



Sloan Career Cornerstone Center

Profiles of Biologists



Louis J. Gross

**Professor of Ecology and Evolutionary Biology and Mathematics and Director of the Institute for Environmental Modeling
University of Tennessee, Knoxville
Knoxville, TN
Homepage: www.tiem.utk.edu/~gross**

EDUCATION	▶ BS, Mathematics, Drexel University ▶ Ph.D., Applied Mathematics, Cornell University
JOB DESCRIPTION	Professor Gross educates students about quantitative methods useful in many areas of the life sciences and applies mathematical and computational methods to address problems in ecology, natural resource management, and epidemiology.
ADVICE TO STUDENTS	"Don't be bashful about critiquing your teachers and what you read in textbooks and on the web. Just because it is written down doesn't mean that it is correct."

▶ INTERVIEW

- ▶ **What fields of biology do you work in?**
- ▶ **Gross: Mathematical and Computational Ecology.**

- ▶ **Q: When did you know you wanted to become a Biologist?**
- ▶ **Gross: Though I long had an interest in natural history, and particularly plants, it was not until graduate school that I made the transition to biology.**

- ▶ **Q: What was your college experience like?**
- ▶ **Gross: It was a dream come true, because of the cooperative education program I was in, as well as the opportunities provided to learn about the diversity of mathematical applications. My first experience with research-level biology came from a math course dealing with methods to evaluate alternative birth control methods using demographic models. Upon entering graduate school, I had the good fortune to be mentored by outstanding mathematicians and ecologists, providing an opportunity to mesh the two fields. Though unusual at the time, this combination is now becoming more commonly available and offers tremendous opportunities to advance biology through a quantitative approach.**

- ▶ **Q: Did you incorporate work experiences while you were an undergrad?**
- ▶ **Gross: I had the opportunity, through a cooperative education program, to work with some of the world's leading radio astronomers using the best equipment available anywhere, and this paid for my undergraduate education. The research experience and skills I obtained were immediately applicable in other areas of science, including biology.**

"Profiles of Biologists"

▶ **Q: How did you get your first job?**

▶ **Gross:** Upon finishing graduate school, the University of Tennessee was just building a program in mathematical ecology and offered me a joint appointment in both fields – something that was very unusual at the time.

▶ **Q: What's the most rewarding thing about being a Biologist?**

▶ **Gross:** The ability to apply new quantitative approaches that can be applicable across very different levels of biological systems is very enticing and particularly rewarding when the results provided are used in practice.

▶ **Q: Is there an example you can provide that shows how something you've worked on has positively impacted the world?**

▶ **Gross:** Over the past two decades I have led an effort to develop mathematical and computer models that have been used extensively to evaluate the biological impacts of alternative restoration plans for the Everglades of South Florida. These models provided one of the only means to account for impacts on endangered species such as the Florida Panther and the Everglades Snail Kite, in addition to many species which are critical components of the ecosystem, used in the planning for this large and complex project. They were applied to evaluate different options for the long-term management of the water resources in this very unique ecosystem.

▶ **Q: Do you spend a fair amount of time traveling?**

▶ **Gross:** Yes, but I attempt to limit this so as not to interfere with my teaching responsibilities. I have had the opportunity to collaborate on research and teach courses and workshops in many different countries.

▶ **Q: Do you have a mentor? Or did you in your college years?**

▶ **Gross:** I had many outstanding mentors both in my undergraduate and graduate years, in mathematics, biology and astronomy. Most have remained friends and colleagues throughout my own career.

▶ **Q: Do you find yourself working more in a team situation, or more alone?**

▶ **Gross:** I regularly lead interdisciplinary teams of researchers due to the scale and scope of many of the problems I am involved with. No one person's expertise is sufficient. As an example, I currently lead a National Science Foundation funded project that involves faculty and graduate students from mathematics, ecology, computer science, geography and wildlife.

▶ **Q: Do you find you are able to balance work with social/family life while working in your current job?**

▶ **Gross:** As do many professionals, there are definitely sacrifices I have made in order to devote the time and effort needed to develop one of the world's leading programs in mathematical biology. However throughout my life I have always set aside significant time for volunteer work that is unrelated to my profession (as a scout leader, dancer and a concert sound engineer) and always encourage students to find something they are passionate about outside of their profession and pursue it avidly.

▶ **Q: If you had to do it all over again, would you still become a Biologist?**

▶ **Gross:** Most definitely – biology offers tremendously challenging problems with the potential to benefit humanity in many ways.

▶ **Q: Did you think that school prepared you for the way the work gets done in the real world?**

▶ **Gross:** Yes, mainly through the cooperative education program I was involved with, and the outstanding graduate education that encouraged interdisciplinarity.

▶ **Q: Where do you see jobs for Biologists in the future? What should students be doing to prepare themselves to take on those roles?**

▶ **Gross:** I encourage students to be diverse in their formal training as well as in their outside efforts. This means taking as many quantitative courses as you can stomach -- math, statistics, computing -- while also obtaining a firm grounding in physical sciences. Biologists of the present draw upon many areas of science to be at the forefront of current biology and there is good reason to expect that the biology of the future will require even more connections to other areas of science. It is important to get the basic grounding so that you are aware of what you don't know that is needed to address a problem, and be able to discuss this effectively with others who have the expertise you lack.

"Profiles of Biologists"

► **Q: What other advice do you have for precollege students?**

► **Gross:** Don't be bashful about critiquing your teachers and what you read in textbooks and on the web. Just because it is written down doesn't mean that it is correct. Develop your own abilities to decide what is correct by reading widely, experiencing the diversity of our planet directly (e.g. spent lots of time outdoors), and interacting with people who have more experience than you and perhaps quite different perspectives.

The Sloan Career Cornerstone Center is an ever-expanding resource center for anyone interested in exploring career opportunities in computing, engineering, healthcare, mathematics, science, and technology. Explore degree fields along with comprehensive education, salary, networking, job hunting, and career planning resources. Browse interviews with hundreds of people who offer candid insight into their own diverse careers. Many resources are in PDF, PowerPoint, or Podcast formats.

"Profiles of Biologists"

Prepared as part of the Sloan Career Cornerstone Center (www.careercornerstone.org)