

forward with an inaugural global meeting of the IFMS in connection with the 90th Annual Meeting of the AMS that will be held 17–21 January 2010 in Atlanta, Georgia. (The formal motion to form the IFMS is available as a *BAMS* online supplement at DOI:10.1175/2009BAMS2902.2.)

A few examples of topics of common concern to IFMS members that were identified at the planning meeting include:

- the role of meteorological societies in global climate change: from education and communication to policy;
- the role of meteorological societies in coping with the impacts of severe natural weather hazards: education, planning, adaptation, and response;
- coping with the rapid evolution of society publications, electronic publishing, and increasing costs of print journals;
- trends in society membership;
- sector trends: academia, government, industry;
- retention of student members after graduation;
- entraining professionals in affiliated hard and soft sciences;
- domestic outreach—the role of the meteorological society in informing and educating professionals and the general public;
- reconciling the needs of professional and scientific members;
- international outreach—missed opportunities?

The first global IFMS meeting in Atlanta will be hosted by the AMS; future meetings are expected to take place every 2 to 3 years and will be hosted by meteorological societies around the world.

## PARTICIPATING METEOROLOGICAL SOCIETIES AND ORGANIZATIONS IN THE IFMS PLANNING MEETING

- American Meteorological Society §
- Australian Meteorological and Oceanographic Society §
- Canadian Meteorological and Oceanographic Society
- Chinese Meteorological Society §
- Centro Argentino de Meteorólogos
- Czech Meteorological Society
- Ethiopian Meteorological Society (EMIBAMA) §
- European Meteorological Society §
- Hong Kong Meteorological Society
- Indian Meteorological Society §
- Korean Meteorological Society
- Latino American Federation Meteorological Societies (FLISMET) §
- Meteorological Society of Japan
- Meteorological Society of New Zealand
- Mexican Organization of Meteorologists (OMMAC)
- Philippines Meteorological Society
- Royal Meteorological Society
- South African Society for Atmospheric Sciences
- World Meteorological Organization

§ Member of the interim steering committee

## CHAPTER CHANNEL

### PAST CIVILIZATIONS AND CLIMATE CHANGE

Lewis (Skip) Messenger, professor of anthropology at Hamline University, brought the Twin Cities chapter back in time during its April meeting. Messenger's primary areas of study include Mesoamerica and Southeast Asia, along with a strong interest in weather. His presentation was entitled "Past Civilizations and Climate Change."

Messenger has studied the Maya in the Yucatan Peninsula with a

focus on what lead to their downfall. At the peak of the Mayan age, there were about 15 million people living in the Yucatan, which is roughly the size of Minnesota. Around 900–1000 A.D., major architecture stopped and the population began to decline dramatically. Messenger looked to see if there was a shift in the weather pattern that could help explain the Maya's disappearance.

In looking at tree pollen from the time period, Messenger noted it disappeared from the samples,

but then returned rather quickly, pointing to a relatively dramatic weather shift. Up to this point, people had only looked at climate over large regions and did not take into account smaller-scale variations. One place showing large variation is the Yucatan. Messenger explained that under most circumstances, rainfall increases in the Yucatan when one travels south and east. The Maya built their culture in the areas receiving the large amounts of rainfall so their crops would thrive. In a short

## ECHOES

“ It could happen in a hundred years or it could happen next week.”

—RICHARD TEEUW, geologist at the University of Portsmouth, on the possibility of tsunami waves, triggered by an unstable volcano, hitting the Caribbean island of Dominica. In a study published in *Eos*, the newsletter of the American Geophysical Union, scientists calculated that the million-ton chunk of rock that forms Devil's Peak could fall into the sea, possibly producing waves up to 10 feet high. In that scenario, the highly populated coast of Guadeloupe, 30 miles north of Dominica, would have little or no warning time to find higher ground. (SOURCE: TerraDaily.com)

period of time, the area receiving the most rainfall shifted to the north and west, creating drought conditions over the core of the Mayan agricultural region. Messenger was able to determine that the classic Mayan collapse corresponded with this drought period.

With this discovery in hand, Messenger looked to another area of interest, Southeast Asia. One area he looked at in particular was Angkor in present day Cambodia. He was able to find evidence that a change in its climate corresponded to the decline in this civilization as well. This decline was at about the same time as the

transition from the Medieval Warm Period to the Little Ice Age, which led to a shortage of water in the region.

Messenger wrapped up his presentation by briefly talking about the Climatic Analogs Data-Gathering Project (CADGAP) that he created in 1991 at Hamline. In this program, his students focus on different regions of the world and research the climate and culture of that region. To date, many regions of the world have been studied, with the exception of North America, which Messenger said is a possible candidate in the future.

—BRYAN HOWELL  
*Twin Cities chapter*

## CONFERENCE NOTEBOOK

### PHOENIX HEAT ISLAND: AN EMERGENT PROPERTY OF RAPID URBANIZATION

Rapid population growth in the Phoenix metro area has led to burgeoning infrastructure and roadways, and the interaction of these factitious urban elements and the natural environment has produced, as an emergent property, an intense urban heat island (UHI). High thermal capacity and surface characteristics of built material are conducive for the retention (storage) of heat for periods longer than that of natural surfaces. In addition, anthropogenic activities (e.g. air conditioning, vehicular traffic) emit substantial amounts of heat into the urban atmosphere, sometimes causing a positive feedback on UHI intensity. For example, during hotter outdoor conditions on summer nights, air conditioner usage drastically increases, thus

increasing outdoor temperature and, subsequently, energy use for cooling. Air pollution exacerbates UHI, either because outgoing radiation from urban surfaces is reflected back from pollutants or that contaminants such as ozone can absorb radiation (urban greenhouse effect). Lighter winds reduce surface cooling and trap pollutants, thus intensifying UHI. All of the above factors collude in the Phoenix area to produce a strong UHI, the intensity of which, as measured by the urban-rural temperature difference, can be as high as 10°C.

Consequently, the impacts from UHI ripple throughout the community, feeding off each other. UHI increases energy usage (with the possibility of power-grid failure), enhances ozone production, triggers heat-related illnesses, and raises environmental justice issues

with underprivileged communities, including Native Americans bearing the brunt of UHI. A 1°C rise of UHI increases the water usage of a single family household by about 500 gallons per month, placing demands on already scarce water resources. Modeling studies indicate that, upon exceeding a certain threshold, the UHI may evoke a sudden “regime shift” of local airflow and pollution dispersion patterns, quite unfavorable to existing residential communities.

Taken together, the outcomes of UHI are threatening the sustainability of the Phoenix area, and call for the implementation of strong heat island mitigation strategies. We continue to use an urbanized version of a mesoscale meteorological model and microscale meteorological and computational fluid dynamics models to study various UHI scenarios and mitiga-