Workshop summary for IASC

*[A workshop summary report (2-5 pages)]*

Arctic Air pollution and Societies

# Workshop theme and purpose

At ASSW 2016 in Fairbanks, Alaska, the IASC and IGAC co-sponsored initiative “Air Pollution in the Arctic: Climate, Environment and Societies” brought together researchers active in the physical/chemical science of air pollution with those active in relevant social science topics. The primary purpose of the workshop was to facilitate a structured dialogue between natural and social sciences as well as humanities in order to map joint research interests to develop a working group of interdisciplinary research under PACES. About 30 people from a variety of scientific backgrounds attended the workshop. Several people’s attendance was supported by the IASC AWG.

# Topics of discussion

To start discussion, accessible presentations from diverse scientific disciplines were given to build a common reference ground for identifying joint interests. Presentations came from the following fields of research and topics:

* Atmospheric sciences: basics of air pollution and specificities of Arctic air pollution, modeling and monitoring approaches
* Cultural anthropology: Concerns of North Slope communities and responses
* Economic ecology/anthropology: A methodological perspective
* Law: Environmental and international law in the Arctic
* Community based monitoring: Engaging through research
* Medicine/health: Health and well-being

# Key points from the open discussion

Both presentations and the open discussion revealed the diversity of contexts through which air pollution can be studied and suggested ways in which linking these contexts is essential to broadening understanding and developing science that is of greater service to society. Local air pollution, already a concern in some Arctic societies, is inextricably linked to local activities, which are changing with Arctic development and community responses to these developments. Examples of emissions from natural resource extraction facilities were discussed, as well as those from infrastructure building and other large-scale activities (e.g. airport or port development). It was noted that locally produced air pollution, in combination with stagnant weather conditions and inversion layers, can lead to significant localized build-up. Communities are aware to varying degrees about the causes and effects of this build-up. By contrast long-range transported air pollution is a current focus of the climate science community, the causes and effects of which might be less visible to Arctic residents. In the discussions it became clear that the nature and extent of local emission sources is not well characterized yet and that this topic could be explored within PACES.

Many talks highlighted the contested nature of topics like air pollution in communities and the need for information that is viewed as credible and legitimate. In considering how various actors in the Arctic observe, monitor and inform each other about air pollution, the issue of trust emerged as an important consideration and subject of study in particular for cultural anthropologists. One example concerned air quality monitoring equipment deployed by industry. This data, though made available to residents, is sometimes rejected by the local population due to a lack of trust between residents and industry. Alternative approaches to community knowledge empowerment are suggested by the lessons learned from community-based monitoring programs in other research areas. By engaging local communities in monitoring (e.g. by deploying small and inexpensive devices), trust in the data can be earned as residents would collect data themselves. The opportunities for engaging with local communities on this type of monitoring are also of great interest within PACES.

In addition to the need for credible and legitimate information, institutional and legal capacity for response to Arctic air pollution was also explored. An overview of legal and regulatory mechanisms that have been successful with other emissions (e.g. CFCs) revealed that the legal frameworks and institutions take time to develop and the organization of scientific information should informed by these capacities. It was viewed as very relevant for PACES to understand the legal and policy context in which it is developing research.

A comprehensive model for the air pollution monitoring in the Russian Arctic region was presented, that included both natural science and social dimensions. It acquires various air quality data in the Arctic, including those obtained in situ and remotely. To obtain the ground based observational data, an active involvement of the indigenous communities is crucial, especially in the less accessible Arctic areas. Properly established, the incorporation of the local population into data collection for the air pollution model implemented in the Arctic zone can bring the following positive side-effects for these indigenous communities in social and cultural spheres, as well as science, education and regional economy.

Furthermore, the close linkage of air pollution to human well-being was discussed. For example, air pollutants are absorbed by lichens that are eaten by animals which in turn serve as food for local communities. Air pollutants hence enter the food web quickly. The same is true for water resources. To further explore the nexus between emissions, ecosystems and human well-being an interdisciplinary approach combining social and natural sciences will be needed. Local communities hold much of the relevant knowledge that atmospheric scientists would not be able to access otherwise. One of the bottom lines in this respect was that a contribution to clean air within the larger sustainable development context in the Arctic can only be achieved when developing more holistic, i.e. systemic, knowledge of causes and effects. This logically requires interdisciplinary research approaches that include community knowledge as well.

# Information dissemination and follow up activities

In addition to a short summary for the IASC webpage, a news article in the IGAC newsletter will be published and disseminated to the wider PACES community. To explore concrete interdisciplinary research questions that qualify under the theme “science with and for society for sustainable Arctic development” a several day long workshop will be held later in 2016. In addition, the objectives will be to identify key regions in the Arctic and potentially already specific communities in which pilot studies might be initiated. As PACES is organized in working groups, it is the aim to form a dedicated working group for the interdisciplinary (humanities, social and natural sciences) theme. Also discussed will be the potential of this work to form under a cross-cutting IASC project between the AWG and SHWG. Linkages with other PACES working group activities as well as other Arctic projects will be identified and a roadmap will be designed that leads up to concrete research projects. The proposed idea to develop a cross-cutting activity in IASC was also discussed in Fairbanks and will be taken forward under the AWG and SHWG.

*[A 1-paragraph description of the workshop and its outcomes]*

# Arctic Air Pollution and Societies

At ASSW 2016 in Fairbanks, Alaska, the IASC and IGAC co-sponsored initiative “air Pollution in the Arctic: Climate, Environment and Societies” brought together researchers active in the physical/chemical science of air pollution with those active in relevant social science topics (development, sustainability, risk, adaptation, policy, health and more) in order to explore common interests and begin to outline research objectives under PACES. Presentations covering various perspectives and research methodologies from all represented sciences revealed that air pollution is a concern high on the priority lists of local communities. While the climate science community has been traditionally more concerned with long-term transport and background levels of pollutants, the intersection of these scales and perspectives has great potential. For example, initial ideas on how to use community-based air pollution monitoring approaches together with systems analyses to improve the characterization of in-Arctic emission sources were discussed. At the same time it became evident that the evolution of local air pollution is intrinsically linked to socio-economic development, infrastructure investments, and has an effect on human well-being. To comprehensively understand the linkages and future development in a changing Arctic, social sciences approaches are needed to facilitate knowledge production together with the local communities. A follow-up workshop is planned for more in-depth discussions. The objective is to define cross-cutting research questions as well as priority study areas.

*[Up to 3 PowerPoint slides from the workshop]*

See attachment.