Perspectives on SIOS data management and remote sensing service, lessons learned in the Norwegian Satellite Earth Observation Database for Marine and Polar Research

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What is SIOS?

- A regional observing system for long-term measurements addressing Earth System Science questions
- Bringing many types of observations together
- Asking questions about how these observations are influencing each other
- Providing new insights on the role of Svalbard and the surrounding region’s role in the Earth system
- An international consortium of institutions with relevant research infrastructure (RI) in and around Svalbard
- Coordinates, develops and optimises this distributed RI – still owned by the member institutions
- Brings the observations together into a coherent, integrated and sustained observational programme
- Within SIOS, researchers can cooperate to access instruments, acquire data and address questions that would not be practical or cost effective for a single institution alone
SIOS Data Management System

- Easy and improved access to data from the region
- Faster & better implementation of user needs
- Facilitation of combined data products

- Based on the principle of distributed data management and open data sharing
- Utilising existing data handling systems
- Must support
  - discovery, access, transformation, submission and preservation of SIOS relevant data sets
  - interdisciplinary combinations of data and products
  - both space- and ground-based data
  - an open data space
SDMS Challenges

- Interoperability
  - Metadata
    - Discovery/Index
      - E.g. ISO19115/GCMD DIF
    - Use
      - E.g. CF-1.6 and higher
  - Observations and infrastructure
    - E.g. WIGOS
- Data
  - Combination of data from different sources require a Common Data Model
  - Standardised interfaces to data
    - Too costly to maintain/support data centre specific interfaces
      - E.g. OPeNDAP
- Semantic
- Procedures
  - Documentation
SDMS Implementation

• Flexible and scalable
  – New data
  – More data
  – More data centres
  – Meeting user needs
• Modularised
  – Software and data centres
    • Web services used for functionality
  – Sustainable
• Open Source
  – Simplifies joint development of software
• Cost efficient
  – A pre-requisite for sustained operation
• Interoperable
  – To contribute to regional and global frameworks

• NIPR/ADS (JP)
• AWI/PANGAEA (DE)
• British Antarctic Survey (UK)
• Norwegian Polar Institute (NO)
• Institute of Marine Research (NO)
• Norwegian Meteorological Institute (NO)
SIOS Remote Sensing

• Providing satellite based information for ground-based research
• Providing high-quality surface measurements for satellite Cal/Val activities
• Developing easy combination of in situ and remote sensing data
• Developing new remote sensing products strengthening multidisciplinary research
• Reducing the environmental footprint through better planning of activities
• The Norwegian Satellite Earth Observation Database for Marine and Polar Research
  – A distributed satellite repository contributing to SIOS
  – Focusing on serving non-satellite experts
  – http://normap.nersc.no/
Transformations in distributed a data management framework

- Emphasising the benefit of
  - standardised interfaces to data
  - a common data model

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Summary

• SIOS is moving forward
  – Addressing institutional contributions to data management and remote sensing
  – Potential contributions of tools and datasets from NIPR have been discussed this week
• Metadata interoperability is quite mature
• The challenge is in data interoperability
  – In data policies
  – In the availability of standardised interfaces
  – In the standardisation of use metadata
  – A common data model is required
    • Preferably the Common Data Model

The probability of snow and sea ice using AVHRR