

# InfoNorth

## Early Career Researchers and Mentors Work Together to Shape the Future of the Arctic Monitoring and Assessment Programme

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### INTRODUCTION

THE ARCTIC HAS LONG BEEN A SYMBOL of natural and cultural richness that attracts the interest of both natural and social science research communities. It is currently garnering increasing interest from public, private, and government sectors as a region that is rich in natural resources and sensitive to human stressors. Much of the current awareness and interest in the Arctic relates to its particular vulnerability to climate change (e.g., ACIA, 2004). Several national and international research initiatives, including the 2007–08 International Polar Year (IPY), have documented increasing summer temperatures in the mid-2000s that reduced summer sea ice extent in the Arctic to some of the lowest levels ever recorded (Barber et al., 2008). The Arctic Monitoring and Assessment Programme (AMAP), established in 1991, is a working group of the Arctic Council that is tasked with tracking changes in the Arctic and providing information to Arctic decision makers. Recent assessments released by AMAP on mercury (AMAP, 2011a), persistent organic pollutants (AMAP, 2011b), and snow, water, ice, and permafrost dynamics (SWIPA; SWIPA, 2011) have stimulated discussions about the future of Arctic environments and communities at high-level international meetings (Mathiasen, 2011).

Like many other science organizations, the AMAP working group recognizes a potentially costly generation/personnel gap; many of its accomplished members are approaching retirement age, while relatively few early- and mid-career researchers have been incorporated into the working group's activities. Consistent with its mandate to track, monitor, and assess long-term change in the Arctic, AMAP recognizes the need to foster a continuum of science by integrating early career researchers (ECRs) into the programme. To this end, AMAP approached the Association of Polar Early Career Scientists (APECS) in 2010. Established in 2007 to engage ECRs in International Polar Year, APECS is the first international and interdisciplinary unifying organization of ECRs who work in polar regions. As of December 2011, APECS had more than 3000 active members, early-career scientists, educators, and policy makers from a wide range of disciplines. Thus APECS is a significant resource to polar organizations, such as AMAP,

that recognize the need to engage and retain ECRs in order to ensure effective succession and institutional continuity.

### JOINT WORKSHOP

To help involve and integrate early career researchers into AMAP working group activities, AMAP and APECS worked collaboratively to support their attendance at an AMAP meeting. With sponsorship from the Nordic Council of Ministers, a one-day workshop entitled “Shaping the Future of AMAP” was held just before the “Arctic as a Global Messenger Conference” in Copenhagen, Denmark, in May 2011. Co-sponsored by AMAP, the University of Aarhus, and the University of Copenhagen, the workshop brought together 40 ECRs and 14 established researchers and decision makers from 12 countries (Canada, Belgium, Denmark, Finland, Germany, Iceland, Norway, Poland, Spain, Sweden, Russia, and the United States). The application process for ECR participants was competitive, and both ECRs and mentors represented a variety of disciplines within AMAP's mandate. Participants included biologists, chemists, atmospheric scientists, social scientists, and policy researchers working on a wide range of issues, with special emphasis on contaminants.

Before the workshop, APECS organizers worked with AMAP leaders to develop expectations and brainstorm topics for the event. These discussions were informed by results from an online questionnaire about policy and research, and participants' responses were used to refine discussion topics, workshop activities, and this report (APECS, 2011).

At the workshop, ECRs discussed Arctic science and policy concerns with AMAP experts in mentor-led breakout groups (Fig. 1), covering research priorities, knowledge gaps, new methodologies, and the interface between science and policy. A team of ECRs then condensed common themes and discussion points from the survey and breakout groups into six recommendations. These recommendations, some general in scope and some specific to AMAP, were presented as a message to AMAP on the final day of the conference, and they went on to become part of the AMAP report to the Arctic Council in Nuuk, Greenland, on 9–12 May 2011.

## RECOMMENDATIONS TO AMAP

1. *Develop an interdisciplinary and internationally coordinated monitoring system.* Research, funding programs, and field activities need to be better coordinated among nations by a central international and interdisciplinary umbrella body. Individual nations must strongly commit their funding agencies and research communities to the design and maintenance of strategic data sharing and monitoring programs. This commitment will ensure the long-term success of circumpolar monitoring and result in minimal duplication of effort.

A common discussion point in breakout groups was the integrity and longevity of monitoring and assessment programmes. ECRs expressed concern that monitoring stations and field sites established both before and during IPY are not well coordinated among nations, and that the end of IPY funding may mean that monitoring ceases in some locations. As Arctic environments and communities face unprecedented change, an integrated and efficient monitoring network is crucial. Such a network can be most effectively achieved through cooperation and coordination among national funding bodies, in addition to individual scientist collaborations. ECRs, as the future long-term users of these facilities, expressed the desire to be involved in succession planning for both personnel and infrastructure at Arctic monitoring stations; they think that establishing long-term, spatially consistent monitoring programmes with a stable funding strategy should be a priority.

2. *Move beyond identifying problems to creating solutions.* In future Arctic assessments, more emphasis should be placed on meeting challenges with recommendations for action that will reduce risks to Arctic environments and communities. ECRs are interested not only in conducting impact assessments, but also in implementing solutions and mitigation strategies.

Early career researchers emphasized that moving beyond the identification of problems and into mitigation and prevention may be achieved in part by more effective communication between researchers, policy makers, and stakeholders. Beyond their interest in undertaking rigorous science, ECRs expressed a desire to interact directly with policy makers and stakeholders. In responses to the pre-workshop survey questions, many ECRs indicated that networks that link scientists, policy makers, and stakeholders would be very valuable. Workshops that promote interactions among scientists, policy makers, and stakeholders are also needed, as communication among these three groups is often not as efficient or effective as it needs to be.

3. *Implement meaningful involvement of early career researchers.* AMAP should include ECRs in all steps of their assessment processes in order to ensure continued success of the programme. AMAP can engage



FIG. 1. Present AMAP leaders and scientists worked with early career researchers to develop ideas about the future of Arctic research and understand the interactions between science and policy. Photo credit: Jakob Sievers.

organizations such as APECS to access and recruit highly motivated, qualified ECRs who can bring new ideas and renewed energy to the programme.

Early career researchers pointed out that unless their graduate supervisor or another mentor was involved with AMAP, there was little opportunity for them to engage with the organization, even if their research was directly applicable to AMAP's mandate and research activities. AMAP mentors recognized that recruitment of ECRs was lacking and needed to be improved. Recruitment and engagement of ECRs into large organizations such as AMAP can be facilitated through networks, such as APECS, that maintain up-to-date and online membership lists of ECRs with associated information on expertise, current activities and positions, and contact details. Funded collaborative workshops (such as this one) also represent important recruitment opportunities.

4. *Practice effective, broad-ranging outreach.* AMAP could communicate its findings to a broader audience by engaging ECRs, as they are often the people who are interacting with stakeholders "on the ground." ECRs encourage AMAP to recognize and promote the education and outreach achievements of early career researchers through formal mentorship and ambassador programmes.

Early career researchers recognize the need to balance engaging the public with conducting cutting-edge research. As calls for scientists to prioritize science communication become more urgent (Lubchenco, 1998; Baron, 2010), organizations need to recognize the pool of ECRs trained during IPY who are interested in engaging the public and communicating their science to wider audiences, and who consider this a critical part of their professional responsibility. These researchers represent an important resource that should be capitalized on, and outreach and education initiatives should be further encouraged through formal training and incentive programs.

5. *Facilitate communication training.* Programmes such as AMAP should work to fund organizations such as APECS to facilitate and deliver communication training for all researchers, both young and established. ECRs, in particular, need to be trained to communicate with policy makers, communities, media, and the broader public to ensure proper dissemination of research results.

In responses to the pre-workshop survey questions, ECRs expressed a desire for more training in communications and access to relevant tools and resources. ECRs also indicated that they thought communication training and tools were more important than increased funding in achieving more effective links between scientists, policy makers, and stakeholders. Since the majority of research is funded by public or government agencies, increasing effective communication of results will help to demonstrate the societal benefits of research, creating a more favourable response to science funding.

6. *Develop a system for retention.* Decision makers in the Arctic science community need to create retention programs that lead to permanent positions for young researchers. If this is not done, the capacity, excitement, and enthusiasm in Arctic research that have been built through graduate education programs will dissipate away from the Arctic at a time when they are most needed.

It is estimated that for every established researcher, there were on average 1.5 ECRs participating and undergoing training in IPY projects (Baeseman et al., 2011). ECRs and mentors alike expressed concern that a mismatch is occurring between the need for Arctic research and coordination and permanent employment opportunities for ECRs trained during IPY. As early career researchers trained during IPY move from being students to looking for research and academic positions in Arctic science, they have encountered a lack of long-term positions and opportunities and are now looking in other fields for employment. While the slow economy is no doubt resulting in a similar phenomenon in other fields of research, it is of particular concern for the Arctic because the investment in ECR development during IPY was so substantial, and because of the pressing need to maintain and expand existing Arctic science programs. The loss of ECRs to other fields and disciplines is a loss in capacity and energy long worked for in a unique and important part of the world.

## CONCLUSIONS

Alongside the enthusiastic engagement and active scientific contribution of early career researchers at the conference, AMAP released the latest SWIPA report (SWIPA, 2011), which outlines how changes in the cryosphere are occurring faster than predicted. Arctic communities and ecosystems need researchers who are fast-acting,

energetic, enthusiastic, and engaged in multidisciplinary science to respond to these changes. Through IPY, early career researchers have formed interdisciplinary, integrated research interests with international colleagues to address environmental and social change in the Arctic. To protect the investment made in ECRs during IPY and to ensure institutional memory, integrity of long-term monitoring programs, and a continuum of knowledge, ECRs need to be supported and integrated into organizations such as AMAP. By partnering with APECS, AMAP is actively working to involve ECRs. Other polar organizations have also taken initial steps at integrating ECRs under the impetus of IPY. With polar ECRs on the threshold of their careers, AMAP and other groups are urged not only to continue these initiatives, but also to take the next step and formally implement and advocate for continued ECR involvement and formal retention programmes. The success of the above-described AMAP-APECS collaboration should inspire and provoke others to become active in shaping the future of polar research.

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