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### Title

Is pretenure interdisciplinary research a career risk?

### Permalink

<https://escholarship.org/uc/item/6br385cb>

### Journal

Eos, Transactions American Geophysical Union, 93(32)

### ISSN

0096-3941

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### Publication Date

2012-08-07

### DOI

10.1029/2012EO320004

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Peer reviewed

## Is Pretenure Interdisciplinary Research a Career Risk?

Despite initiatives to promote interdisciplinary research, early-career academics continue to perceive professional risks to working at the interface between traditional disciplines. Unexpectedly, the inherent practical challenges of interdisciplinary scholarship, such as new methodologies and lexicons, are not the chief source of the perceived risk. The perception of risk is pervasive across disciplines, and it persists despite efforts to support career development for individuals with common interests [Mitchell and Weiler, 2011]. Suggestions that interdisciplinary work can go unrewarded in

academia [Clark et al., 2011] foster a concern that targeting interdisciplinary questions, such as those presented by climate change, will pose problems for acquiring and succeeding in a tenure-track position. If self-preservation limits the questions posed by early-career academics, a perceived career risk is as damaging as a real one to new transdisciplinary initiatives. Thus, institutions should address the source of this perception whether real or specious.

The challenges and benefits of early-career interdisciplinarity emerged at the recent Dissertations Initiative for the

Advancement of Climate Change Research (DISCCRS, <http://discrs.org>) Symposium. Despite new ideas for collaborative work, numerous discussions fixated on perceived hurdles. Here we maintain that early-career interdisciplinary researchers can boost personal success, and we also discuss how funding and incentive structures could be amended.

### Personal Success

Early-career incentives can create pressure to establish a disciplinary academic identity and postpone interdisciplinary projects. New entrants may see a competitive job market where specialization is rewarded, and those already in tenure-track positions may question whether working across departments could leave them homeless. However, another way to establish identity is to create and pursue common research threads, for example, a regional focus or pioneering analytical approach. Well-framed research statements are critical to creating a recognizable specialty even in an interdisciplinary context. Moreover, effectively advocating for a particular interdisciplinary research pathway may prove a mark of excellent work. Bolstered by strong communication, innovative approaches are more likely to be recognized as such.

Mentorship forms a vital part of academic success, particularly for early-career scholars seeking to establish their identity. Yet graduate students are more likely than faculty to have participated in an interdisciplinary venture [Rhoten and Parker, 2004], so there are fewer advanced researchers to serve as role models. Interdisciplinary scholars may benefit from multiple mentors in different disciplines because involvement with several research groups can familiarize scholars with "the culture, language, technology, and literature of two scientific disciplines" [Sung et al., 2003]. Early-career researchers should also consider nontraditional mentors and networking at problem-focused symposia [Mitchell and Weiler, 2011; Weiler, 2007].

Interdisciplinary collaboration can be daunting because of conflicting disciplinary norms, but there are ways to establish effective teams. Groups can dedicate time at project inception to develop methodologies, scope, authorship expectations, and a common language. Those interested in fostering collaboration while developing their own specialty can generate knowledge that is clearly transferable to other disciplines. This will involve framing information without


jargon, a valuable skill in any research track [Dilling and Lemos, 2011].

### Structural Issues

Funding remains a significant perceived barrier to interdisciplinary research, as most grants and fellowships are earmarked for specific disciplines. Broader methodologies can make interdisciplinary proposals more difficult to evaluate, and multiple investigators give the work a higher price. The discipline-grounded peer review process is also often cited as an obstacle to interdisciplinary work [Newell et al., 2005], promoting the idea that eventual publications could prove problematic.

Should these issues still dissuade early-career investigators, or are these problems on track to be resolved? Two new U.S. National Science Foundation (NSF) initiatives, for example, focus on interdisciplinary projects: Science, Engineering and Education for Sustainability [Kileen et al., 2012] and Creative Research Awards for Transformative Interdisciplinary Ventures. Proposals to these programs will be explicitly evaluated on the basis of interdisciplinary approaches to global questions, helping to alleviate competition with disciplinary projects. Nevertheless, there is a sense that these initiatives are designed to support large projects and early-career investigators will not be competitive. Early-career investigators also have to trust these new programs to continue to support their established research paths. Parallel programs that support smaller interdisciplinary collaborations among early-career scholars would be timely. Proposals could be evaluated on potential for integration and teaching, in addition to discovery [Boyer, 1990]. Funding graduate students and postdoctoral researchers poses a further challenge when their work falls between departments. Many graduate fellowships that support interdisciplinary research require outside partnerships, which promotes networking but adds another requirement. Accordingly, extra constraints should be avoided when designing new funding opportunities.

Funding issues aside, institutional policies present another perceived challenge to interdisciplinary research [Paytan and Zoback, 2007]. Most institutions appear to remain structured around long-standing disciplinary divisions [Fox et al., 2006]. Departments and programs



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usually have established expectations for success, including publications in particular venues. However, interdisciplinary success may be defined in different ways [Pohl, 2011]. It can be appropriate for scholars to follow different timelines, publish in different journals, or generate different products, such as policy reports or decision support tools. The lack of precedent for evaluating nontraditional accomplishments can leave early-career scholars doubting whether interdisciplinary research is the best path to academic success [Schmidt and Moyer, 2008].

A growing number of university research institutes have begun integrating sciences and humanities in areas such as climate change. As with other new disciplines, their arrival on campus often required an infusion of external money. If successful, these types of institutes could provide new research models. Meanwhile, departments that have historically used disciplinary journal publications or single-authored monographs for tenure review should recognize an apparent risk associated with interdisciplinary work. The potential for tenure committees to undervalue shared students and large multiauthored projects may be enough to discourage early-career faculty from following their curiosity. Given these

concerns, department chairs could pay particular attention when selecting letter writers and comparing tenure candidates. Establishing guidelines in this process in collaboration with new faculty ought to be prioritized.

Early-career scholars and seasoned practitioners alike perceive barriers to interdisciplinary research (S. Pfirman and M. Begg, Perspective: Troubled by interdisciplinarity?, 2012, [http://sciencecareers.sciencemag.org/career\\_magazine/previous\\_issues/articles/2012\\_04\\_06/caredit.a1200040](http://sciencecareers.sciencemag.org/career_magazine/previous_issues/articles/2012_04_06/caredit.a1200040)). To overcome them, institutions can design more comprehensive metrics for evaluation and combat any perceptions that interdisciplinary work is only a sideline to a traditional academic career. Given the exciting questions posed by interdisciplinary researchers, these efforts would be worthwhile.

**Acknowledgments**

DISCCRS is supported through NSF grants SES-0931402 to the University of Oregon and SES-0932916 to Whitman College and NASA grant NNX10AJ53G to Whitman College.

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