Sea Grant Economic Benefits
2020 Examples Digest

Welcome to the 2020 Economic Benefits Examples Digest. This digest was created by the 2021 NSGO Socioeconomic Specialist Knauss Fellow to support and enhance future reporting by expanding programs' access to examples written by their colleagues. Thank you to those programs who were willing to share their entries from the 2020 reporting year.

For this year's digest, we selected a subset of economic benefits examples from 2020 that encompass a broad range of topic areas, geographies, and economic valuation methodologies. Specifically, we've included valuation examples of COVID-19 assistance, research to application, and marine debris program activities. While all the entries are strong, they also represent a spectrum of effort, from relatively simple to more detailed and complex. This collection is not intended as a 'best of' list; it is intended as a 'likely to be useful' list that reflects recent themes, discussions, and questions raised by programs in the past year. What was chosen or not chosen is not a value judgement on the entries themselves, rather, we chose to highlight examples that we think will be helpful because they differ from the examples shared in either the 2019 Digest or the economic valuation methodology guides, and it is our hope they may spark ideas for new valuations or present feedback that can enhance future practice. Ultimately, we hope that this will help all programs with their valuation efforts and economic stories.

Economic valuation for program reporting purposes is not an exact science, and our understanding of valuation does evolve and change each year. As an annual digest, this document is designed to reflect continual learning and be representative of themes from the year's annual reporting review. *This document is meant to be a helpful tool and we want to emphasize that it is not formal guidance.* These examples are meant to support thinking on this topic, but do not necessarily provide a road map for a "perfect" valuation. In the event that you are unable to find what you are looking for in the 2020 Digest, we encourage you to check out the following online resources, 2019 Digest, the methodology guides, Sea Grant Economics 101: A Guide for Reporting and Communication or feel free to join us on our monthly Sea Grant Economic Valuation Community of Practice calls. We welcome your feedback on this document and how it might be improved for next year's iteration.

Thank you!

Katherine Longmire – National Sea Grant Office Socioeconomic Specialist (2021 Knauss Fellow)
Alison Krepp – National Sea Grant Office Social Science and Economics Lead

Environmental Literacy and Workforce Development

1. Valuing a Specific Audience: Septic 101 Continuing Education Course for Realtors: The MDSG Extension and University of Maryland Extension faculty developed a new 1.5 hour Continuing Education (CE) credit program for realtors to better understand septic systems and their impacts on human and groundwater health. Groundwater quality concerns include understanding the proper maintenance of onsite wastewater treatment systems (septic systems), and realtors are an important type of professional to make use of and share this information. In 2020 the MDSG Extension and University of Maryland Extension faculty trained 115 realtors through this program and also hosted webinars for another 731 individuals. Using a BLS mean hourly wage estimate for Maryland realtors (41-9021 Real Estate Brokers) of $40.59/hour (May 2020), the opportunity cost for the CE training portion of this program is equal to 115 realtors*1.5 hours*$40.59, or a value of $7,002.

a. $7,002, 115 realtors educated about septic systems and water quality.

b. https://www.bls.gov/oes/current/oes_md.htm#41-0000

> **Why we chose this example:** We chose this entry because the details included present a clear and conservative approach to the valuation of a training with a specific audience (realtors). MDSG provides a number of details that increase defensibility such as the mean hourly wage estimate for the specific state (XX) and most recent wage data for the occupation (realtors) and month (May) prior to the SG reporting deadline. In addition to the valuation itself, MDSG provides additional richness by including the individuals reached via webinar, even though these participants are not part of the economic valuation.

2. Valuing Products Developed by Volunteers: In 2020, NH Sea Grant-trained Marine Docents provided a significant economic benefit to three NH marine education centers, enabling them to provide high quality marine science programs to a wide range of visitors—programs that the centers wouldn't be able to provide without this assistance, due to insufficient staffing, or lack of specific programming knowledge. Docents provided over $17,000 worth of services to a Science Center, a Discovery Center, and a local company in 2020. **The dollar value was provided by the science center based, not on service-hours provided by the volunteers, but on each individual center's average cost for developing and presenting a similar program.** Benefits associated with the programs include training of presenters by NH Sea Grant staff or researchers, creation of programming materials, and the audience contact time associated with each presentation.

> **Why we chose this example:** The NSGO accounts for volunteer hours in a separate performance measure and therefore programs are unable to monetize the volunteer hours themselves as an economic benefit because it would result in double-counting. We chose to highlight this entry this year because NHSG took a different approach with its 2020 reporting by valuing the products developed rather than the actual service hours of the volunteers (see bolded text). This provides an alternative approach for programs with volunteer activities to consider and avoids the double-counting associated with service hours.

3. Maximizing Valuations from a Workshop Series: In August of 2020, the S.C. Sea Grant Consortium hosted the fourth and final Palmetto Environmental Education Certification (PEEC) Workshop, culminating in the graduation of the 2018-2020 cohort of educators. The planning, organization, and administration provided by the Consortium for the final PEEC workshop for this cohort is estimated to have provided an economic benefit of $23,705 based on registration fees, savings on CEUs, and opportunity costs of time. For these efforts, 90% of the funding, resources, logistics, organizing, outreach, etc. is attributed to the SCSG Consortium. The registration fee for the 2018-2020 PEEC program is $450.

CEU Valuation: Twenty educators attended the final workshop, and four attendees received 120 CEUs each for attending all four workshops and completing required coursework ($450/120; cost of $3.75 per CEU). Based on comparable courses at private firms, the average CEU cost for similar courses is approximately $37.50 per CEU. Each CEU-receiving participant is estimated to have saved $4,050 (($37.50-$3.75)*120) by obtaining CEUs from these courses.

Willingness to Pay Valuation: For participants who did not receive CEUs, their willingness to pay is assumed to be the registration fee amount of $450 divided by four ($113).

Opportunity Cost Valuation: Based on the US Bureau of Labor Statistics (BLS) occupational employment statistics program's mean hourly wages for high school teachers in South Carolina (US BLS, 2020), the mean hourly wage of participants is assumed to be $25.94. The total value of benefits for government workers was $20.39 in December 2020 (US BLS, 2020), bringing the loaded hourly wage to $46.33. **Participants obtained value from these programs as attending was deemed an appropriate use of their time by either themselves or their supervisor, they deviated from normal routine to attend, and they obtained knowledge and skills.** The final workshop lasted 9 hours over the course of multiple days, therefore each participant has an associated opportunity cost of time of $416.95 ($46.33*9).

Summing opportunity costs with CEU savings ($4,050), and non CEU-receiving participant willingness to pay to attend the fourth workshop ($113), and multiplying by the number of participants and the attribution factor yields a total economic benefit of $23,705 based on the following equation: 90%* [(20*$416.95) + (16*$113) + (4*$4,050)].

> **Why we chose this example:** This entry provides extensive detail for maximizing the multiple valuations a program could perform to value distinct economic benefits from a workshop series resulting in a certification. The SCSG Consortium assigns a 90% attribution value because it was not the sole producer of the benefits and applies that discount value across the 3 benefits calculated - CEUs, willingness-to-pay, and opportunity-cost. The entry includes a clear description for 'opportunity cost' that provides a strong justification (see bolded text) for its application to the activity. Additionally, if this training provided CEUs that were required for these participants to retain their jobs, the program could further maximize this activity and include these participants as part of its 'jobs retained' performance measure as described in 2018-2021 Sea Grant Annual Reporting Guidance.

4. Valuing Partial Attribution non-Knauss Fellowships: One Oregon Sea Grant Malouf Scholar took a research position following their fellowship. This scholarship provides a monthly stipend for one year towards progress in their graduate research, giving advanced graduate students supplemental funds to incorporate an outreach and engagement aspect to their work. This scholarship amounts to about 54% of the full Graduate Tuition at Oregon State University. Based on Koropeckyj et al.'s (2017) conservative estimate showing a 12.2 percent earnings differential (which we attribute at about 6.1 percent per year of graduate school) for advanced degrees over college degrees, we assume that these fellowships result in a $3,132 earnings differential per year of work (based on a 6.1 percent markup on base median earnings of $51,357). Using the following equation, we conservatively estimate the increased earnings for this Sea Grant scholar over their first two years of working is $3,383: ($3,132 increased earnings differential per year of work) X (54% OSG attribution [based on $10,800 annual stipend/$~20,000 OSU Graduate Tuition) X (2 years of salary). Koropeckyj, S., C. Lafakis, and A. Ozimek. 2017. The Economic Impact of Increasing College Education. Available at: https://bit.ly/2vQwIOu Sea Grant Economic Valuation Guide: Workforce Development: Increased Earnings from Fellowship. Available at: https://bit.ly/2IIkbiA (Accessed March 2020) Data are from the OES program, BLS. Average of median wages for physical scientists and life scientists. (May 2018)

> **Why we chose this example:** Sea Grant programs fund many types of graduate fellowships that support policy, research, and, in this case graduate students who combine societally relevant research with education or public engagement. This entry from Oregon Sea Grant illustrates a valuation approach for a graduate fellowship using partial attribution (54%). The entry tells us that the fellow took a research position but it is unclear what the stated $51,357 in median earnings value is based on. The entry's transparency would be enhanced with the inclusion of this information to know if this was a research or scientist position in Oregon, for example.

Sustainable Fisheries and Aquaculture

5. Incorporating context to strengthen attribution: With ongoing support from N.H. Sea Grant, oyster aquaculture continues to expand in NH, building a sustainable seafood industry in New England. In 2020, NHSG funded research projects continued to provide information in areas including 1) identification of, and testing for, new strains of Vibrio Parahaemolyticus; 2) identifying the conditions under which coliphage viruses may not require closure of harvest areas and expanding harvest classification up into the Oyster River where new licenses have been established; and 3) studies of wastewater discharge relative to PFAS and SARS-CoV-2 removal.

NHSG supported the growers by continuing to fund a development project, and providing Extension staff facilitation, to promote the formation of an oyster growers' organization, whose aim is to support one another through permitting and alternative markets. In 2020, NH Sea Grant Extension engaged, and supported, NH oyster farmers at semi-annual meetings with the NHDES. These meetings covered a wide range of issues including permitting changes, shellfish closures and seafood safety. NHSG extension addressed the needs of new industry members regarding permitting, gear, site and seed selection, grow out

methods and market outlets, and farmers were assisted and supported through the public hearing process that allows them to finalize their state aquaculture permit.
2020 was defined by the COVID-19 pandemic, which resulted in dramatically shifted markets as restaurants either closed or operated under drastically limited hours and capacity. The shutdown of restaurant dining due to the COVID-19 pandemic drastically decreased the primary income source for the growers, threatening the industry that is still in a rapid-growth phase. NHSG supported 8 growers through a COVID-19 response initiative that involved, and compensated, growers in habitat restoration efforts. 10,000 oysters were purchased from each of the 8 farmers and moved to sites that will provide a natural habitat for oysters in the Great Bay estuary. Additionally, NHSG supported the growers by developing a Local Seafood Finder Map. Three growers were identified for direct-to-consumer sales, and several seafood markets selling local oysters were included.

Due to New Hampshire's relatively small coastal area, which puts NHSG in close geographical proximity to the entire oyster aquaculture industry in the state, we are able to maintain a key role in maintaining all aspects of the industry—ecosystem health, seafood safety, culture and harvesting methods, permitting, and product marketability. We are in regular contact with most growers, and NHSG includes an active oyster grower on its Policy Advisory Committee. Because of this keystone role, and holistic approach, we conservatively estimate that 60% of oyster aquaculture's ecosystem benefits and economic impacts are attributable to our work.

A NOAA Center for Coastal Monitoring and Assessment study performed during 2014 validated NHSG's approach to the reduction of nutrient loading through oyster aquaculture. Based on the study's nitrogen removal rates per acre (661 lbs/acre/yr), and the cost of nitrogen removal (~$70/lb), the 2020 level of 73.9 acres in culture in the Great Bay Estuary (2020 NHFG Aquaculture Compendium) provided an ecosystem service of approximately $3.3m in 2020 (Source: NOAA Center for Coastal Monitoring Assessment study). 661 lbs/acre/yr x $70/lb = $46,270 acre/yr x 73.9 acres = $3,419,353 x 60% = $2,051,612.

> **Why we chose this example:** This entry is extensive but provides details that strengthen the program's claim. The entry includes what assistance was provided and why, who benefited from the assistance, and how the program was critical to the industry and, by extension, the ecosystem services provided. Here, the program estimates 60% of the ecosystem services provided through oyster aquaculture operations are attributable to the program. This estimate may seem high at first glance, however, the program provides enough detail and justification to make it reasonable.

6. Jobs And Business Support And Creation: Fish producers are under extreme pressure to keep up with process changes to safely produce and process fishing that complies with the rapidly changing health and safety protocols. Michigan Sea Grant provided consultation with a Michigan fish producer over the state's recent decision that they needed to stop production of smoked salmon due to a misinterpretation of a food safety rule. As a result of Michigan Sea Grant's consultation, the company was able to restart production of smoked salmon four weeks earlier than it would have without Michigan Sea Grant's consultation and saved $22,500 by being able to continue selling their smoked fish. This outcome also

supported six smoked fish production jobs that collectively make ~$2,200 per week over that four week timeframe, resulting in a total ~$8,800 more wages earned than if Michigan Sea Grant had not intervened.

In addition to this, Michigan Sea Grant's consultation led the company to create a new job as a sanitation control manager that would help avoid this situation in the future. The estimated salary for this position is $30,000, and would have not been created if it were not for Michigan Sea Grant's consultation.

Please see the following link for all estimated salaries at Fish Co: **
<google doc link with added documentation>
** Link redacted from example

Total wages supported: (~$2,200 total wages for six employees) x (4 weeks of earlier smoked fish production) = ~$8,800
Revenue saved due to being able to open 4 weeks earlier: ~$22,500
Total salaries created as a result of Michigan Sea Grant consultation: ~$30,000 as a Sanitation Control Manager

Total economic benefit for the company and its employees: ~$61,300

> **Why we chose this example:** This entry does an excellent job providing the rationale and calculations for the basis of the economic benefits, they are concise, clearly described, and the program went the extra mile and provided a letter from the company attesting to MISG's critical support. However, because this entry includes both total wages and revenue saved, MISG could increase the entry's rigor by reaching out to the company to clarify and/or affirm that the numbers provided for the total wages supported and revenue saved are distinct from each other as separate benefits since a company's revenue can be inclusive of its wages.

7. Valuing job and business support from program development funds: Sea Grant made a program development award to an oyster hatchery in May 2020 to diagnose and address a sudden problem with poor larval development in their oyster hatchery related to their UV sterilization system. They used the funds to make short term changes to stabilize production, diagnose the source of the problem, and initiate industry and research collaboration to address the issue in the future. They reported that the investment allowed them to retain 8 jobs in their hatchery and research department.
(6x $37,700 = $226,200) Agricultural and Food Science Technicians - 19-4010
+(1x $46,320 = $46,320) First Line Supervisor of Farming, Fishing, and Forestry Workers - 45-1011
+(1x $67,460 = $67,460)
Environmental Scientists and Specialists, Including Health - 19-2041
= $339,980

> **Why we chose this example:** This example illustrates an economic benefit resulting from the application of program development funding to an urgent and unanticipated industry need. Support from ME Sea Grant allowed a company to research and fix a potentially crippling problem that arose with their product. Due to the program's

relationship with the industry member, they were able to track and report the economic benefit (jobs sustained) resulting from the receipt of program development funding and were able to retain positions that they otherwise would not have been able to afford.

Healthy Coastal Ecosystems

8. Using an economic study to value artificial reefs: Florida Sea Grant provided essential technical assistance to help the Florida Fish and Wildlife Conservation Commission (FWC) and communities plan and manage local artificial reef programs. Cross et al. (2018) found that 48% of anglers utilized Florida's artificial reefs generating $3.1 billion in annual economic activity (FWC, 2018). FSG also supports science for monitoring the use and impact of fishing on Florida's artificial reef resources. Primary programmatic achievements for 2020 led by FSG was a virtual 2020 Florida Artificial Reef Summit attended by 200 resource and local government managers - an additional 1,000 people attended via Facebook Live. FSG was also instrumental in the deployment of eight new permitted areas in the Buckeye Reef Complex, off of Taylor County, enhancing the 800 acre fishing habitat. Based on a 2016 economic study conducted by a researcher from the University of West Florida, and data from the FWC, the direct economic value of one reef is $1,033,000 and 13 jobs. Florida's Artificial Reef Coordinator stated: "I wholeheartedly feel that Florida's Artificial Reef Program would not be able to achieve our strategic statewide objectives without the critical support from FSG." FSG's, significant contribution to the organization of these statewide efforts is calculated at 25% - ($1,033,000 X 8 new reefs)* 0.25; (13 jobs X 8 new reefs)*0.25.

Why we chose this example: This entry presents an evidence-based approach to arrive at a 25% attribution value of FLSG's program activities to the economic value of artificial reefs. FLSG concisely describes the nature of their ongoing program activities, provides specific activities in 2020, a testimonial from the state Coordinator and references a 2016 economic study to build its case for the economic benefits provided. While this entry provides robust detail and evidence for its claim as is, two details that would further enhance this benefit are a link to the 2016 economic study cited and an affirmation that the eight 'new' permitted areas occurred in 2020.

9. Economic Benefit of Marine Debris Removal: Florida Sea Grant's adopt-a-waterway program and marine debris removal campaign help support safe navigation and reduce boating impacts in 2,500 acres in Taylor County and 7,608 acres in Hernando County. This effort substantively supports a broader initiative by Taylor and Hernando Counties to improve boating and navigational access. A recent FSG economic study (Florida Sea Grant Technical Publication 177) values the contribution of these services at approximately $7.1 million in direct (no multiplier effects) annual economic impact and 158 jobs to Taylor County alone. These impacts are assumed to equate to nearby Hernando County. FSG's contribution to this economic impact is valued conservatively at 10% - for organizing these waterway improvement efforts and for implementing the economic impact analysis. (7.1M *0.10) 2 county's). https://nsgl.gso.uri.edu/flsgp/flsgps11001.pdf.

Why we chose this example: We anticipate more investment in marine debris in the future and FLSG's entry illustrates some points for considering valuation options for marine debris oriented activities, like Adopt-a-Waterway programs. FLSG has the benefit of an economic study to anchor its calculations, takes care to state that no multipliers were used in the study, and gives itself a relatively conservative, 10% attribution value for the economic impact of its programming. FLSG has strong base elements here but it could strengthen this entry in the future with additional programming details like including how many participants take part each year or describing other campaign activities. FLSG is also transparent in stating that they transferred the Taylor County study to nearby Hernando County, but could add a sentence in the future that provides a bit more justification for the comparability of the two counties.

10. Valuing tool development and agency assistance: An MIT Sea Grant data visualization specialist reduced time spent in analyzing and visualizing water quality data collected from 40 sites across Nantucket by 88%. The Nantucket Natural Resources Department (NNRD) collects water quality data from more than 40 static sensors around the island. Data analysis and visualization of these data was time-consuming and took approximately 240 hours annually to complete. Development of the Water Quality Analysis and Visualization (WQAV) tool, developed from MIT Sea Grant's Seaglass web framework, increased NNRD's data analysis workflow and reporting efficiency. WQAV performs thousands of calculations instantly and creates interactive maps, replacing the old system where data was hand-entered into a spreadsheet and then fed into a separate system to perform calculations and create a static plot. NNRD employees estimated the new workflow takes 30 hours. This results in a time savings of 210 hours annually and an annual cost savings of $6,253.80 (based on the mean hourly wage of $29.78 for a Life, Physical, and Social Science Technicians, All Other in MA (BLS occupation code 19-4099, https://www.bls.gov/oes/current/oes_ma.htm) (2018-A/A-5)

Why we chose this example: This entry illustrates Sea Grant's efficacy in assisting communities to achieve efficiencies that in turn can also help address resource gaps through technology and/or research innovations. Here, MIT Sea Grant used BLS mean hourly wage to value the cost savings of a time-saving tool developed by a Sea Grant program staff for a municipal agency.

11. Valuing volunteer impacts through ecosystem service valuation: Mississippi-Alabama Sea Grant Consortium (MASGC) organized or facilitated 10 cleanup events. The events attracted 1,039 volunteers who contributed 4,156 volunteer hours and removed 13.9 tons of litter, which carries a conservative ecosystem service impact of $45,870. 13.9 tons of trash x $3,300 per ton (Beaumont et al. 2019) = $45,870 – Citation: https://www.sciencedirect.com/science/article/pii/S0025326X19302061 (MASGC Project A/O-49, Core Extension, POC: Eric Sparks) (See Impact 31793)

Why we chose this example: This entry provides another approach to valuing activities that often involve volunteers but values the ecosystem service provided rather than the service hours of the volunteers. MS-AL conservatively uses the lower-bound of the study cited in the entry but could strengthen future entries by including an additional sentence or two on the study's relevance to the clean-up activity (e.g. marine plastics, type of habitat).

12. Cost Savings due to New Technology: MASGC extension specialists led the design of DIY low-cost wave gauges. Over the last year, 28 researchers have used or built 160 of these gauges. The cost for each DIY gauge is $200 and the comparable commercial gauge is $3,000. $3,000 (commercial) - $200 (DIY cost) = $2,800 of cost savings per gauge. $2,800 x 160 = $448,000 cost savings. (MASGC Project A/O-49, Core Extension, POC: Eric Sparks) (See Impact 31792)

> **Why we chose this example:** MS-AL provides the essential elements of this succinct cost-savings benefit in just 4 sentences. While the entry could be enhanced by adding a sentence or two with some added context that describes the gauges' utility and application, this entry illustrates that economic valuations are not always lengthy endeavors.

Resilient Communities and Economies

13. Using transparency to enhance workshop valuation: Vertical Land Motion Workshops: The Vertical Land Motion in the Chesapeake Bay Workshop took place on February 28, 2020, in person at the Virginia Air and Space Center Library. This workshop was hosted in partnership with the Chesapeake Bay Sentinel Site Cooperative and led by the Maryland Sea Grant's Sentinel Site Coordinator. This was an opportunity for coastal resilience scientists, managers, planners, and communicators to engage with vertical land motion's geologic, hydrologic, and geodetic community, and to promote better communication on this topic. This event included 83 participants, 76 of which did not have a Sea Grant affiliation. There were a variety of professional categories present, but a conservative wage estimate that also represents the largest common professional denominator is the BLS category "19-2041 Environmental Scientists and Specialists, Including Health," which has a mean hourly wage of $40.71. We estimate that on average participants travelled approximately 50 miles to the event, which at UMCES mileage reimbursement rate = $0.565/mile. The opportunity cost for non-Sea Grant attendees at the VLM workshop therefore is approximately 76*$40.71*8 = $24,752, plus the estimated mileage cost of 50mi*76 indiv.*$.56.5/mi = $2,147, for a total value of $26,899.
a. $26,899 value, 76 non-Sea Grant attendees.
b. https://www.bls.gov/oes/current/oes_md.htm#19-0000

> **Why we chose this example:** We chose this entry for its transparency. The program is concise and clear in laying out the assumptions and calculations associated with its valuations. Their practice to distinguish between the Sea Grant and non-Sea Grant affiliated attendees increases the entry's rigor and keeps the focus on the economic benefit provided to community stakeholders and leaders. In addition, they also recognized that the non-Sea Grant attendees represented a variety of professional categories but kept the entry concise by valuing only the most represented category.

14. Valuing technical assistance to address community capacity gaps: A county in Texas lacked the resources needed to source a private firm or the experience to develop a comprehensive plan internally. Texas Sea Grant worked with county leadership and citizens to develop a comprehensive plan, which they adopted in 2020. The hourly rate for a private firm to develop a community plan is approximately $36.52 per hour (BLS: Urban and Regional Planners https://www.bls.gov/ooh/life-physical-and-social-science/urban-and-regional-planners.htm) for a minimum of 9 months for a full comprehensive plan. Texas Sea Grant provided planning specialists and geographic information system technical support at a total of 560 hours (3 months) at no cost to the community in 2020 ($36.52 per hour x 3 x 560 hours = $61,353).

> **Why we chose this example:** We chose this entry because it highlights the value of Sea Grant's technical assistance to communities where planning capacity and technical support is limited. It is a well-written model for other entries on valuing assistance to a community. The entry provided a reason for the assistance, tracked the hours of involvement along with the direct link for the hourly rate according to BLS, and clearly spells out how the program calculated their result.

15. Valuing research to application with baseline data: Michigan Sea Grant provided funding to a regional research project led by a researcher to assess coastal resiliency for Lake Michigan communities. As part of this research, the researcher developed a technique/tool that increases the efficiency and cost-effectiveness of nearshore surveys, a tool that can be used for other coastal assessments of the impacts of changing water levels on Great Lakes coastal communities. The researcher and his team maintain log books of all of their precision nearshore survey missions from 1987 to present. In the past, their original survey required a field crew of at least five people. The cost of five people in the field (salary, per diem, lodging, vehicles, fuel, etc.) was well over $1,000 per day when they began and is now approximately $2,000 today. Five survey lines a day along the Lake Michigan shoreline was a very productive day. With the new system in 2020, the researcher was able to do five lines in 2.5 hours by himself. We estimate the cost savings for 10 lines to be $4,500. Using a survey of 10 lines with the new system will cost one person $500 for 5 hours of field surveying and 1 hour for the automated digital data reduction. This compares to the old system that had five people working for two days (~12 hours) in the field along with these five people in the lab reducing and plotting the data for an additional day, totaling to $5,000. This new procedure reduces labor costs and time in the field, allows for more efficient use of research time and funds, and could be used for similar surveys for all five Great Lakes.

Cost of 10 survey lines doing work manually: (~$2,000 for 5 lines in one day of work with five people) x (2 days of work) + (~$1,000 for one day of work manually graphing) = ~$5,000 in 3 days for five people
Cost of 10 survey lines doing work with new automated digital data reduction: ~$500 in 2.5 hours for one person

Cost Savings by using new automated digital data reduction technology for 10 survey lines: (~$5,000 and three days using 5 people) - (~$500 in 2.5 hours for one person) = $4,500 cost saving

Project ID: R/SD-5 - An Integrated Physical-Social-Community (PSC) Approach for Sustainable Shore Protection, Beach Integrity, and Bluff/Dune Stabilization Along Lake Michigan

Why we chose this example: We chose this example because it illustrates an economic valuation performed for a research to application activity and the value of having baseline data available. Here, MISG was able to calculate the cost savings resulting from the tool developed by the research because of the availability of baseline data. In addition, the program provides the project ID number in the write-up and this detail enables the National Sea Grant Office to track and include this project in both program reporting as well as the NOAA Research and Development Database as well.