Science Policy

A Guide to Policy Careers for Scientists

AUTHORS

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UPDATES

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I. An Introduction to Science Policy

Broadly defined, a career in policy refers to any position that supports the maintenance or changing of laws, regulations, or priorities that direct how governments and society function. The primary goal of science policy lies in understanding how science and technology impacts society and how STEM knowledge may be applied to better serve the public through governance systems.

The term "science policy" may refer to one or both of the following approaches: 1. science for policy – applying a scientific lens and/or evidence to inform laws and regulations; or 2. policy for science – laws and regulations that influence research funding and the impacts of scientific discoveries, also known as "research policy."

The roles of scientists in policy fields are broad and dynamic, and scientifically oriented positions may be embedded in organizations and public agencies that are not directly associated with scientific fields. Individuals with scientific training have found that they are just as capable of contributing to policy areas that are related to their field of study as areas that are unrelated. As numerous Professional Narratives demonstrate throughout this document, scientific training provides an approach that is applicable across many policy subject matters. Common science policy issues include health, energy, natural resources, agriculture, and climate change.

Careers in policy are embedded across a range of settings, such as federal, state and local government, lobbying firms, advocacy nonprofits, think tanks, research institutions, law firms, and academic institutions. Experience in policy tends to be highly versatile, allowing an individual to switch between fields and settings more fluidly than in research settings.

The culture of the policy world differs from that of scientific research in a number of ways. Most prominently, policymakers must acknowledge a host of priorities and perspectives, rather than remain laser-focused on a narrow set of topics, as researchers are often required to do to succeed. Laboratories are built to control for naturally occurring variables to facilitate the process of precise discovery, whereas policy institutions must be equipped to forge through uncertainty despite lack of exact evidence that accounts for unique conditions. Policymakers occasionally view themselves as referees of evidence and proposals, rather than subject matter experts.

Whether scientists or students have a clear idea of their goals or are just beginning to explore the broad field of science policy, this guide offers a general roadmap to the varieties of issues, settings, and types of work that one might find. Brief profiles of science policy practitioners are scattered throughout the guide and continued in Appendix A to illustrate both the kinds of tasks science policy practitioners carry out and the various ways these individuals have landed their positions.

To be clear, this guide was developed for individuals with a scientific background who are interested in pursuing a career in the field of science policy, rather than for scientists wishing to engage with policy more generally,

Professional Spotlight

Frances Colón, PhD

CEO and President of Jasperi Consulting
Miami, Florida

After her undergraduate education at the University of Puerto Rico, Dr. Frances Colón completed a PhD in Developmental Neurobiology at Brandeis University. Throughout graduate school, she took interest in local community issues and led science education activities. Later, as a AAAS Science and Technology Policy Fellow, Dr. Colón worked at the State Department, where she helped lead diplomacy in Muslim-predominant regions of the world through STEM outreach. After the fellowship, Dr. Colón focused on crafting the first resource priorities around science cooperation, climate change, and energy for the Bureau, and she was soon promoted to Deputy Science Adviser to the Secretary of State. Dr. Colón reflected on her academic background, "Our scientific training is well suited for policy… our abilities center around asking questions, testing hypotheses, redesigning processes, and re-routing a course of action based on the information we learn when we are not succeeding. I cannot think of an example of a policy without a science/tech or data angle." After a decade with the State Department, Dr. Colón left and founded a consulting firm, where she advises organizations, universities, and local and federal governments across science policy disciplines.

Read more about Dr. Colón's career in Appendix A.

through advocacy, communications, research administration, or otherwise. Numerous resources from the American Association for the Advancement of Sciences and other prominent organizations are available for the latter.

Finally, lists of resources have been compiled, such as fellowships specifically targeted to science policy practice, federal agencies with a science nexus, and select organizations that are influential in the science policy arena.

II. Types of Practice

Scientists working in the policy arena may take on a variety of responsibilities. The categories below are not meant to be exhaustive, but rather are designed to introduce the reader to some of the most common types of work performed by scientists in policy.

Advising

Elected officials, department heads, and other governmental entities (decision makers), particularly those with large staffs, may employ dedicated science advisors. These senior staff members can be called on to make recommendations on votes, policy priorities, strategic planning, and budgetary actions. Ultimately, their job is to use their knowledge (or skills in researching and acquiring the needed information) to make sure the decision maker they work for is making fully informed decisions related to science and technology.

Program Management

This category covers a particularly broad range of work relating to the administration of programs that operate toward some science-based mission. This could be a government or nonprofit program focused on advancing wildlife conservation, improving the affordability of solar energy, or building research capacity in disadvantaged communities.

Advocacy

Advocates attempt to influence decision makers and public institutions in support of their cause. Closely linked to policy development, advocacy can take many forms. Advocates may meet with decision makers and their staff, make public statements supporting or opposing proposed legislation, or negotiate compromises in the interest of their cause or clients. Advocacy can also involve direct work with the public via educational outreach or grassroots organization.

Communications

Another major facet of science policy, though often viewed as its own field as well, is science communication. There are huge needs for scientists in all settings that can competently act as translators of technical research output for decision makers, stakeholders, and members of the public. This could take the form of writing in a traditional journalistic setting, public outreach, or social media management.

Technical Writing

While similar to communications, technical writing can take many forms and is often sought after by government agencies for policy-relevant projects.

Examples include conducting a feasibility study, managing an analysis of alternatives, performing a gap assessment, providing strategic planning support, and evaluating potential solutions to complex challenges. Government agencies often contract out to consulting firms to satisfy their technical writing needs.

Diplomacy

Many science policy settings, particularly at the federal and international levels, may engage in some amount of diplomacy. Cooperation between countries on scientific pursuits can often play an important role in the development of foreign policy and international relationships, and some scientists find themselves best suited to facilitate those collaborations and connections.

Education

Education is an important part of science policy that can take many forms. It may look like public outreach to raise awareness of a new program or gather support for a potential policy. It may be formal education about the intersection of science and policy in an academic setting. Or it may be more informal education, acting as a translator between the worlds of academic research and policymaking.

Research

While there are bountiful opportunities to conduct traditional research in government, academic, and industry settings, scientists can also apply their research skills in policy work. A major part of the implementation of government programs and policies involves the collection of data. Whether it is to evaluate the effectiveness of a program or ensure that laws are being complied with (e.g., corporations are disposing of toxic materials properly), scientists can put their data collection skills to use supporting policies in many governmental settings.

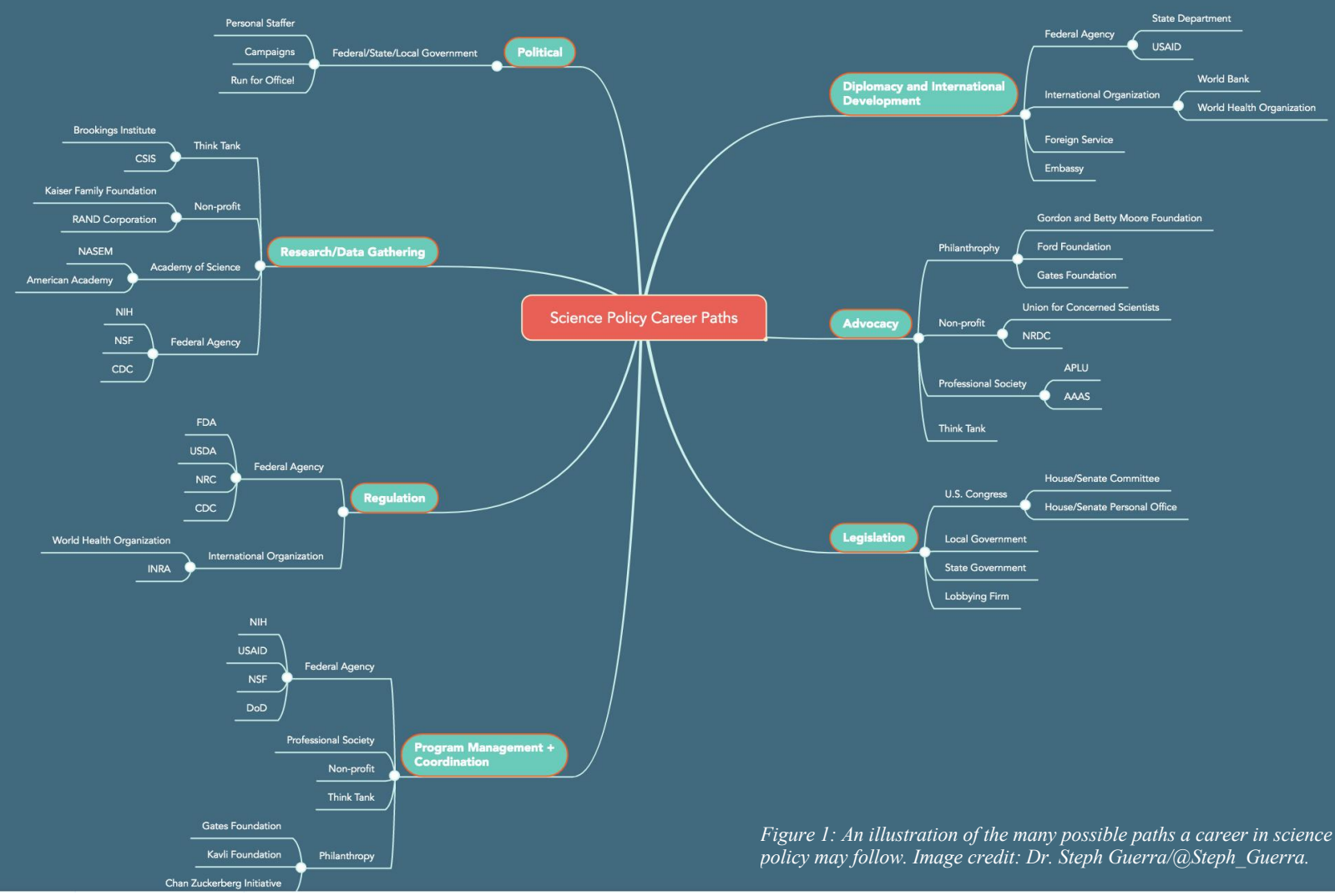

Figure 1: An illustration of the many possible paths a career in science policy may follow. Image credit: Dr. Steph Guerra/@Steph_Guerra.

III. Science Policy Settings

Careers in science policy exist in a wide variety of settings. This section is by no means an exhaustive list of places where scientists can practice policy, but it should give the reader an idea of the breadth of opportunity available to them.

Government

A position with the government is often the first thing that comes to mind when considering a career in science policy, and there is no shortage of opportunities across the various levels of government.

Federal

At the federal level, chances to practice science policy exist both within the executive and legislative branches.

Executive Branch: The executive branch, charged with implementing laws passed by Congress and managing programs, employs scientists in a number of roles across its many departments, offices, and commissions. Given the breadth of subject matter covered by executive agencies, scientists with technical expertise in all disciplines can find

important roles to play in supporting a department's mission, from staff scientists to program managers to analysts. There are also many instances of scientists working in federal executive branch positions not necessarily aligned with their technical expertise but where their scientific perspective and problem-solving skills are highly valued. Appendix B provides a list of some of the agencies and departments in particular that utilize the skills and expertise of trained scientists.

Congress: As bills make their way through Congress, there are several points in the legislative process where scientists can help inform policy. Senators and Representatives, depending on their interests or legislative priorities, may retain staff that have specialized knowledge as they prepare bill language. Congressional committees, which consider bills that cover topics in a particular field, have dedicated staff with subject matter knowledge expertise within the committee's jurisdiction. Some committees with jurisdictions of particular interest to scientists are illustrated in Table 1.

Additionally, there are legislative support offices that offer valuable services to congressional staff, such as the Congressional Research Service, which offers non-partisan policy and legal research to congressional committees, senators, and representatives.

House Committees	Senate Committees
Education and Labor	Agriculture, Nutrition, and Forestry
Energy and Commerce (includes Health)	Commerce, Science, and Transportation
Natural Resources	Energy and Natural Resources
Science, Space, and Technology	Environment and Public Works
Transportation and Infrastructure	Health, Education, Labor, and Pensions

Table 1: Some of the Congressional committees that may interest scientists.

State

Like the federal government, there are ample opportunities for scientists to work in state level government, though these opportunities can vary wildly by the legislative and regulatory landscapes in each state. As of 2020, more scientists work in state government settings than federal government settings.

Executive Branch: The majority of state scientist and science policy jobs exist within the executive branch. At the very top, depending on the state, the

governor's office may employ dedicated science advisors or subject matter experts in fields of particular interest to the governor.

Most states have cabinet-level agencies that share similar jurisdictions and serve similar purposes to their federal counterparts, though the extent of their operations can vary quite a bit from state to state depending on the environment. As such, it is important for prospective applicants to research the type and extent of work done by individual state departments.

Legislative Branch: State legislatures do not operate on the same scale as Congress, but like their federal counterparts, opportunities exist in the offices of elected officials and policy committees. However, it is important to keep in mind that states vary considerably in how often their legislature meets and in the size of the staff needed for legislative work.

Local

Moving below the state level, opportunities for scientists become much more dependent on the nature of the work and the location of the setting. Even the word local can refer to a spectrum of settings. Some services, such as health care and waste management, may be administered at the county or district level. Cities and municipalities, depending on their size, may have a number or public

Professional Spotlight

Louise Bedsworth, PhD

Executive Director of the California Strategic Growth Council
Sacramento, California

A course in Science and Public Controversy at MIT led Dr. Bedsworth to pursue science policy as a career. She achieved an MS in Environmental Engineering and a PhD in Energy and Resources, both from UC Berkeley. Her first professional positions were with the nonprofit Union of Concerned Scientists, as a Senior Vehicles Analyst, and the nonprofit think tank Public Policy Institute of California, as a Research Fellow. When Dr. Bedsworth was appointed to join the California Governor's Office of Planning and Research, she led the development and implementation of policy to guide long-term goals, many related to climate change. Now, as the Executive Director of the California Strategic Growth Council, Dr. Bedsworth leads a team within the Governor's administration that coordinates efforts between state agencies to strengthen outcomes in community sustainability by focusing on local economies, social equity, and environmental stewardship. She commented, "I love my job… I get to interact with local projects, state agency partners, and legislative and executive branch leaders. My job challenges me regularly and I feel like I am continually learning and growing in new directions."

Read more about Dr. Bedsworth's career in Appendix A.

offices that provide opportunities to practice science policy. It is not uncommon for large cities to have offices devoted to public health, sustainability, the environment, disaster preparedness, or technology.

International

Beyond the U.S., there are several international organizations that operate on a global scale and engage governmental leadership from multiple countries to address issues in the public interest. Examples include the **United Nations**, the **World Trade Organization**, and the **International Monetary Fund**.

Nonprofit Organizations

There are many nonprofit organizations whose missions relate to the advancement of science policy. These organizations vary in size and scope, ranging from international organizations that tackle large-scale problems to local operations with narrow, focused missions. Most nonprofits engage in a multitude of activities, including providing direct services in support of their mission, conducting original research, performing public education and outreach, and advocacy.

Many organizations engage directly at the policy level across all levels of government. Depending on the nature of the group, staff may act as researchers developing policy solutions for problems related to their core mission; analysts tracking legislative and regulatory proposals that will affect areas of interest and providing feedback or comments; or advocates that directly interact with decision makers, representing the interests of the organization in the policymaking process.

Other nonprofits engage with science policy through philanthropic gifts and the administration of research grants.

Laws vs. Regulations

While very similar in nature, the distinction between **laws** and **regulations** is a subtle but important one. Both are legally binding, but the source and purpose of each is different. Legislative bodies, such as Congress, write and pass laws, which must ultimately be approved by the head of the executive branch, the President or Governor. Once a law is approved, it officially becomes a **statute** and takes effect.

Laws may not always contain all of the details required for individuals and businesses to come into compliance. To clarify these ambiguities, the department in charge of enforcing the law writes **regulations**. The process by which regulations are approved is called **rulemaking**, and there are several opportunities for stakeholders to provide feedback to the departments along the way.

For example, the Federal Clean Air Act, the law passed by Congress, authorizes the Environmental Protection Agency (EPA) to protect air quality standards throughout the country. The EPA then writes regulations that set the specific levels of compounds that can be safely emitted into the air, as well as providing guidance for businesses to come into compliance.

Some focus on awarding grants to researchers while others provide funding to entities providing direct services related to the nonprofit's mission.

The National Academies of Science, Engineering, and Medicine (NASEM), and the many state-level institutions of a similar nature, are organizations that convene experts to act in an advisory capacity on questions of national (or state) concern in the fields of science, engineering, and medicine. At the national level (and in some states), they produce independent, objective reports to address specific questions, typically at the request of federal agencies, but occasionally Congress, state agencies, foundations, or other partners. It does not perform original research, but rather taps into an extensive network of academic experts and professionals, and through a rigorous review process, provides independent advice, informed by science and research. Academy reports can often influence policy decisions at all levels of government. *State Examples: California Council on Science and Technology, Connecticut Academy of Science and Engineering, Washington Academy of Sciences*

Professional Associations

Though technically nonprofits, the professional scientific associations, such as the **American Chemical Society,** are notable enough settings for science policy to warrant their own category. These organizations, which can range in scope

Professional Spotlight

Flojaune G. Cofer, PhD, MPH

Senior Director of Policy at
Public Health Advocates
Sacramento, California

"I found myself constantly being at the intersection of what we know and what we do," says Dr. Flojaune Cofer on her motivation to transition into a career in science policy. "I understand both the undergirding issues of what we have studied and also understand what we need to do about it… It tapped into my desire to activate and create change." Dr. Cofer is the Senior Director of Policy for Public Health Advocates, a California based policy advocacy organization that focuses on public health issues. After completing her doctorate from the University of Michigan, Dr. Cofer put her training as an epidemiologist to work as a contractor for the California Department of Public Health, leading the preconception health initiative. In her current capacity, Dr. Cofer oversees the statewide policy platform as well as a local program called All Children Thrive-CA, which addresses trauma among children through policy solutions focused on prevention and early intervention. In that work, she spearheaded a successful effort to get the CDC-approved Diabetes Prevention Program covered by Medi-Cal, California's healthcare system for low income residents.

Read more about Dr. Cofer's career in Appendix A.

from the broad **American Association for the Advancement of Science** to the specialized **American Association of Immunologists,** promote the advancement of their scientific discipline through a number of activities. While widely known in the academic research community for their publication of peer-reviewed journals or convening of academic conferences, these entities can also engage in advocacy, the administration of research awards and grants, and public outreach and education. *Additional Examples: American Physical Society, Institute of Electrical and Electronics Engineers, The Society for Neuroscience*

Think Tanks

They often play an important role in influencing both domestic and foreign policy. Think tanks are research institutions that often operate as a bridge between academic research and policymaking, producing white papers and research reports on topics with strong policy implications and potentially engaging in direct advocacy to support them. Think tanks come in a variety of shapes and sizes, and may even have certain ideological perspectives as part of their core mission. For example, the nonpartisan **Brookings Institution** performs research primarily in the social sciences and economics and receives the majority of its funding from philanthropic gifts. In contrast, **RAND Corporation** is primarily supported by federal agencies and operates three federally-funded research and development centers related to national defense and security. *Additional Examples: Institute for Defense Analyses, Pew Research Center, Urban Institute*

Academia

Most academic institutions have government affairs offices that serve as liaisons between the universities and state and federal governments. Staff may work with Congress and state legislatures to advocate for university priorities and act as representatives of the university with elected officials. These offices can often serve as a conduit to connect the research being conducted within the university to decision makers with a vested interest in the institution's output and funding. Additionally, as it is becoming an increasingly attractive career path for scientists, schools are developing dedicated training programs focused on science policy. A select list of graduate programs in science policy is provided in Section VII.

Lobbying Firms

While many of the non-governmental settings that have been discussed so far engage with the government and public policy though internal advocacy or governmental affairs offices, lobbying firms offer these services to clients, representing the interests of those that hire them before legislative and regulatory bodies. Firms may also specialize in a particular industry or issue area, such as health,

technology, the environment, or the financial sector.

Industry

Most large companies have offices dedicated to governmental affairs and/or regulatory affairs that represent their interests before legislative and regulatory bodies, as well as ensuring that the company is in compliance with all appropriate rules and regulations. Pharmaceutical, biomedical, agriculture, transportation, and energy companies all exist within complex regulatory landscapes that they must navigate. To do so, such offices employ scientists who often leverage their technical knowledge related to their field of training to help innovate in and navigate this landscape.

Law Firms

Similarly, law firms may have scientists on staff to support their regulatory efforts. These firms may consult with clients regarding regulatory proceedings and advocacy efforts, assist with compliance with government rules, and act as intermediaries between companies and regulatory agencies.

IV. Science Policy Issue Areas

Science policy encompasses a tremendously broad field, related to the production, organization, and application of knowledge in support of societal needs.

Science is equally broad, and as a result, there are numerous possible policy areas one may work in as a scientist. There are advantages that accompany contributing to a policy issue area that is aligned with one's degree, but many individuals find that their analytical and critical thinking skills also allow them to work in policy areas outside of their primary area of study.

Table 2 illustrates some policy areas and potential issues with a tie to these areas. This illustration is not meant to be exhaustive or comprehensive, but rather to indicate the breadth of topics in the policy sector.

Science Policy Issue Area	Example Issues
Health	Public health; Substance use disorders; Mental and behavioral health; Pharmaceutical/medical device development and regulation; Licensing of health and mental health-professionals
Environmental Quality	Drinking water regulations; Toxic substances (pesticides, rodenticides, hazardous chemicals, toxic waste); Environmental impacts of development; Climate change mitigation and impacts
Natural Resources	Conservation and management of natural resources; Fish and wildlife, including endangered and invasive species, hunting regulations, and importation of animal products; Oil, mining, and geothermal development
Water	Regulation of waterways and water resources, including groundwater supplies, dams, flood and drought infrastructure, and water rights

Table 2: Topics related to various science policy issue areas.

Transportation	Local streets and roads; Highways; Public transit; Rail; Vehicles; Freight; Bicycle and pedestrian facilities; Mobile sources of air pollution
Agriculture	Livestock and crop regulations; Climate-smart agriculture
Energy and Utilities	Utilities; Energy companies; Alternative energy development and conservation; Communications development and technology; Cybersecurity
Business, Labor, and Economic Development	Workforce development; Labor; Workers' compensation; Employment discrimination
Housing	Public housing development; Homelessness; Land-use planning; Housing discrimination; Building codes and standards
Insurance	Indemnity, surety, and warranty agreements; Insurance policies
Judicial	Judges; Courts; Privacy; Consumer protection
Human Services	Public assistance programs; Child welfare and foster care; Services for persons with disabilities; Aging and long-term care; Social services; Rehabilitative services
Education	K-12 education; Higher education; Certifying teachers and other educational professionals
Veterans Affairs	Veterans; Military affairs; Armories; National Guard
Banking and Financial Institutions	Regulations on banks; Real property finance
Elections	Election policy; Voting rights; Voting machinery and systems; Reapportionment
Government and Public Safety	Emergency management; Disaster response; Climate change adaptation; Gambling; Horseracing; Alcohol, tobacco and cannabis

V. Planning For Your Science Policy Career

If you are interested in a career in science policy, it is wise to start thinking about what you can do now to develop the experience and credentials you will need. Not surprisingly, employers look favorably upon candidates who have knowledge, interest, and experience in some aspect of science and policy. Below are some suggestions for preparing for a science policy career. Also keep in mind that there are fellowship opportunities that do not necessarily require prior experience in policy.

1. **Assess your prior experience.** Consider prior policy-related experiences you may have had and determine how you can best bring this experience to the attention of prospective employers. Academic degrees, work experience, volunteer

Professional Spotlight

Alex Engler, MS, MPP

Rubenstein Fellow in Governance Studies at the Brookings Institution and Adjunct Professor at Georgetown University, Washington, DC

With a Master's of Data Science from Northwestern and a Master's of Public Policy from Georgetown, Alex Engler is pushing the boundaries of how computational tools may support and improve policymaking. During his education and afterward, Engler gained professional experience within the nonprofit, academic, and public sectors, including an internship with The Sunlight Foundation, a position as a Data & Research Associate at the Congressional Research Service, and a Data Scientist at the Urban Institute. Engler also developed graduate programs in computational analysis and public policy and lectured at the University of Chicago, Johns Hopkins University, and Georgetown University. He is now a Rubenstein Fellow in Governance Studies at the Brookings Institution, a respected nonprofit public policy think tank that publishes in-depth research on complex societal challenges, and continues to teach at Georgetown University. In his current capacity, Engler asks big questions at the intersection of unthinkably advanced technology and decision-making. "Other than causal inference, the question is expanding into how we define and identify valuable data. AI, machine learning, and network analysis are helping us find out which data are informative."

Read more about Engler's career in Appendix A.

experience, or specific courses all form a solid base. These are features you will want to highlight in your resume and cover letters, and they are the starting place for deciding what sort of additional experiences you will want to seek out to be more competitive in the job market.

2. **Research the science policy arena**. Learn as much as possible about policy organizations that hire scientists, issues within your interest, and the types of work that scientists perform at those institutions. Explore the websites of organizations devoted to science policy to learn more about their approach and the particular issues that they address. Try to attend events featuring scientists working in policy. Get to know academics that work in the field. Set up informational interviews with scientists to learn more about the variety of paths that scientists take. All this research will help you become familiar with the field.

3. **Analyze and move toward your goals**. Explore possible pathways that make sense to your situation. Consider your options through written materials, online resources, and conversations with different professionals. Starting this process early will help to incorporate additional preparation and professional development activities that will expand your horizons and credentials. Numerous interdisciplinary master's degree programs are now available that combine some scientific training with exposure to the language and process of

policymaking (see the list of degree and certificate programs in Section VII). However, many science policy practitioners do not consider such academic preparation a firm requirement. Unlike most graduate schools, many medical schools will offer students the opportunity to pursue a Master's in Public Administration during summer terms or a one-year Master's in Public Policy. Additionally, some graduate schools offer certificates in Public Policy to graduate students currently enrolled in PhD programs.

4. **Contribute to the public sphere.** Consider building a track record as an informed, trustworthy voice on a policy topic you care about. Often, this can involve contributing to blogs, social media, or traditional media outlets on a particular issue you have expertise in, whether it is currently in the news or has yet to reach the level of public discourse.

5. **Develop your network**. Conferences, advocacy events, and local government meetings will provide opportunities to build a community of individuals with variable levels of experience. Make sure you are able to offer a business card when meeting others in such settings, and always follow-up with the individual (preferably within 24 hours), if appropriate.

6. **Tailor your application materials**. A resume for a policy job typically looks quite different than a traditional academic CV. How one's scientific background is presented and described, for example, can emphasize one's communications skills, orientation toward community impacts and engagement, and subject matter expertise in a way that is accessible, flexible, and ultimately relevant to an opportunity in a policy setting.

Helpful Career Planning Links

MyIDP (Individual Development Plan): a web-based career planning tool for science graduate students and postdocs to help define career goals and understand optional tracks for implementation, created and maintained by AAAS, The Federation of American Societies for Experimental Biology, the University of California, San Francisco, the University of Massachusetts Medical School, the University of Illinois at Chicago, and Burroughs Wellcome Fund; myidp.sciencecareers.org/

VersatilePhD: resources for non-academic job hunting, e.g., sample resumes and job listings, and an online community (premium content is only available by institutional subscription); versatilephd.com/

USA Jobs: centralized site for federal government jobs: usajobs.gov

CA Jobs: California state government jobs: jobs.ca.gov

LinkedIn 10-10-10 Exercise

The University of California, San Francisco Office of Career and Professional Development created a simple exercise for graduate students and postdocs seeking careers. Start by browsing LinkedIn profiles of science policy professionals doing work that interest you. In the process, compile the following:

- **10 job titles** – Identify titles of science policy positions that interest you.
- **10 employers** – Identify organizations that work on the type of policy you are interested in. Be mindful of location, size, and focus area.
- **10 individuals** - Identify science policy professionals doing work that you want to learn more about and follow-up with.

View the full exercise from UCSF in Appendix D.

VI. Select Academic Science Policy Programs

The most formal route to entering the field of science policy is to earn an academic degree or certificate. Many universities with a public policy department have recently joined forces with scientific departments to provide options for scientists interested in a formal and structured orientation to policy. Excellent lists of degree and certificate programs exist online and are maintained by organizations like the Engaging Scientists in Policy (ESEP) Coalition. In addition, the National Science Policy Network is planning to release a report about academic curricula and opportunities in 2020. Just as with fellowships, some degree and certificate programs may be conducted in parallel to graduate work and does not necessitate an entire year or two of exclusive coursework.

Academic Graduate Science Policy Programs	Website
Arizona State University Master's in Science & Technology Policy	https://sfis.asu.edu/mstp-welcome
Carnegie Mellon University Master's in Energy Science, Technology, & Policy	https://www.cmu.edu/engineering/estp/
Columbia Environmental Science Policy	https://www.mpaenvironment.ei.columbia.edu/
Duke University Master of Bioethics, Tech Ethics, & Science Policy	https://scienceandsociety.duke.edu/learn/ma/
Georgetown Master's degrees in Biomedical Science Policy, Environmental Metrology & Policy, and Data Science for Public Policy	https://grad.georgetown.edu/biomedical-science-and-advocacy/ https://grad.georgetown.edu/data-sci-pubpol/
Georgia Tech Master's degrees in Cybersecurity Policy and Sustainable Energy & Environmental Management	https://spp.gatech.edu/masters/mscybersecurity/curriculum
Harvard Program in Science, Technology, and Public Policy	belfercenter.org/program/science-technology-and-public-policy

Michigan State University Minor in Science, Technology, Environment, and Public Policy	https://reg.msu.edu/AcademicPrograms/ProgramDetail.aspx?Program=3207
MIT Technology & Policy Program	http://tpp.mit.edu/
Oregon State University Master of Science & Technology Policy	https://liberalarts.oregonstate.edu/spp/mpp/policy-concentrations/science-and-technology-policy
Pardee RAND PhD in Public Policy	https://www.prgs.edu/
University College London Master's of Science, Engineering, and Public Policy	https://www.ucl.ac.uk/steapp/study/masters-public-administration-mpa
University of California, Riverside Certificate in Science Policy	https://sciencetopolicy.ucr.edu/
University of Cambridge Program in Technology Policy	https://www.jbs.cam.ac.uk/programmes/professional-practice/mphil-technology-policy/
University of Colorado Graduate Certificate Program in Science & Technology Policy	https://sciencepolicy.colorado.edu/students/
University of Michigan Graduate Certificate in Science & Technology Public Policy	http://stpp.fordschool.umich.edu/
University of Minnesota Master of Science, Technology, and Environmental Policy	https://www.hhh.umn.edu/masters-degrees/master-science-science-technology-and-environmental-policy
University of Sussex Master's degrees in Energy Policy and Science & Technology Policy	http://www.sussex.ac.uk/spru/study/masters
University of Wisconsin-Madison Neuroscience & Public Policy Program	https://npp.wisc.edu/
University of Chicago Master of Science in Computational Analysis and Public Policy	https://capp.uchicago.edu/

University of California, Berkeley Environmental Science, Policy, & Management Graduate Program	https://ourenvironment.berkeley.edu/graduate-programs
University of California, San Diego Master's of Advanced Studies in Climate Science & Policy	https://csp.ucsd.edu/
Stanford University Master's of Public Policy programs with scientific concentrations	https://publicpolicy.stanford.edu/academics/graduate/concentrations
University of California, Los Angeles Health Policy & Management Graduate Program	https://hpm.ph.ucla.edu/pages/
Iowa State University Wind Energy Science, Engineering & Policy Graduate Program	https://www.grad-college.iastate.edu/academics/programs/apresults.php?id=116
University of Kansas Health Policy & Management Graduate Program	https://catalog.ku.edu/medicine/health-policy-management/
Johns Hopkins University Graduate Programs in Environmental Sciences & Policy and Energy Policy & Climate	https://advanced.jhu.edu/academics/graduate-degree-programs/environmental-sciences-and-policy/

Table 3: A select list of academic science policy programs.

Professional Spotlight

Maureen Cruz, PhD, MPH

Senior Manager of Science, Regulation & Policy at Faegre Drinker Biddle & Reath LLP Washington, DC

Within the Government and Regulatory Affairs Practice Group of the law firm Faegre Drinker Biddle & Reath LLP, Dr. Cruz serves as the Senior Manager of Science, Regulation & Policy. Her team is unique in that scientists work alongside attorneys. Together, they provide diverse technical, legal, and administrative services to several consortia in the health and life sciences Industry. Her clients are companies and organizations primarily from health care, pharmaceutical, and biotechnology fields and seek out her firm with a desire to work together in a confidential, precompetitive, neutral space to more quickly improve patient care. Although competitors in the market, these companies form consortia to share technical expertise and data, as well as to develop industry positions through publications, white papers, and concerted responses to regulatory draft guidances. Dr. Cruz provided an example of a general project: "When the FDA releases a draft guidance, it will often include details of what type of testing the industry must perform," such as to be eligible to submit a new drug application for FDA approval. "The FDA understands that research is constantly advancing, and the agency wants to keep up with how industry leaders are evolving their best practices." Through this system of R&D consortia, companies can present a stronger argument by presenting the united perspective of many industry members. Dr. Cruz achieved a PhD from Georgetown University and a Master's in Public Health from Columbia University, and completed a postdoc at The Scripps Research Institute.

Read more about Dr. Cruz's career in Appendix A.

VII. Extracurricular Science Policy Activities

Extracurricular activities during school or volunteer work alongside one's profession can be an excellent way to meet others who are interested in science policy while gaining practical experience in the field. Many science advocacy efforts, for example are volunteer-driven, which tends to grant ample opportunities to engage at high levels and have a significant impact. The ubiquity of governance structures at the local level, just as at the regional, national, and international levels, provide regular paths to engage in policy without extending beyond one's local community. Examples of extracurricular activities are shown in Table 4 below. These activities can build crucial skills and experiences that are particularly valued in policy careers, including the following examples:

Communications Skills

written, oral, traditional media, social media

Interpersonal Skills
ability to build and maintain relationships, demonstrate diplomacy with diverse stakeholders

Organizational Skills
creating structure and order, boosting productivity, prioritizing tasks

Interest in the Public Good
community perspectives, equity, long-term outcomes

Presentational Skills
comfort with delivering talks, designing presentation slides, and fielding questions

Comprehend a Breadth of Perspectives
ability to understand the big picture and critically evaluate multiple sides of an issue, including equity, scientific, political, and economic perspectives

Working in a Team
project management, organization, meeting deadlines, teamwork, collaboration

Event Planning

Professional Spotlight

Lana Skirboll, PhD

Vice President of Science Policy at Sanofi, Former Director Science Policy at the NIH
Washington, DC Metro Area

The primary purpose of the NIH Office of Science Policy is to advise the NIH Director on biomedical research policy issues that are of significance to the agency, the research community, and the public. The office works with stakeholders within and outside of NIH to develop policies that further the life sciences. As Director of Science Policy of NIH for over fourteen years, Dr. Lana Skirboll managed a massive portfolio, ranging from disease prevention to nanotechnology and precision medicine. When getting into science policy, first with the Mental Health Institute, she recalled, "I realized I could use science in a lot of different ways." She testified in Congress, worked frequently with the White House, and coordinated constantly across the 27 Institutes and Centers of the NIH. Dr. Skirboll achieved a Master of Physiology from Miami University of Ohio and a PhD in Pharmacology from Georgetown University, followed by postdocs at Yale University and the Karolinska Institute. She advises students, "As a scientist, you have a brain. You were trained to look at problems and to be analytical, regardless of the questions. You can definitely succeed in policy."

Read more about Dr. Skirboll's career in Appendix A.

perceptive to detail, developing timelines, budgeting, scheduling, adaptability

Categories	Actionable Recommendations
Internships	• Look for summer or semester-long internships in government offices, companies, nonprofit organizations, etc. in areas that capture your interest. Many internships are not widely advertised beyond the office or department. • Networking and proactively indicating your interest in an internship, whether a formal program exists or not, has led to countless experiences.
Science Policy Student Groups	• Get involved in the science policy student group at your institution. The National Science Policy Network is a great place to find out if your school has one: scipolnetwork.org. If a group does not already exist on your campus, start one!
Science Communication	• Attend webinars about science communication, such as those provided by the Alan Alda Center for Communicating Science: aldacenter.org. • Connect with your university's press office to write a press release about your work or participate in training opportunities. • Propose a science column to local newspapers or submit a Letter to the Editor or Op-Ed in response to reporting on science topics. • Volunteer to be an expert who is willing to be contacted by journalists for comments, such as via SciLine, by AAAS: sciline.org.
STEM Education	• Join a local STEM education organization. • Volunteer at local schools or a science museum to share your knowledge of science or your experience as a scientist with young students.

	• Support a local science competition as a judge, organizer, or day-of volunteer. • Create a booth for a public science festival.
Advocacy in Community or Scientific Organizations	• Become a Science Ambassador of a local community organization. • Participate in fundraising activities. • Engage in lobbying days, such as a visit to your state capital on behalf of a cause.
Political Campaigns	• Volunteer your time to an individual seeking elected office as a science advisor or in another capacity. • Help coordinate fundraisers. • Get involved with communications.
Political Organizations	• Join a local political group to learn about issues you care about. • Help organize a local march or demonstration.
Leadership Training	• Look for opportunities for leadership training from local governments (e.g., Sacramento City Management Academy). • Some organizations provide leadership institutes to prepare participants to run for elected office (e.g., New Leaders Council).
Boards and Commissions	• Advise city, county, regional, or state government by providing input as a member of a formal body, appointed by government leaders. • Many public boards and commissions constitute 50% public members, meaning that one need not be an expert to serve in this role, but rather provide a lay, public perspective. • Explore the resources developed by Engineers and Scientists Acting Locally for ideas and guidance: esal.us.

Table 4: Activities that support a pathway to science policy

VIII. Select Organizations with a Science Policy Nexus

Bridging the scientific world with the policy world is not a new concept, and many organizations have specialized their efforts over years and decades to effectively foster networks and develop guidance to connect scientists with decision makers. Below is a brief list of select organizations, some of which are entirely dedicated to informing science policy or working directly with governments, while others maintain a policy or advocacy arm that focuses on channeling information to governmental agencies and decision makers.

- American Association of Universities
- American Institute of Physics
- American Association for Cancer Research
- American Association for the Advancement of Science
- American Geophysical Union
- American Society of Human Genetics
- Association for Women in Science
- California Council on Science & Technology
- Center for Science in the Public Interest
- Consortium for Science, Policy, and Outcomes
- Ecological Society of America
- Engaging Scientists & Engineers in Policy
- Engineers and Scientists Acting Locally
- Environmental Defense Fund
- European Parliament Scientific and Technological Options Assessment
- Federation of American Scientists
- Federation of American Societies for Experimental Biology
- Forum on Science Ethics and Policy
- Genetics Society of America
- Geological Society of America
- Global Young Academy
- Institute for Science, Engineering, and Public Policy
- Institute of Electrical and Electronics Engineers
- Intergovernmental Panel on Climate Change
- Intergovernmental Science Policy Platform on Biodiversity & Ecosystem Services
- International Science Council

Professional Spotlight

Bao-Ngoc Nguyen, PhD

Biomedical Engineer,
U.S. Food and Drug Administration
Washington, DC

As a PhD student at the University of Maryland, Dr. Bao-Ngoc Nguyen was dedicated to stem cell research. After defending her dissertation, she continued to feed her interest in stem cells even while she was a Science & Technology Policy Fellow in the California Legislature, supported by the California Council on Science & Technology (CCST). During the one-year program, she worked in the Senate Health Committee, and when asked to pitch bill ideas, she proposed a bill to help curb the potentially harmful, unproven practices of stem cell clinics. That bill passed, and Dr. Nguyen was a finalist of the "Stem Cell Person of the Year" award. She is now a Biomedical Engineer in the Office of Tissues and Advanced Therapies within the Center for Biologics Evaluation and Research of the FDA, which she says "is a very unique place to work, as it convenes different medical scientists to assess the future of health care by regulating what medical products are available to the public." She came to the position by way of a two-year fellowship at the FDA.

Read more about Dr. Nguyen's career in Appendix A.

- National Academies of Science, Engineering, and Medicine
- Materials Research Society
- National Council for Science and the Environment
- National Science Policy Network
- Natural Resources Defense Council
- Organization for Economic Co-operation and Development
- Personalized Medicine Coalition
- Public Health Advocates
- Public Health Institute
- RAND
- Research!America
- Sierra Club
- Society for Neuroscience
- The Nature Conservancy
- The Science Coalition
- Union of Concerned Scientists
- United Nations Educational, Scientific and Cultural Organization
- World Economic Forum
- World Health Organization
- World Science Forum
- World Wildlife Fund

IX. Select Science Policy Fellowships & Programs

Science policy fellowships and programs provide a supportive bridge from academia into the policy sector. A large and growing number of such programs span the globe, and vary by issue area, policy setting, location, length, and eligibility requirements.

While all fellowship programs are different, they generally seek applicants who have expressed or demonstrated interest in public policy and who possess strong interpersonal and communication skills (including with non-technical audiences). In some fellowship programs, work outside one's area of study may be required.

In Table 5, you will find the program details of a select group of fellowships and programs. A more comprehensive list of Science Policy Fellowships & Programs can be found in Appendix C. Since programs often change over time and new ones are created, please check the fellowship or program website for the most up-to-date information.

Additionally, aggregated lists of science policy fellowships and programs can be found on websites such as the National

Science Policy Network, American Association for the Advancement of Science, UCSF Science Policy and Advocacy Careers Page, Genetics Society of America, and the Federation of American Societies for Experimental Biology.

Fellowship	Program Details
AAAS Science and Technology Policy Fellowship Administered by the American Association for the Advancement of Science (AAAS), this program administers fellowships spanning the executive, legislative, and judicial branch of the federal government. Many of the legislative placements are funded by professional societies such as APS and ACS who also run the selection process. https://www.aaas.org/programs/science-technology-policy-fellowships	Type of work: Federal government Duration: 1 year Location: Washington, DC area Stipend: $75,000-$100,000 plus other support including health insurance, professional development, and targeted fellowship travel and training. Eligibility: • PhD in science or MS in engineering required • Recent PhD grads to faculty on sabbatical and retired scientists • US citizenship required Application cycle: Applications are due in November each year; fellows are selected in late spring and begin work in September each year.
CCST Science and Technology Policy Fellowship Administered by the California Council on Science & Technology (CCST), this program selects 15 PhD scientists to spend a year working in California's legislative or executive branch. https://ccst.us/ccst-science-fellows-program/	Type of work: State government Duration: 1 year Location: Sacramento, CA Stipend: $50,000+/year plus health benefits, relocation costs, and professional development support Number of fellows: 15/year Eligibility: • PhD or equivalent degree • US citizenship or suitable immigration status for non-residents Application cycle: Applications are accepted December-March, and selections are made in

	the spring. Fellows begin work in November each year. Notes: Applicants need not be located in or from California to apply, but must relocate to the Sacramento area for the duration of the fellowship
Canadian Science Policy Fellowship Program This fellowship, administered by the nonprofit organization Mitacs, places PhD recipients in host government offices throughout Canada. https://www.mitacs.ca/en/programs/policy-fellowship	Type of work: Federal/provincial government (Canada) Duration: 1 year Location: Throughout Canada Stipend: $70,000 CAD - $80,000 CAD Eligibility: • Canadian citizen or permanent resident of Canada • PhD in any academic discipline Application cycle: runs from fall throughout winter; fellows begin work in September each year. Note: Fellows must relocate to their host office and secure local accommodation for the duration of the fellowship. Security clearance requirements may be necessary for some host offices.
Mirzayan Science & Technology Policy Graduate Fellowship Program The Mirzayan Fellowship places early career individuals in the National Academies of Sciences, where they spend 12 weeks learning about science and technology policy and the role that scientists and engineers play in informing policy. https://mirzayanfellow.nas.edu/	Type of work: Non-governmental organization Duration: 12 weeks Location: Washington, DC Stipend: Approx. $9,250 Eligibility: • MS, JD, MD, or PhD (awarded within past five years) in science, law, or business • Applicants do not need to be US citizens, but must satisfy specified visa requirements Application cycle: Applications open in June and close in September; fellows begin work in January each year.

Presidential Management Fellows Program (PMF) This program, administered by the US Office of Personnel Management (OPM), competitively selects finalists who spend two years with a federal agency. https://www.pmf.gov/	Type of work: Federal government Duration: 2 years Location: Washington, DC and throughout US and global locations Stipend: $45,627-$109,362 (varies based on geographic location and experience) Eligibility: • JD, MS, or PhD awarded within two years of application • US citizenship, or eligibility to work in the US with pursuit of US citizenship, unless appointed by agency under specific statute for non-citizens Application cycle: applications accepted during the fall for two weeks; finalists are notified approximately six weeks later and have 12 months to secure a PMF appointment with a federal agency.
John A. Knauss Marine Policy Fellowship Program This program places graduate students who have an interest in ocean, coastal, and Great Lakes resources in the federal government (executive and legislative branches) for one year. https://seagrant.noaa.gov/Knauss-Fellowship-Program	Type of work: federal government Duration: 1 year Location: Washington, DC Stipend: $47,500 as well as additional funds for travel and health benefits Eligibility: • Students enrolled toward a degree in an accredited US graduate program as of application close date • Any nationality • Interest in ocean, coastal, and Great Lakes resources • Must pass federal background check for security clearance Application cycle: Applications must be received by February each year, and finalists are notified in mid- to late-summer; fellows begin work the following winter.

Table 5: Select science policy fellowship programs.

X. Appendix A: Professional Narratives

Frances Colón, PhD, CEO and President of Jasperi Consulting, Miami, Florida

Immediately after her undergraduate education in Biology at the University of Puerto Rico, Dr. Frances Colón began a PhD at Brandeis University. Throughout graduate school researching Developmental Neurobiology, she took interest in local community issues and helped lead science education activities on the side, like creating a summer science camp for young Latinas. Her PI noticed that she was also curious about policy and printed her an application for the AAAS Science and Technology Policy Fellowship Program.

As a AAAS Science and Technology Policy Fellow, Dr. Colón worked at the Department of State. She was assigned to help lead science diplomacy in Muslim-predominant regions of the world through STEM educational outreach. She enrolled in early-morning Arabic lessons and led educational programs for teachers and academic organizations in the Middle East and North Africa.

At the conclusion of the two-year fellowship, Dr. Colón was offered a more permanent position in the department as Science and Environment Adviser for Western Hemisphere Affairs. "At the time, the Energy and Climate Partnership for the Americas had just launched, so I got right to work partnering with governments across Latin America to decrease deforestation, increase renewable energy use, and accelerate sustainability across the region." As part of that work, Dr. Colón crafted the first resource priorities around science cooperation, climate change, and energy for the Bureau. Based on the work she did on these priorities, she was promoted to Deputy Science Adviser to the Secretary of State, which broadened her portfolio substantially.

Dr. Colón reflected on her academic background, commenting, "Our scientific training is well suited for policy. Some think policy decisions shouldn't be made by scientists and only informed by them from afar. But our abilities center around asking questions, testing hypotheses, redesigning processes, and rerouting a course of action based on the information we learn when we are not succeeding. Scientists are huge assets to the policy process. I cannot think of an example of a policy without a science/tech or data angle."

When asked about her original neuroscience focus and transition to environmental science issues, she said, "The PhD training itself is valuable: one learns to be skeptical, ask questions, request to see the data that supports an argument. Those are abilities scientists develop regardless of their specific field." In the State Department, Dr. Colón would advise on how best to design a strategy for a specific country, like how to bring utilities to the table along with communities and government officials to design and implement a new renewable energy matrix. "It wasn't my neuroscience coursework that prepared me for that work, it was the skillset that surrounded the inquiry, like recognizing where the problems exist, convening people around a common goal, analyzing data, and managing a team to optimize skills and perspectives. Scientists tend to be fast learners, with the capacity to take in much information and synthesize it, form a hypothesis, carry out multiple steps to reach a solution, and advance the issue to the next question. Any decision maker must be able to learn quickly."

After ten years with the State Department, Dr. Colón founded her own consulting firm, where she advises organizations, universities, and local and federal governments, both domestic and abroad. She explains consulting in the following way: "When an entity is looking for expertise, they cannot always hire full-time experts in-house for short-term projects or hyper-specialized tasks. For example, when a city drafts its 10-year climate resilience plan, information must be integrated from across all different divisions of city government, for example, to assess the impacts of sea-level rise on infrastructure. Public agencies have a duty to implement laws and regulations. For a project that occurs once a decade, a city or county may bring together different experts, including consultants, to assist in compiling information, analyzing data and recommending a course of action."

Dr. Colón added, "Consultants also provide an outside perspective. Project recommendations may affect those who already work in a department, so it's important to have the outside perspective and progress measurement that consultants can bring." Local, state, and federal governments frequently draw strategic support from consultants, such as guid-

ance for launching a new office or identifying pitfalls of a particular approach. Technical writing assignments are common projects for consultants. "Consultants can have multiple clients and a range of tangible deliverables, like a two-day workshop or a short turn-around report. Every project is unique, so there's not really a typical example."

When asked how clients know to reach out to her, Dr. Colón referenced the network from her previous work at the State Department. Once she concludes a project, news spreads by word-of-mouth of her capacity to provide quality support. She is also very active on boards and commissions, which expands her network further. "There are periods when flexibility is appreciated. Last year, I took a break from running my full-time business to do a fellowship with Open Society Foundations, focusing on climate justice. I chose a project where I mapped the impacts of climate change on vulnerable communities in Florida and worked to catalyze policy action to counter them."

Louise Bedsworth, PhD, Executive Director of the California Strategic Growth Council, Sacramento, California

A course titled "Scientists, Engineers, and Public Controversy" while an undergraduate at MIT led Dr. Bedsworth to recognize that she wanted to focus her career at the intersection of science and policy. She went on to achieve an MS in Environmental Engineering and a PhD in Energy and Resources, both from the University of California, Berkeley.

During graduate school, Dr. Bedsworth discovered the field of Science and Technology Studies, commenting, "The literature and scholarship in this area really spoke to me - it focused on scientific topics, but looked from new angles - sociological, anthropological, and political. For me, this opened my eyes to a new way to think about science and its role in society, decision-making, and policy."

Among her first career steps, Dr. Bedsworth joined the nonprofit Union of Concerned Scientists, as a Senior Vehicles Analyst, and later, the nonprofit think tank Public Policy Institute of California, as a Research Fellow. She then joined the California Governor's Office of Planning and Research, where she led the development and implementation of policy to guide long-term goals, including those related to climate change.

Now, as the Executive Director of the California Strategic Growth Council, Dr. Bedsworth leads a team within the Governor's administration that coordinates efforts between state agencies to strengthen outcomes in community sustainability by focusing on local economies, social equity, and environmental stewardship. When asked about the most rewarding aspects of her work, she responded, "I love my job and what I get to do. It seems like every day is different – I get to interact with local projects on the ground, state agency partners, and legislative and executive branch leaders. My job challenges me regularly and I feel like I am continually learning and growing in new directions. The most rewarding part of my job comes whenever I get to visit projects we have funded and get to see the impact it is having on individuals and communities. Seriously, a site visit will help me build the resilience and resolve to face any of the challenges that come my way!"

One of the programs she oversees is the Climate Change Research Program, which funds solutions-oriented research that upholds community and stakeholder engagement as a central pillar. She commented, "I get to keep a toe dipped in the research world, while also pushing to advance the science-policy interface."

Dr. Bedsworth regularly encourages young scientists to recognize the valuable skills they have developed through their training: "Problem framing and solving, resourcefulness, and analysis – all skills that graduate students possess are an enormous asset in the policy world. Often, I talk to students who worry that they don't "know" enough because they may be leaving their dissertation field behind as they transition into policy. And, in doing so, I so often see that they take for granted the skills they have. The ability to frame a problem, strategize solutions, and identify resources and partners to help you get to that solution are all invaluable in the policy world (though, it often moves a bit faster than academia!). So, don't feel intimidated. Instead capitalize on and communicate your analytical chops as you make your entrée into the policy realm."

To better understand what a career in science policy may be like, Dr. Bedsworth suggests pursuing internships at state agencies and departments. In her words, "they can be invaluable in demystifying the policy world." The California Strategic Growth Council annually hosts Executive Fellows (listed in Appen-

dix C), and department-specific internships can be found on agencies' websites.

Photo Credit: Icarian Photography

Flojaune G. Cofer, PhD, MPH, Senior Director of Policy at Public Health Advocates, Sacramento, California

"I found myself constantly being at the intersection of what we know and what we do," says Dr. Flojaune Cofer on her motivation to transition into a career in science policy. "I understand both the undergirding issues of what we have studied and also understand what we need to do about it… It tapped into my desire to activate and create change." Dr. Cofer is the Senior Director of Policy for Public Health Advocates, a California-based policy advocacy organization that focuses on public health issues.

After completing her doctorate at the University of Michigan, Dr. Cofer put her training as an epidemiologist to work as a contractor for the California Department of Public Health, leading a preconception health initiative, where she conducted data analysis and coordinated efforts to promote the health of women of reproductive age. Dr. Cofer credits this research-based position as the most important part of her transition into science policy. It allowed her to engage with policy through a research lens, without having to leap directly into the world of policy development. She learned how to craft arguments for a policy audience, what questions to ask as she was shaping her research, and how to make her data and results accessible to the advocate community.

In her current capacity, Dr. Cofer oversees the statewide policy platform of Public Health Advocates as well as a local program called All Children Thrive-CA, which addresses trauma among children through policy solutions focused on prevention and early intervention. In 2017, she spearheaded a successful effort to get the CDC-approved Diabetes Prevention Program covered by Medi-

Cal, California's healthcare system for low income residents. "One of the most rewarding aspects of the work is being able to point to something that exists, that someone else really benefits from, and being able to say, I contributed to that," says Dr. Cofer, describing her favorite part of the job.

Alex Engler, MS, MPP, Rubenstein Fellow in Governance Studies at the Brookings Institution and Adjunct Professor at Georgetown University, Washington, DC

Technological tools have already contributed to the advancement of medicine, energy, construction, environmental sustainability, and numerous other pillars of human flourishing. The most sophisticated computational instruments may begin impacting policy, too, if Alex Engler has anything to say about it. With a Master of Data Science degree from Northwestern and a Master of Public Policy from Georgetown, he is qualified to lead the discussion.

After graduating from American University with a bachelor's degree, Engler did an internship with The Sunlight Foundation, a national nonprofit organization that applies data and tech tools to policy questions in pursuit of greater transparency throughout government. During the internship, he stumbled upon the recognition that policy research was utilizing traditional statistical approaches and could tap into the enormous potential of modern data science to further expand tools and methods for deeper analysis.

In parallel to his MPP, he worked at the Congressional Research Service as a Data & Research Associate, and upon completing graduate studies, he took a position as a Data Scientist at the Urban Institute, one of the nation's leading data science think tanks. He then spent several years developing and directing graduate programs in computational analysis and public policy and serving as a lecturer at the University of Chicago, Johns Hopkins University, and Georgetown University. He is now a Rubenstein Fellow in Governance Studies at the Brookings Institution, a respected nonprofit public policy think tank that publishes in-depth research on complex

societal challenges. He is also an Adjunct Professor and Affiliated Scholar at Georgetown University, where he teaches in and contributes to the Master of Data Science and Public Policy degree program.

When asked how he arrived at his positions with universities, developing and directing graduate programs that married policy with data science, he responded, "luck and happenstance. There was no pipeline available at the time." Now, he is expanding the sphere of advocacy for the role of data in drawing causal inference statistics to determine whether a policy has been effective. The traditional approach of economics has been around for about 40 years (The work of the MIT Abdul Latif Jameel Poverty Action Lab is a great example of the classic method), and according to Engler, "it's the bread and butter of policy research. Researchers take advantage of natural experiments and conduct microsimulations to find two or three factors that steadily influence conditions."

He is taking the use of data science in policy research to a new level. "Other than causal inference, the question is expanding into how we define and identify valuable data. AI, machine learning, and network analysis are helping us find out which data are informative." At the Brookings Institution, he tackles issues around the government's role in regulating AI and how AI impacts public safety. Samples of his research are publicly available on the Brookings Institution website (https://www.brookings.edu/experts/alex-engler/).

Maureen Cruz, Senior Manager of Science, Regulation & Policy at Faegre Drinker Biddle & Reath LLP, Washington, DC

Dr. Maureen Cruz applies her scientific training to providing technical, strategic, and project management support to the biomedical industry community. Within the Government and Regulatory Affairs Practice Group of the law firm Faegre Drinker Biddle & Reath LLP, Dr. Cruz serves as a Senior Manager of Science, Regulation, and Policy. Her team is unique in that it includes a significant number of trained scientists working alongside attorneys. Together, they provide diverse technical, legal, and administrative services to several consortia in the health and life sciences industry. Her clients are companies and organizations

primarily from health care, pharmaceutical, and biotechnology fields and seek out her firm with a desire to work together in a confidential, precompetitive, neutral space to more quickly improve patient care.

Although competitors in the market, these companies form consortia to share technical expertise and data, as well as conduct benchmarking exercises. They voluntarily collaborate to establish and share best practices, as well as to develop industry positions through publications, white papers, and concerted responses to regulatory draft guidances. Dr. Cruz provided an example of a general project: "When the FDA releases a draft guidance, it will often include details of what type of testing the industry must perform," such as to be eligible to submit a new drug application for FDA approval. "The FDA understands that research is constantly advancing, and the agency wants to keep up with how industry leaders are evolving their best practices." Through this system of R&D consortia, companies can present a stronger argument by presenting the united perspective of many industry members. Before they submit an application to the FDA for approval, they can learn from one another about where the field currently stands, in terms of best practices and improved standards. For these competitors to work together, they rely on a consortia management team at a law firm to provide anti-trust training and manage data and analytics that have been blinded and compiled from consortia members. The firm facilitates communications in order to help their clients share knowledge. "In this way, we help clients engage with the policymaking process."

Like most, Dr. Cruz was not familiar with this type of work until someone suggested she consider joining the firm. Following a PhD from Georgetown University, Master of Public Health from Columbia University, and postdoc at The Scripps Research Institute, she worked for over five years at Booz Allen Hamilton, a consulting firm focused on information technology and government services. There, Dr. Cruz supported clients in the health care industry with process improvement, research portfolio management, technical reports, and congressionally mandated research proceedings.

As a professional who serves as an intermediary between scientists and attorneys, Dr. Cruz is endlessly striking a balance between the need for confidentiality and the need to share data and information. She reflected on her time in the lab and sees parallels in her current work, "In academia, one tries to be transparent, but you also want to avoid getting scooped by another lab. In the end, however, you know you will benefit from sharing information. That is what we facilitate for our clients." Between the clients who are professionals in the health

care industry and the attorneys who ensure that consortia operations are legally compliant and protect the interests of all stakeholders, she regularly makes the case for why it is beneficial to share information and how to do so in a strategic and thoughtful manner.

Lana Skirboll, PhD, Vice President of Science Policy at Sanofi, Former Director of Science Policy at the NIH, Washington, DC Metro Area

The primary purpose of the NIH Office of Science Policy, housed within the Office of the NIH Director, is to advise on biomedical research policy issues that are of significance to the agency, the research community, and the public. The office works with stakeholders within and outside of NIH to develop policies that promote progress in the life sciences. As Director of Science Policy of NIH for over fourteen years, Dr. Lana Skirboll had a massive portfolio to manage, ranging from disease prevention and rare diseases to nanotechnology and precision medicine.

Dr. Skirboll started like any other scientist, passionate about research. She began her academic career at New York University, followed by a Master of Physiology from Miami University of Ohio and a PhD in Pharmacology from Georgetown University. She was using electrophysiological methods to study neuropeptides in the brain and pursued two postdocs, the first at Yale University and the second at the Karolinska Institute in Stockholm.

When interviewing for several academic positions, she received a call from the NIH asking if she would be interested in conducting her research within the NIH Intramural Program. When Dr. Skirboll realized she would no longer need to write grants to support her experiments, everything seemed to be falling into place. After some time, however, she explained, "My mentor was frank and told me directly that the Intramural Program was not interested in building an electrophysiology lab. By doing so, he was kind enough to suggest I start looking around." By that time, her husband had begun laying a foundation for his profes-

sional aspirations in the area, so she forewent a national career search in academia and was open to other career tracks that would allow her to stay local.

Shortly after a colleague from the Intramural Program went to work on the GeneBank program within NIH, she was invited to assist one day per week. Although she still had a lab to run, she made time to spend one day weekly at the Office of Science to assist with GeneBank. When asked what the environment was like, she commented, "I was a rare bird among mostly lawyers." When the Office of Science offered her a job, she took it. Although it was not research, she said, "I realized I could use science in a lot of different ways. I was anyways the type of scientist who really enjoyed the first experiment, but found the others tedious."

With a young family and a husband who just launched a business venture, when it was time to begin looking for a more permanent role, she decided to stay local and joined the US HHS Alcohol, Drug Abuse, and Mental Health Administration, later named the National Institute of Mental Health. When the former head of the Intramural Program was appointed HHS Secretary, Dr. Skirboll was asked to serve as his Chief of Staff, providing ample room to grow her skillset in politics and policy. She recalled, "There was a steep learning curve, and I was never bored with what felt like one health care delivery crisis after another."

When the Mental Health Institute moved back into the NIH fold, Dr. Skirboll was asked to oversee the Institute's policy portfolio. She commented, "It was comfortable to be a neuroscientist and working in a field that was familiar." But after only a few years, the opportunity presented itself to reach higher. First, she was asked to serve on the search committee that would fill the Science Policy Director role. "My colleague asked why I wasn't a candidate, and I received additional calls of encouragement, convincing me that interviewing with the NIH Director as a learning exercise wasn't a bad idea. I suppose, when I eventually interviewed, I was more relaxed than I otherwise would have been, had I thought I had a chance at getting the job."

At that time, the NIH was known as a grant distributor, and science policy was a relatively new direction. She reflected back and shared, "I felt so inadequate when I started, but I realize now that feeling is far more common among women, and that is a problem." Within one week of moving into the job, a retreat was held with all of the NIH Directors. "I had to exude strong bravado, though I was shaking under the table!"

Dr. Skirboll quickly recognized that policy issues are exponentially broader at the NIH level than at the Institute of Mental Health, for all its complexity. She advises students and younger professionals, "As a scientist, you have a brain.

You were trained to look at problems and to be analytical, regardless of the questions. You can definitely succeed in policy." In her role as NIH Director of Science Policy, she covered a wide range of topics, including national Stem Cell policy. She worked often with the White House and testified in Congress. Reflecting on the general concepts of the work, she described, "I found that, in policy, integrity comes first. One can never cherry-pick the data, you just deliver the facts. But policy is not just about facts - principles and ethics are crucial factors, as well. Every day, new issues would arise that I couldn't have anticipated, and I just had to deal with them." Dr. Skirboll says she learned a lot about leadership and collaboration and developed an effective working relationship with the Director and the 27 Institute Directors.

When the NIH Director departed, he started a consulting firm. Dr. Skirboll accepted his invitation to join him. She recounted her thought process: "If I wasn't going to leave then, I would never leave." During that time, she travelled and worked globally and enjoyed the projects. When her mentor moved on to Sanofi, she accepted yet another invitation about six months later.

She described her current and past work in this way: "In the Venn diagram of Sanofi and NIH, there are many overlapping policy issues, but some are very different. In the middle are complex issues like gene therapy. Now in the private sector, I feel enabled and privileged to be in the sandbox where I can also learn more about cutting-edge pricing and reimbursement issues - things I never thought about at NIH. I am well over normal retirement age, and I'm still having fun!"

She has noticed some trends in her long career: "Lesson One: when some opportunity came along, I went for it. I didn't deliberate, I just had to leap. Lesson Two: you need to honor time to think." Dr. Skirboll thought back to the misguided requirement of a former mentor in academia, who instructed all members of the lab that they were not to spend time writing during the workday. She continued, "Some PIs may see a PhD student as a means of generating data. A postdoc, in that line of reasoning, just means more papers, and that's backwards. I resent when people apply the term 'alternative career' to my journey. It's only 'alternative' in that person's view."

Finally, Dr. Skirboll offered some parting advice: "To succeed in policy, you must be curious as hell." When she speaks to groups of students and younger professionals, she emphasizes the quality of a PhD and the takeaways. "When removed from science, see what you can do! Realize you've developed an ability to face failure and persist, an ability to express yourself and think critically. These are all real skills that employers are looking for.

You don't need to limit the application of your training to experimental science. Times are changing." She would also advise young people to gain knowledge around regulatory policy: "Many don't know what regulatory agencies do, and it's important!"

Bao-Ngoc Nguyen, PhD, Biomedical Engineer, U.S. Food and Drug Administration, Washington, DC

The U.S. Food and Drug Administration (FDA) is the preeminent regulator of new medications and food quality, serving as the gateway for medical products to enter the market. Over ten thousand scientists and engineers work at the FDA, mostly in Regulatory Science, and Dr. Bao-Ngoc Nguyen is one of them. She is a Biomedical Engineer in the Office of Tissues and Advanced Therapies within the Center for Biologics Evaluation and Research, specializing in regulation of cell therapies. Her group is composed of about twenty experts with experiences in a range of biological fields. However, as part of her review of cellular therapies, Dr. Nguyen interacts daily as part of a review team, consisting of experts from numerous scientific and medical specialties, like medicine, veterinarian sciences, and statistics. Dr. Nguyen commented, "The FDA is a very unique place to work, as it convenes different medical scientists to assess the future of health care by regulating what medical products are available to the public."

Her academic career at the University of Maryland was dedicated to stem cell research. She continued to feed her interest in stem cells even while she was a Science & Technology Policy Fellow in the California Legislature, supported by the California Council on Science & Technology (CCST). During her fellowship, she worked in the Senate Health Committee, and when her boss, then-Senator Ed Hernandez, asked his staff to pitch bill ideas, she proposed a bill to help curb the potentially harmful, unproven practices of stem cell clinics. That bill passed,

and Dr. Nguyen was a finalist of the international "Stem Cell Person of the Year" award.

Following the CCST fellowship, she was accepted as a Commissioner's Fellow, a two-year fellowship at the FDA. While that particular fellowship program unfortunately is no longer available, a similar program will be launched in the near future. As part of the program, Dr. Nguyen had the opportunity to rotate between offices at the FDA, learning along the way how various medical products were regulated. "Knowing science is not enough to be successful in a regulatory agency. One needs to understand the context of how and why a law was written and how the regulations are used to implement that legislation. My regulatory review work not only draws on my scientific knowledge but is also strongly dependent on my understanding of the regulatory framework." At the conclusion of the fellowship, she had her choice of several offices and accepted her current position as a reviewer of cellular therapy product applications.

Applications are submitted by academia and industry clients to the FDA and reviewed by a team of experts like Dr. Nguyen. On a typical day, she will write to clients to clarify aspects of their submissions, which include experimental summaries and descriptions of manufacturing processes. If sufficient evidence of safety and effectiveness have been demonstrated in areas of product manufacturing, preclinical studies, and clinical studies, a product may be approved to enter the market and be available to the public. If, during the review of an application, Dr. Nguyen is uncertain of a new molecular assay, for example, she may consult with her research colleagues within the agency. About ten percent of the FDA is research laboratory space, where scientists and engineers develop new tools, standards, and approaches to test new products for safety, efficacy, and quality. The in-house research efforts allow the agency to compare their work with what industry and academia are discovering. By keeping up with the cutting-edge, the FDA can release guidelines for industry to follow, such as for the characterization of a new type of molecular therapy. These guidelines can help applicants as they develop their product and prepare to apply for approval from FDA.

Dr. Nguyen compared her work with that of academia, saying, "Written and oral communications skills are crucial to working in a regulatory agency. Ninety percent of all information shared with clients is written, so one must be adept at translating complex science and regulation in a way that makes sense to all clients, who may be large and experienced companies or small start-ups with limited regulatory exposure." About the environment of working in a regulatory agency, she commented, "It's very collaborative and inspires me to think

across disciplines to achieve our mission of protecting the public health by assuring the safety, efficacy, and security of medicines and the nation's food supply."

John Fleming, PhD, Staff Scientist of the Center for Biological Diversity, Los Angeles, California

Fleming received his PhD in Geological Sciences from the University of Southern California in 2016, but prior to that he had decided that his interests were outside of academia. The academic path is often the one most pronounced for PhD students — grad school, then postdoc, then (hopefully) a tenure-track university faculty position — so it was daunting for Fleming at first to find a different path. He pursued non-tenure track teaching positions, environmental consulting jobs, and science policy jobs and fellowships, but he ultimately found a job posting with the Center for Biological Diversity, an environmental conservation nonprofit, within their Climate Law Institute.

The Climate Law Institute wages legal and grassroots campaigns to protect people, wildlife, and ecosystems from climate change while working to speed the transition from greenhouse gas-emitting fossil fuels to clean, renewable energy sources. Fleming's role includes analyzing existing scientific literature and policy to inform advocacy; conducting public outreach through publications and presentations; preparing original scientific reports; representing the Center at scientific and climate conferences; and engagement with media for interviews.

Fleming derives great fulfilment from his work addressing perhaps the biggest threat facing mankind today: climate change. However, the work is not without its challenges. While the need for solutions such as ending our reliance on fossil fuels is apparent, there is often resistance at the public and governmental levels to making the necessary changes to our way of life. The work is also rewarding because Fleming is able to use the training he received in earning his PhD. The logical, methodical approach to answering questions cultivated during his graduate studies serves him well in his current position, where he is tasked with providing scientific justifications for his program's legal and campaign efforts.

For any scientist that is considering a career in science policy or similar, Fleming's advice is "to leverage the problem-solving, critical thinking, and leadership skills that graduate-level science training grants to go after the job you want. Identify people who have the careers you are considering and reach out. Identify organizations whose work you value and get a sense of what skills they value. You are likely to find that the skills you have translate well to the work you want to do."

Jessica Escobedo, PhD, Director of Science Policy, Ripple Effect, Rockville, Maryland

Dr. Jessica Escobedo is passionate about science policy and communicating science to the public. Over the last 15 years, she has developed expertise in federal science policy, program management, and scientific communications. As the Director of Science Policy at Ripple Effect, a fast-growing women-owned business in Maryland, she oversees a Division full of PhD-trained scientists that supports policy implementation and mission support contracts for NIH and other federal agencies.

Dr. Escobedo began her career by earning a PhD in Integrative Neurobiology at Caltech, where she specialized in moral decision-making, before taking a position at Charles R. Drew University of Medicine and Science. There, she developed a newsletter highlighting the work of five NIH-funded minority institutions and ran social media feeds to bring the work of researchers at Charles Drew to the community. During this time, Dr. Escobedo learned one of the most valuable lessons about transitioning away from academia – understanding her transferable skills.

She commented, "Graduate students and postdocs learn many marketable skills (e.g., project management) during their training, but they often don't realize this. There are many resources available to help young scientists understand the power of their transferable skills. Learning to speak in business terms instead of scientific ones will make a big difference in how non-scientists understand your potential."

Following her time at Charles Drew, Dr. Escobedo spent nearly five years at the NIH working at the National Institute on Minority Health and Health Disparities

(NIMHD). She developed significant experience with an array of scientific communications, ranging from fact sheets for the public to briefings for NIH senior leadership, as well as expertise in science policy and health disparities. Dr. Escobedo received several NIH awards for her work, including an NIH Merit Award for her work on enhancing NIMHD's Congressional reporting.

Dr. Escobedo advises scientists interested in transitioning to policy "to be open to opportunities around you." She encourages graduate students to learn about informational interviews and to do them regularly. "Set yourself a goal of connecting with one new person every month (or whatever time frame is right for you). This might mean reaching out to someone who you find interesting on LinkedIn or asking a friend to connect you with someone. It might just mean talking with someone at a party or a conference. Science policy is such a diverse field that you never know who may help connect to you that next career step."

Teresa Stoepler, Executive Director, InterAcademy Partnership for Policy, and Senior Program Officer, the US National Academies of Sciences, Engineering and Medicine, Washington, DC

"I was captivated by the idea that science could bring countries together, . . . that scientific collaboration could have diplomatic benefits, particularly for countries with difficult political relationships," said Dr. Teresa Stoepler about science diplomacy. Through international science policy, she merged her interests in science, international relations, and policy into a new career path. As the Executive Director of the InterAcademy Partnership for Policy, part of an international network of merit-based academies of sciences, engineering, and medicine, Dr. Stoepler helps academics advise their governments on critical science policy issues.

Though she had not considered a career in policy, Dr. Stoepler couldn't help but be exposed to it in Washington, DC,

where she completed her PhD in Ecology at George Washington University. After completing a postdoc, she received a AAAS Science and Technology Policy Fellowship, where she worked with the US Geological Survey and the Department of the Interior's Strategic Sciences Group to create a formal mechanism to infuse scientific expertise into federal disaster response. She was also detailed to the Department of the Interior's International Policy Office for part of her fellowship, fueling her passion for combining her training as an ecologist with international collaboration.

Dr. Stoepler relishes the opportunity to leverage her scientific training to address issues that impact society on a global scale. "I love my work because it allows me to help ensure science serves society, and provides a platform to help make the voices of science more diverse and inclusive." For those interested in a career in international science policy and science diplomacy, Dr. Stoepler recommends a fellowship or internship, if possible, or any of the many other entry points, such as engaging with organizations such as the Global Young Academy, the UN Major Group for Children and Youth, or responding to calls for volunteer experts for various working groups through the UN system and other international platforms.

Photo Credit: © Global Young Academy, photo credit: James Curtiss

Cheryl Jacobs Smith, PhD, MS, Health Science Policy Analyst at The National Institutes of Health, Bethesda, Maryland

After completing a PhD in Human Genetics and Cancer from the University of Michigan, where she studied animal models of human disease, she switched to an epidemiological field for her postdoc at the National Cancer Institute (NCI). There, she analyzed patient samples (biospecimens) and patient information to determine biological determinants of cancer health disparities. Through this experience, she became interested in protective mechanisms for patient information and better understanding how patients may be engaged as participants, not subjects.

She took note of the dramatic differences between the lab bench and working with subjects and felt that she could

have an impact working at the intersection. She commented, "To expect scientists to consider all the facets of the patient experience is unrealistic, when they are already responsible for keeping up with the literature, managing a lab, and endlessly pouring over the details of their experiments. There just isn't enough time to cover both perspectives sufficiently well: the molecule-sized details and the big picture."

To satisfy her passion for big-picture thinking, she jumped head-first into the activities of scientific and medical societies, such as the American Association for Cancer Research (AACR). She learned about the importance of fundraising through her work with AACR, and advocated for AACR and the National Postdoctoral Association (NPA) to decision makers. "There are great jobs allowing grad students and postdocs opportunities to write blog posts to describe science in lay terms. In policy, it's critical for one to be able to digest information from many different sources and distill complex issues to only what's important."

Recognizing how critical it is that researchers have a voice in policymaking processes, Dr. Smith helped draft a document to teach scientists how to become advocates. Through volunteering, she learned how to write for a policy audience and built the communications and organizational skills that are needed to interact with many people.

These experiences led Dr. Smith to start looking around for a career that would have a positive impact on underprivileged communities. She applied to the NIH and accepted her current role as a Health Science Policy Analyst in the NIH Office of the Director. "Writing is a necessary skill for this position, and I do a lot of it." Another important aspect of her job entails fast-paced coordination between institutes, and she works often with the White House to coordinate policy across the NIH. Dr. Smith commented, "What I like about policy work is that there's no typical day. It's very similar to work in a research lab."

Though Dr. Smith focuses on policy related to genomics and genetic data sharing, she is expected to maintain a breadth of understanding across a wide range of issues. Compared to science, where the results can be limited to specific questions, she enjoys policy work, because of its scope and impact, even if results are achieved over longer horizons than her former experiments.

Jeff Onsted, PhD, Chief Science Adviser, California Department of Conservation, Sacramento, California

Following the completion of his PhD in Geography from the University of California, Santa Barbara, Dr. Onsted became a tenured professor at Florida International University. For nine years, he enjoyed leading research teams, publishing in scientific journals, mentoring students, and facilitating public outreach. He focused his research on the intersection of urban growth and ecological impacts of land use planning and policy.

In southern Florida, Onsted was "hyper-acquainted with sea level rise," commenting that he "knew too much to continue to own property" in an area so vulnerable to the negative effects of climate change. He began seeking information about other career options and connected with friends from graduate school, many of whom started their professional careers in academia and afterward left. One worked in the legislative unit of the California Department of Conservation and informed Dr. Onsted of the open position of Science Adviser.

With a duty statement that fills five pages, much of Dr. Onsted's work can be described as bridging the department's many divisions and supporting the director, for example, by providing background information on research breakthroughs and new fields. He frequently partners with external scientists, such as from The Nature Conservancy, on projects like the TerraCount landscape-based Carbon accounting tool, which models natural resource implications of various development activities for cities, counties, and districts. Throughout his graduate training and earlier work in the private sector with Science Applications International Corporation (SAIC), he always leaned toward research "that would inform policy to solve environmental challenges," so the move to policy was a characteristic fit.

After nearly four years with the Department of Conservation, Dr. Onsted maintains an excitement for his work, where he has the privilege of helping to maximize the impacts of million-dollar invest-

ments in natural resource projects. Compared to being a professor, where the more egalitarian culture meant he did not need approval to speak to the press or plan his research, he was quick to clarify that a more hierarchical structure, like in state government, is not inherently worse. As representatives of an influential public agency, teams and captains must work in lock-step to ensure progress that is consistently aligned with state priorities and processes, and that typically necessitates systematic communication and coordination practices, which anyone can learn.

Danielle Chesky, MS, Environmental Affairs Officer, Embassy of Canada, Washington, DC

Policy applications of research began with Chesky's undergraduate thesis at Denison University and continued through graduate school at the University of Maine, where she received a Master's in Marine Biology and Marine Policy with a joint thesis project. The opportunity through the Knauss Marine Policy Fellowship, which places graduate students in US Senate and House offices as well as within the federal administration, further cemented the desire to continue working in policy.

Currently, as part of the Embassy's Environment and Energy section, Chesky coordinates policy work on transboundary water and wildlife issues across the length of the Canada-US border with additional areas of responsibility within the Great Lakes region. Her background on Capitol Hill provides additional opportunities for outreach and policy movement in areas of mutual concern.

The diversity of the policy world continually provides challenges and awards. Chesky commented, "Having mentors with strong scientific backgrounds who also play prominent roles influencing policy provided some of the best support in developing my career. The job is about solving problems, using technical, advocacy, and policy background, drawing on the networks built over the years. Maintaining those networks as I transitioned from undergraduate to graduate to the career world has been one of the most advantageous benefits and would be my first piece of advice for students."

Dan Von Seggern, JD, PhD, Staff Attorney, The Center for Environmental Law & Policy, Seattle, Washington

Following a PhD in Molecular Biology from the University of California, Berkeley, Dr. Von Seggern worked as a postdoc and then an assistant professor at The Scripps Research Institute in La Jolla, CA, focusing his research on developing targeted viral vectors for gene therapy. Having experienced the increasing economic pressures of sustaining an experimental laboratory, he decided to make a career change to become a patent attorney and enrolled at the University of Washington. In his class of 180 students, he was one of about a dozen who had a PhD. Of those, he believes he is the only one who did not end up working in patent law.

After law school, Dr. Von Seggern worked as a public defender and then joined a litigation defense firm, where he was able to put his biological science background to work in technical cases, including medical malpractice defense. Unlike many of the other lawyers in the firm, his scientific training offered him some familiarity with the manner medical and technical professionals communicated, which helped him establish relationships with expert witnesses. Having been trained as a scientist, in his words, "also gave me something many other lawyers didn't have, and that's the ability to understand and work with technical information."

Dr. Von Seggern is now with the Center for Environmental Law & Policy (CELP) in Seattle, Washington, where he works to protect the state's rivers and streams through litigation and participation in the agency policymaking process. For example, he often interacts with staff and leadership of the Washington State Department of Ecology, and serves on a streamflow restoration committee for the watershed including the Seattle area. He spends about half of his time on litigation, and is currently preparing a case regarding protection of river flows for argument before the Washington Supreme Court.

As a law student more than a decade ago, Dr. Von Seggern had worked on a student clinic project for CELP. This connection was key to landing his full-time position there. About the process of transitioning to a new career, he added, "One's skillset is the most important asset you can offer, but also knowing a network of people is critical to landing a good job. In grad school, it's a mistake to think that what you did was all that mattered. Especially in science, it is easy to concentrate on the work and neglect the importance of who you meet and foster relationships with."

CELP also works to inform state legislators on water-related issues, and to promote passage of legislation. Dr. Von Seggern notes that legislators are regularly inundated with information, "as if they're drinking from fifty firehoses daily," referring to the wide variety of issues that they must become familiar with and make decisions about. To be effective in his role, he communicates why water policy issues matter to CELP and to the people of the state. Occasionally, he testifies to the state legislature about pending legislation involving stream flow issues.

When asked about the parallels between the worlds of science and policy, Dr. Von Seggern responded, "There are many. In the US, our common law system is essentially a body of decisions, which we refer to in making our arguments. This is very similar to the way in which scientists refer to previously published work in support of a hypothesis or an application for funding. The writing style is also much more similar than I had expected it would be." He added, "Scientists who are inclined toward working for the public good have skills that can make them very effective in the policy world."

Gabby Nepomuceno, PhD, Environmental Scientist, California Department of Toxic Substances Control, Sacramento, California

With a passion for chemistry, Dr. Nepomuceno was on the track toward a job in industry, commenting, "I didn't know

there were other avenues to explore." She enjoyed working with people and talking about science, but, "I was looking for something impactful that wasn't necessarily in academia or working in a lab."

Dr. Nepomuceno attended the University of California, Davis when researcher safety became a top priority in the state, so her entry into the policy world was centered around adapting federal and state laws to an academic setting. "One of my many mentors pointed me to the CCST Science and Technology Policy Fellowship because I often questioned how and why laws were written." Without a strong understanding of policy and politics, she entered the fellowship ready to learn. In the Legislature, Dr. Nepomuceno was matched with the Assembly Business and Professions Committee, which is responsible for developing and maintaining laws that govern licensed professions, such as contractors, court reporters, and the new-at-the-time Bureau of Medical Cannabis. After her fellowship, she applied for a job with the California Department of Toxic Substances Control (DTSC), where her background as a chemist could be blended with her interest in policymaking.

"Nowadays, instead of digging through academic journals and SciFinder®, I spend most of my time researching California's use and handling of hazardous chemicals and
looking at how those trends impact DTSC's resources." As an Environmental Scientist at the department, she conveys information through bill analyses, rulemaking packages, and budget proposals. The work requires translating data and technical information into plain language so the public, state agencies, the Governor, and other policymakers can make informed decisions. "Thinking critically, discerning signal from noise, and learning the context in which a problem exists, were skills I developed in school and have since honed while in government. Where I once used my scientific understanding to build complex molecules efficiently, I now use those skills to build consensus around a scientifically sound, resource-efficient policy proposal."

Jennifer Herricks, PhD, Global Health Policy Consultant, National School of Tropical Medicine, Baylor College of Medicine, Houston, Texas

A quick review of current headlines will tell you there is a need for subject matter experts in many areas of health and science policy. In 2014, policy questions arose on how to address the Ebola outbreak in West Africa. Today, similar questions are asked about the coronavirus recently identified in Wuhan. As a Global Health Policy Consultant, Dr. Jennifer Herricks focuses on the connection between poverty and disease, and leverages her skills as a science communicator to ensure that the most reliable research informs public health policy.

Herricks graduated with a PhD in Microbiology and Molecular Genetics from the University of Texas Health Science Center at Houston. As a postdoctoral fellow at Rice University's Baker Institute for Public Policy and the National School of Tropical Medicine at Baylor College of Medicine, Dr. Herricks' work focused on neglected tropical diseases, incredibly common occurrences that affect around one billion of the poorest people on the planet, including areas of the United States. Recognizing her passion for science outreach and wanting to affect positive change in the world through that outreach, she saw a career in policy as a way to accomplish those goals.

Science and health policy work, as Dr. Herricks explained, "requires both the analytical and data mining skills of a scientist and the ability to communicate complex issues to non-experts. Graduate students usually need additional training in the latter, but there is a growing number of resources for training scientists of all levels in communications. These skills can be honed while making an impact by writing opinion editorials, participating in public outreach projects, and engaging with local policymakers." Dr. Herricks encourages all scientists, even those who continue to work in the lab, to engage in these activities at some level.

Naomi Charalambakis, Senior Science Policy Analyst for the Federation of American Societies for Experimental Biology, Bethesda, Maryland

Dr. Charalambakis developed an interest in policy as a PhD student while studying Anatomy and Neurobiology at the University of Louisville School of Medicine, commenting, "I wanted to find a career where I could work to support the next generation." During the economic recession of the mid-2010s, she witnessed labs on her campus struggling for funding, prompting her to start learning about the federal budgeting process and how policy affects research.

Encouraged by her mentor to explore policy, Dr. Charalambakis took a three-month break from the lab in graduate school to pursue a paid summer internship with Research!America. During the internship, she chose to attend Appropriations hearings and meetings and drafted summaries for the organization. She became familiar with the budget process and the policy discussions and negotiations that regularly take place to determine 'sufficient' funding levels.

When she began exploring policy career options, she recalled attending a seminar by the Director of Science Policy at the Federation of American Societies for Experimental Biology (FASEB) and reached out. Not long after, the visiting speaker became her boss, and she moved to Bethesda, Maryland to be part of the organization known as "the policy voice of biological and biomedical researchers." The century-old organization supports research communities through service and advocacy, primarily at the federal level.

In her role as Senior Science Policy Analyst, Dr. Charalambakis covers the Animals in Research portfolio. As part of that work, she staffs the Animals in Research and Education Subcommittee, meets with NIH and Congressional staff, represents the organization at conferences and meetings, and promotes improvements to graduate and lab animal training. The job involves communicating directly with decision makers, sometimes in Congress and often in the Executive

Branch, like the NIH Office of Laboratory Animal Welfare. Her workload is most active during the Council season at the NIH, which is when decisions are made about whether funding should be awarded to projects.

As one of three members of the FASEB Science Policy team, she has to think quickly and know how to read between the lines to anticipate how a proposed policy could affect any one of the 28 member societies of FASEB. For example, when NIH releases a Request for Information on shared resources like animal research or the U.S. Environmental Protection Agency announces a change in research standards, it is Dr. Charalambakis who drafts a response to reflect the perspective of researchers. By doing this work, she supports a sustainable research environment for scientists everywhere to contribute their discoveries to improvements in human health.

Susanna Ehlers, MS, Science Policy Program Officer, Inter-American Institute for Global Change Research, Montevideo, Uruguay

Susanna Ehlers knew from the beginning that she wanted to contribute to research that impacted policy. While an undergraduate at the University of Wisconsin, Ehlers was fortunate to find a fantastic mentor, who fostered a passion for conducting research in air quality. Supported by her mentor, Ehlers was accepted to a brief internship with NOAA-GFDL at Princeton, which allowed her further opportunity to build a set of skills related to air pollution monitoring and mitigation. Ehlers realized that it's not just state or federal air quality policies that matter; air currents carry pollutants across the globe.

In graduate school, Ehlers joined a research lab that applied computer modeling to better understand factors that impact air quality. Alongside learning the subject matter, "the experience taught me that I simply couldn't get excited about debugging and fixing syntax errors." She graduated with a Master of Science degree and joined the U.S. Forest Service as an Air Quality Scientist. She was looking forward to learning more about how the U.S. Forest Service implements environmental policy, but when she arrived, Ehlers was confronted with difficult conditions. During federal budget cuts, many positions went unfilled and strained staff beyond the already-high expectations of the job. There was also a lack of mentorship when she first joined, prompting her to navigate the system without an orientation or formal guidance. Seeing the opportunity to have more flexibility and still work in the same field, Ehlers joined a firm and became a contractor for the Department of Defense. Quickly, she found that the position was not as creative as she would wish, in that that many of the projects were a matter of box-checking for compliance.

Seeking a new line of work, Ehlers applied for an NSF Science Assistant position on a whim, and as part of the interview process that engages all the directorates of the agency, she connected naturally with the leadership of the Geosciences Department. "There, I worked on international and transnational funding of research science. The chance to see how research funding was spent to benefit people reminded me of why I chose to study Geography as an undergrad- it's all about the interactions between the environment and people." As she worked at NSF, she interacted with passionate and smart leaders, including her now-current boss. At present, Ehlers is a Program Officer in Science Policy at the Inter-American Institute for Global Change Research (IAI). It's still challenging, as Ehlers noted, "To work in science policy means to work across disciplines. There is no resource telling you how to succeed; you need to figure it out on-the-job."

Her organization works for 19 nations in the Americas and funds capacity building, scientific research, and projects that are meant to impact policy. A typical day likely consists of reading through reports, reviewing outcomes from previous funding cycles, and, ultimately, considering how she can connect the science with her national partners' priorities.

XI. Appendix B: Select Federal Executive Branch Departments

Census Bureau - conducts ongoing surveys of the U.S. population, primarily the decennial census. Maintains social, economic, and geographic data used by federal, state, and local governments in administering other public programs; academic institutions in conducting research; and private entities.

Department of Agriculture - implements laws related to farming, forestry and food. Oversees programs and conducts research related to food safety and sustainable agriculture and forestry practices. Administers the Food and Nutrition Service, the nation's food assistance program, which includes the Supplemental Nutrition Assistance Program (SNAP).

Department of Defense - oversees government functions related to national security and the armed forces. Implements a number of research and grant programs that have had significant technological impacts even in non-defense related fields, such as the Defense Advanced Research Projects Agency (DARPA).

Department of Energy - oversees government programs related to energy and the handling of nuclear material. Conducts research in the physical sciences through extensive network of national laboratories. Administers research grant program, Advanced Research Projects Agency-Energy (ARPA-E), which funds high risk-high reward research projects in the energy sector.

Department of Health and Human Services - charged with protecting the health and well-being of Americans through the administration of a variety of direct services and research programs. Administers several major programs, including the Centers for Medicare and Medicaid Services, which in partnership with state health and human service agencies, administer the nation's healthcare programs for the elderly and people with low-income; the Food and Drug Administration, which oversees food safety rules and regulates pharmaceuticals; the Centers for Disease Control, which promotes public health through the control and prevention of infectious disease; and the National Institutes of Health (see below), the agency's public health research arm.

Department of Homeland Security - responsible for public security within the U.S., with programs related to counterterrorism, cybersecurity, immigration,

and disaster resilience. Implements several research initiatives through its Directorate for Science and Technology.

National Institute of Justice - the research arm of the Department of Justice, charged with improving knowledge and understanding of crime and justice issues through science. Administers grant programs focused on developing technological solutions to criminal justice problems as well as social science research and evaluation of programs and practice.

Department of State - responsible for U.S. foreign policy and conducting international relations. Through its Office of Science and Technology Cooperation, negotiates Science and Technology Agreements to promote international cooperation in scientific areas of interest and engages in diplomacy programs to promote American scientific programs and identify future collaboration partners.

Environmental Protection Agency - implements law related to the protection of human health and the health of the environment, including land, air, and water quality. Operations include: the development and enforcement of environmental regulations, administration of grants for partners to implement environmental protection projects, conducting research at agency sites and laboratories and publishing results, engaging in education and outreach with relevant stakeholders.

Fish and Wildlife Service - implements laws related to the management of fish, wildlife, and natural habitats. Administers programs related to the protection of endangered species, management of migratory birds, preservation and restoration of national fisheries, and the conservation and restoration of wildlife ecosystems, such as wetlands.

National Aeronautics and Space Administration - responsible for civilian space program, and aeronautical and aerospace research. In addition to internal research conducted at one of its many facilities, administers research grant programs through its Science Mission Directorate.

National Institutes of Health - responsible for biomedical and public health research, via conducting research internally at its facilities and awarding external research grants.

National Institute of Standards and Technology - non-regulatory agency that operates a physical sciences laboratory with a mission to promote innovation and industrial competitiveness. Additionally, NIST administers a number of external research grants.

National Science Foundation - supports fundamental research and education in non-medical fields (in contrast with the

National Institutes of Health) of science and engineering.

U.S. Agency for International Development (USAID) - responsible for administering civilian foreign aid and developmental assistance. Manages programs in low-income countries focused on disaster relief, poverty reduction, environmental conservation, climate change mitigation, and disaster resilience.

White House Office of Science and Technology Policy (OSTP) - advises the administration on science and technology issues as they relate to domestic and foreign policy.

XII. Appendix C: Additional Science Policy Fellowships

General Science

Association for Women in Science Phoebe S. Leboy Public Policy Fellowship
https://medschool.vanderbilt.edu/career-development/blog/phoebe-s-leboy-public-policy-fellowship

Breakthrough Institute Fellows
https://thebreakthrough.org/fellowships/generation-fellowship

Center for Democracy & Technology (CDT) Fellowship
https://cdt.org/about/fellows/

Commonwealth of Virginia Engineering & Science Fellowship (COVES)
https://gradstudies.virginia.edu/funding/uva-nominated/coves

Connecticut Academy of Science and Engineering (CASE) Science and Technology Policy
Fellowship Program
http://www.ctcase.org/fellowship.html

Funder Collaborative Civic Science Fellowship
http://ritaallen.org/stories/funder-civic-science-fellow/

Hellman Fellowship
https://www.amacad.org/about/fellowships

Idaho Science & Technology Policy Fellowship
https://twitter.com/ScienceIdaho

International Institute for Applied Systems Analysis Young Scientists Summer Program
https://www.aaas.org/resources/science-policy-resources

Kavli Foundation Funder Collaborative Civic Science Fellow
http://www.kavlifoundation.org/kavli-news/position-announcement-funder-collaborative-civic-science-fellow#.XUrXx-hKjIW

Kennedy School of Government Belfer Center
https://www.belfercenter.org/program/science-technology-and-public-policy

Missouri Science & Technology Policy Fellowship (MOST)
https://mostpolicyinitiative.org/

National Academies Jefferson Science Fellows Program
http://sites.nationalacademies.org/PGA/Jefferson/

New Jersey Eagleton Science and Politics Fellowship
http://eagleton.rutgers.edu/programs/science-and-politics.php

Population Research Bureau Policy Communication Fellows
https://www.prb.org/policy-communication-fellows/

Research!America Science Policy Fellowship
http://www.researchamerica.org/about-us/careers/science-policy-fellowship

Research!America Science Policy Internship
https://www.researchamerica.org/about-us/careers/science-policy-internship-sponsored-burroughs-wellcome-fund

U.S. Office of Science & Technology Policy Internships
https://www.whitehouse.gov/ostp/internships/

University of California Science Policy Internship Program
https://aip.ucsd.edu/programs/ucdc/spip.html

General Policy

California Executive Fellowship Program
https://www.csus.edu/center/center-california-studies/capital-fellows.html

Canadian Government Recruitment of Policy Leaders
https://www.canada.ca/en/public-service-commission/jobs/services/recruitment/graduates/recruitment-policy-leaders.html

Congressional Black Caucus Foundation Policy Fellowships
https://www.cbcfinc.org/fellowships/

Congressional Hispanic Caucus Institute, Inc.
http://chci.org/programs/public_policy_fellowship/

European Parliament Traineeships
https://www.europarl.europa.eu/at-your-service/en/work-with-us/traineeships

Fulbright Public Policy Fellowship
https://www.cies.org/program/fulbright-public-policy-fellowship?qt-program=2#qt-program

Google Public Policy Fellowship
https://www.google.com/policyfellowship/

Herbert Scoville Jr. Peace Fellowship
http://scoville.org/

OECD (Organization for Economic Cooperation and Development) Internship Programme
http://www.oecd.org/careers/internship-programme/

Supreme Court Fellows Program
https://www.supremecourt.gov/fellows/default.aspx

Udall Foundation Native American Congressional Internship
https://www.udall.gov/OurPrograms/Internship/Internship.aspx

United Nations Internship Programme
https://careers.un.org/lbw/home.aspx?viewtype=ip

USAID Democracy Fellows
https://www.iie.org/Programs/USAID-Democracy-Fellows-and-Grants-Program/Fellows/The-Fellows-Program

Women in Government Relations Judy Schneider Fellowship Program
https://www.wgr.org/page/Fellowship_Benefits

Women's Research and Education Institute
http://www.wrei.org/Fellows.htm

Astronomy

American Astronomical Society John Bahcall Public Policy Fellowship
https://aas.org/advocacy/how-aas-advocates/john-bahcall-public-policy-fellowship

Biology

American Institute of Biological Sciences
https://www.aibs.org/public-policy/student_opportunities.html

Genetics and Public Policy Fellowship
https://www.ashg.org/policy/policy_fellowship.shtml

National Human Genome Research Institute Genetics and Public Policy Fellowship
http://www.genome.gov/10003979

Chemistry

American Chemical Society Public Policy Fellowships
https://www.acs.org/content/acs/en/policy/policyfellowships/programs.html

Climate, Environment and Natural Resources

American Meteorological Society Policy Colloquium
https://www.ametsoc.org/index.cfm/ams/policy/summer-policy-colloquium/about-the-summer-policy-colloquium/

Association for the Sciences of Limnology and Oceanography Science Communication Internship
https://www.aslo.org/opportunities-in-aslo/scicomm-internship/

Gulf Research Program Science Policy Fellowships
https://www.profellow.com/fellowship/gulf-research-program-science-policy-fellowships/

Natural Environment Research Council Policy Internships
https://nerc.ukri.org/funding/available/postgrad/advanced/policy-interns/

NOAA Sea Grant Fellowships
https://seagrant.noaa.gov/graduate-fellowships

Thriving Earth Exchange Community Science Fellowship
https://thrivingearthexchange.org/community-science-fellows/

Engineering & Technology

American Society of Mechanical Engineers
https://www.asme.org/government-relations/federal-fellows-program/energy

Fund for American Studies Tisdale Fellowship Scholars
https://tfas.org/programs/us-programs/tisdale-fellowship/

STEM Advocacy Institute (SAI) Fellows Program
https://www.stemadvocacy.org/sai-fellows/

TechCongress Congressional Innovation Fellowship
https://www.techcongress.io/the-fellowship

Geology

American Geophysical Union Congressional Science Fellowship
https://www.agu.org/Share-and-Advocate/Share/Policymakers/Congressional-Science-Fellowship

American Geosciences Institute Policy Internship
https://www.americangeosciences.org/policy/internships-and-fellowships

Geological Society of American Congressional Science Fellowship
https://www.geosociety.org/GSA/Science_Policy/csf/GSA/csf/home.aspx

Health

Association of Schools & Programs of Public Health Fellowships
https://www.aspph.org/study/fellowships-and-internships/

Commonwealth Fund Harkness Fellowship in Health Care Policy and Practice (International)
https://www.commonwealthfund.org/fellowships/harkness-fellowships-health-care-policy-and-practice?redirect_source=/Fellowships/Harkness-Fellowships.aspx

David A. Winston Health Policy Fellowship
http://www.winstonfellowship.com/

Global Health Corps Fellowship
https://ghcorps.org/fellows/apply-to-be-a-fellow/

Health and Aging Policy Fellowship
http://www.healthandagingpolicy.org/

Morehouse School of Medicine Health Policy Leadership Fellowship Program
https://satcherinstitute.org/division-of-health-policy/health-policy-leadership-fellowship-program/

National Cancer Institute (NCI) Communications Fellowship
https://ncf.nci.nih.gov/

Robert Wood Johnson Health Policy Fellowships Program
http://www.healthpolicyfellows.org/

The Academy of Medical Sciences
https://acmedsci.ac.uk/about/administration/internship-schemes

Neuroscience

Society for Neuroscience (SfN) Early Career Policy Ambassadors Program
https://www.sfn.org/Advocacy/US-Advocacy-Programs/Early-Career-Policy-Ambassadors

Physics

American Institute of Physics and member Society Government Science Fellowships
https://www.aip.org/policy/fellowships/cf

American Physical Society
http://www.aps.org/policy/fellowships/congressional.cfm

Optical Society (OSA) Arthur H. Guenther Congressional Fellowship Program
https://www.osa.org/en-us/get_involved/public_policy/congressional_fellowships/guenther/

Psychology

American Psychological Association (APA) Policy Fellowships
https://www.apa.org/about/awards/goldman-fellow
https://www.apa.org/about/awards/science-fellowship

Science Journalism

AAAS Diverse Voices in Science Journalism Internship
https://www.aaas.org/programs/diverse-voices-science-journalism-internship

AAAS Mass Media Science & Engineering Fellowship
https://www.aaas.org/fellowships/mass-media

Other

NASA Human Capital Program
https://nasapeople.nasa.gov/hcp_lp.htm

Virtual Student Federal Service
https://vsfs.state.gov/

World Economic Forum Global Leadership Fellows
https://www.weforum.org/communities/global-leadership-fellows

XIII. Appendix D: Career Exploration Exercise

UCSF Career Exploration Activity

10-10-10 People-Titles-Organizations List

Many PhD-level scientists are interested in science policy careers but are uncertain about their options and would like to know more about the career trajectories that might be available to them after they make the leap from their academic research environments to the policy world.

CCST Policy Fellows who have experienced this kind of uncertainty have found it useful to create a "10 People-10 Titles-10 Organizations (10-10-10 PTO) List". That is, a list of:

- 10 individual people's names and LinkedIn profiles who have similar backgrounds and interests as yours, and are now in the kinds of positions to which you aspire,
- 10 job titles that typify the kinds of positions to which you aspire, and
- 10 organizations you'd find interesting as potential future employers.

The "10-10-10 PTO List" activity is an engaging exercise that will bring greater focus to your career search efforts. As mentioned above, PTO stands for People, Titles, and Organizations, and the activity involves using LinkedIn to find a combination of 10 People you aspire to be like, 10 Job Titles you might see yourself pursuing, and 10 Employing Organizations that interest you for future employment purposes. After creating your 10-10-10 PTO list, the real value of the overall exercise comes from using the prompts below to look for themes that might help you as you more carefully consider your post-training career options.

Instructions:

1. First, articulate a background and interest statement that describes the kind of work you would like to do in the future. Here are three examples:

   a. *I am a PhD-level electrical engineer with an emphasis in power systems, experience studying a variety of renewable energy sources, and an interest in developing and optimizing ocean wave energy production systems. Eventually I'd like to make an impact on national policy in this area.*

   b. *I am a cell biologist with a background in angiogenesis research, and I have been self-funded through my own competitive grant applications for the past 5 years. Now I have an interest in moving my career toward managing funding portfolios that focus on cancer research in a university setting. I want to do grants management.*

   c. *I am a plant biologist who would like to work for the US Dept of State, applying my scientific background toward the generation of appropriate national policy regulating genetically modified foods.*

2. Next, after you have created your background and interest statement, find people who have already succeeded in your area of focus, typical job titles in this area, and organizations where professionals with your interests and background might work.

P	Using LinkedIn, find 10 People who have a background similar to yours and a career path that you would like to emulate.
T	Based on your LinkedIn research, list 10 job Titles that you think represent the kind of work you aspire to.
O	Based on your LinkedIn research, what are 10 Organizations that work in the space you want to work in, and employ people who have your background?

3. Finally, go back through your PTO list items and identify themes or common threads that might help you answer the following prompts:

People	• Did the people on your list complete transitional training after their PhD or did they jump directly into their ideal jobs? If they all did a policy fellowship of some sort, what does that tell you? In addition to or instead of a policy fellowship, did they complete courses or certificates that might better prepare you for your desired career transition? • What themes do you see in terms of the job titles that they posted, in between their PhD and their current roles? • As you skim through their LinkedIn profiles, what organizations or groups are they following, these people that you wish to emulate? Can you join the same LinkedIn groups? • As you look through their profiles, what skills or qualifications do you see they consistently have, but that you are missing? How might you acquire those skills/qualifications?
Titles	• Did you notice that there's a progression of desirable job titles for the kinds of jobs and organizations to which you aspire? (For example: Program Officer to Senior Program Officer to Director)? If so, how long do people usually spend in each job title before progressing? • Did you notice that certain types of organizations have certain types of titles for the kinds of jobs you would like to have? (For example, within federal government policy positions, how do legislative organization titles differ from agency titles for similarly-qualified PhD level positions?)
Organizations	• What organizations are uniquely focused on the content areas or policy related topics that most interest you? • How might you categorize the organizations working in your area of interest? (For example, if you're interested in working on renewable energy policy, some organizations in that area might be think tanks, some might be lobbying organizations, some might corporations producing renewable energy products.)

Attribution:

The 10-10-10 PTO activity was created by Naledi Saul, MPA as exercise to help highly specialized, policy-interested scientists plan their early career steps. Ms. Saul is Director of the UC San Francisco Office of Career and Professional Development.


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