

**IGERT PhD Fellowship Program at  
Southern Illinois University Carbondale**

**Multidisciplinary, Team-Based Training in  
Watershed Science and Policy**

Southern Illinois University Carbondale (SIU) is offering 3 PhD fellowships in 2013 as part of the National Science Foundation's **I**ntegrative **G**raduate **E**ducation **R**esearch and **T**raining (IGERT) program.

The IGERT cadre will be comprised of an interdisciplinary team of students working together for the two years of the fellowship (2013-2015). Prospective students with interest in any watershed-related field of study (e.g., forestry, geology, hydrology, geography, engineering, biology, ecology, natural resource economics, or human dimensions of natural resource management) are encouraged to inquire with one of the IGERT Principal Investigators (listed below) for more information about the program and potential major advisors in the student's area of interest.

Applicants holding a Master's degree by the time the IGERT fellowship begins are preferred, but direct PhD entry is possible in cases of exceptional qualifications. Fellowship benefits include a \$30,000/year stipend for two years, \$10,500/year cost of education allowance for two years, laptop, and travel support. Fellowships are available to U.S. citizens and permanent residents (only).

The IGERT application deadline is May 1, 2013. The start date for the fellowship program is August 19, 2013. Please note that applying to the IGERT also requires applying to the Graduate School and Department of the student's major advisor.

For more information and the application, please see the following pages or visit <http://www.igert.siu.edu>.

Principal Investigators:

Nicholas Pinter (Geology) [npinter@geo.siu.edu](mailto:npinter@geo.siu.edu)

Chris Lant (Geography) [clant@siu.edu](mailto:clant@siu.edu)

Sara Baer (Plant Biology) [sgbaer@siu.edu](mailto:sgbaer@siu.edu)

Matt Whiles (Zoology) [mwhiles@zoology.siu.edu](mailto:mwhiles@zoology.siu.edu)

Lizette Chevalier (Engineering) [cheval@engr.siu.edu](mailto:cheval@engr.siu.edu)

**Intellectual Merit:** The IGERT PhD Fellowship Program in Watershed Science and Policy at Southern Illinois University (SIU) emphasizes three key elements in graduate education: (1) multidisciplinary education crossing traditional boundaries between science and policy, (2) team-based critical thinking and problem-solving, and (3) the application of scientific knowledge within a policy and management context. The central approach is to train each year's IGERT class as a collaborative, interdisciplinary *cadre* – “a nucleus or core group of trained personnel able to assume control and to train others.” In this model, the SIU IGERT recruits, mentors, and trains a diverse group of outstanding PhD students to become the scientists, managers, and leaders who will tackle tomorrow's interconnected environmental, social, economic, and technical challenges at watershed and river basin scales.

The late 20th century brought a new era in water-resources management, emphasizing collaboration and involving stakeholders in consensus-building and adaptive management. Traditional, single-discipline graduate education can no longer address the complex issues of water and watershed management in the 21<sup>st</sup> century. Instead, this new era demands inter-disciplinary approaches that integrate scientific research with resource management and policy-making, with the goal of creating science-literate leaders and policy-literate scientists for placement in government, academia, and the for-profit and non-profit private sectors.

The SIU IGERT program responds to these needs with several unique features: (1) team-based collaboration; (2) a ground-up multidisciplinary approach to watershed issues; (3) integration of under-represented groups as students, mentors, and trainees; (4) model-based data synthesis; (5) practical experience via extended internships; (6) exposure to transboundary rivers and international watershed management issues; and (7) graduates with training in national and international best practices in integrated watershed science and management.

**Broader Impact:** NSF's outlook in environmental research and education highlights the “demand for collaborative teams of engineers and natural and social scientists that go beyond current disciplinary research and educational frameworks.” The SIU IGERT addresses several of NSF's current focus areas—coupled natural and human systems as well as coupled biological and physical systems—while increasing the diversity of inter-disciplinary scientists and building capabilities to diagnose and resolve complex environmental challenges.

Our goal is to cultivate a new and diverse generation of watershed science and management graduates trained in integrative, team-based collaboration across the full spectrum of relevant physical and social sciences, and with the skills and experience to integrate science, management, and policy at the watershed and river basin levels. These scientists will have the ability to provide leadership in various sectors of employment in watershed science and management to address national and international watershed challenges for the 21st century.

## **Highlights of the 2013 SIU IGERT Program in Watershed Science and Policy**

### **The 2013 SIU IGERT Program in Watershed Science and Policy offers:**

- 2 years (24 months) of stipend: \$2,500 per month
- \$10,500/year for 2 years toward tuition, fees, and related educational expenses
- Select expenses paid for travel related to conferences and research for 2 years
- Select expenses paid for research materials for 2 years
- A new laptop for your use during your PhD work (to be returned to SIU upon completion of degree or departure from SIU)

No pay is guaranteed for the third or subsequent years of PhD work. Your home department will determine if a Teaching or Research Assistantship is available (at a pay rate to be determined by SIU). Please discuss rates with your advisor.

### **Interdisciplinary Group Project:**

The 2013 Fellowship recipients will work as a team—with the guidance of faculty advisors—for much of their first two years on an interdisciplinary group project. This group project is a core requirement of the IGERT Program and thus will be the primary focus of the first two years of PhD work. The 2013 project is summarized below.

#### ***Modeling costs/benefits of in-stream restorations to enhance nutrient uptake and retention***

*Management of nutrient levels in Midwestern streams is accomplished primarily with sewage treatment plants for point sources and riparian buffer development and protection for non-point sources, with little attention to potential in-stream processing. However, studies indicate that healthy streams with high biotic integrity can take up over half of the nutrients they receive. Given that well over 40% of stream reaches in the Midwest are considered impaired, and that larger-scale problems such as Gulf hypoxia are ongoing, current nutrient management approaches are unsatisfactory. Additional measures and/or alternative approaches, particularly those that address persistent non-point problems, are needed. However, changing the way nutrients are managed at the watershed scale will require evidence that alternative approaches are economically and environmentally advantageous. The 2013 cadre of IGERT fellows will work as a team to develop quantitative models to assess the costs/benefits of enhancing in-stream habitat quality for nutrient management. Models will be based on existing information and a series of nutrient uptake experiments performed in regional streams ranging from highly degraded to natural. The group will perform an in-depth analysis of the costs of current approaches and explore the costs/benefits of redirecting some resources used for traditional approaches to stream habitat restoration/engineering programs. Analyses will also include quantifying the dollar value of other ecosystem services that accompany stream restorations, such as flood control, fish production, and enhanced recreation.*

**Expectations of Fellowship Recipients:**

1. Maintain a minimum GPA of 3.0
2. Work as a team with other IGERT fellows and faculty advisors in the completion of the cadre's group project and reports/publications
3. Maintain adequate progress in your degree program
4. Enroll for the minimum of nine graduate credit hours for Fall and Spring semesters and three hours for Summer session. Enrollment must include the required IGERT Watershed Science and Policy courses and seminars offered each academic semester
5. Agree to not accept any other fellowship or scholarship while receiving the *IGERT Fellowship* without the written approval of the University
6. Agree to not accept part-time or full-time employment, other than research or teaching assignments as provided under the Academic Department

To complete the **Application**, visit [www.igert.siu.edu](http://www.igert.siu.edu) to download the form.