ENVIRONMENTAL BIOTECHNOLOGY 7 (2) 2011, 47-49

American funding for environmental science 2012*

Delia Gallinaro

Delia Gallinaro, M.P.A., Director, Office of Research and Sponsored Programs, Sam Houston State University, P.O. Box 2448 Huntsville,Texas 77341-2448, U.S.A.
Voice: (936) 294-3760, Fax: (936) 294-3622, E-mail: RGS_DXG@SHSU.EDU

INTRODUCTION

Recent economic anxieties, felt both in the United States and around the world, are having an impact on research and development funding, causing scientists to worry about the long term support for their projects. Yet, the world is also seeing glitters of hope in the pursuit of science as a catalyst for change. The Arab Spring proved that "freedom of knowledge" has become a human right to pursue, just as health and safety, by millions of young, educated Arabs who want to use their education and knowledge to improve their societies. The world is also united in using science to solve longstanding social problems, such as resource management and sustainability. Furthermore, scientists are striving to understand climate change and its impact on humanity, creating a renaissance of innovation in new technologies.

FUNDING OPPORTUNITIES

Even though funding for research in green energy and technologies development are a focal point across Europe, in the United States, political pressure by the Republican party against the Democratic President and Senate have targeted these programs. As a result, the Environmental Protection Agency and the Department of Energy, both of which have research priorities in this area, have been slated for major research cuts. The justification for this action is that the agencies are obstacles to job creation because of government regulations imposed on businesses, especially for clean air and clean water. The American short-term debt ceiling deal reached on August 2, 2011 will eliminate almost $2.5 billion dollars from the $3.7 trillion budget in the next ten years. All federal agencies have been asked to trim 5-10% from their current budgets with some programs facing an additional cut perhaps to levels from 3 years ago. High profile facilities and nuclear-fusion programs, some national laboratories and "big science" projects involving high-energy physics research will be the biggest losers of research dollars. Other agencies that have been scrutinized for major cutbacks are the Department of Interior, which regulates energy exploration, NASA and the National Oceanic and Atmospheric Administration (NOAA).

Despite the budget cuts, the U.S. has $144.4 billion allocated to research and development in its budget. This amount does not include the funding from private sources such as large corporations. More than one half of this amount is allocated to the Department of Defense (DoD), which has grants for every category including health, environment, energy, and alternative/sustainable fuels. In fact, DoD recently announced a big alternative fuels research program that is on a fast-track for funding because the department wants to use bio fuels in ships, airplanes and trucks within the next five to eight years. This commitment consists also of $500 million to build new bio fuel refineries.

Other emerging research funding opportunities that are part of the national environmental sciences research dialogue stress job creation in energy development, manufacturing processes, electronic recycling, biotechnology and nanotechnology. Given the urgency the U.S. administration has for creating jobs, all these content areas are promising for funding new technology development that leads to innovative, cost-effective and sustainable solutions to social problems. As part of this greater investment, education, global competitiveness and infrastructure spending is juxtaposed with the science to create research priorities.

* Delia Gallinaro, MPA, has moderated the American Grant Funding in Environmental Science Educational Workshop, which constituted a part of The Third International Environmental Best Practices Conference, 13-16 September 2011, Offenburg, Germany

While basic research investments lag behind applied research, the National Institute of Health (NIH) and the National Science Foundation (NSF), both of which predominantly fund basic research and offer almost 100% of all federal environmental sciences basic research grants, have been cautiously optimistic that they will fare better with their budgets than other agencies. Both agencies are heavily promoting international research collaborations and are trying to create virtual communities of scientists around topic areas. NIH is initiating the development of a research platform that will be able to match scientists worldwide around research interests. In the same vein, NSF offers grants to create Research Coordination Networks. While NIH accepts foreign scientists as Principal Investigators (PI), NSF does not; the lead investigator has to be an American. Foreign researchers can be co-Principal Investigators or participate in the project in any other capacity. NSF has established points of contact around the world for foreign scientists wishing to collaborate with American scientists. In Europe, the NSF office is located in Paris and representatives provide assistance and information to any single or group of researchers in Europe interested in collaborating with American universities. The contact information can be found at: http://www.nsf.gov/od/oise/europe/nsf-europe-ofc.jsp.

American grants are offered for: a) scientific research; these are to support investigations aimed at discovery of facts, of accepted theories, or application of new or revised theories, b) demonstration grants; these are to establish the feasibility of a particular theory or approach, c) research and development; these are to investigate feasibility of an idea or technology directly tied to a problem, d) training grants; these are to promote workforce development in a specific area, e) planning/workshop/travel; these grants are offered to bring collaborators together to discuss a project, and f) education; these grants are to develop curricula, e-learning or other activities promoting special groups.

Both NSF and NIH fund grants in all of these categories with education as a vital component of each grant. Educational activities are primarily focused on providing undergraduate research opportunities that are included in the grant-funded research activities. American and foreign college students can be involved in research in respective partner institutions. However, foreign participants in all American funded grants are required to follow the same compliance standards as American institutions, such as Responsible Conduct in Research training for students and PIs, administrative oversight for costs, and time and effort reporting on grant activities. A foreign researcher, along with his/her institution will need to negotiate with the agency and the American collaborative partner how funds will be transferred, either through a fee for service contract, cooperative agreement or some other type of legal document. Foreign researchers can also be paid as consultants on a project, if they elect to do so, and this method is actually preferred by many American universities for their collaborative research abroad. Finally, although international collaborators can participate fully as partners in federal grants, they are required to fulfill all agency-mandated reporting for the project.

IDENTIFYING GRANT FUNDING OPPORTUNITIES

There are several ways to identify individual American grant funding opportunities. One is a paid subscription to the Community of Science (COS). This database of more than 25,000 grants is widely used by American colleges and universities. The most updated version includes profiles of scholars around the world and will enable searches to be conducted around keyword or content areas. Foreign scientists can visit the website www.cos.com and send an email under the "contact" button at the bottom of the page for a European contact representative.

A second method to identify specific grants is by visiting any American agency website and signing up for free email alerts. For example, NSF's Directorate of Environmental Research and Education (ERE) main page is: http://www.nsf.gov/dir/index.jsp?org=ERE, on the top right hand side of the page is a sign up for all email alerts pertaining to this Directorate, emails for funding opportunities or following them on Twitter. There are many Funding Opportunities for this Directorate divided into Program areas: (a) Bio complexity in the Environment, (b) Infrastructure/ Technical Capacity, (c) Coupled Bio/Physical Systems, (d) Environmental Education and Workforce, (e) Coupled Human/Natural Systems, and (f) People and Technology. All funding is organized by name and due date at: http://www.nsf.gov/funding/pgm_list.jsp?org=ERE&ord=date. All descriptions of past and current awards descriptions can be found by using text search criteria at: http://www.nsf.gov/awardsearch/tab.do?dispatch=3. Reviewing past awards is a good way to identify American institutions and scientists working in the same field as foreign researchers' interests.

NIH's Fogarty International Center is specifically aimed at inviting foreign scientists to work within NIH's research areas. The web site is: http://www.fic.nih.gov/Pages/Default.aspx and on the right hand side of the home page is the email sign up as well as specific information on funding opportunities. The bottom of the home page details all the various programs by subject area or relevance available to foreign researchers. The agency will help with all aspects of traveling to the U.S. including obtaining visas and all required documentation. NIH's Environmental Health grants can be found at: http://www.niehs.nih.gov/ and scientists from outside the U.S. can propose research projects as Principal Investigators. Both NSF and NIH fund planning visits and workshops or conferences that support early phases of developing and coordinating research and/or education activities with foreign partners.

In order to identify Environmental Science scholars involved in similar research worldwide, scientists can use Web of Science, Elsevier, Climate and Hydrology Database

projects (CLIMDB) and Journal Storage (JSTOR). Typically these subscriptions are offered through university libraries as reference databases. The Organization for Economic Co-operation and Development (OECD), based in Paris, also offers working papers on global scientific topics. Its website offers much information and can be found at: http://www.oecd.org/home/0,2987,en_2649_201185_1_1_1_1_1,00.html.

Similarly, the American Association for the Advancement of Science (AAAS), with foreign corresponding members through its Consortium of Affiliates for International Programs (CAIP), offers collaborative opportunities. The web site is: www.aaas.org/programs/. It is the world's largest general scientific society with offices and representatives worldwide.

EXAMPLES OF GRANT FUNDING PROGRAMS IN ENVIRONMENTAL SCIENCE

(A) The Department of Energy's Office of Science

(1) Plants Engineered to Replace Oil (PETRO) this program is meant to develop new technologies that will lead to low-cost production of bio fuels;
(2) High Energy Advanced Thermal Storage (HEATS) this programs emphasize three main areas: (a) high-temperature storage systems to deliver solar electricity more efficiently around the clock; (b) fuel produced from the sun's heat and (c) HVAC systems that use thermal storage to improve the driving range of electric vehicles by up to 40%;
(3) Rare Earth Alternatives in Critical Technologies (REACT) this program funds early stage technology alternatives that reduce or eliminate the dependence of naturally occurring minerals with unique magnetic properties (rare earth materials) in electric vehicle motors and wind generators;
(4) Green Electricity Network Integration (GEN) this program funds innovative control software or high voltage hardware to control electric grid for (a) wind/solar power or (b) increased flow efficiency through existing network of transmission lines;
(5) Solar Agile Delivery of Electrical Power Technology (Solar ADEPT) this program aims to develop utility scale solar systems at roughly 6 cents per kilowatt hour by the end of the decade. The program will invest in magnetic, semiconductor switches and charge storage that can make solar panels extract more energy efficiently.

(B) Environmental Protection Agency (EPA)

EPA has prioritized research in Endocrine Disrupting Chemicals (EDC) influencing endocrine systems of people, fish and wildlife. Web site containing list of upcoming grants can be found at: http://www.epa.gov/ncer/rfa/.

(C) National Science Foundation (NSF)

NSF has an Office of International Science and Engineering (OISE) in which country-specific grant information can be obtained. This office manages international funding opportunities, which are prioritized as:
(1) International Collaboration in Chemistry between US Investigators and their counterparts Abroad (ICC); contact: Dr. Zeev Rosenzweig; zrosenzw@nsf.gov;
(2) Partnerships for International Research and Education (PIRE); contact: PIRE-info@nsf.gov;
(3) Materials World Network: Cooperative Activity in Materials Research between US Investigators and their Counterparts Abroad (MWN); contact: Michael J. Scott; mjscott@nsf.gov.

CONCLUSION

In conclusion, it is recommended that the reader investigate the information available in all the web sites cited to identify appropriate programs and contact information that may be suitable to pursue. Additionally, it is important to be informed about current scientific developments world-wide and the author wishes to highly recommend signing up for free email alerts in specific content areas through NSF and/or NIH. Spend some time also navigating the NSF web site to read Abstracts of awarded NSF grants, which will offer insight about the project activities, management and organization of the proposals. Finally, be an advocate at your university for subscribing to grant funding databases that will cost a minimal fee but will pay for itself in the long run.