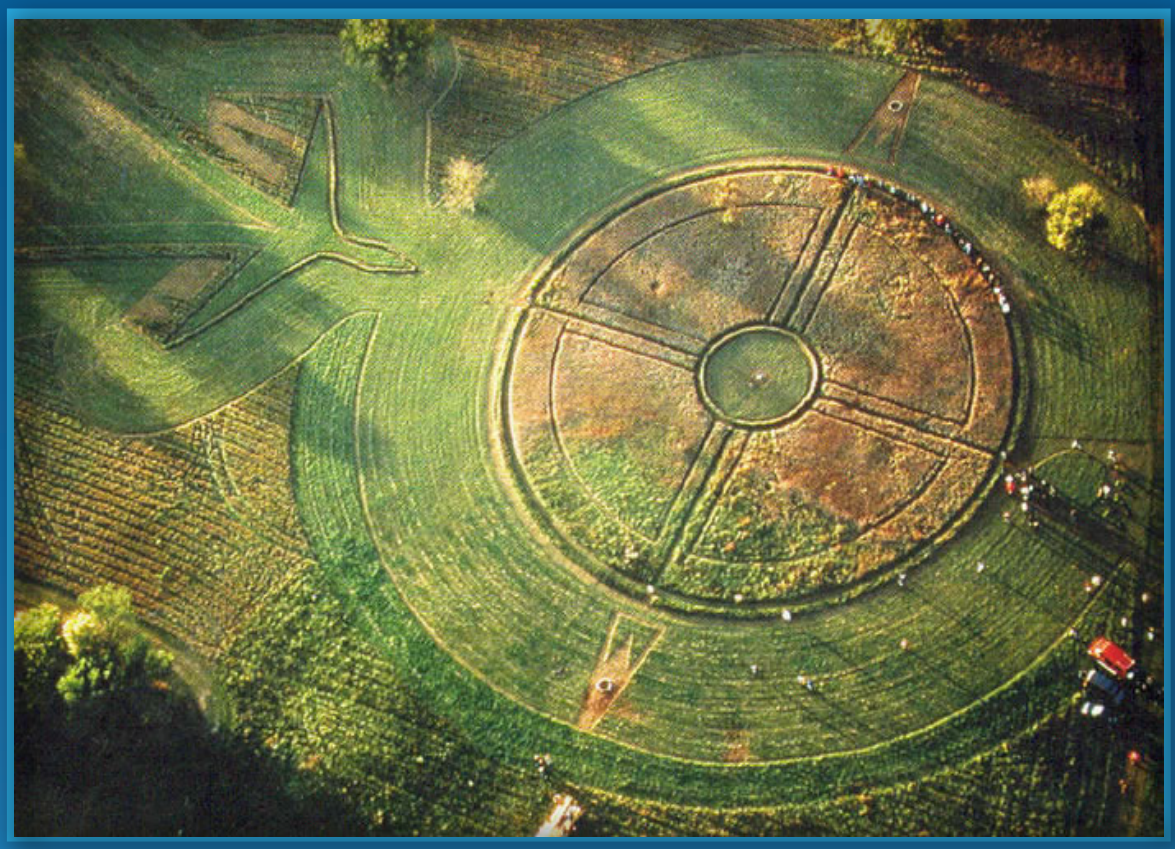
Environmental Health Disparities: Challenges and Opportunities

ENVIRONMENTAL HEALTH INFORMATION PARTNERSHIP



PROCEEDINGS
March 29-30, 2016

Cover: Haskell Medicine Wheel Earthwork

The Haskell Medicine Wheel earthwork lies in the heart of the Haskell wetlands, located south of the Haskell Indian Nations University campus. It is a place for prayer, solitude, and reflection. Students, faculty, staff, and tribal elders designed the Haskell Medicine Wheel earthwork in association with crop artist and painter Stan Herd. It was dedicated in 1992.

The Medicine Wheel has been used by generations of various Native American tribes for health and healing. It embodies the Four Directions, as well as Father Sky, Mother Earth, and Spirit Tree—all of which symbolize dimensions of health and the cycles of life.

Cover photo by Jon Blumb

National Institutes of Health
National Library of Medicine

Environmental Health Information Partnership

Proceedings

Haskell Indian Nations University

Lawrence, Kansas

March 29–30, 2016

Environmental Health Disparities: Challenges and Opportunities

Prepared for

Division of Specialized Information Services

National Library of Medicine

Prepared by

Health, Energy, and Environment

Oak Ridge Associated Universities

This document was prepared for the **Division of Specialized Information Services, National Library of Medicine, National Institutes of Health** by the Oak Ridge Associated Universities (ORAU)

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CONTENTS

History of Haskell Indian Nations University

For more than a century, the educational needs of many American Indian and Alaska Native youths have been met by a small school in Lawrence, Kansas. From the beginning, the institution's curricula were oriented toward American Indian and Alaska Native cultures.

The school opened with 22 American Indian children in 1884. Enrollment at the United States Indian Industrial Training School grew very quickly to more than 400 students.

At first, the training school taught agricultural education and industrial trades. Boys learned farming, wagon making, harness making, blacksmithing, tailoring, shoe making, and painting. Girls learned cooking, sewing, and homemaking.

As a decade passed, the curriculum expanded from elementary grades to also include high school classes. A school to train high school graduates to be teachers was added to address the need for better education in the students' home communities. The Commercial Department, a predecessor of the Business Department, opened in 1895. It was equipped with five typewriters; it is believed that the school's type-touching class was the first one taught in Kansas.

The State of Kansas accredited the high school in 1927, leading to the addition of post-high school classes in several subject areas. Industrial training gained more importance in the early 1930s, and the school evolved into a vocational and technical training institution by 1935. With this new emphasis, the secondary program was phased out, and the last high school class was graduated in 1965. During these decades, the school's athletic programs, particularly football, gained much recognition and led to the campus serving as the home of the American Indian Athletic Hall of Fame.

In 1970, the school began offering a junior college curriculum; this expanded curriculum brought about a name change—Haskell Indian Junior College. In 1992, the National Haskell Board of Regents recommended a new name to reflect its vision for the institution as a national center for Indian education, research, and cultural preservation. The name Haskell Indian Nations University was approved in 1993.

More than 1,000 students from federally recognized tribes from across the United States enroll every semester. They select programs that will prepare them to enter baccalaureate programs in American Indian studies, elementary education, business administration, and environmental science. They can choose to transfer to another baccalaureate degree-granting institute or enter directly into employment.

Haskell University remains unique in many ways, perhaps foremost because of its intertribal constituency and federal support through the Bureau of Indian Affairs. It continues to integrate American Indian and Alaska Native culture into all of its curricula.

Photos: Haskell Indian Nations University

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ENVIRONMENTAL HEALTH INFORMATION PARTNERSHIP MEETING

Theme: Environmental Health Disparities: Challenges and Opportunities

Haskell Indian Nations University, Lawrence, Kansas
Navarre Hall, Room 114
March 29–30, 2016
Patricia Matthews-Juarez, PhD, Presiding

AGENDA

TUESDAY, MARCH 29, 2016

8:30 a.m. – 8:45 a.m.	Registration
8:45 a.m. – 9:15 a.m.	**Meeting Opening and Welcome** Patricia Matthews-Juarez, PhD Chairman, EnHIP
	Haskell Indian Nations Tribal Blessing Rob Brave Lakota Singer, Haskell Indian Nations University
	Remarks Venida S. Chenault, PhD President, Haskell Indian Nations University
	Remarks and NLM Update Betsy L. Humphreys, MLS Acting Director and Deputy Director, NLM
9:15 a.m. – 9:25 a.m.	**Introductions**
9:25 a.m. – 10:00 a.m.	**Global and Regional Environmental Issues** J. Michael Kuperberg, PhD Executive Director, U.S. Global Change Research Program
10:00 a.m. – 10:15 a.m.	**Discussion and Q&A** Facilitated by Ann Barbre, PhD Xavier University of Louisiana
10:15 a.m. – 10:30 a.m.	**South Carolina Floods** Milton A. Morris, PhD Benedict College

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ENVIRONMENTAL HEALTH INFORMATION PARTNERSHIP MEETING

Haskell Indian Nations University
Navarre Hall, Room 114

AGENDA

10:30 a.m. – 10:45 a.m.	BREAK
10:45 a.m. – 11:20 a.m.	**Haskell Environmental Research Studies Discussion Panel** • Daniel R. Wildcat, PhD Haskell Indian Nations University, *Panel Moderator* • Bridgett Chapin, PhD, Haskell Indian Nations University • Melinda M. Crow, MS, Haskell Indian Nations University
11:20 a.m. – 12:00 p.m.	**Discussion and Q&A** Facilitated by Daniel R. Wildcat, PhD
12:00 p.m. – 1:30 p.m.	**LUNCH**
	Presentation of Certificate to Ann Barbre, PhD Betsy L. Humphreys, MLS Patricia Matthews-Juarez, PhD
	Indigenous Peoples, Lands, and Resources: Findings from the Third National Climate Assessment Timothy M. "Bull" Bennett, PhD President and CEO, Kiksapa Consulting, LLC.
1:30 p.m. – 2:00 p.m.	**EnHIP Group Picture** Haskell Indian Nations University Campus
2:00 p.m. – 4:30 p.m.	**Walking Tour of Haskell Indian Nations University Campus** Led by Haskell Eco Ambassadors Haskell Cultural Center and Museum Tommaney Hall Sequoyah Hall
4:30 p.m. – 4:45 p.m.	**Wrap-up and Day 2 Overview** Patricia Matthews-Juarez, PhD

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ENVIRONMENTAL HEALTH INFORMATION PARTNERSHIP MEETING

Haskell Indian Nations University
Navarre Hall, Room 114

AGENDA

WEDNESDAY, MARCH 30, 2016

8:30 a.m. – 8:45 a.m.	Registration
8:45 a.m. – 9:00 a.m.	**Welcome and Introductions** Patricia Matthews-Juarez, PhD Chairman, EnHIP
9:00 a.m. – 9:45 a.m.	**Environmental Epigenetics** Harriet Karimi Kinyamu, PhD Scientist, National Institute of Environmental Health Sciences
9:45 a.m. – 10:00 a.m.	**Discussion and Q&A** Facilitated by Robert Copeland, Jr., PhD Howard University College of Medicine
10:00 a.m. – 10:15 a.m.	BREAK
10:15 a.m. – 10:45 a.m.	**Community Mapping** Kurt Menke, MA, GISP Founder, Bird's Eye View GIS Introduction and Discussion by John C. Scott, MS Director, Center for Public Service Communications
10:45 a.m. – 11:15 a.m.	**Results of EnHIP Institutional Assessment** Janice E. Kelly, MLS Acting Deputy Associate Director, SIS, NLM
11:15 a.m. – 11:30 a.m.	**Wrap-up** Gale Dutcher, MLS, MS Acting Associate Director, SIS, NLM
11:30 a.m. – 11:45 a.m.	**Closing Remarks** Patricia Matthews-Juarez, PhD

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PROCEEDINGS OF THE ENVIRONMENTAL HEALTH INFORMATION PARTNERSHIP (EnHIP) MEETING
March 29–30, 2016

The Environmental Health Information Partnership (EnHIP) convened for its first session on March 29, 2016, at 8:45 a.m. in Navarre Hall of Haskell Indian Nations University, Lawrence, Kansas. EnHIP Chairman Dr. Patricia Matthews-Juarez, Professor and Vice President for Faculty Affairs and Development, Meharry Medical College, presided. The theme of the meeting was "Environmental Health Disparities: Challenges and Opportunities." Representatives convened again March 30, 2016, at 8:45 a.m. at Navarre Hall until adjournment at 11:45 a.m.

ATTENDEES

Representatives from Participating Schools

Dr. Ann Barbre, Xavier University of Louisiana
Ms. Dolores (Dee) E. Caffey-Fleming, Charles R. Drew University of Medicine and Science
Dr. Robert L. Copeland, Jr., Howard University
Dr. Patricia Matthews-Juarez, Meharry Medical College
Dr. Judith Mazique, Texas Southern University
Dr. Arlene Montgomery, Hampton University
Dr. Milton A. Morris, Benedict College
Dr. T. Joan Robinson, Morgan State University
Dr. Paul B. Tchounwou, Jackson State University
Dr. Daniel R. Wildcat, Haskell Indian Nations University
Dr. Doris Withers, Medgar Evers College, CUNY
Ms. Jessica Zephier, Oglala Lakota College
Ms. Jill Ziemann, Colorado Mountain College

Alternate Representatives

Dr. Stephanie Bauer, University of Alaska Anchorage
Dr. Cheryl Davis, Tuskegee University
Dr. João Ferreira-Pinto, The University of Texas at El Paso
Dr. Aramandla Ramesh, Meharry School of Medicine
Mr. Joe Swanson, Jr., Morehouse School of Medicine

Consultant to the EnHIP

Mr. John C. Scott, Center for Public Services Communications

Speakers
Dr. Bridgett Chapin, Haskell Indian Nations University
Dr. Venida S. Chenault, President, Haskell Indian Nations University
Ms. Melinda M. Crow, Haskell Indian Nations University
Dr. Timothy M. "Bull" Bennett, President, Kiksapa Consulting, LLC
Dr. Harriet Karimi Kinyamu, Scientist, National Institute of Environmental Health Sciences, NIH
Dr. J. Michael Kuperberg, Executive Director, U.S. Global Change Research Program
Mr. Kurt Menke, Founder, Bird's Eye View GIS

Invited Guests
Mr. Ron Brave, Haskell Indian Nations University
Ms. Lori Hasselman, Haskell Indian Nations University
Environmental Research Studies Students, Haskell Indian Nations University

NLM Staff
Ms. Betsy L. Humphreys, Acting Director, NLM
Ms. Gale Dutcher, Acting Associate Director, Division of Specialized Information Services, NLM
Ms. Cynthia Gaines, Project Officer, Division of Specialized Information Services, NLM
Ms. Janice E. Kelly, Acting Deputy Associate Director, Division of Specialized Information Services, NLM

ORAU Staff
Ms. Wilma Templin-Branner, Oak Ridge Associated Universities
Ms. Linda Lange, Oak Ridge Associated Universities

Day 1

I. Meeting Opening and Welcome

EnHIP Chairman Dr. Patricia Matthews-Juarez, Professor and Vice President for Faculty Affairs and Development, Meharry Medical College, opened the meeting on March 29, 2016, at 8:45 in Room 114, Navarre Hall, Haskell Indian Nations University, Lawrence, Kansas. The theme of the meeting was "Environmental Health Disparities: Challenges and Opportunities."

II. Haskell Indian Nations Tribal Blessing

Dr. Daniel R. Wildcat, EnHIP representative of Haskell Indian Nations University, spoke in his native language and English to welcome everyone to the campus where he has been for 30 years. He is a Yuchi member of the Muscogee Nation of Oklahoma. Dr. Wildcat introduced Mr. Ron Brave, Lakota Singer, Haskell Indian Nations University. Mr. Brave offered a song and delivered a tribal blessing in the Lakota language. Dr. Wildcat introduced Dr. Venida S. Chenault, President, Haskell Indian Nations University.

III. Remarks

Dr. Venida S. Chenault, President, Haskell Indian Nations University, explained that speaking and singing in native languages are expressions of world view, culture, and philosophies. She introduced herself in her native language, saying she is of the Bear Clan. She belongs to the Prairie Band Potawatomi Nation and Kickapoo Tribe.

"I thank our Father Creator for bringing us together today," said Dr. Chenault as she extended a gracious welcome to the group. She described the Earth as the Mother that nurtures the people and provides for their needs. If people destroy the Earth through unwise practices, they destroy their future.

Environmental issues and their consequences are often disproportionately borne by people without resources and access. Oftentimes, these are people of color. Disruptions to the environment and a way of life over an extended time sometimes cause people within tribal communities to act with violence, yet this reaction is contradictory to the nature of indigenous people. To solve environmental issues, people will be required to engage collaboratively and use collective knowledge.

Dr. Chenault is the seventh president of Haskell Indian Nations University. Throughout her professional career, Dr. Chenault has advocated for supporting the role of higher education in solving social, legal, political, environmental, and cultural issues in Indian Country. Her research focuses on violence and abuse against indigenous women.

IV. Remarks and NLM Update

Ms. Betsy L. Humphreys, Acting Director and Deputy Director, NLM, provided an update on the transition occurring at NLM following the retirement of Dr. Donald A.B. Lindberg in 2015. She expects the announcement of a new director in April or May. She noted that the Library's current Long-Range Strategic Plan extends through 2016. The new director will seek input from various advisory groups during the development of the next strategic plan. Ms. Humphreys encouraged representatives to think about EnHIP's goals and objectives for future initiatives and consider possible different directions for the Partnership. She is looking forward to her continued association with representatives as a new director takes the helm of NLM.

Ms. Humphreys reflected on the environmental problems of 1991, the Partnership's first year, and present-day challenges associated with climate change. She referenced the recent reemergence of the Zika and chikungunya viruses and predicted populations will deal with infectious diseases more frequently in the future as climate change impacts environments.

V. Introductions

Dr. Matthews-Juarez thanked Dr. Chenault for the opportunity to convene at Haskell Indian Nations University and Ms. Humphreys for the NLM update. Dr. Matthews-Juarez welcomed representatives, speakers, and invited guests and asked them to introduce themselves.

VI. Global and Regional Environmental Issues

Dr. J. Michael Kuperberg, Executive Director, U.S. Global Change Research Program, spoke of major findings related to human health from the most recent National Climate Assessment (2014) and more recent climate and health assessments. Dr. Kuperberg is on detail to the White House from the U.S. Department of Energy's Office of Science where he managed environmental research programs for the past decade.

Dr. Kuperberg's current assignment is in the Office of Science and Technology Policy, led by Dr. John P. Holdren, Assistant to the President for Science and Technology and co-chair of the President's Council of Advisors on Science and Technology. President Barack Obama has a strong interest in science and uses science to inform his decisions, according to Dr. Kuperberg.

The National Science and Technology Council oversees the work of various activities across the federal government, including the Committee on Environmental Natural Resources and Sustainability. The Subcommittee on Global Change Research began in 1989 and was mandated by the U.S. Congress in 1990 to assist the nation and the world to understand, assess, predict, and respond to human-induced and natural processes of global change. The Global Change Research Program involves 13 federal agencies, each providing information in their areas of expertise. In 2016, $2.5 billion in funding were allocated for research.

The release of the U.S. Global Change Research Program's Climate and Health Assessment is scheduled for this spring. A team of 100 experts from eight federal agencies and departments contributed to the report titled "The Impacts of Climate Change on Human Health in the United States: A Scientific Assessment." It synthesizes literature searches, assesses peer-reviewed science, weighs evidence, and provides confidence levels for key findings. Four chapters highlight recently published federal quantitative analyses of projected health impacts.

The National Climate and Health Assessment emphasized wide-ranging impacts related to climate change: extreme weather events, decreased air quality, threats to mental health, and illness transmitted by food, water, and disease carriers such as mosquitos and ticks. Increased rates of diabetes and respiratory diseases such as asthma are tied directly to increased vulnerability and sensitivity to environmental factors. Extreme precipitation events impact crops and water quality. The number of days and number of regions with extreme temperatures are increasing and causing dramatic changes to the way of life for many populations.

"Climate change will—absent other changes—amplify some of the existing health threats the nation now faces. Certain people and communities are especially vulnerable, including children, the elderly, the sick, the poor, and some communities of color," said Dr. Kuperberg. Public health actions, preparedness, and prevention can protect people; however as threats increase, the ability to adapt to future changes may be limited.

Dr. Kuperberg asked representatives to conduct research and contribute to assessments for the fourth National Climate Assessment, slated for delivery in 2018. The Global Change Research Program considers many areas of environmental research for inclusion in the National Climate Assessment, so he urged representatives to stay in contact about their published research. He encouraged them to respond positively when asked to review scientific documents.

VII. Discussion and Q&A with Dr. J. Michael Kuperberg

Mr. John Scott, Center for Public Service Communications, asked about cultural changes related to adaptations, particularly as populations are forced to move because of shifts in their environment. Dr. Kuperberg said it is challenging for chemists, biologists, and atmospheric scientists to answer questions about the science of adaptation. The U.S. Global Change Research Program has received requests from the National Academy of Sciences to expand its research program into the social sciences.

Dr. Milton A. Morris, Benedict College, asked to what extent climate change is being taught at universities. Dr. Kuperberg was aware of some universities where climate change is an active area of education, but he viewed those as isolated pockets. Representatives expressed interest in internship opportunities for their students.

In his closing statements, Dr. Kuperberg said, "The challenges we face are not so much about the world. We have built infrastructure, and we've built a society that's not resilient, that has not adapted to a dynamic world. Yet, we have increased the dynamism of the world, and we're going to suffer if we can't figure out a way to deal with this. So, we're really not so much worried about saving the world. The world will live on. It's about trying to save us."

VIII. South Carolina Floods

Dr. Milton A. Morris, Director, Environmental Health Science Program, Benedict College, gave an overview of the destruction brought on by heavy rains that swept across eastern and central South Carolina, his home state. In October 2015, record-breaking rainfall caused flooding, with Mount Pleasant receiving 26.88 inches of rain over a four-day period. Columbia and Charleston received 8.19 and 6.40 inches of rain, respectively, over a 12-hour period.

The heavy rainfall merited the moniker "1,000-year event" because statistically the precipitation amount has a 0.1% chance of occurring in a given year. The movement of very moist air over a stalled frontal boundary near the coast generated the extraordinary rainfall. The clockwise circulation around a stalled upper level low over southern Georgia directed a narrow plume of tropical moisture northward and then westward across South Carolina over four days. The outer circulation of Hurricane Joaquin, situated off the coast, added more tropical moisture to the weather system.

In a slide presentation, Dr. Morris showed stranded citizens, flooded homes, sagging power lines, collapsed roads, abandoned vehicles, damaged cemeteries, and closed businesses. The rainfall and flooding adversely affected all socioeconomic levels of communities; agricultural regions and wildlife areas felt impacts, such as soil erosion and displaced animals.

South Carolina National Guard and South Carolina Environmental Management Agency provided immediate assistance to residents. In subsequent months, an analysis by the Carolinas Integrated Sciences and Assessments at the University of South Carolina illuminated lessons to be learned about community resilience in the wake of extreme weather events. As the region gains population and expands development,

the potential grows for greater economic and environmental impacts, thus underscoring the need for greater resilience during recovery.

IX. Discussion and Q&A with Dr. Milton A. Morris

Dr. Paul B. Tchounwou, Jackson State University, asked about the impact on the state's economy. Dr. Morris indicated agricultural areas across the state suffered severe economic losses, and coastal areas such as Charleston and Myrtle Beach experienced a severe drop in tourism earnings. Responding to Dr. Wildcat's question about regulation of future coastal development, Dr. Morris indicated there is constant argument within the state legislature and at local levels about protecting the environment and developing coastal areas. "Both sides have strong arguments. It happens politically all the time," said Dr. Morris.

X. Haskell Environmental Research Studies Discussion Panel

Dr. Daniel R. Wildcat, Acting Dean, College of Natural and Social Sciences, Haskell Indian Nations University, and Director, Haskell Environmental Research Studies (HERS) Center, described recent environmental research projects. The Center opened in 1995 in partnership with the University of Kansas to advise communities and provide research opportunities and training for students. The Center promotes sustainable and restorative activities for native communities and environmental health. It has worked in partnerships with National Aeronautics and Space Administration, National Oceanic and Atmospheric Administration, National Center for Atmospheric Research, U.S. Environmental Protection Agency, and other federal agencies.

With assistance from a National Science Foundation grant, the Native People's Native Homelands program has allowed staff and students to study wetlands on the southern edge of campus. A seven-week geographic information system (GIS) geoscience "boot camp" teaches students about designing projects. Past projects included studies on air and water quality and declines in biodiversity. Two new projects through the U.S. Environmental Protection Agency examine actions to reduce food waste and the carbon footprint and water use on campus.

Dr. Wildcat, who served as panel moderator, introduced two colleagues, Dr. Bridgett Chapin and Ms. Melinda M. Crow.

Dr. Bridgett Chapin, Professor, Environmental Science, Haskell Indian Nations University, has a strong interest in indicators of environmental change, and she is an active proponent of community-based research. Also, she integrates environmental topics into other programs so students enrolled in business, elementary education, and indigenous and American Indian studies are connected to the environmental science research and curriculum.

One of the research projects developed at the University with funding from the Kansas Network of Biomedical Research Excellence involved students identifying a topic of interest, preparing a proposal, working with a mentor, and executing research. One student's project in Arizona's White Mountains involved testing water for phosphorus levels; the research motivated the student to continue his education in a graduate program.

Dr. Chapin developed a "Building a Network for Environmental Problem Solving" class as a means to connect students to relevant projects, people in tribal communities, and tribal, state, and federal governments. The University also has a visiting native scholar program to share learning and generate interaction with students and faculty.

Ms. Melinda M. Crow, Chair and Professor, Environmental Science Department, Haskell Indian Nations University, recognizes native people's cultural and spiritual connection to the environment. She encourages students to study environmental problems and gain awareness so they are equipped to hold influential positions with their home tribes. Native communities are especially vulnerable to climate change and environmental health disparities because of their remoteness, lack of infrastructure, lack of land ownership, atmospheric pollution, and limited water resources.

Ms. Crow, who hails from the San Carlos Apache Tribe in Arizona, serves as the program coordinator for the HERS Center. One of the main goals of the Center is to add a social aspect to the research process. Faculty and staff members and students conduct interviews with respected tribal elders to learn about changes to the environment and how this relates to other changes. In tribal languages, specific words for plants, sacred animals, and the timing of the season are influenced by the changing climate and environment. The associated culture, language, and spiritual connection are at risk or in transition. Great value lies in the opportunity to have meaningful conversations and reflect upon the changes occurring in native communities.

Ms. Crow described a project related to flooding issues and streambank erosion conducted in coordination with the Kickapoo Nation. The research will help protect tribal waters, the population's main source of drinking water. The project receives funding from the National Institute of Food and Agriculture, U.S. Department of Agriculture. Noteworthy projects under development are preservation of hardwood forests in coordination with the College of Menominee Nation in Wisconsin, and preservation of fish habitat in coordination with Northwest Indian College in Bellingham, Washington.

XI. Discussion and Q&A with Panel

Dr. Chenault explained funding from the federal government has origins in treaties and trust obligations that were negotiated when native lands were ceded. "Virtually every tribe negotiated for education in those treaties, so they were visionary thinkers and could see the importance of education," she said. Haskell Indian Nations University is one of 37 tribal colleges and universities that belong to the American Indian Higher Education Consortium. It serves members of the 567 federally recognized tribes.

The Environmental Science Department, the smallest of the four baccalaureate programs, has two full-time permanent faculty members and four adjunct faculty members. On average, 35 students are enrolled in the program. More than 50 students have completed the HERS program; about one half have applied to, enrolled in, or completed graduate degree programs.

Representatives asked about the future influence of students with Native American communities. Dr. Wildcat, who is Director of the HERS Center, observed that 30 to 40 years ago a very small number of Native Americans with college degrees worked in the area of environmental science. Nowadays, Native American professionals are moving into positions of influence within their tribes and changing policies in a positive way.

Dr. Matthews-Juarez urged collaboration among EnHIP member schools to further research, community engagement, and opportunities for students, faculty, and staff. She suggested establishing an exchange program for mentoring students.

XII. Presentation of Certificate to Dr. Ann Barbre

Ms. Humphreys acknowledged the contributions of Dr. Ann Barbre and thanked her for the four years of service as EnHIP Chairman. Ms. Humphreys stated, "Ann has been a stalwart member of this group,

probably since Day One. There were few women in the room then, but she was one of them, and during her chairmanship we have actually expanded the membership and opened it up in ways that will be serving us extremely well going forward. She has been a really great leader for the group in convening us and showing us, helping us to see the opportunities for collaboration which we are going to continue to build upon." Dr. Barbre became part of EnHIP's predecessor, the Toxicology Information Outreach Panel (TIOP), in 1991. Dr. Barbre is the Associate Dean for Administration and Academic Support and W. Emile and Alitia D. Coleman Professor of Pharmacy at Xavier University of Louisiana. A certificate of appreciation was presented to Dr. Barbre "for her leadership and dedication as Chair, Environmental Health Information Partnership, 2012–2016."

XIII. Indigenous Peoples, Lands, and Resources: Findings from the Third National Climate Assessment

Dr. Timothy M. "Bull" Bennett addressed the group during the lunch hour by providing information about the National Climate Assessment. He is Founder, President, and CEO of Kiksapa Consulting, LLC, and has worked to expand the science and technology capacity of tribal colleges and universities to address climate impacts and conservation issues. He is a member of the Mi'kmaq Tribe.

In 2011, Dr. Bennett was appointed to the National Climate Assessment Development and Advisory Committee, where he coordinated and served as co-convening lead author of *Indigenous Peoples, Lands, and Resources,* National Climate Assessment (2014). The National Climate Assessment summarizes the impacts of climate change on the United States now and in the future. A team of more than 300 experts guided by a 60-member federal advisory committee produced the report, which was extensively reviewed by the public and experts, including federal agencies and a panel of the National Academy of Sciences. The 2014 assessment is the third assessment to be released by the U.S. Global Change Research Program. It is used by the federal government, citizens, communities, and businesses as they create more sustainable and environmentally sound plans for the future.

"Climate change is not a myth, nor is it something on our horizon. It is happening now, and it has been happening for some time. We are now beginning to see the manifestations of some climate impacts," said Dr. Bennett. "Every American across the country in every sector, every walk of life from the smallest to the largest, from the richest to the poorest, is feeling the impacts of a changing climate."

Dr. Bennett focused on the key messages from the Human Health Chapter. Climate change threatens human health and well-being in many ways, including impacts from increased extreme weather events, wildfire, decreased air quality, threats to mental health, and illnesses transmitted by food, water, and disease carriers, such as mosquitoes and ticks. Projected precipitation patterns indicate the magnitude of floods in the Midwest is increasing, while droughts are becoming the norm in the Southwest. More catastrophic fires are occurring in the United States. Alaska's interior, a region that typically did not have large-scale fires, has experienced an increase in these fires. Unprecedented drought and insect infestations have weakened forests, leading to high fuel loads. Fuel load refers to flammable material (trees, underbrush, dry, grassy fields). Abundant, very dry fuel causes intense, fast-moving fires that are difficult to contain.

The most vulnerable populations are at greatest risk, as illustrated by a winter storm in the Central and Northern Plains in January 2010. Wind chills dropped to minus 50 degrees F, snow drifts topped 8 feet, and 12 inches of ice covered the snow. About 15,000 people living on the Cheyenne River and Standing Rock Reservations lost power because 3,000 power poles snapped. The water system and communication network failed across the region. People lived for more than one month without running water and power.

Dr. Bennett remarked the calamitous storm went unreported by news media possibly because it occurred at the same time as the massive earthquake in Haiti.

"Climate change poses very unique threats to indigenous people's health, well-being, homes and ways of life. A lot of our communities still rely on the land in order to survive. Climate change threatens native people's access to traditional foods, to whales, to walrus, to harvesting vegetation and plants and cultivating wild crops which have provided sustenance and cultural identity for thousands and thousands of years," explained Dr. Bennett. The traditional knowledge for hunting and gathering is becoming less reliable because the environment is changing.

Declining sea ice in Alaska is causing significant impacts to native communities, including increasingly risky travel and hunting conditions, damage and loss of settlements, food insecurity, and socioeconomic and health impacts from loss of cultures, traditional knowledge, and homelands. Permafrost thawing destabilizes buildings, roads, water and sewer systems, and other public infrastructure. Repairing this damage adds huge costs to already stretched maintenance budgets. Dr. Bennett explained the extra costs for infrastructure maintenance directly linked to permafrost thawing will be $3.6 to $6 billion.

"I would argue that our single most important currency in the 21st century is water," observed Dr. Bennett. A significant decrease in water quality and quantity is affecting drinking water, food, and cultures. Native communities' vulnerabilities and limited capacity to adapt to water-related challenges are exacerbated by historical and contemporary government policies and poor socioeconomic conditions.

Relocation is causing the loss of community and culture, health impacts, and economic decline. The Biloxi Chitimacha Chowtaw people of Isle de Jean Charles, Louisiana, have lost much of their land to the sea, so they have no choice but to relocate. The tribe was awarded a $48 million grant from the U.S. Department of Housing and Urban Development to reestablish its community; however, the amount is considered inadequate.

Public health actions, especially preparedness and prevention, can do much to protect people from some of the impacts of climate change. As threats increase, the ability to adapt to future changes may be limited. Actions to take include communicating frequently and effectively, adjusting land use practices, reducing greenhouse gas emissions, rethinking means of transportation, and investing in renewable energy sources like solar, wind, and geothermal.

In closing, Dr. Bennett said, "Our best opportunities for mitigation and adaptation efforts have to include that old knowledge from our traditional cultures. A tribal voice has to be persistent and ongoing through the process."

XIV. Discussion and Q&A with Dr. Timothy M. "Bull" Bennett

Ms. Humphreys spoke about the nation's appetite for and reliance upon energy, indicating there is no perfect energy source and all of them have a downside. Decision makers must make tough choices. In his response, Dr. Bennett recalled the valuable lessons of self-sufficiency he learned from his parents who were born during the Great Depression. He grew up in modest circumstances. His father built a washing machine using a plunger, five-gallon bucket of water, and lumber pieces crafted into a small wind turbine. "He turned it loose and let the wind wash his clothes," said Dr. Bennett. "So, I'm not saying there is a perfect energy source, but there's a perfect suite of energy sources, and that includes us taking off our lab coats and becoming part of the equation and accounting for our own contribution. That means us being able to take

a step back and maybe reducing our energy demand by 70% so that a five-gallon bucket actually does do our laundry."

XV. Group Picture and Walking Tour of Haskell Indian Nations University Campus

Representatives, speakers, and NLM staff gathered at the auditorium for a group picture. The auditorium was built in 1933 and houses murals painted by Franklin Gritts, a Haskell alumnus and a member of the Cherokee Tribe. After the photo-taking session, several representatives participated in a walking tour of the Haskell Indian Nations University campus, beginning with a visit to the Haskell Cultural Center and Museum. Director Ms. Jancita Warrington, gave a brief history of the historic educational institution and highlighted achievements of outstanding alumni. Ms. Warrington is a member of both the Prairie Band Potawatomi Nation and the Ho Chunk Nation.

Haskell Eco Ambassador Mr. Ray Phillips, a student from Lincoln, Nebraska, and a member of the Omaha and Santee Sioux Tribes, led a group of representatives across campus. Several structures are listed on the National Register of Historic Places, including Hiawatha Hall, built in 1898, the oldest building on campus. Most buildings on campus are named after Native American chiefs and historical figures.

The Haskell Student Success Center at Sequoyah Hall provides computer access and houses advising and tutoring offices. At the Academic Support Center in Tommaney Hall, Librarian Carrie Cornelius showed representatives the academic library's new computer center and Native American collections, which include a large selection of dictionaries of Native American languages and current newspapers from Native American nations. Ms. Cornelius is a member of the Prairie Band Potawatomi Nation and Oneida Tribe of Wisconsin. Director Beverly Fortner answered questions about library services and collaborations with other libraries. She is a member of the Diné (Navajo) Tribe.

XVI. Wrap-up and Day 2 Overview

Dr. Matthews-Juarez asked attendees to reflect on the meeting's rich discussion and express their thoughts.

Dr. Tchounwou indicated the impacts of climate change will open many opportunities for research, and educators at universities need to train a new generation of scientists. Mr. Joe Swanson, Jr., Morehouse School of Medicine, praised participatory, community-based research, and he called for public health programs to incorporate more into their curriculums.

Ms. Jill A. Ziemann, Colorado Mountain College, indicated climate change will cause populations to resettle, and to do that successfully, they will need to focus on community organizing. Dr. Stephanie Bauer, University of Alaska Anchorage, emphasized the importance of engaging indigenous people and sharing knowledge on health, science, humanities, and social sciences. Dr. Robert Copeland, Jr., Howard University College of Medicine, expressed a concern about respiratory, cardiovascular, and vector-borne diseases that most likely will increase with climate change. Ms. Gale Dutcher, SIS, talked about resiliency in a dynamic and changing world, and advocated for steps to be taken in advance for disaster preparation and response.

Mr. John Scott said climate change will affect minority communities before, and possibly harder, than other communities, and this could provide motivation for action in the environmental justice movement. Mr. Kurt Menke, Bird's Eye View GIS, said he is inspired by the community approach to solving climate change problems because it gives hope and is very powerful.

Many attendees expressed appreciation for the lessons they learned about Native American culture and heritage during their visit to Haskell Indian Nations University. Ms. Humphreys praised the wisdom of Dr. Chenault's opening remarks and thanked Dr. Wildcat for the interesting day at the campus.

Dr. Matthews-Juarez praised the excellent presentations of the morning and afternoon sessions, and previewed the next day's presentations on community mapping and influences in human health and disease on a molecular level.

Dr. Matthews-Juarez closed the afternoon session at 4:45 p.m.

Day 2

XVII. Welcome and Introductions

EnHIP reconvened March 30, 2016, at 8:45 a.m. in Room 114, Navarre Hall, Haskell Indian Nations University. EnHIP Chairman Dr. Patricia Matthews-Juarez welcomed representatives and invited guests.

XVIII. Environmental Epigenetics

Dr. Harriet Karimi Kinyamu presented an overview of environmental epigenetics and emerging research, and explained the role of epigenetics in complex diseases and health disparities. She is a staff scientist in the Chromatin and Gene Expression Section of the Epigenetics and Stem Cell Biology Laboratory at the National Institute of Environmental Health Sciences, National Institutes of Health. Dr. Kinyamu's current research work is focused on understanding the interplay between the ubiquitin proteasome system and epigenetic regulation of nuclear receptor mediated gene expression in breast cancer cells.

Dr. Kinyamu defined epigenetics broadly as the study of the processes involved in the unfolding development of an organism, and more specifically as the study of heritable changes in gene function that occur without changes in DNA sequence. She gave examples of how diet, behavior, and other factors can affect epigenetics, and described experiments that implicate epigenetic changes in long-term health.

Epigenetics information is stored in chromatin, which consists of DNA wrapped around four pairs of histone proteins. Epigenetic modifications regulate the accessibility of DNA to control gene expression. Some epigenetic marks on DNA and histones result in condensed chromatin that shuts down gene expression. Other epigenetic modifications relax chromatin and allow gene expression. With cancer cells, epigenetic mechanisms are misregulated. Three known mechanisms of epigenetic regulation are DNA methylation, histone modification, and RNA-mediated gene silencing.

Dr. Kinyamu listed a number of environmental factors that influence the epigenome: stress, exercise, disease, microbiome, social interactions, drugs, smoking, alcohol, toxic chemicals, and diet. She described several studies conducted with mice and rats, and explained how physical and behavioral characteristics can be altered by epigenetic modification. She also mentioned recently published experimental evidence of transgenerational inheritance of an epigenetic mark in humans—specifically, in Holocaust survivors and their offspring—with possible psychological consequences.

Dr. Kinyamu said that endocrine disrupting chemicals have been shown to cause epigenetic modifications. These chemicals include lead, arsenic, mercury, dioxin, organophosphate pesticides, fire retardants, and many other widely used substances that are present in the environment. Prenatal exposure to the endocrine disrupting drug diethylstilbestrol in the 1960s increased the incidence of vaginal and breast cancers and caused reproductive abnormalities. More recently, female infants drinking soy milk were found to

have higher methylation of a certain gene when compared to infants drinking cow milk. Soy products contain genistein, an endocrine disruptor. The affected gene is an important signaling pathway for insulin metabolism, suggesting possible links to diabetes, obesity, and metabolic syndrome.

Dr. Kinyamu pointed out that genetic material does not control destiny. Negative epigenetic marks can be reversed by changes in lifestyle, such as improving diet, stopping smoking, and increasing exercise. Food insecurity is a major factor linking environmental epigenetics and health disparities. Scientific literature evidence indicates breast, prostate, and lung cancers have genes that are epigenetically regulated. Dr. Kinyamu explained that Caucasian women with estrogen positive breast cancer are treated more successfully than African-American women who have the same disease. African-American women die more frequently, though fewer African-American women contract the disease. These differences lead to questions about mutations or a nonfunctioning estrogen receptor.

XIX. Discussion and Q&A with Dr. Harriet Karimi Kinyamu

Dr. Copeland, Howard University, asked about climate change and its effect on the epigenome. Dr. Kinyamu said adaptation to a changing environment will cause stress, a factor that influences the epigenome. Dr. Doris Withers, Medgar Evers College, CUNY, and Mr. Scott referenced unique minority ethnic populations who experienced severe stress and deprivation. Ms. Humphreys expressed keen interest in a precision medicine initiative where the genetic signatures of tumors lead to targeted treatments for cancer. Patients with different epigenomes are treated with customized drug therapies to increase effectiveness.

XX. Community Mapping

Mr. John C. Scott, Director, Center for Public Service Communications, provided background information about the Community Health Maps initiative of the Specialized Information Services Division, NLM. He has served as an NLM consultant for more than 25 years, including 20 years as an advisor to EnHIP. Mr. Scott is Tlingit and a member of the Tlingit and Haida Indian Tribes of Alaska.

While using geographic information system (GIS) technology in the aftermath of Hurricane Katrina in 2005, Mr. Scott realized some of its shortcomings. Data were handed over to local organizations, but in many instances, the organizations did not have the capacity and training to use it and update it. Also, some minority communities were underrepresented. Ms. Gale Dutcher, SIS, supported the NLM Community Health Maps initiative as technology changed and simplified over the years. The initiative encourages communities to map their own health conditions and generate their own hypotheses. Community researchers are able to explore these hypotheses at low cost and with a low learning curve.

Mr. Scott introduced Mr. Kurt Menke, GISP, Founder, Bird's Eye View GIS. He has served as an NLM consultant for 10 years, and his projects have focused on empowering underserved populations with mapping technology. Mr. Menke gave an example of how GIS mapping uses visuals to identify patterns by showing a map of Baltimore, Maryland, colored by the incidences of diabetes and the areas labeled food deserts. Databases are useful, but they are often difficult to interpret. Maps are more intuitive. Eighty percent of information has a geographic component, so GIS maps are helpful in generating hypotheses.

"You can start seeing trends that can lead you to do further investigation about what's going on in that location," Mr. Menke said. He directed attention to NLM Community Health Maps, a mapping tool for community-based organizations. The tool outlines a workflow that begins with collecting data with smartphones and tablets in the community.

Mr. Menke gave a demonstration of survey work using a Fulcrum data collection application. The survey

data can be uploaded and placed on maps using an account with CartoDB, a software cloud computing platform that provides GIS and Web mapping tools. Information can also be downloaded to a computer for in-depth analyses. Mr. Menke reviewed three case studies conducted in Honolulu, Hawaii; Seattle, Washington; and Charleston, South Carolina. At each location, training of survey workers and collection of data were completed in a short time and at low cost.

Mr. Menke writes a blog on the NLM Community Health Maps Web page to keep people informed about the changing technology. Also, the Web page has six lab exercises to take users through the workflow from data collection to online data presentation.

XXI. Discussion and Q&A with Mr. Kurt Menke

Representatives offered several uses for the technology, including location of asbestos and radon in residences. Dr. Stephanie Bauer asked about the ethics involved with using these tools and releasing the gathered information. Mr. Menke indicated professional certifications dictate a high ethical standard. Also, privacy laws govern public health data.

XXII. Results of EnHIP Institutional Assessment

Ms. Janice E. Kelly, Acting Deputy Associate Director, SIS, NLM, presented results from two assessments conducted for EnHIP by ORAU to validate the impact and continued relevance of EnHIP, provide the clearest understanding of the representatives' experiences, and receive feedback about the Partnership.

For the EnHIP Evaluation Assessment, 22 representatives and alternates received an e-mail invitation to participate in an online survey; 18 representatives responded; of these, 15 representatives completed the survey in its entirety. Respondents use NLM resources frequently, specifically PubMed®/MEDLINE® (89%), MedlinePlus.gov (78%), and TOXNET® (68%). Most respondents indicated NLM resources are easily accessible and user-friendly.

Respondents mentioned several ways their institutions benefit from EnHIP. Mentioned benefits included awareness and use of NLM online resources, increased knowledge of environmental health for students and faculty, support of environmental research and publications, improved teaching and learning in science, technology, engineering, and mathematics (STEM) disciplines, and increased visibility of their institutions nationally and internationally. Respondents suggested the following ways EnHIP could be improved: (1) increase funding (EnHIP Award), (2) initiate more communication with leadership and representatives, (3) invite students to meetings, and (4) involve representatives in the planning and focus of future meetings.

For the Member School Assessment, representatives were asked to identify two faculty or staff members of their institutions to complete a separate assessment to provide feedback about their information needs. It was requested that the selected individuals have involvement with the toxicology, environmental health, and/or public health studies and programs. Sixteen member schools responded to the request; 32 faculty or staff members received an e-mail invitation with an electronic survey link. Twenty-eight faculty or staff members (88%) responded to the survey; 23 faculty or staff members (82%) completed the survey in its entirety.

Respondents indicated they used NLM resources in preparation for a publication or presentation (100%). Other frequently mentioned uses of NLM resources were for scientific research (96%), other academic endeavors (91%), in preparation for lectures (86%), in classroom activity (86%), during an on-campus or off-campus outreach activity (63%), and in designing a course (60%).

Respondents indicated their preferred method to receive training on NLM resources is online/self-paced tutorial (96%), followed by in-person training (48%), training provided on campus by library staff (44%), and training at association meetings (24%). The majority of respondents worked with high schools to open the door for people of color to pursue careers in science and biotechnology.

XXIII. Discussion and Q&A with Ms. Janice E. Kelly

While commenting about the findings, Dr. Withers expressed a desire for information that is professionally enriching and useful in classrooms or for sharing with colleagues. Mr. Joe Swanson, Jr., urged representatives to promote the use of campus libraries. "We always encourage our faculty, staff, and students to come in. We will do a group session or an individual session and walk you through the NLM databases," said Mr. Swanson.

XXIV. Wrap-up of Day 2

Ms. Gale Dutcher, Acting Associate Director, SIS, NLM, praised representatives for their many achievements across 25 years of participating in the Partnership. She asked representatives to help EnHIP reach more historically black colleges and universities, Hispanic-serving institutions, tribal colleges and universities, and Alaska Native-serving institutions. These institutions train the next generation of scientists and health care workers. She requested representatives' input and knowledge about emerging issues and ways SIS and NLM can best address the information needs related to these emerging issues. She encouraged representatives to engage on Listserv and make use of the postings about funding opportunities and webinars.

Ms. Dutcher expressed appreciation to Dr. Wildcat for the opportunity to meet at Haskell Indian Nations University.

XXV. Closing Remarks

Dr. Matthews-Juarez encouraged active communication and collaboration among members and others. She emphasized the need to develop a strategic plan and called for the development of a Facebook page and Twitter. She asked representatives to provide updates related to new college deans and presidents.

Before the close of the meeting, Dr. Tchounwou distributed fliers announcing the 13th International Symposium on Recent Advances in Environmental Health Research. The symposium is slated for September 11–14, 2016, in Jackson, Mississippi. A pre-symposium workshop on NLM Web-based resources for environmental health and biomedical research will be held September 11, 2016.

Dr. Matthews-Juarez closed the meeting at 11:45 a.m.

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 (TIOP). 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 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 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: NLMs 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 NLM 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 (2004 – 2011)

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, NLM 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 NLM 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 NLM 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 NLM 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 NLM postgraduate Associate Fellowship Program.

ENVIRONMENTAL HEALTH INFORMATION PARTNERSHIP MEETING

March 29–30, 2016

DIRECTORY OF GUEST SPEAKERS

Dr. Timothy M. "Bull" Bennett
President and CEO
Kiksapa Consulting, LLC
402 1st Street, N.W.
Mandan, ND 58554
TEL: 701.663.9701
E-mail: kbennett@kiksapa.com

Dr. Bridgett Chapin
Professor, Environmental Science
Haskell Indian Nations University
155 Indian Avenue
Lawrence, KS 66046
TEL: 785.832.2696 x696
E-mail: bchapin@haskell.edu

Dr. Venida Chenault
President
Haskell Indian Nations University
155 Indian Avenue
Lawrence, KS 66046
TEL: 785.749.8497 x497

Ms. Melinda M. Crow
Chair, Environmental Science
Haskell Indian Nations University
155 Indian Avenue
Lawrence, KS 66046
TEL: 785.749.8404 x213
E-mail: mcrow@haskell.edu

Ms. Betsy Humphreys
Acting Director
National Library of Medicine
8600 Rockville Pike
Bethesda, MD 20814
TEL: 301.496.6661
E-mail: humphreb@mail.nih.gov

Dr. Harriet Karimi Kinyamu
Epigenetics and Stem Cell Biology Laboratory
National Institute of Environmental Health Sciences
National Institutes of Health
Bethesda, MD 27709
TEL: 919.541.5201
E-mail: kinyamu@niehs.nih.gov

Dr. J. Michael Kuperberg
Executive Director
U.S. Global Change Research Program
1800 G Street, N.W., Suite #9100
Washington, DC 20006
TEL: 202.223.6262

Mr. Kurt Menke
Bird's Eye View GIS
3016 Santa Clara Avenue, S.E.
Albuquerque, NM 87106
TEL: 505.265.0243
E-mail: kurt@birdseyeviewgis.com

ENVIRONMENTAL HEALTH INFORMATION PARTNERSHIP MEETING

March 29–30, 2016

BIOGRAPHIES

Ann Barbre, PhD, MS, is the Associate Dean for Administration and Academic Support and W. Emile and Alitia D. Coleman Professor of Pharmacy at Xavier University of Louisiana. Dr. Barbre has been a member of the College of Pharmacy faculty at Xavier for more than 25 years. Her teaching responsibilities have centered on pharmacy management, behavioral pharmacy, professional communications, and pharmaco-economics.

Dr. Barbre has also served as the faculty advisor for Kappa Epsilon Pharmacy Fraternity for Women for many years. Dr. Barbre also holds the position of Research Advisory Council, Symposium Chair, for the Association of Minority Health Professions Schools, Inc. Dr. Barbre earned a BS degree in pharmacy at Xavier University, an MS degree in pharmacy at the University of Wisconsin-Madison, and a PhD in health care administration at the University of Mississippi.

Timothy M. "Bull" Bennett, PhD, MS, is a trained ecologist and educator who has worked to expand the science and technology capacity of tribal colleges and universities to address climate impacts and conservation issues. He is a member of the Mi'kmaq Tribe.

In 2011 Dr. Bennett was appointed to the National Climate Assessment Development and Advisory Committee, where he coordinated and then served as co-convening lead author of *Indigenous Peoples, Lands, and Resources,* Third National Climate Assessment (2014).

Dr. Bennett is Founder, President, and CEO of Kiksapa Consulting, LLC. The company provides clientele with geospatial and environmental expertise and products, as well as research and development opportunities. He and his team engage tribal communities in hazard mitigation and adaptation to natural disasters and climate impacts. He has worked extensively with tribes and tribal colleges including Haskell Indian Nations University, Southwestern Indian Polytechnic Institute, White Earth Tribal and Community College, Tohono O'odham Community College, and Blackfeet Community College. He provides science education and research opportunities for students and faculty.

Dr. Bennett teaches courses on coastal and community resiliency for the National Disaster Preparedness Training Center. He has worked extensively with the National Aeronautics and Space Administration, the National Oceanic and Atmospheric Administration, the National Center for Atmospheric Research, U.S. Geological Survey, Federal Emergency Management Agency, and the National Integrated Drought Information System.

Dr. Bennett's research interests include investigating climate impacts on habitats and marginalized populations, and exploring adaptation and mitigation strategies for long-term sustainability. He earned a BS degree in biology from Black Hills State University, an MS degree in zoology and physiology from the University of Wyoming, and a PhD in atmosphere, environment, and water resources from the South Dakota School of Mines and Technology.

Bridgett Chapin, PhD, MS, has served as a professor of environmental science at Haskell Indian Nations University since 2006. She served as the chair of the Department of Natural Sciences from 2012 to 2014. Dr. Chapin's academic research is in aquatic ecology. She has created innovative community-based research opportunities through partnerships with tribal community-based science mentors for students at Haskell Indian Nations University. She earned an MS degree in environmental science and a PhD in ecology and evolutionary biology from the University of Kansas.

Venida S. Chenault, PhD, is the seventh president of Haskell Indian Nations University, one of 37 tribal colleges and universities that belong to the American Indian Higher Education Consortium. She was selected to serve as president in January 2014. Previously she served as the Vice President for Academics at Haskell for 10 years; she was on the faculty for American Indian Studies and Social Work for 14 years.

Throughout her professional career, Dr. Chenault has advocated for supporting the role of higher education in changing social, legal, political, environmental, and cultural issues in Indian Country. She has authored grant proposals to strengthen capacity in these areas and served on numerous community boards. She has received recognition for her work in advancing higher education for native peoples from national organizations, professional associations, and higher education institutions.

Dr. Chenault is an enrolled member of the Prairie Band Potawatomi and Kickapoo Tribe. She has written numerous journal articles emphasizing a strengths-based and empowerment approach to sociopolitical issues affecting tribal peoples. These frameworks are reflected in her new book, *Weaving Strength, Weaving Power: Violence and Abuse Against Indigenous Women.* Her research focuses on the phenomenon of violence and abuse against indigenous women, and incorporates a uniquely cultural critique in the analysis. This book, as well as subsequent research, has concentrated on generating baseline data on the levels of violence and abuse in tribal communities for use by tribal governments and family violence programs in ending violence and abuse against indigenous women.

Melinda M. Crow, MS, is the chair of the Environmental Science Department and a full professor at Haskell Indian Nations University. She is also the program coordinator for the Haskell Environmental Research Studies Center. This institution aligns with her research interests, focusing on the effects of climate change through an indigenous perspective. Ms. Crow is from the San Carlos Apache Tribe in Arizona and hails from Albuquerque, New Mexico. She holds a BS degree in environmental science from Haskell Indian Nations University and an MS degree in agriculture from Purdue University.

Gale Dutcher, MLS, MS, is Acting Associate Director for the Division of Specialized Information Services, National Library of Medicine® (NLM). Previously, she held the position of Chief, Outreach and Special Populations Branch. Ms. Dutcher was involved in early efforts by NLM to provide HIV/AIDS information services. She currently manages AIDS*info*® on behalf of the Department of Health and Human Services (HHS). In the early 1990s, she co-organized a major HIV/AIDS conference for the National Institutes of Health (NIH) on the information needs of the affected community, along with research, clinical, and media stakeholders. This conference led directly to development of the HIV/AIDS Community Information Outreach Program (ACIOP). As Chief of the Outreach and Special Populations Branch, Ms. Dutcher developed programs to increase the capacity of underserved populations to access electronic health resources, develop health literacy, promote awareness of resources and their use, provide training, develop specialized Web sites and other electronic resources, and connect users to local libraries that can serve their needs. Ms. Dutcher is a medical librarian with an MLS degree as well as an MS degree in biology.

Betsy L. Humphreys, MLS, was appointed the acting director of NLM in April 2015 following the retirement of Dr. Donald A.B. Lindberg. Ms. Humphreys has served as Deputy Director of NLM since 2005, sharing responsibility with the director for overall program development, program evaluation, policy formulation, direction, and coordination of all Library activities. As Deputy Director, Humphreys also coordinated extensive activities related to health data standards, serving as U.S. Member and founding Chair of the General Assembly of the International Health Terminology Standards Organisation. She contributed to the development of NIH and HHS policy on a range of matters, including health information technology, public access to research results, and clinical trial registration and results reporting.

Ms. Humphreys is an elected member of the National Academy of Medicine (previously the Institute of Medicine) of the National Academy of Sciences, a Fellow of the American College of Medical Informatics, and a Fellow of the Medical Library Association. She is the recipient of a number of awards, including the Morris F. Collen Award of Excellence from the American College of Medical Informatics, considered the highest honor in the field of medical informatics; the Marcia C. Noyes Award, which is the Medical Library Association's highest honor; and the first Cornerstone Award conferred by the Association of Academic Health Sciences Libraries. She received a BA degree from Smith College and an MLS degree from the University of Maryland, College Park.

Janice E. Kelly, MLS, is Acting Deputy Associate Director and Chief, Outreach and Special Populations Branch in the Division of Specialized Information Services at NLM. Ms. Kelly manages the staff responsible for outreach programs, a number of specialized Web sites, promotional activities, and the SIS exhibit program.

Previously Ms. Kelly was Executive Director of the National Network of Libraries of Medicine, Southeastern/ Atlantic (SE/A) Region at the University of Maryland, Baltimore, and served as Associate Director of the NN/LM Greater Midwest Region. She has directed many outreach initiatives involving libraries and community agencies, expanded the educational programs of the SE/A, and managed an award program directed at health professionals and consumers in support of the mission of the NN/LM. Ms. Kelly also held positions in academic health sciences libraries, a hospital library, and a multi-type library network. She received a BA degree in secondary education and an MLS degree, both from the University of Pittsburgh.

Harriet Karimi Kinyamu, PhD, MS, is a staff scientist in the Chromatin and Gene Expression Section (CGES) of the Epigenetics and Stem Cell Biology Laboratory at the National Institute of Environmental Health Sciences (NIEHS), NIH.

The CGES studies the impact of chromatin architecture on gene regulation. Dr. Kinyamu's current work is focused on understanding the interplay between the ubiquitin proteasome system and epigenetic regulation of nuclear receptor mediated gene expression in breast cancer cells. Several environmental toxins are known to disrupt the proteasome and nuclear hormone receptor function through epigenetic changes that influence human health and disease. Dr. Kinyamu's research has contributed extensively to the understanding of fundamental molecular mechanisms by which environmental exposures lead to epigenetic changes. These changes modulate gene expression pathways that may eventually lead to cancer. Journals with national and international circulation have published her contribution to this area of research.

A native of Kenya, Dr. Kinyamu obtained a BS degree in agriculture at the University of Nairobi. She received an MS degree and a PhD in animal nutrition at Iowa State University. After a productive career in the area of vitamin D nutrition and senile osteoporosis at Creighton University Medical School, Dr. Kinyamu

joined Dr. Trevor Archer's laboratory at the University of Western Ontario, Canada, as a postdoctoral fellow to acquire extensive training in molecular biology focusing on chromatin structure and function.

Dr. Kinyamu is actively involved in student mentoring at Shaw University. She shares her career path trajectory with students visiting NIEHS in collaboration with the Office of Science Education and Diversity. She is an active member of the Endocrine Society and the American Association for Cancer Research.

J. Michael Kuperberg, PhD, MS, became the executive director for the U.S. Global Change Research Program (USGCRP) in July 2015. He is on detail from the Department of Energy's (DOE) Office of Science where he managed environmental research programs for the past decade. His areas of expertise include environmental toxicology, ecology, and carbon cycling with a current focus on Arctic processes.

Prior to his position with the DOE, he spent 17 years on the research faculty of Florida State University, most recently as Associate Director for Environmental Programs within the Center for Biomedical and Toxicological Research. Prior to this position, Dr. Kuperberg was a biological scientist for the Center for Aquatic Research and Resource Management at Florida State University.

Dr. Kuperberg serves as DOE's staff representative to the Interagency Arctic Research Policy Committee. Within the Arctic Council's Arctic Monitoring and Assessment Program, Dr. Kuperberg is the U.S. Head of Delegation, and co-chairs the Methane Expert Group and the new Adaptation Actions for a Changing Arctic project.

He received an MS degree in biology from Florida State University and a PhD in environmental toxicology from Florida A&M University.

Patricia Matthews-Juarez, PhD, is Meharry Medical College's Vice President for Faculty Affairs and Development, and she serves as a professor in the Department of Family and Community Medicine. She works on environmental health disparities and research training at Meharry's Health Disparities Research Center of Excellence.

From April 2013 through August 2015, she was co-founding Director of the Research Center on Health Disparities, Equity, and the Exposome (RCHDEE) and a professor in the Department of Preventive Medicine at the University of Tennessee Health Science Center, Memphis. Prior to her work with RCHDEE, Dr. Matthews-Juarez was a professor in Meharry's Department of Pediatrics and the founding Dean and Associate Vice President of the Office of Faculty Affairs and Development.

She holds a BA degree in psychology from Fisk University, an MSW degree from New York University, and a PhD in social policy from Brandeis University.

Kurt Menke, MA, a Certified GIS Professional (GISP), founded Bird's Eye View GIS, a consulting business, in 2000. Based in Albuquerque, New Mexico, he has been an NLM consultant for 10 years.

Projects have focused on empowering underserved populations with mapping technology and promoting conservation and education. In 2015 he was awarded the Global Educator of the Year Team Award by GeoForAll as part of the GeoAcademy team. He is an avid open source GIS proponent, and he is the author of *Mastering QGIS* and *Discover QGIS.* He received an MA degree in geography from the University of New Mexico.

Milton A. Morris, PhD, MPH, is the director of the Environmental Health Science (EHS) Program at Benedict College where he has been employed since 1989. Dr. Morris worked as an environmental specialist and manager for the South Carolina Department of Health and Environmental Control for 14 years. He served as a research assistant at the Savannah River Ecology Laboratory.

While serving in the U.S. Army, he worked as a health administrative officer and as an environmental science officer. He completed research at the U.S. Army Environmental Center and the Army Center for Health Promotion and Preventive Medicine at Aberdeen Proving Ground, Maryland. Dr. Morris has received multiple fellowships to work at the Environmental Protection Agency. He is a member of numerous health and environmental organizations. He is also a member of the Council for Accreditation for Collegiate Environmental Health Science and Protection Programs.

He received a BS degree in biology from South Carolina State University, an MPH degree (environmental health science specialization) from the University of South Carolina, and a PhD in public health (epidemiology specialization) from Walden University.

John C. Scott, MS, is founder and director of the Center for Public Service Communications. Its mission is to provide guidance and expertise to individuals, communities, and public sector organizations in the specialized field of applying telecommunications and information technologies to reduce health disparities, to improve health services to underserved and disenfranchised individuals and communities, and to improve the collection and sharing of scientific, technical, and community knowledge to reduce human vulnerability to natural hazards.

From 2001 to 2005, Mr. Scott established and was executive director of the National Congress of American Indians (NCAI) President's Task Force on Health Information and Technology. Mr. Scott is Tlingit and a member of the Tlingit and Haida Indian Tribes of Alaska.

Mr. Scott has been a consultant to NLM and the Environmental Health Information Partnership (EnHIP) for more than 20 years. He received a BA degree in communications from American University and an MS degree from the Kogod School of Business at American University.

Daniel R. Wildcat, PhD, is a Yuchi member of the Muscogee Nation of Oklahoma. He is Director of the Haskell Environmental Research Studies Center and Acting Dean of the College of Natural and Social Sciences at Haskell Indian Nations University. He has taught at Haskell for 30 years.

Dr. Wildcat has been an invited speaker on American Indian worldviews at Goddard Space Flight Center, National Museum of the American Indian, Harvard Medical School, Creighton University, University of Kansas Medical School, Kansas State University, University of California, Riverside, and many other institutions of higher education. Dr. Wildcat frequently speaks to community groups and organizations on the issue of cultural diversity.

Dr. Wildcat's recent activities have revolved around forming the American Indian and Alaska Native Climate Change Working Group, a tribal college-centered network of individuals and organizations working on climate change issues. He is the author and editor of several books including *Power and Place: Indian Education in America,* with Vine Deloria, Jr., *Destroying Dogma: Vine Deloria's Legacy on Intellectual America,* with Steve Pavlik, and *Red Alert!: Saving the Planet with Indigenous Knowledge.*

EXECUTIVE SUMMARY

2015–2016 Environmental Health Information Partnership Assessments

The mission of the Environmental Health Information Partnership (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 validate the impact and continued relevance of EnHIP, the National Library of Medicine® (NLM) conducted a needs assessment in 2015–2016. Each EnHIP representative was asked to complete an online assessment and to identify two faculty or staff members of their institutions to complete a separate assessment to provide feedback about their information needs. NLM collaborated with ORAU to administer the two online surveys. This executive summary will address findings from both assessments.

Environmental Health Information Partnership Evaluation Assessment

In October 2015, 22 EnHIP representatives and alternates received an e-mail invitation with an electronic survey link asking for their participation in an evaluation assessment. Eighteen representatives and alternates responded.

PubMed®/MEDLINE®, MedlinePlus®, and TOXNET® were the NLM resources most frequently used within the last year by EnHIP representatives. NLM resources were mostly used in preparation of lectures, in classroom activities, in preparation of a publication or presentation, and during on-campus outreach activities. The few barriers mentioned for using NLM resources included the need for additional training and knowledge on specific resources such as ChemID*plus*.

In the past year, only a few EnHIP representatives have published or presented papers or posters that mention NLM resources. Many had published in the past, were in the process of publishing, or planned to publish in the future.

Participation in EnHIP has assisted them professionally by increasing their knowledge of environmental health, creating networking opportunities with other institutions, increasing environmental resources available to enhance research and publications, and assisting with the promotion of their institutions' environmental programs.

Several representatives leveraged the EnHIP Award on campuses by increasing environmental awareness and community outreach, training students and faculty on the use of NLM resources, supporting faculty development in the areas of research and publication, and encouraging others to apply for the EnHIP Award.

Representatives were asked to list the three most outstanding accomplishments EnHIP has achieved in the last few years. The most frequently mentioned accomplishments included networking and collaboration among member institutions, increasing visibility of NLM resources for environmental health topics, and enhancing their institutions' capacity to conduct research and publish on health issues for minority and underserved populations.

Although representatives noted several benefits to the Partnership, many desired more communication between EnHIP representatives and NLM leadership outside of the yearly meeting. When asked how EnHIP leadership could engage with them outside of the in-person meeting, representatives provided the following methods:

- Conduct webinars on topics such as m-health
- Conduct training sessions
- Continue to fund innovative projects
- Hold teleconferences for updates on important issues and new funding opportunities

Recommendations to improve EnHIP include the following:

- Collect more detailed demographics information (type of academic sector, e.g., health, environmental) to elicit more information on the type of audiences utilizing NLM resources.
- Conduct further qualitative research (e.g., telephone interviews) with NLM leaders and EnHIP representatives in order to obtain in-depth information to assess the relevance and value of the EnHIP program.
- Identify specific NLM resources that are being used and how the resources are being implemented in classrooms, lectures, and other activities. (The survey data showed representatives were using NLM resources; however, minimum data were available to identify the specific NLM resources.)
- Elicit more detailed information to identify which NLM resources are being shared by EnHIP representatives and identify the type of audiences (e.g., TOXNET® with epidemiology staff at institution).

Environmental Health Information Partnership Member School Needs Assessment

In October 2015, 22 EnHIP member schools were sent a request to submit two names of faculty or staff members who would complete a survey to provide feedback about their information needs. It was requested that the selected individuals have involvement with the toxicology, environmental health, and/or public health studies and programs. Sixteen member schools responded to the request. In November 2015, 32 faculty or staff members received an e-mail invitation with an electronic survey link asking for their participation in a needs assessment. Twenty-eight faculty or staff members (88%) responded to the survey. (Throughout this section, EnHIP faculty or staff members will be referred to as members.)

The majority of members were familiar with PubMed®/MEDLINE® (96%) and MedlinePlus (88%). Additional NLM resources with which members were familiar were Hazardous Substance Data Bank® (HSDB) (36%), TOXNET® (36%), Drug Information Portal (20%), ChemID*plus*® (16%), and Integrated Risk Information System (IRIS) (8%).

All members utilized NLM resources in preparation for a publication or presentation (100%). Other frequently mentioned uses of NLM resources were for scientific research (96%), other academic endeavors (91%), in preparation for lectures (86%), in classroom activity (86%), during an on-campus or off-campus outreach activity (63%), and in designing a course (60%).

All members reported they would benefit from training on NLM resources, and the most frequently mentioned method to receive training was online/self-paced tutorials. Members expressed e-mail was the best form of communication to provide information about NLM resources. The most common outreach activities among members were seminars and workshops.

Members seemed to be working in alignment with EnHIP's mission of enhancing the capacity of

their institutions to reduce health disparities through access, use, and delivery of environmental health information on their campuses and in their communities. A significant number of members (91%) currently work with high school students to increase opportunities for people of color to pursue careers in science and biotechnology.

Recommendations to better meet the information needs of the members at EnHIP member schools include the following:

- Collect more detailed demographics information (type of academic sector, e.g., health, environmental) to elicit more information on the type of audiences utilizing NLM resources.
- Gather more specific data on training that members would find beneficial (e.g., specific topics).
- Find out about other academic endeavors related to using NLM resources so the reach of NLM can be expanded.
- Gather more detail on the types of association meetings attended by members so NLM will know about specific audiences for the expansion of training outreach.

ENVIRONMENTAL HEALTH INFORMATION PARTNERSHIP DIRECTORY OF CURRENT REPRESENTATIVES

2015–2016

Patricia Matthews-Juarez, PhD, Chairman
Vice President for Faculty Affairs
and Development and Professor
Meharry Medical College
1005 Dr. B.D. Todd Boulevard, Nashville, TN 37208
TEL: 615.327.6526
E-mail: pmatthews-juarez@mmc.edu

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

Raymond Anthony, PhD
Department of Philosophy
University of Alaska Anchorage
3211 Providence Drive
Anchorage, AK 99508
TEL: 907.786.4459
E-mail: afrxa@uaa.alaska.edu

Dr. Ann Barbre, PhD
Professor and Associate Dean of Pharmacy
Xavier University of Louisiana
1 Drexel Drive
New Orleans, LA 70125
TEL: 504.520.7439
E-mail: arbarbre@xula.edu

Dolores E. Caffey-Fleming, MS, MPH
STEP-UP and Project STRIDE Program
Coordinator
Charles Drew University of Medicine
and Science
1748 East 118th Street, Room N153
Los Angeles, CA 90059
TEL: 323.249.5716
E-mail: deefleming@cdrewu.edu

Robert Copeland, Jr., PhD
Associate Professor, Department
of Pharmacology
Howard University College of Medicine
520 W Street NW, Room 3408
Washington, DC 20059
TEL: 202.806.6311
E-mail: rlcopeland@howard.edu

Kathleen A. Curtis, PT, PhD
Dean, College of Health Sciences
The University of Texas at El Paso
1101 North Campbell Street
El Paso, TX 79902
TEL: 915.747.7201
E-mail: kacurtis@utep.edu

Sandra Harris-Hooker, PhD
Vice President and Senior Associate Dean
Research Affairs
Morehouse School of Medicine
720 Westview Drive SW
Atlanta, GA 30310-1495
TEL: 404.752.1725
E-mail: sharris-hooker@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
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
E-mail: dholeman@mytu.tuskegee.edu

Brett Koontz, PhD
Faculty, Department of Environmental and Occupational Health
California State University, Northridge
18111 Nordhoff Street
Los Angeles, CA 91330
TEL: 818.677.7918
E-mail: brett.koontz@csun.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
E-mail: mazique_jx@tsu.edu

Arlene Montgomery, PhD, RN
Associate Professor, School of Nursing
Hampton University
110 William Freeman Hall
Hampton, VA 23668
TEL: 757.727.5672
E-mail: arlene.montgomery@hamptonu.edu

Milton A. Morris, PhD, MPH, DAAS, CFSP
Director, Department of Environmental Health Sciences
Benedict College
1600 Harden Street
Columbia, SC 29204
TEL: 803.705.4608
E-mail: morrism@benedict.edu

Donald K. Robinson, Jr., PhD
Chairman, Science and Physical Education Division
Diné College
One Circle Drive
Tsaile, AZ 86556
TEL: 928.724.6719
E-mail: dkrobinson@dinecollege.edu

T. Joan Robinson, PhD
Vice President, International Affairs
Morgan State University
1700 East Cold Spring Lane
Montebello D207
Baltimore, MD 21251
TEL: 443.885.4031
E-mail: joan.robinson@morgan.edu

Cheryl Taylor, PhD, RN, FAAN
Chairperson, Graduate Nursing Programs
Director, Office of Nursing Research
Southern University and A&M College
J.K. Haynes Building 170, Swan Street
Baton Rouge, LA 70813
TEL: 225.771.2632
E-mail: cheryl_taylor@subr.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
E-mail: paul.b.tchounwou@jsums.edu

Michael Thompson, PharmD, BCNSP
Dean, College of Pharmacy
and Pharmaceutical Sciences
Florida A&M University
1415 South Martin Luther King, Jr. Boulevard
Tallahassee, FL 32307
TEL: 850.599.3301
E-mail: michael.thompson@famu.edu

Daniel R. Wildcat, PhD
Professor, American Indian Studies
School of Arts and Sciences
Haskell Indian Nations University
155 Indian Avenue
Lawrence, KS 66046-4800
TEL: 785.832.6694
E-mail: dwildcat@haskell.edu

Doris Withers, EdD
Vice President, Assessment Planning
and Accountability
Medgar Evers College
City University of New York
1650 Bedford Avenue
Brooklyn, NY 11225
TEL: 718.270.5020
E-mail: doris@mec.cuny.edu

Jessica Zephier, MSN, RN
Chairperson, Department of Nursing
Oglala Lakota College
P.O. Box 861
Pine Ridge, SD 57770
TEL: 605.867.5856, Ext 11
E-mail: jzephier@olc.edu

Jill A. Ziemann, MS Ed
Director, Go2Work Programs
Gateway/Women In Transition/GarCo Sewing
Works
Colorado Mountain College
802 Grand Avenue
Glenwood Springs, CO 81601
TEL: 970.384.8518
E-mail: jziemann@coloradomtn.edu

NLM CONSULTANT

John C. Scott
President, Center for Public Service
Communications
10388 Bayside Drive
Claiborne, MD 21624
TEL: 703.307.3260
E-mail: jcscott@cpsc.com

EXECUTIVE COMMITTEE

Patricia Matthews-Juarez, PhD
Chairman
Vice President for Faculty Affairs
and Development and Professor
Meharry Medical College
1005 Dr. B.D. Todd Boulevard
Nashville, TN 37208
TEL: 615.327.6526
E-mail: pmatthews-juarez@mmc.edu

Gale Dutcher, MLS, MS Acting Associate Director
Division of Specialized Information
Services
National Library of Medicine
6707 Democracy Boulevard, Suite 510
Bethesda, MD 20892
TEL: 301.496.5082
E-mail: dutcherg@mail.nlm.nih.gov

Janice E. Kelly, MLS
Acting Deputy Associate Director
Division of Specialized Information
Services
National Library of Medicine
6707 Democracy Boulevard, Suite 510
Bethesda, MD 20892
TEL: 301.443.5886
E-mail: janice.kelly@nih.gov

Cynthia Gaines Project Officer
Division of Specialized Information
Services
National Library of Medicine
6707 Democracy Boulevard, Suite 510
Bethesda, MD 20892
TEL: 301.496.3669
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
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
E-mail: bwalker@howard.edu

ALTERNATE REPRESENTATIVES

Seth Y. Ablordeppey, PhD
Professor and Division Director
College of Pharmacy and Pharmaceutical Sciences
Florida A&M University
1415 South Martin Luther King, Jr. Boulevard
Tallahassee, FL 32307
TEL: 850.599.3301
E-mail: seth.ablordeppey@famu.edu

Yesenia Arreola
Coordinator, Upward Bound
Colorado Mountain College
3695 Airport Road
Rifle, CO 81650
TEL: 970.625.6987
E-mail: yarreola@coloradomtn.edu

Mark C. Bauer, PhD
Senior Instructor, Public Health Department
Division of Science and Physical Education
Diné College, Shiprock Campus
P.O. Box 580
Shiprock, AZ 87420
TEL: 505.368.3589
E-mail: mcbauer@dinecollege.edu

Stephanie Bauer, PhD
Department of Philosophy
University of Alaska Anchorage
3211 Providence Drive
Anchorage, AK 99508
TEL: 907.786.4677
E-mail: slbauer@uaa.alaska.edu

Peter Bellin, CIH, PhD
Professor and Chairman, Department of
Environmental and Occupational Health
California State University, Northridge
18111 Nordhoff Street
Los Angeles, CA 91330
TEL: 818.677.4719
E-mail: peter.bellin@csun.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
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
E-mail: bertha.davis@hamptonu.edu

Cheryl G. Davis, DHA
Associate Dean for Administrative and Resource
Development
Tuskegee University
Patterson Hall, Room 301
Tuskegee, AL 36088
TEL: 334.724.4178
E-mail: davis@mytu.tuskegee.edu

Charles desBordes, PhD
Professor, Department of Biology
Medgar Evers College
City University of New York
1150 Carroll Street
Brooklyn, NY 11225
TEL: 718.270.6207
E-mail: desBordes@mec.cuny.edu

João Ferreira-Pinto, PhD
Associate Research Professor
Director of Research and Special Projects College
of Health Sciences
The University of Texas at El Paso
1101 North Campbell Street
El Paso, TX 79902
TEL: 915.747.7295
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
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
E-mail: kkennedy1@xula.edu

Ann Krejci, PhD, MA
Instructor, Department of Nursing
Oglala Lakota College
P.O. Box 861
Pine Ridge, SD 57770
TEL: 605.867.5856, Ext 18
E-mail: akrejci@olc.edu

Melissa Littlefield, PhD
Associate Professor, School of Social Work
Morgan State University
1700 East Cold Spring Lane, Jenkins Building
Baltimore, MD 21251
TEL: 443.885.4300
E-mail: melissa.littlefield@morgan.edu

Safiya Omari, PhD
Associate Professor and 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
E-mail: safiya.r.omari@jsums.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
E-mail: afjsp@uaa.alaska.edu

Aramandla Ramesh, PhD
Associate Professor, Department of Biochemistry and Cancer Biology
Meharry Medical College
1005 Dr. D.B. Todd Boulevard
Nashville, TN 37208
TEL: 615.327.6486
E-mail: aramesh@mmc.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 225.771.3266
E-mail: janet_rami@subr.edu

Thomas E. Smith, PhD
Professor, Department of Pharmacology College of Medicine
Howard University
520 W Street NW, Room 3408
Washington, DC 20059
TEL: 202.806.6289
E-mail: tsmith@howard.edu

Jonathan Stiles, PhD
Professor, Microbiology, Biochemistry, and Immunology
Morehouse School of Medicine
720 Westview Drive, SW
Atlanta, GA 30310
TEL: 404.752.1585
E-mail: jstiles@msm.edu

Mary Stuckey, JD
Instructor, School of Business
Haskell Indian Nations University
Kiva Hall
155 Indian Avenue
Lawrence, KS 66046
TEL: 785.749.8491, Ext. 491
E-mail: mstuckey@haskell.edu

Helene Tamboue, PhD
Professor, Chemistry/Chair Biology, Chemistry,
and Environmental Health Science Department
Benedict College
1600 Harden Street
Columbia, SC 29204
TEL: 803.705.4740
E-mail: tamboue@benedict.edu

Peter Tom, PharmD
Assistant Professor, Pharmacy
Charles R. Drew University of Medicine and
Science
1748 East 118th Street
Los Angeles, CA 90059
TEL: 323.568.3365
E-mail: petertom@cdrewu.edu

ALTERNATES TO THE ALTERNATES

Fatima M. Mncube-Barnes, EdD, MPH, MSIS
Executive Director, Louis Stokes Health Sciences
Library
Howard College
501 W Street, NW
Washington, D.C. 20059
TEL: 202.884.1520
E-mail: fbarnes@howard.edu

Joe Swanson, Jr., MSLS
Director, M. Delmar Edwards, MD Library
Morehouse School of Medicine
720 Westview Drive, SW
Atlanta, GA 30310
TEL: 404.752.1542
E-mail: jswanson@msm.edu











Photos: Haskell Indian Nations University

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