

Portland State University PDXScholar

Environmental Science and Management Faculty
Publications and Presentations

Environmental Science and Management

12-14-2015

Next-Generation Scientists Get a Taste of Their Future Careers

Patrick Michael Edwards
Portland State University, patrick.edwards@pdx.edu

Linda A. George
Portland State University, georgel@pdx.edu

Matthew McTammany
Bucknell University

Let us know how access to this document benefits you.

Follow this and additional works at: http://pdxscholar.library.pdx.edu/esm_fac

 Part of the [Environmental Sciences Commons](#), and the [Science and Mathematics Education Commons](#)

Citation Details

Edwards, P., L. George, and M. McTammany (2015), Next-Generation Scientists Get a Taste of Their Future Careers, *Eos*, 96.
Published on 14 December 2015.

This Article is brought to you for free and open access. It has been accepted for inclusion in Environmental Science and Management Faculty Publications and Presentations by an authorized administrator of PDXScholar. For more information, please contact pdxscholar@pdx.edu.

Next-Generation Scientists Get a Taste of Their Future Careers

High school and middle school students mingled with scientists from all over the world when they presented their posters at the Joint Aquatic Sciences Meeting.



Students in the Cascades-to-Coast GK–12 program put pins in a map to mark the locations of their study sites. Credit: Patrick Edwards

By Patrick Edwards, Linda George, and Matthew McTammany © 14 December 2015

More than 200 students from 10 regional schools joined professional scientists from all over the

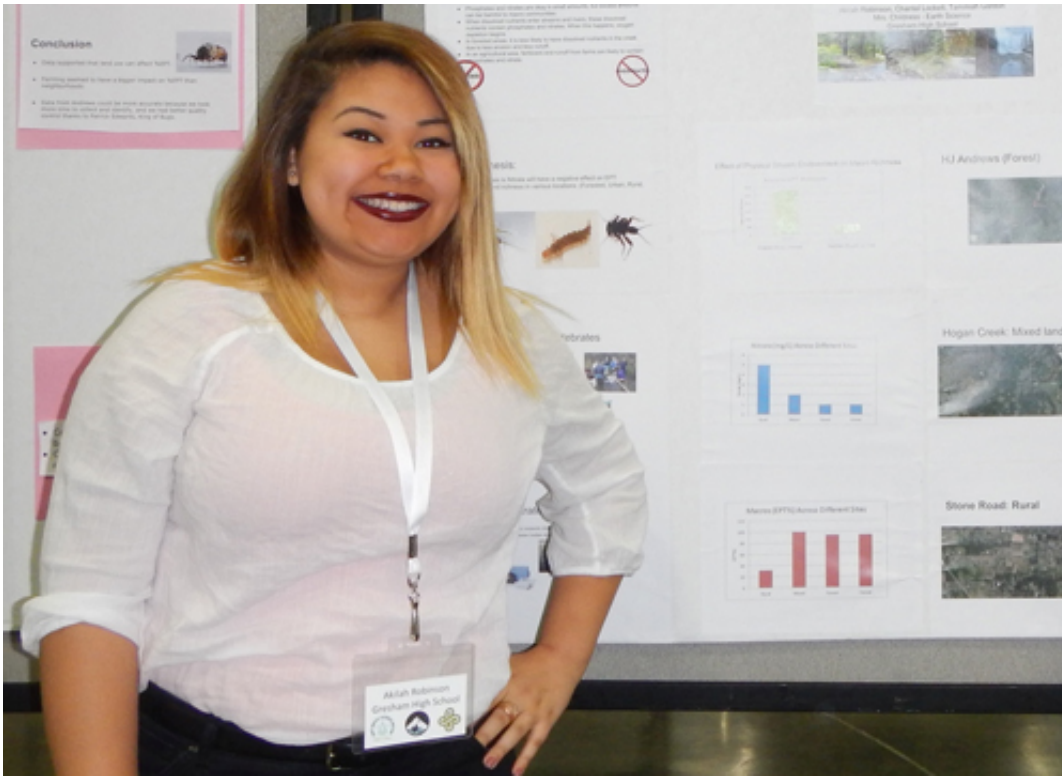
world to present posters on their research projects at the Joint Aquatic Sciences Meeting (<http://sgmeet.com/jasm2014/>) on 22 May 2014 at the Oregon Convention Center Exhibit Hall in Portland. During the poster session, students discussed their research and visited posters presented by scientists from a wide range of aquatic disciplines.

Most professional science organizations seek ways to engage students and enhance science education at the kindergarten through 12th grade (K–12) levels [*Bestelmeyer et al.*, 2015; *Asher and Saltzman*, 2012]. Unfortunately, because the primary outreach and interaction mechanism of scientific societies is through conferences geared toward scientists at the graduate level and above, professional societies have limited resources to support interactions between their members and K–12 teachers and students.

Professional science conferences present an opportunity to connect students with scientists from a range of disciplines and backgrounds.

Science fairs are a time-honored way for educators to engage students in science research and foster relationships between the school and scientific communities [*McComas*, 2011]. Recently, more emphasis has been placed on including students from traditionally underrepresented groups in science fairs [*Bencze and Bowen*, 2009; *González-Espada*, 2007]. These events are the equivalent of professional science conferences, with an emphasis on students' intellectual development.

Taking this one step further, professional science conferences present an opportunity to connect students with scientists from a range of disciplines and backgrounds. For example, the American Geophysical Union's (AGU) Bright Students Training as Research Scientists (<http://education.agu.org/diversity-programs/bright-stars/>) (Bright STaRS) program provides a dedicated forum for students to share their research with professional scientists attending AGU's Fall Meeting [*Asher and Saltzman*, 2012].



https://eos.org/project-updates/next-generation-scientists-get-taste-future-careers/attachment/embed_web-11

Cascades-to-Coast GK–12 student Akilah Robinson (Gresham High School, now graduated) stands in front of her poster on insects that live in streams, entitled “How Does Nitrate Affect Macroinvertebrate Communities,” at the 2014 Joint Aquatic Science Conference.

From Science Fairs to Scientific Conferences

We organized a noncompetitive middle and high school poster session to take place during the 2014 Joint Aquatic Sciences Meeting (JASM) in Portland, Oreg., as a practical and meaningful way for scientists to connect with students, particularly those who are underrepresented in the sciences. The chance to attend a professional meeting motivated students to participate in the research process and prepare their posters, and the poster session provided a relatively easy way for professionals to interact with students. To maximize student participation, JASM partnered with the [Cascades-to-Coast GK–12](http://www.pdx.edu/soe-gk12/home) (<http://www.pdx.edu/soe-gk12/home>) project in the Department of Environmental Science and Management at Portland State University, which places science doctoral students (fellows) in regional K–12 schools to improve their communication skills.

“For me, [the conference] was the turning point in my decision as a student to take my studies further. I met scientists from New York, Australia, India, and more,” said Akilah Robinson

(pictured in the photo), a college freshman who presented a poster as a high school senior. “I also met local scientists. But out of everyone I met, there was one thing in common. They all had a passion and they all loved what they did. They all dedicated themselves to the contribution of new studies for science, and it was absolutely amazing to witness.”

Enthusiastic Response

Feedback from participating teachers was also very positive: “My students were thrilled to be part of the conference and were surprised at how much they knew about their subject,” said Laurie McDowell, a science teacher at Lent Middle School in Portland, Oreg. Linda Wolf, a biology teacher at Glencoe High, said her students “couldn’t believe they could have so much fun at a science conference.”

GK–12 fellows were equally excited to be part of the JASM student poster session. “One of the highlights of the day was when I got to show my poster to my students,” said doctoral candidate Nicole Alfafara, a GK–12 fellow and JASM presenter. “After viewing other professional posters at the conference, my students gave me advice on improving my own poster.”

We solicited feedback from the JASM attendees about their experience interacting with students. Of the 35 online survey responses, 100% of the respondents enjoyed the experience and agreed that professional societies, such as the Society for Freshwater Science (SFS) or AGU, should continue to engage precollege students in combined poster sessions.

“This type of educational outreach is excellent and hopefully will educate and convince students to pursue a career in the aquatic sciences.”

Twenty-six survey respondents provided written comments about the GK–12 poster session, and their feedback was strongly supportive. The majority of the comments indicated positive experiences with the students and high esteem for the quality of the students’ work. For example, one survey respondent wrote, “The students were well prepared, articulate and excited. I thoroughly enjoyed talking to them about the projects.” Another attendee wrote, “SFS should sponsor similar projects that coincide with the annual meeting. This type of educational outreach is excellent and hopefully will educate and convince students to pursue a career in the aquatic sciences.”

One critique of the GK–12 poster session indicated in the survey was that JASM scientists may have been unaware of the session because of the lack of advertisement. This was due in part to the

limited space in the agenda to describe the poster session, as well as the large number of sessions that were concurrent with the poster session. One respondent wrote, “To increase the attendance of conference-goers to this event in the future, it will be helpful to advertise it early and widely.”

Lessons Learned

The Portland JASM conference provided a great opportunity to test out this unique poster session and collaboration. The conference was held well into the school year, so students were ready to present. The participating societies offered planning support and financial commitment, and the conference planning service provided scheduling flexibility for the session. For those seeking to organize a similar session, we can offer a few suggestions.

First, and most important, is to engage with the professional organization early; planning for large science conferences is typically a 2- to 3-year process. Another key element is to engage with universities in the conference city. Local universities are very likely to have programs aimed at K–12 inquiry and will be able to contact teachers and help organize the session. This would be especially advantageous for societies that have a conference in the same city every year.

It’s important to work closely with conference planners to accommodate students and allow them to participate without having to officially register. This may include, for example, providing custom ID badges, using a special session for the poster presentations, and working closely with the conference venue to provide logistical support and other accommodations.

It’s important to ensure maximum participation by professional scientists.

Finally, it’s important to ensure maximum participation by professional scientists. Advertise widely at the event or during the keynote address, and hold the session during long breaks when no other presentations are scheduled.

Currently, we are working on connecting more high schools to the SFS conference and plan to have more poster sessions in the future. At Portland State, the Department of Environmental Science and Management is inviting regional high school students to present at the annual graduate student colloquium; six high school seniors presented two posters at the graduate student poster session in 2015.

Acknowledgments

We would like to thank the JASM Executive Committee and the Society for Freshwater Science

Education and Diversity Committee for providing funding and support for the poster session. The Cascades-to-Coast GK–12 program is supported by the National Science Foundation (grant 0948041). Additional funding for the poster session was provided by the Institute of Sustainable Solutions at Portland State University.

References

Asher, P., and J. Saltzman (2012), Middle and high school students shine, *Eos Trans. AGU*, 93(9), 96, doi:10.1029/2012E0090019.

Bencze, J. L., and G. M. Bowen (2009), A national science fair: Exhibiting support for the knowledge economy, *Int. J. Sci. Educ.*, 31(18), 2459–2483.

Bestelmeyer, S. V., M. M. Elser, K. V. Spellman, E. B. Sparrow, S. S. Haan-Amato, and A. Keener (2015), Collaboration, interdisciplinary thinking, and communication: New approaches to K–12 ecology education, *Front. Ecol. Environ.*, 13(1), 37–43.

González-Espada, W. J. (2007), The role of the scientific community in school science education, *Interciencia*, 32(8), 510–515.

McComas, W. F. (2011), The science fair: A new look at an old tradition, *Sci. Teacher*, 78(8), 34–38.

National Science Teachers Association (1999), Science competitions: An NSTA position statement, Arlington Va. [Available at <http://www.nsta.org/about/positions/competitions.aspx> (<http://www.nsta.org/about/positions/competitions.aspx>).]

Author Information

Patrick Edwards and Linda George, Environmental Sciences and Management, Portland State University, Portland, Oreg.; email: patrick.edwards@pdx.edu (<mailto:patrick.edwards@pdx.edu>); and Matthew McTammany, Department of Biology, Bucknell University, Lewisburg, Pa.

Citation: Edwards, P., L. George, and M. McTammany (2015), Next-generation scientists get a taste of their future careers, *Eos*, 96, doi:10.1029/2015E0040803. Published on 14 December 2015.
