The aim of the 2009-2010 Global Spotlight grants program was to support and promote the establishment of major international research and creative initiatives with global visibility related to Africa and water issues in the world. More than $1,245,000 was awarded in four grant programs to faculty and graduate students in academic programs within 13 colleges and across the system.

**Why Africa?**
The University of Minnesota connections to Africa are numerous and diverse from faculty-led research to outreach in public health, education, economic development, medicine, agriculture, and much more. Over the past 20 years, the African presence in Minnesota has increased substantially.

**Why Water?**
The University of Minnesota is a sea grant as well as a land grant institution. As home to the St. Anthony Falls Laboratory in Minneapolis and the Large Lakes Observatory in Duluth, the University of Minnesota is in a unique position to address the global challenges of water resources.

Global Spotlight is the Global Programs and Strategy Alliance’s biennial focus on a region of the world and a pressing global issue. For the 2009-2010 biennium, the focus was on the region of Africa and the issue of water.
Impact: Faculty Grants

In spring 2010, the University of Minnesota Office of International Programs (now called the Global Programs and Strategy Alliance) through its Global Spotlight initiative to support international scholarship, awarded four faculty major research grants and nine faculty seed grants that focused on the 2009-2010 Global Spotlight themes of Africa and Water.

The Global Spotlight scholarly initiative has yielded many benefits to U of M faculty and students in terms of research productivity, enhanced instruction, international collaborations, external funding opportunities, and global visibility of the University of Minnesota. In addition to the specific research outcomes, the projects developed and enhanced global interdisciplinary collaborations and partnerships across the world. The partnerships, sometimes resulting in formal agreements between the U of M and other institutions, were formed with universities, government agencies, and local/community entities. The U of M researchers also disseminated their research through journal articles, book chapters, books, local and international conference presentations, and interviews given to mass media outlets, such as the BBC and Aljazeera.

The research projects funded through the Global Spotlight were conducted in countries throughout the world, and the principal investigators came from a range of colleges and campuses. While all of the projects included international partners and collaborators from the countries where the research was conducted, several projects fostered additional collaborators from neighboring countries as well as researchers from other parts of the world. The partners included researchers and stakeholders from universities, government agencies, community groups, and non-governmental organizations.
Strong International Partnerships Expand the University of Minnesota’s Global Presence

Stephanie Guildford
Associate Professor
Large Lakes Observatory, Duluth

Robert Hecky
Professor
Large Lakes Observatory, Duluth

The University of Minnesota’s mission statement emphasizes “research, education, and outreach that benefit the student, state, country, and the world.” Today this approach is more appropriate than ever. Only those universities that acknowledge the importance of global communication, economics, and relations will attract the best and the brightest students and researchers.

The past three years have forged unique international partnerships between University of Minnesota faculty and students and their counterparts in five African countries (Rwanda, Uganda, Kenya, Tanzania, and Malawi) bordering lakes in the Rift Valley. African nations lag well behind the world in education of their population, especially in the area of higher education where leadership and innovation critical to development must be found. African universities recognize the essential role that they must play in regional development just as the U of M as a land grant and sea grant university has stimulated and led Minnesota’s development, from an agrarian society to a highly diversified, thriving economy with global connections. Engaging relationships between the University of Minnesota and our global partners not only strengthens our global reach, but also leads to greater impact and defines a land grant vision for the 21st century.

Stephanie Guildford received a Major International Research Grant and Robert Hecky received an International Collaborative Seed Grant from the Global Spotlight in 2009-2010.

Chancellor Lendley Black, UMD, and Professor Emanuel Kaunda, Bunda College of Agriculture, University of Malawi, sign an exchange agreement. Photo courtesy of Professor Stephanie Guildford.
A Case for Interdisciplinary Research

Joseph Knight  
Assistant Professor  
Department of Forest Resources, CFANS

Kirsten Nielsen  
Assistant Professor  
Department of Microbiology, Medical School

Modern science often relies upon collaborative research spanning multiple disciplines. Given the wide breadth and depth of knowledge required in many research areas, it is difficult or even impossible for one scientist to have the necessary background. For example, the study of human-pathogen-environment interactions demands knowledge in medicine, chemistry, ecology, biology, mathematics, and statistics (among others). Scientists representing each of those individual domains can and do perform ground-breaking research, but the added knowledge and capabilities provided by creating an interdisciplinary team of experts in multiple domains can enable truly transformative outcomes.

Interdisciplinary teams facilitate, and indeed require, a sharing of ideas that can be exhilarating. Viewing one's own work through the lens of another's experience and expertise can stimulate lines of thinking that may not otherwise have been evident. Such collaborative research allow teams to study larger and broader significant research problems, while also providing opportunities for intellectual stimulation and excitement through exposure to new ideas.

Joseph Knight and Kirsten Nielsen received a Major International Research Grant from the Global Spotlight in 2009-2010.

Dr. Christine Bii collects a soil sample at a primary school in Nairobi to test for the prevalence of Cryptococcus. Dr. Bii is a research collaborator with Drs. Nielsen and Knight at the Kenya Medical Research Institute. Photo courtesy of Kirsten Nielsen.
Methane: A Sustainable Energy Resource in Rwanda?

Sergei Katsev
Associate Professor, Large Lakes Observatory

As a physicist and geochemist, Professor Katsev has a special interest in Lake Kivu. It is the only lake in the world where methane dissolved in the deep waters accumulates to concentrations that are high enough to make the extraction of the gas commercially viable. The 450-meter deep Lake Kivu is what scientists refer to as “meromictic” because its waters below 60 meters are permanently isolated from the atmosphere and remain devoid of oxygen.

The methane is produced by microbes in the lake from carbon dioxide, supplied through the lake bottom by a nearby volcano. It accumulates in the deep layers of the lake and is only slowly destroyed in a thin near-surface layer where it meets oxygen. This methane resource is being extracted and burned for electricity to satisfy the energy needs of Rwanda, and the currently modest rate of extraction is about to be expanded several fold.

Professor Katsev and his international group of colleagues are looking to characterize the physical, geochemical, biological, and geomicrobiological factors that control the methane cycle: its rates of production, vertical movement through the lake, and the reactions that destroy it. Lake Kivu is also unique in that, unlike most lakes that are colder at the bottom than at the surface, it is heated from the bottom by the volcano. The scientists closely monitor changes in its temperature and the rates of heat removal to the atmosphere. They find, in particular, that the surface of the lake is becoming warmer at a rate that matches the regional climate warming. Ultimately, this could affect the long-term stability of the lake and the accessibility of the methane stored there.
The 2009-2010 Global Spotlight grants supported 14 doctoral student research projects in 11 different countries—all in Africa, except one project conducted in Samoa and American Samoa. The grants supported students who were engaged in doctoral study at the University of Minnesota, and provided critical assistance at this early stage of their careers. The grants allowed students the opportunity to travel to the respective countries of their research, and to network with local university scholars, government officials, and community leaders. These in-country contacts were incredibly important to students in refining the conceptualization of their research and its implementation. The research projects generally included a combination of review of archival materials often not available outside of the host country, and the collection of quantitative and qualitative data.

The Global Spotlight funds provided the opportunity to live and learn in their country of research while engaging in scholarly activities. These activities included attending and presenting at professional conferences both in the United States and abroad, developing scholarly papers and other forms of research dissemination (e.g., videos or social media networks), and completing pre-dissertation and dissertation requirements. The Global Spotlight funds have helped graduate students to embark in pivotal field research that will continue to not only lay the foundation for their dissertation but also shape their careers.

**Doctoral Student Justin Schell films musician MC Manifest in Ghana as part of his doctoral dissertation, “We Rock Long Distance.” His research looks at how immigrant artists explore and collaborate across generations and geography through the music and musicians from previous generations and homelands.**
Megan Strauss has made annual visits to the Serengeti since 2008 monitoring the giraffe population and collecting data that includes a library of more than 890 giraffes, based on their unique coat markings. Megan’s passion for these gentle giants comes at a critical time, as the last decade has seen a 30 percent decrease in the giraffe population across Africa. This most recent trip, in addition to the accumulation of her prior trips research findings, will form the basis of her dissertation that will assess how Serengeti’s giraffe abundance has changed since the 1970s. It will also address how ecological and anthropogenic factors affect their population structure and ultimately maintain viable giraffe populations across Africa.

Conserving the Serengeti’s Towering Herbivores

Megan Strauss
Ph.D. candidate; Ecology, Evolution, and Behavior

Photo courtesy of Alexandra Swanson.
Global Spotlight Support of International Scholarly Initiatives 2009-2010

Students:
Research Grants & Event Co-Sponsorship

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Faculty:
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Photo courtesy of Christina Kwauk, Ph.D. candidate, CEHD. Front cover photos by (top) hdptcar, Flickr Creative Commons, and (bottom) Mkeranat, Wikimedia Commons.