

# Research Outcomes from Sustainability Centers of Northland College 2015-2018

## Burke Center for Fresh Water Innovation

Funding: Approximately \$373,000 in revenue for the Center through contracts and grants since 2016.

Collaboration: Students: 29 different individuals.  
Faculty: 7 faculty research positions

Outcomes: The center produced 100 presentations, 22 publications, hosted 3 major events, and appeared in 4 different media outlets. The center has worked with over 20 local and regional organizations.

### 2015-2017 Research Outcome Details

#### (1) Presentations:

1. **Lehr, R.A.** and M. Hudson, "Lake Management Planning—Penokee Lakes", Penokee Lakes Steering Group, Northland College (third presentations since 2015), November, 13th, 2017
2. **Hudson, M.H.**, R.A. Lehr, M.J. Cooper, and C.J. McNerney. "Understanding Nearshore Conditions in Lake Superior's Chequamegon Bay." Red Cliff Watershed Symposium, Red Cliff, WI, September 26, 2017.
3. **Annin, P.**, "Sound Carries Over Water. Who is Listening? Lessons learned from the Great Lakes Compact," Aqua Hacking Summit 2017" University of Waterloo, Ontario. Sept 13, 2017
4. **Lehr, R.A.**, "Trends in Lake Management", Spider Chain of Lakes Association – Leadership Retreat, Hayward, WI, July 21<sup>st</sup>, 2017
5. **Hudson, M.H.**, R.A. Lehr, M.J. Cooper, and C.J. McNerney. "Understanding Nearshore Conditions in Lake Superior's Chequamegon Bay." Invited to the Lake Superior Partnership Working Group weekly conference call, July 19, 2017.
6. **Lehr, R.A.**, "Warm, Wet and Windy - Adapting to Climate Change in the Apostle Islands", Summer Speaker Series, Wilderness Preserve, La Point, WI, July 5<sup>th</sup>, 2017
7. **Hudson, M.J.**, "Ecological Restoration in Action," Center for Conservation Leadership Program, Northland College, June 26, 2017.
8. **Lehr, R.A.**, "Dragonflies and Mercury: What's in Your Water", Northwest Lakes Conference, Hayward, WI, June 16<sup>th</sup>, 2017
9. **Lehr, R.A.**, "Limnology 101", Northwest Lakes Conference, Hayward, WI, June 16<sup>th</sup>, 2017
10. **Tyler Larson** (Burke Center student), "Weather Driven Events on E. coli at Maslowski Beach." Burke Center Orientation, May 29<sup>th</sup> 2017

11. **Hudson, M.H.**, R.A. Lehr, M.J. Cooper, and C.J. McNERney. "Understanding Nearshore Conditions in Lake Superior's Chequamegon Bay." International Association for Great Lakes Research 60<sup>th</sup> Annual Meeting, Detroit, MI, May 15-19, 2017.
12. **Cooper, M.J.**, Brady, V.J., Uzarski, D.G., Lamberti, G.A., Moerke, A.H., Ruetz, C.R., Wilcox, D.A., Ciborowski, J.J.H., Gathman, J.P., Grabas, G.P., and Johnson, L.B. "An Expanded Fish-Based Index of Biotic Integrity for Great Lakes Coastal Wetlands." International Association for Great Lakes Research 60<sup>th</sup> Annual Meeting, Detroit, MI, May 15-19, 2017.
13. Hein, M.C. and **Cooper, M.J.** "Untangling drivers of chlorophyll a in Great Lakes coastal wetlands." International Association for Great Lakes Research 60<sup>th</sup> Annual Meeting, Detroit, MI, May 15-19, 2017.
14. Kneisel, A.N., **Cooper, M.J.**, and Uzarski, D.G. "The Impact of *Phragmites australis* Invasion on Great Lakes Coastal Wetland Macroinvertebrates." International Association for Great Lakes Research 60<sup>th</sup> Annual Meeting, Detroit, MI, May 15-19, 2017.
15. Moore, L.P., **Cooper, M.J.**, and Uzarski, D.G. "Nutrient limitations in Great Lakes coastal wetlands: gradients and their influence." International Association for Great Lakes Research 60<sup>th</sup> Annual Meeting, Detroit, MI, May 15-19, 2017.
16. Reisinger, A.J., Axler, R.P., **Cooper, M.J.**, Johnson, L.B., Ruetz III, C.R., Steinman, A.D., and Uzarski, D.G. "Natural and anthropogenic disturbances affect water quality of Great Lakes coastal wetlands." International Association for Great Lakes Research 60<sup>th</sup> Annual Meeting, Detroit, MI, May 15-19, 2017.
17. Reisinger, L.S., Pangle, K.L., **Cooper, M.J.**, Learman, D.R., Uzarski, D.G., Woolnough, D.A., Bugal, M.R., Burck, E.K., Dollard, R.E., Goetz, A., Goss, M., Gu, S., Karl, K., Rose, V.A., Schenemann, A.E., Webster, R., Weldon, C.R., and Yan, J. "The influence of water currents on community and ecosystem dynamics in coastal Lake Michigan." International Association for Great Lakes Research 60<sup>th</sup> Annual Meeting, Detroit, MI, May 15-19, 2017.
18. Uzarski, D.G., Brady, V.J., and **Cooper, M.J.** "The Great Lakes Coastal Wetland Monitoring Program: Seven Years of Implementation." International Association for Great Lakes Research 60<sup>th</sup> Annual Meeting, Detroit, MI, May 15-19, 2017.
19. **Lehr, R.A.**, "Climate Change and Stream Hydrology", Stream Ecology, Northland College, Ashland, WI, May 16<sup>th</sup>, 2017
20. **Lehr, R.A.**, "Adapting to Climate Change in Lake Superior", Water Symposium, University of Wisconsin, Madison, WI, May 9<sup>th</sup>, 2017
21. **McNERney, C.J.** "Water Quality in the Chequamegon Bay Region." Chemistry of Natural Water CHM210, Northland College, May 1, 2017
22. **Lehr, R.A.**, "Adapting to Climate Change in Lake Superior," Lake Superior Youth Symposium, Northland College, April 27, 2017
23. **Annin, P.**, "Lake Superior and the Great Lakes Compact," Lake Superior Youth Symposium, Northland College, April 27, 2017
24. **Cooper, M.J.**, D.G. Uzarski, and A. Garwood, "Great Lakes Coastal Wetland Monitoring." Webinar hosted by Michigan Department of Environmental Quality, April 14, 2017. 78 attendees.

25. **Cooper, M.J.** "Coastal wetlands as metabolic gates, pollution filters, Swiss Army Knife habitats, and biogeochemical hotspots." Science on Tap, Ashland, WI, March 21, 2017
26. **Lehr, R.A.**, "Climate Change Impacts on Hydrology and Water Quality," United States Forest Service, Northern Institute on Applied Climate Science, Minocqua, WI, March 15<sup>th</sup>, 2017
27. **Lehr, R.A.**, "Climate Change in the Chequamegon Bay Area," Madeline Island Ferry Service, Speaker Series, Bayfield, WI, March 9th, 2017
28. **Cooper, M.J.**, T.M. Redder, V.J. Brady, and D.G. Uzarski. "Developing a decision support tool to guide restoration and protection of Great Lakes coastal wetlands," Wisconsin Wetlands Association Annual Meeting, Steven's Point, WI, February 28-March 2, 2017
29. **Lehr, R.A.**, "Molecular impacts of Perflourinated Chemicals on largemouth bass in Minnesota Lakes," Biology, Senior Capstone – Northland College, Ashland, WI, February, 21<sup>st</sup> 2017
30. **Hudson, M.H.** and **C.J. McNerney**. "From Research to Management in Chequamegon Bay: Our Evolving Understanding of a Complex Ecosystem," Planning meeting for Maslowski Beach re-design, Ashland, WI, February 14, 2017.
31. **Hudson, M.H.** "Water Quality in the Chequamegon Bay Region, What Are We Learning?" Bayfield County Land Conservation Committee meeting, Benoit, WI, February 9, 2017.
32. **Cooper, M.J.**, T.M. Redder, C. Hippensteel, V.J. Brady, and D.G. Uzarski. "Developing a decision support tool to guide restoration and protection of Great Lakes coastal wetlands," Midwest Fish and Wildlife Conference, Lincoln, NE, February 5-8, 2017
33. **Cooper, M.C.**, D.G. Uzarski, T.M. Redder, L.B. Johnson, and V.J. Brady. "A decision support tool for Great Lakes coastal wetlands", The Upper Midwest and Great Lakes LCC, webinar, Dec. 19<sup>th</sup>, 2016
34. **Lehr, R.A.**, "Climate Change in the Great Lakes Region", University of Wisconsin – Extension, Master Naturalist Training, Northland Great Lakes Visitor Center, Ashland, WI, November 18th, 2016
35. **Annin, P.** "Water Tension and the Great Lakes Compact," Keynote, Shaker Lakes Ohio Garden Club, Chagrin Valley Hunt Club, outside Cleveland, OH. Nov. 29, 2016
36. **Cooper, M.C.** and H. Stirratt. "Great Lakes Coastal Wetlands", Resilient Lands and Waters Initiative Roundtable Event, The White House, Washington, DC, November 17
37. **Cooper, M.C.** "Developing a decision support tool for Great Lakes coastal wetlands", U.S. Fish and Wildlife Service, Nov. 6, 2016
38. **Lehr, R.A.**, "Linking Science and Policy in Lake Management: An Integrated Ecosystem Management Approach." North American Lake Management Society, Banff, Alberta, November 4th, 2016 (Published Abstract)
39. **Lehr, R.A.** and B. Hofstedt. "An Adaptive Framework for Integrating Social Science Data into the Lake Management Process." North American Lake Management Society, Banff, Alberta, November 3rd, 2016 (Published Abstract)
40. **Lehr, R.A.**, "Infrastructure Design in the Presence of Climate Change", Pew Charitable Trust, Flood Prepared Community Program, Washington DC, October 28<sup>th</sup>, 2016

41. **Annin, P.** “The Future of Media in the Great Lakes Region,” panel discussion as part of the Great Lakes Funders Collaborative Annual Meeting, Flint, MI. Oct. 20, 2016
42. **Lehr, R.A.** (one of 7 invited roundtable participants), “Federal Flood Policy: A Review”, Pew Charitable Trust, Great Lakes Visitor Center, Ashland, WI, October 13<sup>th</sup>, 2016
43. **Lehr, R.A.**, “Adapting to Climate Change Impacts in the Great Lakes”, The Nature Conservancy, Great Lakes Trustee Meeting, Buffalo, NY, October 6<sup>th</sup>, 2016
44. **Annin, P.** “Water Tension and the Great Lakes Compact,” The Nature Conservancy, Great Lakes Trustee Meeting, Buffalo, NY Oct. 6<sup>th</sup>, 2016
45. **Cooper, M.C.**, C. Hippensteel, D.G. Uzarski, and T.M. Redder. “Developing a decision support tool for Great Lakes coastal wetlands”, LCC Coastal Conservation Working Group Annual Meeting, Great Lakes Environmental Research Laboratory, Ann Arbor, MI, Oct. 6, 2016
46. **Lehr, R.A.**, “Understanding Climate Change Impacts in the Chequamegon Bay Area”, Trout Unlimited Annual Meeting, Ashland, WI, September 14<sup>th</sup>, 2016
47. Stirratt, H., “Landscape Conservation Design for the Great Lakes.” Panel discussion in the American Pavilion at the International Union for the Conservation of Nature, World Conservation Congress, September 1-10, Hawai’i.
48. **Lehr, R.A.**, “History of the Great Lakes Restoration Initiative”, Chequamegon Bay Area Partnership, Ashland, WI, September 13<sup>th</sup>, 2016
49. **Lehr, R.A.**, “History of the Great Lakes Restoration Initiative”, Water Summit, Burke Center for Freshwater Innovation, Northland College, Ashland, WI, September 13<sup>th</sup>, 2016
50. **Lehr, R.A.**, “The Chequamegon Bay and Apostle Islands—A Model System for Understanding Climate Change Impacts”, University of Wisconsin—Stevens Point, University of Wisconsin Extension, Faculty Course Development Workshop, Northland College, August 22<sup>nd</sup>, 2016
51. **Lehr, R.A.**, “Fostering Sustainable Water Systems—Integrating Science, Communication and Undergraduate Research”, Wisconsin Lakes Partnership, Annual Meeting, Ashland, WI, August 14<sup>th</sup>, 2016
52. **Cooper, M.J.**, “Coastal Ecosystems of the Laurentian Great Lakes”, Rivers to Lake Program, Ashland, WI, August 4, 2016
53. **Peter Annin** gave a keynote address at the Great Lakes Legislative Caucus in Milwaukee on July 16, 2016. Approximately 70 regional legislators attended.
54. **Peter Annin** gave a talk to the Wisconsin Chapter of The Nature Conservancy Board of Trustees, “Water Tension and the Great Lakes Compact,” July 15, 2016 in Sheboygan.
55. **Lehr, R.A.**, “The Chequamegon Bay and Apostle Islands—A Model System for Understanding Nearshore Ecosystems and Climate Change Impacts”, Master Gardner’s Annual Meeting, Washburn, WI, July 14<sup>th</sup>, 2016
56. **Lehr, R.A.** and M.H., Hudson, “The Chequamegon Bay and Apostle Islands—Our Evolving Understanding of a Complex Ecosystem”, United States Environmental Protection Agency, Educators Workshop, Lake Guardian, July 11<sup>th</sup>, 2016

57. **Peter Annin** gave a talk “Water Tension & the Great Lakes Compact,” at the Town of Bell, WI Community Center on July 5, 2016. Approximately 75 people attended.
58. Kneisel, A.N., **Cooper, M.J.**, and Uzarski, D.G., “Impact of Phragmites Invasion on Macroinvertebrate Communities in Wetlands of Thunder Bay, MI.” 59<sup>th</sup> Annual Meeting of the International Association for Great Lakes Research. University of Guelph, June 8, 2016. (Published Abstract)
59. Moore, L.P., **Cooper, M.J.**, Uzarski, D.G., and Bozimowski, A.A., “Nutrient limitation of algal biofilms in Great Lakes coastal wetlands: gradients and their influence.” 59<sup>th</sup> Annual Meeting of the International Association for Great Lakes Research. University of Guelph, June 7, 2016. (Published Abstract)
60. **Lehr, R.A.**, L.P. Van Roekel, T.D. LaFrancois. “Characterizing the Magnitude and Mechanisms of Climate Change Impacts in the Chequamegon Bay of Lake Superior.” International Association of Great Lakes Research, Guelph, Ontario, June 7, 2016 (Published Abstract)
61. **Cooper, M.J.**, “The Depth of Wisconsin’s Water Resources.” Wisconsin History Tour, Panel Discussion, Northern Great Lakes Visitors Center, June 2016.
62. **Lehr, R.A.**, “Fostering Sustainable Water Systems”, Chequamegon Water Collaborative, Great Lakes Visitor Center, May 15, 2016
63. **Hudson, M.H.**, “*Ecological Restoration in Chequamegon Bay: A Case Study in North Fish Creek*”, Chequamegon Water Collaborative Conference, Northern Great Lakes Visitor Center, May 15, 2016
64. **Niewinski, Desiree** (Student), “Maslowski Beach Health and Monitoring Program?” Chequamegon Water Collaborative Conference, May 15, 2016
65. **Cooper, M.J.**, “Monitoring Biotic & Abiotic Conditions in Great Lakes Coastal Wetlands.” Wisconsin DNR Annual Surface Water Quality Meeting. Tomahawk, WI, May 2016.
66. **Cooper, M.J.**, “Translating Science Into Action in the Great Lakes.” Marvin J. Pertzik Lecture Series. Northland College, May 4, 2016.
67. **Lehr, R.A.**, “Life in the Great Lakes—Adapting to Climate Change in Lake Superior” Earth Day Lyceum, Washburn High School, April 22, 2016
68. **Soukey, Anthony** (Student), “Post-Secondary Work in Environmental Monitoring” Earth Day Celebration, School of Environmental Studies Apply, April, 21, 2016 (2 presentations)
69. **Lehr, R.A.**, (and others) “Reimagining Great Lakes Water Systems”. Invited Conference Participant. Great Lakes Protection Fund. April 13 and 14, 2016 (Published Proceedings)
70. **Welnetz, J. and J. Fitzgerald (Students)**, “*Evidence of Upwelling Events in Chequamegon Bay*”, Chequamegon Bay Symposium, Northern Great Lakes Visitor Center, April 13, 2016
71. **Hudson, M.H.** and R.A. Lehr, “*Penokee Lakes and Streams Project – Northland College-Burke Center*”, 5<sup>th</sup> annual Penokee Data Discussion and Monitoring Coordination Meeting, Northern Great Lakes Visitor Center, April 12, 2016 (Published Abstract)
72. **Welnetz, J.** (Student), *Wind-driven Temperature Patterns in Chequamegon Bay of Lake Superior*”, Honors Day poster session, Northland College, April 7, 2016

73. **Niewinski, Desiree** (Student), "Implementation of the Second Derivative UV Spectroscopy Method Measuring Nitrate Concentrations?" Northland College Honors Day, April 7, 2016
74. **Niewinski, Desiree** (Student), "Bacterial Dynamics through DNA Source Tracking and Sanitary Surveys on Beaches in Douglas County Wisconsin?" Northland College Honors Day, April 7, 2016
75. **Hudson, M.H.** and R.A. Lehr. "From Research to Management in Chequamegon Bay". Chequamegon Bay Symposium, Chequamegon Bay Area Partnership, Ashland, WI, April 3, 2016
76. **Cooper, M.J.**, Uzarski, D.G., Brady, V.J., "Developing a Decision Support Tool for Prioritizing Protection and Restoration of Coastal Wetlands." Wisconsin Wetlands Association Annual Meeting. University of Wisconsin-Green Bay, February 2016.
77. **Lehr, R.A.**, "Sailing, Science and Sustainability—the Liberal Arts in Everyday Life" Northland College, Ashland, WI, January 12<sup>th</sup>, 2016
78. **Lehr, R.A.**, "Slow-release Aquatic Herbicides", Wisconsin Department of Natural Resources, Rhinelander, WI, March 16<sup>th</sup>, 2016
79. **Cooper, M.J.**, "Developing a Decision Support Tool for Prioritizing Protection and Restoration of Coastal Wetlands" Wisconsin Wetlands Association, Green Bay, WI, February 24<sup>th</sup>, 2016
80. **Cooper, M.J.**, "Nutrient Limitation in Wetland Ecosystems" Wisconsin Department of Natural Resources, Rhinelander, WI, February 12<sup>th</sup> 2016
81. **Lehr, R.A.**, "The Chequamegon Bay and Apostle Islands—a Model System for Understanding the Nearshore" National Oceanic and Atmospheric Administration, Chanhassen, MN, January 12<sup>th</sup>, 2016
82. **Lehr, R.A.**, "Fish Creek Water Quality Monitoring and Assessment?" Bayfield County Large Livestock Advisory Committee, Bayfield County, November 19, 2015
83. **Cooper, M.J.**, "Developing a Decision Support Tool for Prioritizing Protection and Restoration of Coastal Wetlands" Upper Midwest and Great Lakes LCC Coastal Conservation Working Group, Traverse City, MI, October 26, 2015
84. **Cooper, M.J.**, "Great Lakes Coastal Wetland Monitoring" National Park Service, Ashland, WI, November 5, 2015
85. **Cooper, M.J.**, "Ecosystem and Career Transition Zones Along the Laurentian Great Lakes Coast" Annis Water Resources Institute, Grand Valley State University, Distinguished Alumni Seminar, October 22, 2015
86. Stirratt, H., B. Krumwiede, K. Kowalski, **M. Cooper**, J. Saarinen, R. Macleod, B. Potter, and M. Davis, "Great Lakes Resilient Lands and Waters Initiative" remote presentation to the White House Council on Environmental Quality and partner agencies, December 14, 2015
87. **Lehr, R.A.**, "Life on Lake Superior in a Changing Climate?" Northland College, September 2015
88. **Lehr, R.A.**, "Beaches and Bacteria—Water Quality and Public Health Considerations?" Northern Great Lakes Visitor Center, September 2015
89. **Lehr, R.A.**, "Living with Lakes—How Healthy are Our Lakes and How Much Do We Care?" Cable Natural History Museum, July 2015
90. **Lehr, R.A.**, "Climate Currents and the Madeline Island Eddy", Madeline Island Historical Society, July 2015

91. **Lehr, R.A.**, “Surface Water Quality in the Chequamegon Bay Region—What We Know and What We Don’t”, Bayfield County Large Livestock Advisory Committee, Bayfield County, June 2015 (2 presentations)
92. **Lehr, R.A.**, “The Chequamegon Bay and Apostle Islands Ecosystem—Past, Present and Future”, Ashland Science-on-Tap, May 2015
93. **Lehr, R.A.**, “Predicting Climate Change Impacts in the Chequamegon Bay”. Climate Change Speaker Series. Sigurd Olson Environmental Institute, Northland College, April 2015
94. **Lehr, R.A.** and Matthew Hudson, “Modeling the Chequamegon Bay Ecosystem to Assess Climate Change Impacts.” Chequamegon Bay Science Symposium, Northland College, April 2015
95. **Lehr, R.A.**, “The Chequamegon Bay and Apostle Islands Ecosystem—Past, Present and Future”, Ashland Science-on-Tap, May 2015
96. **Lehr, R.A.**, “Predicting Climate Change Impacts in the Chequamegon Bay”. Climate Change Speaker Series. Sigurd Olson Environmental Institute, Northland College, April 2015
97. **Lehr, R.A.**, “Monitoring and Assessment in the Chequamegon Bay Area”. United States Environmental Protection Agency, Lake Superior Coordinated Monitoring Meeting, Michigan Technological University, March 2015
98. **Annin, P.A.**, “Water Tension & The Great Lakes Compact,” Keynote Address, Society for Freshwater Sciences Annual Meeting, Milwaukee, May 2015
99. **Annin, P.A.**, “Water Tension & The Great Lakes Compact,” Institutes for Journalism & Natural Resources Lake Superior Institute, Duluth, June 2015.
100. **Annin, P.A.**, “Water Tension, Dredging & The Great Lakes Compact,” Keynote Address, Dredgefest, University of Minnesota, August 2015

## **(2) Publications and Reports:**

1. Peter Annin submitted a 107,000-word manuscript, including 53 photos/maps/figures to the University of Chicago Press on December 31, 2017. This is the second edition of *The Great Lakes Water Wars*, and represents an extensive rewrite and update of the book, including three entirely new chapters, four chapters that have been thoroughly overhauled, and every chapter in the book has been updated and revised. The preliminary publication date is Nov. 1, 2018, and several organizations are already planning book-launch events in late 2018.
2. Langer, T.A., **M.J. Cooper**, L.S. Reisinger, A.J. Reisinger, and D.G. Uzarski. Water depth and lake-wide water level fluctuation influence on  $\alpha$ - and  $\beta$ -diversity of coastal wetland fish communities. *Journal of Great Lakes Research*. Available online 11 November 2017
3. Langer, T.A., **M.J. Cooper**, L.S. Reisinger, A.J. Reisinger, and D.G. Uzarski. Water fluctuation influence on  $\alpha$ - and  $\beta$ -diversity of coastal wetland fish communities. Submitted to *Journal of Great Lakes Research*.
4. **Lehr, Randy A.** “Comprehensive Management Plan for the Cisco Chain of Lakes” Technical Report to the Wisconsin Department of Natural Resources (Madison, WI).
5. **Lehr, Randy A.** “Comprehensive Management Plan for the Namakagon Chain of Lakes” Technical Report to the Wisconsin Department of Natural Resources (Madison, WI).

6. Matt Hudson edited and coordinated the publication of the Summer 2017 edition of the Fish Creek Partnership newsletter. The newsletter is part of a Burke Center stream restoration grant in the Fish Creek watershed and is aimed at promoting public awareness and involvement in stream restoration in Fish Creek. The newsletter is mailed to about 1,000 landowners in the Fish Creek watershed and is posted on Northland College's website.
7. Randy Lehr, Matt Hudson, and Chris McNerney. "Diagnosing Potential E. coli Sources and Management Options." 2017 Maslowski Beach Summary Report.
8. Reisinger, L.S., K.L. Pangle, **M.J. Cooper**, D.R. Learman, D.A. Woolnough, M.R. Bugaj, E.K. Burck, R.E. Dollard, A.N. Goetz, M.K. Goss, S. Gu, K.E. Karl, V.A. Rose, A. Scheunemann, R. Webster, C.R. Weldon, J. Yan, and D.G. Uzarski. *The influence of water currents on coastal community and ecosystem dynamics in northern Lake Michigan*. Submitted to Journal of Great Lakes Research.
9. Uzarski, D.G., V.J. Brady, and **M.J. Cooper**. "Implementing Great Lakes Coastal Wetland Monitoring, 5-year Summary Report," Technical Report to the US EPA. EPAGLNPO-2010-H-3-984-758.
10. **Lehr, Randy A.** "Comprehensive Management Plan for Lake Nebagamon" Technical Report to the Wisconsin Department of Natural Resources (Madison, WI). Approved 11/29/2016, #LPL-1484-13
11. Future of the Great Lakes Restoration Initiative. Mary Griggs Burke Center for Freshwater Innovation, Northland College, 10/1/2016 (Policy white paper presented to presidential transition teams)
12. Uzarski, D.G., V.J. Brady, **M.J. Cooper**, D.A. Wilcox, D.A. Albert, R.P. Axler, ... & J. P. Gathman. In Press. "Standardized measures of coastal wetland condition: Implementation at a Laurentian Great Lakes basin-wide scale", Wetlands.
13. **Lehr, R.A.**, "Preparing for a Wetter Future in the Great Lakes Region". Milwaukee Journal Sentinel, Milwaukee, WI, July, 24<sup>th</sup> 2016. USA Today Network Coverage in: Daily Tribune (Wisconsin Rapids)
14. **Annin, Peter**. "Waukesha's Water Request May End Up In Court," Duluth News Tribune op-ed. April 30, 2016
15. **Annin, Peter**. "Will Waukesha Get A Rewrite?" Milwaukee Journal Sentinel op-ed. April 20, 2016.
16. **Annin, Peter**. "Battle Is Brewing Over Great Lakes: Will Cuomo Veto Application Seeking to Divert Water to Milwaukee Suburb?" Buffalo News op-ed. January 9, 2016. (This article was also reprinted in the most recent issue of the Northland College Magazine.
17. **Lehr, Randy A.** "A Multi-parameter Stressor Identification for the Elm Creek Watershed." Technical Report to the Minnesota Pollution Control Agency (St. Paul, Minnesota) and Region 5 USEPA (Chicago, IL). (Published) Project #: wq-iw11-04w
18. Brasch, Rich, Marylee Murphy, Brian Vlach, and **Randy A. Lehr**. "Elm Creek Watershed Wide TMDL." Technical Report to the Minnesota Pollution Control Agency (St. Paul, Minnesota) and Region 5 USEPA (Chicago, IL). *In Review*
19. R. Cristina Colli-Dula, Christopher J. Martyniuk, Nancy D. Denslow, **Randy A. Lehr**. 2015. Assessing the impacts of Peflourinated Chemicals (PFASs) in the livers and testis of male largemouth bass (*Micropterus salmoides*) in Minnesota Lakes. (Published) Comparative Biochemistry and Physiology Part D Genomics and Proteomics. 02/2016; DOI: 10.1016/j.cbcd.2016.02.001
20. Smith, Dayna .L, **Matthew J. Cooper**, Jessica M. Kosiara, and Gary A. Lamberti. Body burdens of heavy metals in



Lake Michigan wetland turtles. Environmental Monitoring and Assessment. *Accepted*

21. **Cooper, Matthew J.**, Gabrielle M. Costello, Steven N. Francoeur, and Gary A. Lamberti. In Press. Nitrogen limitation of algal biofilms in coastal wetlands of Lakes Michigan and Huron. *Freshwater Science*.
22. **Cooper, Matthew J.**, and Donald G. Uzarski. 2016. Invertebrates in Great Lakes Marshes. In: *Invertebrates in Freshwater Marshes: An International Perspective on their Ecology*: D. Batzer (ed). Springer.

### **(3) Events:**

1. Second annual Marvin Pertzig, World Water Day Lecture, March 22<sup>nd</sup>, 2017. Professor George Kraft from the University of Wisconsin—Stevens Point Discussed Groundwater Stresses and Statewide Policies for Wisconsin. This evening presentation was preceded by a series of on-campus meetings with faculty, staff and students from across campus.
2. Randy Lehr participated in the lease signing event to celebrate the long-term partnership between Northland College and the US Forest Service for education, research and outreach programming at Forest Lodge. January 9<sup>th</sup>, 2017
3. **Water Summit 2016:** On Sept. 30-Oct. 1, Peter Annin, Randy Lehr and President Michael Miller hosted a two-day Water Summit for approximately 20 high-ranking officials, Great Lakes experts, scientists and thought leaders from throughout the Great Lakes region titled “The Future of the Great Lakes Restoration Initiative.” The Summit included a private welcome dinner for speakers on Sept. 30<sup>th</sup>, immediately followed by a panel discussion attended by approximately 150 members of the general public. Later Friday evening an invitation-only reception was held at the Blue Wave so that Summit guests could interact with local friends of the college. On Oct. 1, the actual Summit took place on Madeline Island where participants sketched out a 12-point high-level nonpartisan White Paper focused on The Future of the Great Lakes Restoration Initiative—a federal program that has contributed more than \$2 billion to the Great Lakes environment and economy since 2010. The White Paper, which was written, edited and printed within weeks of the Summit, was sent to both presidential transition teams before the 2016 election. Students played a crucial role in planning and conducting the Water Summit, as did a large number of Northland College staff. The Summit resulted in more than 50 news articles that ran in outlets from Minnesota, to Ontario and Washington, DC. (See attached list.) The nonpartisan Northeast Midwest Institute also sent the White Paper to every Great Lakes-related Congressional Office on Capitol Hill. In December 2016 Congress adopted, and the President signed, legislation to expand the budget authorization for GLRI from one year to five years at a level of at least \$300 million per year, which was recommendation #2 in the White Paper. President Miller and the Burke Center team raised independent funds to support the Water Summit so that revenues were not used from the Burke Center endowment. The project came in under budget. The White Paper, list of participants, Summit video and student video can all be found on this link: <https://www.northland.edu/sustain/freshwater/watersummit/>

# Center for Rural Communities

Funding: Approximately \$1,250,000 in revenue for the Center through contracts, grants, and gifts since 2014

Collaboration: Students: 140-150 from 14 different courses.

Faculty: 7 faculty research positions

Staff: 4 staff positions

Outcomes: Approximately 25 community based research projects working with over 50 local and regional organizations.

## **2016-2017 Research Outcome Details:**

### **(1) General:**

- Engaged nonprofits, local government, and research partners on collaborations focused on economic development, effective communication of environmental conditions, and inclusive development,
- Completed an environmental public opinion poll spanning two counties,
- Collected community level data in Chequamegon Bay communities, as well as communities in the north woods region of Wisconsin, Minnesota and Michigan, U.P.,
- Developed a webpage with support from the Northland College Marketing and Communications Department, containing information about our programs as well as links to reports and data,
- Disseminated findings and reports to the public, including presentations at local events and national conferences and print materials stakeholders,
- Participated in two WPR interviews,
- Offered applied research opportunities for students (e.g. instrument development, data collection, analysis, report writing, etc.),
- Collaborated with faculty in multidisciplinary research projects.
- In partnership with Northern Wisconsin Health Network and Essentia Health, we secured an eight year health grant to address social determinants of behavioral health,
- Engaged Chequamegon Bay area community leaders and members on local economic development and inclusive development,
- Completed an environmental public opinion poll spanning four counties,
- Collected additional community and county level data in the north woods region of Wisconsin, Minnesota and Michigan, U.P.,
- Developed additional marketing and communications materials for the CRC,
- Offered applied research opportunities for students (e.g. instrument development, data collection, analysis, report writing, etc.),
- Collaborated with faculty in multidisciplinary research projects,
- Currently employ seven summer research assistants and provided twelve environmental poll interviewer positions during the month of May.
- Gave three public presentations - CBAP conference, Sustainable Harvest conference, and the Northland Student led initiative Chequamegon Water Collaborative conference.
- In partnership with Northern Wisconsin Health Network and Essentia Health, launched Phase I of the Advancing a Healthier Wisconsin Partnership,
- Began development of our third environmental public opinion poll on local food and self-provisioning behaviors,
- Started enhancements to our assets and amenities database to pilot test an interactive online interface for the public use,

- Secured funding to conduct a market feasibility study on value-added dairy products for farmers in Ashland County,
- Submitted a proposal to the USDA’s National Institute of Food & Agriculture AFRI (Agriculture and Food Research Initiative) program to complete a four year project on local food systems,
- In collaboration with the City of Ashland, co-organized the Bay Area Housing Symposium, which convened providers to identify service gaps and system strengths, and explore potential partnerships to address homelessness in the Chequamegon Bay area,
- Co-sponsored an economic development presentation by Davis Taylor from the College of the Atlantic with the Ecoleague,
- Developed additional marketing and communications materials for the CRC,
- Participated in one WPR interview related to our water poll completed in the spring,
- Continued planning and facilitating development of the Great Lakes Islands Project,
- Completed research report for Maslowski Beach Education project,
- Collaborated with faculty in multidisciplinary research projects,
- Employed seven research assistants over the summer, and eight research assistants this fall, including two work-study students,
- Continued collaboration with the City of Ashland on SOARs strategies,
- Continued to engage Chequamegon Bay area community leaders and members on local economic development and inclusive development.
- In partnership with Northern Wisconsin Health Network and Essentia Health, mapped regional behavioral health systems and drafted strategies to support the goals of the Advancing a Healthier Wisconsin Partnership,
- Completed our third environmental public opinion poll on local food and self-provisioning behaviors,
- Continued enhancements to our assets and amenities database to pilot test an interactive online interface for the public use,
- Completed a market feasibility study on value-added dairy products for farmers in Ashland County,
- Developed additional marketing and communications materials for the CRC,
- Participated in one WPR interview, and received press coverage related to our recent food poll,
- Continued planning and facilitating development of the Great Lakes Islands Project,
- Collaborated with the City of Ashland to report and disseminate information on projects that emerged at the SOARs forum hosted in the fall of 2015,
- Collaborated with the City of Ashland on the Bay Area Housing Symposium,
- Received a USDA National Institute of Food & Agriculture - Agriculture and Food Research Initiative,
- Launched a study on the athletics program and a prospective football team to inform administrative decisions,
- Employed eight research assistants in the fall and eight in the spring,
- Collaborated with faculty in multidisciplinary research projects,
- Supported class projects including:
  - A community development studio class working on a campus student lounge, a redevelopment plan for a brownfield site in the city of Ashland, and a feasibility study on a worker co-operative,
  - A research methods class by providing training in CATI interviewing, interviewing with human subjects, and hosting interviews at the lab.

## **(2) Presentations/Reports:**

[“Ashland and Bayfield Counties Household Food Survey”](#). 2018.

“City of Ashland Housing Market Study.” 2018.

[“Public Opinion Poll: Local Foods – Northern Wisconsin Local Foods Public Opinion Poll Fact Sheet.”](#) 2017.

[“Northland College Athletics Study.”](#) 2017.

“Maslowski Beach Water Quality Education Project Report.” 2017.

“Penokee Lakes 2015 Lakeshore Management Survey Summary Report.” 2017.

[“Public Opinion Poll: Drinking Water in Northern Wisconsin.”](#) 2016.

[“Roots in the Chequamegon Bay: Opportunities for Strengthening Community Attachment.”](#) 2016.

[“Public Opinion Poll: Proposed CAFO in Bayfield County.”](#) 2015.

[“Assets & Amenities Comparison Report – Ashland, Wisconsin.”](#) 2015.

[“Local Foods Survey.”](#) 2015.

“Namakagon Chain of Lakes 2014 Lakeshore Management Survey Summary Report.” 2015.

“Cisco Chain of Lakes 2014 General Management Survey Summary Report.” 2015.

“Lake Nebagamon 2014 General Management Survey Summary Report.” 2015.

“Lake Owen 2014 General Management Survey Summary Report.” 2015.

### **(3) Events/Projects:**

#### **1. Healthier Wisconsin Partnership Program**

In partnership with the Northern Wisconsin Health Network, which consists of two Critical Access Hospitals, four County Health Departments and the Northlakes Community Clinic, and Essentia Health, we received a 8-year grant of up to \$1.5 million from the Advancing a Healthier Wisconsin Partnership stewarded by the Medical College of Wisconsin. The funded project is designed to create a system of care that addresses the social determinants of behavioral health and improves regional services. The Center will lead the evaluation of project activities, work with the Medical College of Wisconsin to ensure fidelity to the broader evaluation model, and support collaborators’ efforts to meet project goals. The Center will receive ~\$62,000 the first year of the grant with a minimum of this amount for each additional year of the grant.

- Participated in three learning community meetings facilitated by the medical college of Wisconsin to support grant efforts,
- Met with partners to identify shared goals and metrics,
- Began individual meeting with partners and other organizations to broaden collaboration, and map our system of care.
- Participated in three learning community meetings facilitated by the medical college of Wisconsin to support grant efforts,
- Met with stakeholders to collect information and map regional systems,
- Collected and presented data on behavioral health crisis,
- Researched models to improved collaboration across systems,
- Met with partners to discuss strategies,
- Developed implementation and evaluation plans to support the next phase of the project.

### **3. Water Poll**

We completed our second computer-assisted phone poll on drinking water (May 5<sup>th</sup>-June 2<sup>nd</sup> 2016). We interviewed a random sample of 640 residents of Ashland, Bayfield, Douglas, and Iron counties. The poll included questions about respondent's drinking water, responsibilities of the public sector in relation to drinking water, private ownership of water resources, and potential concerns about local water infrastructure. This quarter we:

- Prepared and disseminated a summary report detailing overall findings as well as a breakdown by county,
- With support from the Northland College Marketing and Communications Department we developed a postcard with infographics to community members(to be disseminated mid-July 2016),
- With support from the Northland College Marketing and Communications Department we prepared a press release with poll results (to be published mid-July 2016).

### **4. CAFO Poll**

We completed a computer-assisted phone poll on concentrated animal feeding operations (CAFO) in December of 2015. We interviewed a random sample of 701 residents of Ashland and Bayfield counties about their opinions on CAFOs and in particular their favorability or opposition to a proposed CAFO in Bayfield County and their interest in county regulations. This quarter we:

- Prepared and disseminated a summary report detailing overall findings as well as a breakdown by county,
- With support from the Northland College Marketing and Communications Department we developed and disseminated a postcard with infographics to community members,
- With support from the Northland College Marketing and Communications Department we prepared and disseminated a press release with poll results, (published in several media outlets, including the Ashland Daily Press, Duluth News Tribune and Wisconsin Public Radio).

### **5. Local Food Public Opinion Poll**

We have completed our third environmental poll on local food and self-provisioning behaviors. The poll was administered through our computer-assisted telephone interviewing system. We interviewed 444 households across eight to ten of the most northern counties of Wisconsin, including Ashland, Bayfield, Burnett, Douglas, Iron, Oneida, Price, Sawyer, Vilas, and Washburn counties.

### **6. Lakes Stakeholder Surveys**

We are collaborating with the Northland College Center for Freshwater Innovation on a number of regional lake grants designed to understand how different stakeholders interact with and affect lake ecosystems in northern Wisconsin, and to develop inform an effective lake management plan. This quarter we started to draft a comprehensive report examining demographic, attitudinal, and value based characteristics of respondents and their willingness to engage in the protection of northern Wisconsin lakes.

### **7. Great Lakes Island Project**

In collaboration with Michigan Office of the Great Lakes (OGL), we are moving ahead with the second phase of coordinating peopled Great Lakes Islands and the possibility of developing a Great Lakes Island Institute. The project is designed to preserve rural island culture across 17 unbridged, peopled islands in the Great Lakes. Over the last quarter, CRC staff visited one partner island – Beaver Island, Michigan – and now is working with the Michigan OGL to reach out to other islands – notably Madeline Island – and to develop an Island's Indicator database for Great Lakes islands.

In collaboration with residents and leaders from Madeline Island, we organized a four-day field visit to the island that introduced representatives from the Michigan Office of the Great Lakes (OGL), the Island Institute in Maine, and residents from Beaver Island, MI to Madeline Island. This was a pivotal step toward a Great Lakes Island Project designed to coordinate community development efforts in peopled Great Lakes Islands, and support the development of a Great Lakes Island Institute. In this period we:

- Set up a web site with support from our marketing department,
- Established and expanded our broad-based coalition of island stakeholders to support this effort,
- Planned a Great Lakes Islands Summit scheduled for September of 2017.

### **8. League of Women Voters of Ashland and Bayfield Counties**

We collaborated with the League of Women Voters on a series of events in the Chequamegon Bay area designed to disseminate innovative ideas on addressing inequality and promote local economic growth. This quarter we:

- Co-sponsored the first event in April featuring Laura Dresser, a labor economist and associate director at the University of Wisconsin COWS. Dresser discussed Wisconsin labor issues and labor-based strategies to address inequality.
- Co-sponsored the second event in June featuring Sarah McKinley, manager of Community Development Programs for The Democracy Collaborative. McKinley discussed strategies for community wealth building and provided examples from efforts around the country.

### **9. Economic Development Series**

We collaborated with the EcoLeague and Jonathan Martin, assistant professor of forestry at Northland, to host Davis Taylor, economist from College of the Atlantic. Dr. Taylor's visit to northern Wisconsin was to explore local economic development, cooperatives, and forestry in the region. During his visit, we sponsored his talk, "Unusual Economics: A Sustainable and Cooperative Future." This talk is part of an ongoing series related to discussing innovative ideas on addressing inequality and promoting local economic growth.

### **10. Maslowski Beach Project**

We are in the second phase of the beach project that measures drivers of risky and non-risky swimming behavior at Maslowski beach. After collecting baseline data over the last two summers (2014 and 2015) and analyzing these data to understand who is swimming, under what conditions they are swimming, and why they are swimming, CRC staff worked with project partners to produce a new warning sign. This sign was installed in June. We have started data collection to try to understand the effectiveness of the new sign and to see if the new warning system maximizes public health knowledge and minimizes beach users' contact with polluted waters. This study is funded by a Wisconsin Coastal Management Program (WCMP) award to the City of Ashland Parks and Recreation Department.

### **11. Dairy Feasibility Study**

We completed a market analysis to assess whether small dairy farms can capture a niche market by processing locally and transitioning to grass fed and/or organic dairy. The market analysis was the first step in determining if constructing a dairy plant and transitioning to certified, differentiated agricultural practices will be economically feasible for a group of local farmers. In this period we:

- Completed a direct to consumer survey,
- Completed interviews with area institutions, including hospitals, schools and local colleges and universities,
- Shared the results with our local partners.

## **12. Assets and Amenities**

Last year we completed the Ashland Assets and Amenities report, which compares Ashland to other north woods communities that are similar in size to identify opportunities for building on existing assets and expanding amenities. We then worked with the City of Ashland on the Strategies to Optimize Ashland Resources (SOARs) forum to disseminate findings and promote discussion around potential community-led economic development strategies for the city. Over 200 community members, including community leaders and interested citizens attended the forum. Beyond the initial scope of the grant, we continue to support to the Mayor of Ashland and City Planning department in their efforts to establish collaborations to further develop and implement the strategies identified at the forum. This quarter we:

- Met with Ashland City Planning to plan efforts to establish additional collaborations,
- Met with CBAP and Ashland Parks and Recreation to plan a community program for the Ashland waterfront.

## **13. SOARs forum Update**

We are working with the City of Ashland on a yearly update to the Strategies to Optimize Ashland Resources (SOARs) forum. The forum was designed to disseminate the Ashland Assets and Amenities report findings and promote discussion around potential community-led economic development strategies for the city. This quarter we:

- Drafted a document outlining updates and drafted a plan to disseminate information,
- In collaboration with the Chequamegon Bay Area partnership and Ashland Parks and Recreation, we facilitated two beach trail clean-up days in Ashland, and launched the I < 3 Parks program, designed to engage local community members in caring for local trails, parks and green spaces,
- In collaboration with Brendan Baylor, the Hulings Teaching Fellow in Drawing and Printmaking at Northland College, we received City of Ashland Plan Commission approval for a community art project designed to engage community members with the lake and downtown area, and enhance public spaces in downtown Ashland,

## **14. Roots in the Chequamegon Bay: Opportunities for Strengthening Community Attachment**

This quarter we released the "Roots in the Chequamegon Bay: Opportunities for Strengthening Community Attachment " report. The report used survey data (n=496) previously collected from communities in the Chequamegon Bay area to explore the relationship between social capital and community attachment, and inform investment in social infrastructure that can retain and attract community members. Findings were reported in the Ashland Daily Press and Wisconsin Public Radio.

## **15. Climate Change Adaptation**

We have prepared a proposal for a research project collaboration with the Northland College Center for Freshwater Innovation on a climate change adaptation grant. This is a regional collaboration in the Chequamegon Bay area to prioritize climate adaptation efforts by assessing the value of economic, social, ecological and cultural resources, and their vulnerability to climate change. We will use these data to inform adaptation plans that are relevant to the region. We plan to commence data collection in May or June.

## **16. Athletics Survey**

The Northland College administration has requested support in surveying the Northland community including students, faculty, staff, coaches, and alumni, about a prospective football program, athletic programs and other aspects of the college community. This effort will inform a larger study led by an independent consultant assessing athletic programs and examining the feasibility of adding a football program.

### **17. USDA National Institute of Food and Agriculture Grant**

This is a \$310,000 four-year award to improve access to local food for low-income households in Ashland and Bayfield counties, help achieve economic sustainability for small farmers in the region, and contribute to a body of knowledge that could help strengthen local food economies in other remote rural regions.



## **Hulings Rice Food Center**

Funding: \$11,250 since July, 2017

Collaboration: Students: 8

Faculty: 0

Staff: 1

Outcomes: Four research projects over the past six months.

### **2017 Research Outcomes Details:**

- Determined “value-added food products” that can be developed using mostly local raw ingredients and sold to the College’s cafeteria and to the local community. The project identified five products: baby food, garlic seasoning (using scapes rather than the bulbs), “All-Local” pizza, French fries, and hash browns.
- Tested the effects on texture and flavor of various foods that underwent blast freezing and storage for differing time periods (3 months, 6 months, 12 months). The food items included broccoli, carrots, green beans, potatoes. This project was in collaboration with Sustainable Agriculture Research and Education, University of Wisconsin Extension Office, Bayfield City, and four local farms.
- Identified a meaningful rubric to measure the amount of local food being served at the College (as opposed to being purchased) and creating a platform for local food data collection.
- Identified ways to process potatoes and a variety of different gravies so that they do not scorch or burn upon cooking/frying.

# Sigurd Olson Environmental Institute

Funding: Over \$2,000,000 since 2016

Collaboration: Students: 25 students through coursework and research projects

Employed Students: 12 additional to above

Post-graduation fellowships to NC students: 2

Faculty: 10

Staff: 4

Outcomes: The center produced 9 presentations, 2 publications, hosted 47 events, and interacted with 3,500 or more people (including local high school students) during education programming on wildlife, wilderness, policy issues, and regional and global sustainability. The center has worked with over 30 regional and national organizations.

## 2016-17 Research Outcomes Details:

### (1) Publications:

- **Wydeven**, Adrian and **Olson**, Eric, "Wolf Population Goals for Wisconsin: Opinions of the Wisconsin Chapter of the Wildlife Society ", Timber Wolf Alliance, 2018
- **Coulson**, Evan, "The 31st Annual Apostle Islands School Program Report." SOEI and USDI National Park Service, 2017

### (2) Projects:

- SOEI held a two-part series on the Paris Climate Change Summit. Maria Langholz, who co-led the U.S. Youth Delegation to the Summit, spoke a month before the conference to discuss the summit preparations and what to expect; Dr. Jonathan Patz of the U.W. Global Health Center and delegate to the conference spoke a month after the conference explaining the dynamics and accomplishments of the summit.
- **LoonWatch**: Conducted a statewide loon population survey (held every five years) to determine the status of loons in Wisconsin. This ambitious "citizen science" census recruited and coordinated 210 volunteers who surveyed over 200 lakes across 27 counties. The results show that loon populations are increasing, despite challenges to the species from disease, the BP oil spill, and habitat degradation. LoonWatch developed and distributed over 2,300 informational posters and over 2,000 fact sheets and brochures throughout the region. It held three annual lakes monitoring training workshops, essential to train new and existing volunteers about how what they can do to protect loons and their habitats. LoonWatch employs 1-2 Northland College students to assist in its educational outreach and monitoring. LoonWatch is working closely with the US Fish and Wildlife Service in a joint grant proposal to help loons through the BP Oil Damage Assessment Funds. The College's portion of the grant totals over \$2M over ten years to work on protection of loon habitat and educational outreach.
- **Timber Wolf Alliance**: Since 1990, the SOEI Timber Wolf Alliance (TWA) program has sponsored Wolf Awareness Week in October, which has now become celebrated by a number of organizations across the country. TWA produced and distributed nationally 10,000 wolf posters for public display, sponsored a visit to Northland College by Yellowstone's senior wildlife biologist for a public presentation on the 20<sup>th</sup> anniversary of wolf reintroduction to Yellowstone, and hosted two "citizen science" educational workshops on carnivore and wolf tracking. TWA is also working on wolf

conservation policy issues on various scales from local to international, including most of the Wisconsin tribes to discuss tribal concerns on wolf management and explore ways that TWA can promote conservation of wolves on and near tribal lands. TWA is also serving as a formal representative on the Mexican wolf recovery team for wolves in the southwest US and for the National Park Service scientists on the evolving Isle Royale National Park wolf management plan. TWA is exploring wolf conservation plans in New England by meeting with biologists, state wildlife administrators and others to discuss the status, ecology and future conservation of eastern wolves recently listed as threatened by the Canadian government. TWA also conducted winter wolf survey work with the DNR and other volunteers, participating in a wolf count to determine the Wisconsin wolf population.

- **Sigurd Olson Nature Writing Award (SONWA):** Each year the institute hosts a Nature Writing Contest where noted scholars and authors from around the world submit work to be considered. The winners provide presentations at Northland College regarding their work. Last year the winner in the adult book category went to Gary Ferguson for his book, "The Carry Home: Lessons from the American Wilderness." Paul Fleishman and Alan Rabinowitz won the award in books they authored for teen and young children, respectively.
- **National Marine Sanctuary:** A new SOEI project (started in January 2016) supports a local citizen-driven effort to nominate The Apostle Islands area of Lake Superior as a National Marine Sanctuary through the National Oceanic and Atmospheric Association (NOAA). Achieving this designation would provide funding for research and educational programs in the area. The project and nomination garnered unanimous Resolutions of Support from Bayfield, Ashland and Iron Counties, and strong support from shoreline communities, private and non-profit entities. In May of 2016, the written portion of the nomination was submitted for approval to the Tribal Councils of Bad River and Red Cliff. With approval from the Tribal Nations, state elected officials will be asked for their support so the final nomination can be submitted to NOAA.
- **Chequamegon Bay Area Partnership (CBAP):** SOEI organized and facilitated a partnership of about 20 resource management entities, both public and non-profit, around the Chequamegon Bay to provide greater coordination and cooperation on projects to improve water quality. CBAP organized a Chequamegon Bay Symposium in March which attracted over 70 people representing 31 federal, state, tribal, county and city governments and NGOs to share information about recent projects and discuss how the information can be used to inform local policy and management decisions regarding water resources. CBAP instituted monthly "brown bag" noon seminars at SOEI focusing on various resource projects being conducted in the area. It also sponsored a public information session titled, "Understanding Beach Monitoring in the Chequamegon Bay."

### **(3) Presentations:**

- "Under the Surface: Uncovering the Connections between Mental and Ecological Health through Underwater Photography", Sept. 23rd, 2017.  
Wolf Awareness Week, including a screening of "Michigan's Gray Wolf: Ghost of the Big Timber" and a lecture titled "The Future of Wolf Management: What Can You Do?" by Carter Niemeyer, Oct. 15th to 21st, 2017.
- Second annual "Planting the Seeds of Literature" Children's and Young Adult Literature Conference, Nov. 9th and 10th, 2017.
- Sigurd Olson Nature Writing Award Reading by Dan Flores, winner of the 2017 SONWA for his book
- "Coyote America: A Natural and Supernatural History." Nov. 16th, 2017.
- "Superior Connections" Film Premiere, Dec. 4th, 2017.

- "For the Love of Tiny" a presentation on Tiny House living by Lucas Will and Natalie Jackson, December 6th, 2017.
- Two-part Backwoods Skiing Workshop, Jan. 23rd and 27th, 2018.  
"A Year in the Wilderness" by Dave and Amy Freeman (Lecture 1: Boundary Waters Canoe Area Wilderness lecture series), Jan. 30th, 2018
- "Sustaining Lake Superior: Climate Change and Our Future" by Nancy Langston, Feb. 8th, 2018.
- "Wilderness Wrought by Man: The Interwoven Fate of People and Pines in the BWCAW" by Evan Larson (Lecture 2: Boundary Waters Canoe Area Wilderness lecture series), Feb. 13th, 2018.