3. SCIENCE: Polar year research yields conclusions and uncertainties surrounding climate change (04/07/2009)

Lea Radick, E&E reporter

For the first time ever, scientists finally have a clear satellite image of Antarctica thanks to the Landsat Image Mosaic of Antarctica, or LIMA, a project that provided a cloudless, true-color, high-resolution image of the southern polar region.

This technology, developed by an international team of researchers, was just one of the many technologies and climate models used or developed on one of more than 200 expeditions that took place during the International Polar Year, or IPY -- a massive global research effort undertaken by more than 50,000 people to better understand climate change in the Arctic and Antarctica.

Polar researchers, policymakers, diplomats and even one noble, Prince Albert II of Monaco, gathered yesterday at a symposium hosted by the National Academy of Sciences and the National Science Foundation to learn about the early findings gleaned from some of the IPY projects.

Although this was the fourth International Polar Year, it differed from past efforts in that it allowed the use of new technologies, said Ralph Cicerone, president of the National Academy of Sciences.

"Any of us 50 years from now will be commenting on what happened in this decade," Cicerone said, adding that this two-year round of studies also focused more on the linkages between polar regions and the rest of the world and offered "unprecedented" educational and outreach efforts to better inform younger generations of the importance of polar research.

"This International Polar Year comes at a fundamental time in human history," said James White, chairman of the Polar Research Board at the National Academy of Sciences.

"Every generation prior to this one saw the Earth as fundamentally infinite. We and every generation from now on will see the Earth as finite. We know there are limits. We know we can change climate, we know that through our actions that ice melts, sea levels rise, climate change, all of these things, we have an impact on," White said.

International collaboration was also an important aspect of the IPY research, said National Science Foundation Director Arden Bement, as well as several other speakers.

"It's important to strike a balance between the large-scale policy or geopolitics, if you will, and building on existing international frameworks, international networks at the local level and the scientific level that are going to help us ultimately track and prepare for this different Arctic," said Timothy Killeen, assistant director for geosciences at the National Science Foundation.

Hajo Eicken, a professor of geophysics at the University of Alaska, Fairbanks, stressed the need for scientists to be more aware of what information is useful to people in terms of policy and lifestyle and called for the development of partnerships between the scientific community and local communities and stakeholders when studying the effects of melting sea ice and ways of responding to that transition.

Killeen said a commitment to systems science, or the use of climate models in studying the polar regions, would be the biggest legacy to emerge from the 2007-08 IPY.

"Polar regions are essential to our understanding of Earth as a system," he said, adding that with climate models, "we have a crystal ball and can see what the future looks like."

Scratching the surface

While some of the findings discussed at the symposium provided answers, many simply scraped the surface of issues such as polar ice sheet stability and sea level rise that warrant much more research.

Some of the IPY findings will not be published until months or years from now, said the National Science Foundation's Bement.

Scientists know that Earth has warmed significantly and that this warming is contributing to the melting of ice sheets, but it is difficult to predict how these factors might affect sea levels, according to David Holland, director of the Center for Atmosphere Ocean Science at New York University.

"The science is not there yet," Holland said, adding that this problem can be solved with the help of international partners.
Many of the IPY projects involved multinational collaboration, such as the Antarctic Geological Drilling ice coring project, or ANDRILL, which involved the recovery and study of ice cores by more than 200 people from four countries.

This project enabled researchers to understand how Antarctica's ice sheet has advanced and retreated over time, said Richard Alley, a professor of geosciences and an associate of the Earth and Environmental Systems Institute at Pennsylvania State University.

While findings from this project confirmed what past climate models have indicated -- that high levels of carbon dioxide emissions contribute to warming temperatures and not vice versa -- climate model projections might underestimate the effects of climate change on ecosystems, Alley said.

"The last big warming did not arrive smoothly," he said.

Some of the plants and animals of the western Antarctic peninsula are already reacting to warming temperatures, including the Adélie penguin, which has begun to move south in search of food.

"[We have] seen a shift in species composition very rapidly," said Diana Wall, a biology professor and director of the School of Global Environmental Sustainability at Colorado State University, who also talked about another IPY project that involved the study of the ecological complexity in Antarctica by using satellite data.

The IPY symposium coincided yesterday with the opening event of the Antarctic Treaty Consultative Meeting in Baltimore. The two-week meeting occurs as the Antarctic Treaty marks its 50th anniversary.

**CLIMATEWIRE HEADLINES -- Tuesday, April 7, 2009**

**SPOTLIGHT**

1. MARKETS: Secretive U.N. board awards lucrative credits with few rules barring conflicts

**TODAY'S STORIES**

2. NATIONS: Clinton stresses int'l cooperation for Arctic-Antarctica action

3. SCIENCE: Polar year research yields conclusions and uncertainties surrounding climate change

4. SCIENCE: Elephant seals aid Antarctic researchers

5. TRADING: The jury remains out on cap and trade as enthusiasts gather

6. EPA: Slow response to agency's proposed greenhouse gas registry

7. RENEWABLES: Mass. lawmakers create a political sea change behind Cape Wind

8. WIND POWER: Sweden moves closer to hosting Europe's largest wind farm

9. COASTAL EROSION: Global warming washing away historic artifacts

10. SOLAR POWER: Pa.'s Sunshine initiative still waiting for funding

**E&TV'S ONPOINT**

11. CARBON MARKETS: Merrill Lynch's Karmali discusses role of markets in economic recovery
Science: Polar year research yields conclusions and uncertainties surrounding climate cha...