

## **Newly Funded Projects**

### **An Earth Institute Program for Environmental Measurements in Development**

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People prefer cleaner, safer environments. Why then do so many people drink contaminated water, breathe polluted air, and use dangerous chemicals, even when protective measures are available and inexpensive? This project is based on the hypothesis that they do so -- in some situations at least -- because they lack access to salient, credible information about their environment. Many important environmental variables can now be measured in the field with off-the-shelf materials. Interpreting the results, however, requires expert judgment. Fortunately, the recent explosion in mobile telecommunications opens new avenues for communicating results gathered in the field by local populations. The purpose of the new program will be to marry existing chemical and biological kits with mobile phone communication to help people in remote, under-served places monitor environmental quality and thus make better decisions about environmental health risks. Activities supported by the program over two years include pilot projects in Peru and Ghana involving students and faculty that are intended to set the stage for proposals to larger-scale funding agencies.

### **Integrating Urban-Rural Mapping and Cardiovascular Disease Epidemic Modeling: Urbanization and the future epidemic of cardiovascular disease in China**

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*Andrew Moran*, Assistant Professor, Department of Medicine, Columbia University College of Physicians and Surgeons

China, the most populous country in the world, is rapidly urbanizing. By 2030, 60% of Chinese will live in cities. Many in China have an improved standard of living and life expectancy, but rapid change has resulted in certain adverse effects on health in China: tobacco use remains high, and overweight, hypertension, dyslipidemia, diabetes, and physical inactivity are accelerating in prevalence. Cardiovascular disease (CVD) risk factors are associated with urbanization in developing nations, and prevention efforts-e.g., enacting legislation to mandate smoke-free environments and minimize dietary salt and fats in prepared foods, or designing public spaces to promote physical activity-may be easier to implement in urban areas. The Cardiovascular Disease Policy Model-China is a computer predictive model developed at Columbia University that can be used to assess the effectiveness and cost-efficiency of targeting CVD prevention efforts to urban areas in China. This project proposes to develop the multi-disciplinary capacity to integrate CVD risk factor data from national epidemiologic surveys, a national CVD computer policy model, GIS data, demographic models of urbanization, and econometric forecasting in order to model cost-effective CVD health policy decisions in China.

## **Established Projects**

### **Epi-Meteorology - Towards a new discipline in the service of global public health**

*Madeleine Thomson*, Senior Research Scientist, International Research Institute for Climate and Society, The Earth Institute

*Patrick Kinney*, Associate Professor, Department of Environmental Health Sciences, Mailman School of Public Health

The overall goal of this project is to create and set in motion a new interdisciplinary teaching and research discipline at Columbia focused on the complex influences of climate on human health at the population level. This project addresses a critical gap in the interface of health and climate science and practice – with a strong focus on developing countries. It aims to develop a process whereby the Earth Institute makes a major contribution to addressing a current disciplinary gap – that of epi-meteorology. Whereas the field of bio-meteorology is chiefly concerned with physiological responses of human and biological systems to meteorological parameters, the new discipline of epi-meteorology will link the tools of epidemiology with those of climate science to study interactions between climatic factors and human health at regional and population scales. Our aim is explicitly to address the data, methodologies, analysis and research required to create tools of direct relevance to the public health sector for dealing with climate-sensitive health issues in the context of current climatology, climate variability and climate change.

### **Building a scientific community around environment-security linkages**

*Marc Levy*, Deputy Director, Center for International Earth Science Information Network, The Earth Institute

There is a clear, growing awareness among Columbia University faculty and students regarding the linkages connecting climate change, resource degradation and scarcity, poverty, habitat loss, and conflict. This interest is mirrored in high-level scholarly and policy deliberations in the world at large concerning such linkages. However, there is little coordination across disciplines at Columbia on this matter. This project aims to foster the nascent scientific community at Columbia around the issue of environment-security linkages, in order to promote more creative interdisciplinary research, to provide a mechanism to meet the growing demand for policy advice, and to open up new educational opportunities on this topic. The specific activities include the (1) creation of an interdisciplinary geospatial database integrating data on conflict, climate, natural resources, and biodiversity, (2) formation of a cross-unit working group on environment and security linkages, and (3) holding a seminar series on environment-conflict linkages.

## **Institution-Building Activities**

### **Development of an Interdisciplinary Center on Water and Sustainable Development**

*Upmanu Lall*, Director, Columbia Water Center, The Earth Institute, and Alan and Carol Silberstein Professor, Department of Earth and Environmental Engineering and Department of Civil Engineering and Engineering Mechanics

This project addressed an issue that is central to the mission of the Earth Institute: water and its relationship to sustainable development. The project team proposed to establish, over ten months, an interdisciplinary center on Water and Sustainable Development and thus bring to fruition an idea that has been under discussion within the Water Cross-Cutting Initiative for some time. This initiative sought a unifying approach to sustainable development through improved access to water and sanitation, human and ecological health, resilience to hydrologic hazards, and resource allocation in a competitive environment. Cross-disciplinary research, technology development, and global partnerships for research, training, advising and implementation support will enable the Center to become the leading global resource to identify and address current and emerging water constraints on development in the 21<sup>st</sup> century. From this project emerged the Columbia Water Center.

### **A Colloquium on Carbon Regulation and the Diffusion of Low-Carbon Technology**

*Klaus Lackner*, Director, Lenfest Center for Sustainable Energy, The Earth Institute, and Maurice Ewing and J. Lamar Worzel Professor of Geophysics, Department of Earth and Environmental Engineering

The Lenfest Center for Sustainable Energy convened a colloquium on carbon regulation and the diffusion of low-carbon energy technologies. The colloquium, designed to cut across existing research programs within Columbia University, had three objectives: to increase research on carbon policy, to build institutional capacity at Columbia University on carbon regulation, and to identify consensus within Columbia University on issues related to international and U.S. carbon policy. The Center brought together researchers from across Columbia who are working on the issue in relative isolation and aimed to spur new research projects and collaborations. In order to foster intellectual discourse, the series was held bi-weekly with discussions on climate change regulation.