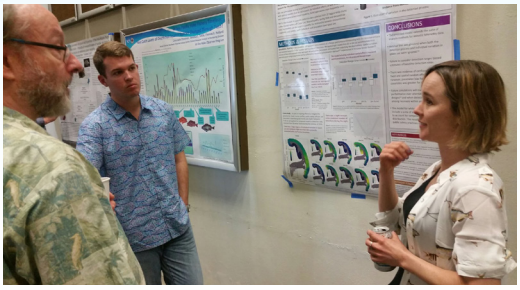
Key Considerations from Primer

The program must play an essential role to report on this measure. An essential role is one that would be described by stakeholders and partners as essential for the project's ultimate success.

When a program has a non-essential role, describe the the project's impacts or accomplishments in narrative form for the annual report but do not include these the performance measures and metrics.

- Not everything needs a number
- Count what you can count
- Sometimes a story is best
- If it's too complicated, report it as an Impact or Accomplishment
- Do not seek out nor shy away from large numbers. Larger benefits are ok but should be reviewed with added rigor
- Do not use multipliers
- Include citations in reporting to enhance clarity, defensibility, and transparency.

Workforce Development: Increased Earnings from Fellowships[1]



Overview: Sea Grant offers a wide variety of opportunities to enhance the professional pathways of early-career professionals by supporting graduate fellowships. Examples include full-year, full-time fellowships, such as the Knauss Fellowship; post-graduate fellowships; and fellowships while in graduate school (e.g., Sea Grant State Fellows Program, Rhode Island Sea Grant Marine Law Fellowship). These opportunities provide two kinds of benefits: outcomes from the valuable work that early-career professionals conduct and the meaningful career benefits early-career professionals gain. These opportunities increase the likelihood that individuals will find a job in a desired field, help them build stronger professional networks and skills in desired areas, and potentially result in higher earnings by enabling them to find a job faster and often at an increased salary. This methodology guide focuses on the latter and provides a way to estimate increased earnings for the first two years following the fellowship.

Thresholds and Applicability: While all research and fellowship opportunities including and beyond those listed above could potentially benefit an early-career professional, to be conservative about how Sea Grant quantitatively claims these benefits, we recommend your fellowship opportunities meet the following thresholds and criteria before you monetize them:

- **Program type:** This criterion focuses on programs that support graduate students. These could be programs that occur during graduate school, post-graduate fellowships, or a full-time program before graduate school. Currently, this methodology does not support undergraduate research opportunities (e.g., a capstone project or senior thesis). We recommend you capture those opportunities as a qualitative impact statement.
- **Length and level of commitment by participant:** At least one full semester or 6+ months where the participant commits an average of approximately 16+ hours per week of time related to the fellowship or research.
- **Sea Grant contribution:** Sea Grant should provide time or resources that convince outside stakeholders that its role is substantial and essential. We recommend that Sea Grant either financially contribute approximately 25 percent of the total associated cost of the opportunity, or that Sea Grant personnel centrally contribute to the opportunity by serving as the principal investigator, project advisor, or other type of mentor.
- **Defending your opportunity's value to participants:** This criterion partially encapsulates the two criteria above and combines them with your understanding of your fellowship's benefit. This simply comes down to whether you can make a strong argument that your opportunity helps early-career professionals enhance their ability to get a job in their field.

1. This methodology guide was developed to help Sea Grant and other coastal engagement programs calculate and characterize the economic benefits and impacts of their program activities. This methodology guide is a tool and does not constitute official guidance for reporting economic benefits and impacts.

Background on Methodology: The approach in this guide translates fellowships to the equivalent of attaining a graduate degree and the documented incremental earnings that go along with those degrees, such as finding jobs faster and attaining a higher salary. We then allocate some portion of this increased salary based on Sea Grant's contribution. We count two years of salary following the opportunity because it is the timeframe where the fellowship has the strongest influence on finding a job faster, with a potentially higher salary leading to higher overall earnings. While this methodology provides a valuation strategy that quantitatively captures the estimated increased earnings, qualitative stories can be used to highlight other benefits, including diversity in fields, opportunities for those that may not otherwise have them, and increases in the number of people placed in their desired fields. As we discuss further in the "Recommended Methodology and Best Practices" section below, this guide uses labor economics as the basis of the valuation strategy. Labor economics—specifically the study of incremental wages based on schooling and experience—is a well-studied area. This guide references a recent and well-cited study, Koropeckyj et al.,[2] as the basis for the methodology presented below.

Examples

As this is a new methodology that has not been used by Sea Grant, we have generated some hypothetical examples to better understand how this valuation methodology could be used. Please see the "Recommended Methodology and Best Practices" below for guidance on how to calculate these earnings.

1 **Full-year, full-time fellowship (after graduate school):** Sea Grant confirmed five former Knauss fellows attained jobs in their desired field of marine research or policy within the last year. These fellowships are a full-time commitment for one year. They give early-career professionals extensive job experience, help them develop a network of connections, and increase their credibility as job candidates in their field. We are equating these full-time, one-year programs to the equivalent of one year of graduate education. Based on Koropeckyj et al.'s (2017)[2] 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 the Knauss Fellowship results in a $4,781 earnings differential per year of work (based on a 6.1 percent markup on base median earnings of $78,370 for life scientists and physical scientists).[3] Using the following equation, we conservatively estimate the increased earnings for these five Knauss fellows over their first two years of working is $47,806: ($4,781 increased earnings differential per year of work) X (2 years of salary) X (5 fellows receiving jobs)

2 **One-semester (about four months) fellowship while in graduate school:** Sea Grant awarded one-semester fellowships to enrolled graduate students and confirmed eight recent fellows obtained a job within the last year. The fellowship gave these students opportunities they would not have otherwise received, including working in the state house, receiving real-world experience in policy, and strengthening their professional networks. It covered approximately 50 percent of the early-career professionals' full stipend (for tuition, books, housing, etc.) over the course of the year and helped all eight of them get jobs in their desired field of government. Based on Koropeckyj et al.'s[4] conservative estimate showing a 12.2 percent earnings differential for advanced degrees over college degrees, we attribute one-sixth (Sea Grant is providing a 50 percent stipend for one-third of a year) of a $4,150 earnings differential per year of work (based on 6.1 percent markup on base earnings of $68,036).[5] Using the following equation, we conservatively estimate the increased earnings for these eight early-career professionals over their first two years of working is $10,956: ($4,150 increased earnings differential for a year of graduate education) X (1/3 of a year) X (about 50% of a full stipend) X (counting 2 years of salary) X (8 early-career professionals receiving jobs)

2. Koropeckyj, S., C. Lafakis, and A. Ozimek. 2017. The Economic Impact of Increasing College Education. Available at: https://www.amacad.org/sites/default/files/academy/multimedia/pdfs/publications/researchpapersmonographs/CFUE_Economic-Impact/CFUE_Economic-Impact.pdf.

3. Data are from the Occupational Employment Statistics (OES) program, U.S. Bureau of Labor Statistics (BLS). Average of median wages for physical scientists and life scientists. (May 2018).

4. Koropeckyj et al. 2017, op. cit.

5. Based on GS Grade 11, Step 1 for Washington, D.C.-area workers, which is a reasonable entry level job for an advanced degree. https://www.federalpay.org/gs/locality/washington-dc

Present Your Story as a Value Chain

Value chains illustrate the sequence of events or activities that result in an economic impact or benefit. Consider developing a value chain diagram to help you tell a compelling and defensible story about how your Sea Grant program, product, or service generated a measurable result.

Here's an example broken down into how it tells a value chain story. **Sea Grant** *[the program/product/service]* **supported five Sea Grant state fellows** *[what was affected]* who went on to get jobs in their desired field of marine research. These fellowships are a full-time commitment for one year. They give early-career professionals **extensive job experience, help them develop a network of connections, and increase their credibility as job candidates in their field** *[what was done to get impact]*. We are equating these full-time, one-year programs to the equivalent of one year of graduate education. Based on Koropeckyj et al.'s (2017)[6] 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 the Sea Grant state fellowship results in a $4,781 earnings differential per year of work (based on a 6.1 percent markup on base median earnings of $78,370 for life scientists and physical scientists).[7] Using the following equation, we conservatively estimate the **increased earnings for these five Sea Grant state fellows** *[measurable change]* over their first two years of working is $47,806: ($4,781 increased earnings differential per year of work) X (2 years of salary) X (5 early-career professionals receiving jobs) *[economic impact] [cite for defensibility]*

Recommended Methodology and Best Practices

Recommended Methodology: Translate fellowship to a percentage of the earnings differential associated with an additional year of graduate education.

Description: This methodology is based on well-accepted empirical methods in labor economics that estimate the relationship between education and wages.[8] In our methodology, we reference a study that calculated the increased earnings from additional graduate education (12.2 percent increase going from an undergraduate to graduate degree)[9] to develop a factor that estimates the associated percent increase in earnings. We then recommend an approach to estimate how a fellowship compares to a year of graduate education, and we include fellowships both during and after graduate school in this assumption.[10] For simplicity, we developed some broad-ranging categories to estimate increased earnings and applied them conservatively to avoid overstating increased earnings.

6. Koropeckyj et al. 2017, op. cit.
7. Data are from the OES program, BLS. Average of median wages for physical scientists and life scientists. (May 2018).
8. The Mincer earnings function (or Mincer equation) is a widely examined and accepted model used in empirical economics to determine how additional schooling/experience with fellowships can contribute to higher wages.
9. Koropeckyj et al. 2017, op. cit. To calculate the 6.1 percent increment for a graduate degree, we took the more conservative estimate (Earnings Model 2) from "Table: Earnings and Employment Models" and calculated the difference between an advanced degree (0.431) and bachelor's degree (0.309), which is 0.122 (12.2 percent). For simplicity, we then attribute each year of the advanced degree to be half of the 12.2 percent incremental salary.
10. We recognize that the salary increase is related to attaining a degree. Fellowships during graduate school are closely aligned with attaining the degree. We have also included fellowships outside of graduate school, such as post-graduate fellowships. While these are not associated with a degree, they provide similar skills and enhance an early-career professional's ability to get a job.

Data Needs: Before you get started, be sure to understand your data needs for performing this valuation by following these steps:

- Determine the number of early-career professionals who have found jobs in the past year and who participated in programs that meet the thresholds and applicability section near the beginning of this methodology guide. Note: You will only count students once (after you confirm they get their first job), but you will count two years of increased salary when you report their economic impact. For example, if Fellow A and B finish a program in 2018, and you confirm Fellow A got a job, you would calculate two years of increased salary for Fellow A in your next report and then never report for Fellow A again. Then, if Fellow B got a job after your economic benefits reporting, you would report Fellow B's increased salary in the next reporting cycle and calculate the associated two years of increased salary.
- Identify the field the program participants are working in.
- Determine the Sea Grant funding's approximate contribution to tuition or stipend to attribute a portion of the economic impact to Sea Grant.

Key Steps and Practices:

1 **Tally the number of early-career professionals who have found jobs in the past year and their incremental earnings.** For each job category, determine the annual incremental earnings associated with a one-year graduate or post-graduate fellowship (middle column of Table 1 below).

These incremental earnings are based on the relationship between a graduate degree and salary, which is discussed in more detail in the "Background on Methodology" section early in this guide. Note, we recommend using the national salary figures in Table 1 to normalize across the network. This allows us to avoid accounting for the geographic differences across the 33 programs and the mobility of the early-career professional population.

If you cannot find a representative category below or feel the starting salary is dramatically different from the "default" category, you can visit the U.S. Bureau of Labor Statistics (BLS) Occupational Employment Statistics (OES) national salary data webpage (see the downloadable XLS file link at the top of the page to find median salaries). Once there, find the median annual salary for the job position and multiply it by 6.1 percent to estimate the annual incremental earnings. For self-employed, use the default value.

Table 1. Incremental Earnings for a One-Year Graduate or Post-Graduate Fellowship

Job Following Graduate or Post-Graduate Fellowship	Annual Incremental Earnings	Notes
Default	$3,133	Based on 6.1% markup on median base earnings of $51,357.[11]
Elementary, middle school, high school teacher	$3,559	Based on 6.1% markup on median base earnings of $58,350.[12]
Lawyers	$7,376	Based on 6.1% markup on median base earnings of $120,910.[13]
University/post-secondary teacher or professor	$5,543	Based on 6.1% markup on median base earnings of $90,860.[14]
Life scientist or physical scientist	$4,781	Based on 6.1% markup on median base earnings of $78,370.[15]
Government employee/public policy	$4,150	Based on 6.1% markup on median earnings of $68,036.[16]

11. For earnings of 25–29-year-old professionals, see Current Population Survey, 2018 Annual Social and Economic Supplement, at https://www.census.gov/data/tables/time-series/demo/income-poverty/cps-pinc/pinc-04.html.
12. Data are from the OES program, BLS. (May 2018). We used median wages for the employment code "Elementary and Middle School Teachers" (occupational code 25-2020).
13. Data are from the OES program, BLS. (May 2018). We used the median wages for "Lawyers" (occupational code 23-1011).
14. Data are from the OES program, BLS. (May 2018). We used the median wages for "Atmospheric, earth, marine, and space sciences teachers, postsecondary" (occupational code 25-1051).
15. Data are from the OES program, BLS. (May 2018). Average of median wages for physical scientists (occupational code 19-2000) and life scientists (occupational code 19-1000).
16. Based on GS Grade 11, Step 1 for Washington, D.C.-area workers, which is a reasonable entry level job for an advanced degree. https://www.federalpay.org/gs/locality/washington-dc.

2 **Determine the "education adjustment factor."** This is the comparison of your fellowship to a year of graduate school. A one-year fellowship is equal to 100 percent, a two-year fellowship is equal to 200 percent, and a half-year fellowship is equal to 50 percent. A one-year post-graduate fellowship (e.g., Knauss) is equal to 100 percent, and a two-year post-graduate fellowship would be 200 percent. Based on labor economics theory, more school or work experience improves an early-career professional's ability to be hired at an increased salary. This methodology assumes that a longer fellowship will increase salary accordingly.

Examples of Calculating Education Adjustment Factor and Attribution in Steps 2 and 3

Fellowships During Graduate School: An example of these fellowships include the Sea Grant State Fellows Program. Here are examples of how you can determine the educational adjustment factor (Step 2) and Sea Grant percent attribution (Step 3):

- **Full year, substantial funding:** A full-year fellowship (100 percent education adjustment factor) and Sea Grant provides approximately the full cost of tuition for a year or close to a full stipend (tuition, books, housing, etc.) (100 percent attribution).
- **Full year, 50 percent funding:** A one-year fellowship (100 percent educational adjustment factor) and Sea Grant provides 50 percent of the stipend (tuition, books, housing, etc.) (50 percent attribution or approximately whatever percentage of stipend Sea Grant provides during fellowship).
- **Multiple years, substantial funding:** A two-year fellowship (200 percent education adjustment factor) and Sea Grant provides approximately the full cost of tuition for a year or close to a full stipend (100 percent attribution).
- **Partial year, no funding but substantial Sea Grant mentor role:** A one-semester (half-year) fellowship (50 percent education adjustment factor) and Sea Grant provides $10,000 worth of time (calculated as hours x hourly rate) as a mentor but none of the $30,000 tuition cost (25 percent attribution based on $10,000 / [$30,000 tuition + $10,000 in the value of your time for mentoring]).

Full-Time Fellowships After Graduate School: Some examples of these include the Knauss Marine Policy Fellowship (one-year program), Coastal and Marine Policy Fellowship (one-year program), Coastal Resilience Post-Graduate Fellowship (one-year program), Florida Sea Grant Fellowship (one-year program), and Washington Sea Grant State Fellowship (one-year program). While these are not strictly the same as graduate education, we are equating a year of these types of NOAA fellowships to a year of additional graduate education based on the similarities these programs have to fellowships that lead to advanced degrees. For these programs, Sea Grant often covers the full stipend (100 percent attribution of fellowship in Step 3). The education adjustment factor is based on the length of the fellowship (e.g., a one-year fellowship is a 100 percent factor, a two-year fellowship is a 200 percent factor, and a half-year fellowship is a 50 percent factor).

3 **Determine Sea Grant's attribution to the fellowship** by calculating the approximate portion of the tuition or stipend that Sea Grant covered (e.g., if you pay for half of the tuition, adjust your factor by 50 percent). This relative impact will be a percentage compared to a full year of graduate education. We have provided examples in the text box above as guidance for how to generate this factor. Sea Grant will occasionally provide substantial support by serving as a principal investigator or other mentor. If this is the case, monetize the value of your time (hours of support X hourly rate of person providing support). For example, if tuition is $30,000 and the value of your time is worth $10,000, the attribution would be 25 percent (i.e., $10,000 for value of your time / $40,000 [sum of tuition and value of your time]).

4 **Calculate the incremental earnings.** For each early-career professional, multiply (incremental earnings in Step 1) X (education adjustment factor in Step 2) X (percent attribution in Step 3) X (2 years) and sum across all early-career professionals. This will give the earnings increase over a two-year period. For reporting to Sea Grant's Planning, Implementation, and Evaluation Resources (PIER) database, we are using a two-year period as a conservative estimate because the fellowship has a clear link to earnings during this period.

- **Calculation example:** Use the following equation to calculate the incremental earnings for a graduate research fellow (one trimester program, full Sea Grant stipend paid for fellowship) who gets a job in law: ($7,274 incremental earnings per year of work) X (33% education adjustment factor for a one trimester program) X (100% attribution for full stipend) X (2 years) = $4,849 incremental earnings.

Factors to Consider in Communicating Economic Impacts

You should consider the following when reporting your economic impact to Sea Grant's PIER database versus communicating its value in other outreach pieces (e.g., fact sheets, websites, impact statements, accomplishment statements).

	Performance Measuring Reporting in PIER	Impact Statements and Other Outreach
Recurring Benefits	Report the metric one time after the early-career professional gains employment. Count two years of increased salary when reporting. We acknowledge this is likely conservative, but there is a stronger link and more defensible argument to connect a fellowship to the first job that follows. There is less certainty that the fellowship plays as strong of a role in subsequent jobs or the salary many years into a professional position.	
Attribution	This methodology accounts for attribution by asking Sea Grant to factor in how large the fellowship was relative to the full tuition or stipend. This is factored into Step 3 of the "Key Steps and Best Practices."	
Very Large Impact	The impacts are unlikely to be very large, but use the national-level BLS numbers we provide in the methodology section. These averages will be representative when considering jobs over the entire country.	If you have concerns about the salary increase being too high in Table 1 of the methodology section, go to the BLS OES national or state salary estimates and assume a 6.1% salary increase from the fellowship based on the location where the job was attained.

Tools for Implementation

The following tools and resources can be used to estimate incremental salaries.

- National salary estimates or state salary estimates: The BLS OES provides links to downloadable XLS outputs, which include the median values we referenced in this guide along with the hourly and annual 10th, 25th, 75th, and 90th percentile wages. For simplicity, we pulled the most applicable salaries into the methodology portion of this guide, but these data provide an avenue to find and calculate incremental salaries for other employment types.
- Economic Impact of Increasing College Education
- Current Population Survey, 2018 Social and Economic Supplement