e.g. hedonic property models), stated preference value (e.g. surveys), benefits transfer, etc.
- In terms of next steps, focus should be on capacity-building; primary data collection and valuation studies; assessment of the validity of all valuation methods; linking of ecosystems, recreation, and human health; use of Indigenous knowledge; and better understanding of the distribution of benefits and costs.

## Dr. Bonnie Keeler, University of Minnesota

### Valuation Methods and Valuation in Practice: Implications for the Use and Misuse of ES Values

Dr. Keeler provided an overview of ecosystem service/sociocultural valuation methods with a focus on non-monetary metrics and ecosystems. Highlights of her presentation include:

- Both costs and benefits of policies must be considered. Benefits are often measured by looking at individual preferences and then modelling preferences to a market or through behavior.
- There are multiple water-related ecosystem services which are reflected through different biophysical and economic modeling which connect to various methodologies such as the use of ecosystem service metrics and indicators, value prioritization (e.g. via Qsort), surveys of environmental values, and semi-structured interviews.
- There is evidence of both altruistic and biospheric values (e.g. safe and clean drinking water, future generations etc.), noting that different values result in different investment priorities.
- A framework for inclusive valuation is important and must (1) identify the relevant population, the values at stake, and how value outputs will be used, (2) select the value-articulating process and methodology, and (3) interpret and communicate the results.
- It is important to recognize the risk of masking the distribution of benefits across different groups when aggregating them (e.g. willingness to pay comes from ability to pay, which in turn is affected by social inequity), consider the spatial aspect of the work being considered, and diagnose the decision context, accessibility, credibility, and relevance.

## Rob Southwick, Southwick and Associates

### Evolution of Applied Economic Contributions Research in the Great Lakes

Mr. Southwick presented on quantifying the value of Great Lakes fisheries, drawing on past research reports and lessons learned. Highlights of his presentation include:

- The state-level economic impacts of sportfishing is investigated by the American Sportfishing Association, which builds on previous national survey data but it has a number of limitations in terms of applicability to Great Lakes fisheries valuation, sampling size, and depth of insights. Moreover, the data does not cover Canada.
- A more up-to-date, customized economic contributions and valuation study is underway including an in-depth license-based angler survey, which will use a larger sample size, allow for greater control over sampling, be content-specific to the Great Lakes, and provide greater control over communications. While an improvement over the previous national survey, it was noted that the cost of this study will be higher, the repeatability will be funding-dependant, and non-licensed anglers will be missed. A draft is expected to be available later this year.
- Opportunities and considerations for gathering relevant data in the future include new potential data sources such as third-party apps, cell phone tracking, and retail point-of-sale data. DIS/lifestyle data, which have a potential for significant coverage both spatial and temporal, ought to be explored.

## Dr. Patrick Lloyd-Smith, University of Saskatchewan

### Assessing the Economic Value of Protecting the Great Lakes

Dr. Lloyd-Smith presented on assessing the economic value of protecting the Great Lakes. Highlights of his presentation include:

- The Economic Value of Protecting the Great Lakes was a large project for the Ontario Ministry of the Environment conducted approximately 10 years ago. The project included a literature review, proposals for key priority areas, and economic analyses for chosen studies.
- The study area was the Rouge River Watershed (near Toronto, Ontario) and the economic analysis was based on two future watershed plans (full build-out vs sustainable communities), which differed in terms of land cover types and intervention strategies. The report quantified the environmental benefits and assessed and compared the (incremental) costs and benefits between the scenarios.
- For non-market valuation, the study sought to link environmental indicators with ecosystem services and value surface water quality improvements through benefit transfers using (1) meta-analysis based on stated preference studies and (2) unit transfer based on hedonic price method. Surface water quality benefits were over 50% of all benefits.
- Although challenging to do well, it is important to incorporate uncertainty into the analysis.

## Dr. Lisa Colburn, NOAA Fisheries

### Social Indicators for Coastal Communities: A Tool to Give Fishing Communities a “Place at the Table”

Dr. Colburn presented on mapping the socioeconomic value of coastal fisheries. Highlights of her presentation include:

- NOAA Fisheries is looking to characterize place-based communities through National Environmental Policy Act (NEPA) and Magnuson–Stevens Fishery Conservation and Management Act (MSA) social impact assessments using regional/national/international comparisons, as well as climate change and integrated ecosystem assessments.
- There is a Community Social Vulnerability Indicators toolbox which considers fishing dependence (commercial and recreational), environmental justice (poverty, population composition, personal disruption), gentrification pressure (housing disruption, retiree migration, urban sprawl), climate change (sea level rise, storm surge, vulnerable species), and economics. The toolbox incorporates a total of 14 indicators and includes 24 states and 4,600 communities.
- Fishing communities are multidimensional, and a range of indicators must be considered together while evaluating commercial, recreational, and subsistence fishing; present and historical significance; place-based and interest groups; networks on land and on the water; and the working waterfront.

## Session 5: Panel Discussion

Following the Session 5 presentations, Dr. Marc Gaden, Communications Director and Legislative Liaison at GLFC, invited the presenters to join a moderated panel discussion. Perspectives and advice as shared in the discussion have been synthesized here:

### Communications

- It is important to **explore communications** as a means of enhancing awareness of the value of natural resources. This work should include improvements to methods for providing an understanding of the validity of the information that exists and to explore ways to record “undocumented” information/insights (e.g. on how people enjoy the Great Lakes).
- There is overlap between ecosystem services, ecology, fisheries biology etc., though current outreach efforts do not talk about this overlap effectively, leading to **gaps in communications**.
- Local communities should be empowered to engage in the conversation/work.
- It is important to get a solid sense as to **where the data come from** and to put this information into context; this may involve challenging the data/assumptions.
- Investment in the human dimension component to **value socio-cultural and socio-economic importance of fisheries**, and to integrate data from other peoples and groups, is crucial. This includes **communication and capacity building** to integrate social science and natural science, and to work across groups.

## Rights and Equity Considerations

- When rights and equity within Indigenous communities are discussed, the focus is predominantly on culture and cultural heritage, which is frequently couched in socio-cultural values. However, for most Indigenous communities, such values are considered **treaty rights**. When thinking of maximizing net social welfare, policy analysis should also include rights-based analysis, equity, viability, etc.
- There is a profoundly unequal landscape that negatively impacts equity and distribution in terms of policy intervention; it is essential that more effort be made to **incorporate inclusivity** in the way data are collected and from whom such data are collected.

## Opportunities to Explore

- Addressing **valuation research priorities** to increase our understanding will motivate and/or compel better policy direction. Valuation methods chosen will depend on the context, scale, audience, timeframe etc. However, it is important to **incorporate social methods into community interaction and valuation**. There may be an opportunity for social network analysis and behavioral economics in this emerging approach.
- Timely **sharing of best practices, data, and research results** within the valuation community would advance and improve research and application of policy across the Great Lakes. More work is required to **translate economics into policy** to be able to communicate the value of the research succinctly.
- For those that have funding capacity, it is important to support the **testing of new methods and techniques**, for both data gathering and analysis. Researchers should continue to explore **innovative thinking** in their work.

## Influencing Decision-Making

- Community snapshots are used in social impact assessments which decision-makers use as part of a **regulatory evaluation framework**. However, the degree to which snapshots influence final decisions remains unclear.
- There is some tension between using multiple biophysical indicators and **letting decision-makers decide the trade-offs** (and thus the implied values) versus getting the **choices/trade-off from individual members of the public** (or individual stakeholders). More consideration is required to address this tension.
- Where there are opportunities to do so, **working with decision-makers throughout the research design and execution processes** may be valuable to determine the most relevant information to put forward.

## Session 6: Identifying Next Steps and Recommendations

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On the final day of the workshop, David Burden, Director of the Great Lakes Regional Office at IJC introduced guest speakers Cameron Davis (VP at GEI Consultants; Commissioner of the Chicago Metropolitan Water Reclamation District) and Vance Badawey (Canadian Member of Parliament, Niagara Centre; Co-Chair of Great Lakes Task Force) who spoke to the importance of the economic valuation for policy-making and investment decisions.



**Cameron Davis**  
VP at GEI Consultants;  
Commissioner of the Chicago  
Metropolitan Water  
Reclamation Project



**Vance Badawey**  
Member of Parliament,  
Niagara Centre;  
Co-Chair of Great Lakes Task  
Force

Figure 5: Session 6 Presenters and Panelists

### Cameron Davis, GEI Consultants

Mr. Davis shared his thoughts on the value of Great Lakes valuation research. Highlights of his presentation include:

- Different policymakers respond to different arguments for Great Lakes and fishery investments. Using a diversity of arguments—including everything from monetary valuation to spiritual and cultural value—helps.
- Expressions of success and shared values, as well as demonstrations of the interconnection between ecosystem health and personal health, can help contribute to restoration and revitalization investments.
- Successful valuation helps define programmatic and policy successes (e.g. recreation, cultural needs, subsistence, etc.), ensure the ability to meet needs (e.g. environmental clean-up), and communicate success. For example, persistence in communicating Great Lakes Restorative Initiative (GLRI) outcomes/successes to policymakers resulted in continued funding for the program.
- Communication is key to success. It is important to be able to tell the story of the value of projects and how and who they benefit. It is also important to communicate at various scales and be able to tell the story of how the assets of the Great Lakes could be affected by stressors (e.g. climate change).
- The Great Lakes Water Quality Agreement could be a place to explore collaboration between the Canadian and US governments in terms of “finding a home” for valuation efforts.

## Vance Badawey, MP, Co-Chair of Great Lakes Task Force

Mr. Badawey shared his thoughts on the value of the Great Lakes valuation research. Highlights of his presentation include:

- Performance measures that include positive changes are a tremendous help when communicating to decision makers – be clear and persuasive about who benefits and why. The valuation and “return on investment (ROI)”, whether cultural or financial, is important as it shows decision makers the results of their investments. This valuation can be seen as a triple bottom line that comprises elements of ecology, culture, and economy.
- The Great Lakes are an economic engine in terms of jobs, movement of goods, and other quantifiable benefits, but it was also noted that the full value expression is incomplete without considering broader values including habitat protection, biomass etc.
- The US Great Lakes Task force provided a template for Canada to develop its Great Lakes Task Force. Working together as a Great Lakes delegation and open to all political parties maximizes the MPs’ efforts in Ottawa. The new Canadian Great Lakes Task Force is looking at the US Great Lakes Restoration Initiative for inspiration for a restoration program in Canada.
- Despite the challenges of COVID-19, the Task Force was created to focus attention and legislative efforts to promote multiparty and binational collaboration, foster and respect relationships for cooperation and partnerships, provide stakeholders with consistent interface, and help ensure the government appreciates the national importance of the Great Lakes and St. Lawrence Watershed. The Task Force also provides a venue for collaboration with existing organizations to promote and ensure economic and environmental stewardship through agencies and organizations such as the Canadian Water Agency (CWA) and the IJC.

## Identifying Next Steps: Breakout Group Discussions

Through breakout group discussions, participants were encouraged to reflect on the presentations over the course of the workshop and identify initial short-term (within 2 years) and long-term (2-5 years) recommendations. The participants were asked to focus their recommendations on research and management actions that would lead to better policies and greater investments in the Great Lakes fisheries and ecosystems. The participants also were asked to reflect on how to improve collaboration around addressing high-priority socio-economic research gaps with the goal of increasing the understanding and ability to measure and communicate the value of Great Lakes fisheries and aquatic ecosystem services to key audiences.

A wide number of recommendations were discussed in the breakout groups. In plenary, a collective list was curated through shared reporting back, as synthesized here:

### Short Term Next Steps (within 2 years)

- a) Develop standard methods for determining socioeconomics for consistency and credibility.
- b) Gather broad and diverse input for ecological conceptual models.
- c) Develop relationships and mechanisms to incorporate western science and indigenous ecological knowledge.
- d) Build an understanding in communities on value of native prey fish and predator species.
- e) Target managers to assist with identifying core values to develop metrics.
- f) Identify expert communicators to convey findings to appropriate audiences.
- g) Develop a well-supported and structured community of practice with regular discussions and sessions at forums (e.g. for literacy purpose or strategic progress).
- h) Build a framework to identify purpose, need, and target audience (i.e. work plan). This framework would help clarify research gaps and strategies for addressing them, plan communication strategies to key audiences, and include a longer-term strategic plan for assessment and reporting of new metrics.
- i) Develop methods for fisheries and ecosystem service valuations that would be useful for individual restoration projects.
- j) Direct additional focus on economic analysis to demonstrate value of specific resources, investments, policies, and programs – locally-focused.
- k) Develop scenarios of management actions and use data for focused studies (re: native species).

### Long Term Next Steps (2 to 5 years)

- a) Restructure processes from reactive to proactive (e.g. earlier incorporation of socio-economic experts in the planning processes).
- b) Coordinate completion of valuations, developing long-term actions, and communicating the results.
- c) Explore long-term funding to support ecosystem health, fisheries, and valuation; incorporate such funding into base budgets so the work can go beyond the Great Lakes Restoration Initiative.
- d) Take advantage of the Great Lakes Sea Grant network to coordinate and deliver outreach to key audiences.
- e) Develop a dashboard with appropriate valuation metrics.
- f) Address data gaps (e.g. link ecological and socioeconomic risk assessments, subsistence fishing data, indirect and intangible ecosystem services).
- g) Create biological economic models.
- h) Create an inventory of data (infrastructure to collect social data).
- i) Develop consistent long-term data collection supported by novel approaches (including experiments and trend analysis).
- j) Develop mechanisms to assess the value of fisheries and ecosystems services in a standardized, ongoing way to allow regular reporting and regular updating to the research (every 3-5years).
- k) Expand survey activities to include recreational activities.

# Session 7: Aligning on Priority Recommendations

Building on the short-term and long-term next steps that were co-created in the previous session, participants voted for their top choices in plenary and the results were synthesized (including the poll results). These voting results are for indicative purposes only – further refinement of these and other possibilities will be required.

## Short-Term Next Steps – Top Choices

1. Develop standard methods for socioeconomic for consistency and credibility.
2. Develop a well-supported and structured community of practice with regular discussions and sessions at forums (e.g. for literacy purpose or strategic progress).
3. Develop relationships and mechanisms to incorporate western science and Indigenous ecological knowledge.
4. Build a framework to identify purpose, need, and target audience (i.e. work plan). This framework would help clarify research gaps and strategies for addressing them, plan communication strategies to key audiences, and include a longer-term strategic plan for assessment and reporting of new metrics.

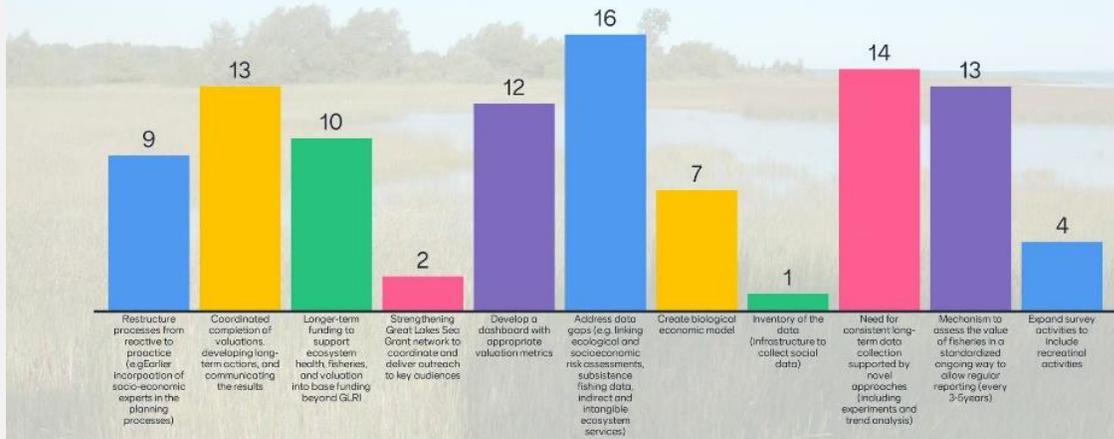
## Short-term actions



## Long-Term Next Steps – Top Choices

1. Address data gaps (e.g. linking ecological and socioeconomic risk assessments, subsistence fishing data, indirect and intangible ecosystem services).
2. Develop consistent long-term data collection supported by novel approaches (including experiments and trend analysis).
3. Develop mechanisms to assess the value of fisheries and ecosystems services in a standardized ongoing way to allow regular reporting and regular updating to the research (every 3-5years).
4. Coordinate completion of valuations, developing long-term actions, and communicating the results.

## Long-term actions



# Where to Go from Here?

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The workshop provided many suggestions for practical short-term and long-term actions. A suggested path forward, described below, was crafted through input and dialogue with the Workshop Planning Team following the formal workshop close. Completing these next steps will position the other short- and long-term steps identified by workshop participants to be undertaken in a more coordinated, efficient, and robust manner.

## Step 1: Create a Community of Practice

To date, one of the challenges identified is the siloed and sparse approach to undertaking comprehensive socio-economic assessments of the Great Lakes fisheries and ecosystem services. To aid in breaking down these siloes and to collaborate more efficiently, it is proposed that a community of practice be established.

Workshop participants may be the initial “hub” to initiate the community of practice. Such a community of practice would bring together experts, policy-makers, interested communities, and funders to generate enthusiasm, interest, and a shared vision of the work they could do together. Such a community of practice would need to be formed (perhaps informally to start) and used as an “anchor” before advancing the other steps.

To form such a community of practice, a few preliminary steps are required:

- **Identify and Enable Initial Leaders:** Although communities of practice are sometimes self-organized, in the case of the Great Lakes fisheries and ecosystem services valuation, some leadership is required to advance the recommendations of this workshop. An initial set of “champions” would need to be identified and appropriately supported to move the initiative forward, as suggested below.
- **Identify and Engage Interested Parties:** With leaders identified and enabled, the next step is to identify and solicit a certain level of informal commitment or “signing on” by potentially interested parties (e.g. perhaps as signatories in the form of a letter of commitment). Details for the best approach to take for the initial formation and signal of commitment may be informed by best practices from similar initiatives (e.g. International Conference on Aquatic Invasive Species (ICAIS)).

## Step 2: Identify the “home” and business model for the Community of Practice

Once the community of practice has been formed with the appropriate initial set of leaders, the next steps will be to develop, test, and refine the “work” of the community and find the right “home” for it to rest. It is likely preferable to undertake the “initial formative conversations” at this stage but acknowledge that finalization will come at a later point after more comprehensive engagement has been undertaken (e.g. with policy-makers, research institutions, funders, etc.).

To help identify an appropriate “home” for the community of practice, it might be helpful to:

- **Define the Vision of the Community of Practice:** An important first step will be to create a concise statement that summarizes the desired outcomes from the collaborative and coordinated work of the community of practice. This step should be viewed as an initial crafting, noting that others may help to shape and refine the vision as their involvement increases.
- **Articulate the Value Proposition of the Community of Practice:** Similar to the vision, it will be important to articulate the unique value of this community of practice and the work it plans to accomplish. This will help to establish its “value” as various entities consider their involvement and support.
- **Create a Sustainable Business Model:** To ensure a community of practice can exist beyond the initial “start-up” phase, a robust and sustainable business model is required. This business model, articulated through a business plan, would include a “Vision and Value Proposition,” and would describe the necessary structures, policies, funding requirements, and other resources to support its existence (e.g. Secretariat). Again, it may be helpful to draw on other similar initiatives such as the International Conference on Aquatic Invasive Species (ICAIS) to guide design considerations.

#### **Preliminary Concepts for a Vision:**

The Community of Practice is committed to driving a research agenda that articulates the full and comprehensive value of the Great Lakes, ensuring this knowledge is transferred from researchers to those decision-makers that influence and impact the health and well-being of Great Lakes communities.

### Step 3: Facilitate the Ongoing Work of the Community of Practice

With appropriate and sustained support in place, the Community of Practice would create a defined work plan that is aligned with the vision. This work plan will serve as a rallying point for researchers, funders, decision-makers, and others to visualize and enable the work to be done. Some initial concepts for items that could be incorporated into a preliminary work plan of the Community of Practice include:

- **Convening Function:**
  - Establish and activate a convening function where an initial (and eventually recurring) set of meetings/conferences is held to collaborate and advance the applied research agenda.
- **Applied Research Agenda:**
  - Develop an applied research agenda that has the financial support needed to follow through on the research priorities.
  - Support operational research and effectively communicate the results of this research to facilitate effective decision-making by governments and affected communities.
  - Approach the research activities with the intention of being able to relay a comprehensive and integrated story of the Great Lakes overall value as a whole.
  - Support research, including regular valuation assessments, that articulates the socio-economic and cultural status, trends, and impacts of the communities that depend on the Great Lakes.
- **Measuring Success:**
  - Develop a series of metrics over the longer-term on human well being and ecosystem health for the Great Lakes community.

## Appendix A – Workshop Participant List

Below is the list of participants (members of the Workshop Planning Team are highlighted in grey).

Name	Organization	Day 1	Day 2	Day 3
Joel Brammeier	Alliance for the Great Lakes	X		X
John Whitehead	Appalachian State University	X	X	X
Diane Dupont	Brock University	X		
Salim Hayder	Department of Fisheries and Oceans	X	X	X
Lydia Olander	Duke University	X	X	X
Brad Bass	Environment and Climate Change Canada	X		X
Amanda Holmes	Fishtown Preservation	X	X	X
Ryan Holem	GEI Consultants	X	X	
Dan Lovell	Government of Canada			
Seth Moore	Grand Portage Band of Chippewa	X		X
Erika Jensen	Great Lakes Commission	X	X	X
Greg McClinchey	Great Lakes Fishery Commission	X	X	X
Julie Hinderer		X		
Roger Knight		X	X	X
Jim Thannum	Great Lakes Indian Fish and Wildlife Commission	X	X	X
Steve Cole	Great Lakes Protection Fund	X	X	X
Victor Santucci	Illinois Department of Natural Resources	X	X	X
Allison Voglesong Zejnati	International Joint Commission	X	X	X
Jennifer Boehme		X	X	X
John Wilson			X	
Mark Burrows		X	X	X
Raj Bejanki			X	
Steven McNevin		Lake Ontario Management Unit, Ont. Ministry of Natural Resources and Forestry	X	X
Matt Dellinger	Medical College of Wisconsin	X		
Caryn MacLoghlin	Métis Nation of Ontario	X	X	X
Chiara Zuccarino-Crowe	Michigan Sea Grant / Michigan State University	X	X	X
Catherine Riseng	Michigan Sea Grant / University of Michigan	X	X	X
Lauren Jescovitch	Michigan State University	X	X	X
Ronald Kinnunen		X	X	X

Name	Organization	Day 1	Day 2	Day 3
Mauri Liberati		X	X	X
Frank Lupi		X	X	X
William Taylor		X	X	
Valoree Gagnon	Michigan Tech University	X	X	
David Gonder	Ministry of Natural Resources and Forestry	X	X	X
Jennifer Day	National Oceanic and Atmospheric Administration	X		
Lisa Colburn		X	X	
Rajendra Poudel		X	X	
Rebecca Shuford	New York Sea Grant		X	X
Stacy Furgal		X	X	
Scott Hale	Ohio Department of Natural Resources	X	X	X
Matt DeMille	Ontario Federation of Anglers and Hunters	X	X	X
Andy Todd	Ontario Ministry of Natural Resources & Forestry	X	X	X
Erin Brown		X	X	X
Brian Locke		X	X	
Richard Drouin				
Len Hunt		X	X	X
Lou Cornicelli	Southwick Associates	X	X	X
Rob Southwick		X	X	X
Andrew Tucker	The Nature Conservancy	X	X	X
David Klein		X	X	X
Jamie Dobosenski		X	X	X
Kaitlin Harison		X	X	X
Mahesha Kulupparachchi	The Ohio State University	X		
Travis Warziniack	United States Department of Agriculture	X	X	X
Christopher Huber	United States Geological Survey	X	X	X
Emily Pindilli		X	X	
Jon Hortness		X	X	X
Vic Adamowicz	University of Alberta	X	X	X
David Allan	University of Michigan	X	X	X
Joshua Fergen	University of Minnesota	X		
Bonnie Keeler		X	X	
Lucinda B Johnson		X	X	X
Ryan Bergstrom		X		
Joshua Fergen	University of Minnesota Duluth	X	X	X
Patrick Lloyd-Smith	University of Saskatchewan	X	X	X
Christina Semeniuk	University of Windsor	X		

Name	Organization	Day 1	Day 2	Day 3
Cameron Davis	GEI Consultants	X	X	X
Vance Badawey	Parliament of Canada			X
Bob Lambe	Great Lakes Fishery Commission	X	X	X
Marc Gaden		X	X	X
David Burden	International Joint Commission	X	X	X
Jenny Apriesnig	Michigan Tech University	X	X	X
Philippa Kohn	The Nature Conservancy	X	X	X
Scott Sowa		X	X	X
John Livernois	University of Guelph	X	X	X
Barb Sweazey	Stratos	X	X	X
Guy-Thierry Tenkouano		X	X	X
Isha Mistry		X	X	X
Rebecca Lafontaine		X	X	X
Roaha Muhammad		X	X	X

# Appendix B – Agenda

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## Valuation of the Great Lakes Fisheries and Aquatic Ecosystem Services Virtual Workshop Agenda April 12-14, 2021

### Workshop Context and Purpose

Great Lakes commercial and recreational fisheries are socially, culturally, and economically significant components of the region. The economic value of these fisheries has been estimated to be more than \$7 billion annually. However, there is a perception that Great Lakes' fisheries are undervalued and underappreciated by key stakeholders. Many also believe that there is a lack of fundamental data and knowledge on how these fisheries impact peoples' lives and livelihoods. Furthermore, there is a lack of appreciation for the value of broader ecosystem services provided by fish and different types of aquatic habitat. These natural systems are essential for maintaining water quality, shoreline protection, biodiversity and many other factors that influence the overall health of the Great Lakes and the quality of life of those that depend on them for economic, social, cultural, and recreational benefits. The lack of appreciation for these resources can partly be seen by declining budgets of state, provincial and federal fisheries management programs, and the loss of aquatic habitat throughout the Great Lakes basin.

The body of research that contributes to comprehensive socio-economic assessments of Great Lakes fisheries and aquatic ecosystem services is sparse, even if we look back 30 years or more. The research that has been done has focused on specific restoration activities, the impact of invasive species, changes in nutrient inputs, recreational fishing activities and potential changes in fishery management strategies. However, there has been:

- No synthesis of these studies to identify gaps,
- No proactive effort to prioritize the research and data needed to quantify various dimensions of Great Lakes fisheries more accurately, and
- Minimal research on how to improve the ability to communicate this information more effectively to key audiences.

To better understand the value and appreciation of Great Lakes fisheries, a coordinated and collaborative research effort focused on filling the most critical information gaps on the socio-economic value of these fisheries is needed. Such research will help shape a more accurate, complete

and compelling narrative about how these fisheries relate to the region's ecology, communities, and people's lives and livelihoods.



#### **WORKSHOP PURPOSE AND OBJECTIVES**

The purpose of this workshop is to bring together experts to help identify the major gaps in knowledge about socio-cultural factors and values that are critical for improving understanding of socio-economic impacts of Great Lakes fisheries and Great Lakes aquatic ecosystems, as well as to identify the research methods needed to fill these gaps.

The workshop will take a holistic approach by considering the core values and concerns of key stakeholders as well as involving experts in fisheries and aquatic ecosystem services valuation in such discussions. Specifically, the workshop objectives are to:

- Identify core values and concerns of key stakeholders
- Align on a general framework for assessing gaps and priorities in socio-economic research
- Align on socio-economic research gaps and priorities
- Develop a common understanding of the appropriate research methods for filling those gaps
- Align on immediate and long-term actions for most effectively addressing research gaps and priorities



#### **WORKSHOP OUTCOMES**

The outcomes of this workshop will bring attention among legislators/policy makers, funding agencies, researchers, resource managers and other stakeholders to the need for research to fill key research gaps. Specifically, the workshop outcomes will generate:

- A revised literature review and framework for assessing socio-economic research gaps
- A prioritization of the research areas that should be funded
- Identified best methodological practices for filling these gaps and practical next steps to fill research gaps

Together, this information will enhance understanding of the social and economic values of fisheries and the ecosystems in which they exist, thereby enhancing ecosystem management and informing public and private investments.



#### **WORKSHOP PREPARATION**

To prepare for this session, participants are invited to reflect on the discussion prompts in the agenda presented below. Additional resources are available through the workshop website (<https://www.greatlakesvaluation.stratos-sts.com/>) and all participants are invited to spend a bit of time in advance reviewing this material.



### NEED ASSISTANCE?

- If you have any questions about the workshop, its objectives or purpose, or the registration process, please contact the Stratos team via email: Guy Tenkouano (cc: Isha Mistry) at [gtenkouano@stratos-sts.com](mailto:gtenkouano@stratos-sts.com) (cc: [imistry@stratos-sts.com](mailto:imistry@stratos-sts.com)).

*This workshop is brought to you through a collaborative effort, with support from many organizations including: Great Lakes Fishery Commission (GLFC), The Nature Conservancy (TNC), and Michigan Sea Grant, as well as in-kind contributions provided by the International Joint Commission (IJC), University of Guelph, Council of Great Lakes Region, and Michigan Tech University.*

## Day 1: Monday, April 12, 2021 (12:00 – 4:00 pm)

Time (ET)	Activity
11:50 am – 12:00 pm	<p><b>Logging in</b></p> <p><i>Participants may sign in as early as 11:50am to join the workshop. A few minutes may be required to allow for downloading the Zoom application. Stratos will be on hand during this time in case you encounter any technical difficulties. Please do not hesitate to contact Stratos directly at <a href="mailto:gtenkouano@stratos-sts.com">gtenkouano@stratos-sts.com</a> or 819-209-0309 for technical support.</i></p>
<b>Session 1: Welcome and Introduction</b>	
12:00 – 12:15 pm	<p><b>Welcome and Introductions</b></p> <ul style="list-style-type: none"> <li>• Opening remarks</li> <li>• Review of meeting agenda and objectives</li> <li>• Participant orientation and introductions</li> </ul>
<b>Session 2: Setting the Stage and Great Lakes Context</b>	
12:15 pm – 12:45 pm	<p><b>Incorporating the Value of Ecosystems into Natural Resource Decisions</b></p> <p><i>Presenter: Lydia Olander, Duke University</i></p>
12:45 pm – 1:45 pm	<p><b>Value of the Great Lakes from Local Coastal Community and Indigenous Perspectives</b></p> <p><i>Presenters: Amanda Holmes, Fishtown Preservation Society</i>  <b>Seth Moore</b>, 1854 Treaty Authority  <b>Matt Demille</b>, Ontario Federation of Anglers and Hunters</p>
1:45 pm – 2:15 pm	<p><b>Current State of Knowledge, Gaps, and Challenges in Valuation of Great Lakes Fisheries</b></p> <p><i>Presenter: William (Bill) Taylor, Michigan State University</i></p>

Time (ET)	Activity
2:15 pm – 2:30 pm	<b>BREAK</b>
2:25 pm – 3:45 pm	<b>Panel Discussion with Session 2 Presenters</b>
3:45 pm – 4:00 pm	<b>Wrap up and Day 2 Agenda Overview</b>

## Day 2: Tuesday, April 13, 2021 (8:45 – 3:45 pm)

Time (ET)	Activity
8:45 am – 9:00 am	<b>Sign-in / Small group networking / Coffee connections</b>
9:00 am – 9:15 am	<b>Welcome, Recap of Day 1 and Overview of Day 2</b>
<b>Session 3: Preparing to Advance the Conversation</b>	
9:15 am – 10:15 am	<b>Summary of Pre-Workshop Survey and Annotated Bibliography</b> <ul style="list-style-type: none"> <li>• Results from pre-workshop survey, literature review and gap analysis</li> <li>• Plenary discussion</li> </ul>
10:15 am – 10:20 am	<b>SHORT BREAK</b>
<b>Session 4: Identifying Research Gaps and Priorities Breakout Group Discussions</b>	
10:20 am – 11:30 am	<b>Identification of Socio-economic Research Gaps and Priorities: Concurrent Breakout Discussions and Reporting Back</b> <ul style="list-style-type: none"> <li>• Group discussion to help identify and prioritize audiences, messages, data and research gaps / research questions</li> </ul>
<b>Session 5: Socio-economic Research Methods</b>	
11:30 am – 12:00 pm	<b>Socio-economic Research Methods</b> <i>Presenter:</i> <ul style="list-style-type: none"> <li>• Economic Valuation Methods:  <b>Vic Adamowicz</b>, University of Alberta</li> </ul>
12:00 pm – 12:45 pm	<b>LUNCH BREAK</b>
12:45 pm – 1:15 pm	<b>Socio-economic Research Methods (continued)</b> <i>Presenter:</i>

Time (ET)	Activity
	<ul style="list-style-type: none"> <li>Sociocultural/Ecosystem Service Valuation Methods: <b>Bonnie Keeler</b>, University of Minnesota</li> </ul>
1:15 pm – 2:15 pm	<b>Case Studies and Practical Tools</b> <i>Presenters:</i> <b>Rob Southwick</b> , Southwick and Associates <b>Patrick Lloyd-Smith</b> , University of Saskatchewan <b>Lisa Colburn</b> , National Oceanic and Atmospheric Administration (NOAA)
2:15 pm – 2:30 pm	<b>BREAK</b>
2:30 pm – 3:30 pm	<b>Panel Discussion with Session 5 Presenters</b>
3:30 pm – 3:45 pm	<b>Wrap up and Review of Day 3</b>

### Day 3: Wednesday, April 14, 2021 (8:45am – 12:00pm)

Time ET	Activity
8:45 am – 9:00 am	<b>Sign-in / Small group networking / Coffee connections</b>
9:00 am – 9:05 am	<b>Welcome, Overview and Recap of Days 1 and 2</b>
9:05 am – 9:45 am	<b>Opening Remarks</b> <i>Presenters:</i> <b>Cameron Davis</b> , VP at GEI Consultants; Commissioner of the Chicago Metropolitan Water Reclamation Project  <b>Vance Badawey</b> , Member of Parliament, Niagara Centre; Co-Chair of Great Lakes Task Force
<b>Session 6: Identifying Next Steps and Recommendations</b> <b>Breakout Group Discussions</b>	
9:45 am – 10:45 am (including a short break)	<b>Create Set of Recommendations for Short- and Long-term Next Steps:</b> <b>Concurrent Breakout Discussions</b> <ul style="list-style-type: none"> <li>Group discussion on initial recommendations for how to assist the Great Lakes fisheries research and management community to come together to increase investment in and collaborate around addressing the highest priority socio-economic research gaps for the Great Lakes</li> </ul>

Time ET	Activity
	to increase the understanding and ability to measure and communicate the value of Great Lakes fisheries and aquatic ecosystem services to key audiences
10:45 am – 11:15 am	<b>Breakout Group Reporting Back and Plenary Synthesis</b>
<b>Session 7: Aligning on Priority Recommendations</b>	
11:15 am – 11:45 am	<b>Alignment and Plenary Discussion on Priority Recommendations</b>
11:45 am – 12:00 pm	<b>Wrap Up and Closing Remarks</b>

## Appendix C – Workshop Materials

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Various documents and resources were put together for this workshop including presentation slides, recordings, survey results etc. and are available through the **workshop website**:

<https://www.greatlakesvaluation.stratos-sts.com/>