**AOS 2013 - Brief synthesis notes based on white papers under *Data Management* theme**

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## Data management

This synthesis is primarily based on 18 papers listed on the next page.

To ensure full exploitation of the observing systems they need to be supported by a data management system. Several data management systems exist and others are proposed. Some systems aim to contain the metadata, reports (ex. Arctic Observing Viewer (AOV)), and links to data archives, while others actually hold the data (usually near the data producer). The data management systems that actually hold data handle a selection of data types developed to support a particular observing system with a more or less focused "scientific " objective. Others support regional observing systems with a broad range of observations such as SIOS. Most data management systems are founded on principles of interoperability, with an emerging metadata standard and open web service formats.

- *How well do the different systems compile/interact with each other?*
- *What are the main bottlenecks for inter-operationality (interoperability)?*
- *Standardization/homogenization or harmonization of data?*

A strong data management approach (both strategy and infrastructure) is a key component of a robust observing system design and implementation at both national and international scales and can provide an efficient means to achieve system-wide data integration and synthesis (Moore). Furthermore, the data management system will help to meld model development and sampling/monitoring strategies such that we acquire the most rapid and cost effective development of both to maximize the amount of understanding from the available information (Ellis-Evans et al).

- *Should the Arctic Observing System have an international overarching data management body?*
- *What would be their tasks?*
- *Who should fund it?*

Data availability varies a lot depending on type of observing system and which country the observations are made in (Eicken). Moore et al. clearly formulate some of the key issues concerning data availability: "One of the biggest hurdles facing the arctic research community is the lack of an Arctic Observations Data Policy agreement that stimulates the free and open access to the remarkably diverse data coming from the region. Such a policy should first, encourage the unrestricted access to some or all of the Arctic data in the U.S. Second, it is vital that the policy respect restrictions on data access but require open access once clearly specified embargo periods are over. The policy should emphasize the need for a common metadata schema to enhance exchange. The policy must emphasize the need for dataset attribution to make sure the data providers are given proper credit and citation for the data provided (e.g., the use of Digital Object Identifiers for datasets). One way to move development of such a policy forward would be to identify the most used/highest priority AON datasets and the key questions being answered with those data. These data could then be used as a demonstration of the benefits of improved data/metadata collection, archival and sharing from all groups."

- *At what level should a data policy be formulated?*
- *Does the funding mechanisms influence the availability of sustainable observational data?*
- *E.g. Would it help to transfer the responsibility of long term (sustainable)monitoring systems*

*from research institutions to governmental institutions?*

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| Barber, et al. | The International Arctic Ocean Drift Study – Arctic ODS<br>(Proposal) |
| Berkman et al. | Institutional Dimensions of Sustaining Arctic Observing Networks (SAON) |
| *Hajo Eicken, et al* | Dual-purpose Arctic observing networks: Lessons from SEARCH on frameworks for prioritization and coordination |
| Cynan Ellis-Evans, et al.<br>The SIOS Preparatory Phase Project | A regional initiative to build observing capacity for an Arctic Observing System |
| W. Goedkoop, et al. | Biodiversity of Arctic Freshwaters: Developing the CAFF CBMP. Integrated Monitoring Plan |
| Forrest M. Homan, et al. | A Model-Inspired Sampling Network Design and Representativeness Methodology for the Arctic |
| Jakobson et al | Arctic Ocean Bathymetry: A required geospatial framework |
| Juniper et al. | Community-based mini-observatories for Arctic ocean science and outreach |
| Keskitalo et al. | White paper outline: Stakeholder integration: a response to a suggested focus on arctic residents and monitoring |
| Key, et al. | A Global Cryosphere Watch<br>(Data management system) |
| Knopp et al | Inuvialuit Settlement Region Community-Based Monitoring Program (ISR-CBMP):Community-Driven Monitoring of Locally Important Natural Resources |
| Manley et al | The New U.S. Arctic Observing Viewer: A Tool for Strategic Assessment |
| Mc Clelland et al | Coordination and sustainability of river observing activities in the Arctic |
| Moore, et al. | Data Management Perspective for an International Arctic Observing Network:<br>Preserving the Legacy—Promoting Exchange |
| Pulsifer et al. | Data Management for Arctic Observing |
| Larsen, J. R. | SAON |
| Starkweather et al. | Advancing Arctic Atmospheric Science through Developing Collaborative Targets for International Observatories |
| Tannerfeldt et al. | Arctic Research Icebreaker Cooperation towards ARICE and beyond: A strategy for meeting the needs for marine research in the Arctic |
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