



Upper Great Lakes *Law and Policy* Symposium
Managing Water Across Boundaries

Agenda

March 24, 2016 | 8:00 a.m. - 6:30 p.m.

7:30 a.m. – Registration

8:00 – 8:15 a.m. – Welcome

- **John A. Downing**, Minnesota Sea Grant Director and symposium moderator
- **Catherine Janasie**, Research Counsel for the National Sea Grant Law Center, University of Mississippi School of Law

8:15 – 8:45 a.m. – Why We Are Here

- **Jamshed Merchant**, Consul General of Canada in Minneapolis
- **Michael Isham**, Chairman, Lac Courte Oreilles Tribal Government, WI
- **Jon Allan**, Director, Office of the Great Lakes, Michigan Department of Environmental Quality

8:45 – 9:05 a.m. – Water Tension and The Great Lakes Compact

- **Peter Annin**, Co-director of Northland College's Burke Center for Freshwater Innovation

9:05 – 10:05 a.m. – Water Diversion and Water Levels Panel

- **Peter Johnson**, Deputy Director, Conference of Great Lakes and St. Lawrence Governors and Premiers. *Water Resources Management in the Great Lakes-St. Lawrence River Basin*
- **Noah Hall**, Associate Professor of Law, Wayne State University Law School. *From Protection to Harmony: A Vision for Public Health, Natural Wealth and Environmental Justice for the Great Lakes Region*
- **Lauren Fry**, Civil Engineer, U.S. Army Corps of Engineers Detroit District. *Great Lakes Water Levels and Water Budget*
- **Brad Karkkainen**, Henry J. Fletcher Professor in Law, University of Minnesota. *The Great Lakes Water Resources Compact and Agreement: A Model for Transboundary Governance at Subnational Scales*

10:05 – 10:35 a.m. – Questions, Answers, Discussion

10:35 – 10:50 a.m. – Break

10:50 – 11:50 a.m. – Non-Native Aquatic Species Panel

- **Adam Reinhardt**, Pre-Law Student, University of Minnesota Duluth. *Great Lakes Ballast Water Collaborative: A Model for Addressing Complex Environmental Regulation*
- **Craig Middlebrook**, Deputy Administrator, Saint Lawrence Seaway Development Corporation, Washington, DC. *Making Smart Policy Decisions in a Fractured Regulatory Environment*
- **Mark Burrows**, Physical Scientist and Project Manager, International Joint Commission - Great Lakes Regional Office, Ontario. *Science-based Bilateral Collaboration as a Basis for IJC Action*
- **Marc Gaden**, Communications Director and Legislative Liaison, Great Lakes Fishery Commission. *The Asian Carp Strategy: Monitoring, Management and Contingency Actions*

11:50 – 12:20 p.m. – Questions, Answers, Discussion

12:20 – 1:20 p.m. – Lunch

1:00 – 1:10 p.m. – Introduction to the Afternoon

- **Brad Karkkainen**, University of Minnesota

1:10 – 1:25 p.m. – Why We Are Here

- **Mark Privratsky**, Field & Constituent Services Representative, Congressman Richard M. Nolan (MN-08)
- **Ida Rukavina**, Regional Outreach Director, U.S. Senator Amy Klobuchar
- **Kelly Westlund**, Regional Representative, Office of U.S. Senator Tammy Baldwin, WI

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Agenda (cont)

1:25 – 1:45 p.m. – Regulations or Protections – What’s in a Word?

- Lana Pollack, Chair of U.S. Section of the International Joint Commission, Washington, DC

1:45 – 2:45 p.m. – Contaminants, Climate and Emerging Challenges Panel

- Gretel Lee, Law Student, University of Minnesota Law School, Minneapolis, MN. *Establishing a Cumulative Transboundary Environmental Review Process*
- Jason MacLean, Assistant Professor, Bora Laskin Faculty of Law, Lakehead University. *Green Industrial Policy for Great Lakes Governance: Institutionalism, International Environmental Law, and the IJC*
- Wenona Singel, Associate Professor of Law and Associate Director of the Indigenous Law and Policy Center, Michigan State University College of Law. *Indigenous Responses to Climate Change and Water Quality Concerns in the Great Lakes*
- J. Val Klump, Senior Director and Associate Dean of Research, School of Freshwater Science, Director of Great Lakes Water Institute, University of Wisconsin-Milwaukee, Milwaukee, WI. *The Challenge for Great Lake Science*

2:45 – 3:15 p.m. – Questions, Answers, Discussion

3:15 – 3:30 p.m. – Break

3:30 – 3:55 p.m. – Continuing Past Momentum into the Future

- Cameron Davis, Senior Advisor to the Administrator, U.S. Environmental Protection Agency,

3:55 – 4:20 p.m. – Linking Science, Policy and Great Lakes Governance

- Michael Goffin, Regional Director General, Environment and Climate Change Canada

4:20 – 4:30 p.m. – Closing Remarks

- John A. Downing, Minnesota Sea Grant Director and symposium moderator
- Catherine Janasie, Research Counsel for the National Sea Grant Law Center, University of Mississippi School of Law.

4:30 – 6:30 p.m. – Reception (cash bar with hors d'oeuvres)

Hosts:



Sponsors:

Superior Level (\$1000 and Up):



Great Lakes Level (\$500 - \$1000):



Student Level (Up to \$500):



Speaker Bios and Presentation Briefs

By order of appearance

Welcome & Closing Remarks



John A. Downing is the Director of the University of Minnesota's Sea Grant Program, a professor with the University of Minnesota Duluth, and a research scientist at the Large Lakes Observatory. John is an internationally prominent aquatic researcher and educator who, prior to coming to Sea Grant, was a Regent's Excellence Professor of Ecology, Evolution, and Organismal Biology at Iowa State University. He is the immediate past-chair of the Council of Scientific Society Presidents and earned the Thieneman-Naumann Medal for Excellence in Limnological Research from the International Society of Limnology. He is an invited member on the U.S. Committee for the Intergovernmental Oceanographic Commission of UNESCO and was formerly a professor at McGill University and the Université de Montréal where he was director of the Laurentian Biological Station and a founding member of the Groupe de Recherche Interuniversitaire en Limnologie. He earned a bachelor's degree from Hamline University, a master's from North Dakota State University and a doctorate from McGill University.



Catherine Janasie is Research Counsel with the National Sea Grant Law Center (NSGLC) at The University of Mississippi School of Law where she provides legal and policy analyses on ocean, coastal, and natural resources issues and teaches environmental law classes. Her recent projects include drafting a model law and regulations to prevent the spread of aquatic invasive species and on land use planning options to address climate change. She also serves as the Editor of the Sea Grant Law & Policy Journal and as a Vice Chair on the Marine Resources Committee of the American Bar Association's Section on Environment, Energy, and Resources. Prior to joining the NSGLC, she worked for the National Wildlife Refuge System, Division of Realty of the U.S. Fish and Wildlife Service and practiced law in New York, NY. Cathy received her J.D. and B.A. from Rutgers University and her LL.M. in Environmental & Natural Resources Law from Lewis & Clark Law School.

Why We Are Here



Jamshed Merchant is Canada's senior representative in the Upper Midwest states of Iowa, Minnesota, Nebraska, North Dakota and South Dakota. His team at the consulate builds two-way trade and investment ties, engages decision-makers and citizens, and helps Canadians in the region. Jamshed started his career as a faculty lecturer in geography at McGill University after which he joined Alberta's Ministry of the Environment as a soil scientist. He went on to work with Agriculture and Agri-Food Canada and the Treasury Board of Canada Secretariat and was appointed Assistant Deputy Minister of the Agri-Environment Services Branch. Jamshed graduated from the University of East Anglia (U.K.) with a degree in environmental science, and received his master's in pedology and soil survey at the University of Reading.



Michael J. "Mic" Isham, Jr., is Chairman of the the Lac Courte Oreilles Band of Lake Superior Chippewa Indians, located in northwest Wisconsin. He has served on the Tribe's Governing Board since 1995. He also serves on the Great Lakes Indian Fish & Wildlife Commission's Board of Commissioners and on its Voigt Intertribal Task Force. Mic has 30 years of experience in natural resources management, starting as an intern with the Great Lakes Indian Fish & Wildlife Commission, and moving on to the Wisconsin Department of Natural Resources, the U.S. EPA, and the Lac Courte Oreilles Tribal Conservation Department where he served as the Department's Director. He is a graduate of Northland College.



Jon Allan is the Director of the Office of the Great Lakes for the Michigan Department of Environmental Quality. In addition to decades of experience in environmental policy and law, he has taught courses in biology, ecology, and environmental impact assessment at Michigan State University and elsewhere. He served as advisor to the Great Lakes Compact negotiations and co-chaired Michigan's Advisory Councils for Groundwater Conservation and Water Resources. He also served as chair of the Michigan Chamber of Commerce's Environmental Quality Committee. Jon was appointed to the Michigan Climate Action Council and was a member of the Midwest Governors' Greenhouse Gas Reduction Accord Advisory Group. Jon has a bachelor's degree in fisheries and wildlife, a master's in zoology and post-graduate experience in environmental policy and law from Michigan State University.

Water Tension and The Great Lakes Compact



Peter Annin is co-director of Northland College's Mary Griggs Burke Center for Freshwater Innovation in Ashland, Wisconsin. The Center focuses on scientific research, communication, and thought leadership on water issues. In 2006 Peter wrote *The Great Lakes Water Wars*, which has been called the definitive work on the Great Lakes water diversion controversy. He spent more than a decade reporting for Newsweek after which he became associate director of the Institutes for Journalism and Natural Resources, and then managing director of the University of Notre Dame's Environmental Change Initiative. Peter has a bachelor's degree in journalism from the University of Wisconsin-Madison, and a master's in international affairs from Columbia University in New York.

Water Tension and The Great Lakes Compact delves into the long history of political maneuvers and water diversion schemes that have proposed sending Great Lakes water everywhere from Akron to Arizona. Through the prism of the past, this talk analyzes the future of Great Lakes water diversion management, which is now controlled by the Great Lakes Compact, a legal document released by the Council of Great Lakes Governors in December 2005. The Compact, which prohibits most Great Lakes water diversions, with limited exceptions, was ratified by the eight state legislatures in the Great Lakes region as well as the U.S. Congress. President Bush signed the Compact in 2008. Companion agreements mirroring the Compact were adopted in Ontario in 2007 and Quebec in 2009.

Water Diversion and Water Levels Panel



Peter Johnson serves as the Deputy Director of the Conference of Great Lakes and St. Lawrence Governors and Premiers. The Conference unites eight U.S. Governors and two Canadian Premiers to grow the region's economy and protect its environment. Peter served as primary draftsman of the "Great Lakes Compact" and the companion cross-border Agreement – historic agreements and legislation that allow the U.S. Great Lakes States, Ontario and Québec to cooperatively manage water use in the Great Lakes-St. Lawrence Basin. He serves as the Secretary to the Governors' Compact Council, helping to lead the economic development program. Peter practiced commercial litigation and taught at the Guangdong University of Foreign Studies, Canton, China. He has a B.A. in political science from North Park University, a J.D. from Boston College Law School, and is a member of the Illinois Bar and the American Bar Association's Section on Environment, Energy and Resources.

Water Resources Management in the Great Lakes-St. Lawrence River Basin includes an overview of the impetus for creating the Great Lakes-St. Lawrence River Basin Sustainable Water Resources Agreement and the Great Lakes-St. Lawrence River Basin Water Resources Compact, as well as an overview of several key components of each agreement.



Noah Hall is an Associate Professor of Law at Wayne State University Law School and founder of the Great Lakes Environmental Law Center, a nonprofit that provides legal assistance to community and environmental organizations, and to government entities. Noah's expertise is in environmental and water law with a focus on governance, federalism, and transboundary pollution and resource management. Previously, he taught at the University of Michigan Law School and was an attorney with the National Wildlife Federation, where he managed the Great Lakes Water Resources Program. Noah also worked in private practice, gaining extensive litigation experience and published decisions in state and federal courts by representing business and public-interest clients. He continues to represent clients in significant environmental policy disputes. Noah graduated from the University of Michigan's Law School and its School of Natural Resources and Environment.

From Protection to Harmony: A Vision for Public Health, Natural Wealth, and Environmental Justice for the Great Lakes Region highlights a need for a new measure of success. Having accomplished goals of the last decade: (1) collaboration between governments; (2) protecting Great Lakes water from outside uses and threats; and (3) demonstrating that the Great Lakes are worthy of national resources for restoration and international agreements, this presentation suggests that successes like the Great Lakes-St. Lawrence River Basin Water Resources Compact and its companion Sustainable Water Resources Agreement, the recent Great Lakes Water Quality Agreement, and court victories that have pushed new protections against ballast water pollution and the spread of invasive species, give a substantive foundation and a basis for optimism in setting new goals for the next decade: (1) protecting public health from pollution; (2) restoring the natural wealth of the water and landscape and the human connection to it; and (3) providing environmental justice through equality – especially in wealth, race, and age – in advancing the first two goals. Protecting our water from diversion to other places does not make it safe to drink in Flint. Preventing invasive species from entering our Great Lakes does not make it safe to eat the fish that many cultures rely on for basic sustenance. And the benefits of new international agreements and streams of federal funding are not shared equally by all.



Lauren Fry leads the water level forecasting mission at the U.S. Army Corps of Engineers Detroit District Office of Great Lakes Hydraulics and Hydrology. She holds an M.S. and Ph.D. in environmental engineering from Michigan Technological University. Prior to working with the Corps, she conducted postdoctoral research related to Great Lakes basin-scale hydrological modeling at NOAA's Great Lakes Environmental Research Laboratory, University of Michigan, and Michigan Technological University.

Great Lakes Water Levels and Water Budget reviews how the U.S. Army Corps of Engineers partners with multiple U.S. and Canadian federal agencies to monitor Great Lakes water levels and water budget components. The official long term record of these hydrological data, dating back to 1918 in the case of water levels, allows these agencies to better understand how water levels fluctuate on time scales ranging from sub-daily to decadal. This presentation will place recent changes in water levels in the context of past fluctuations and provide a brief description of the mission of the U.S. Army Corps of Engineers in Great Lakes water budget monitoring and regulation.



Bradley Karkkainen from the University of Minnesota School of Law is a recognized authority in the fields of environmental and natural resources law. His publications center on innovative strategies for environmental regulation and natural resources management, with an emphasis on mechanisms that promote adaptive learning, flexibility, transparency, and policy integration. Brad's career has encompassed positions at the University of California-Berkeley, the Columbia Law School, and Woods Hole Oceanographic Institution Marine Policy Center. He is a principal investigator of Project on Public Problem-Solving, a collaborative research effort involving Columbia, Harvard, the University of California-Berkeley and the University of Minnesota. He holds a B.A. in philosophy from the University of Michigan, and a J.D. from the Yale Law School, where he served as an editor of both the Yale Law Journal and the Yale Journal of International Law.

The Great Lakes Water Resources Compact and Agreement: A Model for Transboundary Governance at Subnational Scales argues that the Compact and Agreement model merits careful examination as a potential governance solution to other transboundary natural resource management challenges, given that the resources we seek to protect are often perceived as too “regional” in scope to rank high on the policy agendas of national decision-makers, yet are beyond the capacity of individual subnational governments (e.g., states, provinces) to manage. *The Great Lakes-St. Lawrence River Basin Water Resources Compact – a legally binding intergovernmental agreement among the eight U.S. Great Lakes basin states – and the parallel Great Lakes-St. Lawrence River Basin Sustainable Water Resources Agreement among those eight states and the Canadian provinces of Ontario and Quebec establish uniform basin-wide policies and mechanisms to regulate large-scale water withdrawals and restrict bulk exports of water from the Great Lakes basin. These are singular accomplishments in their own right, reflecting a shared basin-wide commitment to protecting the natural systems of the Great Lakes and their tributaries in situ, rather than exploiting them simply as a cheap and abundant source of commodified water. But the Compact and Agreement, combined with the multi-jurisdictional policy harmonization and regional decision-making bodies they establish, also represent a striking innovation in regional transboundary governance at place-based, system-wide, subnational scales.*

Non-Native Aquatic Species Panel



Adam Reinhardt is a Pre-Law Student at the University of Minnesota Duluth.

Great Lakes Ballast Water Collaborative: A Model for Addressing Complex Environmental Regulation reviews how the Great Lakes Ballast Water Collaborative successfully created discussions among competing interests and advanced policy by bringing together a critical mass of ballast water regulation stakeholders in a constructive environment firmly anchored in the constraints of science and technology. Ballast water, the water that stabilizes empty and partially full ships in transit, is a known vector for spreading aquatic invasive species to the Laurentian Great Lakes. To prevent this spread of economically and environmentally harmful organisms, U.S. states, and the governments of Canada and the United States, enacted regulations that do not necessarily coordinate with each other or the rulings put forth by the United Nation's International Maritime Organization. The resulting complex web of regulations and the frustrations associated with it gave rise to the Great Lakes Ballast Water Collaborative in 2009.



Craig Middlebrook is Deputy Administrator of the Saint Lawrence Seaway Development Corporation (SLSDC) based in Washington, DC. SLSDC is a wholly owned government corporation that aims to enhance Great Lakes/St. Lawrence Seaway System utilization without respect to territorial or geographic limits. Prior to coming to the SLSDC, Craig worked on surface transportation issues at the Interstate Commerce Commission and worked for a merchant bank in the City of London. Middlebrook holds J.D. and bachelor's degrees from Northwestern University. In 2011, he was awarded the Presidential Rank Award for Distinguished Service by President Barack Obama.

Making Smart Policy Decisions in a Fractured Regulatory Environment acknowledges that even under optimal conditions, where broad consensus, complementary regulatory frameworks, and a limited number of policymakers exist, formulating and achieving effective policy outcomes is a challenge. Realizing successful outcomes becomes exponentially harder in a landscape where even one of those optimal conditions is lacking. In the case of the Great Lakes in 2008, when it came to ballast water discharge management and regulation, none of those optimal conditions were present. Yet, in the face of that situation an initiative arose - the Great Lakes Ballast Water Collaborative - that sought to facilitate smart public policy outcomes in a fractured legal, regulatory, and policy environment.



Mark Burrows is Physical Scientist and Project Manager, International Joint Commission - Great Lakes Regional Office, Windsor, Ontario.

Science-based Bilateral Collaboration as a Basis for IJC Action reviews how the International Joint Commission's (IJC) Great Lakes Regional Advisory Boards were established under the Great Lakes Water Quality Agreement to inform the Commission's advice and help carry out its responsibilities under the agreement. Consultations with experts from the U.S. and Canada underpin every report and recommendation the IJC has made regarding preventing the further introduction of aquatic invasive species in the Great Lakes. This presentation will highlight key IJC studies and reports on aquatic invasive species prevention to demonstrate how binational collaborative formed a foundation for IJC action.



Marc Gaden is the Communications Director and Legislative Liaison for the Great Lakes Fishery Commission, a Canada-U.S. agency established by treaty to improve and perpetuate the Great Lakes fishery. He is also an adjunct assistant professor in the School of Natural Resources and Environment at the University of Michigan and adjunct associate professor in the the Department of Fisheries and Wildlife at Michigan State University. He teaches courses in environmental and water policy and has written about environmental governance, Great Lakes policy, and cooperative fishery management. He works on issues involving regional coordination of fisheries policies, invasive species, and ecosystem restoration. Prior to joining the Commission, Marc worked as a legislative assistant for the U.S. House of Representatives' Great Lakes Task Force and for U.S. Congressman Dennis Hertel of Michigan. He earned his PhD in environmental policy from the University of Michigan, a master's in foreign policy from The American University, and a bachelor's in history and political science from the University of Michigan.

The Asian Carp Strategy: Monitoring, Management, and Contingency Actions discusses the current Asian carp strategy, which focuses on monitoring, management, and contingency actions. Asian carp threaten to enter the Great Lakes from the Mississippi River basin through the manmade Chicago Area Waterway System, or CAWS. Permanent solutions to prevent Asian carp migration (e.g., physical separation) are still many years away. In the meantime, all relevant agencies must cooperate to monitor Asian carp movement and manage the species. If need be, agencies must also be ready and able to implement contingency actions, using aggressive measures, at the right locations.

Why We Are Here

Mark Privratsky is a Field and Constituent Services Representative for Congressman Rick Nolan of Minnesota's 8th District. He has worked for Rep. Nolan since 2011. Mark's field area includes Carlton, South St Louis, Lake and Cook Counties, where he works closely on issues related to Port Infrastructure, the Great Lakes Restoration Initiative, Forestry, Tribal Affairs and Transportation. Mark is originally from Walker, MN and is a proud alumni of the University of Minnesota, Morris.

Ida Rukavina is the Regional Outreach Director for U.S. Senator Amy Klobuchar, serving the Northeast area of Minnesota and working out of the Virginia, MN office.



Kelly Westlund is a Regional Representative of the Office of U.S. Senator Tammy Baldwin from Wisconsin. She was the Executive Director of the Alliance for Sustainability where she focused on helping rural communities become more self-reliant and coordinated a regional pilot project with the State Office of Energy Independence to increase energy efficiency and promote the use of renewable energy alternatives. Kelly works with the Bayfield Regional Food Producers Cooperative, helping to build a food system that can support family farms for generations to come. She is a graduate of the Leadership Wisconsin program and has served on the Ashland City Council since 2011. She has a degree in Conflict Resolution from Northland College.

Regulations or Protection – What's in a Word?



Lana Pollack was appointed Chair of the U.S. Section, International Joint Commission, by President Barack Obama. Lana served as president of the Michigan Environmental Council and was elected three times to the Michigan legislature, serving as a state senator from 1983-1994. As a state senator, Lana became a leading advocate for women, children and the environment, earning praise as the architect of Michigan's landmark 1990 polluter pay statute. In addition to these roles, Lana was a Fellow at the Institute of Politics at Harvard University's Kennedy School of Government, taught at the University of Michigan and was an elected trustee of the Ann Arbor Board of Education. She co-founded a statewide general interest magazine and co-directed a school for elementary education in Lusaka, Zambia. Lana earned a bachelor's in political science and a master's in education from the University of Michigan.

Regulations or Protections – What's in a Word? addresses how people across the political spectrum – even those who find regulations onerous – are disturbed by governments' failure to protect Flint residents from lead contaminated drinking water. What would happen if environmental policies were discussed in terms of enough protections rather than too many regulations?

Emerging Challenges Panel



Gretel Lee, a proud Duluth native, is a second-year law student at the University of Minnesota Law School. She graduated from the University of Minnesota in 2014 with a B.S. in Environmental Science, Policy, and Management. She serves as a staff member and articles editor of the University of Minnesota Law School's *Law and Inequality: A Journal of Theory and Practice* and is an executive member of the Environmental and Energy Law Society at the UMN Law School.

Establishing a Cumulative Transboundary Environmental Review Process is focusing on mining in the Lake Superior Basin. This presentation discusses the importance of Cumulative Transboundary Environmental Review as society looks to protect the resources of the Great Lakes. Large scale industrial projects have taken place within the Great Lakes Basin for many years. While individual states and provinces, as well as the federal governments of both the U.S. and Canada, have required environmental review for such projects, there is currently no process in place to manage these projects cumulatively.



Jason MacLean is an Assistant Professor with the Bora Laskin Faculty of Law at Lakehead University in Thunder Bay, Ontario. His research interests include environmental law, corporate law, civil procedure, constitutional law and legal education. He is co-author of *Corporate Social Responsibility: A Legal Analysis* (2nd ed., LexisNexis), as well as a contributing editor of the *Global Competition Litigation Review* and the Constitutional and Administrative Law Editor of the *Toronto Law Journal*. Jason writes a bi-weekly column for the *Thunder Bay Chronicle-Journal* on environmental sustainability and blogs about a variety of legal issues on the University of Alberta Faculty of Law Blog. Jason clerked for Justice Marie Deschamps at the Supreme Court of Canada and practiced law as a litigator. He has served as a legal consultant to the Expert Panel on Securities Regulation and the Canadian Securities Transition Office. He is called to the Bar in New York and Ontario, having received a joint B.C.L. / LL.B. from the McGill University Faculty of Law.

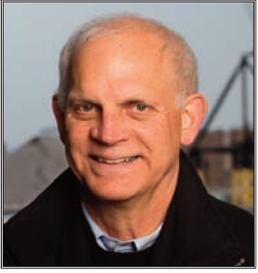
Green Industrial Policy for Great Lakes Governance: Institutionalism, International Environmental Law, and the IJC suggests that the Great Lakes need a new governance model. The presentation draws from the emergent "green industrial policy" literature to propose a new institutional approach capable of promoting Great Lakes environmental protection through a reinvigorated IJC and international environmental law framework.



Wenona Singel is an Associate Professor of Law and Associate Director of the Indigenous Law and Policy Center at the Michigan State University College of Law in Ann Arbor, Michigan. She is also a presidential appointee to the Advisory Board of the St. Lawrence Seaway Development Corporation. Wenona's research addresses the development of tribal legal systems and tribal accountability for human rights. In addition to teaching, her professional activities include serving as the Chief Appellate Justice for the Little Traverse Bay Bands of Odawa Indians, where she is a citizen. Wenona is also an elected member of the American Law Institute, where she is the Co-Reporter for a project to develop a Restatement of the Law of American Indians. She has served as President and Board Member of the Michigan Indian Judicial Association, as an Assistant Professor at the University of North Dakota School of Law, and as a Fellow with the Northern Plains Indian Law Center. Before teaching, she worked in private practice and served as a member of the Economic

Development Commission of the Little Traverse Bay Bands of Odawa Indians. Wenona received an A.B. from Harvard College and a J.D. from Harvard Law School.

Indigenous Responses to Climate Change and Water Quality Concerns in the Great Lakes considers the impact of climate change on the Great Lakes, and the important role of indigenous governance in conserving and protecting the Nayaano-nibiimaang Gichigamiin (The Great Lakes, or The Five Freshwater Seas). Tribes and First Nations whose territories border the Great Lakes in the U.S. and Canada share a critical perspective in that they have a profound awareness of the interrelatedness of the various parts of the Great Lakes ecosystem, and their culture, language, values, and land use patterns are both connected to the Great Lakes and deeply affected by the alteration of water flows, the spread of invasive species, changes to water levels, and decline in water quality produced by industrialization, dams, resource extraction, and agricultural run-off. Global warming and climate change threaten to exacerbate these changes and cause further reduction in water levels, loss of habitat, and a decline in species survival. As tribes and First Nations actively engage in efforts to protect and restore Great Lakes water, habitat, and species, this work is strengthened by indigenous expertise, technical capacity, traditional knowledge, and cultural values that promote an ethic of respect and responsibility.



J. Val Klump is the Senior Director and Associate Dean of Research in the School of Freshwater Science at the University of Wisconsin-Milwaukee, where he is also Director of the Great Lakes Water Institute. His research focuses on how nutrients and carbon are cycled in lakes. His work led him to be the first person to reach the deepest spot in Lake Superior (1,332 ft/ 406 m), which is also the lowest point in the United States. He is also the first person to reach to the deepest point in Lake Michigan. His research highlights the presence and dynamics of “dead zones” in Lake Michigan including the impact climate change has on their extent and duration. Klump serves on many boards, including: The International Joint Commission's Science Advisory Board Research Coordination Council, the NOAA Integrated Ocean Observing System Federal Advisory Committee, the National Association of Marine Laboratories Executive Board, and Discovery World. He holds a degree in Law from Georgetown University and a PhD in Marine Science from the University of North Carolina at Chapel Hill.

The Challenge for Great Lake Science focuses on the point that the Great Lakes are, for the most part, essentially closed systems. They are also large, diverse, and complex. At the same time, despite their size, these inland seas are surprisingly fragile, and the changes wrought in the last few decades driven by human activities have been immense. Projected future changes and vulnerabilities are no less extensive. This poses a major challenge for science: to provide the understanding needed to effectively manage these systems for a sustainable future - and for policy and law to provide the means by which to ensure that future.

Continuing Past Momentum into the Future



Cameron Davis is senior advisor to the U.S. Environmental Protection Agency Administrator. He provides counsel on the Great Lakes Restoration Initiative, which includes coordinating Great Lakes policy and funding initiatives valued at more than \$1 billion since 2010 with more than a dozen federal agencies and with state, municipal, tribal, business and civic stakeholders. He also served as a lead negotiator on the U.S. negotiating team for the 2012 U.S.-Canada Great Lakes Water Quality Agreement. For more than two decades, Cameron has worked to develop and implement water quality and quantity policy. He served as a litigating attorney and law teacher at the University of Michigan Law School before serving as president and CEO of the Alliance for the Great Lakes. Under his leadership, the organization won the American Bar Association's Distinguished Award in Environmental Law & Policy, the first time for a public interest organization in the honor's history. He earned his law degree, including certification in environmental and energy law, from the Chicago-Kent College of Law and a

B.A. from Boston University in International Relations.

Continuing Past Momentum into the Future asks, “How can we lock in and sustain the renewed momentum toward revitalizing Great Lakes health?” Progress on ecological protection and restoration over the years has provided the Great Lakes - and we, the people who rely on them - a trajectory for a resilient and sustainable future.

Linking Science, Policy and Great Lakes Governance



Michael Goffin is the Regional Director General for Environment and Climate Change Canada in Ontario. For more than 30 years, Michael has been engaged in Canada's policy and program delivery in environmental protection, wildlife management, meteorology, water and ecosystem management, intergovernmental affairs and community outreach and engagement. For the past 10 years, he has led Canada's efforts to restore and protect the water quality and ecosystem health of the Great Lakes and was lead negotiator for Canada in negotiating the Amended Canada-United States Great Lakes Water Quality Agreement. Michael has been a long-time member of the International Joint Commission's Great Lakes Water Quality Board and serves as Canadian Co-chair of the International Joint Commission's International Rainy-Lake of the Woods Watershed Board. He received his undergraduate degree in environmental studies and a Master of Science in

geomorphology from the University of Toronto.

Linking Science, Policy and Great Lakes Governance addresses the importance of the Great Lakes from a Canadian perspective and focuses on two key tenants underpinning the Canada-United States Great Lakes Water Quality Agreement, essential to the restoration and protection of Great Lakes water quality and ecosystem health: application of science based decision making and recognition of jurisdictional differences