International Arctic Vegetation Database

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Overview of talk

- Milestones of the project
- Conceptual framework for the project
- A proposal for creating the AVA
- Timeline
- Funding
’Boulder Resolution’ signed by 44 attendees at the workshop

“...Be it resolved that the international community of arctic vegetation scientists undertakes the joint tasks of:

1. Creating a database of type relevé data, using the Panarctic Flora as a common taxonomical base;

2. Developing a comprehensive synthesis of phytosociological information through the publication of a Prodromus of arctic vegetation syntaxa; publication of a bibliography of arctic vegetation studies, and development of a revised syntaxonomical classification for the circumpolar region;

3. Compilation, editing and publishing an arctic circumpolar vegetation map depicting the distribution and boundaries of arctic vegetation north of the arctic tree line at a scale of 1:7,500,000 and legend that is acceptable and understood the international community of plant scientists.
2003: Circumpolar Arctic Vegetation Map (CAVM)

First step in completing the Boulder Resolution
Proceedings from the concluding CAVM meeting in Tromsø, 2004

Classification and mapping of arctic vegetation

A tribute to Boris A. Yurtsev. A selection of contributions presented at the 2. Internat. Workshop on Circumpolar Vegetation Classification and Mapping, Tromso, Sommaroya, Norway, 2-6 June 2004

Ed.: Fred J.A. Daniels; Arve Elvebakk; Stephen S. Talbot; Donald A. Walker

2005. V, 375 pages, 205 figures, 135 tables, 24x16cm, 850 g

Language: English
2011: International Arctic Vegetation Database Concept Paper

A unified web-based database containing as much of the Circumpolar Arctic relevé data as possible.

2012: CBIO-NET workshops, Roskilde, Denmark

- 2 meetings at the Cromwell in Roskilde.
- Sponsored by the Nordic Network on Climate and Biodiversity (CBIO-NET) and Aarhus University.
- Highlighted the application of a vegetation archive for modeling and predicting biodiversity.
- InfoNorth article in *Arctic* (Walker et al. 2013).
Need for a panarctic vegetation database

Why now?

• Global climate change has intensified efforts to inventory, classify and map the vegetation of the Arctic in much more detail than has been done previously.

• The amount of information in the Arctic (approximately 20,000 relevés) makes it feasible.

• Legacy information is in danger of being lost.

Why vegetation?

• Key integrator of many of the physical and biological attributes of ecosystems.

• Often used in environmental and biodiversity inventories, land-use planning, remote-sensing, environmental management, and conservation evaluations.

Photo: D.A. Walker, Nuuk, Greenland
Why the Arctic?

Of all the global biomes, the Arctic Tundra Biome best lends itself to a unified international approach for managing its vegetation information.

- Floristically and vegetatively the most homogeneous of the global biomes.
- Its entire list of known vascular plants, bryophytes and lichens are documented in up-to-date checklists.
- It is already mapped (CAVM Team 2003).
- If successfully applied here, it would be a model for application to other global biomes.

Photo: D.A. Walker, Hayes I., Franz Josef Land, Russia
International Arctic Vegetation Database

Ultimate goals:
1. Panarctic vegetation.
2. Prodromus (list) of Arctic plant communities.
3. Foundation database for biodiversity, ecosystem modeling, and remote-sensing studies.
4. Educational tool including web portal with descriptions, photos, maps of each plant community.

Photo: D.A. Walker, Nuuk, Greenland
What type of data?

Plant Community Plot Data:

• Preferably published plot data from homogeneous plant communities with tables of cover or cover-abundance scores for all species, including vascular plants, bryophytes, and lichens.
• Preferably with accompanying environmental information.
• Braun-Blanquet or USNVC protocols are ideal.

Photo: G. Matyshak, Hayes Island, Franz Josef Land, Russia
Need to harmonize North American and European vegetation sampling and classification approaches

- So much of the world is heavily invested in one or the other method (DeCaceras & Wiser 2011).
- The Arctic vegetation database would be constructed so that the date could be incorporated into either approach.

Photo: Ina Timling, moss-cushion community, Hayes Island, Franz Josef Land, Russia
Name Change to Arctic Vegetation Archive (AVA)

- AVA is compatible with EVA (European Vegetation Archive). Intention is to be a parallel effort and a subset thereof.
- Shorter easier to remember acronym. Certain degree of replication in the old name: The Arctic is “International”.
- Derivation:
  - Latin: “Bird”
  - German: “Desired”
  - Persian: “A pleasant sound”, associated with music.
  - Hebrew: “life” From Eve, and Chava

Photo: Ina Timling, moss-cushion community, Hayes Island, Franz Josef Land, Russia
Conceptual framework

Panarctic Species List

- Vascular plants: Elven et al. 2011
- Lichens: Kristiansen et al. 2010

- Unified Arctic plant species checklist with accepted PAF names and synonyms
- Other species lists associated with raw species plot data

- Images, morphology, biology, genetics, distribution, ecology

Arctic Vegetation Archive

- Published and unpublished plot data
  - Species cover data
  - Preliminary prodromus
  - Environmental data

Plot data: Original & standardized data sets, grouped by vegetation types, habitat types, locations or other variable

CBMP Data Portal: Web-based Products

- Species pages
- Plot Pages
- Plant community pages
- Vegetation classification & Prodromus
- Bibliography

- Plot data download
- Metadata download
- Google maps
- Interactive database
- Checklist download
- Biodiversity assessment, gap analysis
- PDFs of original papers
CAFF Vegetation Web Portal

- Will be part of the CAFF Arctic Biodiversity Data Portal.
- Hierarchy of pages linking vegetation maps to vegetation unit descriptions, species pages, and vegetation plot data.
Arctic Vegetation Archive Workshop

14-16 April, 2013, Krakow, Poland

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Goals of the 2013 Kraków AVA meeting

- Review the status of relevé data in each of the circumpolar countries.
- Unify the Arctic vegetation community behind an approach that is acceptable to all involved.
- Begin recruiting the people and resources necessary to complete the work.

Photo: www.krakow.pl
http://krakow.pl/english/5666,artykul,krakow_advantages.html
Proposed Timeline

- Year 1-2: Organizing workshop, ASSW, Krakow, Poland. Complete IAVD prototypes. Obtain international funding.
- Year 2-4: Assemble data from literature sources at three main centers UAF (North America), Münster (Greenland and Scandinavia), and a to-be-determined site in Russia. Build server site software. Build web pages for data portal.
- Year 5-6: Test and release the database.
Funding

- Will require funds from a variety of international agencies.
- Proposals after this Krakow workshop.
- NASA is funding the Alaska component. Canada (CHARS) committed to developing the Canadian portion.
- Anticipated 5-6 year project.
NASA ABoVE initiative

Similar in scope to previous large NASA field campaigns in the grasslands, (FIFE) and boreal forest (BOREAS).

• Pre-ABoVE: Preparation for ABoVE, data gathering phase.
• Just funded: “Recovery and archiving of key Arctic Alaska vegetation map and plot data for long-term vegetation analyses”
• Funds the Alaska Arctic Vegetation Archive and a hierarchical map database for Alaska.
Concluding statements

• The AVA was conceived 21 years ago to help consolidate the large amount of plot data from around the Arctic to aid in development of a circumpolar Arctic vegetation classification.

• The vision has recently been revitalized with the help of CAFF, IASC, and the CBIO-NET workshops and has the potential to contribute to a wide diversity of Arctic biodiversity, habitat, and ecosystem modeling efforts.

• The first steps to develop a collaborative effort for funding have been made.

Photo: D.A. Walker. Franz Josef Land