

# Broader Impacts 2.0<sup>®</sup>

## Frequently Asked Questions About Revisions to NSF's Broader Impacts Criterion<sup>‡</sup>



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In October 2012, the National Science Foundation (NSF) released a new version of the Grant Proposal Guide (GPG) that included significant changes to the review elements and considerations underlying the Merit Review Criteria. This was the first major revision of the Criteria in 15 years. Of particular note were significant changes to the criteria used by panelists, reviewers, and program officers to evaluate a proposal's broader impacts. To help inform Florida ocean scientists of these changes in anticipation of proposal submission deadlines in early 2013, the Center for Ocean Sciences Education Excellence – Florida (COSEE-Florida) sponsored a series of lunchtime seminars (Broader Impacts 2.0<sup>®</sup> Lunches) at six universities and research institutes throughout Florida. Nearly 150 scientists of all career stages (graduate students to senior scientist) participated in the interactive sessions.

Participant questions during the seminars were transcribed and used to generate the following list of Frequently Asked Questions (FAQs). The questions fall into five broad categories and range from general philosophical questions regarding the underlying motivation for the changes, to more detailed ones concerning the impact of the changes on the submission and review process. As noted above, the Broader Impacts 2.0 seminars targeted ocean scientists in Florida. Yet we think the questions contained within this FAQ are representative of the concerns and queries of the broader science research community.

Although the opinions and answers/responses provided below do not necessarily reflect the policies or positions of NSF, they are based on published documents and information provided by NSF and are informed by consultations and discussions with NSF staff (including Program Directors in the Division of Ocean Sciences) and policy experts. We are grateful to the Broader Impacts 2.0<sup>®</sup> participants and NSF staff for their help with generating the questions and answers for this FAQ.

Finally, the responses to the questions listed below are intended to complement additional resources and materials available on the NSF website, including:

[NSF Merit Review Website](#)

[NSF Proposal & Award Policies & Procedures Guide \(PAPPG, NSF 13\\_1\)](#)

[NSF Grant Proposal Guide \(GPG 13001\)](#)

[National Science Board Task Force on Merit Review Report \(2011\)](#)

[NSF Merit Review Frequently Asked Questions \(FAQs\)](#)

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## Summary of Questions

<b>1. Understanding the Revisions to the Broader Impacts Criterion</b> .....	<b>4</b>
1a. Why did NSF decide to change the Merit Review Criteria? .....	4
1b. What is different or “new” about the Broader Impacts (BI) Criterion? .....	4
1c. When will the new Merit Review Criteria go into effect? .....	4
1d. Where can I go to find out more about the changes to the Merit Review process? .....	4
<b>2. Understanding the Nature of Broader Impacts</b> .....	<b>5</b>
2a. What is the recommended level of integration between Intellectual Merit and Broader Impacts? ..	5
2b. Aren’t Broader Impacts the same as educational outreach? .....	5
2c. Can I still consider training graduate students or post-docs as part of my broader impact activities? .....	5
2d. Does the research outlined in the proposal have to directly impact society? .....	6
<b>3. Impact of the Revisions on Proposal Preparation</b> .....	<b>6</b>
3a. Where should I address the Broader Impacts of my research in the Project Description? .....	6
3b. Do I also have to address Broader Impacts in the Project Summary? .....	6
3c. How much space should I allocate to the Broader Impacts section in the Project Description? .....	7
3d. Is there an increase in the page limit for proposals to accommodate the need for a separate section in the Project Description that addresses Broader Impacts? .....	7
3e. Do I need to include more than one broader impact activity in my proposal? .....	7
3f. Should I include in the proposal how I plan to assess any proposed broader impact activities? .....	7
3g. Do I have to report on the broader impacts of past NSF awards in the Results from Prior NSF Support section? .....	8
3h. Should I include a request for funds in the budget to support Broader Impacts? .....	8
<b>4. Impact of the Revisions on Proposal Review and Project Reporting</b> .....	<b>8</b>
4a. How will the Broader Impacts of a proposal be evaluated by NSF reviewers and panelists? .....	8
4b. How will reviewers and panelists learn about the changes to the Merit Review Criteria? What instructions will they receive? .....	9
4c. Will Broader Impacts be weighted the same as Intellectual Merit in the review process? .....	9
4d. How much weight will Program Directors give to the Broader Impacts Criteria when making funding decisions? .....	9
4e. With the increased prominence of Broader Impacts, will Program Directors recruit experts in Broader Impacts to review proposals and serve as panelists? .....	9
4f. Will I need to report on the progress and results of my broader impact activities in my annual reports? .....	10
<b>5. Assistance with Preparing Effective Broader Impacts Descriptions and Designing Activities</b> ...	<b>10</b>
5a. Are there plans to distribute examples of good Broader Impacts descriptions or activities? .....	10
5b. Where can I get help with preparing a good Broader Impacts description? .....	10
5c. How do I get feedback on a Broader Impacts description for a proposal? .....	11
5d. Should I consider developing collaborations to increase my broader impacts capability or capacity? .....	11
5e. Are institutions going to be expected to provide support for the broader impact activities proposed by PIs? .....	11

## 1. Understanding the Revisions to the Broader Impacts Criterion

### 1a. Why did NSF decide to change the Merit Review Criteria?

Periodically (about every 2 years) NSF releases an updated and revised version of the Proposal and Award Policies and Procedures Guide ([PAPPG](#)). Included in the PAPPG is the Grant Proposal Guide ([GPG](#)), which provides guidance to Principal Investigators (PIs) on the preparation, submission, and review of NSF proposals. The new PAPPG, released October 2012, includes significant changes to the Merit Review Criteria, especially the elements used to evaluate a proposal's Broader Impacts. The changes were in response to a study completed by the National Science Board's Task Force on Merit Review ([NSB 2011](#)) and provisions in the *America COMPETES Reauthorization Act of 2010* that increased the status of the Broader Impacts Criterion.

### 1b. What is different or “new” about the Broader Impacts (BI) Criterion?

The new GPG includes several changes in how Broader Impacts are described, evaluated, and reported. You must now explicitly address a proposal's broader impacts in a separate section in the Project Description (see 3a) and provide descriptions of the progress and accomplishments of any broader impact activities in grantee annual and final reports (see 4f). More importantly, the NSF has raised the prominence of Broader Impacts by applying the same five review elements used to assess intellectual merit (see 3a). Previously, reviewers and panelist were asked to consider very different criteria when assessing a proposal's Intellectual Merit and Broader Impacts.

### 1c. When will the new Merit Review Criteria go into effect?

The Merit Review Criteria contained in the new [PAPPG \(NSF 13 1\)](#) is effective for all proposals submitted or due on or after January 14, 2013.

### 1d. Where can I go to find out more about the changes to the Merit Review process?

NSF's website on [Merit Review](#) is a good place to start. Several recently published papers and articles provide information on the background, rationale, and impact of the changes. They include:

Frodeman, R, J.B. Holbrook, P.S. Bourexis, S.B. Cook, L. Diederick, and R.A. Tankersley. 2013. Broader Impacts 2.0: Seeing-and seizing-the opportunity. *BioScience* 63:153-154 ([DOI: 10.1525/bio.2013.63.3.2](#)).

Lok, C. 2010. Science for the masses. *Nature* 465: 416-418 ([DOI:10.1038/465416a](#))

Markin, K.M. 2013. Don't underestimate NSF's new grant-submission rules. [Chronicle of Higher Education](#), January 9, 2013.

Mervis, J. 2011. Beyond the data. *Science* 334: 169-171 ([DOI: 10.1126/science.334.6053.169](#)).

Sarewitz, D. 2011. The dubious benefits of broader impact. [Nature](#) 475: 141 ([DOI:10.1038/475141a](#)).

## 2. Understanding the Nature of Broader Impacts

### 2a. What is the recommended level of integration between Intellectual Merit and Broader Impacts?

Most reviewers look for integration between a proposal's Intellectual Merit and Broader Impacts and NSF encourages PIs to consider how the results and outcomes of the proposed research may make broader contributions – including contributions to society. The Grant Proposal Guide (GPG; [Chapter II.C.2.d.i](#)) states, “Broader impacts may be accomplished through the research itself, through the activities that are directly related to specific research projects, or through activities that are supported by, yet are complementary to the project.” Thus, in some cases, separate broader impact activities may not be necessary or relevant. The research itself may directly address or contribute to one or more of the desired societal outcomes listed in the GPG – or other outcomes not listed (GPG; [Chapter II.C.2.d](#)). However, if additional activities are proposed, they should be related to and complement the research. Moreover, broader impact activities should not be activities that you might do regardless of whether the proposal is funded. For example, if you are expected to develop new laboratory modules, lectures, or course components as part of your academic or institutional appointment, then these undertakings should not be listed as broader impact activities.

### 2b. Aren't Broader Impacts the same as educational outreach?

No. This is a common misconception. Educational outreach is one of many strategies that scientists can use to broaden the impact of their research and share the results and societal benefits of their discoveries with a wider audience. However, broader impacts can be far “broader” than just educational outreach and can include activities that are inherent and imbedded in the research itself, such as the transfer and scale-up of new technologies, the use of research results to inform science policy, and the development of new technologies, instrumentation, or research tools that enhance the infrastructure for research or directly benefit society. For example, as part of a larger research project, a group of PIs may propose to design and test a new, low-cost sensor array that improves or transforms how research scientists and water resource managers monitor water quality.

### 2c. Can I still consider training graduate students or post-docs as part of my broader impact activities?

Yes. In fact, STEM (science, technology, engineering and mathematics) education and the development of a strong, competitive STEM workforce are two of the possible “societally relevant outcomes” cited in the GPG ([Chapter II.C.2.d](#)). Yet, reviewers may feel that simply providing financial support for students or post-docs is not sufficient – or creative or innovative enough. They may ask “what is the added value (i.e., beyond salary, stipend or tuition) of the project to the education and training of the student or post-doc (i.e., workforce development)?” Thus, a good Broader Impacts description might highlight any specialized training, mentoring, access to facilities or

instrumentation, or professional development the students and post-docs will receive if the proposal is awarded.

## **2d. Does the research outlined in the proposal have to directly impact society?**

The first two Merit Review Principles state that “(1) All NSF projects should be of the highest quality and have the potential to advance, if not transform, the frontiers of knowledge and (2) NSF projects, in the aggregate, should contribute more broadly to achieving societal goals.” In other words, NSF would like the research it supports to advance knowledge and understanding in the scientific field and bring tangible benefits to society. Some societal benefits may be tied directly to the outcomes of the research, while others may be accomplished or demonstrated indirectly through activities that are complementary to the project. Yet, as articulated in the second Merit Review Principle, NSF does not expect individual projects to achieve societal goals by themselves. Instead, projects in the NSF portfolio that address similar goals or societal needs should collectively (i.e., in the aggregate) contribute to the achievement of societally relevant outcomes. Thus, it is up to the PIs to clearly articulate in the Broader Impacts section how the research itself, or any associated broader impact activities, will make a difference in achieving those goals.

## **3. Impact of the Revisions on Proposal Preparation**

### **3a. Where should I address the Broader Impacts of my research in the Project Description?**

You are now required to describe the broader impacts of your proposed research activities in a separate section labeled “Broader Impacts” in the Project Description. Moreover, if you or one of your co-PIs has received funding from NSF in the past five years, then you are also required to explicitly address the results and outcomes of both the intellectual merit and broader impact activities in two separate areas in the *Results from Prior NSF Support* section of the Project Description. It is important to note that proposals that lack either of these two sections run the risk of being returned without review because they are not in compliance.

### **3b. Do I also have to address Broader Impacts in the Project Summary?**

Yes. Project Summaries are now divided into three sections: an overview, a statement on the Intellectual Merit, and a statement on the Broader Impacts. When entering the Project Summary in NSF’s FastLane system, each section is placed in a separate text box. Information must be entered in each box prior to proposal submission. There are no specific character or word limits for each text box. However, the entire summary (i.e., all three text boxes combined) cannot exceed 4,600 characters. It is up to you to decide how to partition the characters among the three boxes.

### **3c. How much space should I allocate to the Broader Impacts section in the Project Description?**

As with other parts of the Project Description, NSF does not suggest or prescribe a page limit or length for the Broader Impacts section. Determining how much space to allocate is entirely up to you. However, you should keep in mind that reviewers will be asked to evaluate the Broader Impacts descriptions using the five elements outlined in the GPG ([Chapter III.A.2](#)). Thus, in a well-written Broader Impacts section, PIs should outline “what they want to do, why they want to do it, how they plan to do it, how they will know if they succeed, and what benefits could accrue if the project is successful” (GPG, [Chapter II.C.2.d.i](#)). Any proposed activities should be described with sufficient detail for the reviewers to determine if they are creative, original, or potentially transformative. The description should include a clear and well-justified rationale and present evidence that the PIs have the expertise, qualifications, and resources (either on their own or through collaborations) to carry out the planned activities. The description should also include a plan to document the results and evaluate the success of any proposed activities. Consequently, considerable amount of proposal space may be required to provide the level of detail necessary for reviewers to adequately evaluate the description and associated activities.

### **3d. Is there an increase in the page limit for proposals to accommodate the need for a separate section in the Project Description that addresses Broader Impacts?**

No. The page limit for the Project Description for most of NSF proposals is still 15 single-spaced pages. However, some funding programs may deviate from this page limit, as described in the program’s solicitation.

### **3e. Do I need to include more than one broader impact activity in my proposal?**

No. The quality of the broader impact activities is more important than the quantity. The strongest proposals include novel, creative, and innovative activities that complement the proposed research, are well-thought out, and are based on a sound rationale. Thus, NSF staff and reviewers expect the broader impacts to vary among projects and be comparable, in terms of caliber, quality, and stature, to the intellectual merit of the project.

### **3f. Should I include in the proposal how I plan to assess any proposed broader impact activities?**

Yes. Under the new Merit Review Criteria, reviewers will be asked to evaluate whether the descriptions of any proposed broader impact activities includes “a mechanism to assess success”. Thus, the Broader Impacts section of your proposal should include a detailed plan to document the outputs and outcomes of any proposed broader impact activities, including ones that are intrinsic to the research.

### **3g. Do I have to report on the broader impacts of past NSF awards in the Results from Prior NSF Support section?**

Yes. As in the past, all PIs and co-PIs who have received NSF funding within the last five years are required to provide information about the projects in a section of the Project Description labeled *Results from Prior NSF Support* (GPG: [Chapter II.C.2.d.iii](#)). Each PI and co-PI who has received more than one award in the past five years must report on the one award most closely related to the proposal. However, the new Grant Proposal Guidelines include a requirement that the results and accomplishments of completed work associated with intellectual merit and broader impact activities be addressed in separate sections. As noted in 3a, proposals failing to comply with this requirement may be returned without review.

### **3h. Should I include a request for funds in the budget to support Broader Impacts?**

Yes. If your proposal includes Broader Impact activities that are separate from, yet complementary to, the proposed research, then funds to support these activities should be requested in the budget. Reviewers may be critical of a proposal that includes a list of Broader Impact activities with no means or resources to implement them. However, as stated in [Chapter II.C.2.d.i](#) of the GPG, some Broader Impacts may be inherent in the proposed research and therefore may not require additional budget requests. For example, your proposal may include unique training opportunities for undergraduate and graduate students that can be considered broader impacts and the support for these activities might already be included in the budget as student support. Moreover, your project may involve the construction of a new instrument or the development of a new database that will be widely available for use by other researchers in other disciplines. It's likely that the financial costs of these types of broader impacts are already included in the project's budget.

## **4. Impact of the Revisions on Proposal Review and Project Reporting**

### **4a. How will the Broader Impacts of a proposal be evaluated by NSF reviewers and panelists?**

Under the new Merit Review guidelines, reviewers and panelists will be asked to evaluate the Broader Impacts of a proposal using the same review elements they use to evaluate a proposal's Intellectual Merit. As described in 1b above, this represents the most significant change in the proposal review process and NSF staff will be asked to use the same merit criteria and evaluation elements when making recommendations for funding. The five elements to be applied to Broader Impacts are:

1. What is the potential for the proposed activity to benefit society or advance desired societal outcomes?
2. To what extent do the proposed activities suggest and explore creative, original, or potentially transformative concepts?



3. Is the plan for carrying out the proposed activities well-reasoned, well-organized, and based on a sound rationale? Does the plan incorporate a mechanism to assess success?
4. How well qualified is the individual, team, or institution to conduct the proposed activities?
5. Are there adequate resources available to the PI (either at the home institution or through collaborations) to carry out the proposed activities?

**4b. How will reviewers and panelists learn about the changes to the Merit Review Criteria? What instructions will they receive?**

NSF has conducted a series of webinars and information sessions on the new Merit Review Criteria. Links to these resources are available on the [NSF Merit Review webpage](#). Hopefully some reviewers and panelists have participated in these sessions or attended one of COSEE Florida's Broader Impacts 2.0<sup>®</sup> seminars. Upon agreeing to review a proposal, ad hoc reviewers will receive guidance from NSF staff via email and will see additional instructions and directions on FastLane when submitting their review. Panelists will be briefed on the changes to the Merit Review Criteria by Program Officers and Panel Managers prior to discussing proposals.

**4c. Will Broader Impacts be weighted the same as Intellectual Merit in the review process?**

NSF does not assign weights to the two Merit Review Criteria (Intellectual Merit and Broader Impacts), and Program Directors acknowledge that the relative weighting of the two criteria often varies with the nature of the project, funding program, and discipline. Nevertheless, reviewers, panelists, and NSF staff are expected to give both criteria full consideration when assessing the merits of a proposal and making recommendations for funding.

**4d. How much weight will Program Directors give to the Broader Impacts Criteria when making funding decisions?**

As stated in 4c, no weights have been assigned to either review criteria, and Program Directors are required to consider and address both the Intellectual Merit and Broader Impacts of a proposal when making funding recommendations. Thus, when considering proposals of equal and exceptional intellectual merit, the relative strengths of the Broader Impacts of the proposals may be a deciding factor.

**4e. With the increased prominence of Broader Impacts, will Program Directors recruit experts in Broader Impacts to review proposals and serve as panelists?**

When selecting ad hoc reviewers and panelists, Program Directors try to identify a mix of people with both general and specialized knowledge of a particular field or subfield represented in the proposals. This includes people who are qualified to address the potential societal benefits of a research project and the quality of broader impact

activities. Needless to say, it is unlikely that a single review or panelist can be an expert on all aspects of a proposal. Yet, when a proposal is reviewed by a diverse group of people with complementary expertise, it receives a thorough and fair review. It is important to note that you may suggest names of persons you feel are well qualified to review your proposal – as well as persons you would prefer not to review it.

**4f. Will I need to report on the progress and results of my broader impact activities in my annual reports?**

Yes. The section describing Project Reports in the new GPG reflects the increased emphasis on Broader Impacts. Your annual and final reports should contain updates on the progress, results, outcomes, and achievements of all activities associated with the project, including those intended to address the Broader Impacts Criteria. Thus, you should have a plan in place to generate data to assess the effectiveness and successes of the Broader Impacts.

## **5. Assistance with Preparing Effective Broader Impacts Descriptions and Designing Activities**

**5a. Are there plans to distribute examples of good Broader Impacts descriptions or activities?**

No. NSF does not plan to distribute examples of good (or bad) Broader Impacts descriptions or activities. In fact, because of the confusion it caused, NSF has removed (effective January 14, 2013) pointers and links to a list of categories and examples (“representative activities”) that were available on the NSF website. Many scientists and policy experts were critical of the list because it was too prescriptive and could limit what reviewers and Program Directors viewed as Broader Impacts.

**5b. Where can I get help with preparing a good Broader Impacts description?**

Many universities have sponsored research staff and outreach experts that can provide assistance with writing Broader Impacts descriptions. Moreover, COSEE Florida, through its Broader Impacts Coaching Program, offers free, individualized help and guidance with crafting effective broader impact descriptions to Florida ocean scientists (all career stages). For more information, contact Dr. Sue Cook at [scook@teamorca.org](mailto:scook@teamorca.org).

COSEE Florida also offers a workshop entitled *Broader Impacts 2.0*<sup>®</sup> that focuses on techniques for developing effective Broader Impact plans that complement the proposed research. The workshop also includes assistance with writing clear and compelling Broader Impacts statements that address the elements that reviewers will consider when evaluating a proposal.

### **5c. How do I get feedback on a Broader Impacts description for a proposal?**

As described in 5b, COSEE Florida offers free Broader Impacts assistance to ocean, marine, and coastal scientists throughout Florida who are planning to submit proposals to NSF and other federal granting agencies (i.e., Broader Impact Coaching Program). Services provided include (1) feedback on draft copies of Broader Impacts statements and summaries for proposals, (2) guidance with identifying appropriate Broader Impacts activities that align with the PI's interests and complement the research outlined in the proposal, and (3) the identification of potential partners and collaborators, such as informal science centers and outreach experts, who can provide assistance with carrying out Broader Impacts activities.

### **5d. Should I consider developing collaborations to increase my broader impacts capability or capacity?**

Yes. As described in 3c, reviewers will be asked to evaluate whether you have the expertise, qualifications, and resources to carry out any planned Broader Impact activities. If you lack experience with conducting activities described in the proposal or if the activities require resources that are not readily available to you or your team, you should consider collaborating with experts who can provide the necessary expertise, assistance, and resources. Support for these collaborations should be identified in the proposal.

### **5e. Are institutions going to be expected to provide support for the broader impact activities proposed by PIs?**

Yes. When your organization/institution submits your proposal for consideration, it must agree to the "Organizational Support Certification" (GPG; [Chapter II.C.1.e](#)). This certification was revised in the new GPG to address a provision in the *America COMPETES Reauthorization Act of 2010* that required evidence of institutional support for a proposal's Broader Impact activities. Because NSF considers the Merit Review Criteria to be integrated (and perhaps interdependent), the certification was expanded to cover both Broader Impact and Intellectual Merit activities. Thus, at the time of submission an organization must "certify" that, if funded, it will provide the support necessary to ensure that the proposed activities designed to address both Merit Review Criteria will be implemented successfully. However, "support" should not be interpreted to mean "funding".