NATIONAL INSTITUTES OF HEALTH
THE NATIONAL LIBRARY OF MEDICINE

ENVIRONMENTAL HEALTH
INFORMATION PARTNERSHIP

PROCEEDINGS

National Library of Medicine
Bethesda, Maryland
March 25–26, 2010

Climate Change and Human Health

Prepared for
Division of Specialized Information Services
National Library of Medicine

Prepared by
Health Promotion and Outreach Group
Oak Ridge Institute for Science and Education

This document was prepared for the **Division of Specialized Information Services, National Library of Medicine, National Institutes of Health** by the Oak Ridge Institute for Science and Education (ORISE) through an interagency agreement with the U.S. Department of Energy (DOE). ORISE is managed by Oak Ridge Associated Universities under DOE contract number DE-AC05-06OR23100.

ORISE is a U.S. Department of Energy institute focusing on scientific initiatives to research health risks from occupational hazards, assess environmental cleanup, respond to radiation medical emergencies, support national security and emergency preparedness, and educate the next generation of scientists.

History of the National Library of Medicine

The National Library of Medicine (NLM) was established in 1836 as the library of the Army Surgeon General's Office. The Armed Forces Institute of Pathology and its Medical Museum were founded in 1862 as the Army Medical Museum. Throughout their history, the Army Medical Library and the Army Medical Museum often shared quarters. From 1866 to 1887, they were housed in Ford's Theatre, located in Washington, DC, following the assassination of President Abraham Lincoln in 1865.

In 1956, the Library collection was transferred from the control of the Department of Defense to the Public Health Service of the Department of Health, Education and Welfare and renamed the "National Library of Medicine." The Library moved to its current quarters in Bethesda, Maryland, on the campus of the National Institutes of Health (NIH) in 1962.

The NIH is the world's leader in medical research. Comprised of 27 separate institutes and centers, NIH is the primary federal agency for conducting and supporting medical research, and it provides leadership and financial support to top scientists in every state in the nation and throughout the world.

The Library makes available a wide variety of health and medical information to professionals in the health sciences and researchers in academia, industry and other institutes. Abstracts and full texts from 5,200 journals, complete genome sequences for hundreds of species, including humankind, and registries for more than 87,000 clinical trials are all published online.

For the health care consumer, NLM makes available, on its Web site http://medlineplus.gov/, the most accurate, up-to-date information on 800 health topics regarding conditions, diseases, and wellness as well as providing a database of drug information and adverse drug reactions. Currently, the Web site receives more than one billion hits per year from some 194 countries.

The Division of Specialized Information Services (SIS, http://sis.nlm.nih.gov/), NLM, creates information resources and services in toxicology, environmental health, chemistry, disaster preparedness, and HIV/AIDS. The Office of Outreach and Special Populations (OOSP, http://sis.nlm.nih.gov/outreach.html) manages and develops programs in an effort to eliminate disparities in accessing health information by providing community outreach support, training health professionals to use NLM health information databases, and designing special population Web sites that address health information in underserved and special populations.

As the world's largest biomedical library, NLM coordinates the activities of eight regional medical libraries and approximately 6,000 libraries and information centers across the country to provide both specialized and general information in all aspects of the biomedical and medical sciences.

For more information see http://www.nlm.nih.gov/services/nlmhistory.html.

CONTENTS

NATIONAL LIBRARY OF MEDICINE
ENVIRONMENTAL HEALTH INFORMATION PARTNERSHIP MEETING
Board of Regents Room
Mezzanine, Building 38
March 25–26, 2010
Henry Lewis, III, PharmD, Presiding

AGENDA

Thursday—March 25, 2010

1:00 p.m. – 1:15 p.m.	**Meeting Opening and Welcome** Henry Lewis, III, PharmD Chairman, EnHIP
1:15 p.m. – 1:20 p.m.	**Remarks** Donald A.B. Lindberg, MD Director, NLM
1:20 p.m. – 1:30 p.m.	**Introductions** Henry Lewis, III, PharmD Chairman, EnHIP
1:30 p.m. – 2:30 p.m.	**Climate Change: Update on Science** Ralph J. Cicerone, PhD President, National Academy of Sciences
2:30 p.m. – 3:15 p.m.	**Emerging Vibrios in the Climate Change Paradigm** Robert H. Hall, PhD Enteric and Hepatic Diseases Program Officer National Institute of Allergy and Infectious Diseases
3:15 p.m. – 3:30 p.m.	BREAK
3:30 p.m. – 4:30 p.m.	**Climate Change and Health: Identifying and Protecting Vulnerable Populations** John Balbus, MD, MPH Senior Advisor for Public Health National Institute of Environmental Health Sciences
4:30 p.m. – 5:00 p.m.	**Wrap-Up and Day 2 Overview** Henry Lewis, III, PharmD Chairman, EnHIP
6:00 p.m. – 7:30 p.m.	**Evening Session at Hyatt Hotel**

NATIONAL LIBRARY OF MEDICINE
ENVIRONMENTAL HEALTH INFORMATION PARTNERSHIP MEETING

AGENDA

Friday—March 26, 2010
National Library of Medicine: Board of Regents Room

8:30 a.m. – 8:45 a.m.	Registration and Continental Breakfast
8:45 a.m. – 9:00 a.m.	**Welcome and Introductions** Henry Lewis III, PharmD Chairman, EnHIP
9:00 a.m. – 10:00 a.m.	**Update on the EnHIP Strategic Plan** Henry Lewis III, PharmD
10:00 a.m. – 10:30 a.m.	**Discussion on the EnHIP Outreach Awards** Facilitated by Gale Dutcher, MS, MLS Deputy Associate Director, SIS
10:30 a.m. – 10:45 a.m.	BREAK
10:45a.m. – 11:15 a.m.	**Remote Sensing, Climate Change, and Health** Nancy G. Maynard, PhD Senior Research Scientist NASA Tribal College and University Project Manager NASA Goddard Space Flight Center
11:15a.m. – 11:40 a.m.	**Update on Climate Change as Related to Alaska Natives and American Indians and Presentation of Book to Dr. Lindberg** Daniel Wildcat, PhD Haskell Indian Nations University
11:40 a.m. – 12:00 Noon	**EnHIP Schools Researching Climate Change** Facilitated by Judith Mazique, JD, MPH Texas Southern University ▪ Paul B. Tchounwou, ScD, MSPH, MSc, *Jackson State University* ▪ Diógenes Herreño-Sáenz, PhD, *University of Puerto Rico, Medical Sciences Campus* ▪ Arlene Montgomery, PhD, RN, *Hampton University*
12:00 Noon – 1:15 p.m.	**Lunch: NLMs Role and Perspective on Climate Change** Sally E. Howe, PhD Research Associate to Director, NLM
1:15 p.m. – 1:30 p.m.	**EnHIP Group Picture** Michael Spencer, Photographer, NIH Front Steps of NLM or HMD Reading Room, Building 38

NATIONAL LIBRARY OF MEDICINE
ENVIRONMENTAL HEALTH INFORMATION PARTNERSHIP MEETING

AGENDA

Friday—March 26, 2010
National Library of Medicine: Board of Regents Room

1:30 p.m. – 3:00 p.m.	**The EnHIP Outreach Awards Project Presentations** ▪ Doris Withers, EdD, *Medgar Evers College, CUNY* ▪ Milton Morris, MPH, DAAS, CFSP, *Benedict College* ▪ Marnie Carroll, *Diné College* ▪ Diógenes Herreño-Sáenz, PhD, *University of Puerto Rico, Medical Sciences Campus* ▪ Robert Copeland, Jr., PhD, *Howard University*
3:00 p.m. – 3:10 p.m.	BREAK
3:10 p.m. – 3:45 p.m.	**Disaster Preparation and Pharmaceutical Services** Lt. Col. (Retired) Jasper Watkins, III Chief, Bureau Statewide Pharmaceutical Services Florida Department of Health
3:45 p.m. – 4:15p.m.	**Climate Change Summary** Henry Lewis, III, PharmD Chairman, EnHIP
4:15 p.m. – 4:30 p.m.	**Closing Remarks** Henry Lewis, III, PharmD Chairman, EnHIP

CLIMATE CHANGE AND HUMAN HEALTH

DEPARTMENT OF HEALTH AND HUMAN SERVICES

NATIONAL INSTITUTES OF HEALTH
NATIONAL LIBRARY OF MEDICINE

PROCEEDINGS OF THE ENVIRONMENTAL HEALTH INFORMATION PARTNERSHIP (EnHIP) MEETING
March 25–26, 2010

The Environmental Health Information Partnership (EnHIP) convened for its first session on March 25, 2010, at 1:00 p.m. in the National Library of Medicine (NLM) Board of Regents Room, National Institutes of Health, Bethesda, Maryland. The theme of the meeting was "Climate Change and Human Health." The evening session meeting continued at 6:00 p.m. in the Haverford Room, Hyatt Regency Bethesda Hotel. The program topics were NLM outreach in Africa and NLMs use of social media for outreach. Representatives convened again March 26, 2010, at 8:30 a.m. in the Board of Regents Room until adjournment at 4:30 p.m. Dr. Henry Lewis, III, Dean, College of Pharmacy and Pharmaceutical Sciences, Florida A&M University, and EnHIP Chairman, presided.

ATTENDEES

Representatives from Participating Institutions

Dr. Bruce Allen, Jr., Charles Drew University of Medicine and Science
Dr. Ann Barbre, Xavier University of Louisiana
Dr. Robert Copeland, Jr., Howard University
Dr. Joao Ferriera-Pinto, The University of Texas at El Paso (Alternate)
Ms. Cynthia Henderson, Morehouse School of Medicine
Dr. Diógenes Herreño-Sáenz, University of Puerto Rico Medical Sciences Campus
Dr. Doris Holeman, Tuskegee University
Dr. Henry Lewis, III, Florida A&M University
Ms. Benita Litson, Diné College (Alternate)
Dr. Melissa Littlefield, Morgan State University (Alternate)
Dr. Patricia Matthews-Juarez, Meharry Medical College
Dr. Judith Mazique, Texas Southern University
Dr. Arlene Montgomery, Hampton University
Dr. Milton Morris, Benedict College
Ms. Joan Nelson, Oglala Lakota College
Dr. Paul B. Tchounwou, Jackson State University
Dr. Daniel Wildcat, Haskell Indian Nations University
Dr. Doris Withers, Medgar Evers College

Consultants to the EnHIP

Mr. John Scott, Center for Public Service Communications
Dr. Melvin L. Spann, NLM, Retired (EnHIP Executive Secretary)
Dr. Bailus Walker, Howard University (Senior Scientific Advisor)

Speakers
Dr. John Balbus, National Institute of Environmental Health Sciences, NIH
Ms. Marnie Carroll, Diné College
Dr. Ralph J. Cicerone, National Academy of Sciences
Dr. Robert H. Hall, National Institute of Allergy and Infectious Diseases, NIH
Dr. Sally E. Howe, National Library of Medicine
Dr. Nancy G. Maynard, National Aeronautics and Space Administration (NASA)
Ms. Melanie A. Modlin, National Library of Medicine
Ms. Julia Royall, Office of the Director, NLM
Lt. Col. (Retired) Jasper Watkins, III, Florida Department of Health
Dr. Daniel Wildcat, Haskell Indian Nations University

Invited Guests
Mr. Jesse Burnett, Office of the Director, EEO, NIH
Ms. Joy Van Cooten, Office of the Director, NIH
Dr. Shelia McClure, NIH
Mr. George Franklin, Office of the Director, NLM
Mr. David Nash, Office of the Director, NLM
Mr. Bryant Pegram, Office of the Director, NLM
Mrs. Susan Phillips, Esquire

NLM Staff
Dr. Donald A.B. Lindberg, Director, NLM
Ms. Betsy Humphreys, Deputy Director, NLM
Dr. Milton Corn, Office of the Director, NLM
Mr. Elliott Siegel, Office of the Director, NLM
Mr. Frederick Wood, Office of the Director, NLM
Dr. Steven Phillips, Division of Specialized Information Services, NLM
Ms. Gale Dutcher, Division of Specialized Information Services, NLM
Ms. Cynthia Gaines, Division of Specialized Information Services, NLM
Ms. Cassandra Allen, Division of Specialized Information Services, NLM
Ms. Stacey Arnesen, Division of Specialized Information Services, NLM
Ms. Laura Bartlett, Division of Specialized Information Services, NLM
Ms. Cynthia Burke, Library Operations, NLM
Ms. Florence Chang, Division of Specialized Information Services, NLM
Mr. James Charuhas, Division of Specialized Information Services, NLM
Dr. Alla Keselman, Division of Specialized Information Services, NLM
Ms. Gale Lucase, Division of Specialized Information Services, NLM
Ms. Jamie Peacock, Division of Specialized Information Services, NLM
Ms. Rose White, Division of Specialized Information Services, NLM

ORISE Staff
Ms. Rose Foster, Oak Ridge Institute for Science and Education
Ms. Linda Lange, Oak Ridge Institute for Science and Education
Ms. LaFrancis McMurray, Oak Ridge Institute for Science and Education

I. Meeting Opening and Welcome

Dr. Henry Lewis, III, Dean, College of Pharmacy and Pharmaceutical Sciences, Florida A&M University, and EnHIP Chairman, opened the meeting on March 25, 2010, at 1:00 p.m. in the National Library of Medicine (NLM) Board of Regents Room, National Institutes of Health, Bethesda, Maryland. He welcomed the attendees and introduced the invited guests. He summarized the presentations and activities planned for the two-day meeting.

Dr. Lewis reviewed the history of the EnHIP. The Partnership is a collaboration involving NLM and 21 Historically Black Colleges and Universities, Hispanic-Serving Institutions, Tribal Colleges and Universities, and Alaska Native-Serving Institutions. EnHIP evolved from the Toxicology Information Outreach Program (TIOP), which was established in 1991 in response to the pressing issue of toxic waste and the exposure to toxic chemicals in minority communities. The mission of EnHIP is to enhance the capacity of minority-serving academic institutions to reduce health disparities through the access, use, and delivery of environmental health information on their campuses and in their surrounding communities.

Dr. Lewis thanked the EnHIP Executive Committee for its vision and leadership in selecting outstanding program speakers. The theme, Climate Change and Human Health, has been regarded as a very relevant topic in connection to NLM and EnHIP missions.

II. Remarks

Dr. Donald A.B. Lindberg, Director, National Library of Medicine, recognized the Partnership's achievements. He noted the importance and timeliness of the theme. He acknowledged the distinguished honor to have Dr. Ralph J. Cicerone, President, National Academy of Sciences, speak at the EnHIP meeting.

III. Climate Change: Update on Science

Dr. Ralph J. Cicerone, President, National Academy of Sciences, and Chair, National Research Council, emphasized the forcefulness of scientific research related to climate change. He shapes science and environmental policy at the highest levels nationally and internationally, and he engages in extensive research in atmospheric chemistry, energy, and climate change.

Dr. Cicerone presented data on changes of temperatures of air and water, of ice amounts, and of sea level. Maps and graphs translated voluminous research acquired from international scientific institutions. Dr. Cicerone summarized the massive findings and stated that the enhanced greenhouse effect is caused by what humans are putting into the global atmosphere.

Measurements of ocean heat content show substantial change. Citing a report by the Levitus Group (2009) on the reliability of collected data, Dr. Cicerone indicated the research confirms that the previously calculated trends are based on solid science.

New data available through earth-orbiting satellites with radar altimetry show that the rate of sea level rise has more than doubled in recent years. "Where is the sea level rise coming from? Six or eight years ago,

when we were dealing with a smaller number, people were thinking maybe the rise can be explained by the expansion of sea water due to the warming. Although water is mostly incompressible; if you heat it and cool it, it does expand and shrink. But now what is becoming clear is that some of the sea level rise is due to the loss of ice from Greenland and Antarctica and inland continental glaciers, as well as the thermal expansion of sea water," he explained.

Turning the discussion to the greenhouse effect, Dr. Cicerone said evidence indicates very clearly that the carbon dioxide increase is due to fossil-fuel burning with a small component due to deforestation in the tropics. Human activity is amplifying the greenhouse effect.

He explained how scientists searched for older carbon dioxide measurements in ice cores. They found that some of the ice samples from Antarctica and Greenland dated back 450,000 years. They have identified previous ice ages and warm periods and determined that carbon dioxide amounts were much lower than what the atmosphere holds today.

Dr. Cicerone reviewed other possible explanations for the warming of the earth, warming of the ocean, and loss of ice. Recent advances in accurate measurement show that the sun's output is not increasing. Instead, it is oscillating. He noted the greenhouse gases' impact on the earth's energy budget is increasing, not oscillating.

The U.S. Department of Energy foresees growth of total world energy usage coming primarily from developing countries in the next 20 years. "One of the real clashes—points of disagreement—is who should take responsibility for holding down the future emissions of carbon dioxide. Should it be the rich countries that put most of the carbon dioxide in the air so far? Or should the blame also be spread to the countries that are increasing their usage so much? For example, China became the world's biggest carbon dioxide emitter in the year 2006–2007, even bigger than the United States. They do not want to take the blame for that. In fact, they tell us, 'We are doing all the manufacturing for you. You do not manufacture anything. We are doing all the heavy lifting.' So this gives rise to a lot of disagreements," Dr. Cicerone said. Forecasts of total world energy usage made by the Energy Information Administration a few years ago need constant revision because of gross underestimates.

An accelerated rate of climate change causes difficulties for human society and natural systems. He recalled the 2003 record heat wave that swept across Western Europe. French public health authorities indicated that 12,000 extra deaths in July showed evidence of links to the heat wave. "At the time, it was thought to be a one in 300- or 400-year event. But the odds are changing now because of underlying warming. In fact, if you go forward about 30–40 years, you get to a time when the heat wave average July temperature is going to be around a one-in-two-year event," Dr. Cicerone explained.

In closing, Dr. Cicerone stressed the primary concerns related to irreversible changes, such as biodiversity loss, large ice losses, and sea level rise. The challenges are to mitigate or reduce the pace and amount of climate change caused by humans and to adapt or reduce impacts on human well-being from climate changes once they occur.

Dr. Cicerone's presentation was well received and led to an extended question-and-answer session. He was asked about political polarization, fuel dependency, utility companies, communication issues, and science education in schools. Dr. Lewis indicated that the program set the tone for the EnHIP meeting, and he challenged members to take Dr. Cicerone's message to their own communities and educate residents about the health aspects associated with climate change.

IV. Emerging Vibrios in the Climate Change Paradigm

Dr. Robert H. Hall, Enteric and Hepatic Diseases Program Officer, National Institute of Allergy and Infectious Diseases, introduced the topic of infectious diseases. He explained that the world's scientists and doctors know an enormous amount about how to control, prevent, and cure infectious diseases.

Climate change adds a layer of complexity, he observed. The major challenge is to continually update and implement public health measures that have proven useful in the past and bring them up to speed with modern realities. Since infectious diseases are distributed all over the world, there are plenty of great success stories where good public health interventions used all tools and techniques to mitigate major problems. However, there are also huge problems with endemic, epidemic, and pandemic diseases.

Dr. Hall confirmed that climate change will most likely cause problems more immediate and severe than infectious diseases. It will change the way people live and make it more difficult to meet basic needs. As survival becomes more difficult, poverty will increase. He linked poverty to malnutrition, a major concern because it stresses the immune system and predisposes humans to greater exposure to infectious diseases. Instability of global food supplies is certainly a major concern for the future, said Dr. Hall.

The extramural research program he manages focuses on vibrios, a genus of bacteria that includes the organism that causes cholera. Sanitation is a key factor in controlling the spread of the cholera disease. Outbreaks in U.S. history were blamed on waves of immigrants who carried the disease and entered into the United States. Once the cause of the disease was understood, outbreaks were controlled domestically but not always internationally.

The most successful model for understanding and managing infectious diseases is to set up research laboratories directly where the disease is found. He gave examples of cholera treatment facilities in Bangladesh and India. Advances in care and prevention have improved significantly. Success rates depend on the availability of safe human drinking water because cholera is a waterborne disease.

Looking into the future, Dr. Hall projected that millions of people will be born into areas with insecure water supplies. He used outbreaks in Angola as an example. The country's population doubled from 1994–2006. In the capital, Luanda, only one in six households had running water, so many people depended on contaminated surface water sources. People were too poor to purchase clean bottled water, and river water was contaminated. Subsequently, because of the utilization of contaminated water, a cholera epidemic swept across the nation. Outbreaks of cholera have also hit Southeast Asia following natural disasters, such as floods and cyclones. However, cholera was not a major problem during the 2004 Indian Ocean tsunami, partially because of the swift action of the World Health Organization (WHO) and global recovery efforts.

Human drinking water will face threats from informal urbanization and agricultural development in areas subjected to intensified oceanic and atmospheric activity. Dr. Hall stressed the need for better management of human and animal waste, because contaminants emerge via the water system in the foods people eat. While the United States does a better job of managing waste than many other countries, it is important to note that most of this country's agriculture food is imported. He also gave an example of how high summertime water temperatures in 2004 caused an overgrowth of pathogenic *Vibrio parahaemolyticus* in Alaskan oysters, resulting in numerous hospitalizations from gastroenteritis. However, when temperatures returned to normal, the illnesses diminished.

Microbes are the first responders to environmental change and stressed human populations, so scientists in the 21st century need to record local observations and understand local microbial ecology and human susceptibility, Dr. Hall emphasized.

During a question-and-answer session, Dr. Hall addressed several topics, including the cholera vaccine, coastal pollution with agricultural waste, and local adaptations to climate change.

V. Climate Change and Health: Identifying and Protecting Vulnerable Populations

Dr. John Balbus, Senior Advisor for Public Health, National Institute of Environmental Health Sciences (NIEHS), discussed the importance of climate change manifestations and called on public health professionals and others to seek environmental justice and a more equitable distribution of benefits and burden. He stated that climate change will provide incentives to make beneficial public health choices.

He encouraged everyone to put a human face on climate change so the people of the world understand that concerns are truly about the human race. He quoted Dr. Margaret Chan, Director-General of the WHO: "We need to convince the world that humanity really is the most important species endangered by climate change." He shared a warning issued by Dr. Georges Benjamin, Executive Director of the American Public Health Association, who said climate change is one of the most serious public health threats of our nation, yet few Americans are aware of the very real consequences.

Dr. Balbus also gave an overview of climate influences on the main human diseases as outlined below:

- Asthma, Respiratory Allergies, and Airway Diseases: May become more prevalent because of increased human exposure to pollen, molds, dust, air pollution, and aerosolized marine toxins.
- Cardiovascular Disease and Stroke: May be exacerbated by increasing heat stress, increasing exposure to particulate air pollution, and changing the distribution of zoonotic vectors that cause infectious diseases linked with cardiovascular disease.
- Foodborne Disease and Nutrition: May cause staple food shortages, malnutrition, and food contamination.
- Heat-Related Morbidity and Mortality: May increase heat-related illness and death.

- Mental Health and Stress-Related Disorders: May negatively affect mental health as increased extreme weather events result in geographic displacement, damage to property, loss of loved ones, and chronic stress

- Vector-borne and Zoonotic Diseases: May increase risks due to expansion in vector ranges, shortening of pathogen incubation periods, and disruption and relocation of large human populations; may increase malaria and dengue fever in places not previously associated with outbreaks.

- Waterborne Diseases: May increase harmful pathogens and chemicals with a rise in water temperature and precipitation frequency and severity; may have impacts on evaporation-transpiration rates and on coastal ecosystems.

- Weather-related Morbidity and Mortality: May increase incidence and intensity of extreme weather events, such as hurricanes, floods, droughts, and wildfires, and may adversely affect people's health during or after the event.

While reviewing the human disease vulnerabilities to climate influences, Dr. Balbus linked different factors and their impact on at-risk populations. Heat waves, such as those in Chicago in 1995 and in Paris in 2003, have a serious heat stress impact on vulnerable populations. However, climate change will have a positive effect on cardiovascular mortality if places are warmer in winter.

Dr. Balbus shifted his focus to identify vulnerability as a concept. "Vulnerability is the state that you are in combined with the exposure that you are likely to experience," he said. Climate change will exacerbate underlying problems and inequalities.

Hurricane Katrina clearly showed that it is a national issue when a disaster of this magnitude happens. In the aftermath, people are thinking in a much more rigorous way about solutions, transportation, green jobs, economic recovery, easing disparities in health care, and preventing disease outbreaks.

Mitigating climate change presents unrivaled opportunities for improving public health. The policies that need to be implemented to reduce greenhouse gas emissions will also bring about substantial reductions in heart disease, cancer, obesity, diabetes, road deaths and injuries, and air pollution. Some health benefits may arise because climate change policies necessarily impact on two of the most important determinants of health: human nutrition and human movement.

Dr. Balbus elaborated on the collaborations on climate change work at the National Institutes of Health. These collaborations involve environmental scientists, social scientists, and health scientists. They are identifying people who are most vulnerable: the elderly, the sick, the unattended or isolated, and people living in poverty with unsuitable housing and no transportation.

He mentioned that the NIEHS has a 20-year history of community-based research partnerships and continues to expand all efforts related to climate change. Collaborative research areas include the following:

- Community-based health vulnerability assessments and response planning.
- Ecological impacts on diseases caused by biological agents (infectious and noninfectious).
- Mental health impacts of serious environmental disruption.
- Integrated modeling of ecosystems and human health.
- Economic valuation of health impacts: cultural, geographic, and temporal issues.

Dr. Balbus closed his presentation with a notation from the 2007 United Nations' *Intergovernmental Panel on Climate Change (IPCC)* report: "In the future, vulnerability to climate will depend not only on the extent of socioeconomic change, but also on how evenly the benefits and costs are distributed, and the manner in which change occurs."

VI. Wrap-up and Day 2 Overview

Dr. Lewis thanked the afternoon's guest speakers for their insightful presentations. He said the theme Climate Change and Human Health offered many opportunities for further discussion and gave an overview of the activities scheduled for March 26, 2010. He closed the afternoon session and invited everyone to attend the evening session at the Hyatt Regency Bethesda Hotel. Guest speakers for the evening session were Ms. Julia Royall, Chief, Office of International Programs, NLM, and Ms. Melanie A. Modlin, Deputy Director, Office of Communications and Public Liaison, NLM.

Evening Session at the Hyatt Regency Bethesda Hotel

VII. Welcome and Introductions

The EnHIP Meeting on Climate Change and Human Health continued with an evening session beginning March 25, 2010, at 6:15 p.m. at the Hyatt Regency Bethesda Hotel. Dr. Steven Phillips, Associate Director, NLM, Division of Specialized Information Services (SIS), welcomed attendees, guests, and speakers and urged them to use the wealth of information presented earlier in the day to seek solutions to the growing demands caused by climate change.

VIII. NLM into Africa: Outreach and Collaboration on Another Continent

The evening's first speaker, Ms. Julia Royall, Chief, Office of International Programs, NLM, expressed her gratitude for the opportunity to address the group. She cited a quote attributed to Senator Lister Hill, a staunch supporter of health and education legislation. "We must develop a communications system so that the miraculous triumphs of modern science can be taken from the laboratory and transmitted to all in need." The Lister Hill Center was established by an act of Congress in 1968 and is a research and development division of the U.S. National Library of Medicine.

NLMs outreach in Africa is a two-way street. NLM provides tools and expertise, and it gains learning experiences on effective implementation. NLM staff promotes a partnership among community decision makers, health workers, and researchers. As NLM approaches its 175th birthday, it plays an important role in expanding medical knowledge.

Outreach initiatives in Africa focus on several important areas of impact. The African Medical Journal Partnership Project supports the publication of information written by African scientists. It was established in 2004 by the NLM and the Fogarty International Center in order to promote capacity-building efforts for medical journals in Africa. Six African medical journals and six journals from the United States and the United Kingdom are partners. African malaria researchers can access NLM medical literature because they now have reliable connectivity to the Internet.

Ms. Royall praised the work of the five previous African associate fellows in the NLM Associate Program. The medical librarians formed a network and are creating a course in information retrieval that will be adopted at seven universities in Africa. She credited the Internet with putting Africa in the international research loop. Malaria researchers, such as Kenyan Dr. Andrew Githeko, senior scientist and climatologist, have utilized databases to study weather patterns and make predictions about malaria epidemics. Dr. Githeko and others also advise health officials on the planning for drug delivery and vector interventions in advance of malaria outbreaks.

African medical students have seized the opportunity to use MedlinePlus® Tutorials, which feature local languages, local cultures and locally created illustrations. Posters and booklets complement electronic materials. Medical students take tutorials into communities for field testing in order to customize the approach more effectively. Ms. Royall highlighted the work being done to address the mental health needs of individuals in war-torn Uganda. A group created a tutorial about problems associated with depression. A local artist served as curator and collected illustrations from young people; these drawings were incorporated into the tutorial. The objectives were to improve recognition, detection, diagnosis, and care and to reduce suffering associated with depression.

An NLM team investigating the prevalence of bed nets has employed digital pens to collect information. Villagers in Uganda were asked about bed-net usage; information was sent via Bluetooth to a computer; and a database was composed immediately. Ms. Royall closed her presentation with an African adage: "When spider webs unite, they can tie up a lion."

IX. National Library of Medicine Outreach Initiatives: What Can NLM Do for You?

Ms. Royall's praise for NLMs information resources was substantiated by Ms. Melanie A. Modlin, Deputy Director, Office of Communications and Public Liaison, NLM. She discussed electronic information services, such as PubMed® and MedlinePlus, which deliver trillions of bytes of data to millions of users each day. They gain in popularity and reach more audiences every year. The National Network of Libraries of Medicine (NN/LM®) provides all U.S. health professionals with equal access to biomedical information. NN/LM also improves the public's access to information to enable everyone to make informed decisions about health care. ClinicalTrials.gov allows people to read about studies and find out results. Ms. Modlin showed a map of the United States and indicated that NLM covers the country with regional and medical libraries.

Other NLM outreach initiatives include health career events for high school students. This program continues nationwide in memory of Dr. Michael DeBakey, cardiovascular surgeon, inventor, and former

chairman of the NLM Board of Regents. He was a strong proponent of introducing students to careers in medicine.

NLM teams set up exhibit tents for demonstrations at powwows in an effort to establish one-to-one connections to Native American populations. NLM traveling exhibitions carry health messages across the country. A special upcoming exhibition will focus on native healing. NLM also manages an energetic social media presence that includes Twitter, Facebook, and other interactive media.

Ms. Modlin encouraged attendees to promote NLMs mission and utilize its resources in their own programs and projects. She concluded by explaining how the NLM staff continues to search for ways to make important, peer-reviewed data accessible to the greater population and works diligently to meet the needs of the public.

X. Wrap-up of Day 1 – Evening Session

Dr. Henry Lewis, III, Dean, College of Pharmacy and Pharmaceutical Sciences and EnHIP Chairman, Florida A&M University, acknowledged the contributions of the guest speakers at the session held earlier in the day and during the evening session. He summarized the day's sessions and emphasized that the issue of climate change is critical to people throughout the United States and the rest of the world. He reflected on the formation of the Partnership years ago when the locations of member institutions were close to communities with adverse health consequences. Adverse health consequences in connection with climate change are issues that demand much attention.

Following Dr. Lewis' remarks, an announcement was made by Dr. Bailus Walker, Jr., Senior Scientific Advisor, Howard University College of Medicine, of the recent honor bestowed on Dr. Henry Lewis. He was the recipient of the 2009 American Pharmacists Association's Hugo H. Schaefer Award for outstanding voluntary contributions to the organization, the profession, and society. Recognizing that this award was given by Dr. Lewis' peers in the pharmaceutical profession, Dr. Walker praised Dr. Lewis' comprehensive work at Florida A&M University, his contributions to pharmaceutical sciences, and his achievements with EnHIP. Dr. Walker gave a heartfelt toast to Dr. Lewis for his many accomplishments in the field. Dr. Lewis responded, "Thank you so much. I am indeed honored and touched."

Dr. Phillips, Associate Director, NLM, SIS, thanked the speakers for their thoughtful, informative presentations, acknowledged the NIH scientists and NLM senior staff in attendance, and closed the meeting to give attendees the opportunity to network with each other.

Day 2

XI. Welcome and Introductions

EnHIP reconvened March 26, 2010, at 8:30 a.m. in the NLM Board of Regents Room, National Institutes of Health. Dr. Henry Lewis, III, Dean, College of Pharmacy and Pharmaceutical Sciences, Florida A&M University, and EnHIP Chairman, presided. He welcomed attendees and invited them to introduce themselves for the benefit of those that were unable to attend the previous sessions.

Dr. Lewis gave recognition to the christening of the U.S. Navel Ship Charles Drew, a logistics ship in the Lewis- and-Clark class of dry cargo/ammunitions ships. It is the 10th ship in the class to the U.S. Navy's Military Sealift Command. The christening ceremony was held on February 27, 2010, at the shipyard in San Diego, California.

The USNS Charles Drew is named after Dr. Charles R. Drew, an African-American physician who pioneered work in blood preservation and who is regarded as the father of the modern blood bank. He ranks as one of the most prominent scientists in United States history. Charles Drew University of Medicine and Science in Los Angeles, California, is a member of EnHIP. Founders of the University established the medical school as a way to empower people with socioeconomic disadvantages to take greater control of their health and lives. The mission of the University is to put an end to health disparities associated with underserved communities.

Dr. Paul B. Tchounwou, Associate Dean and Distinguished Professor, Jackson State University, distributed information for the Seventh International Symposium on Recent Advances in Environmental Health Research. This symposium will host participants from more than 22 counties and will have representatives from the U.S. Department of Education and the U.S. Environmental Protection Agency.

As a final announcement, Dr. Lewis reminded everyone that abstracts for the EnHIP Outreach Awards are due June 20, 2010. He encouraged attendees to share with their institutions the information about free training programs for accessing NLMs databases, available to faculty, staff, and students.

XII. Update on the EnHIP Strategic Plan

Dr. Lewis opened the discussion on the EnHIP Strategic Plan, *Charting a Course for the 21st Century* (see Appendix A). The EnHIP Strategic Plan gives directives for the Partnership to be accountable to the NLM as well as for the EnHIP to play an integral role as an advisor to and supporter of the NLM. The goals in the EnHIP Strategic Plan align with the major goals in the NLM Strategic Plan, *Charting a Course for the 21st Century: NLMs Long Range Plan 2006–2016.*

He emphasized the necessity to give merit to NLMs tremendous investment of time, energy, and funding. NLMs investment has allowed the initial concept to grow from the Toxicology Information Outreach Program into EnHIP with NLM. He reviewed the goals and asked for dialogue on how to make the EnHIP Strategic Plan a living action plan. The goals are stated as follows:

- Goal 1: Seamless, uninterrupted access to expanding collections of biomedical data, medical knowledge, and health information
- Goal 2: Trusted information services that promote health literacy and the reduction of health disparities
- Goal 3: Integrated biomedical, clinical, and public health information systems that promote scientific discovery and speed the translation of research into practice
- Goal 4: A strong and diverse workforce for biomedical informatics research, systems development, and innovative service delivery.

Dr. Steven Phillips, Associate Director, NLM, Division of Specialized Information Services, expressed continued commitment to strengthen the efforts to address the needs of underserved populations, particularly in education. Dr. Patricia Matthews-Juarez, Meharry Medical College (MMC), encouraged more involvement in environmental justice. She cited the work MMC did to address community health disparities in disaster situations for Gulf Coast residents. The project used the EnHIP Outreach Award and enlarged the funded amount through collaborations with other institutions. Other attendees shared examples of how their projects expanded when funding from other sources was combined with the EnHIP Outreach Award funding.

Dr. Melissa Littlefield, Associate Professor, Morgan State University, urged members to be more inclusive of social workers because they play a huge role in disaster preparedness and information dissemination on environmental issues. She discussed how she used the EnHIP Outreach Award to train people in the community on how to use NLMs resources and databases to address health disparities.

Dr. Doris Withers, Vice President for Assessment Planning and Accountability, Medgar Evers College, City University of New York (CUNY), directed the discussion toward the EnHIP Strategic Plan's recommendations on increasing the number of underrepresented minorities in the library science workforce. Ms. Betsy Humphreys, Deputy Director, NLM, explained there is a wide range of careers in the field of library science, particularly careers in accessing biomedical and scientific information. People with backgrounds in the sciences might consider steering their careers toward medical libraries. The focus is always about making information available to people, she stated. Ms. Gale Dutcher, Deputy Associate Director, NLM, Division of Specialized Information Services, stated there are very good distance-learning programs available for people seeking to study library science. These programs are convenient for people who may not live near an educational institution that offers library science courses.

Ms. Cynthia L. Henderson, Director, Library, Morehouse School of Medicine, and a member of the Medical Library Association Board emphasized the importance of participating in career days to get more minorities into the library science profession. She suggested coordination with the African-American Medical Librarians, an organization within the Medical Library Association. Ms. Henderson also stressed the importance of the "people connection," the vital link between the community and the material needed to make informed decisions. Dr. Daniel Wildcat of Haskell Indian Nations University suggested that all projects should have a social media aspect, such as blogs or Twitter, in order to connect with the younger generation.

Dr. Lewis summarized all issues mentioned in the discussion and called on members to direct their students and graduates to opportunities for internships and fellowships at the NLM. He stated that activities need to align with the EnHIP Strategic Plan because its mission emphasizes information exchange and information transfer.

XIII. Discussion on the EnHIP Outreach Awards

Ms. Gale Dutcher, Deputy Associate Director, NLM, Division of Specialized Information Services, stated that the NLM mission is to collect, organize, and disseminate information by using different tools, products, mechanisms, location settings—virtually and in person. Quality, peer-reviewed data remain the focus.

Ms. Dutcher facilitated a discussion on the EnHIP Outreach Awards that are available to the EnHIP institutions. The EnHIP Outreach Awards began in 2005, and so far 64 projects have received financial support. Individually, the projects are small, but as a group they represent a substantial body of work. She mentioned that the EnHIP Outreach Awards are modest in amount and they are regarded as contracts. As the program matures, the application and reporting processes change in order to have more accountability of project outcomes. Proposals are now reviewed by the Contracts Office rather than by Ms. Dutcher. However, she will continue to provide leadership in the approval process.

She asked the panel about whether or not the EnHIP Outreach Awards should be tied to yearly themes, NLM initiatives, or the EnHIP Strategic Plan. The discussion led to the commitment to the EnHIP Strategic Plan, because its flexibility allows for a full range of projects.

Various members wanted more reporting on the projects so decision makers can recognize the successful outcomes resulting from expenditures. As EnHIP reaches its 20th anniversary, a second 10-year review will be done, and this would be the time to document the many accomplishments from the EnHIP Outreach Awards. Ms. Dutcher will develop a proposed format for recording the outcomes of projects. Attendees will be able to read what was done and learn about the outcomes of the EnHIP Outreach Awards.

XIV. Remote Sensing, Climate Change, and Health

Dr. Nancy G. Maynard, Senior Research Scientist and Associate Director for Environment and Health in the Earth Sciences Directorate at the National Aeronautics and Space Administration (NASA) Goddard Space Flight Center, shared information about how remote sensing data can be used to study climate change and human health issues. She also gave examples of NASA-Tribal College Student remote sensing research on environmental and climate change issues.

She explained how remote sensing allows for direct observation of temperatures, landscape, vegetation, water bodies, ice floods, infrastructure, pollutants, and ozone depletion. Researchers can infer information for the epidemiology and the suitability of the habitat for vector diseases. With this data, researchers can find the source and follow the transport and deposition of some pollutants.

Dr. Maynard outlined the impact of extreme weather conditions in the Arctic and showed a remote image of a winter storm with 109 mph winds carrying glacial silt and sediment from Alaska into the ocean. Extreme climate conditions impact people, particularly indigenous people who live from the land and work with the environment. The risk to their safety is great, both in terms of travel and in relation to food supplies.

Changes in the Arctic regions are felt directly and indirectly by indigenous people and the animals they depend upon for food. During times of extreme weather, people remain indoors, where they have more exposure to smoke from the fires used to heat their dwellings. There are social stresses from isolation. Housing built on permafrost is collapsing as melting occurs. Shorelines are eroding because the ice floes that once protected the coastline have disappeared. Early thaws pose problems for reindeer herders who cannot move animals across weak ice on rivers.

A second image was shown of the runoff across North Carolina's Pamlico Sound after Hurricane Floyd. It illustrated another set of health impacts. The image revealed sediments that combined with pesticides and fertilizers and then washed onto the beaches and into the watersheds. Changes in plant and animal populations are important in relation to health issues, particularly infectious and vector-borne diseases. Satellites are useful in mapping factors related to vector distribution or disease incidence. This includes mapping habitats, predicting changes in host vector populations, and creating risk maps for early warning or control programs. As an example, she showed an image in Brazil where earth movers had plowed a forest. The heavy equipment created puddles and ruts that filled with water and harbored disease.

NASA satellites can observe the presence and movements of solids, liquids, and gases in the atmosphere. Smoke plumes and dust storms transport pollutants. A series of images showed a 1,000-mile-long dust plume from Africa as it moved across the Atlantic Ocean. Southerly winds drove it northward where it joined with pollution from the United Kingdom and Ireland and continued to the Arctic. Satellite maps document changes in vegetation cover, water level, and wetland habitat. They show the extent and spread of harmful algal blooms.

Human health is the reason to study climate change, indicated Dr. Maynard, as she linked remote sensing technology to the NASA Tribal College and University Project, an endeavor that included two member institutions—Diné College, Tsaile, Arizona, and Haskell Indian Nations University, Lawrence, Kansas. Dr. Maynard serves as the NASA Tribal College and University Project Manager.

As examples, she mentioned 2008 student projects at Haskell Indian Nations University. These included air particulate matter and ozone on the Navajo Nation and historical land-use changes in the Haskell-Baker Wetlands. Projects for 2008 at Diné College included water quality mapping of the Northern Navajo Reservation and black bear habitat in Canyon de Chelly.

During a 10-week program that includes internships and externships, students learn how satellite imagery can help them address issues on tribal lands. NASA seeks to increase partnerships with Tribal Colleges and Universities. "The whole idea is to combine indigenous knowledge with scientific knowledge and try to expand power thinking," said Dr. Maynard. This would allow NASA and other organizations to share their information and benefit from elder oral histories and observations made by native people. She praised the work of the American Indian/Alaska Native Climate Change Working Group, an organization on which EnHIP member Dr. Daniel Wildcat serves.

Dr. Maynard stated in closing that students at Tribal Colleges and Universities are the future leaders. They can make the difference in how well capabilities and strategies develop to climate change.

XV. Update on Climate Change as Related to Alaska Natives and American Indians

Dr. Daniel Wildcat, Director of the American Indian Studies Program, Haskell Indian Nations University, gave an update on climate change and called for a reconnection between people and the environment. Dr. Wildcat noted that society has insulated itself from the natural world, and this separation causes problems when dealing with climate change. Traditionally, native people are bound to the land and possess empirical knowledge about changes that are sweeping across the landscape.

One of the challenges facing native people is the long-standing disinterest that the academic and scientific communities may have regarding ancient mythologies and oral traditions. "I am unwilling to accept the notion that our oral traditions, our storytelling traditions, the kind of knowledge that is contained in custom, habit, and ceremony, should be dismissed because they are not documented or written down," said Dr. Wildcat. These contributions deserve more attention and respect, because problems associated with climate change will require innovative thinking for solutions.

Dr. Wildcat extended an invitation to the EnHIP members to attend the American Indian/Alaska Native Climate Change Working Group meeting, to be held June 2–4, 2010, at the National Weather Service Regional Training Center, Kansas City, Missouri. The group functions as a network to link native populations with federal agencies, national scientific laboratories, research centers, and nongovernmental agencies. Dr. Wildcat said the group also seeks to expand educational opportunities for native people in scientific and public health fields.

Tribal Colleges and Universities are channeling students into math and the sciences so they are prepared to deal with climate change issues. This includes training on database accessibility with NLM and internships/externships with NASA and the National Center for Atmospheric Research.

Dr. Daniel Wildcat, Director of the American Indian Studies Program, Haskell Indian Nations University, presented Dr. Donald A.B. Lindberg, NLM Director, with a signed copy of his new book, *Red Alert!: Saving the Planet with Indigenous Knowledge,* and thanked him for his support of Tribal Colleges and Universities.

XVI. EnHIP Schools Researching Climate Change

Reinforcing the theme of Climate Change and Human Health, three member universities presented their research projects. These institutions were identified through a survey requesting those who were involved in climate change research to submit their abstracts (see Appendix F). Dr. Judith Mazique, Texas Southern University, facilitated presentations on the research by the member universities.

Jackson State University, Jackson, Mississippi
Environmental Modeling and Prediction for Climate and Seasonal Fluctuations over Grand Bay of the Gulf of Mexico
Presented by: Dr. Paul B. Tchounwou

Dr. Paul B. Tchounwou, Associate Dean, College of Science, Engineering and Technology, Jackson State University, gave the IPCC definition of climate change: any change in climate over time, whether due to

natural variability or as a result of human activity. The conclusion of the IPCC 2007 assessment report stated that the warming of the climate system is unequivocal. The fact is evidenced from the following observations: increases in global average air temperature, increases in global average sea temperature, widespread melting of snow and ice, and rising global average sea level. A 100-year prediction shows a significant increase in changes in sea level and in temperature. Impact is felt in terms of water, ecosystem, food, coastal, and human health.

Effects of Hurricane Katrina on Land Cover Within the Grand Bay National Estuarine Research Reserve in Mississippi, USA

Presented by: Dr. Paul B. Tchounwou

The Jackson State University-Trent Lott Geospatial and Visualization Research Center is focusing efforts on the Gulf Coast, a region with sensitive marine ecosystems. The research center is working on climate models, regional weather forecast models, and air pollution models. An important study focused on the impact of Hurricane Katrina on the diverse habitats of Grand Bay National Estuarine Research Reserve. Using remote sensing technology, the center documented major alterations to habitats. Rainfall and storm surge led to the expansion of open water, wind and storm surge led to the loss of evergreen forest habitats, and forested land was converted to grassland.

University of Puerto Rico—Medical Sciences Campus, San Juan, Puerto Rico

Health and Medical Geography in the Context of Climate Change: The Case of Puerto Rico, 1990–2008

Presented by: Dr. Diógenes Herreño-Sáenz

Dr. Diógenes Herreño-Sáenz, Associate Professor, Department of Pharmacology and Toxicology, School of Medicine, reported on one of several research projects conducted by José Seguinot Barbosa, Chair of the Environmental Health Department, Graduate School of Public Health, Medical Science Campus, University of Puerto Rico. Evaluation of the research allowed the construction of the medical and health geography of Puerto Rico and its association with various elements of climate change. One of the elements considered was diseases, including skin cancer, asthma, dengue, malaria, tuberculosis and diabetes. The study identified urban islands of heat and revealed that metropolitan areas showed higher temperatures than in the past.

Hampton University, Hampton, Virginia

Aircraft Lidar Measurements and MODIS Aerosol Optical Depths in a Regional Air Quality

Presented by: Dr. Arlene Montgomery

Dr. Arlene Montgomery, Dean, School of Nursing, Hampton University, submitted a presentation on projects in the Department of Atmospheric and Planetary Sciences in the School of Science. The Center for Atmospheric Sciences is working on experiments associated with the Cloud-Aerosol Lidar and Infrared Pathfinder Satellite Observation (CALIPSO) Mission. The satellite measures aerosols and clouds. This data will help investigators learn more about climate change and the environment.

Dr. Montgomery mentioned the dissertation by Jasper Lewis, doctoral student, on aerosol concentration in the atmosphere and its relation to increased mortality and morbidity rates. Satellite instruments are used to make global measurements of aerosol optical depth. These findings are used in conjunction with other measurements to evaluate air quality more accurately.

In closing the EnHIP Schools Researching Climate Change presentations, Dr. Mazique and Dr. Lewis thanked Dr. Tchounwou, Dr. Herreño-Sáenz and Dr. Montgomery for their informative presentations. They praised the EnHIP Schools for their commitment to researching climate change and the effects on human health. Dr. Lewis introduced Dr. Sally E. Howe as the lunchtime speaker.

XVII. NLMs Role and Perspective on Climate Change

Dr. Sally E. Howe, Research Associate for the Director, NLM, described key governmental and intergovernmental resources on the health effects of climate change, a procedure for analyzing how well NLM is collecting and indexing the relevant literature, guidelines for assessing claims about projected effects of climate change, and NLM information resources related to health effects of climate change.

The U.S. Global Change Research Act of 1990 established the U.S. Global Change Research Program (GCRP) (known between 2002 and 2009 as the Climate Change Science Program [CCSP] and requires the GCRP to produce annual reports to Congress about its efforts to understand and address the effects, including the health effects, of climate change on the United States. The 2010 report highlights research in excessive heat, aeroallergens, water quality, and infrastructure and energy vulnerabilities under extreme weather challenges; 2010 plans include research on air pollution and on high-resolution integrated assessment models for improved insight into mitigation and adaption. A CCSP report, titled *Analyses of the Effects of Global Change on Human Health and Welfare and Human Systems* is one of 21 Synthesis and Assessment Products released between 2004 and 2009 on topics, including weather and climate extremes, mid-Atlantic coastal sensitivity to sea level rise, and the effects on agriculture, land resources, water resources, biodiversity, ecosystems, energy production, and Gulf Coast transportation systems and infrastructure. The United Nations' IPCC and the WHO produce similar reports that address climate change around the world. A 2009 WHO report, titled *Protecting Health from Climate Change: Global Research Priorities* makes recommendations about assessing risk, identifying the most effective interventions, guiding health-promoting mitigation and adaptation decisions in other sectors, improving decision support, and estimating the costs of protecting health from climate change.

Dr. Howe described a new automated procedure for analyzing how well NLM is collecting and indexing the health effects of climate change research literature (or literature on any other topic), such as a CCSP or IPCC report. Each reference in a report, or one of its chapters, is identified as a journal article, book, conference or workshop proceeding, report, or Web site. Each journal is identified by whether or not it is in NLMs List of Journals Indexed (LJI), and each article is identified by whether or not it is indexed in MEDLINE®, NLMs keyword-searchable database of more than 16 million references to journal articles in life sciences, especially biomedicine. Analysis of the 278 references in "Chapter 2: Effects of Global Change on Human Health" of the above-mentioned CCSP report found that almost 80 % (85 out of 109) of the referenced journals are indexed in LJI and almost 80 % (191 out of 243) of the referenced journal articles are indexed in MEDLINE.

She presented her guidelines developed for assessing claims about climate change: (1) *Presume nothing.* She found that climate was not a major contributing factor when she had thought it might have been, and some expected impacts surprised her. (2) *The plural of "anecdote" is not "data."* What happened in one geographical location does not refute global climate change. (3) *Ask climate skeptics to document their*

criticisms in authoritative sources. Reading about scientific data, methods, and results can aid in challenging their claims. (4) *Seek out and read original authoritative sources yourself*. Those sources can be found easily through straightforward Google searches. Using these guidelines, she concluded that the effects of climate change are local and depend on geography; the health effects and impacts are local, too; and infrastructure affects the health impacts of climate change.

Dr. Howe noted that, according to the nonprofit Trust for America's Health, while 33 states have climate change action plans, only 5 of them mention human health issues, and then only briefly. She added, "I think every sector of the economy is talking about this, if not dealing with it."

NLMs online information resources related to health effects of climate change include the PubMed biomedical research literature that is searchable by Medical Subject Headings (MeSH®) keywords, such as "climate" or "greenhouse effect" or "ozone"; MedlinePlus for consumer health information; and Division of Specialized Information Services and SIS Disaster Information Management Research Center (DIMRC) Web pages for use in climate change preparedness, mitigation, adaption, and response. NLM considers climate change to be real and projects that its effects will play out differently in different parts of the world. Dr. Howe noted that the biomedical research, health care, and public health communities are largely not yet much engaged in addressing the health effects of climate change, but NLMs information resources are there—free, comprehensive, authoritative, up-to-date—for when they do become involved.

XVIII. The EnHIP Outreach Awards Project Presentations

The mission of EnHIP is to enhance the capacity of minority-serving academic institutions to reduce health disparities through the access, use, and delivery of environmental health information on their campuses and in their communities. To further this aim, NLM provides modest financial support to panel members for training and other outreach activities.

This year, 14 institutions were awarded the EnHIP Outreach Awards. Representatives from five EnHIP member schools gave progress reports on the projects for which they had received the EnHIP Outreach Awards. For summaries of all of the 2009–2010 awards, see Appendix G.

Medgar Evers College, CUNY, New York, New York
Genomics Education and Outreach Program: DNA Ancestry, Human Variation, Complex Diseases and Health Promotion
Presented by: Dr. Doris Withers

Dr. Doris Withers, Professor of Biology and Education, Medgar Evers College, CUNY, initiated the Genomics Education and Outreach Program in 2006 with support in part from NLM. Using research data from the program, Dr .Withers established activities to achieve the following goals:

- Encourage student interest in genomic science careers.
- Increase knowledge about the relationship of the human genome to health promotion and disease treatment and prevention.

- Increase awareness of the relationship of health disparities to genetics and environment.
- Increase knowledge and promote understanding of human diversity and issues of race and identity.

She shared details of several outreach activities, including an educational celebration on DNA Day, April 25, 2009, in conjunction with the Brooklyn Public Library. Activities planned for DNA Day, April 23, 2010, include an interactive virtual lab, student essay contest, guest speakers, and career information.

Dr. Withers gave an overview of progress on the African American Diaspora Diversity Project. It involves the determination of deep maternal and paternal ancestry through DNA analysis by the National Geographic Genographic Project, an international study to understand the migratory history of humans out of Africa. Approximately 300 people participated in community workshops, where they learned about their ancestry and engaged in dialogue about biology, human origins, migration, history, social implications and cultural identity.

Benedict College, Columbia, South Carolina
Improving Minority-Serving Institutions' Knowledge of National Library of Medicine Resources Through Competitive Student Team Presentations
Presented by: Dr. Milton Morris

Dr. Milton Morris, Director, Department of Environmental Health Sciences, Benedict College, spoke about the NLM online database training undertaken by members of the Benedict College Student Environmental Health Association, an organization with about 33 members.

Students presented their findings to faculty, staff, and students within the College's School of Science, Technology, Engineering and Mathematics. The goals of the project were to increase awareness of important NLM resources and to improve students' ability to detail both orally and graphically important contributions of NLM databases. Dr. Morris showed attendees a presentation created by two upperclassmen about the 2004 Indian Ocean tsunami. Research articles accessed from NLM databases were part of the students' project.

Diné College, Shiprock, New Mexico
Using Shiprock, New Mexico, as a Model for a Rural Desert Town for the Tox Town® Web Site
Presented by: Ms. Marnie Carroll

Ms. Marnie Carroll, Executive Director, Diné Environmental Institute, gave an overview of environmental concerns of Shiprock, New Mexico, and the work of the Institute in seeking solutions. It is affiliated with Diné College, a multicampus institution across the Navajo Nation in the Four Corners Region. The mission of the Institute is to develop culturally relevant curriculum, environmental policy, and environmental project management; conduct environmental studies and community outreach and training; maintain and manage data collections; and produce Native American scientists and technicians.

Her focus for the presentation was on impacts of toxic hazards and the difficulties associated with cleanup efforts. The area represents a Tox Town Model Community. Toxins in the air include dust, automotive exhaust, and pollution from power plants. Water toxins result from mining, oil and gas drilling, arsenic,

and mercury from coal. Other concerns are illegal dumping, incineration, uranium, nitrates, and *Escherichia coli*. Problem solving is difficult for many reasons, including the factor that the area falls across three different Environmental Protection Agency jurisdictions and three different U.S. Department of Agriculture jurisdictions.

A project to filter uranium from water by using indigenous methods is set to begin in partnership with the University of New Mexico. At this time, uranium is leaking into the San Juan River. All research was done in partnership with principal investigators from agencies and universities, and the Institute actively seeks other partners, said Ms. Carroll.

In the discussion that followed, attendees listed several research documents that outline health hazards associated with power plants, arsenic, and toxic sites that might be useful for her research. Members also sought a discussion from the Executive Committee to expand educational opportunities for students at Tribal Colleges and Universities.

University of Puerto Rico—Medical Sciences Campus, San Juan, Puerto Rico
Outreach Project in Environmental Health Information Path 2009–2010
Presented by: Dr. Diógenes Herreño-Sáenz

Dr. Diógenes Herreño-Sáenz, Associate Professor, Department of Pharmacology and Toxicology, School of Medicine, University of Puerto Rico (UPR), described three different types of workshops, presented in Spanish, undertaken this year. They were as follows:

- Workshop for graduate students in the effective use of NLM environmental health and toxicology information resources at the UPR School of Medicine
- Workshops for high school students on subjects related to health and environment (sexually transmitted diseases, HIV, alcohol abuse, drug abuse)
- Workshop for faculty and undergraduate students in the effective use of NLM environmental health and toxicology information resources at the Universidad Metropolitana, San Juan

In addition, a graduate student received seed money support for research of xylazine in relation to recreational drug use by substance abuse addicts.

Howard University, Washington, DC
Consumer Genetics Education Network Workshop Continuation
Presented by: Dr. Robert Copeland, Jr.

Dr. Robert Copeland, Jr., Associate Professor, Department of Pharmacology, Howard University College of Medicine, presented a report of the Consumer Genetics Education Network (CGEN) Workshop project, an endeavor funded by an EnHIP Outreach Award and the March of Dimes. The purpose was to find intervention strategies that will promote more positive behavior in health and reduce health risks in urban African-American populations. Goals were to improve the genetic literacy and disseminate culturally relevant genetic literacy materials. These are viewed as important steps to eliminating health disparities.

Genetic education workshops were set up in churches and recreation centers in the Washington, DC, metropolitan area. The 178 participants gathered health-related family histories and were counseled on healthy diet and exercise. Later, they were contacted to record if any lifestyle changes had occurred. Evaluation of this community-based program indicated a high percentage of participants found the information relevant, appealing, and very informative. The study highlighted the importance of community outreach and engagement.

Discussion following Dr. Copeland's presentation centered on shaping children's healthy living habits and fostering active interaction between patients and physicians for better health care.

XIX. Disaster Preparation and Pharmaceutical Services

Lt. Col. (Retired) Jasper W. Watkins, III, highlighted the EnHIP meeting theme, Climate Change and Human Health, for his presentation on disaster preparedness. He is Chief, Bureau for Statewide Pharmaceutical Services, Florida Department of Health. Lt. Col. Watkins, who has oversight of the management and procurement of the State Emergency Stockpile Medications, spoke of the importance of having emergency management systems in place.

Effective disaster preparation depends on points of distribution (PODs), Lt. Col. Watkins explained. The public needs to be aware of places to go to receive medical supplies, food, water, and other assistance. Institutions, such as universities, churches, and health centers, should expect people to gather there. Leaders from these institutions should participate in community education programs and disaster simulation exercises so they know how to react to emergency situations. The first 48 hours after a disaster are critical for the delivery of medical supplies and basic water needs.

The four phases of emergency management are as follows: prevent, prepare, respond, and recover. Antibiotics and other medications are pre-positioned for quick distribution to health clinics, pharmacies, and other facilities. Solutions for roadblocks, such as fee issues and cumbersome medication paperwork, are ready for implementation during disaster situations. Security measures are in place to thwart counterfeiters from diverting surplus medications.

According to Lt. Col. Watkins, a social stigma is often attached to county health departments. He works to change this perception because it keeps people from receiving the assistance they need. In some socioeconomic disadvantaged areas, people often do not seek help at these facilities even though medications are dispensed free of charge. He developed memorandums of understanding with a network of community pharmacies, and they became PODs for antiviral and other medications.

In summary, Lt. Col. Watkins called for those attending to use their management capabilities to identify, assess, and monitor disaster risks. Recognizing that many attendees represent universities, he strongly encouraged EnHIP members to join forces with disaster preparedness personnel. He urged EnHIP members to use knowledge, information, and education to build a culture of safety and resilience at all levels. "Adaptation to climate change will be an enormous challenge for society over the next several decades," he said.

XX. Climate Change Summary

Dr. Lewis thanked everyone for their participation and attending the EnHIP meeting that focused on Climate Change and Human Health. He indicated that one of the intents of this meeting was to provide EnHIP members with factual information relative to the science versus the myths and media hype surrounding the issues related to climate change. Special appreciation was extended to Dr. Ralph J. Cicerone, President of the National Academy of Sciences, for his presentation of up-to-date factual information on the scientific basis for climate change. Dr. Lewis further extended acknowledgments to Dr. Robert H. Hall, National Institute of Allergy and Infectious Diseases, Dr. John Balbus, National Institute of Environmental Health Sciences, and Dr. Nancy G. Maynard, NASA Goddard Space Flight Center, for outstanding contributions furthering the scientific understanding of other aspects of climate change.

XXI. Closing Remarks

Dr. Lewis expressed optimism about the many ongoing projects at EnHIP member schools that are both researching climate change and preparing the next generation of scientists to address this global issue. The potential environmental impacts of climate change will have manifestations in virtually every area of human health, ecology, food production, species survival, international cooperation, and many other areas. He challenged EnHIP members to initiate dialogue of the environmental and other issues surrounding climate change on their campuses and in their communities so that the public can be better informed.

He also urged member schools to ensure that projects related to the EnHIP Outreach Awards correlate to the NLM and EnHIP Strategic Plans. This ensures that the EnHIP is assisting NLM in accomplishing its strategic direction into the future. He encouraged EnHIP members to look for ways to increase student exchange programs amongst each other, particularly the Tribal Colleges and Universities, and to explore research opportunities for partnership with those institutions as well.

APPENDICES

National Library of Medicine
Division of Specialized Information Services
Environmental Health Information Partnership
Charting a Course for the 21st Century
Environmental Health Information Partnership Strategic Plan

INTRODUCTION

Environmental Health Information Partnership

The Environmental Health Information Partnership (EnHIP) was established by the National Library of Medicine (NLM) in 1991 as the Toxicology Information Outreach Panel. This group was started at a time in which the issue of racial and ethnic health disparities in a myriad of conditions had been elevated into sharp visibility. There was also concern about disparities in potential and real exposure to environmental toxicants and their contribution to disparities in morbidity and mortality. At the same time there was an increase in the complex literature of toxicological science. The Panel then evolved into the Environmental Health Information Outreach Program and subsequently refined into the current state, the Environmental Information Outreach Partnership. This Partnership reflects a broader focus on the multiple dimensions of environmental health, the environmental health sciences, and health disparities. The objective is to assist in addressing disparities among academic institutions in access to information technology and related pedagogical and research resources.

In this context, it was increasingly recognized that modern instruction, research, and service to communities, students, and professions—the core mission of academic institutions—were nearly impossible without computers and related technologies. Indeed, evidence abounds that the addition of computer science and bioinformatics to the arsenal of environmental health, biomedical, social, behavioral, and clinical research holds enormous promise and continues to stir considerable excitement among researchers, academicians, practitioners, and the entire health services community.

These were among the developments that prompted the NLM to initiate a series of programs and services specifically designed to expand and strengthen its partnership with Minority-Serving Institutions (MSIs) and, in the process, enhance the efforts of these schools to increase the number of racial and ethnic minorities in the environmental health, biomedical research, and health care workforce. The NLM was also interested in ensuring that, through planned outreach efforts, both lay and professional groups were aware of, had ready access to, and utilized the NLM's rapidly expanding collections of medical and health information.

Working together, the NLM and the participating colleges and universities continue to apply themselves to these efforts as the 21st century becomes the digital era, creating a better and a more innovative and collaborative future.

Rationale and Process

The Environmental Health Information Partnership has made substantial progress during the past decade in achieving its initial objectives. A prominent feature of this progress has been information sharing,

including regular NLM staff reports on the continuous expansion of the Library databases and programs, as well as presentations from other National Institutes of Health (NIH) Institutes and Centers on development in other areas of the NIH, which supports research and discovery that ultimately improves the methods and outcomes of public health services and personal health care. These discussions have added to the substrate of information which academicians need to bring to full fruition the core functions of academic institutions.

The challenge for the Partnership is not only to maintain its role as a progressive component of NLM's outreach efforts, but to advance to even higher levels of productivity consistent with the NLM Long Range Plan (2006–2016) (*Charting a Course for the 21st Century: NLM's Long Range Plan 2006–2016;* http://www.nlm.nih.gov/pubs/plan/lrp06/NLM_LRP2006_WEB.pdf). That plan includes four overall objectives that serve as the reference frame for the Partnership strategic planning process.

The process began with a number of discussions within the Executive Committee, the administrative arm of the Partnership. These discussions, by teleconference as well as face-to-face interactions at the Library on the NIH campus, culminated in a comprehensive review of the NLM Board of Regents-endorsed new l0-year Long Range Plan.

Later, in meetings at the Library, the Partnership organized into four working group, consistent with the NLM plan's four goals. Each group was charged with sorting from the 66-page Library plan challenges and strategies for the partnership—all within the context of the overarching mission of the Library.

The outcome was a report of each working group's deliberations. As with any broad-ranging discussion among multidisciplinary academicians with differing perspectives, numerous important and relevant topics were discussed, a number of which were beyond the boundaries of NLMs statutory responsibilities. The Executive Committee attempted to capture the key themes of all of the working group reports. The results of that effort are reflected in the plan that follows.

Henry Lewis, III, Professor and Dean
College of Pharmacy and Pharmaceutical Sciences
Florida A&M University, Tallahassee, Florida
Chairman, National Library of Medicine Environmental Health Information Partnership

VISION

EnHIP will be a strong, stable, and effective partner of NLM as the Library becomes even more central to scientific discovery and treatment and prevention of disease. Through this partnership, NLMs programs and services, adapted to 21st century health and health sciences developments, will further strengthen the capacity of MSIs to perform three important and fundamental functions within the public health and health care system. These are: (1) educate and train health professionals; (2) conduct basic and applied research in disciplines pertinent to biomedicine, health services, health care, and health disparities; and (3) engage in community, public, and professional services.

MISSION

The mission of the Environmental Health Information Partnership is to enhance the capacity of minority serving academic institutions to reduce health disparities through the access, use and delivery of environmental health information on their campuses and in their communities.

Assumptions: Environmental health refers to the impact of chemical, microbial, physical, and radiological agents on the health of living organisms.

Minority serving educational institutions are those served by programs funded under Title III Historically Black Colleges and Universities, American Indian Tribally Controlled Colleges and Universities, Alaska Native and Native Hawaiian Serving Institutions, and Title V Hispanic Serving Institutions. (Reference: U.S. Department of Education, http://www.ed.gov/about/offices/list/ope/index.html).

STRATEGIC GOALS

Goal 1. Seamless, Uninterrupted Access to Expanding Collections of Biomedical Data, Medical Knowledge, and Health Information

Objectives of the Partnership for Achieving Goal 1

- Assess the current capacity of MSIs to access NLM databases and related Library resources that can enhance efforts of these colleges and universities to carry out their fundamental mission.
- Use the above-cited assessment to develop a program that will address the deficiencies revealed in the survey.
- Expand and intensify efforts to ensure that MSI faculty and students are thoroughly knowledgeable of detailed aspects of NLMs collections of health and biomedical information.
- Provide technical assistance and related resources to aid MSIs in increasing knowledge and use of NLM programs and services by lay and professional groups within their surrounding communities.
- Initiate appropriate action to include selected MSI libraries in the National Network of Libraries of Medicine (NN/LM).
- Initiate the necessary administrative and logistical procedures to ensure that future NLM exhibits are available for display in MSI communities.
- Convene a seminar, first at NLM and then at MSIs, on the “hows and whys” of disaster management information.

- Determine the extent of instruction in disaster management at MSIs and potential interest in disaster management information research consistent with the research agenda that may emerge from the NLM Disaster Information Management Research Center (DIMRC).

Goal 2. Trusted Information Services That Promote Health Literacy and the Reduction of Health Disparities

Objectives of the Partnership for Achieving Goal 2

- Structure a program (i.e., internships) to provide opportunities for interested students from MSIs to gain "field experience" in the operational aspects of NLM, including the management of the expansive databases and related activities.
- Initiate discussions with consumer advocacy groups in MSI communities to plan an intensive consumer awareness campaign designed to increase the number of consumers who are aware of and use NLMs free high quality consumer information resources.
- Develop specific recommendations for increasing the number of underrepresented minorities in the library sciences workforce.
- Convene a symposium on research advances in environmental health, climate change effects, and the animal-human connection as it relates to disease, designed to enhance the understanding of librarians of the multiple dimensions of the confederations of disciplines that comprise the environmental health sciences and the implications of these advances for both NLM programs and services and for those of local library services.
- Emphasize and promote the importance of MSI community high school teachers' and students' understanding of environmental health, climate change, and the animal-human connection as it relates to disease, as well as knowledge and use of NLM environmental health databases.

Goal 3. Integrated Biomedical, Clinical, and Public Health Information Systems That Promote Scientific Discovery and Speed the Translation of Research into Practice

Objectives of the Partnership for Achieving Goal 3

- Determine the extent of electronic medical records use by physicians, hospitals, and clinics in MSI communities.
- Use data from the preceding objective as [a] basis for a seminar/discussion on the development of electronic health records, including presentations of case studies in which health records were [an] essential source of data.
- Increase MSI faculty members' awareness of the value of electronic health records in environmental health and related research.
- Enhance MSI faculty involvement in translation of public health research findings and knowledge to evidence-based practice.
- Expand Partnership understanding of the NLM online resources and their relevance to the mission of MSIs.
- Increase MSI students' and communities' knowledge of [the] hows and whys of the NLM online resources and their relevance to consumer and academic services.

- Attract new students to the field of environmental health research, including the study of climate change effects, comparative medicine, and vector-borne diseases.
- Play a leadership role in encouraging community engagement in research activities of MSIs.
- Increase research productivity and, in the process, increase contributions of MSI faculty members to professional journals.

Goal 4. A Strong and Diverse Workforce for Biomedical Informatics Research, Systems Development, and Innovative Service Delivery

Objectives of the Partnership for Achieving Goal 4

- Increase NLM/Partnership visibility in MSI communities.
- Increase Partnership knowledge of NLMs programs and services designed to shape biomedical informatics education and training.
- Play a leadership role in initiating discussions of career opportunities in biomedical informatics and library science, including the promotion of interest in these careers.
- Ensure a prominent role for the NLM/Partnership in "career day" or similar programs at MSIs.

Attract new MSI students to health sciences librarianship through NLMs postgraduate Associate Fellowship Program.

ENVIRONMENTAL HEALTH INFORMATION PARTNERSHIP MEETING

March 25–26, 2010

DIRECTORY OF GUEST SPEAKERS

John Balbus, MD, MPH
Senior Advisor for Public Health
National Institute of Environmental Health Sciences
31 Center Drive
Bethesda, MD 20892
TEL: (301) 496-2920
E-mail: balbusjm@niehs.nih.gov
Web site: www.niehs.nih.gov

Marnie Carroll
Director of Diné Environmental Institute
Diné College
Shiprock, NM 87420
TEL: (505) 368-3556
E-mail: mkcarroll@dinecollege.edu
Web site: dinecollege.edu/institutes/institutes.php

Ralph J. Cicerone, PhD
President
National Academy of Sciences
2100 C Street, NW
Washington, DC 20001
TEL: (202) 334-2101
E-mail: naspresident@nas.edu
Web site: www.nationalacademies.org

Robert H. Hall, PhD
Enteric and Hepatic Diseases Branch
National Institute of Allergy and Infectious Diseases
6610 Rockledge Drive
Bethesda, MD 20892
TEL: (301) 451-5074
E-mail: robert.hall@nih.gov
Web site: www3.niaid.nih.gov

Sally E. Howe, PhD
Research Associate for the Director
Office of High Performance Computing and Communications
National Library of Medicine
8600 Rockville Pike
Bethesda, MD 20894
TEL: (301) 496-6481
E-mail: howe@nlm.nih.gov
Web site: http://lhncbc.nlm.nih.gov/ohpcc

Nancy G. Maynard, PhD
Associate Director, Earth Sciences Directorate
National Aeronautics and Space Administration
Goddard Space Flight Center
Greenbelt, MD 20771
TEL: (301) 614-6572
E-mail: nancy.g.maynard@nasa.gov
Web site: www.nasa.gov/centers/goddard/home/index

Melanie A. Modlin
Public Liaison Officer/Deputy Director
National Library of Medicine
8600 Rockville Pike
Bethesda, MD 20894
TEL: (301) 496-7771
E-mail: melanie.modlin@nih.gov
Web site: www.nlm.nih.gov/ocpl/ocpl.html

Julia Royall, MA
Chief, Office of International Programs
National Library of Medicine
8600 Rockville Pike
Bethesda, MD 20894
TEL: (301) 402-2808
E-mail: jroyall@nlm.nih.gov
Web site: www.nlm.nih.gov/about/training/associate/internationalinfo.html

Lt. Col. (Retired) Jasper Watkins, III
Chief, Bureau of Statewide Pharmaceutical Services
Florida Department of Health
104-2 Hamilton Park Drive
Tallahassee, FL 32304
TEL: (850) 922-9036
E-mail: jasper_watkins@doh.state.fl.US
Web site: www.doh.state.fl.us

Daniel Wildcat, PhD
Professor, American Indian Studies
Haskell Indian Nations University
155 Indian Avenue
Lawrence, KS 66046-4800
TEL: (785) 832-6677
E-mail: dwildcat@haskell.edu
Web site: www.haskell.edu/ais/index.html

ENVIRONMENTAL HEALTH INFORMATION PARTNERSHIP DIRECTORY OF CURRENT REPRESENTATIVES 2009–2010

Dr. Henry Lewis, III, PharmD, Chairman
Dean, College of Pharmacy and Pharmaceutical Sciences
Florida A&M University, New Pharmacy Building, Room 353
1415 S. Martin Luther King, Jr. Boulevard
Tallahassee, FL 32307
TEL: (850) 599-3301
FAX: (850) 599-3347
E-mail: henry.lewis@famu.edu

PARTICIPATING HISTORICALLY BLACK COLLEGES AND UNIVERSITIES, HISPANIC-SERVING INSTITUTIONS, and TRIBAL COLLEGES

Bruce Allen, Jr., DrPH
Assistant Professor, Obstetrics/Gynecology
Charles Drew University of Medicine & Science
1731 East 120th Street
Los Angeles, CA 90059
TEL: (323) 563-5872
FAX: (310) 566-7909
E-mail: brallen@cdrewu.edu

Ann Barbre, PhD
Professor of Pharmacy Administration
College of Pharmacy
Xavier University of Louisiana
1 Drexel Drive
New Orleans, LA 70125
TEL: (504) 520-7439
FAX: (504) 520-7930
E-mail: arbarbre@xula.edu

Ferlin Clark, PhD
President
Diné College
P.O. Box 126
Tsaile, AZ 86556
TEL: (928) 724-6670
FAX: (928) 724-3327
E-mail: fclark@dinecollege.edu

Robert Copeland, Jr., PhD
Associate Professor, Dept. of Pharmacology
Howard University College of Medicine
520 W Street NW, Room 3408
Washington, DC 20059
TEL: (202) 806-6311
FAX: (202) 806-4453
E-mail: rlcopeland@howard.edu

Kathleen A. Curtis, PT, PhD
Dean, College of Health Sciences
The University of Texas at El Paso
1101 N. Campbell
El Paso, TX 79902
TEL: (915) 747-7201
FAX: (915) 747-8223
E-mail: kacurtis@utep.edu

Thomas H. Hatfield, DrPH, REHS, DAAS
Professor and Chair
Dept. of Environmental & Occupational Health
California State University, Northridge
18111 Nordhoff Street
Northridge, CA 91330-8412
TEL: (818) 677-7476
FAX: (818) 677-7411
E-mail: thomas.hatfield@csun.edu

Ms. Cynthia L. Henderson, MILS, AHIP
Director, Library
Morehouse School of Medicine
720 Westview Drive SW
Atlanta, GA 30310
TEL: (404) 752-1531
FAX: (404) 752-1049
E-mail: chenderson@msm.edu

Diógenes Herreño-Sáenz, PhD
Associate Professor, Department of
Pharmacology and Toxicology
School of Medicine
University of Puerto Rico
P.O. Box 365067
San Juan, PR 00936-5067
TEL: (787) 758-2525 Ext 1005
FAX: (787) 282-0568
E-mail: diogenes.herreno@upr.edu

Doris Holeman, PhD, RN
Associate Dean and Director of Nursing
College of Veterinary Medicine, Nursing and
Allied Health
Tuskegee University
Basil O'Connor Hall
Tuskegee, AL 36088
TEL: (334) 727-8382
FAX: (334) 727-8177
E-mail: dholeman@tuskegee.edu

Patricia Matthews-Juarez, PhD
Associate Vice President, Faculty Affairs and
Development, Professor
Department of Family and Community Medicine
Meharry Medical College
1005 D B Todd Boulevard, Suite 127
Nashville, TN 37208
TEL: (615) 327-6862/6718
FAX: (615) 327-6568
E-mail: pmatthews-juarez@mmc.edu

Judith Mazique, JD, MPH
Assistant Professor, Environmental Health
College of Pharmacy and Health Sciences
Texas Southern University
3100 Cleburne Street
Houston, TX 77004
TEL: (713) 313-4335
FAX: (713) 313-1901
E-mail: mazique_jx@tsu.edu

Arlene Montgomery, PhD, RN
Dean, School of Nursing
Hampton University
110 Freeman Hall
Hampton, VA 23668
TEL: (757) 727-5654
FAX: (757) 727-5423
E-mail: Arlene.montgomery@hamptonu.edu

Milton Morris, MPH, DAAS, CFSP
Director, Department of Environmental
Health Sciences
Benedict College
1600 Harden Street
Columbia, SC 29204
TEL: (803) 705-4608
FAX: (803) 253-5336
E-mail: morrism@benedict.edu

Joan Nelson, RN, MSN
Instructor, Chairperson
Nursing Department
Oglala Lakota College
P.O. Box 861
Pine Ridge, SD 57770
TEL: (605) 867-5856/7
FAX: (605) 867-5724
E-mail: jnelson@olc.edu

Jackie Pflaum, DNSc, RN
Associate Vice Provost for Health Programs
University of Alaska Anchorage
3211 Providence Drive
Anchorage, AK 99508
TEL: (907) 786-4574
Fax: (907) 786-4559
E-mail: afjsp@uaa.alaska.edu

Janet Rami, PhD, RN
Dean, School of Nursing
Southern University at Baton Rouge
P.O. Box 11794
Baton Rouge, LA 70813
TEL: (225) 771-2166 or 3266
FAX: (225) 771-2641
E-mail: janet_rami@subr.edu

T. Joan Robinson, PhD
Provost/Vice President of Academic Affairs
Morgan State University
1700 E. Cold Spring Lane
Baltimore, MD 21251
TEL: (443) 885-3350
FAX: (443) 885-8289
E-mail: joan.robinson@morgan.edu

Paul B. Tchounwou, ScD, MSPH, MSc
Associate Dean and Distinguished Professor
College of Science, Engineering and Technology
Jackson State University
P.O. Box 18540
Jackson, MS 39217
TEL: (601) 979-3321
FAX: (601) 979-2341
E-mail: paul.b.tchounwou@jsums.edu

Daniel Wildcat, PhD
Professor of American Indian Studies
School of Arts and Sciences
Haskell Indian Nations University
155 Indian Avenue
Lawrence, KS 66046-4800
TEL: (785) 832-6677
FAX: (785) 832-6613
E-mail: dwildcat@haskell.edu

Doris Withers, EdD
Vice President for Assessment Planning and Accountability
Medgar Evers College, CUNY
1650 Bedford Avenue
Brooklyn, NY 11225
TEL: (718) 270-5020
FAX: (718) 270-6918
E-mail: doris@mec.cuny.edu

NLM CONSULTANT

John Scott
President, Center for Public Service Communications
3221 N. George Mason Drive
Arlington, VA 22207-1836
TEL: (703) 536-5642
FAX: (703) 536-5652
E-mail: jcscott@cpsc.com

ENVIRONMENTAL HEALTH INFORMATION PARTNERSHIP 2009–2010

EXECUTIVE COMMITTEE

Henry Lewis, III, PharmD
Chairman
Dean, College of Pharmacy and
Pharmaceutical Sciences
Florida A&M University
New Pharmacy Building, Room 353
1415 S. Martin Luther King, Jr. Boulevard
TEL: (850) 599-3301
FAX: (850) 599-3347
E-mail: henry.lewis@famu.edu

Steven Phillips, MD
Associate Director
Division of Specialized Information Services
National Library of Medicine
6707 Democracy Boulevard, Suite 510
Bethesda, MD 20892
TEL: (301) 496-3147
FAX: (301) 480-3537
E-mail: sphillip@mail.nlm.nih.gov

Gale Dutcher, MLS, MS
Deputy Associate Director Specialized Information Services
Acting Chief, Outreach and Special Populations Branch
Division of Specialized Information Services
National Library of Medicine
6707 Democracy Boulevard, Suite 510
Bethesda, MD 20892
TEL: (301) 496-5082
FAX: (301) 480-3537
E-mail: dutcherg@mail.nlm.nih.gov

Cynthia Gaines
Project Officer
Division of Specialized Information Services
National Library of Medicine
6707 Democracy Boulevard, Suite 510
Bethesda, MD 20894
TEL: (301) 496-3669
FAX: (301) 480-3537
E-mail: gainesc@mail.nlm.nih.gov

Melvin L. Spann, PhD
Executive Secretary
National Library of Medicine (Retired)
11525 Lovejoy Street
Silver Spring, MD 20902
TEL: (301) 593-7364
FAX: (301) 593-5059
E-mail: melspann7@aol.com

Bailus Walker, Jr., PhD
Senior Scientific Advisor
Professor of Environmental and Occupational Medicine and Toxicology
Howard University College of Medicine
520 W Street NW
Washington, DC 20059
TEL: (202) 806-4477
FAX: (202) 806-4898
E-mail: bwalker@howard.edu

Rose Foster
Project Advisor
Medical Education and Outreach Group
Oak Ridge Institute for Science and Education
P.O. Box 117, MS-37
Oak Ridge, TN 37831-0117
TEL: (865) 576-9342
FAX: (865) 241-3851
E-mail: rose.foster@orise.orau.gov

ENVIRONMENTAL HEALTH INFORMATION PARTNERSHIP 2009–2010

ALTERNATE REPRESENTATIVES

Gail Orum-Alexander, PharmD
Dean, College of Science and Health
Charles Drew University of Medicine & Science
1731 East 120th Street
Los Angeles, CA 90059-3051
TEL: (323) 563-5851
FAX: (323) 563-4923
E-mail: gailorum@cdrewu.edu

Jose Condé, MD, MPH
Associate Professor
Division of Graduate Studies,
School of Medicine
University of Puerto Rico Medical Sciences Campus
P.O. Box 365067
San Juan, PR 00936-5067
TEL: (787) 763-9401
FAX: (787) 758-5206
E-mail: jose.conde1@upr.edu

Bertha L. Davis, PhD, RN, FAAN, ANEF
Professor, School of Nursing
William Freeman Hall
Hampton University
Hampton, VA 23668
TEL: (757) 727-5780
FAX: (757) 727-5423
E-mail: bertha.davis@hamptonu.edu

Charles desBordes, PhD
Professor, Department of Biology
Medgar Evers College, CUNY
1150 Carroll Street
Brooklyn NY 11225
TEL: (718) 270-6207
FAX: (718) 270-6196
E-mail: desBordes@mec.cuny.edu

João Ferriera-Pinto, PhD
Associate Research Professor
Director of Research and Special Projects
College of Health Sciences
The University of Texas at El Paso
1101 N. Campbell Street
El Paso, TX 79902
TEL: (915) 747-7295
FAX: (915) 747-7207
E-mail: joao@utep.edu

Jean Hampton, PhD
Associate Professor
Department of Health Sciences
Texas Southern University
3100 Cleburne Street
Houston, TX 77004
TEL: (713) 313-7377
FAX: unknown
E-mail: hampton_JM@tsu.edu

Kathleen Kennedy, PharmD
Associate Dean, College of Pharmacy
Xavier University of Louisiana
1 Drexel Drive
New Orleans, LA 70125
TEL: (504) 520-7421
FAX: (504) 520-7930
E-mail: kkennedy1@xula.edu

Benita Litson, MS
Director
Land Grant Office
Diné College
P.O. Box 7B
Tsaile, AZ 86556
TEL: (928) 724-6941
FAX: (928) 724-6949
E-mail: blitson@dinecollege.edu

Allan Noonan, MD, MPH
Dean, School of Community Health
and Policy
Morgan State University
1700 East Cold Spring Lane
Baltimore, MD 21251
TEL: (443) 885-4012
FAX: (443) 885-8309
E-mail: allan.noonan@morgan.edu

Safiya Omari, PhD
Associate Professor of Social Work and Health Sciences
Director, Southern Institute for Mental Health Advocacy, Research, and Training
Jackson State University
350 West Woodrow Wilson Avenue
Jackson, MS 39213
TEL: (601) 979-1530
FAX: (601) 979-1537
E-mail: safiya.r.omari@jsums.edu

Samir Raychoudhury, PhD
Professor, Biology, Chemistry and
Environmental Health Sciences
Benedict College
1600 Harden Street
Columbia, SC 29204
TEL: (803) 705-4648
FAX: (803) 705-6637
E-mail: raychoudhurys@benedict.edu

Deig Sandoval, PhD
Professor of Chemistry
Department of Math and Science
Oglala Lakota College
490 Three Mile Creek Road
Kyle, SD 57752
TEL: (605) 455-6132
FAX: (605) 455-2603
E-mail: dsandoval@olc.edu

Michael Sullivan, PhD, CIH, REA
Associate Professor
Department of Environmental and Occupational Health
California State University, Northridge
18111 Nordhoff Street
Northridge CA 91330-8412
TEL: (805) 728-5317
FAX: (818) 677-7411
E-mail: michael.sullivan@csun.edu

Thomas E. Smith, PhD
Professor, Biochemistry and Molecular Biology
Department of Pharmacology
College of Medicine
Howard University
520 W Street NW, Room 3408
Washington, DC 20059
TEL: (202) 806-6289
FAX: (202) 806-5784
E-mail: tsmith@howard.edu

Cheryl Taylor, PhD, RN
Associate Professor
Director, Office of Nursing Research
Southern University Baton Rouge
P.O. Box 11794
Baton Rouge, LA 70813-0400
TEL: (225) 771-3266
FAX: (225) 771-2641
E-mail: cheryl_taylor@subr.edu

Mike Tosee, MA
Acting Dean
College of Arts and Sciences
Haskell Indian Nations University
155 Indian Avenue
Lawrence, KS 66046-4800
TEL: (785) 749-8428
FAX: (785) 749-6613
E-mail: mtosee@haskell.edu

James Webster, PhD
Chairman, Department of Biomedical Sciences
School of Veterinary Medicine
Tuskegee University
Tuskegee, AL 36088
TEL: (334) 727-8469
FAX: (334) 727-8177

VACANT
University of Alaska Anchorage
3211 Providence Drive
Anchorage, AK 99508

VACANT
Meharry Medical College
1005 D B Todd Boulevard, Suite 127
Nashville, TN 37208

VACANT
Morehouse School of Medicine
720 Westview Drive SW
Atlanta, GA 30310-1714

ENVIRONMENTAL HEALTH INFORMATION PARTNERSHIP

EnHIP Schools Researching Climate Change

Jackson State University, Jackson, Mississippi

Effects of Hurricane Katrina on Land Cover Within the Grand Bay National Estuarine Research Reserve in Mississippi, USA
Eric D. Evans, Paul B. Tchounwou, Yerramilli Anjaneyulu

Hurricane Katrina hit the Mississippi Gulf Coast on August 29, 2005, as a Category 3 hurricane at the mouth of the Pearl River on the Mississippi/Louisiana border. Hurricane Katrina is considered one of the costliest natural disasters in United States history. Grand Bay National Wildlife Refuge (GBNWR) is located in the coastal zone of Jackson County in Mississippi and Mobile County in Alabama. The Mississippi portion of GBNWR is part of the 18,400-acre Grand Bay National Estuarine Research Reserve (GBNERR), which was designated in 1999. The objectives of this study were to map changes to wetland and forest habitats resulting from Hurricane Katrina and to discuss the implications of changes in these habitats on biodiversity within the GBNERR. Pre- and post-Hurricane Katrina subsets of the GBNERR—Bayou Heron and Bangs Lake—were derived from Landsat (satellite) images downloaded from The Coastal Change Analysis Program (C-CAP) Web site. Unsupervised classification and change detection analysis were applied to each Landsat-derived, three-band data sets. The land cover change analysis revealed that Hurricane Katrina caused a decrease in evergreen forest and the conversion of evergreen forest into grassland. The major land cover changes were due to the expansion of open water. The increase in open water caused the decrease in estuarine emergent wetlands (salt marsh habitats) and the conversion of one type of land cover into another. These land cover changes could have a profound effect on the flora and fauna located within the reserve. Remote sensing technology appears to be a valuable tool for monitoring and implementing restoration and conservation strategies by the GBNERR managers.

Environmental Modeling and Prediction for Climate and Seasonal Fluctuations over Grand Bay of the Gulf of Mexico
Suseela Reddy, Paulinus Chigbu, Paul B. Tchounwou

The Gulf of Mexico region is prone to severe weather events throughout the year and is affected due to environmental changes over the coastal regions (e.g., flooding and sea breeze circulations, tropical cyclones/hurricanes, El Niño-Southern Oscillation [ENSO]). Understanding, modeling, and predicting weather/climate dynamics and meteorological coastal processes for the Gulf region are important for agriculture, fisheries and forestry management because this region is of interest to the country's economy and social aspects. The goal is to investigate the seasonal patterns of meteorological parameters in order to predict their impacts on ecosystem and fish populations over the Grand Bay National Estuarine Research Reserve (GBNERR) area by using the Penn State/NCAR Mesoscale Model (MM5). In the present study, the MM5 version 3 Weather/Environmental model was run by using data assimilation techniques where nonconventional data from various sources are fed into the model as initial and lateral boundary conditions to simulate seasonal variations of surface features and precipitation. Other

simulation parameters include sea surface temperature, sea level pressure, and surface wind magnitude. The climatic and seasonal fluctuations of these parameters have important implications for the GBNERR ecosystem.

Factors Determining Distribution and Composition of Submersed Aquatic Vegetation (SAV) in Grand Bay National Estuarine Research Reserve (GBNERR), Mississippi
Hyun J. Cho, Christopher A. May, Melissa Larmer, Christina Watters, and Clayton Younts

Submersed aquatic vegetation (SAV) is a vital component of ecological dynamics and productivity of coastal ecosystems. Composition and distribution of SAV reflect water quality, including salinity and water transparency. Healthy SAV beds reduce wave energy, enhance sedimentation, stabilize sediment, provide fisheries habitat, and serve as a food source for wildlife. Estuarine SAV affects processes, evolution, and the fate of the estuary. Therefore, information on SAV distribution, composition, and abundance is widely used as an indicator of aquatic environmental quality. Major activities of this research project include (1) monitoring seasonal and annual changes in species composition, areal extent, and density of SAV; (2) assessing the effects of water quality on SAV depth distribution; (3) visualizating and modeling the increases in SAV distribution with improved water quality by using Geographical Information System (GIS); and (4) collecting hyperspectral data over SAV beds and experimental tanks to investigate the depth-induced variation in the spectral responses.

University of Puerto Rico, Medical Sciences Campus, San Juan, Puerto Rico

Health and Medical Geography in the Context of Climate Change: The Case of Puerto Rico, 1990–2008
José Seguinot Barbosa Research Group on Health and Climate Change

This project focuses on the present and future situation of Puerto Rico by constructing the medical and health geography, as well as global warming indicators. The main objective is to present the prevalent health conditions during the period of 1990–2008 according to several diseases that are associated with climate change. Skin cancer (or melanoma), asthma, dengue, malaria, tuberculosis, and diabetes were considered. The exposure to climate change was examined by using temperature, precipitation, heat islands, and Sahara dust data. The spatial geographical analysis was done by using the Geographical Information System (GIS)—ArcGIS 9.3. Researchers used cluster and queries analysis to determine the municipalities and health regions with the highest and lower value for each epidemiological and climatic variable. This allowed researchers to construct the medical and health geography of Puerto Rico and its association with various elements of climate change.

Hampton University, Hampton, Virginia

Aircraft Lidar Measurements and MODIS Aerosol Optical Depths in a Regional Air Quality
Jasper Lewis, PhD Student, Department of Atmospheric and Planetary Sciences

Aerosols are small liquid or solid particles suspended in the atmosphere. Aerosols, which can occur naturally or by human activities, affect both climate and human health. History has shown that when aerosol concentrations reach unhealthy levels, mortality and morbidity rates increase. Consequently, government agencies are seeking methods to make better measurements and forecasts of aerosol concentrations. Ground in-situ monitors are used to measure aerosol concentrations in many cities

throughout the world; however, these are only point-source measurements and are not available in all locations. Satellite instruments are used to make global measurements of aerosol optical depth (AOD), which can be correlated to in situ aerosol concentrations at the surface; however, the process is complicated by the uncertainty in the vertical aerosol distribution. Aerosol layers aloft contribute to the columnar AOD but are not measured by in situ monitors at the surface. Therefore, it can be difficult to make strong correlations of AOD to ground aerosol concentrations.

Lidar measurements can be used to determine the vertical distribution of aerosol layers. The combination of lidar and satellite AOD measurements should improve correlations to aerosol concentrations at the surface. In this dissertation, aircraft lidar measurements are used in conjunction with AOD measurements, made by the MODerate resolution Imaging Spectroradiometer (MODIS) instrument aboard the Terra and Aqua satellites, and in situ measurements of aerosols at the surface in a regional-scale air quality study.

Five aircraft lidar flights were conducted in the Hampton-Norfolk-Virginia Beach region, showing complex aerosol distributions. Comparisons with MODIS AOD at 10×10 km and 5×5 km resolutions show good agreement with correlation R-squared values of 0.82 and 0.88, respectively. Linear regressions of PM2.5 and AOD resulted in R-squared values 0.71 and 0.82 for MODIS and aircraft lidar, respectively. The linear regressions reflect approximately 54 mg/m^3 to unity AOD. These relationships are in agreement with previous findings for air pollution aerosols in the eastern United States and in northern Italy. However, large vertical variation is seen case by case, with planetary boundary-layer heights ranging between 0.7 and 2 km and uncertainties between 0.1 and 0.4 km. The results of these case studies suggest that AOD can be used as an indicator of surface measurements of PM2.5 but with larger uncertainties associated with small aerosol loading (AOD < 0:3).

Furthermore, comparisons of winter and summer aerosol distributions in the San Joaquin Valley, California, were made by using two different aircraft lidar systems. The results show how measurements of the planetary boundary layer height provide valuable information needed to understand the relationship between satellite measurements of optical depth and in situ ground aerosol measurements. Finally, the techniques used during the aircraft lidar campaigns were applied to Cloud-Aerosol Lidar and Infrared Pathfinder Satellite Observation (CALIPSO) to demonstrate the potential use of spaceborne lidar for air quality monitoring, and suggestions were offered for the development of an aerosol lidar network collocated with PM2.5 monitors for improved ground aerosol measurements.

ENVIRONMENTAL HEALTH INFORMATION PARTNERSHIP

EnHIP PROJECTS 2009–2010

Benedict College, Columbia, South Carolina
Improving Minority-Serving Institutions' Knowledge of National Library of Medicine Resources Through Competitive Student Team Presentations

This project improves on previously funded informational efforts by requiring three teams of four students to intensely research the National Library of Medicine (NLM) online databases and to make presentations on their findings. The students have multidisciplinary majors, but all are members of the College's Student Environmental Health Association. Each team is required to research and prepare an informative poster and PowerPoint presentation on select NLM online databases. The students will present their findings to students, faculty, and staff within the College's School of Science, Technology, Engineering, and Mathematics (STEM) required seminar classes. Approximately 300 students will benefit from the posters and presentations. The goals of the project are to (1) increase awareness of important NLM resources among students within the College's School of STEM, and (2) improve students' ability to detail both orally and graphically important contributions of NLM databases. The project's objectives are as follows:

- Provide information to a core group of motivated students about NLM resources, including how those resources help in disaster preparedness.
- Assist the approximately 40 members of the College's Student Environmental Health Association in developing teams to research and make presentations on NLM databases.
- Identify top teams that will make presentations on NLM database research to students within junior- and senior-level STEM seminar courses.
- Conduct team presentations for seminar students' knowledge and evaluation.

Charles Drew University of Medicine and Science, Los Angeles, California
Environmental Health Outreach and Education Project

Consistent with NLMs efforts to promote scientific discovery and treatment and prevention of disease, the goals of this project are to increase the awareness of NLM online resources related to the use of toxicological, environmental, occupational, and hazardous materials/waste at Drew University, Martin Luther King, Jr. Multi-Service Ambulatory Care Center, and other agencies serving the south Los Angeles area; to provide instruction in the use of NLM Web-based resources; and to enhance the use and the distribution of health-related information to the Drew University faculty, staff, and students and the staff of other agencies serving the south Los Angeles area.

Training will be delivered to approximately 300 employees, professional staff, and students of Charles Drew University and its affiliated training sites and to the staff and clients of other agencies serving the south Los Angeles area. Experts in the fields of toxicology, environmental health, and informational and instructional technology will provide the training It will focus on the scientific literature in the fields of

medicine, nursing, dentistry, and health care systems; TOXNET® for information on toxicological profiles on hazardous chemicals that cause health and environmental effects; Haz-Map® for specific information about the possible effects of exposure to chemicals and biological agents; and Tox Town® for information on common toxic substances encountered in everyday life.

California State University at Northridge, Northridge, California
Assessing the Impact of NLM Web Site Training on Information Source Trustability

Many communities across the country face issues relating to pollution in their neighborhoods. As government agencies and businesses reach out to these citizens in an attempt to provide them information, there are factors that can influence the ability to successfully communicate environmental information. One of these factors is information source trustability (IST). It is the identification of those sources of information trusted by the community. The goal of this project is to understand which environmental information sources are considered trustworthy by Hispanic undergraduate students at California State University-Northridge (CSUN) and to determine whether the introduction to and the training of using NLM online resources changes the IST perspective of these students.

Previous studies (for example, the Six Community Study by Columbia University, 1992) have focused on traditional sources of information in the study of IST. These sources include community leaders, safety and medical service providers, friends, family, and companies. In the last two decades, new electronic sources of information are available and are used often to access information. As an example, the NLM Web site, which includes both health and toxicological information, is an authoritative source of health information available to the general public. The issue of IST needs to be reevaluated in light of these information sources. CSUN serves the community of southern California with its large Hispanic population. Understanding the issues of IST within this population is of interest to those who work in the community when faced with the issue of providing trusted health information. The nonscience major CSUN student population provides an opportunity to study the issues of IST within the Hispanic community and the availability and impact of electronic information sources.

Diné College, Shiprock, New Mexico
Using Shiprock, New Mexico, as a Model for a Rural Desert Town for the Tox Town® Web Site

The Diné College at Shiprock project will focus on increasing community awareness of toxics by modeling the NLM Tox Town Web site to create a typical desert southwest community in Indian Country. This focus stimulated from the many Native Americans who are not well informed of toxics they may be exposed to daily in their communities. Such communities have fewer services, a factor which contributes to toxic exposures. The project is targeted to rural communities, especially Native American communities. The overall goals of this project include improving environmental quality for rural communities through education and providing a convenient source for health information to rural communities. The objectives of this project are as follows:

- Using research already in progress from funding received from the U.S. Environmental Protection Agency, which has designated Shiprock, New Mexico, as a CARE community, add toxics unique to these locations.
- Providing links to the best information available to assist communities in improving their health through decreased exposures and better life choices.
- Providing links to volunteer programs that could be organized to help provide missing community services.

Howard University, Washington, DC
Consumer Genetics Education Network Workshop Continuation

The Consumer Genetics Education Network Workshop (CGEN) project will expand to include other wards of Washington, DC. The overall goal of the Howard CGEN project is to improve the genetic literacy of the participant communities by integrating genetic research activities into the local and national communities of African Americans and other people of color in order to facilitate their active participation in efforts to eliminate health disparities. The use of NLM Web sites will enhance the project by providing more educational resources to those who want to understand how genetics and race plays a role in their current health status. The CGEN project has been holding NLM database training workshops at churches and community centers to provide urban, underserved African-American adults the opportunity to enhance their literacy and content knowledge of genetic and family health history concepts, increase their awareness of the importance of genetic and family health history issues, and increase their skills to complete genetic-related tasks (e.g., family health history record). One intervention of the CGEN project includes the development of two handbooks used at community education training workshops.

The expected outcomes of the CGEN project are to (1) increase the genetic literacy so people can make informed health and genetics-related decisions, (2) increase access to and use of culturally appropriate programs, and (3) promote lifestyle changes to reduce health risks.

Jackson State University, Jackson, Mississippi
Continued Enhancement of Biomedical and Environmental Health Research and Education Through Utilization of the NLM Web-Based Resources

The goal of this project is to continue the enhancement of environmental health and biomedical sciences research and education at Jackson State University and around the world by hosting a pre-symposium workshop in conjunction with our yearly International Symposium on Recent Advances in Environmental Health Research. The pre-symposium workshop, titled "The National Library of Medicine Web Resources for Environmental Health Research," is provided for attendees who need information on health issues related to exposure to environmental substances (including those that are naturally occurring) and environmental agents known to induce illnesses and health disparities. The NLM Toxicology and Environmental Health Information Program (TEHIP) databases provide an invaluable resource to address these issues. Major emphasis will be placed on navigating through the TEHIP TOXNET® (Toxicology Data Network) databases and related resources. As in previous years, workshop participants will (1) learn

how to access NLM toxicology and environmental health databases on the Internet; (2) learn how to find valuable information on environmental contaminants; and (3) explore other environmental health information resources on the Internet. The seventh pre-symposium workshop will be held in September 2010. Attendees of the pre-symposium workshop will include Jackson State University's faculty, staff, and students who are involved in biomedical sciences and environmental health research as well as students, faculty, and scientists who will be participating in the international symposium.

Medgar Evers College, CUNY, New York, New York
Genomics Education and Outreach Program: DNA Ancestry, Human Variation, Complex Diseases and Health Promotion

Medgar Evers College (MEC) Genomics Education & Outreach Program (GenEOP) is completing its third year of operation. GenEOP is designed to educate and inform the students, the College, and community members about genetics and the human genome. This year the focus is on health promotion through education about the relationship of genes, environment, and human variation to complex diseases and wellness. Two diseases have been identified for special attention, asthma and diabetes. They are representative of the health disparities especially in urban minority communities.

The goal of this project is to provide information, incorporating the resources of NLM. Outreach activities will promote knowledge about genetics, human variation, health, and environment at the Brooklyn Public Library and at the College. The target audience will be MEC biology majors and other students, faculty, staff, and community members who use the Brooklyn Central Public Library and its branches.

Activities, such as workshops, community discussions, and a seminar, are planned throughout the year. They will focus on information and promotion of the knowledge of human variation, complex diseases, and healthy lifestyles through the interest created from the haplotype (a term used for different genes that are located closely together on the same chromosome and tend to be inherited) results of maternal and paternal ancestry obtained from the National Geographic Genographic Project.

Meharry Medical College, Nashville, Tennessee
Promote and Encourage the Use of "Trusted Information Services that Promote Health Literacy and the Reduction of Health Disparities"

Meeting the ongoing needs for health literacy in Nashville/Davidson County, Tennessee, this project builds on the College's efforts to collaborate with four local community churches in developing faith-based partnerships with public libraries to emphasize and promote the importance of health literacy and health disparities and their connection to community health as well as the knowledge and use of NLM databases and the electronic medical record. Focus meetings will be held to initiate discussions with the lay public through the "Faith-based Network" (Network) about NLMs free consumer information resources, health literacy, health disparities, and the value and importance of the electronic medical record in patient care. The next step will be to increase the awareness of 500 members of the Network regarding health literacy, health disparities, and the importance of electronic medical records by offering sessions on how to access and use NLM and other federal agency databases and resources. This will empower

individuals and families in the Network to gain information on health literacy and health disparities through trusted electronic databases and to reinforce searching skills and knowledge in their explorations.

It is anticipated that these activities will influence participants on the necessity of becoming more knowledgeable about trusted information services on Web sites by using NLM as the authoritative resource for disseminating health information.

Morehouse School of Medicine, Atlanta, Georgia
Disaster and Emergency Planning Outreach Workshops at Three Atlanta Fulton Branch Public Libraries

Continuing with its public health preparedness efforts, this project builds on the previous year's project by presenting workshops on disaster and emergency at three Atlanta Fulton Public Libraries, targeting public libraries and their users. This project has the potential of reaching at least 1,200 individuals. The Morehouse School of Medicine (MSM) already houses a Regional Coordinating Center for Hurricane Response. MSM believes strongly in providing disaster and emergency information to the community.

Through a series of workshops, MSM librarians will use the resources from the NLM newly formed Disaster Information Management Research Center to show participants where to find disaster or emergency information, how to create a disaster or emergency plan, and how to share the information with members not living with them and encourage them to have a plan of their own. Other selected NLM databases and resources will be demonstrated, including Haz-Map, Household Products, Tox Town, TOXMAP®, and MedlinePlus®. Promotional activities will include a kickoff event at each library with brochures, flyers, posters, e-mails, resource manuals, and on-site demonstrations of NLM databases.

Southern University A&M College, Baton Rouge, Louisiana
Journey to Wellness Online with the National Library of Medicine: Community based Workshops

The purpose of the project is to provide basic health informatics instruction to students, faculty, and community members to promote and enhance their ability to use NLM databases and resources. Implementation plans are as follows:

- To design an interactive, comprehensive one-day symposium to introduce and demonstrate practical uses of eight NLM databases and resources to new users
- To implement a face-to-face and online course/content specific e-health resource module for future users
- To evaluate the effectiveness of the teaching styles used in the symposia and to evaluate new users' ability

The following NLM databases and resources will be introduced to 20 institutional and community change agents and 30 nursing students:

- **Health Services Research and Health Care Technology**—Includes clinical practice guidelines.
- **Journals Database**—Search for journals cited in any Entrez databases, including PubMed®.

- **NIH Public Access**—The NIH Public Access Policy ensures that the public has access to the published results of NIH-funded research. The NIH Manuscript Submission System is a mechanism for authors to deposit their NIH-funded manuscripts.
- **Research Reporting Guidelines and Initiatives by Chart**—Shows the major biomedical research reporting guidelines that provide advice for reporting research methods and findings.
- **Disaster Information Management Research Center**—Health information resources and informatics research related to disasters of natural, accidental, or deliberate origin.
- **Environmental Health and Toxicology**—A portal to numerous NLM databases and resources in environmental health and toxicology.
- **MedlinePlus**—Health information for patients, families, and health care providers. Also available in Spanish.
- **NIH Senior Health**—Easily accessible, age-related health information.

Texas Southern University, Houston, Texas
Knowledge for Health

The goal of this project is to provide primary prevention and intervention through education and risk factor modification during childhood to reduce chances of developing cardiovascular disease (CVD) in adulthood. Therefore, specific target approaches have been proposed in order to assess (1) the level of knowledge, attitude, and practices related to CVD risks among middle-school-aged African-American students and their parents; and (2) the impact of an educational intervention to encourage healthy behavior.

The objective of the project is to ascertain the baseline knowledge, attitude, and practice (KAP) about CVD among middle-school-aged African-American students and their parents and to enhance their knowledge through a series of activities and lessons.

To following strategies will be employed to complete this study:

- Phase I: Recruitment of eligible students, age 12 to 15, enrolled in the University's Charter School.
- Phase II: Data collection (Part I) will consist of obtaining a detailed questionnaire from students and parents to determine their baseline KAP.
- Phase III: Delivery of the intervention will take place though program staff providing students with a series of educational sessions about CVD. Similar information will be sent home to share with parents.
- Phase IV: Data collection (Part 2) will consist of a questionnaire similar to the one that was given to students and parents during Phase II to determine the impact of the project.

University of Puerto Rico, Medical Sciences Campus—San Juan, Puerto Rico
Outreach Project in Environmental Health Information Path 2009–2010

Continuing the University's commitment to increase awareness about health and environmental concerns, the goal of this project is to reduce the inequality in the access to information related to health among minority groups, disadvantaged communities, and health students and to increase the awareness of addressing health literacy among groups of students, librarians, school faculty, and community leaders. Customized training in the effective use of NLMs medical and environmental online databases will be provided to the following groups:

- Graduate students in the programs of pharmacy, nursing, and basic sciences (microbiology, anatomy, pharmacology and toxicology, biochemistry) and faculties of the Medical Sciences Campus.
- Students of the ASPIRA Association's Alternative School (CASA—Spanish acronym for Help and Student Services Centers) in subjects related to health and environment that impact their lives (sexually transmitted diseases and HIV).
- Middle and high school teachers and students and school librarians.
- Faculty, librarians, and graduate students of private universities located in the San Juan metropolitan area.
- A graduate student's project on the quantization and toxic effects characterization of xylazine (a veterinary anesthetic) mixed with recreational drugs by substance abuse addicts in Puerto Rico.

The University of Texas at El Paso, El Paso, Texas
Service Learning in Guatemala: A Collaborative Project of Occupational and Physical Therapy Students

This international service learning project will give students the opportunity to practice clinical skills learned in the classroom. The students will improve their cultural competence and gain a better understanding of health disparities, two experiences they can apply to the local community. A group of selected occupational and physical therapy graduate students from the University of Texas at El Paso will spend a week during the 2010 school year working with children and adults with disabilities in several locations throughout Guatemala, including a special needs orphanage and a hospital/residential living center. Students will conduct evaluations, provide therapy, construct equipment, and consult with family members and staff.

Some anticipated outcomes of this project will provide opportunities for students to (1) understand the significant differences and similarities in culture as they relate to development, health, health disparities, and education between Guatemala and the United States; (2) describe the influences of the environment on service provision; and (3) identify the social and economic determinants of health care.

Xavier University—New Orleans, Louisiana
Connecting Older Americans and NLM Electronic Health Information

The project, Connecting Older Americans and NLM Electronic Health Information, will educate older adults regarding the use of computers and introduce them to resources provided by the NLM database, NIH SeniorHealth. The project developed a toolkit called "Helping Older Adults Search for Health Information Online: A Toolkit for Trainers." Once the training is complete, the participants will be introduced to select NLM Web sites as well as other reputable health information sites. These include Enviro-Health Links, Drug Information Portal, and MedlinePlus. Participants will be encouraged to navigate the selected NLM Web sites to obtain information on medications, emergency and disaster preparedness, and environmental health information for seniors. The project is targeted to residents of Christopher Homes, Incorporated, facilities for individuals age 60 years and older.

Anticipated outcomes of this project include (1) increase the number of older Americans who are able to use a computer; and (2) increase the availability of NLM electronic material to older Americans.