

COLUMBIA UNIVERSITY RECEIVES \$16.9 MILLION AWARD FROM NATIONAL INSTITUTE OF ENVIRONMENTAL HEALTH SCIENCES TO STUDY ORIGIN AND HEALTH EFFECTS OF ARSENIC IN GROUND WATER

Researchers from the Mailman School of Public Health, Lamont-Doherty and CIESIN to contribute to continued and growing efforts in the U.S. and South Asia

July 26, 2006 --Researchers at Columbia University's Mailman School of Public Health, Lamont-Doherty Earth Observatory and Center for International Earth Science Information Network announced that they have been awarded a five-year, \$16.9 million grant renewal from the National Institute of Environmental Health Sciences (NIEHS) Superfund Basic Research Program (SBRP). The grant will fund ongoing investigations into the health effects and geochemistry of arsenic and manganese exposure, particularly in groundwater of New England and South Asia.

Building upon Columbia University's SBRP research progress over the past six years (<http://superfund.ciesin.columbia.edu/>) in conjunction with a previous, \$11 million award, the highly competitive grant renewal will enable this multi-disciplinary team of scientists to conduct research concerning anthropogenic and naturally occurring sources of human exposure to arsenic and manganese in New York, New Jersey, New Hampshire, and Maine. The award also allows for a continuation of the group's landmark work in Bangladesh, where tens of millions of people have been chronically exposed to naturally occurring arsenic in drinking water. Although arsenic is an environmental carcinogen that affects millions of people worldwide, at high levels such as those found in Bangladesh it is also associated with a constellation of other adverse health effects, including diseases of the cardiovascular, pulmonary, endocrine, and nervous systems.

According to the team's researchers, arsenic contamination of groundwater and soils is associated with serious and widespread public health, mitigation, and environmental policy problems. "Arsenic contamination of groundwater has been documented in nearly 20 countries, including the U.S. as the result of either natural geologic processes or from

mining, industrial and agricultural activities,” said Joseph Graziano, professor of Environmental Health Sciences and director of the Columbia Superfund program. “Because exposure to arsenic in drinking water has been associated with the development of skin, bladder, kidney and lung cancers as well as non-carcinogenic effects such as diabetes, peripheral neuropathy and cardiovascular diseases, public health intervention strategies to reduce arsenic exposure are critical.”

The latest Superfund grant also includes a component studying the effects of environmental arsenic on children’s health. While exposure to arsenic has long been known to have neurological consequences in the occupational setting, to date there have been limited well-controlled studies of children or of the potential effects of chronic exposure to arsenic in groundwater used for drinking and cooking.

Since the early 1990s, when the epidemic of arsenic poisoning began to emerge in Bangladesh, India, and other countries in South Asia, it has been estimated that as many as 100 million people worldwide regularly drink or cook with well water with arsenic concentrations greater than 10 micrograms per liter ($\mu\text{g/L}$) or 10 parts per billion (ppb), the World Health Organization’s maximum exposure level. Until the early 1970s, people in Bangladesh generally did not drink well water, but rather relied on microbially-contaminated surface water, which caused a host of infectious diseases, particularly fatal diarrheal diseases in young children. Ironically, the arsenic crisis arose as a result of the well-intentioned efforts of non-governmental organizations, which installed millions of tube wells throughout the country in an attempt to shift communities away from the consumption of microbially-contaminated surface water, not realizing that the ground water was naturally enriched with arsenic. “I am delighted that we have been given the opportunity to continue our efforts to link our growing understanding of the fundamental mechanisms of arsenic release to groundwater with more effective mitigation in the U.S. and in Bangladesh,” said Alexander van Geen, Doherty Senior Research Scientist at Lamont-Doherty and associate director of the Columbia Superfund program.

Additional investigators from the Mailman School of Public Health include Habibul Ahsan, associate professor of Epidemiology; Tom Hei, professor of Environmental Health Sciences; and Mary Gamble, assistant professor of Environmental Health Sciences. Lamont-Doherty contributions to this multi-disciplinary initiative also include adjunct associate research scientist Yan Zheng, also professor of environmental sciences at Queens College - CUNY; Steven Chillrud, Doherty Research Scientist; adjunct research scientist Martin Stute, also professor of environmental sciences at Barnard College; and H. James Simpson, professor of Earth and Environmental Sciences at Columbia. Meredith Golden, senior staff associate at the Center for International Earth Science Information Network (CIESIN), will help direct the group's research translation and geospatial visualization endeavors.

About the Mailman School of Public Health

The only accredited school of public health in New York City, and among the first in the nation Columbia University's Mailman School of Public Health provides instruction and research opportunities to more than 950 graduate students in pursuit of masters and doctoral degrees. Its students and more than 270 multi-disciplinary faculty engage in research and service in the city, nation, and around the world, concentrating on biostatistics, environmental health sciences, epidemiology, health policy and management, population and family health, and sociomedical sciences.

www.mailman.hs.columbia.edu.

About the Lamont-Doherty Earth Observatory

The Lamont-Doherty Earth Observatory, a member of The Earth Institute at Columbia University, is one of the world's leading research centers seeking fundamental knowledge about the origin, evolution and future of the natural world. More than 300 research scientists study the planet from its deepest interior to the outer reaches of its atmosphere, on every continent and in every ocean. From global climate change to earthquakes, volcanoes, nonrenewable resources, environmental hazards and beyond, Observatory scientists provide a rational basis for the difficult choices facing humankind in the planet's stewardship. For more information, visit <http://www.ldeo.columbia.edu/>.

About the Center for International Earth Science Information Network

The Center for International Earth Science Information Network (CIESIN), a member of the Earth Institute at Columbia University, works at the intersection of the social, natural, and information sciences. Scientists at CIESIN specialize in online data and information

management, spatial data integration and training, and interdisciplinary research related to human interactions in the environment. CIESIN researchers seek to provide data that informs scientific, public and private decision-makers worldwide. For more information, visit <http://www.ciesin.columbia.edu/>.