

Martha Muse Prize for Science and Policy in Antarctica: An International Polar Year Legacy

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Martha Muse Prize for Science and Policy in Antarctica
An International Polar Year Legacy

Committee on the Design of the Martha Muse Award to
Support the Advancement of Antarctic Researchers

Polar Research Board

Division on Earth and Life Studies

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This report has been reviewed in draft form by persons chosen for their diverse perspectives and technical expertise in accordance with procedures approved by the National Research Council's Report Review Committee. The purpose of this independent review is to provide candid and critical comments that will assist the institution in making its published report as sound as possible and to ensure that the report meets institutional standards of objectivity, evidence, and responsiveness to the study charge. The review comments and draft manuscript remain confidential to protect the integrity of the deliberative process. We thank the following for their participation in their review of this report:

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Although the reviewers listed above have provided many constructive comments and suggestions, they were not asked to endorse the conclusions or recommendations, nor did they see the final draft of the report before its release. The review of this report was overseen by **Mary R. Albert**, U.S. Army Corps of Engineers, Hanover, New Hampshire, appointed by the Division on Earth and Life Studies, who was responsible for making certain that an independent examination of this report was carried out in accordance with institutional procedures and that all review comments were carefully considered. Responsibility for the final content of this report rests entirely with the authoring committee and the National Research Council.

The report was enhanced by the participants in the committee's meeting. The committee acknowledges the efforts of those who gave presentations: Jennifer Baeseman, University of Alaska, Fairbanks; John Brauman, Stanford University; Renate Rennie, Tinker Foundation; and Steve Scudder, American Bar Association. Their input helped to set the stage for fruitful discussions.

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Summary

International Polar Year (IPY) 2007–2008 is an intense, coordinated field campaign of polar observations, research, and analysis. It is one of the largest collaborative science programs ever attempted, involving more than 200 projects and people from more than 60 nations. The ambitious agenda has a distinctly multidisciplinary approach, incorporating activities in the physical, biological, and social sciences and including a large education component. Themes include improving understanding of the status of the environment, the changes in the environment and social systems, the global linkages, the new frontiers in science, the polar regions as a unique vantage point, and the human dimension. This IPY follows in a long tradition of polar scientific collaboration and achievement, dating back to the first IPY 150 years ago in 1882–1883, a second IPY in 1932–1933, and the International Geophysical Year in 1957–1958.

In honor of its long-time leader, Ms. Martha Twitchell Muse, and to provide a lasting legacy of IPY, the Tinker Foundation is establishing an annual, prestigious prize: the Martha Muse IPY Prize for Science and Policy in Antarctica (abbreviated as the Martha Muse Prize). This \$100,000 unrestricted prize will be awarded following a nominations process similar to that of the National Medal of Science, meaning that people are nominated by others in the community. The committee concluded that the prize should be intended for an early to mid-career researcher, in any field of Antarctic science or policy, who has demonstrated exceptional research capabilities and the potential to show significant creativity and leadership in the future. The prize winner can be from any country and work in any field of Antarctic science or policy. The goal is to provide recognition of the outstanding and important work being done by the individual and to call attention to the importance of understanding Antarctica in this time of global climate change.

This report outlines the strategy and steps necessary to take the Martha Muse Prize from concept to implementation. It describes the prize's purpose and nature, the system that could be used to announce the prize and collect nominations, potential procedures to be used by the Selection Committee, and possible post-award activities.

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Introduction

THE TINKER FOUNDATION AND MARTHA MUSE

The Tinker Foundation was founded in 1959 by Dr. Edward Larocque Tinker in support of the Iberian tradition in the Old and New Worlds and continues to reflect this linguistic and geographical focus today. The Foundation's grants are awarded to organizations and institutions concerned with the affairs of Latin America, Spain, and Portugal. Over time, the Foundation developed a specific interest in Antarctica. Its grants support the study of public policy and the search for innovative solutions to some of the environmental, economic, political, and social problems facing these areas today. The Foundation has long been committed to advancing education. The "Tinker Field Research Grant" supports centers and institutes of Latin American studies within U.S. universities to assist outstanding graduate students for brief periods of field research in Latin America, Spain, or Portugal.

Martha Twitchell Muse is the Chair of the Tinker Foundation. She was a founding director of the Foundation in 1959 and since then has served in various capacities, becoming executive director in 1965, president in 1968, and Chairman of the Board of Directors in 1975. Ms. Muse has provided outstanding leadership over her years of service, both to the Tinker Foundation and others. She was the first woman to be elected to the Board of Trustees of Columbia University and continues to serve the school as Trustee Emerita. She also serves as a director on the boards of several organizations, including the Americas Society, the Council of the Americas, and the Spanish Institute. Her past directorships have included the New York Stock Exchange; the Cuba Policy Foundation; and many corporate directorships, including the American Smelting and Refining Company, the Bank of New York, ACF Industries (formerly named the American Car and Foundry Company), Sterling Drug Inc., Associated Dry Goods Inc., May Department Stores, and Irving Bank and Trust Company. In addition to her directorships, Ms. Muse is also a member of the Council on Foreign Relations, the Inter-American Dialogue, and the U.S.–Spain Council. For her many contributions to the field of Latin American and Iberian relations, she has received various awards, including the Orden al Mérito por Servicios Distinguidos en el Grado de la Gran Cruz (Merit Order for Distinguished Services in the Rank of the Great Cross) from Peru, the Order of the Southern Cross from Brazil, the Order of Bernardo O'Higgins from Chile, and the Orden de Mayo al Mérito (May Order of Merit) from Argentina.

INTERNATIONAL POLAR YEAR 2007–2008

Environmental change and variability are part of the natural pattern on Earth, but environmental changes currently witnessed in the polar regions are in many cases more pronounced than changes observed in the middle latitudes or tropics. Arctic sea ice cover is

decreasing; some ice shelves in Antarctica are retreating and thinning; glaciers are shrinking; and ecosystems are changing, for instance, with plants flowering at earlier times. These changes are having human impacts: some Alaskan villages have been moved to higher ground in response to increased coastal erosion, and thawing of permafrost is undermining roads and buildings in northern communities around the world. Why should the vast majority of us who live in the warmer regions of the Earth care? The polar regions, while physically distant, are critical links in the global climate system. The polar oceans play a critical role in maintaining ocean currents that keep coastal Europe much warmer than it would be otherwise, and the sea ice cover modifies Earth's surface temperature by reflecting solar energy. These are just a few of the many global connections. The polar regions also hold unique information of Earth's past climate history, and they are growing in economic and geopolitical importance. They are a unique vantage point for studies that will help scientists understand environmental changes in the context of past changes, which in turn will help us make informed choices for our future. The exploration of new scientific frontiers in the polar regions also will lead to new discoveries, insights, and theories potentially important to all people.

At its most fundamental level, International Polar Year (IPY) 2007–2008 is an intense, coordinated field campaign of polar observations, research, and analysis that is multidisciplinary in scope and international in participation. IPY 2007–2008 provides a framework and impetus to undertake projects that normally could not be achieved by any single nation. It allows us to think beyond traditional borders—whether national borders or disciplinary constraints—toward a new level of integrated, cooperative science. A coordinated international approach maximizes both impact and cost effectiveness, and the international collaborations started today will build relationships and understanding that will bring long-term benefits. IPY serves as a mechanism to attract and develop a new generation of scientists and engineers with the versatility to tackle complex global issues. In addition, IPY is an opportunity to organize an exciting range of education and outreach activities designed to excite and engage the public, with a presence in classrooms around the world and in the media.

IPY 2007–2008 is fundamentally broader than past international years because it explicitly incorporates multidisciplinary and interdisciplinary studies, including biological, ecological, and social science elements. It spans from March 1, 2007 to March 1, 2009, allowing for two field seasons of research in both the Arctic and the Antarctic. (Source: National Research Council, 2004¹)

The following six scientific themes provide the framework for IPY 2007–2008:

1. **Status:** to determine the present environmental status of the polar regions.
2. **Change:** to quantify and understand past and present natural environmental and social change in the polar regions and to improve projections of future change.
3. **Global linkages:** to advance understanding on all scales of the links and interactions between polar regions and the rest of the globe and of the processes controlling these.
4. **New frontiers:** to investigate the frontiers of science in the polar regions.
5. **Vantage point:** to use the unique vantage point of the polar regions to develop and enhance observatories from the interior of the Earth to the sun and the cosmos beyond.

¹ National Research Council. 2004. *A Vision for International Polar Year 2007–2008*. From the “Report in Brief” available at: http://dels.nas.edu/dels/rpt_briefs/ipy_final.pdf.

6. **The human dimension:** to investigate the cultural, historical, and social processes that shape the sustainability of circumpolar human societies and to identify their unique contributions to global cultural diversity and citizenship. (Source: World Meteorological Organization, 2007²)

PURPOSE OF THIS REPORT

The Tinker Foundation approached the National Academy of Sciences' (NAS) Polar Research Board (PRB) seeking advice on how best to organize and administer a monetary prize to honor its long-term Chair, Martha Twitchell Muse. The Tinker Foundation wished to design a prestigious, annual prize to support an exemplary researcher in any field of Antarctic science or policy. This prize would be targeted to assist in developing and growing the ranks of Antarctic researchers by providing support to a researcher with clear leadership potential at a critical early or middle stage in his or her career. The prize was envisioned as being truly international (i.e., not just Latin America) in scope and supportive of the mission of the Tinker Foundation.

To this end, NAS established the Committee on the Design of the Martha Muse Award to Support the Advancement of Antarctic Researchers. This committee was asked to define the prize, establish selection criteria and application materials, and develop a strategy for announcing the inaugural competition during IPY 2007–2008. The committee examined other scientific awards and fellowships for insights on how to ensure that this prize supports important Antarctic research, that it becomes a recognized and highly valued prize, and that it is one of the long-term legacies of IPY. (The committee's full statement of task is given in Appendix A.) This report is intended to be an "instruction manual" to assist the Tinker Foundation and the administrative organization to launch and manage the prize. (Since the Tinker Foundation is not equipped to establish and administer the Martha Muse IPY Prize for Science and Policy in Antarctica [hereafter abbreviated as the Martha Muse Prize], a separate, independent organization will be tasked by the Foundation to implement its vision. See Chapter 5 for more information regarding the administrative organization.)

² World Meteorological Organization/International Council for Science. 2007. *The Scope of Science for the International Polar Year 2007–2008*. International Council for Science/World Meteorological Organization Joint Committee for IPY 2007–2008, Geneva.

2

The Martha Muse Prize

VISION AND PHILOSOPHY

The Martha Muse Prize will recognize an individual who has demonstrated excellence in Antarctic science or policy and who shows clear potential for sustained major and significant contributions that will enhance the understanding of Antarctica. The Martha Muse Prize is inspired by Martha Muse’s passion for Antarctica and is intended to be a legacy of IPY. The Tinker Foundation’s goal is to establish a prestigious award that recognizes excellence in Antarctic research by honoring someone in the early to mid-stages of his or her career. (Although the committee’s statement of task specifically mentions individuals in the early stages of their career, the president of the Tinker Foundation stressed to the committee that it should use its best judgment regarding whom the prize should target. It was also conveyed that the Foundation would be open to whatever the committee recommended.) This goal is best achieved by an unrestricted prize given to an individual nominated for recognition by members of the broad Antarctic community of researchers.

CHARACTERISTICS OF A PRIZE WINNER

Nominees for the Martha Muse Prize should be capable of making a significant contribution in a field or topic that advances our understanding of Antarctic science or policy during their career. Exemplar activities in which a Martha Muse Prize winner might show promise of future leadership include—but are not limited to—the following areas:

- Studying the agreements, instruments, and conventions among nations that foster international cooperation, promote shared governance, and protect the environment of Antarctica.
- Advancing cross-disciplinary efforts to better understand Antarctica.
- Conducting investigations that advance our understanding of Antarctic systems and living resources as key components of the Earth system.
- Studying the unique characteristics and adaptations of Antarctic organisms.
- Defining the role of humans in change in the Antarctic environment and improving our ability to predict future outcomes, promote environmental stewardship, and inform management of the region.
- Studying the critical linkages between Antarctica and the planet as a whole.
- Addressing one or more of the themes embodied in IPY 2007–2008 (see Chapter 1 for details).

- Contributing to the public understanding and appreciation of Antarctica, its value, and its role in our lives.

LONG-TERM STRATEGY

The committee recognized that many characteristics, attributes, and wishes for impacts cannot be realized in any single one-time award but can be accomplished by multiple awardees over a period of several years. Goals for diversity, geographic location, discipline, and topic coverage will be obtainable when a cadre of prize winners has been created over time. Therefore, it is recommended that the Selection Committee adopt a long-term vision of the desired outcomes while at the same time selecting the very best nominee each year. (See Chapter 4 for more information regarding the Selection Committee.) The attributes of past winners should be considered if all other criteria are equal. For example, an overabundance of prize winners from a single country or geographic region might suggest emphasizing candidates from other locations in subsequent years. Over a five- or ten-year period, most of the major scientific foci from Antarctic science and policy could be represented amongst the winners. This longer-term strategy allows maximization of the impact of the Martha Muse Prize on Antarctic science and policy by creating a diverse community of scholars.

3 Prize Logistics

NOMINEE ELIGIBILITY

Candidates for the Martha Muse Prize will only be identified by external nomination. All persons are eligible to make a nomination; self-nominations will not be considered. To ensure the broadest pool of potential nominees, the committee did not specifically define “early career” or “mid-career.” Therefore, no age restrictions, years past a terminal degree, or scientific record (e.g., numbers of publications, grants, presentations, leadership positions held) are specified. However, a nominee should have an existing track record of sufficient depth and breadth to provide indications of future potential for success and leadership, allowing the Selection Committee to project, with reasonable assurance, that this person will remain in Antarctic science as a career choice and become a leader in his or her field. Nominators are encouraged to identify exceptional candidates from any region of the world, as well as those from groups under-represented in Antarctic science and policy. Ideally, the pool of candidates each year would be representative of the full diversity (e.g., gender, geographic location, disciplines) of the international Antarctic community of scientists, researchers, and academicians.

NOMINATION PROCESS AND MATERIALS

The nomination process will be entirely web-based, and nomination materials must be submitted electronically via the prize website. This will require the rapid development of a comprehensible and informative website that allows information to be submitted by nominators, and one that can be accessed securely by members of the Selection Committee.

A complete nomination package will consist of the following items:

- A letter of nomination from an individual familiar with the candidate’s achievements and future potential, both of which should be explained succinctly in the letter. This letter should not exceed three single-spaced pages and be provided in English. It must state the nominator and nominee’s names, professional or home contact information, present occupational titles, and institutional titles.
- Up to three additional letters of support from other individuals familiar with the nominee’s qualifications directed to the Selection Committee. These letters should not exceed one single-spaced page and be provided in English. These additional letters should be significantly different in content from the nomination letter to further inform the Selection Committee of the nominee’s qualifications for the prize and should not simply repeat the content of the nomination letter.

- The nominee's curriculum vita or resume, including education record; career history; list of publications, research grants, and major presentations and awards; and a description (no more than 1,000 words) of significant activities in Antarctic science, policy, and/or educational outreach.

Nomination packages for highly competitive candidates not selected for the Martha Muse Prize in a given year will be held for three years for possible consideration in subsequent years. If a nomination is carried forward, the Selection Committee will ask the nominator to submit a new cover letter and curriculum vita and to update the nomination package with recent developments in the nominee's career.

CALL FOR NOMINATIONS

If the Martha Muse Prize is enacted as anticipated in mid-2008, it will be important to announce it as soon as possible to ensure it is widely publicized and to set the nomination deadline to allow announcement of the winner in March 2009, the end of IPY 2007–2008. Thereafter, a call for nominations will be announced each year on March 1, and nominations must be received by July 1.³ Incomplete nominations and nominations arriving after the deadline date will not be considered.

It is critical that, in its first year, the Martha Muse Prize be announced as widely and as prominently as possible. At a minimum, this should include the following resources:

- Electronic mailings to the most prominent listservs and mailing lists that reach all segments of the Antarctic community. (Personnel associated with NAS/PRB and the Scientific Committee on Antarctic Research [SCAR] should be consulted to identify these mailing lists.⁴)
- Electronic mailings to the major international professional societies and organizations (e.g., the Council of Managers of National Antarctic Programs, the Antarctic Treaty System, the European Polar Board) whose members conduct work in Antarctic science and policy, with a request that the call for nominations be forwarded to their membership. (Contact information would be available through PRB, SCAR, and the International Council for Science [ICSU].)
- A website developed and deployed by the administrative organization that includes the call for nominations, as well as explicit instructions about the nomination process. There are several models of other prize websites, such as the Tyler Prize for Environmental Achievement, the Ramon Margalef Prize in Ecology and Environmental Sciences, and the BBVA Foundation Frontiers of Knowledge Awards. (See Appendix C for more information on these and other awards reviewed by this committee and for their website addresses.)

³ These times were chosen to accommodate those doing research during the Antarctic summer.

⁴ A number of peripherally-relevant organizations, such as the Federation of American Societies for Experimental Biology and the American Association for the Advancement of Science, may be useful sources of nominations. In order to cast the widest net, the call for nominations should be sent to as many entities as possible.

- A brochure or announcement sent via print mail to well-respected individuals that are likely to offer nominations. (This list could be drawn up by PRB in consultation with SCAR.)
- If funds allow, the call for nominations advertized in major scientific journals (e.g., Nature, Science, Eos) commonly read by members of the Antarctic community. Antarctic experts and organizations should be consulted to compile and prioritize this list.

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The Selection Committee and the Selection Process

The Selection Committee plays a critical role in ensuring the success and reputation of the Martha Muse Prize. Its role will be to evaluate nominations and recommend the prize winner from the pool of nominations, ensuring that the selection process is fair and unbiased. The Selection Committee will be independent of, but supported by, the organization administering the prize. The Selection Committee's operations must be beyond reproach for the Martha Muse Prize to become the highly prestigious prize that the Tinker Foundation seeks.

SELECTION COMMITTEE OPERATIONS AND RESPONSIBILITIES

Members should serve for three years with some portion of the Selection Committee being renewed each year. Initially, time-limited service for some Committee members will be needed to implement the Committee membership rotation policy. The chair plays a critical role, providing longer-term memory and leadership to the Selection Committee, and is eligible for reappointment for an additional three years, if approved by the Tinker Foundation. Members are not eligible for reappointment after completion of their service, other than promotion to chair. No Selection Committee member shall serve for more than a total of six years in any combination of capacities. Attention to avoid conflict of interest will be needed, perhaps modeled on NAS procedures for study committees.

In its deliberations of nominees, the Selection Committee should, by its selections, ensure the following goals:

- Promotion of IPY's goals even after the official IPY 2007–2008 period has concluded.
- Consideration of the wide range of disciplinary and interdisciplinary Antarctic science and policy topics over time.
- Enhancement of the diversity and perspectives brought to bear on Antarctic issues.
- Illustration of the importance of international collaboration in Antarctic science and policy.

Although it is possible to conduct the selection process by teleconference, the preferred approach would be a face-to-face meeting of the Selection Committee to allow for optimum back-and-forth discussion and deliberation during the selection process. (To reduce costs, if timing allows, Selection Committee meetings could be held in conjunction with the biennial SCAR Open Science Conference or other large international science meetings that the Committee members may already be attending.) Committee deliberations are to be in closed session, and the privacy of nomination materials, as well as the opinions and remarks of individuals, must be guarded scrupulously to encourage open and frank discussions. The chair

will report the prize winner recommended by the Selection Committee to the administrative organization and the Tinker Foundation so that the Foundation can review the selection process and outcome and announce the winner.

SELECTING THE COMMITTEE

Although this report is needed by June 2008, to assist the Tinker Foundation with the initiation of the prize, NAS's PRB will continue in an advisory capacity for a year to implement the prize fully as part of its agreement with the sponsor. Thereafter, the Tinker Foundation will need periodic advice from a group (or groups) that has experience successfully assembling and balancing committees to ensure that the Selection Committee continues to be unbiased, inclusive, and exemplary in its composition and conduct. Over time, as Selection Committee members rotate, nominations for new members should be sought from the Selection Committee, SCAR, ICSU, Antarctic Treaty parties, the Tinker Foundation, and other individuals and organizations considered appropriate. The Tinker Foundation may wish to form a small steering group to choose and formally invest the new Selection Committee members. The Selection Committee should contain six members, including the chair, with the following characteristics:

- Eminent scholars and experts with exposure to and knowledge of a broad array of Antarctic science and policy endeavors.
- Represent the diversity of the Antarctic research community in terms of race, gender, and nationality.

EVALUATING NOMINEES AND SELECTING THE PRIZE WINNER

The prestige and recognition that accrues to a "prize" or "award" relates to the quality of its recipients. The financial incentives and recognition associated with the prize have innate value. However, the subsequent history and accomplishments of previous prize winners, to a large degree, will define the perception of the importance and value of a prize. Once the Martha Muse Prize has become an established entity within the Antarctic community; ideally, simply being a nominee will provide recognition. This is something Selection Committees should strive to achieve over time. Thus, selection must ensure that the very best candidates are selected using a process of explicit and unambiguous review, evaluation, and selection criteria. The process should be perceived by potential nominators and nominees as obtainable (i.e., with a chance of success), inclusive, unbiased, and fair.

Within two weeks of the close of the nomination period, the administrative organization will review all nomination packages to ensure that they are complete. (It is not the role of the administrative organization or the Selection Committee to notify nominators of missing items; this responsibility rests solely with the nominators.) After this initial review, the nomination packages will be distributed to the Selection Committee—at least two weeks before the Committee meets to allow adequate time for the Committee to prepare. At this time, any conflicts of interest with nominees must be declared by Committee members and a plan devised to address these conflicts, such as reassignment of nomination packages or recusal from

deliberations on a particular nominee.⁵ Prior to the Selection Committee meeting, the chair will assign each member several nominations to study; the member will serve as the lead presenter of the nomination during discussions. Nominee assignments to Selection Committee members should attempt to match their expertise as much as possible to allow informed discussion of all aspects of the nomination package. At the beginning of the meeting, following disclosure of conflicts of interest, the chair will reiterate the selection criteria, the procedures to arrive at a consensus selectee, and follow-up on the progress of previous prize winners (after the inaugural year).

Along with the complete nomination packages, each Committee member should receive a standard checklist and evaluation criteria ranking form for each nominee to allow for consistent and uniform evaluation of the nomination packages. (Appendix D⁶ contains an example of evaluation and ranking criteria, which is utilized by the American Association for the Advancement of Science's [AAAS] Science & Technology Policy Fellowships.) The forms should include a "comments" section for Committee members to record any matters not covered by the selection criteria that were considered in the deliberations. These forms will serve as part of the record of the deliberations of the Selection Committee.

At the meeting, the Selection Committee should first conduct an initial discussion of each nomination, and then the members will individually rank the nominations using the evaluation forms. In discussions, the members should evaluate the nominations in terms of the selection criteria. The rankings will be compiled, and nominations that fall in the upper 50 percent will be discussed further. Following that discussion, a subsequent ranking by each member will be conducted, and either the top 50 percent or the top five nominations will be further discussed. (If Selection Committee member evaluations evolve during the selection process, new evaluation forms should be completed and added to the Committee's record.) This sequence will be repeated until the Committee votes on just the top two nominations; ultimately, the nominee receiving the majority vote will be the Committee's selection. Dissenting opinions should be recorded, but it is hoped that a unanimous decision can be reached. In the event that the Selection Committee deems no nominee to be worthy of the Martha Muse Prize in a given year, the prize will not be awarded, and the funds will be left for a subsequent year either to increase the future prize amount or to select more than one winner in the future.

The Selection Committee's decision will be summarized in a short (electronic) report to the Tinker Foundation, which retains the authority to give final approval and which will then announce the recipient (likely in conjunction with the administrative organization). The report should be sufficiently comprehensive to ensure that selection procedures were followed and that nominees were given fair and equal treatment. Any anomalies or variations (e.g., conflicts of interest) and how these were addressed should be highlighted.

⁵ To ensure unbiased proceedings, it is likely appropriate that no Selection Committee member be present during the discussion of a nominee or be allowed to rank a nominee who belongs to his or her organization or university.

⁶ Appendix D also provides information on AAAS's online review process, candidate eligibility, and reviewer considerations that may be helpful to the Tinker Foundation and the administrative organization.

5

Responsibilities of the Administrative Organization

Administration of the Martha Muse Prize will require expertise and staff beyond the normal operations of the Tinker Foundation; therefore, the committee recommends that the Foundation enter into agreement with a suitable body to serve as the administrative organization. Administration will include activities for establishing and managing the prize website (including online application capabilities), promoting and publicizing the prize, announcing the call for nominations, compiling the nomination materials for the Selection Committee, arranging the meetings and other business of the Selection Committee, organizing the prize ceremony, and helping to facilitate any post-award activities that may be necessary (see Box 1). Figure 1

Box 1**Administration Responsibilities**

- 1) Inaugurate the Martha Muse Prize, with guidance from the Tinker Foundation and NAS/PRB:
 - a) Develop, launch, and maintain the prize website, including the online, automated electronic nomination system.
 - b) Promote and publicize the Martha Muse Prize.
 - c) Announce the call for nominations to the Antarctic science and policy communities.
 - d) Facilitate initial organization of the Selection Committee.
 - e) Coordinate the design and production of the Martha Muse Medal.
- 2) Implement the prize selection and processes:
 - a) Receive nomination packages and send the complete ones to the Selection Committee.
 - b) Arrange the Selection Committee meetings, including travel, local accommodations, and meeting facilities.
 - c) Provide clerical and other support services during the Selection Committee meetings.
 - d) In conjunction with the Tinker Foundation, announce and publicize the prize winner.
 - e) In conjunction with the Tinker Foundation, arrange and organize the award ceremony.
 - f) Assist with the publication of the prize winner's public address.
- 3) Facilitate post-award activities:
 - a) Interface between prize winner and a national Antarctic program, if necessary.
 - b) Review the prize winner's expenditures, if requested by the Tinker Foundation.
 - c) Maintain records of Selection Committee deliberations.
 - d) Communicate the report of the Selection Committee to the Tinker Foundation.
 - e) Organize and conduct an assessment of the performance and effectiveness of the selection process, as requested by the Tinker Foundation, and suggest improvements and efficiencies to the process.

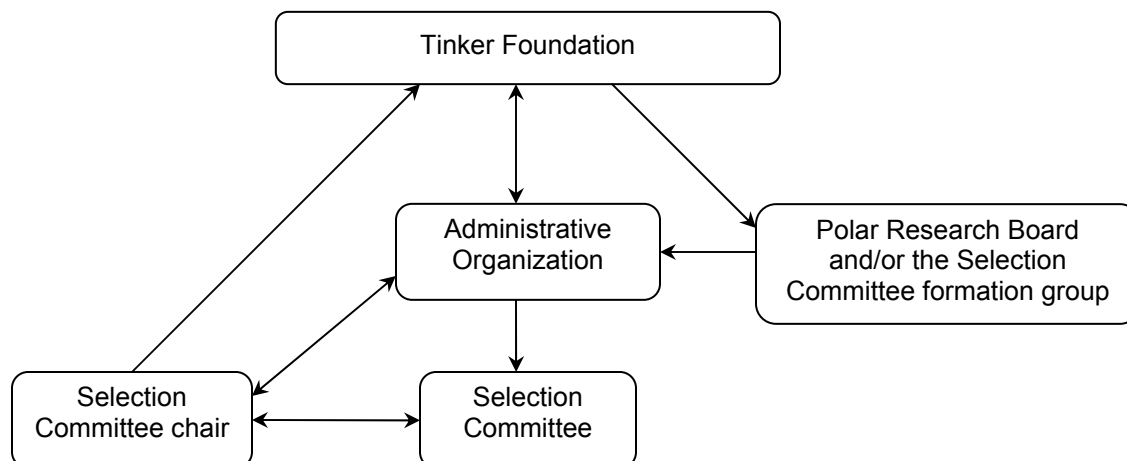


Figure 1. This diagram illustrates the various interactions of the bodies involved in the Martha Muse Prize.

diagrams the interactions of the relevant bodies (i.e., the Tinker Foundation, the administrative organization, PRB [for the first year] and then a different Selection Committee formation group [for subsequent years], the Selection Committee, and the Selection Committee chair). The Tinker Foundation should be ready to support some financial needs of administrating the Martha Muse Prize. (See Box 2 for a list of costs, outside of the US\$100,000 prize, that are likely to be incurred by the Tinker Foundation.)

Box 2
Additional Expenses Likely to be Incurred by the Tinker Foundation

- 1) Activities deemed the responsibility of the administrative organization (see Box 1) including:
 - a) Design and maintenance of the prize website.
 - b) Publication of the call for nominations and the prize winner’s public address in scientific journals.
 - c) Promotion and publicity of the prize and the prize winner.
 - d) Travel costs and administrative support associated with the Selection Committee meetings.
 - e) Award ceremony, including the travel costs of the prize winner, his or her family, and the Selection Committee and/or chair.
- 2) Taxes associated with the prize money.
- 3) Design and production of the Martha Muse Medal.

The administration of the Martha Muse Prize will be funded via an agreement between the chosen administrative organization and the Tinker Foundation. One possible administrative organization is SCAR because its mission is “to be the leading independent organization for facilitating and coordinating Antarctic research and for identifying issues emerging from greater scientific understanding of the region that should be brought to the attention of policy makers” (Scientific Committee on Antarctic Research, 2004⁷). SCAR, which is located in the United Kingdom, is a committee of ICSU and has a membership comprised of the national scientific academies or research councils that are the adhering bodies to ICSU and that are, or plan to be, active in Antarctic research (Scientific Committee on Antarctic Research, 2007⁸). Due to its experience with Antarctica, its international contacts, and its experience in the administration of other prizes and awards, SCAR might be a suitable administrative organization for the Martha Muse Prize. However, the final decision regarding selection of the administrative organization and subsequent negotiations with that organization are the responsibility of the Tinker Foundation and may be changed over time pending performance.

PRIZE PROMOTION AND PUBLICITY

The Martha Muse Prize should be promoted and advertised internationally to a wide audience, utilizing the same outlets as those used for the call for nominations process (see Chapter 3). The prize winner should be announced each year through the same channels and any newly identified mechanisms. Nominators should be kept informed of the status and outcome of the selection process. The Tinker Foundation will need to dedicate resources to the administrative organization for publicity.

NOMINATION PROCESS

The administrative organization will issue a call for nominations through direct emails to scientists, scientific bodies, scientific society presidents, university deans of research and department heads; through announcements at scientific meetings and congresses; and through other suitable outlets. A record of the advertisement campaign should be kept for future consultations. Nomination packages will be assembled, logged, and forwarded to the Selection Committee soon after the deadline date has passed. The administrative organization will schedule the meeting of the Selection Committee, arrange the members’ travel, and provide suitable administrative support. In conjunction with the Tinker Foundation, the administrative organization will publicize the prize winner and will organize the award ceremony.

⁷ Scientific Committee on Antarctic Research. 2004. *SCAR Strategic Plan 2004–2010*. International Council for Science/Scientific Committee on Antarctic Research, Cambridge, UK.

⁸ Scientific Committee on Antarctic Research. 2007. *Welcome to SCAR*. Available at: <http://www.scar.org/>.

PRIZE ANNOUNCEMENT AND CEREMONY

As envisioned, the Martha Muse Prize will consist of an unrestricted cash prize of US\$100,000 and a specially-designed medal to be known as the Martha Muse Medal. The prize winner may spend the prize money in any manner that will aid or advance his or her career, including both personal and professional uses; however, the money needs to be spent completely within three years of reception. There are no conditions attached to the spending of the money, except for reporting to the Tinker Foundation in whatever fashion it requires. It is expected that the administrative organization will oversee post-award record and filing requirements of the financial aspects of the prize.

The Martha Muse Prize will be awarded to the winner at a public ceremony convened at a distinguished venue, such as the Smithsonian Institution, The Explorers Club, NAS,⁹ or an international venue. The ceremony will feature a public address by the prize winner on a topic relevant to his or her research. The Tinker Foundation will provide resources to the administrative organization to support the ceremony, including travel for the prize winner, his or her family, and the Selection Committee and/or chair. Other aspects of the ceremony and award process may be decided jointly by the Selection Committee, the Tinker Foundation, and the administrative organization. The public address should be written in advance for distribution at the ceremony, and attempts should be made to publish it in a suitable outlet, such as a major scientific journal, and possibly on the prize website.

POST-AWARD ACTIVITIES

Martha Muse Prize winners shall be known as Martha Muse Antarctic Medalists. Winners are required to submit a brief annual report to the Tinker Foundation each year until the funds are spent so the Foundation can track the professional progress of the medalists over time. Previous winners should be highlighted with dedicated pages on the prize website. After five years, the Tinker Foundation may choose to convene a scientific colloquium to assess the progress and success of these medalists.

The administrative organization will work with the prize winner to facilitate other post-award issues. For example, if the prize winner wants to use the prize money to visit or conduct research in Antarctica, the administrative organization should try to help him or her make the contacts needed for logistics, such as opening doors of communication with the appropriate national Antarctic program.

⁹ As part of the agreement to assist the Tinker Foundation during the first year and to facilitate success, NAS's PRB is open to hosting the event.

LEGACY

The Martha Muse Prize is being inaugurated during IPY 2007–2008 and is intended to be a lasting legacy of IPY. The prize will, once each year for at least four to five years,¹⁰ reward an Antarctic researcher for his or her contributions and call attention to Antarctica. The connection between IPY and the Martha Muse Prize should be clear; the prize citation should note the scientific ideals and goals of IPY. Moreover, the Tinker Foundation may find it appropriate to incorporate the IPY logo into the design of the Martha Muse Medal.

¹⁰ In communications to date, the Tinker Foundation has indicated a willingness to fund this prize annually for about five years, at which time the Foundation would assess the prize's success and influence and would determine how to proceed.

Appendix A

Committee Statement of Task¹¹

This committee will assist the Tinker Foundation by designing a prestigious award to support an exemplary Antarctic researcher, in any field of Antarctic science or policy, to be presented annually by the Tinker Foundation in honor of its Chairman, Martha Twitchell Muse. The Muse Fellowship will be targeted to help develop and grow the ranks of Antarctic researchers by providing support to a researcher with clear leadership potential at the critical early stages of his/her academic career. The committee will:

- define the purpose and scope of the award
- establish selection criteria and application materials
- develop a strategy for announcing the inaugural competition during the International Polar Year 2007–2008

The committee will examine other scientific awards and fellowships for insights about how to ensure that this award supports significant research and is a long-term legacy of the International Polar Year. The committee will provide a written plan to guide the award process; administration of the award will be done by an independent, international body, such as the International Council of Science's Scientific Committee on Antarctic Research.

¹¹ Although the committee's statement of task specifically mentions individuals in the early stages of their career, the president of the Tinker Foundation stressed to the committee that it should use its best judgment regarding whom the prize should target. It was also conveyed that the Foundation would be open to whatever the committee recommended.

Appendix B Committee and Staff Biographies

COMMITTEE

David H. Bromwich (*Chair*) is a senior research scientist and director of the Polar Meteorology Group at the Byrd Polar Research Center of Ohio State University. He is also a professor with the Atmospheric Sciences Program in the Department of Geography. Dr. Bromwich earned his Ph.D. in meteorology from the University of Wisconsin, Madison in 1979. His research interests include the climatic impacts of the Greenland and Antarctic ice sheets; coupled mesoscale-global circulation model simulations; the atmospheric moisture budget of high southern latitudes, Greenland, and the Arctic basin using numerical analyses; and the influence of tropical ocean-atmosphere variability on the polar regions. Dr. Bromwich has served on the National Research Council's Committee on Geophysical and Environmental Data and was previously a U.S. representative of the Scientific Committee on Antarctic Research. He currently serves on the National Research Council's Polar Research Board and chaired the Committee to Review the CCSP Draft SAP 1.3: Re-Analyses of Historical Climate Data and Implications for Attribution. He is a member of the American Meteorological Society, the American Geophysical Union, the Royal Meteorological Society, and the Association of American Geographers.

Judith L. Bronstein is a program director in the Division of Environmental Biology at the National Science Foundation as well as a professor of ecology and evolutionary biology at the University of Arizona. She earned her Ph.D. in ecology and evolutionary biology from the University of Michigan. Dr. Bronstein's lab focuses on the study of interspecific interactions, particularly on the poorly-understood, mutually beneficial ones (mutualisms). Specific conceptual areas of interest include (1) conflicts of interest between mutualists and their consequences for the maintenance of beneficial outcomes in these interactions and (2) context-dependent outcomes in both mutualisms and antagonisms. Using a combination of field observations and experiments, she is examining how population processes, abiotic conditions, and the community context determine net effects of the interactions for the fitness of each participant species. She is also collaborating on theoretical and empirical investigations of the fragility of mutualism in light of conservation threats and mechanisms of restoring disrupted interactions and the causes and consequences of "cheating" within mutualism. In 2007, Dr. Bronstein won the Distinguished Career Teaching Award.

Hugh Ducklow is a senior scientist and the director of the Ecosystems Center at the Marine Biological Laboratory. He earned his A.B. in 1972, his A.M. in 1974, and his Ph.D. in 1977 from Harvard University. Dr. Ducklow was originally trained as a microbial ecologist and now studies the roles of marine bacteria in the global carbon cycle. His current research focuses on the interactions between climate change and ecosystem function, especially on the Antarctic

Peninsula, a region of especially rapid warming. He has conducted research in the North Atlantic, the central North Pacific, the Arabian Sea, the Red Sea, the Southern Ocean, the Great Barrier Reef, the Caribbean, the Black Sea, and the Chesapeake Bay. For several months of the year, Dr. Ducklow is at the Palmer Station directing the Palmer Antarctica Long-Term Ecological Research project.

Karl Erb is director of the Office of Polar Programs at the National Science Foundation. In his role as head of the Office of Polar Programs, Dr. Erb oversees the operations of the Division of Arctic Sciences and has experience in the logistical issues that surround grant and award programs. He also heads the U.S. Antarctic Program, which manages all U.S. research on the southernmost continent. Dr. Erb is a physicist and previously served as a science adviser to the National Science Foundation director and in the White House Office of Science and Technology Policy. He has worked toward scientific cooperation between nations in his work with the International Polar Year and has made contributions to the informal diplomacy of international science. Dr. Erb has received many awards, including the New Zealand Antarctic Medal by Prime Minister Clark in 2007, and was named a Chevalier of the French National Order of Merit by the President of the Republic of France.

Mahlon C. Kennicutt, II is the director of Sustainable Development and team leader for the Sustainable Coastal Margins Program in the Office of the Vice President for Research at Texas A&M University. Dr. Kennicutt earned his Ph.D. in oceanography in 1980 from Texas A&M University. His research interests include environmental monitoring, fate and effects of contaminants, environmental impacts of offshore energy exploration and exploitation, coordination of the social and physical sciences to address environmental issues, and all aspects of the sustainable development of coastal margins. He has worked as an oceanographer for 25 years and spent over 500 days at sea, including on various ships in Antarctica, and is familiar with the logistics operations at McMurdo Station as well as UNOLS ship operations. In addition, Dr. Kennicutt is a vice-president of the Scientific Committee on Antarctic Research (SCAR) of the International Council for Science, which is an international committee that serves as the formal science adviser to the Antarctic Treaty Consultative Parties. In this role, he is familiar with the Antarctic Treaty and especially its environmental protocols. As the U.S. Delegate to SCAR, he accompanies the U.S. Department of State delegation to treaty meetings. He served on the NAS's Committee to Review the Oil Spill Recovery Institute and the Committee on Cumulative Environmental Effects of Oil and Gas Activities on Alaska's North Slope. He serves as an ex-officio member of the Polar Research Board.

Diane M. McKnight is a professor of civil, environmental, and architectural engineering at the University of Colorado. She earned her Ph.D. in environmental engineering from the Massachusetts Institute of Technology. Her research focuses on interactions between hydrologic, chemical, and biological processes in controlling the dynamics in aquatic ecosystems. This research is carried out through field-scale experiments and modeling of diverse freshwater environments, including lakes and streams in the Rocky Mountains and in the McMurdo Dry Valleys in Antarctica. She also interacts with state and local groups involved in mine drainage and watershed issues in the Rocky Mountains. Dr. McKnight is a former member of the NAS's Water Science and Technology Board and of the Polar Research Board. She is past president of the American Society of Limnology and Oceanography, a Fellow of the

American Geophysical Union, and is currently the Editor of the Journal of Geophysical Research-Biogeosciences.

Karen E. Nelson is an assistant investigator at the Institute for Genomic Research (formerly the J. Craig Venter Institute) where she has been involved in the whole genome sequencing and analysis of numerous microbial species including *Thermotoga maritima*, *Campylobacter jejuni*, *Listeria monocytogenes*, and *Salinibacter ruber*. After migrating to the United States from Jamaica, she earned a Ph.D. in microbiology from Cornell University. Dr. Nelson has led a number of metagenomics projects to analyze the human oral cavity, gastrointestinal tract, and the rumen. Dr. Nelson has been involved in many outreach projects with minority institutions and is currently employed at Howard University. She is also editor in chief of *Microbial Ecology*. Dr. Nelson was one of the microbiologists featured in a TV series called *Intimate Strangers: Unseen Life on Earth*, which appeared on PBS in 1999. She served on the NAS's Committee on the Design of an NSF Innovation Prize.

Warren Zapol is the Jenney Professor of Anesthesia at Harvard Medical School and Massachusetts General Hospital. Dr. Zapol earned his MD in 1966. His major interests are the promotion of safety in medical care especially, complex medical procedures through the use of medical simulation, team training in simulators, and the teaching of crisis management techniques and the regulations and rules governing the testing of novel drugs in humans. As an anesthesiologist and critical care physician, Dr. Zapol has great interest in the provision of safe critical care, especially respiratory care in national emergencies as well as after complex surgery and trauma. He studies Antarctic Seals with microprocessors diving beneath the Antarctic ice at the McMurdo Station. Dr. Zapol is a member of the Institute of Medicine.

STAFF

Jodi Bostrom (*Study Director*) is a research associate with the Ocean Studies Board. She earned an MS in environmental science from American University in 2006 and a BS in zoology from the University of Wisconsin-Madison in 1998. Since starting with the board in May 1999, Ms. Bostrom has worked on several studies pertaining to coastal restoration, fisheries, marine mammals, nutrient over-enrichment, ocean exploration, capacity building, and marine debris.

Chris Elfring is Director of the Polar Research Board (PRB) and also the Board on Atmospheric Sciences and Climate (BASC) at the National Academies. Since she joined the PRB in 1996 and BASC in 2002, she has been responsible for all aspects of strategic planning, project development and oversight, financial management, and personnel for both units. Ms. Elfring has been involved in studies such as *A Vision for International Polar Year*, *Assessment of U.S. Polar Icebreaker Needs*, *Environmental Stewardship for the Exploration of Subglacial Lake Environments*, and *Toward an Integrated Arctic Observing Network*. She has played a key, primarily “behind-the-scenes” role in planning International Polar Year 2007–2008. Before coming to the National Academies, Ms. Elfring was a policy analyst at Congress' Office of Technology Assessment, where she focused on agriculture, water use, and natural resource management. She first came to Washington, DC in 1979 as a AAAS Congressional Fellow from the University of Wisconsin-Madison. She has a long-standing interest in the policy dimensions of science and communicating science to non-scientists.

Rachael Shiflett is a senior program assistant with the Polar Research Board and the Board on Atmospheric Sciences and Climate. She received her M.Sc. in environmental law from Vermont Law School in 2001 and her J.D. at Catholic University in May 2007. Ms. Shiflett has coordinated National Research Council studies that produced the reports *International Polar Year 2007–2008 Report of the Implementation Workshop*, *Toward an Integrated Arctic Observing Network*, and *Environmental Stewardship for the Exploration of Subglacial Lake Environments*.

Appendix C

Review of Other Prizes and Awards

This committee reviewed other prizes and awards to provide a context in which to consider its guidelines for the implementation of the Martha Muse Prize. The prizes and awards discussed by the committee fell into two groups: prizes, for which deserving individuals are nominated; and awards, for which individuals apply. Prizes are unrestricted with few, if any, conditions or requirements for use of the prize funds. Award applications generally require some plan or proposal describing work that will be undertaken using the award and/or identifying deliverables that will be produced.

PRIZES

Tyler Prize for Environmental Achievement (<http://www.usc.edu/dept/LAS/tylerprize/>):

- US\$400,000.
- Administered by the University of Southern California.
- Has an independent selection committee.

Ramon Margalef Prize in Ecology and Environmental Sciences
(<http://www.gencat.net/premiramonmargalef/eng/index.htm>):

- €100,000.
- Administered by the President of the Generalitat of Catalonia, Spain.
- Has an independent selection committee.

BBVA Foundation Frontiers of Knowledge Awards
(<https://w3.grupobbva.com/TLFU/premios/fronteras/en/index.html>):

- €400,000.
- Administered by the BBVA Foundation and Spain's Consejo Superior de Investigaciones Científicas.

Ecological Society of America's George Mercer Award
(<http://www.esa.org/aboutesa/awards.php>):

- US\$1,000 for an outstanding publication by a young scientist.
- Has an independent selection committee.

Ecological Society of America's Robert H. MacArthur Award
(<http://www.esa.org/aboutesa/awards.php>):

- US\$1,700 prize and travel support for meritorious achievement by a mid-career scientist.
- Has an independent selection committee.

American Society of Naturalists' Sewall Wright Award (<http://www.amnat.org/ASN/awa.html>):

- US\$1,000 rewarding contributions by a senior investigator.
- Has an independent selection committee.

American Society of Naturalists' E. O. Wilson Award (<http://www.amnat.org/ASN/awa.html>):

- US\$2,000 for an active investigator in mid-career who has made significant contributions to the knowledge of a particular ecosystem or group of organisms; an individual whose research and writing illuminate principles of evolutionary biology and an enhanced aesthetic appreciation of natural history are given special consideration.
- Has an independent selection committee.

AWARDS

National Science Foundation's (NSF) Faculty Early Career Development (CAREER) Program
(<http://www.nsf.gov/pubs/2005/nsf05579/nsf05579.htm>):

- US\$200,000.
- For career development.
- Requires a detailed proposal.

NSF's Postdoctoral Fellowships in Polar Regions Research
(http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=5650):

- US\$100,000.
- Requires a proposal, study plan, and participating mentor and home institution.

European Research Council Starting Independent Researcher Grant
(<http://erc.europa.eu/index.cfm?fuseaction=page.display&topicID=65>):

- Up to €2,000,000 for five years.
- Requires a proposal.

Appendix D

AAAS Science & Technology Policy Fellowships: Candidate Evaluation Summary, Guidelines, and Scoring Outline¹²

MISSION AND OBJECTIVES

The AAAS Science & Technology Policy Fellowships are provided as a professional development opportunity with the aim of fostering more policy-savvy scientists and engineers. Fellowships are awarded to highly qualified individuals interested in learning about the science-policy interface while applying their scientific and technical knowledge and analytical skills in the federal policy realm.

The overarching goals of the Fellowships are to increase the capacity of scientists to inform the discussions and decisions of individuals and institutions that influence or determine policies, and to provide scientific knowledge and analysis to support decision-makers confronting increasingly complex scientific and technological issues. The Fellowships aim to:

- educate scientists and engineers on the intricacies of federal policymaking;
- foster positive exchange between scientists and policymakers;
- empower scientists and engineers to conduct policy-relevant research and other activities that address challenges facing society; and
- increase the involvement and visibility of scientists and engineers in the public policy realm.

REVIEW AND SELECTION SUMMARY

The AAAS Science & Technology Policy Fellowships are extremely competitive, involving an intensive process to review applications and select fellowship finalists, which involves the following steps:

- 1) AAAS Fellowships staff review all applications to ensure applicants meet the basic eligibility criteria and that all required materials are submitted.
- 2) Each application is read and scored by three Readers (former Fellows), who rate it according to the guidelines provided in this document. Readers submit scores via the online review system. Raw and Z-scores are then calculated and utilized to designate the top-ranking candidates that will be forwarded to the Selection Committees.
- 3) These candidates are then evaluated and rated by a minimum of three Selection Committee members, using the guidelines provided in this document. Scores are submitted via the

¹² American Association for the Advancement of Science. 2008. *AAAS Science & Technology Policy Fellowships: Candidate Evaluation Summary, Guidelines, and Scoring Outline*. AAAS, Washington, DC.

online review system. Raw and Z-scores are then calculated and provided to the Selection Committee members, along with a summary of reviewers' comments, before the first Selection Committee meeting.

- 4) Selection Committees convene for a breakfast or luncheon meeting to discuss the candidates and determine the semi-finalists to interview. The raw scores, Z-scores and comments are used to enrich the discussions. At this meeting the Selection Committee members also determine the briefing memo topic(s).
- 5) Semi-finalists submit a briefing memo either on a designated topic or on their choice of topic from among a range of issues (to be determined by the Selection Committees at their first meeting) that is read by all Selection Committee members before the interviews.
- 6) Semi-finalists are interviewed in person by Selection Committees in Washington, DC. At the end of each day of interviews, the semi-finalists are scored, ranked, discussed, and voted on to determine the fellowship finalists.

Once candidates are designated as finalists, they are invited to participate in Placement Week in Washington, DC, in April (except Congressional Fellows, who select their assignments following the September orientation). Upon acceptance of a suitable placement offer, finalists are officially offered a AAAS Fellowship.

ONLINE REVIEW PROCESS

Selection Committee members review assigned applications and input comments and scores via the online review system. Each reviewer is sent an e-mail with a web link that connects directly to the applications assigned to him/her.

Ratings of the candidates provide a means by which to compare applications for purposes of initial sorting and for the initial Selection Committee decisions regarding which candidates to interview. This framework is *only* for initial sorting. Final fellowship award decisions are based on the Selection Committee discussions and rankings following the individual interviews.

The scores and comments are critical to the review process. In addition to the numerical indices that help to sort the applicant pool, the written comments from Selection Committee members are critical to gain a substantive sense of opinions and rationale for scores. Summaries of the scores and comments are distributed to the designated Selection Committee prior to its first meeting so that all members of that committee may see how others have reacted to candidates.

Selection Committee members should use the comments section to provide information on the following:

- general assessment of the applicant;
- the reason for an exceptionally high or low score in any rating area;
- special considerations for further review—why the candidate is particularly meritorious or not; and
- input to consider if the applicant becomes an “on the fence” candidate.

Scores in the five rating areas (detailed sections below) will be totaled automatically by the online system. Reviewers may stop and save score sheets in progress and return to them later. Scores may be changed at any time prior to clicking the submit button. Before hitting the submit button, Selection Committee members should assess the overall scores to ensure that rankings across candidates are consistent and appropriate, using the guidelines outlined in the sections below.

When the Selection Committee member is satisfied with all scores and comments, he/she must click the submit button. *Once scores and comments are submitted they cannot be changed.* The sections below outline AAAS Fellowship eligibility, review considerations, and the criteria and scoring mechanism to use when reviewing applicants.

CANDIDATE ELIGIBILITY

AAAS accepts candidates from a broad array of backgrounds and a diversity of geographic, disciplinary, gender, and ethnic perspectives. Fellows come from a range of sectors, including academia, industry, non-governmental organizations, and government (postdocs and contract only; permanent federal employees are not eligible). Fellows also represent a spectrum of career stages, from recent Ph.D. graduates to faculty on sabbatical to retired scientists and engineers. They have ranged in age from late twenties to early seventies.

All applications forwarded to the Readers and Selection Committee members have been reviewed by AAAS Fellowships staff, and the applicants are deemed eligible for a fellowship based on meeting the following requirements:

- Doctoral-level scientist (Ph.D., MD, DVM, D.Sc. and other terminal degrees), in any physical, biological, medical/health, or social/behavioral science, any field of engineering, or any relevant interdisciplinary field. Or an individual with a master's degree in engineering and at least three years of post-master's degree professional experience. All degree requirements completed by 12/20.
- Not a permanent federal employee.
- Hold U.S. citizenship.

REVIEW CONSIDERATIONS

There are a number of issues to be addressed individually and collectively when reviewing fellowship applications. This section presents important considerations for Readers and Selection Committee members to keep in mind throughout the candidate assessment and selection process.

Career Stage

A range of career stages is represented in the pool of applicants, which can make comparisons among candidates challenging. Candidates at an earlier stage in their career are not expected to have accomplished as much as more senior individuals. Applicants earlier in their

career may have fewer publications, grants, collaborative activities, or a shorter history of leadership roles. This should be taken into consideration when assessing and scoring the candidates.

Disciplinary Diversity

Often it is difficult to make comparisons among candidates from diverse disciplinary backgrounds and professional fields. This may be reflected in the number and type of publications and professional activities (typically driven by the priorities of the institutional settings in which the candidates have worked). Individuals in some fields, such as engineering or medicine, may not publish as prolifically in peer-reviewed journals or be as involved in research activities. These contextual factors should be taken into account when assessing and scoring the candidates.

Gender, Race, and Cultural Diversity

In no sense are there quotas for gender, racial, or cultural diversity. The caliber of a candidate supersedes these considerations. However, a thoughtful review will include consideration of the candidate's cultural background, his/her challenges for success, and how potential disadvantages might be reflected in his/her application in terms of barriers not faced by other candidates, or ways in which the candidate, via superior ability, may have overcome them.

Institutional Affiliation

AAAS welcomes applicants from academic institutions of all sizes, structures and foci (public, private, large, small, various disciplinary emphases), as well as from the nonprofit sector, from industry, and from government (if federal, only postdocs or contractors; permanent federal employees are not eligible). Candidates should be considered equal on the basis of their current institutional affiliation alone (we do not give greater weight to applicants from academia versus the other sectors, or to select institutions from within the sectors).

Previous Applications

There is no limit to the number of times an individual may apply for a AAAS Fellowship if he/she has not previously been selected for a fellowship, or has not previously accepted a fellowship (e.g., a candidate may have had to withdraw or decline due to health issues, an unexpected change in family circumstances, etc.). A candidate's application history should not be a factor in assessing his/her current application.

Applications from Current/Former Fellows

AAAS accepts applications from current or former Fellows who present a strong rationale for the value and benefit of a second fellowship opportunity, and who clearly articulate how they will apply the experience in the future. An individual may have no more than two AAAS Fellowships. Fellows may not apply for a fellowship in the same area in which they currently serve, or have previously served (AAAS staff have already screened for these factors).

CRITERIA AND SCORING GUIDELINES

Candidates are evaluated and scored based on the five categories outlined below. Scientific/Technical Background and Professional Accomplishment are weighted more heavily than the other four categories, as first and foremost the AAAS Science & Technology Policy Fellowships are professional development opportunities for highly-qualified scientists and engineers.

However, that alone is not sufficient for success as a Fellow. We also seek individuals who have a combination of leadership attributes, initiative, analytical and problem-solving abilities, and communication skills, who demonstrate commitment to this professional development opportunity and the fellowship objectives, and whose experiences and interests fit with the focus of the specific fellowship area.

The five criteria categories are presented with descriptors of what we seek in successful fellowship finalists, and the point ranges to use when evaluating applicants in each category. A perfect single score for a candidate would be 100 points.

Scientific/Technical Background and Professional Accomplishment (1–40 points)

- Solid scientific/technical education and experience in area of expertise, appropriate to career stage
- Employment in relevant academic, applied scientific/technical, research, administration, outreach or policy positions appropriate to career stage and field
- Record of publications and/or presentations appropriate to career stage, field, and institutional setting
- Record of grants and/or participation in research projects or other scientific/technical initiatives appropriate to career stage, field, and institutional setting

Leadership and Potential (1–15 points)

- Prior leadership roles relevant to career stage (graduate student governance or faculty committees; advisory or editorial committees; active in professional societies, non-profit, or community initiatives; other)
- Skill/potential to organize, build consensus, lead projects and people toward positive outcomes
- Confidence, maturity, and self-direction with the capacity, initiative and flexibility to work well independently as well as in groups
- Ability to identify personal strengths and areas for growth and development

- Potential to take initiative to make the fellowship a rich and positive experience, to disseminate the skills learned through the fellowship, and take advantage of networks developed

Analytical and Problem-Solving Abilities (1–15 points)

- Evidence of creative thinking and analytical skill
- Ability to translate and apply theoretical concepts into practice to solve problems
- Capacity to make connections between science/technology and broader economic, social, political issues

Communication, Interpersonal, and Outreach Skills (1–15 points)

- Excellent communication skills: articulate, cohesive, concise, rational flow of information, and clear in both context and detail
- Ability to convey scientific knowledge in broader, non-scientific contexts
- Capacity to work effectively with diverse stakeholders outside scientific/engineering communities

Commitment to AAAS Fellowship Mission and Opportunities (1–15 points)

- Strong interest in applying his/her knowledge toward the solution of problems in areas in which the fellowship would be served
- Clarity of objectives for applying to the fellowship, and how he/she imagines using the fellowship experience in the future
- Willingness and flexibility to tackle issues beyond area of expertise, openness and capacity to expand experience in the policy realm, and to interact with policymakers and regulators
- Realistic expectations, open-minded and adaptable to fellowship opportunities as well as working through challenges
- Demonstrates/communicates commitment to apply scientific/technical expertise to serve society

When reviewing and scoring applications, consider all the materials, including the candidate statement, CV and educational record, summary of extracurricular activities, and the letters of recommendation.

TOTAL SCORES AND COMPARISONS

Once you complete all of your reviews and enter your scores and comments in the grids at the bottom of each application, you will see a summary of your ratings for the candidates. Your scores should be distributed among the applicants you consider the most qualified and the least qualified. The following guide is provided to reduce subjectivity and promote consistency in scoring. If an applicant's score does not correspond with the descriptions below, please reassess your rating.

90–100: The applicant has an excellent essay, CV and qualifications, record of extracurricular activities, and recommendations. Overall, she/he excels in the outlined criteria, and therefore is **highly qualified** for a AAAS Fellowship.

79–89: The applicant has submitted a good essay, has a solid CV and qualifications and summary of extracurricular activities, and the references attest to the quality of the candidate. Overall, the candidate meets or exceeds the outlined criteria and is **well-qualified** for a AAAS Fellowship.

61–78: The applicant appears average for his/her career stage and does not stand out, therefore he/she is **not well qualified** for a AAAS Fellowship.

31–60: The applicant demonstrates merit only in some portions of his/her application, and the credentials are not clearly communicated through the essay, and/or the CV, record of extracurricular activities, recommendations. The applicant meets only some of the outlined criteria and therefore is **not qualified**.

0–30: The applicant does not meet the majority of criteria for a AAAS Fellowship and therefore is **not qualified**.

SCORING SUMMARY

The online review system tallies raw scores and calculates Z-scores for use in evaluating the applicants. No set of scores can fully describe the qualities sought, and therefore cannot serve as the ultimate arbiter of final decisions. That task will fall to the Selection Committee members following the completion of interviews.

Raw Scores

These scores are the total of the ratings each Selection Committee member provides on the candidates in each of the five criteria areas.

1. Scientific/Technical Background & Professional Accomplishment	40 points
2. Leadership & Potential	15 points
3. Analytical and Problem-Solving Abilities	15 points
4. Communication, Interpersonal & Outreach Skills	15 points
5. Commitment to AAAS Fellowship Mission & Opportunities	15 points
TOTAL:	100 points

Z-Scores

These scores are determined by a statistical treatment to account for Selection Committee member variability—that is, the differences between the average of each Selection Committee member’s scores (i.e., is a particular reviewer an “easy” or “hard” grader) and the distribution of their scores for all the applicants they evaluated.

The Z-score expresses each individual score as a standardized function of the mean and distribution for all the applicants scored by a particular Selection Committee member. For example, a zero Z-score for a candidate would indicate that he or she is an average among those reviewed by a particular individual. A positive Z-score indicates an above average candidate, and a negative Z-score denotes a below average candidate. Thus, the Z-score allows better comparability among reviewers. It also reduces the possibility that a candidate receives an unusually low or high grand total raw score (the sum of the three assigned Selection Committee members' scores) because they happened to be assigned to "hard" or "easy" reviewers. The Z-scores for each candidate are then averaged.

While Z-scores highlight many of the most talented candidates, Selection Committee discussions shed new light on other candidates not as highly ranked in the initial reviews.