Polar Technology Conference

History
Goals & Roles
Future Content, Format, Venue(s) and Operations

Polar Technology Conference
Fairlee, VT
4 April 2012

2005 & 2012 PTC Invitation

From: Bob.Twiggs@stanford.edu
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Stanford University plans to hold a conference bringing together the Polar Scientists and Polar Technology Developers together for a forum to help match scientists needs for Polar Research and Polar Technology that is being developed. We would like to invite you to participate.

The primary purpose of this conference is to bring together Polar Scientists and Technology Developers in a forum to exchange information on research system operational needs and technology solutions that have been successful in polar environments. This exchange of knowledge helps to address issues of design, implementation, and deployment for systems that are to achieve their research goals in the Polar Regions.

PTC Attendance

Year	Attendees	Talks	Venue	Host
2005	31	14	Mt. View, CA	Stanford University
2006	21	8	Mt. View, CA	Stanford University
2007	15	15	Menlo Park, CA	SRI International
2008	28	12	Menlo Park, CA	SRI International
2009	42	15	Madison, WI	Univ. of Wisconsin
2010	80	18	Boulder, CO	UNAVCO
2011	79	34	Albuquerque, NM	IRIS PASSCAL
2012	70	26	Fairlee, VT	CRREL & Dartmouth

PTC "Culture"

- Grass roots effort, bottom up; Volunteer effort
- Provides technical information exchange not available at scientific conferences
  - How was it possible to collect the data?
  - What works and what doesn't work?
- Improve the reliability of success; Enhance safety
- Single lane of presentations, because participants support a wide range of systems
- Archival of presentations on PTC Website
- Face-to-face side discussions; Workshops
- Venue changes to ease regional attendance
- International participation

White papers and project examples

APOS Conclusions & Recommendations

1) Autonomous polar deployments should be undertaken as cooperative ventures between multiple communities and with international collaboration, if possible.

a. **The establishment of super-sites where many disciplines install instruments at the same geographic location and share the logistical costs of the deployment.**

b. **Much-improved communication between disciplines and between countries on planned field camps, traverses, cruises, and areas of special focus.**

c. **A comprehensive database of existing and in-progress autonomous deployments. The best solution would be a recognized website that is professionally maintained and regularly updated.**

d. **Continued exchange of knowledge, successes and failures, advancements, and opportunities through the Polar Technology Conference and by working closely with instrumentation consortia such as UNAVCO and IRIS/PASSCAL.**

APOS Conclusions & Recommendations

2) Autonomous polar technology development must be encouraged and supported at various levels.

a. Individual PI-led efforts are often innovative, targeted, and high-risk…but also high-reward. Under the right circumstances these efforts have an important role and must be continued. Knowledge gained from such teams should be incorporated into the information systems that may be maintained by instrumentation consortia.

b. Physical deployment issues such as logistics, packaging, deployment strategies, etc, must be shared and continually improved as experience is gained. The instrumentation consortia should be charged with maintaining and disseminating this knowledge.

c. Power systems must be improved with an eye to ongoing battery technology advances. The initial cost burden of advanced-technology batteries must be weighed against the long-term logistical costs of older-technology batteries.

d. Communications technology is evolving rapidly. There is short-term stability/stagnation, with little change in bandwidth for polar communications in the immediate future. However, we recommend aggressive investment in long-term communication technologies.

e. Human resources are at a premium. Students should be afforded opportunities at the consortia; at institutions doing instrument development; and in the field. "Cross-training" that transcends the traditional disciplinary/technical and institutional boundaries should be strongly encouraged so that fewer people need to go to the field.

APOS Conclusions & Recommendations

3) A management structure for autonomous polar observing systems is perhaps the most difficult question. Coordination is needed, but the need to preserve autonomy of efforts within the different research communities is also recognized, and thus the workshop does not recommend a "top-down" strategy. The research community is small, so another oversight committee would be a heavy burden on scientists' time. We propose instead:

a. The major stakeholders in polar observing systems should communicate through forums that already exist. Examples of multidisciplinary venues include the IRIS/UNAVCO Polar Networks Science Committee and the Scientific Committee for Antarctic Research (SCAR) Open Science Conferences.

b. The establishment of a professionally maintained and updated website, as described above. The website will inform and bring together the community and will facilitate a degree of self-organization.

c. The continuation and enlargement of the Polar Technology Conference (or a similarly oriented conference) to allow rapid dissemination of newly developed technologies.

APOS Executive Summary

International strategies that should be considered where appropriate include:

1) "Supersites," which are locations where many researchers could share logistics and on-site capabilities, and where support personnel would have the training to meet the needs of multiple science groups.

2) Improved early planning and subsequent coordination of field camps and traverses.

3) Establishment of a comprehensive, accessible, and up-to-date international database of past, present, and future polar deployments and associated logistical resources.

4) Timely publication (e.g., web) of updated "best practices" information on power, communications, and other polar instrumentation subsystems.

5) Establishment and encouragement of interdisciplinary working groups to advance common goals.

6) Continued support for community conferences with agency, researcher, and instrumentation consortium participation in this area.

7) Establishment of student intern and other opportunities to engage science and engineering students in these activities.