Meteorologisk institutt
met.no

# WIS Workshop on Information Access Enablers

## DCPC development from IPY perspective

Heiko Klein, Genf, 18.05.2010

# Information Exchange in IPY

IPY aims:

- Link researchers across different fields to address questions and issues lying beyond the scope of individual disciplines.
- Leave a legacy of observing sites, facilities and networks, as well as individual data and data systems to support ongoing polar research and monitoring.
- Balance the rights between investigators and indigenous people, and the need for widespread access through the free and unrestricted sharing and access of both data and metadata.

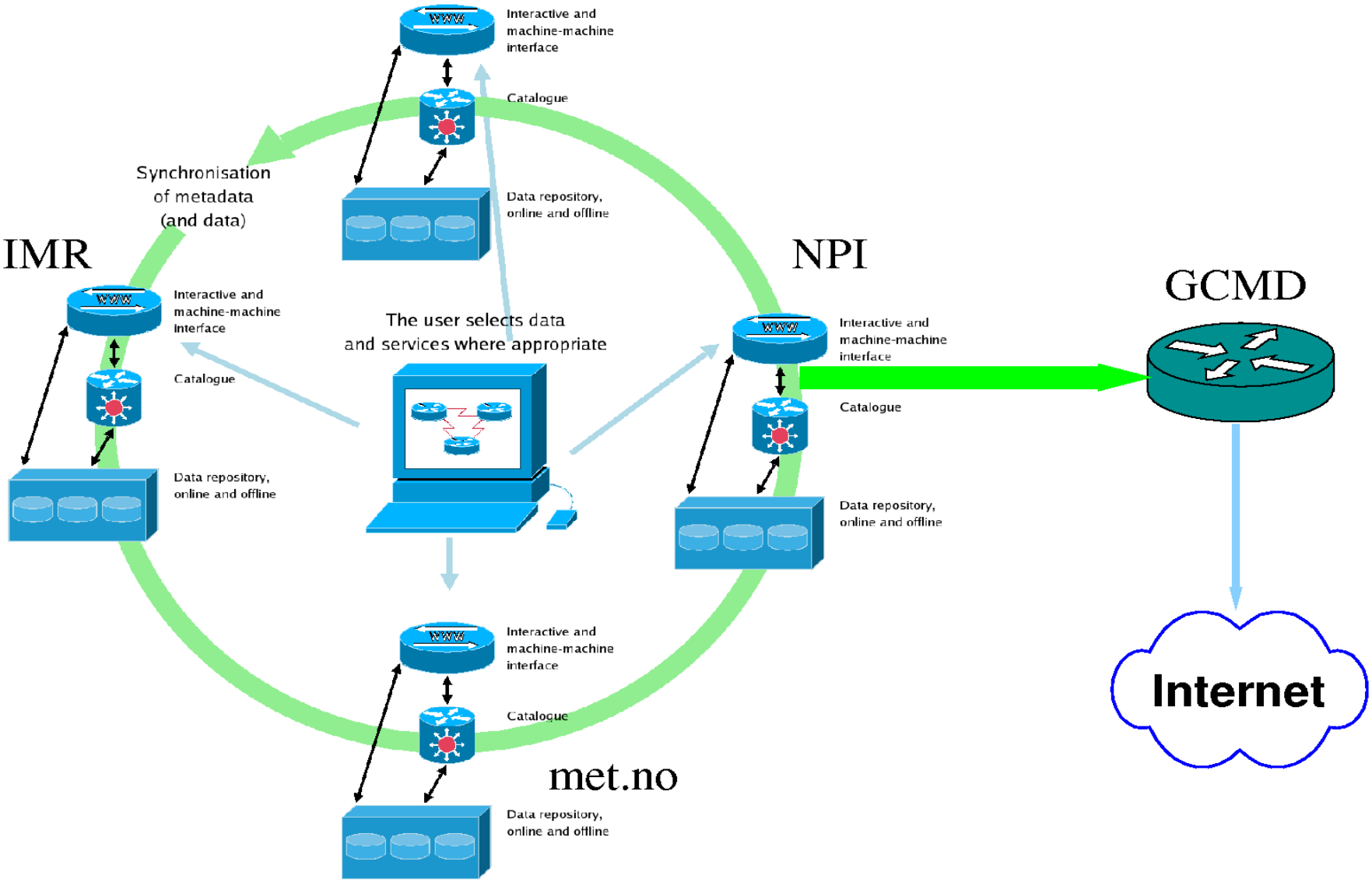
# IPYDIS

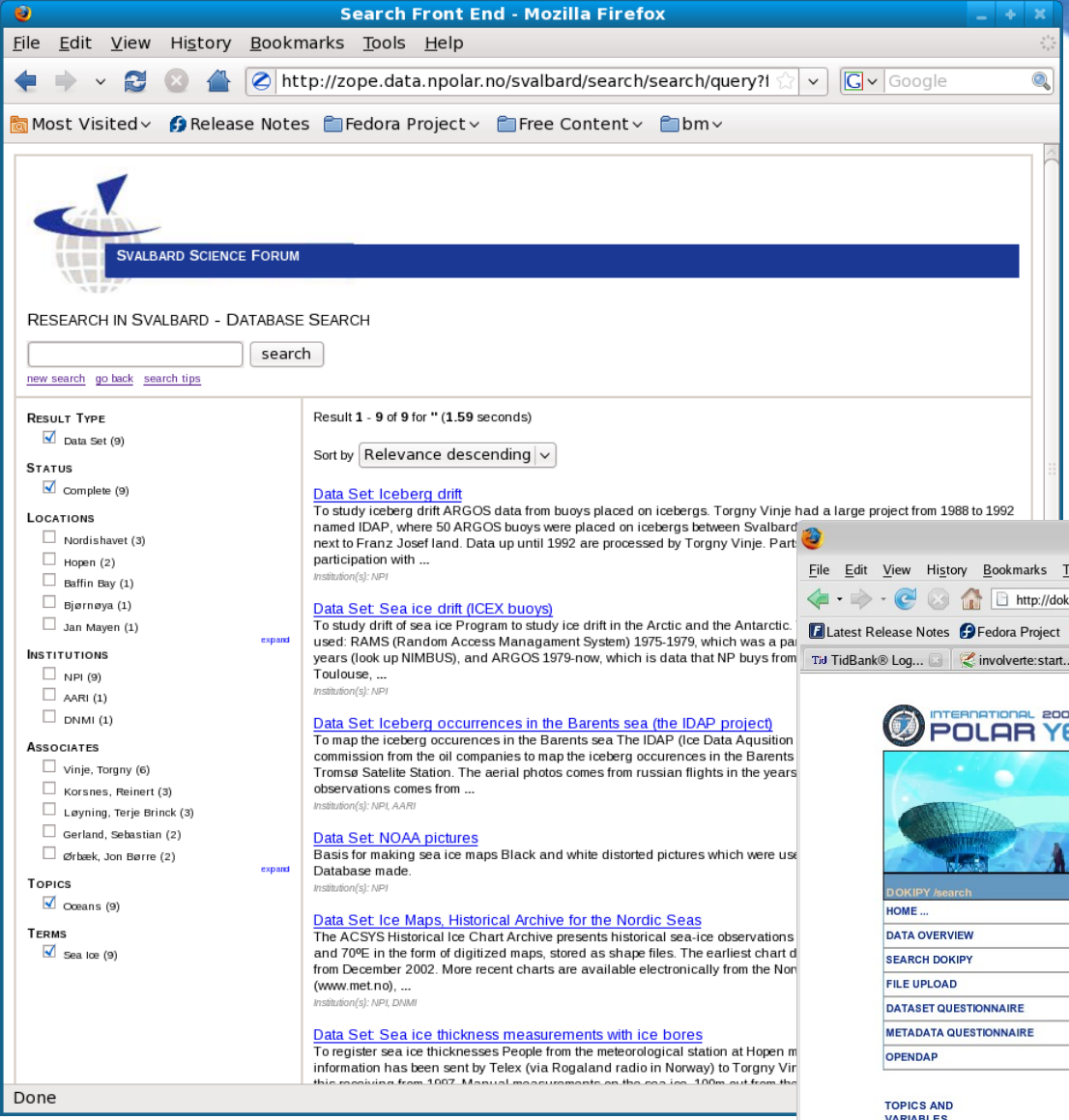
The International Polar Year Data and Information Service (IPYDIS) is a global partnership of data centers, archives, and networks working to ensure proper stewardship of IPY and related data.

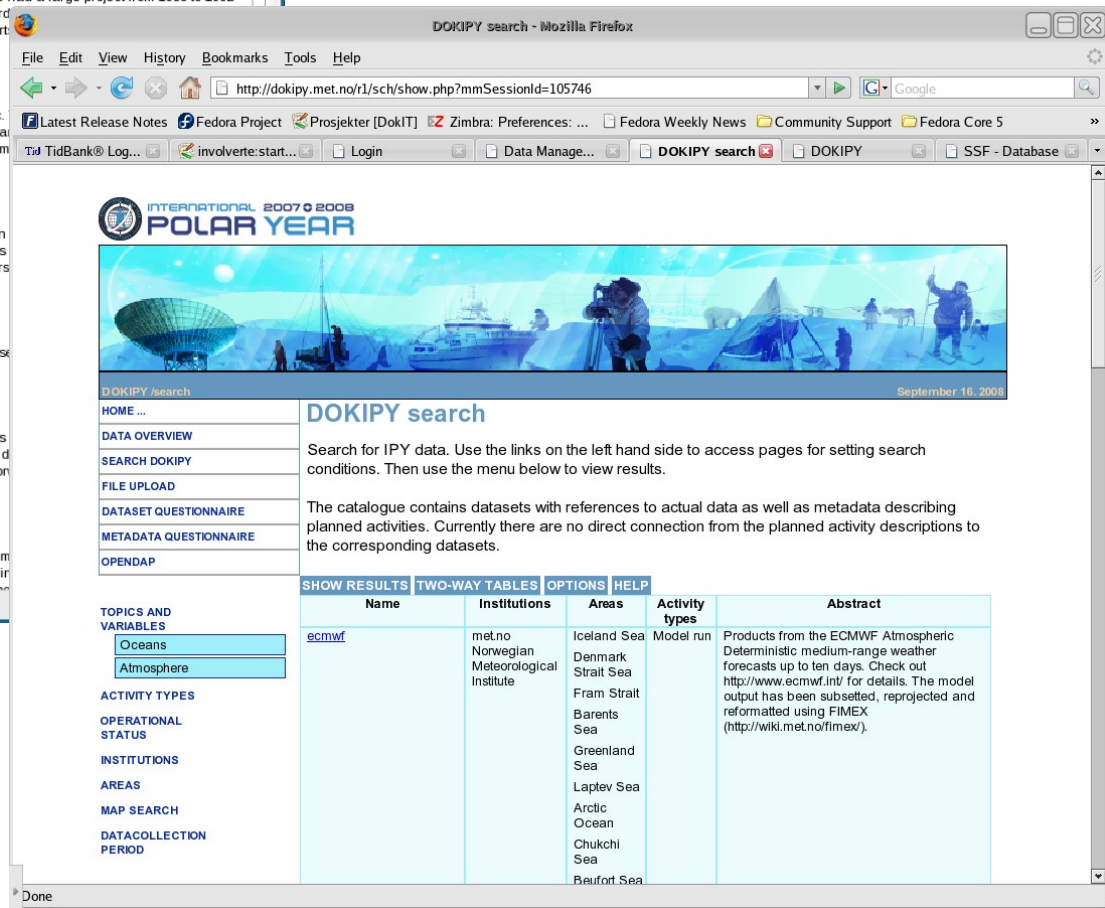
IPYDIS ~ WIS/DCPC

- International exchange (>60 countries)
- Interdisciplinary science (>50,000 participants representing physical, life, and social scientists)

# Norwegian Implementation




Search Front End - Mozilla Firefox
File Edit View History Bookmarks Tools Help
http://zope.data.npolar.no/svalbard/search/search/query?l
Google
Most Visited Release Notes Fedora Project Free Content bm
SVALBARD SCIENCE FORUM
RESEARCH IN SVALBARD - DATABASE SEARCH
search
new search go back search tips
RESULT TYPE
Data Set (9)
STATUS
Complete (9)
LOCATIONS
Nordishavet (3)
Hopen (2)
Baffin Bay (1)
Bjørnøya (1)
Jan Mayen (1)
expand
INSTITUTIONS
NPI (9)
AARI (1)
DNMI (1)
ASSOCIATES
Vinje, Torgny (6)
Korsnes, Reinert (3)
Løyning, Terje Brinck (3)
Gerland, Sebastian (2)
Ørbæk, Jon Børre (2)
expand
TOPICS
Oceans (9)
TERMS
Sea Ice (9)
Result 1 - 9 of 9 for '' (1.59 seconds)
Sort by Relevance descending
Data Set: Iceberg drift
To study iceberg drift ARGOS data from buoys placed on icebergs. Torgny Vinje had a large project from 1988 to 1992 named IDAP, where 50 ARGOS buoys were placed on icebergs between Svalbard next to Franz Josef land. Data up until 1992 are processed by Torgny Vinje. Part participation with ...
Institution(s): NPI
Data Set: Sea ice drift (ICEX buoys)
To study drift of sea ice Program to study ice drift in the Arctic and the Antarctic. used: RAMS (Random Access Managament System) 1975-1979, which was a pa years (look up NIMBUS), and ARGOS 1979-now, which is data that NP buys from Toulouse, ...
Institution(s): NPI
Data Set: Iceberg occurrences in the Barents sea (the IDAP project)
To map the iceberg occurences in the Barents sea The IDAP (Ice Data Aqusition commission from the oil companies to map the iceberg occurences in the Barents Tromsø Satelite Station. The aerial photos comes from russian flights in the years observations comes from ...
Institution(s): NPI, AARI
Data Set: NOAA pictures
Basis for making sea ice maps Black and white distorted pictures which were use Database made.
Institution(s): NPI
Data Set: Ice Maps, Historical Archive for the Nordic Seas
The ACSYS Historical Ice Chart Archive presents historical sea-ice observations and 70ºE in the form of digitized maps, stored as shape files. The earliest chart d from December 2002. More recent charts are available electronically from the Nor (www.met.no), ...
Institution(s): NPI, DNMI
Data Set: Sea ice thickness measurements with ice bores
To register sea ice thicknesses People from the meteorological station at Hopen m information has been sent by Telex (via Rogaland radio in Norway) to Torgny Vir
Done

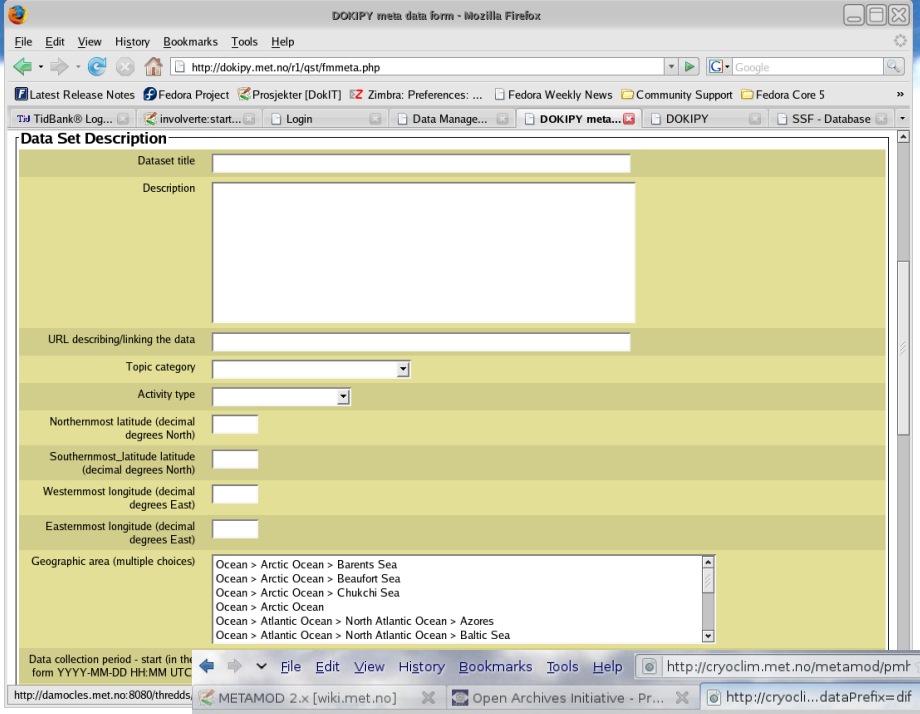

DOKIPY search - Mozilla Firefox
File Edit View History Bookmarks Tools Help
http://dokipy.met.no/r1/sch/show.php?mmSessionId=105746
Google
Latest Release Notes Fedora Project Prosjekter [DokIT] Zimbra: Preferences: ... Fedora Weekly News Community Support Fedora Core 5
TidBank® Log... involverte:start... Login Data Manage... DOKIPY search DOKIPY SSF - Database
INTERNATIONAL 2007 2008 POLAR YEAR
DOKIPY /search
September 16, 2008
HOME ...
DATA OVERVIEW
SEARCH DOKIPY
FILE UPLOAD
DATASET QUESTIONNAIRE
METADATA QUESTIONNAIRE
OPENDAP
TOPICS AND VARIABLES
Oceans
Atmosphere
ACTIVITY TYPES
OPERATIONAL STATUS
INSTITUTIONS
AREAS
MAP SEARCH
DATACOLLECTION PERIOD
DOKIPY search
Search for IPY data. Use the links on the left hand side to access pages for setting search conditions. Then use the menu below to view results.
The catalogue contains datasets with references to actual data as well as metadata describing planned activities. Currently there are no direct connection from the planned activity descriptions to the corresponding datasets.
SHOW RESULTS TWO-WAY TABLES OPTIONS HELP
Name
Institutions
Areas
Activity types
Abstract
ecmwf
met.no Norwegian Meteorological Institute
Iceland Sea
Denmark Strait Sea
Fram Strait
Barents Sea
Greenland Sea
Laptev Sea
Arctic Ocean
Chukchi Sea
Beufort Sea
Model run
Products from the ECMWF Atmospheric Deterministic medium-range weather forecasts up to ten days. Check out http://www.ecmwf.int/ for details. The model output has been subsetted, reprojected and reformatted using FIMEX (http://wiki.met.no/fimex/).
Done

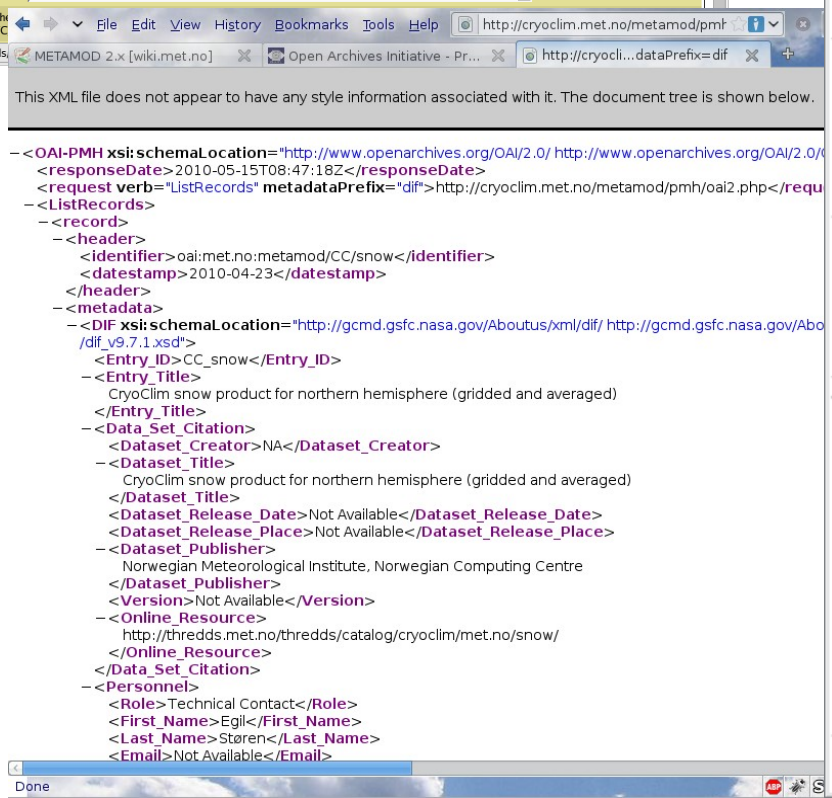
# Metamod2

- Metadata generation, upload, storage, exchange and search platform
- Loosely coupled to data-layer
- Free software (GPL), php/perl
- Used for IPY at met.no and SMHI
- Currently extended for DCPC usage
- https://wiki.met.no/metamod/start

# Metamod2: Metadata sources

- Manually added – questionnaire (key-value pairs: MM2)
- Automatically extracted from data, i.e. netcdf-files + CF-1.0 + damocles data recovery convention (key-value pairs: MM2)
- Harvester (OAI-PMH): Dublin Core (DC), DIF
- Partly impl.: Harvester (CSW/ISO23950): ISO19115, WMO Core profile


DOKIPY meta data form - Mozilla Firefox
File Edit View History Bookmarks Tools Help
http://dokipy.met.no/r1/qst/fmmeta.php
Data Set Description
Dataset title
Description
URL describing/linking the data
Topic category
Activity type
Northernmost latitude (decimal degrees North)
Southernmost_latitude latitude (decimal degrees North)
Westernmost longitude (decimal degrees East)
Easternmost longitude (decimal degrees East)
Geographic area (multiple choices)
Ocean > Arctic Ocean > Barents Sea
Ocean > Arctic Ocean > Beaufort Sea
Ocean > Arctic Ocean > Chukchi Sea
Ocean > Arctic Ocean
Ocean > Atlantic Ocean > North Atlantic Ocean > Azores
Ocean > Atlantic Ocean > North Atlantic Ocean > Baltic Sea


This XML file does not appear to have any style information associated with it. The document tree is shown below.
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<ListRecords>
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</header>
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<DIF xsi:schemaLocation="http://gcmd.gsfc.nasa.gov/Aboutus/xml/dif/ http://gcmd.gsfc.nasa.gov/Abo
/dif_v9.7.1.xsd">
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CryoClim snow product for northern hemisphere (gridded and averaged)
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Norwegian Meteorological Institute, Norwegian Computing Centre
</Dataset_Publisher>
<Version>Not Available</Version>
<Online_Resource>
http://thredds.met.no/thredds/catalog/cryoclim/met.no/snow/
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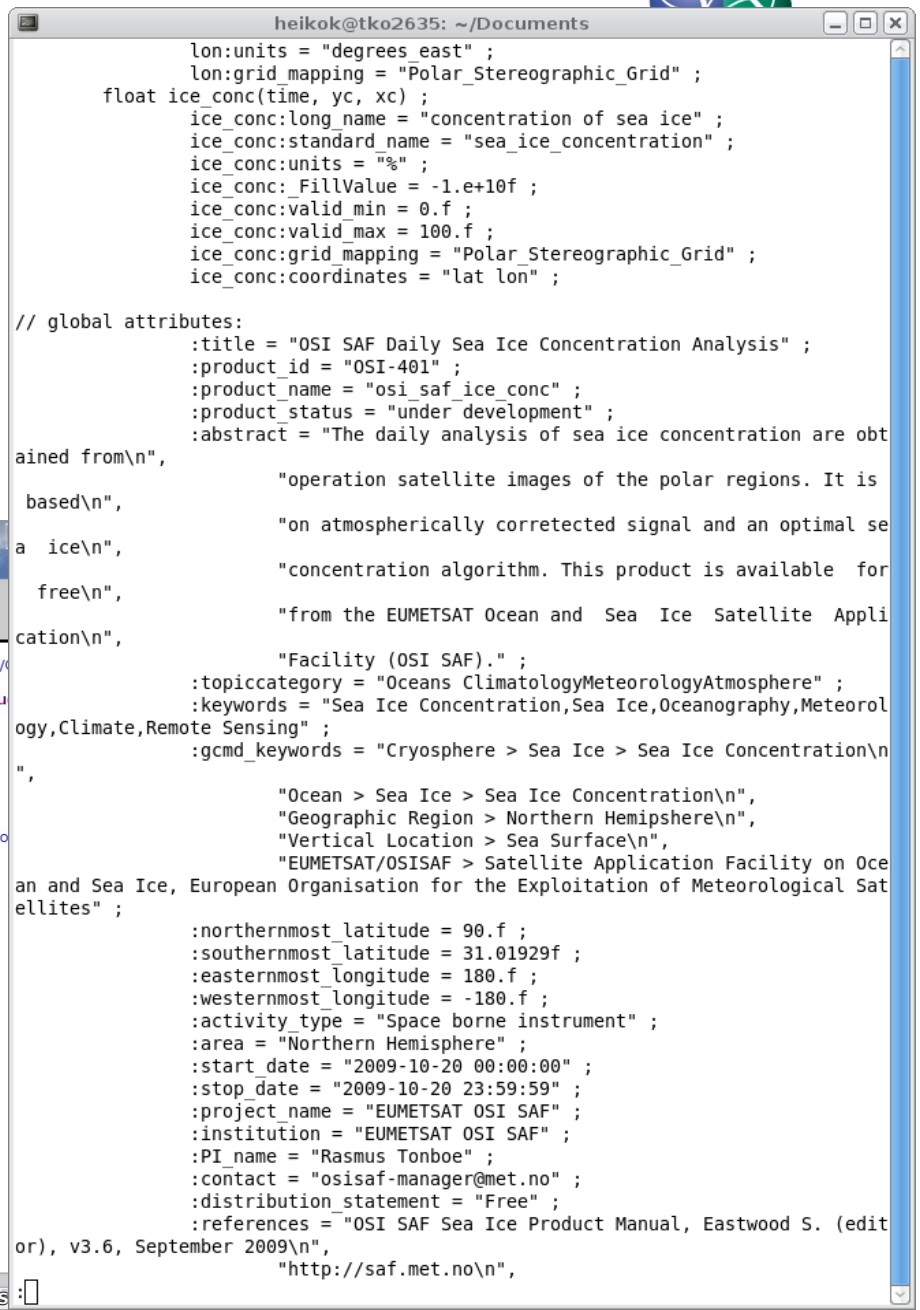
<Last_Name>Støren</Last_Name>
<Email>Not Available</Email>


heikok@tko2635: ~/Documents
lon:units = "degrees_east" ;
lon:grid_mapping = "Polar_Stereographic_Grid" ;
float ice_conc(time, yc, xc) ;
ice_conc:long_name = "concentration of sea ice" ;
ice_conc:standard_name = "sea_ice_concentration" ;
ice_conc:units = "%" ;
ice_conc:_FillValue = -1.e+10f ;
ice_conc:valid_min = 0.f ;
ice_conc:valid_max = 100.f ;
ice_conc:grid_mapping = "Polar_Stereographic_Grid" ;
ice_conc:coordinates = "lat lon" ;
// global attributes:
:title = "OSI SAF Daily Sea Ice Concentration Analysis" ;
:product_id = "OSI-401" ;
:product_name = "osi_saf_ice_conc" ;
:product_status = "under development" ;
:abstract = "The daily analysis of sea ice concentration are obt
ained from\n",
"operation satellite images of the polar regions. It is
based\n",
"on atmospherically corretected signal and an optimal se
a ice\n",
"concentration algorithm. This product is available for
free\n",
"from the EUMETSAT Ocean and Sea Ice Satellite Appli
cation\n",
"Facility (OSI SAF)." ;
:topiccategory = "Oceans ClimatologyMeteorologyAtmosphere" ;
:keywords = "Sea Ice Concentration,Sea Ice,Oceanography,Meteorol
ogy,Climate,Remote Sensing" ;
:gcmd_keywords = "Cryosphere > Sea Ice > Sea Ice Concentration\n
",
"Ocean > Sea Ice > Sea Ice Concentration\n",
"Geographic Region > Northern Hemipshere\n",
"Vertical Location > Sea Surface\n",
"EUMETSAT/OSISAF > Satellite Application Facility on Oce
an and Sea Ice, European Organisation for the Exploitation of Meteorological Sat
ellites" ;
:northernmost_latitude = 90.f ;
:southernmost_latitude = 31.01929f ;
:easternmost_longitude = 180.f ;
:westernmost_longitude = -180.f ;
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:area = "Northern Hemisphere" ;
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:stop_date = "2009-10-20 23:59:59" ;
:project_name = "EUMETSAT OSI SAF" ;
:institution = "EUMETSAT OSI SAF" ;
:PI_name = "Rasmus Tonboe" ;
:contact = "osisaf-manager@met.no" ;
:distribution_statement = "Free" ;
:references = "OSI SAF Sea Ice Product Manual, Eastwood S. (edit
or), v3.6, September 2009\n",
"http://saf.met.no\n",
:

# Metadata-conversion challenges

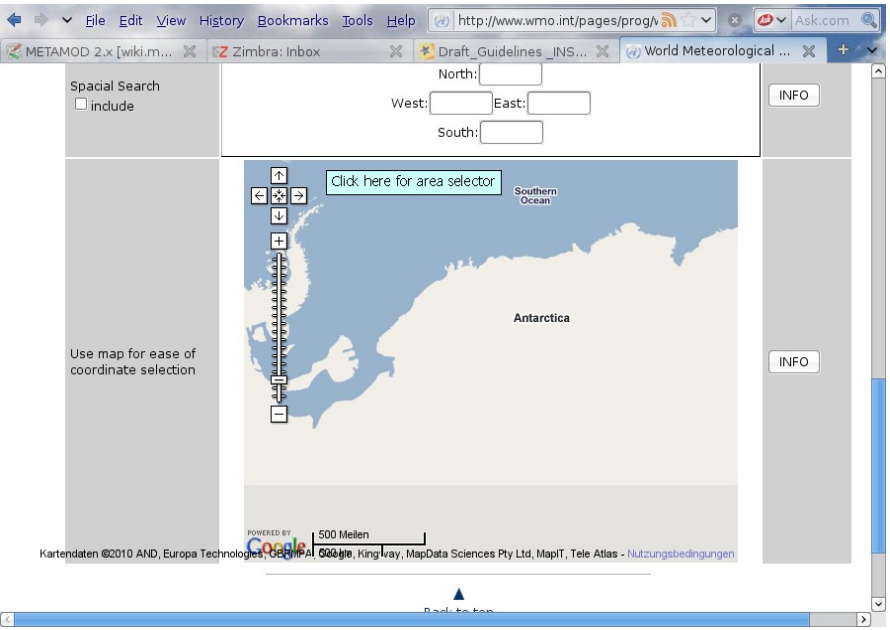
- Minimum requirements / missing information
- Different multiplicities of entries
- Several ways of encoding metadata (ISO19115)
- Different dictionaries for keywords, translation cumbersome, partly impossible
- WMO Core profile keywords not interdisciplinary
- WMO Core profile validator (xsd)?

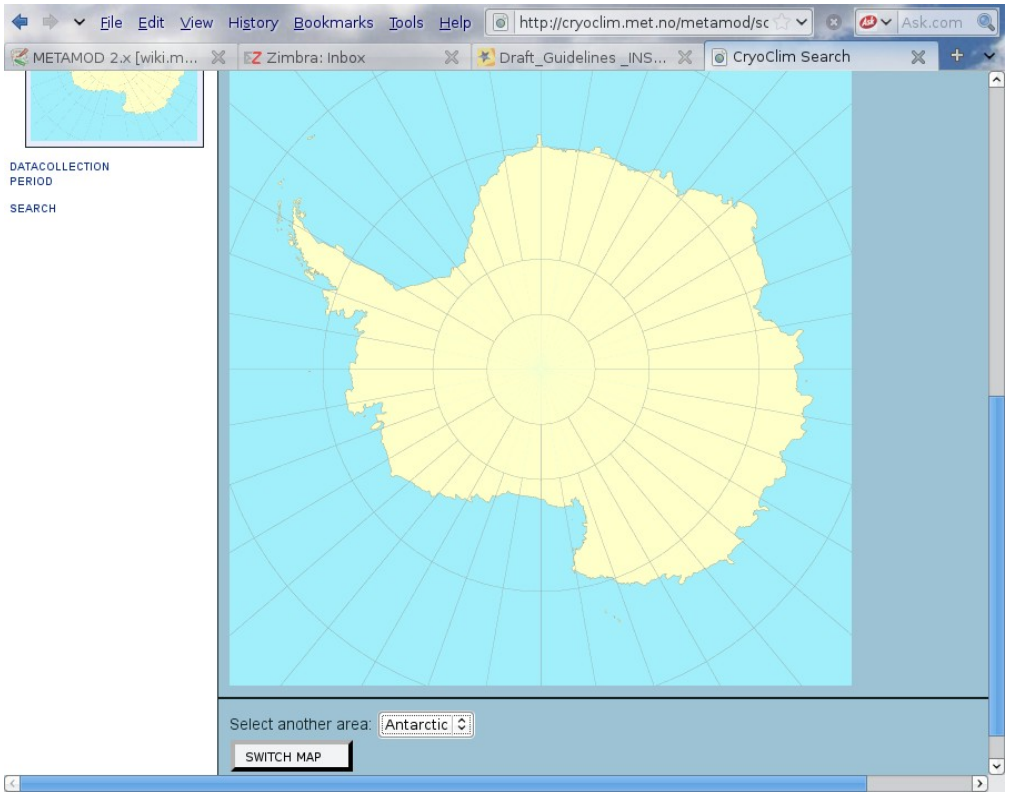
=> Conversion not 100% lossless

# Metamod2: Metadata exposure

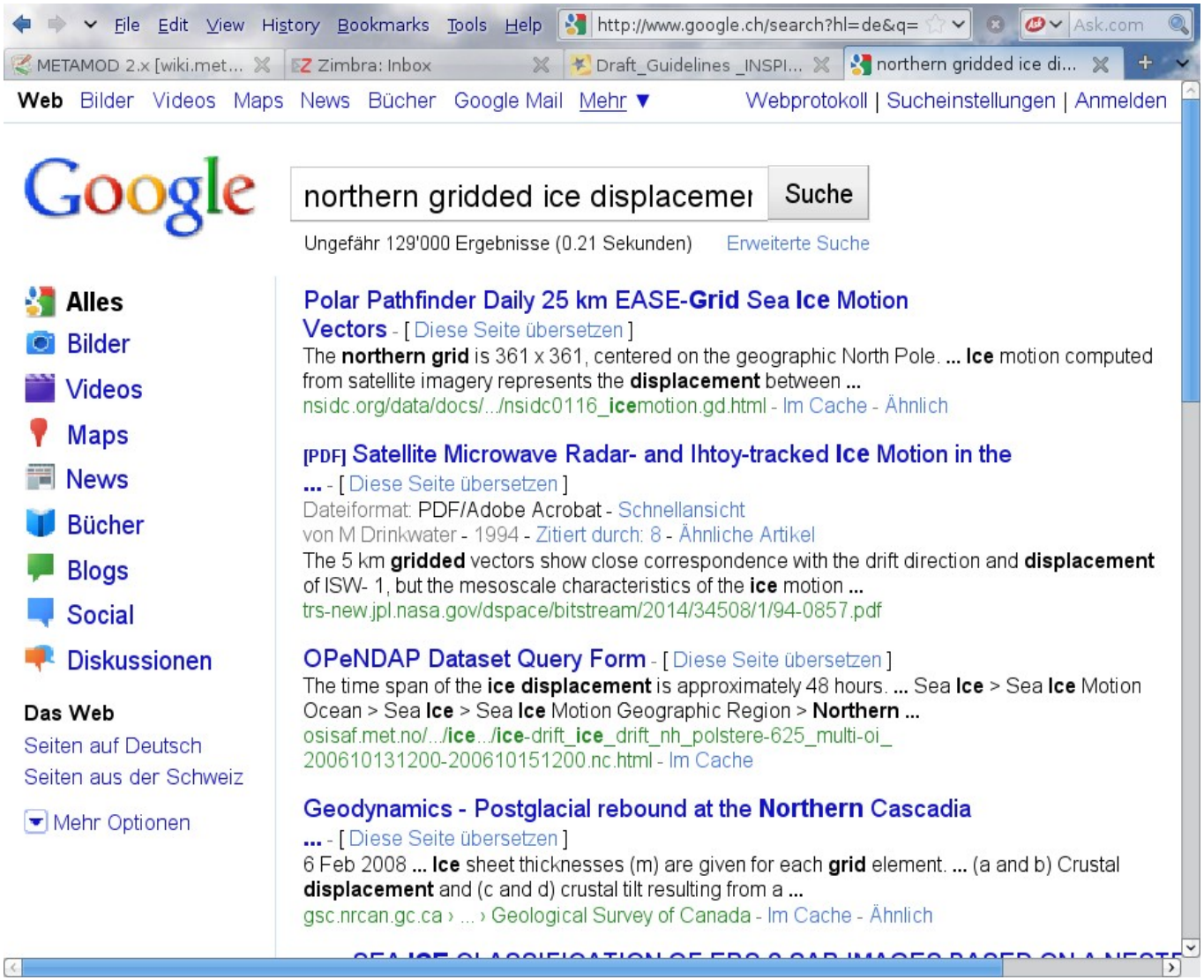
- Search interface
- Offered through OAI-PMH
- Planned: ISO23950 / CSW
- Internal storage: = source storage
- Export-formats: MM2, DIF, DC¸ ISO19115 (WMO core 1.0?)

# Specialized search forms



# Metadata search (OpenDap)



# Data handling

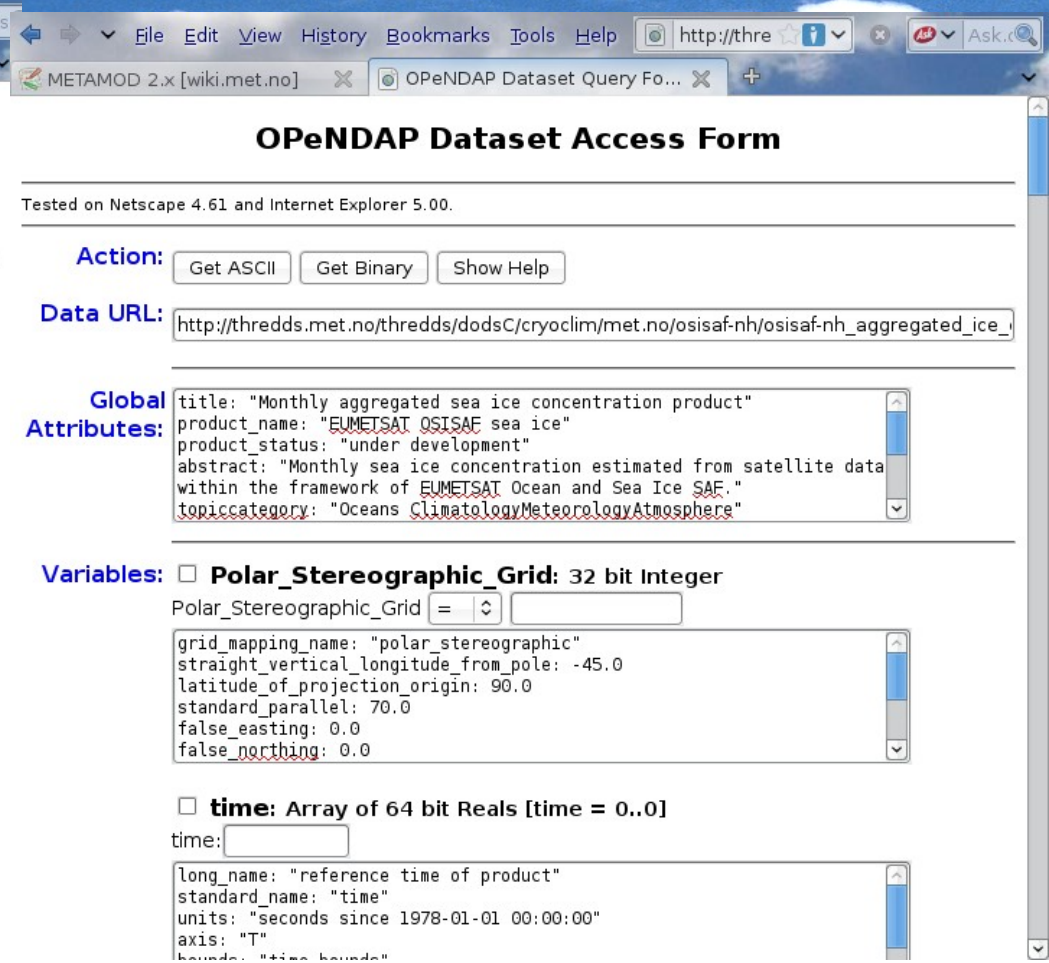
- Allow all datatypes, export as is (Metamod2 at SMHI for IPY)
- Unique data-type in repository, flexible export (Metamod2 at met.no)
  - Provide guidance on data-packing
  - How flexible? Preprocessing, streaming?
  - Data-owner controlled flexibility

# Data handling at met.no

- Full-automated data-services through Unidata's THREDDS Data Server 

  - HTTP-download
  - Aggregation (e.g. join all time-steps)
  - OpenDAP (data-subsetting, stream)
    - Much used, excellent clients (netcdf-library, ncks)
  - WCS (data-subsetting, stream, OGC)
  - WMS (OGC)
    - Openlayers based web-client


File Edit View History Bookmarks Tools Help
METAMOD 2.x [wiki.met.no]
Catalog Services
Norwegian Meteorological Institute
met.no
Met.no Thredds
THREDDS Data Server
Catalog http://thredds.met.no/thredds/catalog/cryoclim/met.no/osisaf-nh/catalog.html
Dataset: osisaf-nh/osisaf-nh_aggregated_ice_concentration_nh_polstere-100_200504010000.nc
ID: cryoclim/met.no/osisaf-nh/osisaf-nh_aggregated_ice_concentration_nh_polstere-100_200504010000.nc
Access:
1. OPENDAP: /thredds/dodsC/cryoclim/met.no/osisaf-nh/osisaf-nh_aggregated_ice_concentration_nh_polstere-100_200504010000.nc
2. HTTPServer: /thredds/fileServer/cryoclim/met.no/osisaf-nh/osisaf-nh_aggregated_ice_concentration_nh_polstere-100_200504010000.nc
3. WMS: /thredds/wms/cryoclim/met.no/osisaf-nh/osisaf-nh_aggregated_ice_concentration_nh_polstere-100_200504010000.nc
Dates:
2010-04-26 16:52:42Z (modified)
Viewers:
NetCDF-Java ToolsUI (webstart)


File Edit View History Bookmarks Tools Help
http://thre
METAMOD 2.x [wiki.met.no]
OPeNDAP Dataset Query Fo...
OPeNDAP Dataset Access Form
Tested on Netscape 4.61 and Internet Explorer 5.00.
Action: Get ASCII Get Binary Show Help
Data URL: http://thredds.met.no/thredds/dodsC/cryoclim/met.no/osisaf-nh/osisaf-nh_aggregated_ice_
Global Attributes:
title: "Monthly aggregated sea ice concentration product"
product_name: "EUMETSAT OSISAF sea ice"
product_status: "under development"
abstract: "Monthly sea ice concentration estimated from satellite data within the framework of EUMETSAT Ocean and Sea Ice SAF."
topiccategory: "Oceans ClimatologyMeteorologyAtmosphere"
Variables:
Polar_Stereographic_Grid: 32 bit Integer
Polar_Stereographic_Grid =
grid_mapping_name: "polar_stereographic"
straight_vertical_longitude_from_pole: -45.0
latitude_of_projection_origin: 90.0
standard_parallel: 70.0
false_easting: 0.0
false_northing: 0.0
time: Array of 64 bit Reals [time = 0..0]
time:
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standard_name: "time"
units: "seconds since 1978-01-01 00:00:00"
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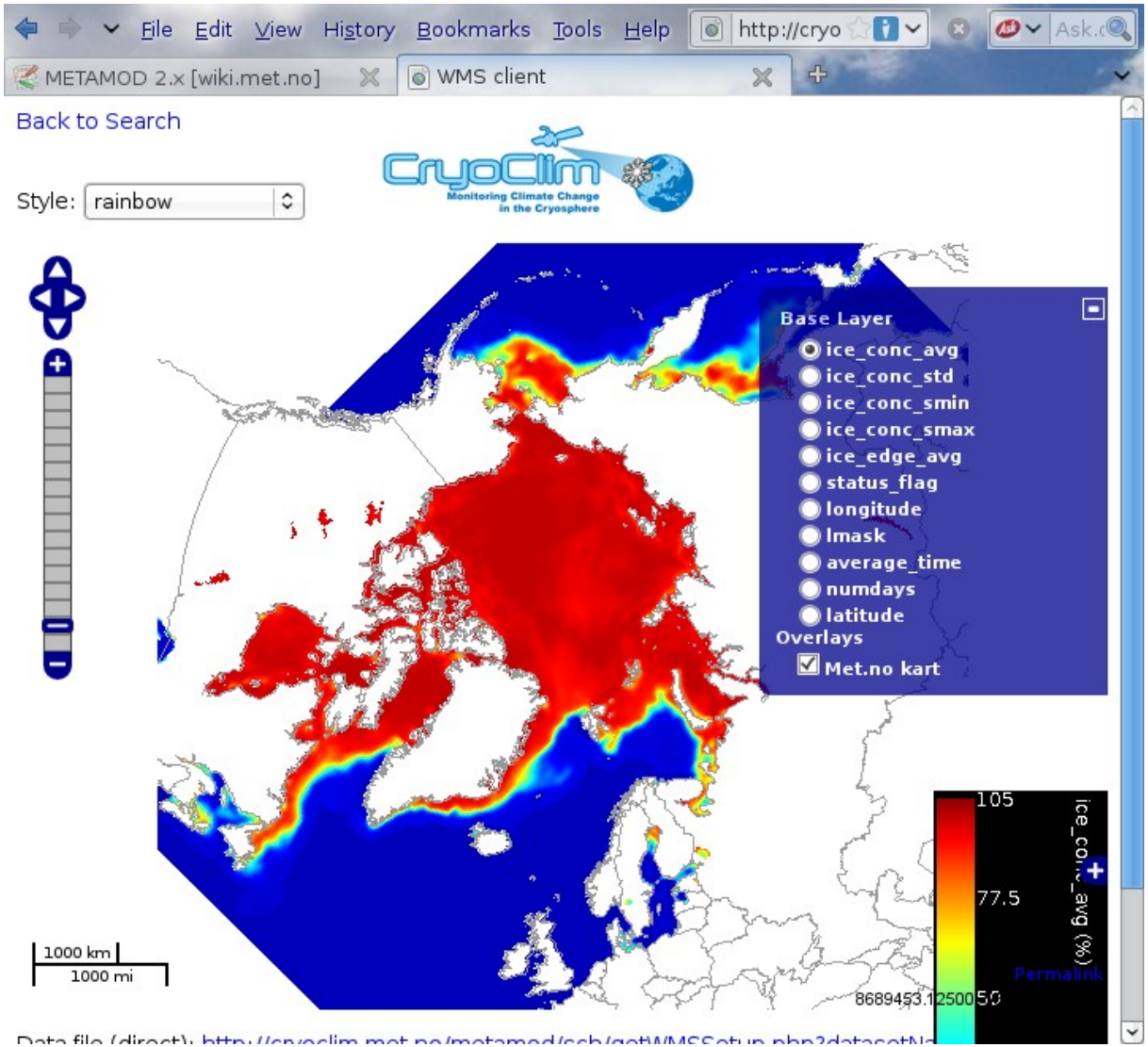
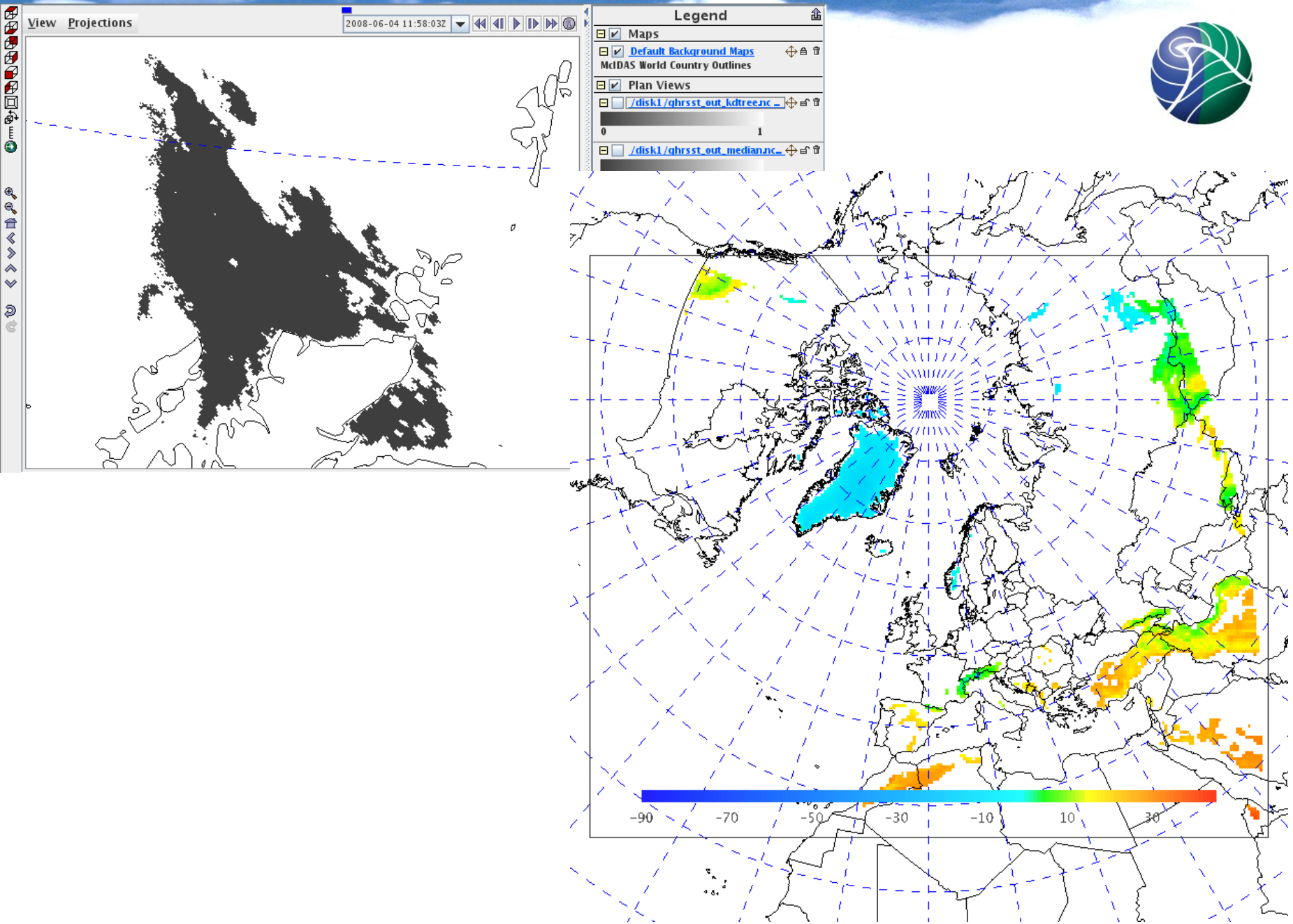

File Edit View History Bookmarks Tools Help
http://cryo
METAMOD 2.x [wiki.met.no]
WMS client
Back to Search
CryoClim
Monitoring Climate Change in the Cryosphere
Style: rainbow
Base Layer
ice_conc_avg
ice_conc_std
ice_conc_smin
ice_conc_smax
ice_edge_avg
status_flag
longitude
lmask
average_time
numdays
latitude
Overlays
Met.no kart
105
77.5
50
ice_conc_avg (%)
Permalink
1000 km
1000 mi

# Data-handling through FIMEX

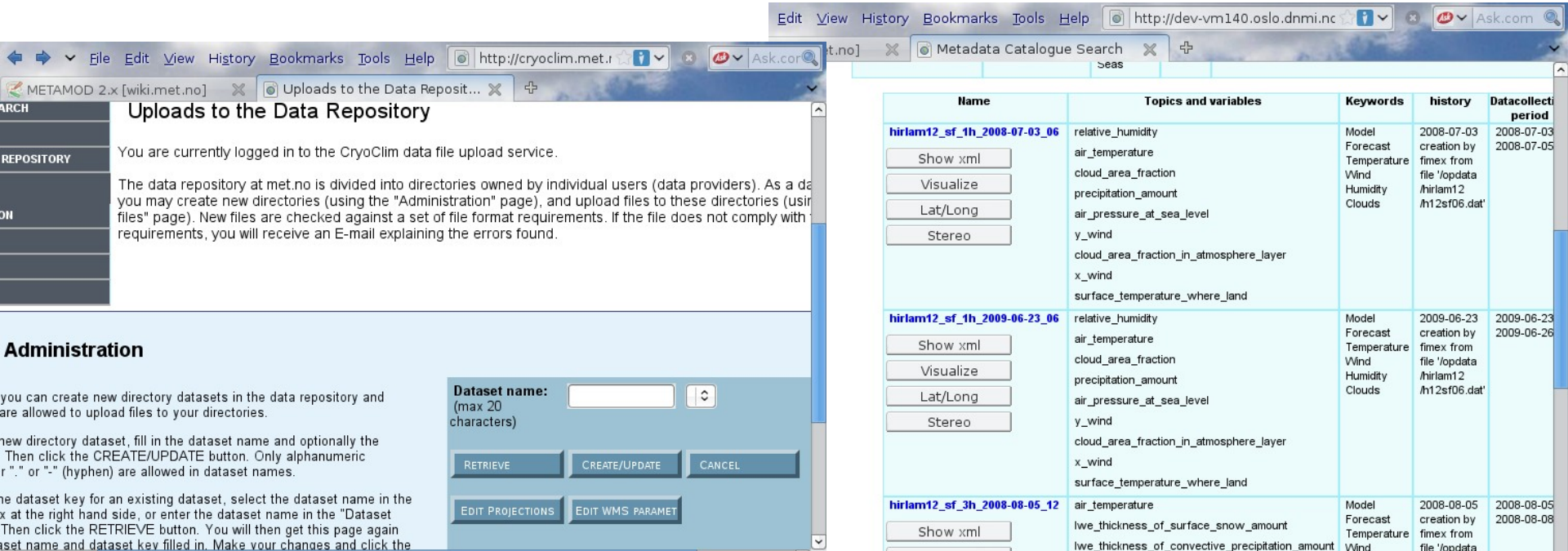
Fimex: File Interpolation, Manipulation and EXtraction library for gridded data

- https://wiki.met.no/fimex/start, C/C++, LGPL
- Pluggable file-formats: netcdf/hdf, grib1/2 (ecmwf grib_api), felt (met.no)
- Projection support via proj4
- Spatial interpolation: forward, backward, kd-tree, nearest-neighbor, bi-linear, bi-cubic, vectors
- Temporal interpolation
- Extraction with/without quality-settings


View
Projections
2008-06-04 11:58:03Z
Legend
Maps
Default Background Maps
McIDAS World Country Outlines
Plan Views
/disk1/ghrsst_out_kdtree.nc
0
1
/disk1/ghrsst_out_median.nc
-90
-70
-50
-30
-10
10
30

# Metamod2 and Fimex

- Data-owner describes interpolation parameters (projections, resolution, method)
- On the fly processed data-downloads
- REST based, cache-able



# Access to Long-Term Archives

- Metadata of archived data visible in data-discovery
- Special archived data request - email?
- Offline handling of request?

# Metamod2 & Fimex Team

- met.no:
  - Egil Støren
  - Geir Aalberg
  - Heiko Klein
  - Trond Michelsen
  - Øystein Godøy
  - Øystein Torget
- NR (Norwegian Computing Center):
  - Thor Kristoffersen
  - Øivind Due Trier