NYC International Polar Weekend

Stephanie Pfirman, Margie Turrin, Ross MacPhee
American Museum of Natural History

Past: March 10-11, 2007 and February 2-3, 2008
Future: February 7-8, 2009 and April, 2009, Baltimore (ATCM)

Supported by NSF OPP

NYC-IPW Goals/Content Messages

Anne Aghion, Filming Extreme Science...on Ice,
NSF Antarctic Artists and Writers Program

- Public understanding of science through a focus on the polar regions
- Excitement of polar research
- Critical role of the poles in global climate change and dramatic changes that are already underway
- Understanding of what can be done to mitigate and adapt to global warming
- Appreciation for careers in science and education

Polar Fair


Theater

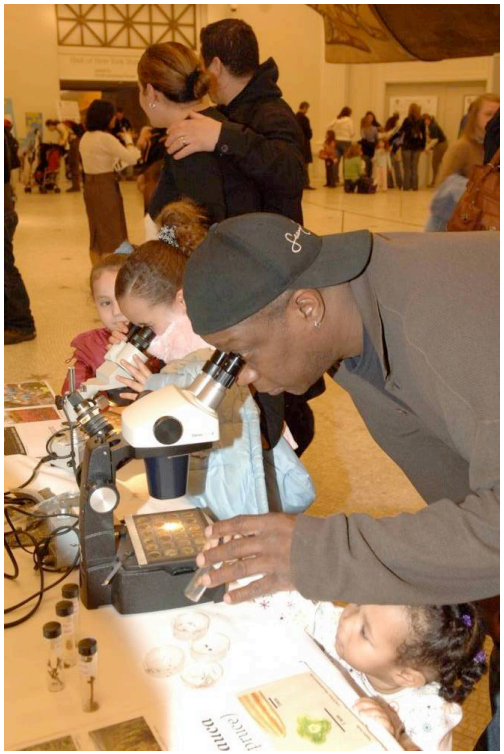
3 Components

Lectures

Polar Fair

IGY Veterans, Lamont-Doherty Earth Observatory

NASA/GISS and Lamont-Doherty Earth Observatory



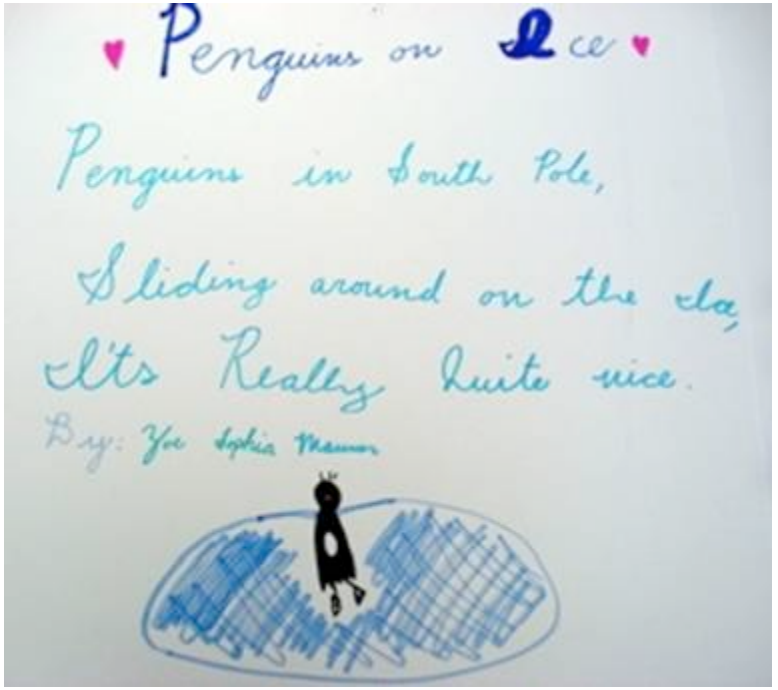
The Central Park & Bronx Zoo Educators

New York University

Columbia University Center for Research on Environmental Decisions, NSF DMUU Center

Susan Fox Rogers, Bard College, Polar Poetry, NSF Antarctic Artists and Writers Program

Polar Fair



Big Plump Penguins in the Sun
Ice is melting Fast
Soon those Penguins'll be Past! ☹

Education Template for each Polar Fair Topic

EACH TEMPLATE INCLUDED:

- Topic/Title
- Project Personnel
- Background
- Vocabulary
- Why are we studying this in the polar regions?
- How does this affect us here in the United States?
- Additional Resources

TOPIC: AN UNKNOWN SUBGLACIAL WORLD

PROJECT PERSONNEL: Michael Studinger, Robin Bell

GENERAL BACKGROUND INFORMATION ON THE SUBJECT:
Subglacial Lakes are unique environments isolated from the sun for millions of years, yet they may be playing an important role is changing ice sheets today. It is interesting to think that ice floats – Even when it is 2 miles thick. How does water form or stay liquid under ice? Geothermal heat, the heat coming out of the center of the earth, occurs throughout the world. This heat keeps deep mines, down towards the core of the earth, actually hot! It can cause warming and melting at the bottom of a glacier. Additionally, pressure from the several miles of glacial ice thickness can cause melting at the base.

TERMS YOU SHOULD KNOW (VOCABULARY):
Ice sheet – thick piece of ice often over 2 miles thick that can cover an entire continent
Glacier - slow moving mass of ice often found high in the mountains and in polar regions
Subglacial – beneath a glacier or ice sheet/ **Subglacial Lake** – Lake beneath an ice sheet
Subglacial Environments – The environments beneath an ice sheet can include lakes, rivers, streams, swamps
Vostok – Russian word for East/ **Vostok Station** – Russian Station in East Antarctica
Lake Vostok – Biggest subglacial lake found under 2 miles of ice under Vostok station
Microbe – microorganisms that probably live in subglacial lakes
Ice Streams – Rivers made of ice that act like a conveyor belt moving ice in an ice sheet towards the ocean where it becomes icebergs

WHY ARE WE STUDYING THIS IN THE POLAR REGIONS?
There is a lot of water under the Antarctica ice sheets - it collects in lakes, flows between different lakes, in rivers and even drains out in huge flood events. These are unique environments that we did not know existed 10 years ago. ***SO what have we learned:***
•Ice sheets Insulate – the top of an ice sheet is cold (-50C) but the bottom is warm. The ice sheet traps the geothermal heat just like a blanket traps your body heat at night
•Ice Melts – The bottom of an ice sheet can get so warm that it melts!!!
•Ice Melts – If you add friction to the bottom of an ice sheet it will also melt!!
•Ice Sheets are old – The ice at the bottom of the Antarctic ice sheet is almost 1 million yrs . old!!

HOW DOES THIS AFFECT US HERE IN THE UNITED STATES?
Water, in subglacial lakes or streams, can make the bottom of the ice sheet slippery like a banana on a sidewalk. Water draining out of a lake may make the ice sheet flow faster, carrying it towards the ocean where pieces can break off. This can have a wide reaching effect including sea level rise, reduced marine environments, climate change from reduced reflectivity.

TO LEARN MORE ABOUT THIS TOPIC:
http://www.ldeo.columbia.edu/res/pi/gambit/SubglacialLakes.htm
http://www.ldeo.columbia.edu/~mstuding/vostok.html

Wally Broecker, Lamont-Doherty Earth Observatory and Columbia University

Lectures

Andy Revkin, NYT

Stephanie Pfirman, Barnard College

The Central Park & Bronx Zoo Wildlife Theater

Theater

Inuit Cultural Performers

Partnership with Norwegian Consulate, 2008

Saami performers, tent, and photo display

Northern Lights

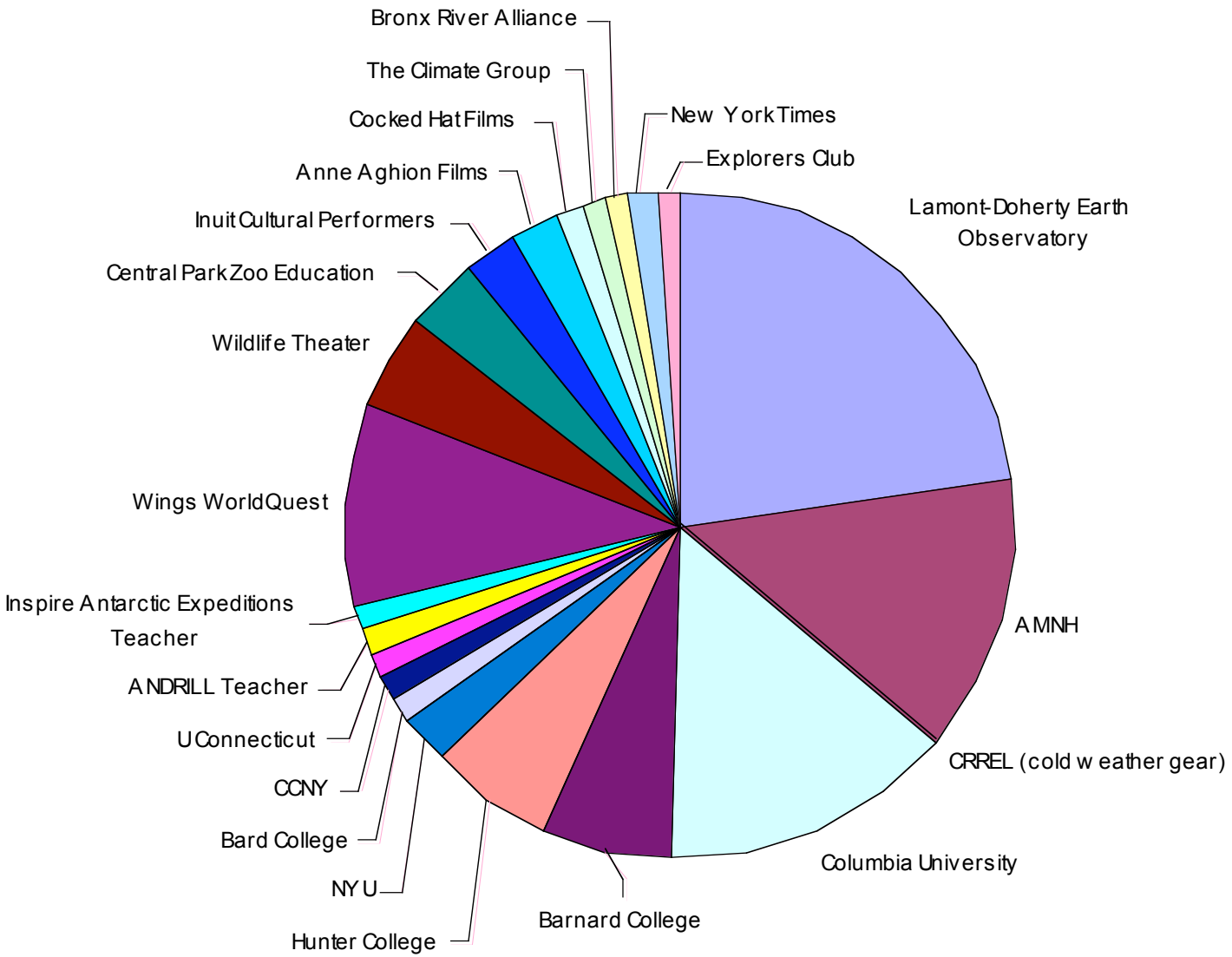
NYC-IPW Visitors
3,500 in 2007 and 5,000 in 2008

Grand Gallery – Usually

- General AMNH Visitors 2007
  - 13,515 people Saturday March 10
  - 11,486 people Sunday March 11
  - 3,500 for NYC-IPW = 14% of total
- General AMNH Visitors 2008
  - 11,649 people Saturday February 2
  - 8,492 people Sunday February 3 (Superbowl, Giants playing!)
  - 5,000 for NYC-IPW = 25% of total

85 Presenters/Volunteers from 22 Institutions in 2007

(142 Presenters/Volunteers from 38 Institutions and organizations in 2008)



Summative Evaluation Goals

2008

Report prepared by Maritza MacDonald and Haelee Kim, AMNH

- Understand visitors' experience at the NYC International Polar Weekend
- Determine the successes and shortcomings of the program, eliciting suggestions for improvement for next year
- Understand the event's impact on visitors, focusing on the content messages

Evaluation Methodology

- Observations
  - Volunteers recorded all questions asked during the Q&A portions of each program
  - Noted comments and recorded general observations in the Polar Fair area
- Interviews
  - ca. 100 individual adults were randomly selected by interviewers and asked to answer a few questions
- Questionnaires
  - ca. 400 adult visitors entering Kaufmann and Linder Theaters were asked to complete a standardized questionnaire

Polar Weekend program content?

(Interviews: n=97, Questionnaire: n=405)

Critical role of the poles in global climate and the dramatic changes that are already underway	32%, 20%
Understanding and appreciating polar environments and culture	31%, 27%
Convey excitement about polar research	21%, 20%
Understanding what can be done to mitigate and adapt to global warming	10%, 15%
Appreciation for careers in science and education	6%, 19%

Why did you come to the museum today? (Interviews: n=75)	
To see Polar Weekend Program	36%
With school group or for school	20%
General interest in the museum	17%
Other	17%
To see Water exhibition	5%
Had free time/something to do	3%
From out of town/tourist	1%

Before coming to this program, how would you rate your interest in climate change/polar issues? (Interviews, n=70)	
No interest	4%
Somewhat interested	29%
Interested	43%
Extremely interested	24%

Before coming to this program how would you rate your knowledge of climate change/polar issues? (Interviews, n=69)	
No knowledge	3%
Some knowledge	44%
Knowledgeable	20%
Extremely knowledgeable	2%

Would like to see other programs like this because … (n=106)

40% (42) Educational/Informative
23% (25) Interest in Subject

- Cultural diversity is great (4)
- Not available anywhere else (2)
- They emphasize the thrill of discovery
- It pulls together many concepts into one theme
- It was inspiring to be in the presence of explorers (2)
- It’s very informative and the person that is speaking was really there
- It was nontraditional and something I knew nothing about
- You can't get this information from TV
- They are instructive and fun
- Great for kids

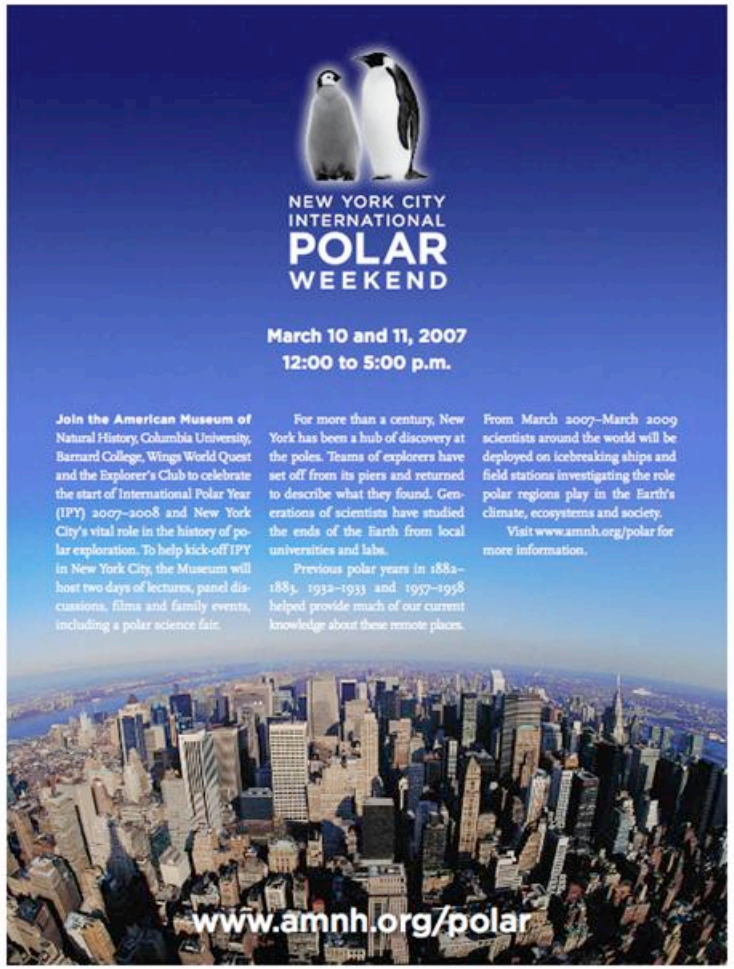
Most Surprising?
n=86

- The presence of under ice lakes in Antarctica (2)
- Fossils in Antarctica (3)
- Variety of life in Antarctica and the past
- Dramatic amount of change in polar ice during a short time (3)
- Visual images of polar environment
- How people could survive in Arctic/Antarctic climate
- How cold the area is (2)
- How teachers are playing a role in polar exploration (2)
- The difficulty of Polar exploration (3)
- The time spent in travel to Antarctica and the Arctic
- That each object has its own "yolka"
- Music still lives now from back then
- The Eemian Mystery in the ice core

Suggestions for the Future

n=56

- 39%, the majority of the responses, dealt with logistics
  - Advertising of the program and providing more information on the different activities
- 21% suggested that AMNH continue similar programming
  - “more programs like this are needed for the general public”



Presenter Survey (2008)

- Were you successful in conveying your message to the public?
  - 92% yes, - 8% somewhat
- Did your message change as you interacted?
  - 31% said yes - after they realized what was of interest to the visitors, and what was confusing to them, they adjusted their message
- New colleagues of connections made?
  - 46% yes
- Any surprises?
  - 62% were surprised by the number of attendees and the great interest and questions they received

Comments by Presenters

- Learn from the event in terms of communication?
  - Importance of communicating science to the public
  - Importance of hands on activities
  - Speak in short, concise statements
- Changes in your approaches to dealing with the public?
  - Have hand out just for adults - we had kids handouts but not adult
  - Keep things general and have props to help with the explanations
- Different perspective in how people relate to our research
  - Realized some people pull anything to support their underlying beliefs. It is important to explain the fundamental processes in the science for people before getting caught up in details

NYC-IPW Conclusions

- Visitor perspective
  - Content goals were conveyed
  - Multiple media approach engaged the public -- Polar Fair, theater, lectures
  - Unique nature of program
    - Value of actually meeting polar experts in person
    - Different type of venue from TV, reading, etc.
    - Interdisciplinary, cultural components appreciated
- Presenter perspective
  - Enthusiastic about their experience
  - With experience, learned how to convey science better
  - Wanted to be involved in future programs