



## CAREER AND PROFESSIONAL DEVELOPMENT

*Valerie Sloan*

*Pranoti Asher*

*Reginald Blake*

*Jennifer Nocerino*

*Gabriela Noriega*

*Janet Liou-Mark*

Most REU students are eager to learn about graduate school, careers beyond academia, and how to get there. Some know little about how to apply to graduate school, what the grad school experience is like, and have limited information about career opportunities for early-career scientists. Learning about how to navigate their educational and career path, along with getting tips on how to network and be professional, is much appreciated by these students. This chapter will introduce elements of career development and provide relevant tips and materials.

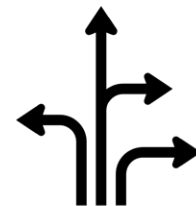
## ➔ Career and Professional Development Topics

Given that students in research internships are interested in educational and career paths in the sciences, several activities are useful for helping them to figure out their own path and to develop the needed skills.

- » Panels with multiple speakers sharing insights, such as:
  - REU alumni panel
  - Graduate school: Faculty panel & grad student panel
  - Careers outside of academia (private for profit, non-profit, government)
- » Graduate school application preparation workshop
- » Resume/CV writing workshop
- » Cover letter workshop
- » Career webinars
- » Membership/participation in professional societies
- » Conference participation/membership (discipline-specific) or research teams

## ➔ General Tips Applicable to All Career Development Events

- » **Aim for diversity:** In finding speakers for your events and workshops, be sure to aim for diversity in demographics, subdiscipline, and type of organization. Consider other types of diversity such as how people identify across many realms. Diverse representation in panels is important for everyone to see and will improve student involvement.
- » **Share career paths to different destinations:** Ask everyone involved in the program or speaking to students to spend five minutes describing their own career path. This illustrates the wide range of winding paths that people take to get where they are, and the breadth of careers that can involve STEM backgrounds.



## ➔ REU Alumni Panel

Holding an REU alumni panel can give students near-peer mentoring and allow them to hear from alumni on what they got out of an REU experience.

To prepare, provide the alumni panelists with a list of questions, and then facilitate a Q&A discussion. Avoid asking panelists to answer all questions in one go; instead, go around the panel with a couple of questions, and then go around again. This breaks it up.

Questions for the alumni could include:

- » Give your name and what school you're from/graduated from.
- » Share a tip to success in the REU program.
- » Share the thing you liked most about the REU program.
- » Share your successes since the program and if you think the REU helped with that.
- » Include tips on how you got your current employment.
- » Encourage students to network and suggest coursework they might consider taking.
- » Anything else you think is important.
- » Open up to questions from this year's students.

## ➔ Graduate School Panels

### Faculty Panel

Organize a panel with faculty discussing the application process and their hopes and expectations for graduate students. This panel of graduate school advisors and faculty can give their perspective on reviewing student applications and what they look for. You might also consider adding a graduate student to this panel who can offer advice on this process from a student perspective. This will help to reinforce what the faculty advise.



For an example of a faculty panel hosted in 2020, see this one-hour video:

[Graduate school panel: faculty perspectives](#) (video).

\*Note: To see the names of panelists, click on "CC" (Closed Captioning) while watching the videos on YouTube.

## Graduate Student Panel

Have three to four graduate students answer questions about how to find a graduate advisor or school, their experience in applying, and their impressions of grad school.

For an example of a graduate student panel hosted in 2020, see this one-hour video:

[Graduate school panel: grad student perspectives](#) (video).

### Tips for a Successful Panel

- » It is possible to hold these two panels consecutively, e.g., the faculty panel in the first hour, and the grad student panel in the second hour. You could also hold a panel with both students and faculty for both perspectives in one hour.
- » Invite speakers at least two weeks in advance, if possible. Provide them with information on what they will need to prepare in advance, how the program will be operated, and contact information for additional questions. Reach out to them a second time a few days before the event with your final logistics.
- » Advertise the session with some encouraging text such as: This is your chance to get an honest, insider view about what it's like to apply to, and complete a graduate program. "We hope that you will see it is a highly individual decision for both students and faculty."
- » Provide students with a link to a place where they can submit questions in advance, and possibly vote on others' questions, e.g., using a tool like [Slido](#).
- » Format:
  - Introductions (5-10 minutes):* After welcoming the REU students and panelists, ask each panelist to briefly introduce themselves, discuss their career trajectory, and perhaps offer one tip that they have for the students. This should be very brief to allow a lot of time for questions.
  - Discussion (40 - 50 minutes):* Open up Q&A from the students, using the "raise hand" and chat functions in Zoom. If you meet in person, consider providing a way for students to ask questions verbally and written. Some students might be nervous speaking in front of a group.



## Workshop on Preparing Graduate School Applications

Hold a workshop in which you and two graduate students provide examples and walk the REU students through:

- » How they sought out and evaluated graduate school options. See the excellent advice from [Callan Bentely's blog](#) here.
- » How they prepared documents for graduate school, such as the statement of research or personal statement.
- » How to prepare materials for the NSF Graduate Research Fellowship, and tips they have. NSF Graduate Research Fellowship Application links are:
  - [FAQ](#)
  - [Tips on applying](#)
  - [A collection of quotes and data from past recipients](#)
  - [A webinar on preparing for the NSF GRFP](#) by the American Geosciences Institute.

## ➔ Career Panel

Holding career panels is beneficial to students, especially if you can invite professionals who work in different sectors within STEM. These sectors can include private, small organizations, non-profit organizations, industry, government, research labs and academia. Some REUs host a panel for each of those sectors. Try to expose students to work outside of research and teaching, such as:

- » Scientific data collection, data analysis, and modeling
- » Instrument development and testing
- » Careers with the government
- » Careers in industry
- » Science journalism
- » Education and outreach
- » Policy development

## Tips:



**Do rounds:** Ask panelists to address your questions in rounds. For example, ask each panelist to say who they are, where they work, and briefly what kind of work they do in the first round. In the next round, ask each panelist to talk about their career path, and in the third round, ask them to speak to the joys and challenges of their work. Limit their time in each case, reminding them to be brief.

**Leave Time:** A panel is not really a panel if the speakers use up the whole time; then it is a series of talks. Students will have numerous questions, so leave **plenty** of time for them to ask the professionals their questions.



### Example Invitation

#### Career Panel in the Ocean Sciences

Join us for a career panel in the ocean sciences. Panelists will include speakers from a variety of work sectors, including the private sector, policy, scientific companies, government, and a museum.

After each panelist briefly introduces themselves, we will discuss your career interests, how you ended up in the position you are in now, and what mentorship and support systems were valuable to you. Students will be interested in your career challenges, and any advice you might have for undergraduates seeking to enter a similar career “track” - especially if your career path was a winding one!

#### Ocean Science Career Panel

**Time:** Wed. July 8, 12:00 - 1:30 pm PST / 3:00 - 4:30 PM EST

**Registration:** Register in advance for this panel (include hyperlink).

After registering, you will receive a confirmation email containing information about joining the meeting.

#### Agenda:

12:00 - 12:45 pm PT: Career panel responses

12:45 - 1:30 pm PT: Student Q&A

**Faculty Panel Members** (examples; include hyperlinks to each panelist):

- » **Panelist's name**, Wildlife Biologist, NOAA National Marine Mammal Laboratory (Government, he/his)
- » **Panelist's name**, Environmental Journalist, National Geographic (Journalism, she/hers)
- » **Panelist's name**, Ocean Policy Analyst, Center for American Progress (Policy and Government, she/hers)
- » **Panelist's name**, Scientist, INSPIRE Environmental (Consulting, he/his)
- » **Panelist's name**, NSF Postdoctoral Fellow at American Museum of Natural History (Applied Science and Academia, they/them)

#### Action items:

1. Upload your questions for panelists and vote on others' questions in advance. (include hyperlink)
2. Mark your calendar!

## ➔ Resources for Students on Careers

*Career Tools:* Share the [Career Compass](#) which provides options, tips, suggestions, and strategies for how students can obtain critical skills, experiences, and competencies in order to launch their geoscience career. Students will also be interested in the [workforce infographic](#) to help identify career possibilities in the geosciences. The American Geosciences Institute (AGI) has developed these and [other excellent resources](#). See the videos on geoscience opportunities, including [one on types of work in the different sectors](#) and another with [guides by field of interest](#).

*Individual Development Plans (IDPs):* This is a helpful tool for scientists at all levels to identify the training they need, getting guidance from mentors, and being proactive about their own careers. IDPs are a planning tool that identifies professional development needs and career objectives. Point students to these or have them fill one out before meeting with a mentor or you.

- » [Create Your Individual Development Plan](#) - A brief description
- » [MyScienceCareers](#) - A website with interactive questions to help find the right career path
- » [Building Your Individual Development Plan - A Guide for Undergraduate Students](#) (by SACNAS)
- » [Individual Development Plan](#) - A more comprehensive version designed for grad students and postdocs.

*Video:* [Career panel in the ocean sciences](#) from the NSF Ocean Sciences REU 2020.

*Not for Profit Organizations:* Do some research on the Not for Profit organizations that offer scientific meetings in your area of interest. These organizations will usually have online resources, webinars, career panels and workshops that you might find helpful.

*Readings:* Send articles to the students such as the following to indicate your comfort with their pursuing a non-academic career in science, as students are sometimes nervous to reveal this interest:

[Academia is the alternate career path.](#)

[Why it is not a 'failure' to leave academia](#) (in Nature)





Ocean Sciences



Career Compass  
Geosciences

This career compass provides options, tips, suggestions, and strategies for how a student can obtain critical skills, experiences, and competencies in order to launch their geoscience career based on their academic standing. The content herein is based on data from the U.S. Bureau of Labor Statistics, Interviews with personnel in the occupation, and research on available student opportunities.

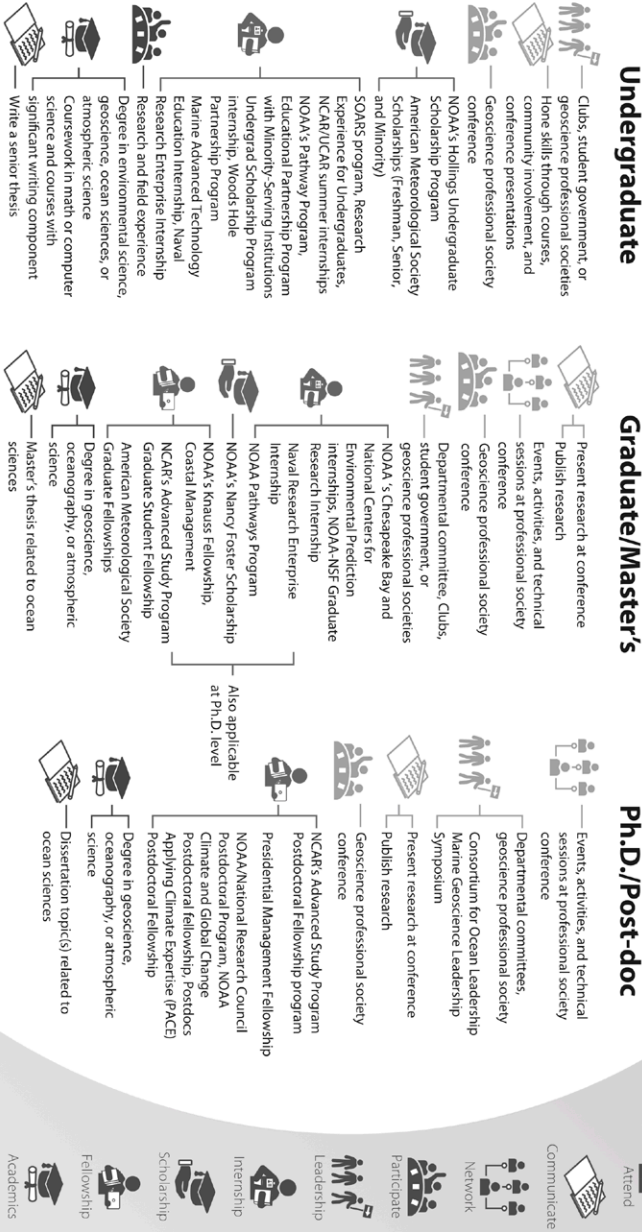
Job Summary

Oceanographers study the motion and circulation of ocean waters; the physical and chemical properties of the oceans; and how these properties affect coastal areas, climate, and weather. Oceanographers plan, organize, conduct, and administer seagoing and land-based student and research of ocean phenomena for interpreting, predicting, utilizing, and controlling ocean forces and events.



Career compass is a product of the American Geosciences Institute. Use is reserved for AGI member societies, AGI Partners, and academic departments. Copyright 2018 AGI

Build      Grow      Connect



[www.americangeosciences.org/workforce/](http://www.americangeosciences.org/workforce/)

## ➔ Resume, CVs, and Cover Letter Workshop

Most REU students are hungry to learn about the dos and don'ts of writing resumes, CVs, and cover letters. Students often undersell their REU experience and need help with creating a rich description of this research experience for their own materials. Topics might include:

### Factors to Consider in a Job Search

- » Which sectors geoscientists work in
- » Self-assessment of skills, values, interests, and personality
- » Creating an Individual Assessment Plan (see example)
- » Networking is the key to most jobs. Make sure you network with professionals whenever you can
- » How employers find employees vs how job seekers approach things

### Resumes and CVs

- » When do we use a resume or a CV?
- » Review a few good resumes, noting the idea of describing accomplishments and not simply listing the skills out of context
- » Provide a list of categories typically in a CV
- » Tailoring and ordering headings in a resume according to the job description
- » Identifying the skills applied during this REU internship - have them brainstorm on this
- » Order the experience and skills by importance or relevance to the job
- » Common mistakes made in resumes (typos, irrelevant detail, too little, poor layout, etc.)
- » If possible, provide them with some poorly prepared resumes or CVs

### Cover Letters

- » Go through a couple of bad examples and then a good example. This gives students an idea of how many letters are too generic, brag too much, and need detail about skills and experience.
- » Review the components by paragraph in a template
- » Have them work in small groups and read several bad examples of cover letters to critique them. This is a good learning exercise of what not to include in their own letter
- » Have them write a pretend cover letter for a specific job ad, if time allows

## ➔ Scientific Societies and Conferences

Attending conferences and joining scientific societies are an excellent way for students to network, as well as to demonstrate their productivity. Undergraduates will be mostly unaware of this world of meetings, and so providing them with some opportunities can be extremely helpful.

### Engaging Students in Conferences

- » Share deadlines for conference abstract submissions
- » Coach students on writing an abstract (see the [chapter on Science Communication Training](#))
- » Require that students submit an abstract to a conference
- » Provide funds for their membership and registration if you want students to attend a conference



### Provide Students with Support Before a Conference

- » Check in with the student(s) before the conference
- » Ensure that they have the funds for registration
- » Organize a session for students to do practice talks or poster presentation
- » Give tips on presenting on Zoom (having lighting in front, avoid having a window behind, minimize interruptions, check audio before a presentation, etc.)
- » Watch the student presentations if possible
- » Give positive feedback, and if needed, suggestions for improvement

### Assist Students with Networking

- » Encourage students to identify talks/posters/meetings to attend prior to the conference
- » Suggest that they write to scientists presenting at the meeting who are in a field of interest or who are potential grad school advisors and ask to meet for 15 minutes remotely after the conference
- » Encourage students to attend 'Town Halls' and sessions on topics outside of their familiar topics, such as education, diversity, science policy, and science communication sessions
- » Suggest that students join committees at the science societies, as most committees seek students, and some societies have heavy student involvement





## Resources

### Videos:

[Resumes, CVs, Cover Letters and More: Finding the Right Match](#). This was part of a professional development workshop series in the NSF 2020 Ocean Sciences REU program.

[Graduate school panel: faculty perspectives](#)

[Graduate school panel: grad student perspectives](#)

**Slides:** [Powerpoints of the Resumes, CVs, Cover Letters, and job exploration](#).

**Interactive Website:** [MyScienceCareers](#) - A guide to identify professional goals, skill strengths and weaknesses, and the right career path.

### Articles:

[Academia is the alternate career path](#).

[Why it is not a 'failure' to leave academia](#) (in Nature)

**Note:** There are many other resources available on the web that can be found at university career center websites.

