Improving postdoctoral training programs through alumni perspectives and experiences - A study of NCAR’s Advanced Study Program

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Capsule
A study of NCAR’s Advanced Study Program provides insights into career paths of postdoctoral researchers, attitudes about mentoring, diversity, equity, and inclusion, and future training needs.

Abstract
The Advanced Study Program (ASP) at the National Center for Atmospheric Research has supported the career development of postdoctoral fellows for over 60 years. This study of ASP alumni helps better understand their career paths and provides a window into the geoscience community. It examines career aspirations and job satisfaction, as well as experiences with mentoring, and attitudes about diversity and inclusion in the workplace. While about half of ASP alumni today work in academia, job changes and pursuit of careers outside of academia are increasing. Former ASP participants are actively engaged in mentoring and are supportive of efforts in diversity, equity, and inclusion (DEI). Alumni who identify as women reported feeling less supported by their employers in their career growth and in their service activities such as mentoring than alumni who identify as men. The study also found that women engage in a broader range of DEI activities and mentor more often out of altruistic reasons rather than as an expectation of their position. In addition to mastering research and teaching skills, future postdocs will need training in leadership, grant writing, DEI, and project management to succeed in today’s geoscience workforce.

1 Postdoctoral Training in the Atmospheric Sciences
Postdoctoral training in the atmospheric sciences currently faces multiple challenges. A postdoctoral researcher or fellow (hereafter referred to as postdoc) is broadly defined as “an individual holding a doctoral degree who is engaged in a temporary period of mentored research and/or scholarly training for the purpose of acquiring the professional skills needed to pursue a career path of [their] choosing” (National Postdoctoral Association 2022). Postdoc positions are part of a career track originally designed to lead to tenured academic positions (Postdoctoral Researcher 2023).
The number of postdocs in the United States has more than tripled in the past 40 years, from 18,000 in 1979 to 66,000 in 2019, with an even faster growth in the geosciences, where numbers rose from 300 in 1979 to 1,800 in 2019 (National Center for Science and Engineering Statistics 2021).

At the same time, the number of academic positions has not increased (Ganguli et al. 2022). According to McConnell et al. (2018), only about 15% of all postdocs in 2014 in the U.S. could expect to go on to tenure-track faculty positions. Powell (2015) coined the phrase ‘the postdoc pile-up’ to describe this phenomenon; Kirby and Czujko (1993) pointed to this problem even earlier. Postdocs are aware of this imbalance, and it creates enormous pressure on them as they compete for academic positions, continue as a postdoc researcher, or find employment elsewhere. While careers outside of academia are often referred to as the alternative career path for PhDs, the limited number of faculty positions has made a career in academia the exception (Langin 2019).

The COVID-19 pandemic put considerable stress on the postdoc population. Many postdocs had to work from home for their entire appointment. The lack of in-person mentoring, feedback, and co-working increased isolation, reduced collaboration, and altered career perspectives (Ahmed et al. 2020, Morin et al. 2021). In the geosciences, field campaigns were canceled, missing data collection and delaying postdoc research plans. Scientific conferences were held virtually, with missed networking opportunities. Many academic institutions implemented hiring freezes during the pandemic (Woolston 2020a).

An additional consideration for postdoc training is that the atmospheric sciences, like all of STEM, are reckoning with critical issues that emerged in the national discourse on racist discrimination in the summer of 2020 (Morris et al. 2020). Systemic biases can impact the selection of applicants (Berhe et al. 2022) leading to an overrepresentation of white scholars and poor retention of minoritized scholars. The issues also manifest as cultural othering of those from marginalized groups (Morales et al. 2021) and can lead to scholars leaving their field or contemplating leaving due to feeling isolated, discouraged, and unwelcome (Marin-Spiotta et al. 2023). Donovan (2021) emphasized the importance of a sense of belonging in envisioning a future for themselves in the atmospheric sciences. Mentoring and investments in diversity, equity, and inclusion are becoming more recognized as being essential.
In the coming years, universities and research labs like the National Center for Atmospheric Research (NCAR) will need to better understand the job market to adequately prepare postdocs. Long-standing traditional, research-only focused training is no longer sufficient, and the need for additional training is likely to increase (Steen et al. 2021).

2 History and Goals of the Advanced Study Program

NCAR, where the Advanced Study Program is housed, was established by the National Science Foundation in 1960 to provide the university community with facilities and services that were beyond the reach of any individual institution. Today, NCAR is still delivering on that mission by providing the atmospheric and related Earth system science community with access to resources such as supercomputers, research aircraft, community models, and extensive data sets. An important part of NCAR’s mission is the training of the next generation scientists by providing collaborative research opportunities as well as internships and fellowships, scientific workshops, and tutorials. ASP was founded in 1964 as a program where recent Ph.D. scholars, under the guidance of more experienced scientists, engaged in research and publishing prior to moving into (mostly) academic positions (Figure 1).

Figure 1: ASP Alumni Kai-Fong Lee in front of the NCAR Mesa Lab during his fellowship at NCAR in the early days of the program, August 1968 (photo credit Lee)
ASP postdocs are granted considerable academic freedom to establish their research foundation before moving on to a more permanent position. This aspect of the ASP fellowship differs from project-funded postdocs at NCAR, who work on a particular project under the supervision of a lead scientist. About 25% of ASP postdocs remain at NCAR to augment the research capacity in NCAR’s laboratories and help NCAR meet its strategic objectives.

2.1 The Advanced Study Program Experience

Each year ASP recruits approximately ten new postdocs for a two-year appointment from universities in the U.S. and abroad. Over the past ten years, the program has had an average acceptance rate of 10%. Applicants are selected by an NCAR-wide search committee based on their research proposal, CV, letters of recommendation, a broader impact statement, a diversity, equity and inclusion statement, and a short interview. After selection, postdocs are matched with a host mentor, which can be one scientist or a group of researchers in one or multiple NCAR laboratories. The supervision of the postdoc remains within ASP to maintain the spirit of a fellowship. Postdocs take charge of identifying and tracking career goals in their individual development plan (National Postdoc Association 2022). A goal of ASP is to train a workforce with an understanding of interdisciplinary work; thus, ASP postdocs are expected to develop a broad appreciation for the full range of research at NCAR.

Practices of supporting postdocs at NCAR are well aligned with recommendations of the National Postdoc Association (Sloan and Haacker 2019). Individual supervision, mentoring, and career support in ASP have been complemented by a year-round professional development workshop series that supports postdocs with the job search process, publishing, proposal writing, and broadening perspectives on career options since 2018.

The cohort experience is an important element of ASP. Postdocs work together to organize research seminars, professional development workshops, and social activities. Combined, these activities serve two purposes; they create a sense of belonging, “the extent to which an individual believes they are accepted, valued, and included in a community” (Stachl and Baranger 2020), and strengthen the science identity of the postdocs (Hudson et al. 2018). They also set examples of
how positive leaders can create supportive work and learning environments for the postdocs to build upon as they become faculty or supervisors. Cohort activities were modified and moved online during the COVID-19 pandemic. To help mitigate the impacts the pandemic had on postdoc research and job searches, NCAR offered all postdocs working on NSF-funded projects a six-month extension of their fellowship.

To better support postdocs, ASP leadership initiated this study of its alumni hoping to learn more about their career paths and experiences, and to gather their perspectives on skills needed in today’s workforce.

3 Research Methods
The ASP alumni study took place from spring 2021 to summer 2022. The authors of this study comprise NCAR and ASP staff, including an ASP alum (Davis). NCAR education specialists who are not directly connected to ASP conducted the surveys and focus groups, and an evaluator, internal to NCAR, assisted with analysis of the qualitative data.

3.1 Alumni Database
An initial goal of the study was to locate and update records for all postdocs who had participated in ASP since its inception. The first phase consisted of creating a database with information found in the physical ASP archives and through online searches (e.g., name, graduate school institution, PhD discipline, last known affiliation, contact information). More than 600 records were found and examined for this study. The second phase involved sending a request to all 480 former postdocs we could find email addresses for, to verify basic contact information, dates of ASP participation, and the current employment sector. We received responses from 260 alumni.

3.2 Alumni Survey
The database set the groundwork for conducting a comprehensive alumni survey. The 260 alumni with verified contact information in the database received a survey consisting of 18 assessment questions and seven demographic questions to understand what employment sectors alumni had entered, number of job changes during their careers, satisfaction with their careers, and sense of belonging in their current workplace. The survey also asked about skills that alumni had acquired
while in ASP, skills they would recommend to new postdocs to support career readiness, and alumni involvement in mentoring and diversity, equity, and inclusion efforts in their workplace (see Supplemental Materials for the survey).

The survey remained open for five weeks, with a reminder sent out once. It resulted in 140 alumni responses, a 54% response rate. All questions following the request for consent were optional resulting in a varying number of responses (n) per question. The authors analyzed survey responses using descriptive and inferential statistics, such as histograms and nonparametric tests. Kruskal-Wallis tests, a nonparametric analysis conducted on categorical variables, were conducted on ordinal (e.g. Likert scales) and nominal data (e.g. gender) to determine whether various groups of unequal sizes differed significantly in their responses to certain questions (Kruskal–Wallis Test. In: The Concise Encyclopedia of Statistics, pp. 288–290 2008). Tests were conducted in all cases where the assumptions of the test (such as sample size) were met; only statistically significant results are described in the paper. Quotes from open-ended responses to survey questions illustrate themes in the data.

3.3 Alumni Focus Groups
Focus groups (e.g., Fielding et al. 2008) followed the collection of survey responses and explored topics in the survey to contextualize survey responses. The focus groups deepened our understanding of alumni experiences in ASP, their career trajectory, thoughts on mentoring, their involvement in DEI, and suggestions for improving the ASP postdoc experience. The 260 alumni who were sent the survey were invited to participate. Twenty-one alumni participated in one of four focus groups led by co-author Vara and NCAR education specialist Zietlow. Neither have professional involvement in the management of ASP. Focus groups were recorded with permission by the participants. Audio recordings were transcribed, and identifiable information redacted prior to analysis.

The authors analyzed qualitative data using an inductive approach to thematic analysis in which the themes identified were data-driven, analyzed across the data set of responses, and analyzed per research area (Braun and Clarke 2006). Initial codes were generated and refined across the data set, then clustered into themes and analyzed for prevalence. Themes derived from the focus group
are reported within the sections of this paper focusing on career paths, mentoring, DEI, and the future of ASP (see Supplemental Material for questions asked and focus group themes). Quotes illustrate themes from the focus group discussion.

3.4 Limitations of the Study

Locating alumni was challenging, as some are retired, deceased, or have changed names, while others had potentially left the field. Contact information was difficult to find for some alumni who had left the U.S. for international positions. ASP does not record demographic information of its participants so demographic information collected via the survey cannot be compared to demographics of the total ASP alumni population.

The majority of survey respondents were postdocs between 1980 and 2019 and identify as White men or women. Due to the small sample sizes for those who identify as non-white, nonbinary, or LGBTQ+, data for most of the analyses were not disaggregated by race, ethnicity, sexual orientation, and identities beyond binary gender definitions. However, the authors provide an analysis of the data disaggregated by a man-woman gender-identified binary. The data was interpreted with the understanding that responses represent specific lenses of STEM professional experiences within a field with long-standing inequities regarding diversity and inclusion across gender, racial, and ethnic identities (Bernard and Cooperdock 2018).

Comprehensive national data about postdocs are not routinely collected (Daniels and Beninson 2018), which is in part due to a lack of job title standardization, postdoc mobility, and the ad hoc nature of institutional postdoctoral administration (Schaller et al. 2017). A dataset is therefore not available for comparison with this study. Where possible, the authors drew from other research studies, but this study should be understood as a view into the geosciences workforce gained from understanding the experiences of ASP alumni.

Individuals in the focus groups self-selected to participate and were not a purposive sample selected by the authors. Demographic information other than years active in ASP was not collected as the number of participants was small and demographic information would potentially identify individuals. Past and current employment were collected in a non-identifying manner. Participants
in the focus groups were ASP postdocs in the 1970s (n=2), 1980s (n=7), 1990s (n=3), 2000s (n=4), and 2010s (n=5). Thus 43% of participants had been in the program in recent decades (2000s-2010s), and 57% had been in the program further in the past (1970s-1990s). Focus groups typically include a small percentage of a larger sample. All focus group participants expressed positive memories about their postdoctoral experience and only a few expressed criticisms of the program. Thus, findings gathered provide insights into the ASP program through the mostly positive reflections of participants. The themes in the study are derived from the meaning of those experiences as related through the group interviews. The findings are thus transferable but not generalizable to all alumni experiences.

3.5 Characteristics of the Survey Respondents

Respondents to the alumni survey spanned the six decades of ASP, with most of the respondents participating in the program between 1980 and 2019 (Table 1).

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Table 1: Distribution of survey respondents' years of participation in ASP.

Seventy-five percent of survey respondents (n=132) work in the U.S. and/or U.S. Territories today. Of the 25% who work abroad, Canada, the United Kingdom, China, France, and South Korea were specifically named.

Twenty-seven percent of the respondents (n=140) identified as women, 64% as men, 2% preferred not to answer, and 5% skipped this question. Other options included transgender, non-binary, and identify in a different way but were not selected. Of the respondents, 70% identified as White (non-Hispanic/Latinx), 13% as Asian American, 4% as Hispanic/Latine/Latinx, 2% as Black/African American, and <1% as American Indian/Alaska Native. The options of Middle Eastern and Native Hawaiian/Pacific Islander were not selected. A small percentage (3%) of the respondents identified as LBGTQ+. More than 30% of the respondents (n=133) were the first person in their family to pursue a college degree. Only one respondent indicated that they are serving in or are a veteran of the U.S. Armed Forces and 4% indicated that they identify as having a disability. These numbers
mirror the small population of scholars from minoritized communities in STEM workplaces and reflect the well-established need to reduce barriers to entry and create more kind and inclusive cultures (Bernard and Cooperdock 2018).

4 STEM Careers and Experiences of ASP Alumni

4.1 Career Pathways

One goal of this study was to establish career paths of ASP alumni. Fifty-one percent of respondents (n=133) had participated in an NCAR program prior to becoming an ASP postdoc, such as workshops, conferences, tutorials or training opportunities, the ASP Graduate Visitor Program, or student internships. This shows the importance of pathways for recruitment into training programs such as ASP.

Half of the survey respondents (n=134) reported working in academia. Others work at NCAR, in other research labs, are retired, or work in federal, state, or local government (Figure 2). Few respondents work in industry, the private sector, or non-profits, or are currently not employed. There were no differences in job sectors for demographic characteristics such as gender, race/ethnicity, or first-generation status.
Figure 2. This bar graph shows the percent of ASP alumni respondents who work in each of the presented work sectors, with 51% in academia, 18% at NCAR, 10% in a research lab, 9% retired, and 7% in federal, state, and local government jobs (shown as “Government” on the x-axis). 1% each worked in industry/private sector, are self-employed, unemployed, or work for a non-profit. This indicates that most respondents do research in academia, at NCAR, or in a research lab.

Half the respondents had not changed their employment sector during their career, the other half did so once or twice. One respondent shared “All my work has been in the environmental/social/policy sector, but with consultancies [...], an independent research institution [...] and with universities [...]”. A higher percentage of respondents identifying as women (55%) than those identifying as men (47%) stayed in the same work sector during their careers.

Responses from alumni in the focus groups showed a very similar distribution of work sectors and job changes. Reasons given for changing jobs included seeking a job that allows teaching and mentoring of undergraduates, family circumstances, seeking greater job security and financial...
stability. Gewin (2002) found similar reasons for changing job sectors, especially away from academia towards other opportunities.

4.2 Career Satisfaction and Sense of Belonging

Nearly all respondents (97%) reported that they definitely or to some extent are in a career or position that they had hoped for (n=135). Woolston (2020b) showed that postdoc career paths can be meandering, and it can be challenging to find permanent positions. One alum shared “I am now in the role I had hoped for when I graduated with my PhD and started my ASP postdoc. The road to get here from there was much harder and less straightforward than I expected. I think my initial vision was far too narrow and I might be happier if I had been more open minded and less attached to a specific role.”

Most alumni reported feeling a great deal (69%) or somewhat (26%) of a sense of belonging at their current place of employment (n=132). An alum shared “I have spent 40+ years as a full professor at a top university, including working after formally retiring. I definitely feel a strong sense of community with my colleagues, students, postdocs, advisees, and research collaborators.” In contrast, another alum wrote “During my 40 year career I never found a workplace where I felt completely accepted, supported and at home. There was always too much competition for grants and power.”

Part of a sense of belonging is being supported in professional development and career growth. The majority of respondents either experience consistent support of their career growth by their employers (51%) or occasional support (42%). Unfortunately, 5% reported either that their employers actively limited their career growth, or that they didn’t feel supported by their employers at all. Written comments shared issues such as heavy teaching load, lawsuits related to gender discrimination or sexual harassment, or hostile supervisors related to not receiving support in their career development.

A greater portion of respondents who identified as men than women felt their employers consistently supported their career growth (41%W:57%M). This difference is statistically significant using the Kruskal-Wallis test at a 0.10 level of significance (p-value = .065482). A lack
of support for women’s careers has long been given as a possible reason for attrition for women all along the career path in STEM fields (Vongalis-Macrow 2016).

4.3 Career Readiness and Training for Today’s Workforce
Alumni rated research and writing skills, interpersonal skills, science communication, as well as data analytics, and mentoring as the most important skills learned in ASP, in order of priority. Alumni also shared that “Collaboration with people of different scientific backgrounds” and “Interdisciplinarity, especially natural-social science collaboration” were among the things they learned about and appreciated.

For future postdocs, most of the alumni recommended training in all of the skills mentioned above, as well as grant writing, leadership skills, DEI, and project management skills (Figure 3). Other specific skills that were recommended by alumni include advanced mathematics, statistics, programming, cloud computing, and teaching. Respondents across all years of participating in ASP rated DEI training as necessary for today’s workforce.
Figure 3. This bar chart shows the percent of responses recommending professional skills for postdocs in today’s job market. Research, writing, grant writing, and scientific communication ranked the most highly. The label ‘Justice, equity, diversity, and inclusion’ is abbreviated on the x-axis.

Academic respondents prioritized mentoring, DEI, management, and grant writing skills while non-academics prioritized interpersonal skills and data analysis skills. Leadership training was recommended to future postdocs by both groups equally.

4.4 Culture of Mentoring

We found a great presence of mentoring in the workplaces of our alumni. Seventy-five percent of respondents (n=125) reported having benefited from being mentored at work, by their former NCAR colleagues (55%), former professors and advisors (55%), and their personal community (46%). About 20% had benefited from mentoring through professional societies, and 8% reported
not having benefited from mentoring. One respondent said that “Having mentors available to reach out to (including my ASP mentor) has helped keep me going during the rough patches.” Interestingly, respondents who identified as first-generation college students (FG) had a lower incidence of benefiting from mentoring at work than those who identified as non-first generation (NFG) (57%FG:75%NFG). The same applied for being mentored as postdoc at NCAR (52%FG:60%NFG), or in professional society contexts (17% FG:24% NFG).

Nearly all respondents (97%, n=126) have mentored others, for example in mentoring students or interns, colleagues, or peers. One alum shared “Part of my job as a professor is to mentor both my own students and postdocs as well as young academics such as assistant professors on tenure track.” Others reported mentoring in a personal or community capacity or through professional societies. One alum wrote “Mentoring is ESSENTIAL. [...] Mentorship may be the most important factor in determining success and happiness in science. So, I try to help in every opportunity.”

The main reasons why alumni mentor others are because of a sense of responsibility, finding it a rewarding experience and to give back. The motivation behind mentoring differs between men and women, as shown in Figure 4. More men than women reported that they mentor because it is part of their job description, while more women reported that they mentor for altruistic reasons or to be a role model to others.
Figure 4: More men than women reported that they mentor because it is part of their job description (50%W:68% M). Slightly more women than men reported that they mentor to give back (82%W:69%M), because of a sense of responsibility (84%W:74%M), and because it can be a rewarding experience (79%W:74%M). Substantially more women than men mentor to be a role model to others (47%W:31%M).

Most respondents indicated that their employers have been consistently (66%) or occasionally (25%) supportive of them mentoring others (n=122). However, women reported feeling less supported by their employers than their male colleagues in engaging in mentoring activities (53% W:71% M). One alum shared a caution about mentoring: “I think scientists in top research centers and universities must first prove they are good at research. Having done that they can branch out into mentoring and communicating science to the public.”

Focus group data align with the survey findings. Interestingly, a quarter of focus group participants mentioned that experiencing mentoring while in ASP shaped how they mentor, thus showing that ASP served as a model for alumni to draw upon later in their careers. Another theme in the focus groups, which was found to a lesser extent in the survey, is that alumni mentor because they experience a reciprocal benefit to the behavior. One survey respondent shared “Being a mentor
has not only benefited me personally but professionally -- some of the students I mentored ended up stretching me scientifically -- and teaching me new things.”

4.5 Making the STEM Community more Diverse, Equitable, and Inclusive

Our study found that most respondents (87%, n=132) are participating in efforts to make the STEM community more diverse, equitable, and inclusive. Alumni shared their awareness of DEI issues, for example by noticing the better representation of women in the geosciences in the last decade. At the same time, one participant also observed that “Our record in making the field inclusive for people of color, minorities, indigenous people, and LGBTQ+ people, has been a disgraceful failure so far. I am aware of the great privilege I derive from being a wealthy white American male. We still have a long way to go. At least more people now realize this.”

A higher number of respondents who identify as women than men participate in DEI training at work, in DEI committees and sessions in professional societies, and advocate for DEI considerations in hiring processes. Other DEI activities mentioned by alumni include starting a DEI focused non-profit or creating DEI classes in their department.

Out of the 17 respondents who said they were not involved in DEI activities, 12 gave reasons why. These included not having enough time, stating that DEI was not a problem that needs to be addressed, having no interest, thinking they would not do it well, or having employers that are not valuing this work. Some studies found similar reasons why STEM professionals, especially men, do not get involved in DEI efforts (Todd 2020). Other respondents said that DEI efforts are too narrowly focused and do not include a broad range of aspects of diversity.

Among the participants of the alumni focus groups, most had positive views towards DEI efforts. They noted that they are observing these efforts in their workplaces and in the scientific community and see progress in advances in DEI. One alum explained “My job has nothing to do with DEI, but [...] I have to work with it all the time and make sure that I'm not [.... ] perpetuating the way things have gone before.” Alumni also noted a gradual increase of attention to DEI in ASP; one alum shared “I remember at that time when I applied for the ASP program, then [..we did] not
necessarily need [...] the DEI statement or anything related to that, but now I know ASP recruitment requires applicants to submit a statement [...].”

5 Conclusions and Recommendations
Postdoctoral appointments continue to be an important step in the career preparation of many atmospheric scientists. Engaging ASP alumni in this study provided data on their careers and career paths, as well as broader insights into their work environments, the sense of belonging, availability of mentoring, and efforts in DEI in STEM. Study participants were interested in staying in contact with ASP to connect with other alumni and to share their experiences with new generations of scientists. ASP plans to create an alumni newsletter, host alumni events at the Annual Meeting of the AMS, and to introduce current ASP postdocs to alumni in similar research topics or career paths to offer near-peer mentoring.

It’s beneficial for postdoctoral programs to invest in long-term participant tracking, engage alumni to support their professional networking, and ask for their input when modernizing program activities and practices.

ASP experiences impacted how alumni view the importance of mentoring and serving as a mentor. That, combined with awareness of DEI issues in STEM, shows that postdoc training can contribute substantially to needed culture changes in the atmospheric sciences. Our study also indicated that ASP alumni who identify as women are more highly engaged in mentoring efforts than their colleagues who identify as men but feel less supported by their employers doing so. This is important for institutions to be aware of. Women are also more engaged in a broader range of DEI efforts, which should be recognized. NCAR is moving forward by emphasizing training in mentoring and diversity and by supporting postdocs to mentor graduate and undergraduate students. ASP has also made changes to address the persistent lack of representation in STEM by modernizing its application and selection processes for postdocs to support institutional goals to diversify the cohorts demographically and by institutions under which postdocs earned their PhD.

Postdocs can be agents of change in our community. Their interest and commitment to mentoring and DEI should be supported with training and properly recognized. Institutions need to be aware which demographic groups carry more of the emotional labor of mentoring and DEI service.
Approximately half of ASP alumni work in academia, and others have moved into a broader range of other career opportunities. To maintain its relevance, ASP needs to evolve and adapt to train postdocs for today’s varied geoscience careers. To address this, NCAR has created an Early-Career Leadership Program with a focus on workplace skills transferable to careers inside and outside of academia. Other institutions can provide this training in-house or connect their postdocs with opportunities such as the AMS Early-Career Leadership Academy. While scientific training is still the core purpose of a postdoctoral appointment, other aspects such as preparing scientists to be good mentors and expanding their knowledge about project management and leadership should be part of a well-rounded postdoctoral experience.

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Data availability
The study protocol and data management measures were reviewed and approved by the UCAR Human Subjects Committee (HSC) under Memo #2021-17. Data analyzed for this study and presented in this paper are derived from individuals who gave consent. To maintain participant privacy and confidentiality, individual data collected from surveys and focus groups is not publicly available. The survey instrument and questionnaire are made available in supplemental material.
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