Sea Grant Economic Benefits
2021 Examples Digest

Welcome to the 2021 Economic Benefits Examples Digest. The purpose of this document is to support and enhance future reporting by expanding programs' access to examples written by their colleagues. Each year the diversity of entries and applications of the methodology guides become more robust each year. Now in its third year, the Annual Examples Digest has shared examples from 27 state programs to help their peers and enhance the story of Sea Grant's economic value - thank you to the programs who have made these compilations possible.

Each year, we select a subset of economic benefits examples from the prior reporting year that reflect recent themes, discussions, and questions raised by programs in the past year. The 2019 Digest included an array of examples that highlighted how to use Sea Grant's methodology guides. We continued this in 2020 with added focus on valuations involving COVID-19 assistance, research to application, and marine debris. For 2021, we've provided the usual variety and increased examples of resilience activities and their associated valuations, including assistance with securing grants. The entries 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. What was chosen or not chosen is not a value judgment on the entries themselves, rather, we chose these examples because they differ from the examples shared in either the 2020 Digest, 2019 Digest or the economic valuation methodology guides. It is our hope these entries 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 2021 Digest, we encourage you to check out the following online resources, 2020 Digest, 2019 Digest, the methodology guides, Sea Grant Economics 101: A Guide for Reporting and Communication. Sea Grant also hosts an Economic Valuation Community of Practice whose activities are communicated and coordinated through a listserv, please reach to Alison.Krepp@noaa.gov if you'd like to join.

Thank you!

Alison Krepp (NSGO) and Brandon Uckele (MI Sea Grant)

Co-Chairs, Sea Grant Economic Valuation Community of Practice

Resilient Communities and Economies

1. Flood Insurance Savings: Regional South Atlantic Sea Grant partnership helps Monroe County, Florida, receive improvement in its Community Rating System score, that is now providing 14,255 National Flood Insurance Program policyholders in the county a 25 percent premium discount on their flood insurance, with an additional 10 percent slated for 2022. The FSG funded research team is currently working with Monroe County to further improve its CRS score from a class 5 to a class 4 designation. These discounts are now saving policyholders about $5,317,202 a year, an average of $373 per policy per year according to a news release from Monroe County that discusses this flood insurance cost saving with the CRS Class 5: http://www.monroecounty-fl.gov/691/Community-Rating-System-CRS. Calculation: The CRS methodology guide requires documentation of the marginal change due to FLSG programming ($522 - $373 = $149 per policy for going from Class 6 to Class 5). This equates to a savings of $2,123,995 (14,255 policies * $149 in additional savings per policy = $2,123,995). FSG continues to report this economic benefit for 2021 as work continues to further improve Monroe County's CRS rating. FLSG's Role: FLSG co-sponsored the project with south Atlantic Sea Grant Programs. End User: Monroe County, Florida. Project number R/C-S-65.

Why we chose this example: This is a clear and concise example where the economic benefits realized by the community are coming through a Sea Grant funded research team rather than the technical assistance of a Sea Grant Extension agent. In addition, the inclusion of the program's calculations and end users add clarity and transparency.

2. Resilience Workshops with Partners: The Consortium partnered with the North Inlet Winyah Bay NERR, ACE Basin NERR, SCDNR, and USC to develop and host 2 wetlands buffer trainings. The first training focused on design and siting considerations, while the second focused on putting buffers into practice. Attendance was virtual and free, and stormwater engineers, land use professionals, real estate agents, and local government employees attended. The planning, organization, and administration provided by the Consortium for the 2021 Wetland Buffer trainings is estimated to have provided an economic benefit of $6,919 based on the provision of continuing education credits (CEUs) at a discounted rate, registration fees, and opportunity costs of time. For the first training, 177 non-Consortium participants attended, and 112 of these participants received 1.5 CEUs each for their time. For the second training, 80 non-Consortium participants attended, and 72 of these participants received 1.5 CEUs each for their time. Based on comparable courses at private firms, the average CEU cost for eight similar courses is rounded to $34.45 per CEU. Each CEU-receiving participant is estimated to have saved $51.67 ($34.45*1.5) by obtaining CEUs from the trainings. The occupations were mixed and based on the US Bureau of Labor Statistics (BLS) occupational employment statistics program's mean hourly wages for all occupations in South Carolina (US BLS, 2021), the mean hourly wage of participants is assumed to be $22.83. The total value of benefits for civilian industry workers was $12.52 in December 2021 (US BLS, 2021), bringing the loaded hourly wage to $35.35. Participants obtained value from this meeting as attending was deemed an appropriate use of their time by either themselves or their supervisor, they deviated from normal work duties to attend the workshop, and they obtained knowledge and skills. Approximately 25% of the effort (e.g. funding, resources, logistics, organizing, outreach, etc.) needed for the implementation of both the conference and the field day is attributed to the Consortium. Each training

lasted 2 hours, therefore each participant has an associated opportunity cost of time of $70.70 ($35.35*2). Summing opportunity costs ($70.70), with CEU savings ($51.67), and multiplying by the attribution factor (25%) yields an economic benefit of $30.59 per CEU receiving participant. For non-CEU receiving participants, opportunity costs ($70.70) are multiplied by the attribution factor (25%) to derive an estimated economic benefit of $17.68 per non CEU-receiving participant. Multiplying $30.59 by 184 participants, multiplying $17.68 by 73 participants, and summing these two aggregates yields a total economic benefit of $6,919 for the trainings.

> **Why we chose this example:** Sea Grant's resilience activities often involve partners and this entry illustrates attribution in two ways (1) qualitatively by naming the partners and (2) quantitatively by assigning a percentage for Sea Grant's contribution to the shared effort in the valuation calculations.

3. Continuity of Commercial Operations: Virginia Sea Grant extension staff at Virginia Tech provided direct technical assistance to six seafood companies in Virginia. The direct support helped the companies resolve incomplete Seafood Hazard Analysis and Critical Control Point (HACCP) plans, incomplete/inadequate sanitation and monitoring documentation, deficient implementation of Good Manufacturing Practices (GMPs), and provided support to complete variance requirements. The support helped each company meet the requirements set by the U.S. Food and Drug Administration (FDA) Seafood HACCP regulation 21 CFR 123 and Food Safety Modernization Act (FSMA) regulation 21 CFR 117. As a result, these companies were able to sell their products, including soft-shell crabs, smoked seafood, oysters, trout, live conch, and cooked shrimp, while keeping associated costs to a minimum. This assistance sustained 36 seafood processing jobs and six owner/manager positions at six companies. Two of these companies were new, which created two jobs. Annual Mean Wage for Butchers and Other Meat, Poultry, and Fish Processing Workers (BLS Occupation Code 51-3020; accessed May 2022) = $33,360 per employee, and Annual Mean Wage for First-line Supervisor of Farming, Fishing, and Forestry Workers (BLS Occupation Code 45-1011; accessed May 2022) = $54,450 per employee. VASG Project A/721542

Economic Benefit or Impact	Businesses Created	Businesses Retained	Jobs Created	Jobs Retained
$1,527,660	2	4	2	42

> **Why we chose this example:** We placed this example here rather than SFA because of its economic focus on continuity that others may want to adapt. The details provided increase the entry's defensibility and VASG fully transferred the details from the narrative to the metrics for jobs and businesses - we don't always see this from programs in their reporting submissions. Inclusion of the calculations would improve the valuation's transparency in the future.

4. Job Creation to Support Resilience: Wisconsin Sea Grant, through A/AS-1, supports an outreach specialist focused on water quality. Through this individual's work, resiliency work in the city of Green Bay accelerated in this reporting year. A project team has been studying factors leading to repeated flooding in a Lake Michigan tributary river, and with WISG assistance, the city is developing resiliency plans. There was also a three-part flood resilience field tour series focusing on the upper, middle and lower parts of the watershed. To begin implementation of WISG-informed plans, the city hired two staff members in the Bureau of Labor Statistics field of environmental scientists and at the rate for Wisconsin (2 x $74,710 at 50%=$74,710). The water quality specialist also works with collaborators on a statewide clean marina program that this year sustained a Wisconsin Marine Association executive director. WISG provides training and technical assistance for marinas to improve water quality. (The Wisconsin rate of a management position is $145,400/annual and accounting for taking 10% of that=$14,540). Combining the figures for the three jobs leads to $89,250.

> **Why we chose this example:** Sea Grant programs provide planning assistance in many communities that result in planning documents and recommendations. Job creation is a concrete outcome from WISG's technical assistance in the development of Green Bay's resiliency plans. In this case, WISG claims a conservative percentage (10%) of the value of the created job.

Sustainable Fisheries and Aquaculture

5. Fisher Assistance Valuation: An average of ten million pounds of shrimp are landed with a dockside value of more than twenty million dollars in Vermilion, Iberia, and St. Mary Parishes Louisiana. Using the 2018 Louisiana Summary: Agriculture and Natural Resources link, https://www.lsuagcenter.com/~/media/system/7/9/6/7/796773af58d4c3e610063c7a8f7985f1/pub2382%20ag%20summary%202018_fullpdf.pdf, there are small businesses in these three parishes which directly employ over 400 people with an average of 3-4 fisherman per boat (120*3.1 persons), most of these are Vietnamese.

Louisiana Sea Grant (LSG) provides fishers in these parishes with easy-to-understand fact sheets and assistance so that they can better understand new bycatch regulations, U.S. Coast Guard documentation, and state and federal fishing licensing requirements that pertain to their business operation. In 2021, 120 fishing businesses in these parishes participated in Louisiana Sea Grant's fisher assistance program that included important information about permitting, landing limits, seasons, and shrimp harvesting gear. Fishing businesses are required to comply with numerous state and federal fishing regulations and marine safety rules. This program focuses on keeping fishermen up to date on the frequent changes to fishing and safety regulations so that these businesses can remain in compliance and continue to operate. Through this program, Louisiana Sea Grant directly impacted: 120 fishing businesses, and 400 jobs were sustained. This program supported and sustained $15,048,000 worth of jobs in these 120 businesses (400 people * average wage of $37,620 = $15,048,000). Salary data are from the Bureau of Labor Statistics and are specific to the Farming, Fishing, and Forestry Occupations (Major Group) for Louisiana.

Why we chose this example: The social and economic context provided in this entry strengthen the defensibility of the large valuation claimed by LASG. The program also provides brief and helpful details that focus on the value of proactive extension support as an economic benefit, namely that keeping fishers in compliance maintains business continuity.

6. Cost Savings of Technology Adoption: Texas Sea Grants efforts to educate fishermen on the 186 Cameron County, TX shrimp vessels about sustainable fishing technologies resulted in a total diesel fuel savings of $4,262,053 in 2021 ($2,053,819 fuel savings from advanced netting + $2,208,234 fuel savings from cambered doors = $4,262,053 total fuel savings based upon an average of $3.48/gallon of diesel fuel in 2021 from the afdc.energy.gov report). All 186 Cameron County shrimp vessels are now using advanced netting saving an annual average of 3,173 gallons per vessel (3,173 gallons x 186 vessels = 590,178 total gallons of fuel savings x $3.48/gallon = $2,053,819). Fifty Cameron County shrimp vessels use cambered doors saving an annual average of 12,691 gallons per vessel (12,691 gallons x 50 vessels = 634,550 total gallons of fuel savings x $3.48/gallon = $2,208,234).

Why we chose this example: The focus on cost-savings from sustainable technology and the use of a new valuation tool, afdc.energy.gov, present a new direction for valuation that may not be readily considered by other programs but very applicable for operations focused industries like fishing.

7. Valuing Cost Avoidance: As a result of Texas Sea Grant training to shrimp vessel captains and crew on the installation and use of 157 turtle excluder devices (TEDs), 133 fishermen from 45 vessels learned how proper TED use can increase shrimp capture and decrease impacts to sea turtles and other bycatch and adopted best practices to comply with federal regulations. Fishermen avoided $368,000 in fines and used TED compliance verification to access markets and consumers seeking sustainably harvested shrimp. Of the 45 vessels inspected, 32 had non-compliance TED deficiencies (5 major and 68 minor) which were corrected onsite through TXSG support. TXSG's actions resulted in these vessels avoiding penalties that average $1,000 per TED minor non-compliance, and $60,000 per TED major non-compliance in fines and seizure of products. TXSG saved fisheries $368,000 by avoiding penalties and loss of product [(68 TED Minor x $1,000) + (5 TED Major x $60,000) = $368,000].

Why we chose this example: Cost-avoidance is an important part of Sea Grant's work but is often difficult to value. This example using TEDs provides a template for cost-avoidance documentation that may have transferability to other Sea Grant activities where cost-avoidance is the desired outcome, such as permit and planning work associated with resilience.

8. Required Training: WASG-coordinated Coast Guard required Drill Instructor and First Aid training for fishermen allows vessels to continue safe and legal operations (45 in Drill Classes + 96 in First Aid classes x $38,050 mean wage (BLS occupation code 45-0000) = $5,365,050). A/ACE-1

> **Why we chose this example:** While other entries in this Digest highlight context and added value details, this entry takes a minimalist approach. This valuation is simple and direct and provides the essential elements needed to value a required training.

9. Aquaculture Capacity Building: Oyster Remote Setting Training Program: This program has continued to successfully grow in Maryland and significantly expand oyster aquaculture production. A Sea Grant aquaculture extension agent at UMCES Horn Point Laboratory operates a demonstration farm and a remote setting aquaculture training program. Through the training program, she worked with 25 submerged land leaseholders in Maryland to train and equip them to successfully set 320 million larvae and operate remote setting systems, yielding 96 million spat planted on Maryland leases in 2021. Assuming the spat have 15-20% survival to harvest in the Chesapeake Bay (Congrove et al. 2009; Bosch and Shabman, 1990), they will yield a harvest of 14.4-19.2 million oysters. At 300 oysters per Maryland bushel, that is 48,000-64,000 bushels. At $55/bushel paid to leaseholders (Parker et al. 2020; Hudson, 2019), that gives us a harvest value to leaseholders of $2.64-$3.52 million. Opting for the conservative estimate means we have a valuation of $2.64 million. Further, five of these growers are now operating their own systems, no longer reliant on the program's physical resources.

- Supported 25 businesses retained.
- Total value of approximately $2,640,000.

Citations:

Bosch, D. J., & Shabman, L. A. (1990). Reversing the decline of private oyster planting in the Chesapeake Bay: an evaluation of policy strategies.

Congrove, M. S., Wesson, J. A., & Allen Jr, S. K. (2009). A practical manual for remote setting in Virginia.

Hudson, K. (2019). Virginia Shellfish Aquaculture Situation and Outlook Report. Results of the 2018 Virginia Shellfish Aquaculture Crop Reporting Survey, VIMS Mar. Resour. Rep. Virginia Sea Grant VSG-19-3 (2019) 8. Virginia Sea Grant Marine Extension Program, Virginia Institute of Marine Science.

Parker, M., Lipton, D., & Harrell, R. M. (2020). Impact financing and aquaculture: Maryland oyster aquaculture profitability. Journal of the World Aquaculture Society, 51(4), 874-895.

> **Why we chose this example:** Sea Grant is a key driver in the growth of the aquaculture industry in many states. This entry provides a template that can be adapted by others in terms of key information leading to a defensible and rigorous economic valuation of extension efforts supporting aquaculture development.

Environmental Literacy and Workforce Development

10. Loaner Program Cost Savings: In 2021, 12 educators borrowed a Hydrolab as part of IISG's LimnoLoan program, which they used to supplement existing lessons. A survey of private consultant websites reveals that Hydrolabs rent for about $400 per week. Assuming each teacher kept the Hydrolabs for 2 weeks, that yields an economic impact of $9600. As usual, we round down a bit to be conservative.

> **Why we chose this example:** This is another example of a valuation approach that is not lengthy or involved and calculates the cost-savings realized by educators when using loaner equipment. There is an assumption in the write-up that there was a $0 cost to the educators and the entry could be enhanced by including this information in the future.

11. Proxy Value for In-Classroom Programming: AinA #1: The Aquaculture in Action (AinA) program continued support for in-classroom aquaponics systems for raising bluegill fish in 2021. The program supported systems in classrooms in Carroll County, MD as well as at the Baltimore Polytechnic Institute High School (Baltimore, MD). This program included 11 teachers/classrooms and approximately 2 hours per day (5days/week for 8 months, or 160 teaching days) of system upkeep and related teaching activities . With a BLS estimate of the median Maryland teacher's salary of $75,840 (for an approximately 180 day school year, using BLS category 25-2031 Secondary School Teachers, Except Special and Career/Technical Education), this works out to $52.67/hr. Based on the value of the teachers' time, the time commitment of the project (2hrs*160 days), and the duration, we can calculate the value as: 11 teachers*$52.67/hr*2hrs*160 days = $185,398.40
a. https://www.bls.gov/oes/current/oes_md.htm#25-0000

> **Why we chose this example:** The application of teacher salary as proxy for value is an innovative approach to valuing in-classroom programs that may serve as a multiplier strategy for state Sea Grant programs to amplify the reach of its education programs beyond its own staff capacity. While not cited, it is likely that the program instructions could enhance the defensibility for the time commitment and could be added to the entry in the future.

12. Workforce Development for Low-Income Youth: In 2021, New Jersey Sea Grant Research project "Fishadelphia" has met the goals of providing affordable fresh seafood to underserved urban communities and supporting New Jersey fisheries. The "Fishadelphia" team has expanded the amount of fish distribution and customer engagement while also creating programming and employment opportunities for low-income youth. The NJSG research team has sold 7449 lbs of local fish and 44,684 pieces of shellfish from 10 NJ suppliers to 460+ customers. The purchase of the seafood created $51922 in revenue to the industry participants.

> **Why we chose this example:** The "Fishadelphia"program differs from the Fellowships Guide approach to workforce development, focusing on supporting fish market employment opportunities with a specific audience. While the valuation here is the revenue for the industry participants, other valuations could be explored such as jobs created or sustained and baselines

could be established to measure program growth and impact over time. One way to enhance the current entry in the future would be to clarify if the revenue provided here is gross revenue (before expenses) or net revenue (minus expenses).

Healthy Coastal Ecosystems

13. Valuing Grant Assistance as Cost Savings: Employing funds from a $3 million NFWF grant received and managed by Florida Sea Grant agents, FSG oversaw the removal of 25 vessels left damaged and derelict by Hurricane Michael from Franklin County waters in 2021. FSG's efforts saved Franklin County and FWC $160,000 in retrieval and disposal fees associated with these derelict vessels ($6,400 per vessel). FSG Project: A/SGEP-17.

Why we chose this example: Many programs bring in additional grant funding to support their work. This entry is written in a way that acknowledges the grant funding as context (not the benefit) while focusing the economic valuation on the cost-savings realized by the County.

14. Informing Resource Management Decisions : Enhancement of the lake trout recreational fishery. Information from the lake trout collected as part of a Lake Champlain Sea Grant-funded research project provided additional evidence that the naturally-produced population of lake trout in Lake Champlain is increasing with individuals from multiple year-classes surviving to maturity. This knowledge was shared with fisheries managers and contributed to the decision to terminate lake trout stocking into the system by the New York Department of Environmental Conservation (NY DEC). The New York stocking program in Lake Champlain had an annual cost of approximately $36,000, which can now be directed towards other projects. The contribution of our study towards this savings was approximately 20%, representing a final savings of $7,200. The operating costs for NY DEC lake trout stocking in Lake Champlain were estimated based on the total cost of running the hatchery system divided by the total pounds of fish reared. This estimate (approximately $8 per pound of fish) was then multiplied by the total weight of lake trout stocked into Lake Champlain (approximately 25,000 fish stocked at 5.5 fish/pound).

Why we chose this example: It shows a conservative approach and partial attribution of SG research informing a management decision. LCSG succinctly described the resource issue, SG role (funded research project) and the project's contribution (20%) to the NY DEC decision to terminate stocking in transparent and defensible manner.

15. Technical Assistance and Benefits Transfer: In this reporting year, the Wisconsin Sea Grant (WISG) coastal engineer provided design assistance—for example, stone sizing, design considerations and wall construction—to 10 Great Lakes property owners to reduce erosion due to record-high Great Lakes water levels. Literature indicates that the reduction of coastal hazard risks can increase property values (Kriesal, 1993; Jin, 205; Bin, 2008). Kriesal et al (1993) found that adding an erosion control device to a property on Lake Erie can increase its value by $9,735. All property owners armored their shorelines based on WISG advice and assistance. (10 homes x $9,735).

Why we chose this example: Transparency is key when transferring the benefits from one study to another setting. This entry's inclusion of details such as the activity, location, reference to multiple studies (including years), add to the defensibility of the transfer. The Kriesal et al study's age is a trade-off but the program is transparent about this fact and may want to use an online tool to adjust for inflation in the future.