

### Executive Summary

If the 65 educators, scientists and media specialists who gathered at the “Bridging the Poles” workshop in Washington, DC on June 23-25, 2004 have their way, a semi-trailer truck labeled “Got Snow?” would traverse the country during the International Polar Year (IPY) of 2007-2009 loaded with polar gear, interactive activities, and a snowmaker. We would significantly increase the number of Arctic residents—especially

indigenous Alaskans—with PhDs. We would build exchange programs between inner city youths and polar residents. Polar exhibitions would open at natural history and art museums and zoos. And polar postage stamps, interactive polar computer games, national polar book-of-the-month recommendations, made-for-TV polar documentaries, and a polar youth forum, would bring the poles front and center to the public’s attention. The goals of the NSF-sponsored workshop were to define strategies that will engage the next generation of polar scientists, engineers and leaders, and inspire the general public. Through a series of plenary talks and roundtable discussions, the workshop focused on: opportunities and needs for different levels, engaging diverse communities, leveraging the importance and excitement of polar science, and programs to feature nationally and internationally over the next 5 years. This workshop was the first major community effort to develop an integrated education and outreach program that would maximize the potential of the International Polar Year.

Discussions about opportunities and models for engaging different levels: grades K-5, 6-12,



Photo courtesy of science teacher Carol Landis (12/03) a mountain on the north rim of the Taylor Dry Valley, Antarctica, was framed by a hole in one of the wind-eroded rocks (ventifacts) above Lake Bonney Camp.

undergraduate non-science, undergraduate and graduate science majors, and the general public, emphasized capitalizing on the tremendous ability of polar themes to attract attention and the need for a broad, interdisciplinary approach. With their geographic foundation, the poles encompass multiple content areas ranging from science to culture and heritage. Workshop participants advocated capturing student interest and increasing science literacy in the general public by linking fascination with polar environments, to improving science, math, reading, and other skills, while integrating polar themes into state and national standards. Polar science can engage diverse groups of learners in science as

a human endeavor, history and nature of science, science as inquiry, and science and technology. For advanced students, there are exciting opportunities in circumpolar distance learning with Web course delivery, as well as other programs such as the University of the Arctic's PhD networks and collaborative field courses. Beyond curricula, the use of polar themes in major competitions such as the National History Month, the National Ocean Sciences Bowl and Intel is a powerful way to expand attention on, and interest in, polar subjects. Other imaginative polar

education and outreach ideas discussed at the workshop include polar-themed McDonald's Happy Meals, circumpolar following of "A Day in the Life at the Poles," and junior Arctic and Antarctic councils.

Participants articulated the need of the polar science community to fully engage more diverse participation, including Arctic peoples and communities, underrepresented minorities, and women, as well as broadening economic and geographic involvement. Communication with Arctic indigenous people must extend beyond the simple transmittal of science results. Programs must advance the next generation of researchers from the Arctic who will investigate and communicate northern issues to global populations and decision makers. This theme of building capacity within communities, together with providing opportunities for personal contact and field experiences, making polar issues relevant at the community level, and developing mentoring and support systems was articulated by workshop participants for each target group. Common interests can bring diverse communities together. For example, Matthew Henson, the African American explorer who went to the North Pole with Robert E. Peary, played a crucial role in polar exploration at the turn of the last century, yet since his time minorities have remained underrepresented in polar science. A first step towards bridging the gap between inner city communities and communities in the Arctic was taken at the workshop when the leader of the Earth Conservation Corps' Matthew Henson Center in Washington DC established contact with Native Alaskans and together they began to plan exchange programs. Unlike many of the other sciences, user data collected through the experience of San Francisco's Exploratorium's Web-based "Live@", including "Science Live from Antarctica," indicates that polar themes, unlike many other science themes, draw a nearly gender-balanced audience. Polar education efforts should build on this latent interest to develop a more gender-diverse community.

Just as it is important to engage diverse audiences within their own community, establishing connections among local scientists, educators and informal outreach venues, can have long-lasting impacts. These connections build networks that sustain, and encourage further engagement on all sides. Especially important are providing opportunities for field experiences for students, teachers, and the media; these opportunities can build life-long advocates of the poles.

The group identified ways to leverage the importance and excitement of polar science, starting with what people think they know about polar organisms – and then moving beyond the



charismatic megafauna of polar bears, penguins and whales to look at the diversity of adaptations to life in extreme environments. Participants discussed ways that major emerging science programs can be connected with meaningful education and outreach programming, and rolled out to the public as media events. Examples include: ANDRILL - drilling in the Ross Sea to recover key paleoclimatic records; and Ice Cube - a neutrino observatory at the South Pole. Polar environmental change, including SEARCH

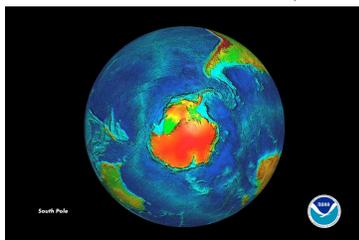
(Study of Environmental Arctic Change), links communities around the world with the worlds at the ends of the Earth, and underscores the feedback mechanisms of the poles on and also from the global system. “Think Globally/Act Locally” and the complementary “Think Locally/Act Globally” will be important themes for local, national and international IPY programming.

To ensure the success of polar education and outreach efforts, coordination of existing resources, linking communities and developing partnerships, access to data and content from the polar regions, securing funding to develop new programs, and sustaining programs after the conclusion of the IPY, are crucial. Education and outreach initiatives must be clearly defined with measurable outcomes so that IPY's promise in building capacity in Arctic communities, growing a new generation of polar researchers, and stimulating the public to know more — and care more — about the poles, is realized. Workshop participants recommended that interagency and international working groups on IPY education and outreach, with staff, be created to coordinate and leverage programs, and be integrated with research plans. A rich, sophisticated, multidisciplinary, international and multilingual one-stop Web portal should be developed to host research and education resources, opportunities, and advances, post reports from the field and curriculum material, serve as a central meeting point for a diverse suite of populations, and provide contacts for researchers, educators, the media, and the public at all levels. The media – television, radio and print – as well as educators, zoos and museums – are eager for timely, accessible, and meaningful content. Access to high quality content requires improved high bandwidth communications – this issue emerged repeatedly in the workshop as critical to timely and dynamic connections between the poles, the media and other communities.

In conclusion, to maximize the potential of the International Polar Year, workshop participants recommended integrating research, education and outreach efforts, at the international as well as national level, with the goal of building a coherent and exciting public presence during 2007-2009. Requests for proposals (RFPs) for the International Polar Year should encourage a broad spectrum of research, education, and outreach projects. The RFPs should be written to allow maximum flexibility in design and size: not all research programs need to have a major education component, and not all outreach programs need to have a major research component. Expensive, collaborative projects can have major national or even international impact when science programs are connected with press events, educational programming, and spin-offs of local programs. But small, individual projects can produce sustained transformation of local or target communities. There is a pressing need to start now to develop an integrated research/media/education strategy; establish partners among the research, media, and education communities; and diversify participation and audiences. Just as it takes time to define a research program and establish the logistics to carry it out, effective education and outreach programs take years to develop.

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## BRIDGING THE POLES

