

Mentoring Women in the Biological Sciences: Is Informatics Leading the Pack?

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Across the landscape of informatics, particularly biological and ecological informatics, are quite a few women in leadership positions at important organizations, such as the National Center for Ecological Analysis and Synthesis, the National Evolutionary Synthesis Center, and the National Ecological Observatory Network. It would appear that career opportunities for women are burgeoning in the field of informatics.

Yet mathematics, science, and high technology—the building blocks of informatics—are not typically considered to be women-dominated fields. Why, then, are a growing number of women found in these decisionmaking positions, which require not only superior scientific skills but also highly analytic modeling and computer science skills? The answer is twofold: mentoring and education.

On the education side of the equation, the number of women pursuing baccalaureates in mathematics, engineering, and science is rising steadily, but education alone is not translating into a greater number of women researchers in informatics. To achieve that result, says Marcie McClure, associate professor in the Department of Microbiology at Montana State University–Bozeman, mentoring women who are studying biological informatics is critical.

According to McClure, “the reason why there are women leading the centers is that these positions are not strictly research. By and large, basic research positions attract more men.” “The problem,” she adds, “is women don’t know it [bioinformatics research] is an option.” If more women knew that their research interests were part of the field called bioinformatics, more women would pursue bioinformatics research as a career.

McClure, a bioinformatics researcher herself, believes that both bioinformatics and computational biology suffer from the dearth of women scientists and engineers. To address this problem, McClure has started the “Women in Bioinformatics” seminar series at Montana State University. The series highlights exceptional works of established and up-and-coming bioinformatics researchers and their experiences as women in a predominantly male field. The goal is to inspire the younger generations of women scientists by providing role models and mentors for women in science and engineering. The idea, McClure says, is to “set up women for success.” She wants to create a place where women in bioinformatics can discuss their research and provide mentoring and support.

McClure hopes to spur the interest of women and other groups that are underrepresented in the sciences. The women who give presentations at the seminars are chosen for their excellence in research and for the variety of educational backgrounds and career paths they represent. To reach the widest audience possible, the seminars are Webcast. A documentary film on women in bioinformatics has also been produced.

Deana Pennington, a research assistant professor at the University of New Mexico Long Term Ecological Research Network Office, is leading another weekly seminar, one that provides the rigorous training necessary for informaticians. The seminars are part of a National Science Foundation project called “Advancing Cyberinfrastructure-based Science through Education, Training, and Mentoring of Science Communities.” Pennington, the primary investigator for this project, is an ecoinformatics researcher who studies the application of information technology for integrated and synthetic analy-

sis of environmental and ecologic data. Through these seminars, which are taught online at five institutions, students learn the skills for scaling up ecological studies from the local level to regional and global levels. As studies move from the local to the global scale, the research itself becomes increasingly interdisciplinary.

“Interdisciplinarity occurs in two aspects,” Pennington says, “the cross-sciences aspect and the cross between science and technology required to conduct the science. In this arena, which absolutely requires abilities in ‘conceptual multitasking’ to understand different perspectives, communicate effectively, and cooperate rather than compete, women seem to have some skills and attitudes that are very relevant. Opportunities to conduct basic research on interdisciplinary systems are growing, and women should take advantage of these.”

The idea is to mentor these scientists as they transition from disciplinary basic research into cross-disciplinary, technology-enhanced research so that they can develop the requisite skills for working on interdisciplinary teams and learn to integrate scientific inquiry with state-of-the-art computer software and hardware. “It is too soon to say how the women in the group are responding relative to the men,” Pennington says. “But I will be analyzing the responses to surveys based on gender, and it will be interesting to see if there are patterns that emerge.” The role for women in bioinformatics may soon become clearer.

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