Norwegian Meteorological Institute

Arctic Regional Climate Centre Network

Arctic-RCC Web and data

PARCOF

Ottawa, 16.05.2018

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Nikolai Mikhailov, Sylvain Deland

ArcRCC - “flagship” products

1. **Seasonal Outlooks** for the upcoming season: forecasts from models on
   - temperature,
   - precipitation and
   - sea-ice forecasts

2. **Seasonal Summaries** of the past season: describes actual temperature, precipitation and sea-ice details based on monitoring observations

3. **Arctic Consensus Statement** a collaborate effort by the network which reviews
   - Trends in the historical monitoring data
   - Forecasts from the models
   - Using Met/Ice climate expertise, fill gaps in the data
   - Develop a consensus outlook for the Arctic for the upcoming season

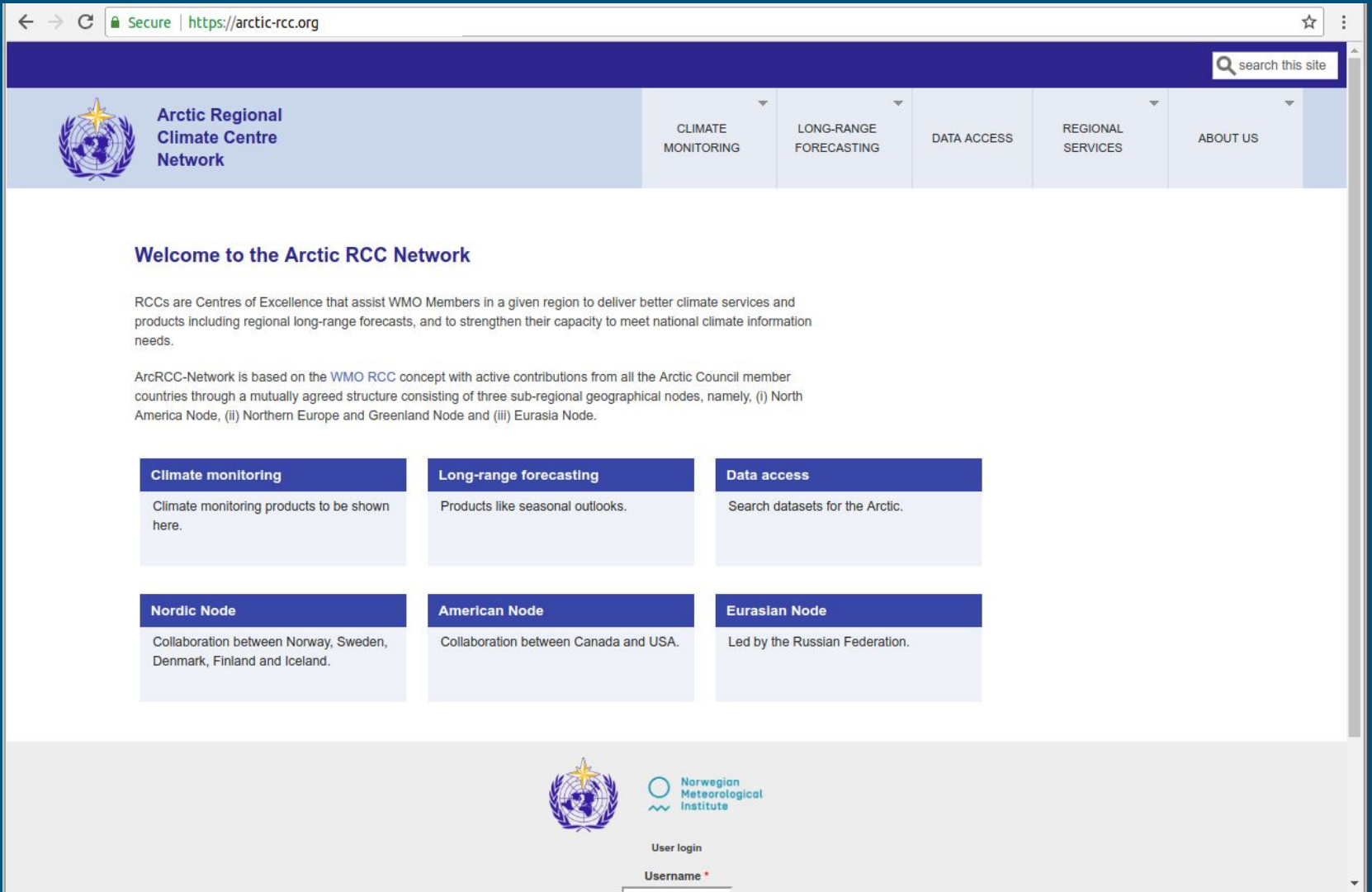
Website

- Host the flagship (pan-Arctic) products
  - Supplementary info/documentation
  - Archive of past products
- Pointer to regional (node specific) products/services
- Data portal
- Info about us, our partners, contact, feedback

How to access ArcRCC content

Primary point of access:

arctic-rcc.org


Secure | https://arctic-rcc.org
search this site
Arctic Regional Climate Centre Network
CLIMATE MONITORING
LONG-RANGE FORECASTING
DATA ACCESS
REGIONAL SERVICES
ABOUT US
Welcome to the Arctic RCC Network
RCCs are Centres of Excellence that assist WMO Members in a given region to deliver better climate services and products including regional long-range forecasts, and to strengthen their capacity to meet national climate information needs.
ArcRCC-Network is based on the WMO RCC concept with active contributions from all the Arctic Council member countries through a mutually agreed structure consisting of three sub-regional geographical nodes, namely, (i) North America Node, (ii) Northern Europe and Greenland Node and (iii) Eurasia Node.
Climate monitoring
Climate monitoring products to be shown here.
Long-range forecasting
Products like seasonal outlooks.
Data access
Search datasets for the Arctic.
Nordic Node
Collaboration between Norway, Sweden, Denmark, Finland and Iceland.
American Node
Collaboration between Canada and USA.
Eurasian Node
Led by the Russian Federation.
Norwegian Meteorological Institute
User login
Username *

search this site

Arctic Regional Climate Centre Network

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Global Cryosphere Watch

Climate monitoring

Climate monitoring products will be available here.

Norwegian Meteorological Institute

User login

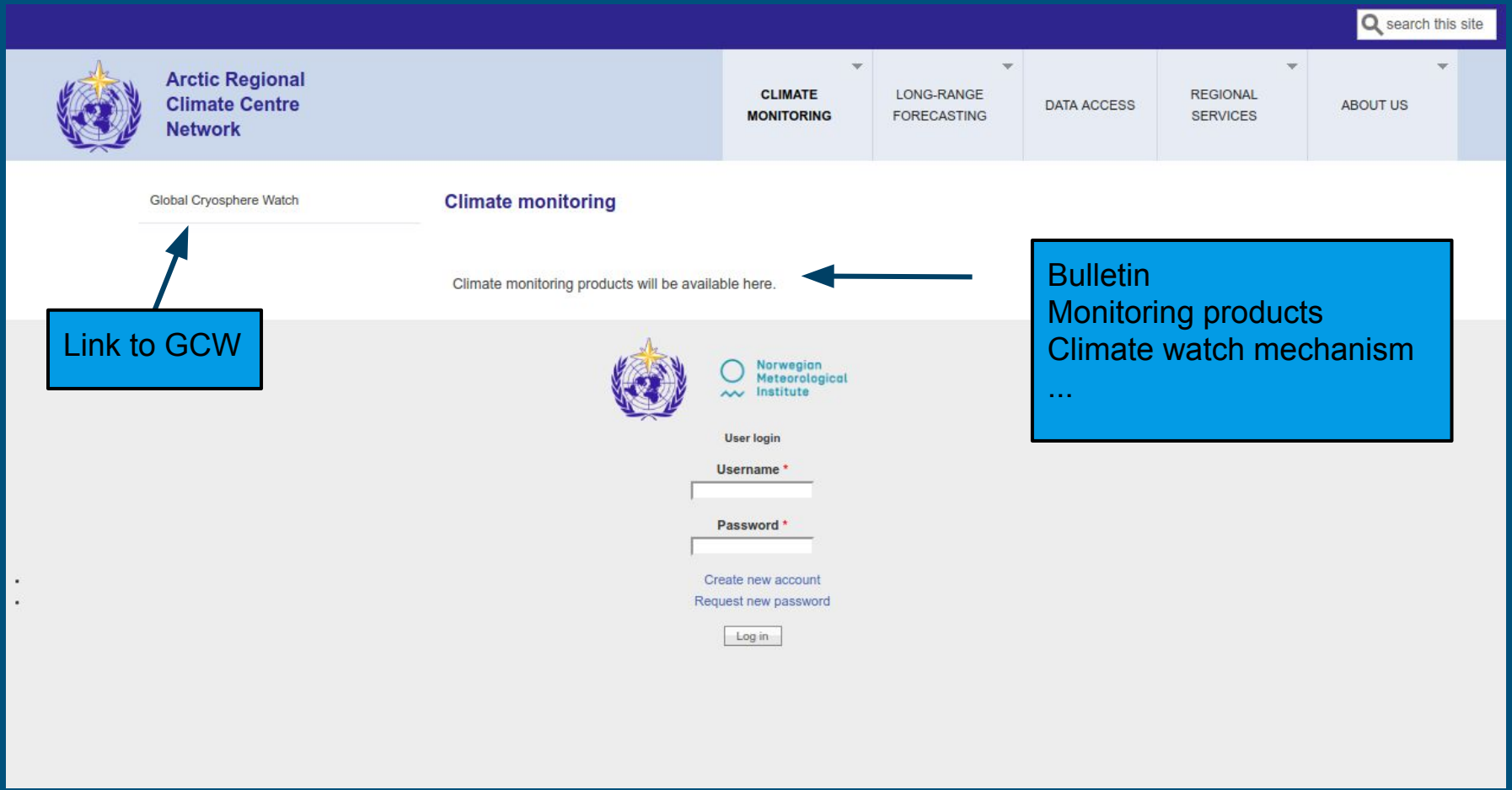
Username *

Password *

Create new account

Request new password

Log in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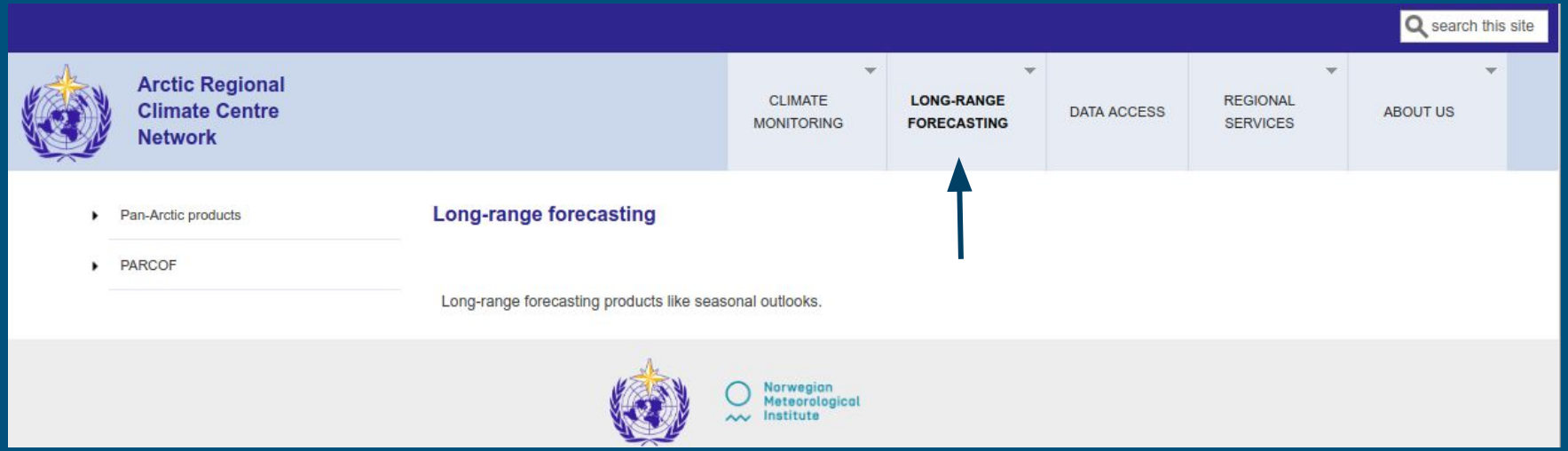
ABOUT US
Global Cryosphere Watch
Climate monitoring
Climate monitoring products will be available here.
Link to GCW
Bulletin
Monitoring products
Climate watch mechanism
...
Norwegian Meteorological Institute
User login
Username *
Password *
Create new account
Request new password
Log in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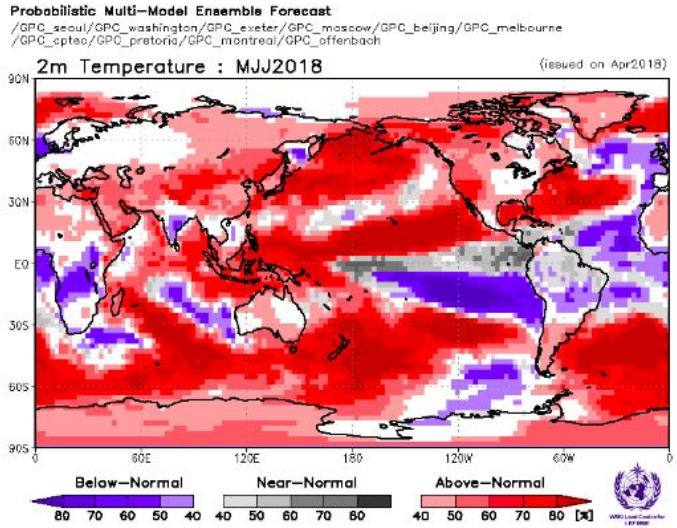
REGIONAL SERVICES
ABOUT US
Pan-Arctic products
PARCOF
Long-range forecasting
Long-range forecasting products like seasonal outlooks.
Norwegian Meteorological Institute

Pan-Arctic products
Seasonal outlooks
WMS Sea ice - GeoMet
PARCOF

Seasonal outlooks

The images below show seasonal outlooks for May to July 2018, for temperature and precipitation.



Temperature MJJ18 seasonal outlook: There is probability of 50% or more that the temperature will be above normal in the Northwestern and northern Alaska and north western Canada. Over the European Arctic there is low probability of 40% or more for below normal temperature in the southwestern Norway. We expect low probability of 40% or more for above average temperature in the eastern Europe and central and northern Russia. Source: https://www.wmolc.org/.

search this site

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- Pan-Arctic products
  - Seasonal outlooks
  - WMS Service - GeoMet
- PARCOF

Long-range forecasting >

Seasonal outlooks

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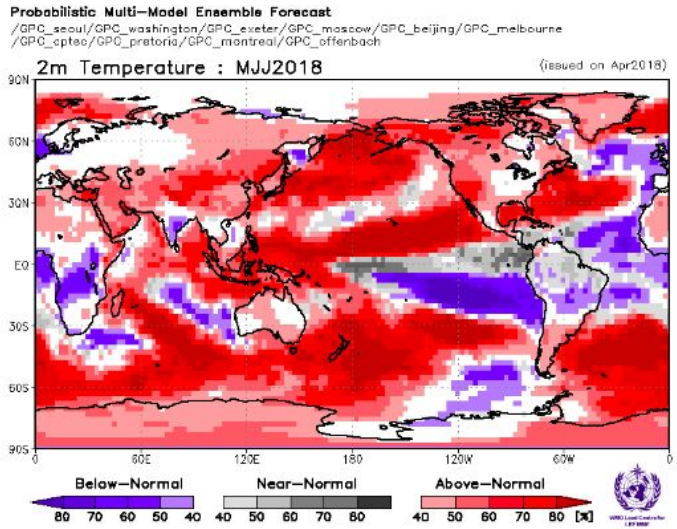

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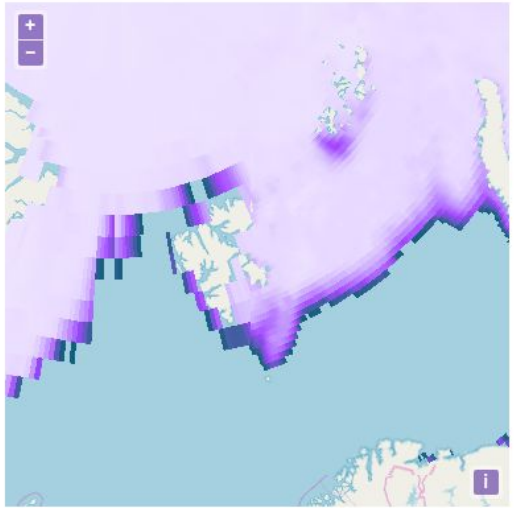
add:
- archive of previous outlooks
- description/explanation of terminology

Pan-Arctic products
Seasonal outlooks
WMS Sea ice - GeoMet
PARCOF

WMS Sea ice - GeoMet

GeoMet provides access to the Environment Canada's Meteorological Service of Canada (MSC) raw numerical weather prediction (NWP) model data layers and the weather radar mosaic via, e.g., Web Map Service (WMS). The new version, GeoMet Beta, is under development, but ready for test use. Below is an example of the WMS products available.

WMS layer	Projection	Map orientation
Sea ice fraction	WGS 84/UPS North (EPSG:32661)	North



Interactive visualization

Depends on product availability..

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- Pan-Arctic products
- **PARCOF**
  - PARCOF-1 2018

Long-range forecasting >

PARCOF

Climate change in the Arctic is affecting the entire Earth system. Northerners, Indigenous communities, industry and wildlife are experiencing significant and direct impacts. For example, temperature increases have led to significant reductions of sea ice, thawing permafrost and coastal erosion. To meet the Arctic adaptation and decision-making needs, substantial progress has been made towards the establishment of an Arctic Regional Climate Centre Network (ArcRCC-Network). ArcRCC-Network is based on the WMO RCC concept with active contributions from all the Arctic Council member countries through a mutually agreed structure consisting of three sub-regional geographical nodes, namely, (i) North America Node, (ii) Northern Europe and Greenland Node and (iii) Eurasia Node.

The Pan-Arctic Regional Climate Outlook Forum (PARCOF) is a flagship activity of the ArcRCC-Network, following the Regional Climate Outlook Forum (RCOF) concept supported by WMO and its partners around the world.

The first session of Pan-Arctic Regional Climate Outlook Forum (PARCOF-1) will take place in Ottawa, Canda, 15 to 16 May 2018.

Info on PARCOFs

The main objectives of PARCOF are to:

- establish a sustainable interaction mechanism between climate information providers and users on an ongoing basis;
- review monthly and seasonal forecast products for the region (temperature, precipitation as well as various operational and experimental sea ice products) and develop statements in plain language to communicate the information as well as the associated risks;
- provide a platform to work together to co-develop useful output products such as consensus statement on the current status and future outlook of the Arctic climate for the upcoming season, taking into account northern/indigenous perspectives;
- engage with key users, decision-makers and indigenous knowledge holders in a dialogue to better understand their needs and for them to explore how indigenous perspectives can be mobilized by the ArcRCC-Network;
- discuss with the polar scientific community, especially those involved in the Polar Prediction Project (PPP) and Year Of Polar Prediction (YOPP) activities, how advances in knowledge will translate into improvements in regional-scale services delivered through the ArcRCC-Network; and
- learn about the climate information currently used for planning and decision making, and user needs for climate information, also to raise user awareness on new climate products and services including their reliability aspects.

Partners

Reports

About us

World Meteorological Organization (WMO) Regional Climate Centres (RCCs) are centres of excellence that operationally generate regional climate products including climate monitoring and prediction in support of regional and national climate activities and thereby strengthen the capacity of WMO members in a given region to deliver better climate services to national users. While all WMO RCCs are required to fulfill certain mandatory functions, the RCC concept includes flexibility to accommodate specific regional needs, capabilities and limitations. The concept also provides options to implement a single multi-functional entity or a distributed-function RCC-Network collaboratively implemented by a number of interested hosts. Under the RCC concept service delivery to national clients remains in the purview of national institutions, the RCC is designed to assist with their mandate.

Mandatory and recommended functions of WMO RCCs and the relevant designation criteria are part of the WMO Technical Regulations. This and other related information are also described at https://www.wmo.int/pages/prog/wcp/wcasp/RCCs.html.

Info on us and potential partners

Mandatory Functions

- operational activities for long range forecasts (LRF);
- operational activities for climate monitoring;
- operational data services to support LRF and climate monitoring; and
- training in the use of operational RCC products and services.

Highly Recommended Functions

- climate prediction and climate projection;
- non-operational data services;
- coordination functions;
- training and capacity development; and
- research and development.

The Arctic Regional Climate Centre Network (ArcRCC-N) has a domain that falls across three of the WMO Regional Associations: Asia, Europe and North America. The structure is on two levels: there are three sub-regional geographic domains, each of which will be guided by a Node that will perform all mandatory functions for the countries in its domain, and exceptionally, each node will undertake a significant

About us

- Canada will lead the North American Node (with Canada and USA as members of consortium); Norway will lead the Northern Europe and Greenland Node (with Denmark, Finland, Iceland, Norway, Sweden and possibly other interested European countries as members of consortium); and the Russian Federation will lead the Eurasian Node.
- Canada will lead development of Long-Range Forecasts (LRF); the Russian Federation will lead the Climate Monitoring; and Norway will lead operational Data Services based on WMO Information System (WIS) requirements.

Contact

Name *

E-mail *

Subject *

Message *

What code is in the image? *

Enter the characters shown in the image.

Submit

Feedback is encouraged!

search this site

Arctic Regional Climate Centre Network

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- **Nordic Node**
  - Climate monitoring
  - Long-range forecasting
  - WMS
- American Node
- Eurasian Node

Regional services >

Nordic Node

The Nordic Node is a collaboration between Norway, Sweden, Denmark, Finland and Iceland. Currently, Norway serves as the lead and the Norwegian Meteorological Institute coordinates all PRCC functions for the Node's domain. The institutions in these countries that support and contribute to the Node include:

- Denmark: the Danish Meteorological Institute (DMI); the Geological Survey of Denmark and Greenland (GEUS); the Polar Portal (Monitoring ice and climate in the Arctic);
- Finland: the Finnish Meteorological Institute (FMI);
- Iceland: the Icelandic Meteorological Office (IMO);
- Norway: the Norwegian Meteorological Institute (NMI);
- Sweden: the Swedish Meteorological and Hydrological Institute (SMHI).

Climate monitoring	Long-range forecasting	WMS
Climate monitoring products like Norwegian Ice Service, Polar Portal and Arctic-HYPE.	Example products from ECMWF.	Web map service products.

Regional services

examples for Nordic node

Utilize existing services!

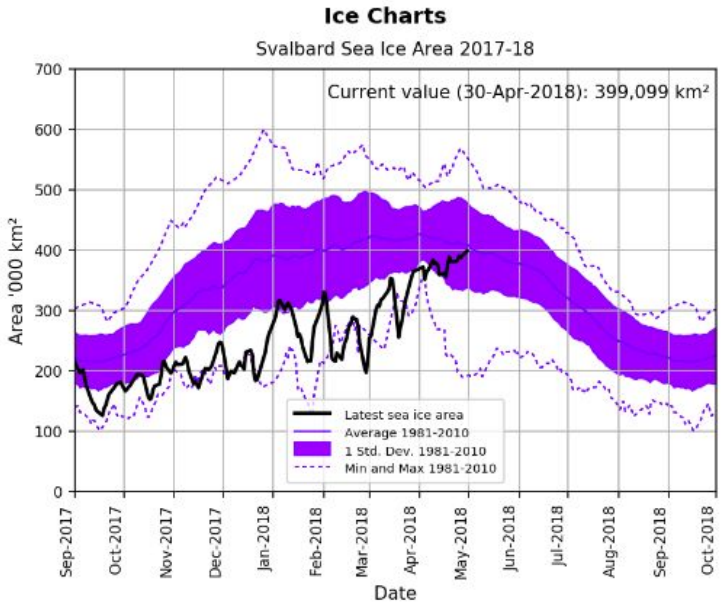
Norwegian Meteorological Institute

Regional services > Nordic Node >

- Nordic Node
  - Climate monitoring
    - Norwegian Ice Service
    - OSI SAF
    - Polar Portal
    - Arctic-HYPE
    - Environmental Monitoring of Svalbard and Jan Mayen
    - Swedish climate diagnostics contributions
    - Climate Change Impact Research
  - Long-range forecasting
  - WMS
- American Node
- Eurasian Node

Norwegian Ice Service

The Norwegian Ice Service is the operational service at MET Norway, and a part of Polar View. The icecharts are updated every week day.



Latest sea ice area for the Svalbard region derived from the ice charts and compared with climatology (1981-2010).

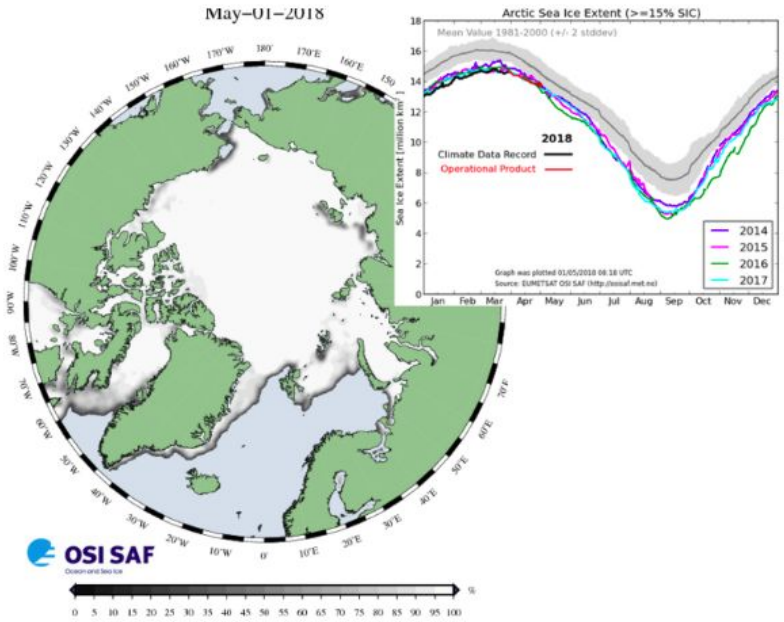
- Climate monitoring
  - Norwegian Ice Service
  - OSI SAF
  - **Polar Portal**
  - Arctic-HYPE
  - Environmental Monitoring of Svalbard and Jan Mayen
  - Swedish climate diagnostics contributions
  - Climate Change Impact Research
- Long-range forecasting
- WMS

American Node

Eurasian Node

Polar Portal

On polarportal.org, Danish research institutions display the results of their monitoring of the Greenland Ice Sheet and the sea ice in the Arctic. The main purpose of the site is to make updated information from this monitoring available to the general public, both nationally and internationally. In addition, the site will provide access to scientifically based information resources.



The map shows the sea ice extent in the Northern Hemisphere. It is updated on a daily basis. The graph shows the annual variation in the extent of the sea ice in the Northern Hemisphere. The extent of the sea ice is defined by areas that have an ice concentration of at least 15%, i.e. 15% of the surface is covered by ice. The grey band around the climatological mean value corresponds to plus/minus one standard deviation. The extent of the ice is based on satellite data and are from the Ocean and Sea Ice, Satellite Application Facility project (OSISAF). Read more about the data the map is based on at DMI. Image retrieved from http://polarportal.dk/en/sea-ice-and-icebergs/sea-ice-extent0/.

- Nordic Node
  - Climate monitoring
    - Norwegian Ice Service
    - OSI SAF
    - Polar Portal
    - Arctic-HYPE
    - **Environmental Monitoring of Svalbard and Jan Mayen**
    - Swedish climate diagnostics contributions
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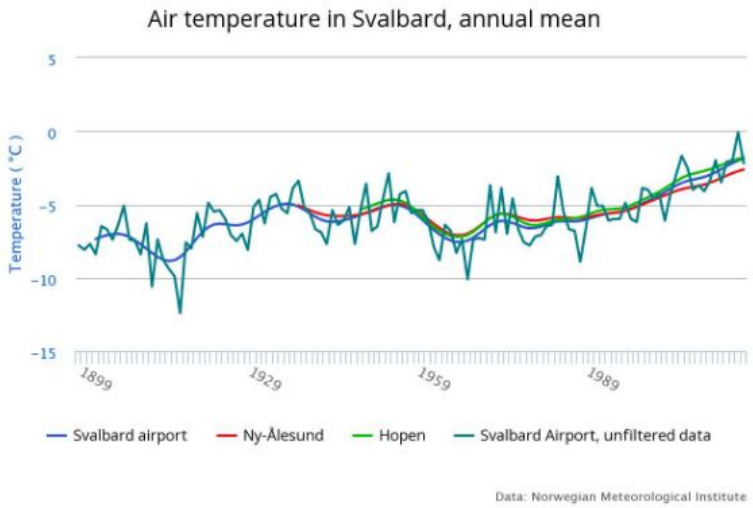
  - Long-range forecasting
  - WMS
- American Node
- Eurasian Node

Environmental Monitoring of Svalbard and Jan Mayen

MOSJ (Environmental Monitoring of Svalbard and Jan Mayen) is an environmental monitoring system and part of the Government's environmental monitoring in Norway. The site provides historical climate records (ocean, land, and atmosphere), including temperature precipitation, snow, permafrost and sea-ice.

The figure shows the annual mean temperature at the Norwegian Arctic stations in Svalbard. The data have been filtered so that variations on time scales shorter than 10 years have been smoothed. Unfiltered data from Svalbard Airport may be activated in the figure. The annual mean temperature shows quite a similar trend at the various stations. The longest data series is from Svalbard Airport, and started in 1898. It shows periods of rising temperatures from 1915 to the 1930s and 1970 to 2016, but cooling from the 1950s to about 1970. When the period is viewed as a whole, the temperature on average has risen by 0.3°C per decade. This exceeds that shown by similar series from the Norwegian mainland.



The figure shows the annual mean temperature at the Norwegian Arctic stations in Bjørnøya and Jan Mayen. The data have been filtered so that variations on time scales shorter than 10 years have been smoothed.

- Nordic Node
  - Climate monitoring
  - Long-range forecasting
  - WMS
    - WMS Arome Arctic
    - **WMS Ocean physical fields**
    - WMS Ocean wave fields
- American Node
- Eurasian Node

WMS Ocean physical fields

WMS from Topaz4 Arctic Physical ocean and sea ice forecasting system.

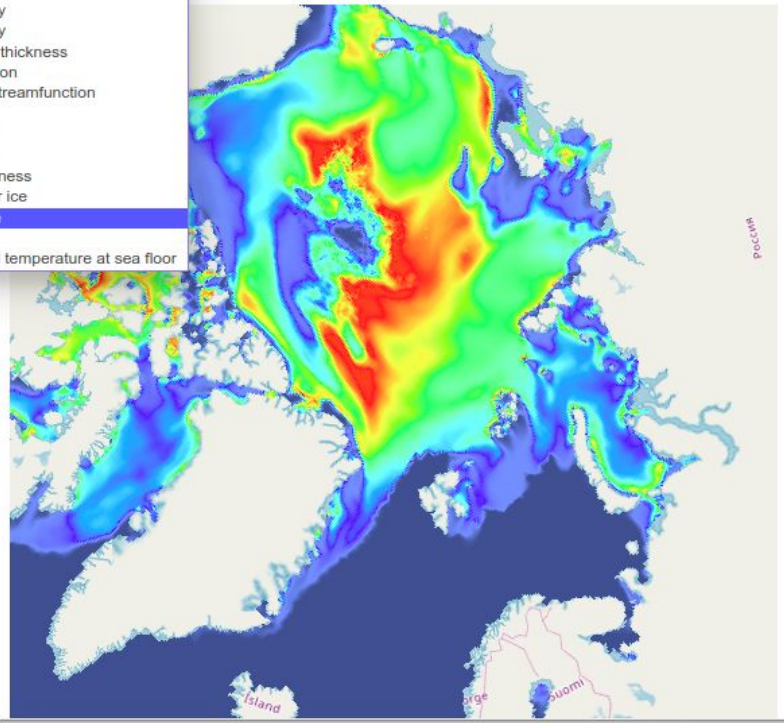
WMS layer

age of first year ice

- sea water potential temperature
- sea water salinity
- x sea water velocity
- y sea water velocity
- ocean mixed layer thickness
- sea surface elevation
- ocean barotropic streamfunction
- sea ice thickness
- sea ice x velocity
- sea ice y velocity
- surface snow thickness
- fraction of first year ice
- age of first year ice
- sea ice albedo
- sea water potential temperature at sea floor

Map orientation

north



Interactive plotting

Arctic Regional Climate Centre Network

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Data access

▾ Full text search

Search words

▾ Data collection period

Start date

1900-01-01

End date

yyyy-mm-dd

▸ Bounding box

▸ Institutions

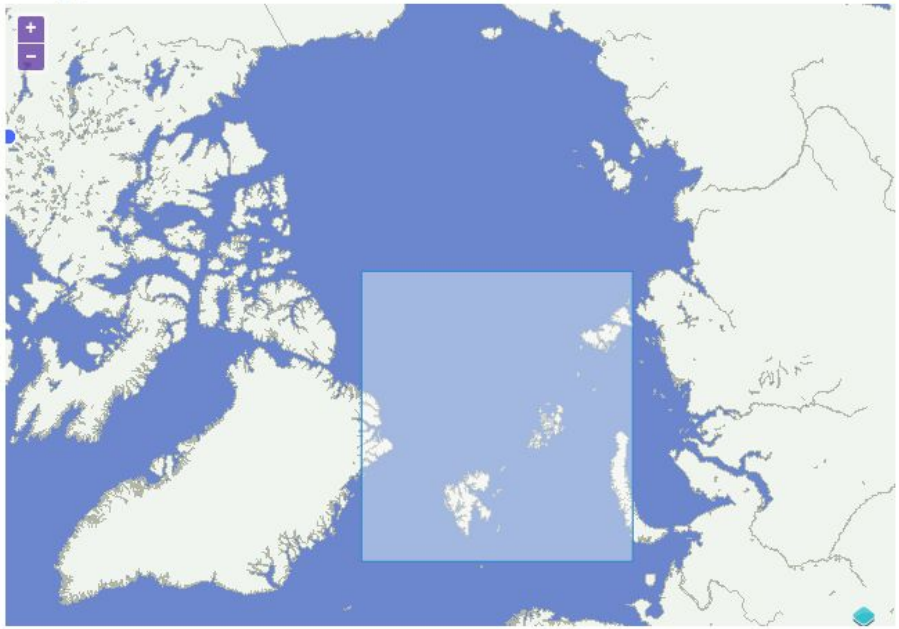
▸ Investigator

▾ Topics and variables

Atmosphere > Precipitation > Precipitation Amount

Search | Reset

▾ Geographical search



The data portal

Searchable by keyword, time, variable location ++

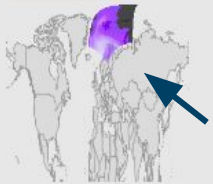
Norwegian Meteorological Institute

Number of datasets found: 22

No thumbnail URL is indexed for **urn:x-wmo:md:int.ecmwf::yopp**

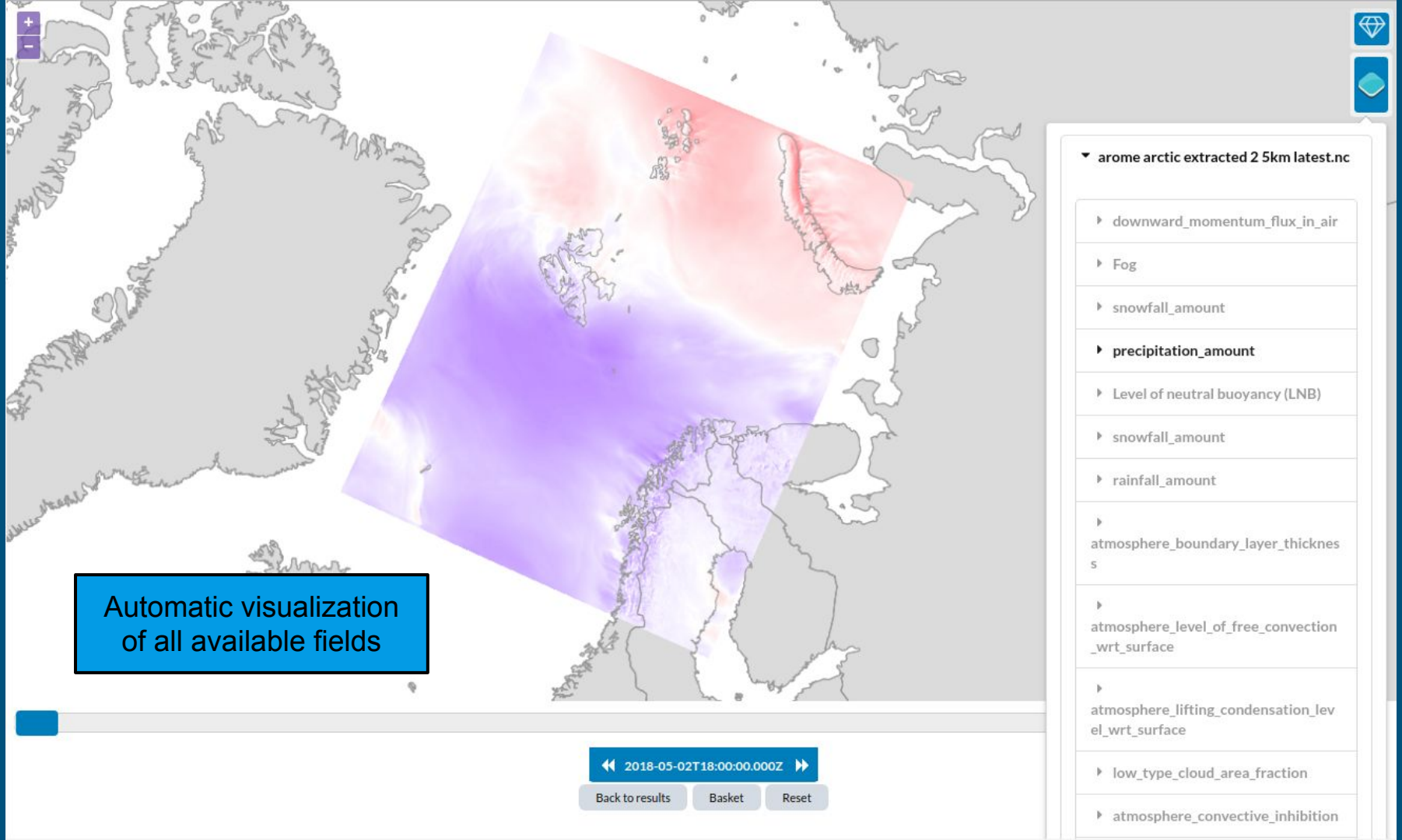
Search results

Dataset name	Institutions	Project	Abstract	Collection period
YOPP (Year Of Polar Prediction) Show metadata	European Centre for Medium-Range Weather Forecasts		Enable a significant improvement in environmental prediction capabilities for the polar regions and beyond, by coordinating a period of intensive observing, modelling, verification, user-engagement and education activities. The Year of Polar Prediction (YOPP) is one of the key elements of the Polar Prediction Project. YOPP is scheduled to take place from mid-2017 to mid-2019.	2017-05-01T12:00:00Z to 2019-05-31T12:00:00Z
met-arome-arctic-2p5km-extracted Download data Show metadata Transform	Norwegian Meteorological Institute		Extracted variables based on the latest run of the AROME-Arctic model, without additional post-processing. Data on surface, and selected model and pressure levels. Horizontal data resolution is 2,5km. The forecast is updated 4 times per day. For historical runs see http://thredds.met.no/thredds/catalog/aromearcticraw/catalog.html	2016-02-01T12:00:00Z to



Example search result

Visualization, other services..


arome arctic extracted 2 5km latest.nc
downward_momentum_flux_in_air
Fog
snowfall_amount
precipitation_amount
Level of neutral buoyancy (LNB)
snowfall_amount
rainfall_amount
atmosphere_boundary_layer_thickness
atmosphere_level_of_free_convection_wrt_surface
atmosphere_lifting_condensation_level_wrt_surface
low_type_cloud_area_fraction
atmosphere_convective_inhibition
Automatic visualization of all available fields
2018-05-02T18:00:00.000Z
Back to results
Basket
Reset

Thank you for requesting data from **WMO Arctic Data Centre**. An e-mail will be sent to **eivinds@met.no** when your order is ready.

Transform dataset

Title (discovery metadata): met-arome-arctic-2p5km-extracted

Abstract (discovery metadata): Extracted variables based on the latest run of the AR resolution is 2,5km. The forecast is updated 4 times per day. For historical runs see h

▾ The e-mail address to send the results to

Send results to: *

eivinds@met.no

▾ Select spatial extent

Degrees north

87.6

Degrees south

62

Degrees east

80

Degrees west

-18

▾ Select temporal extent

Start date

Name	Standard name	Long name	Units
air_pressure_at_sea_level	air_pressure_at_sea_level	Mean Sea Level Pressure (MSLP)	Pa
lwe_thickness_of_atmosphere_mass_content_of_water_vapor	lwe_thickness_of_atmosphere_mass_content_of_water_vapor	Precipitable water	m
atmosphere_level_of_neutral_buoyancy		Level of neutral buoyancy (LNB)	m
relative_humidity_ml	relative_humidity	Relative humidity model levels	1
wind_direction	wind_from_direction	Wind direction	degree
wind_speed	wind_speed	Wind direction	m/s
precipitation_amount_acc	precipitation_amount	Accumulated total precipitation	kg/m^2
snowfall_amount_acc	snowfall_amount	Total accumulated solid precipitation (snow+graupel+hail)	kg/m^2
wind_speed_of_gust	wind_speed_of_gust	Wind gust	m/s
fog_area_fraction		Fog	1

▾ Select map projection

x-axis from:
Minimum value of x-coordinate

x-axis to:
Maximum value of x-coordinate

y-axis from:
Minmum value of y-coordinate

y-axis to:
Maximum value of y-coordinate

Number of steps
Number of point to interpolate to

Interpolation
nearestneighbor

Projection
No description found

Submit | Back to results

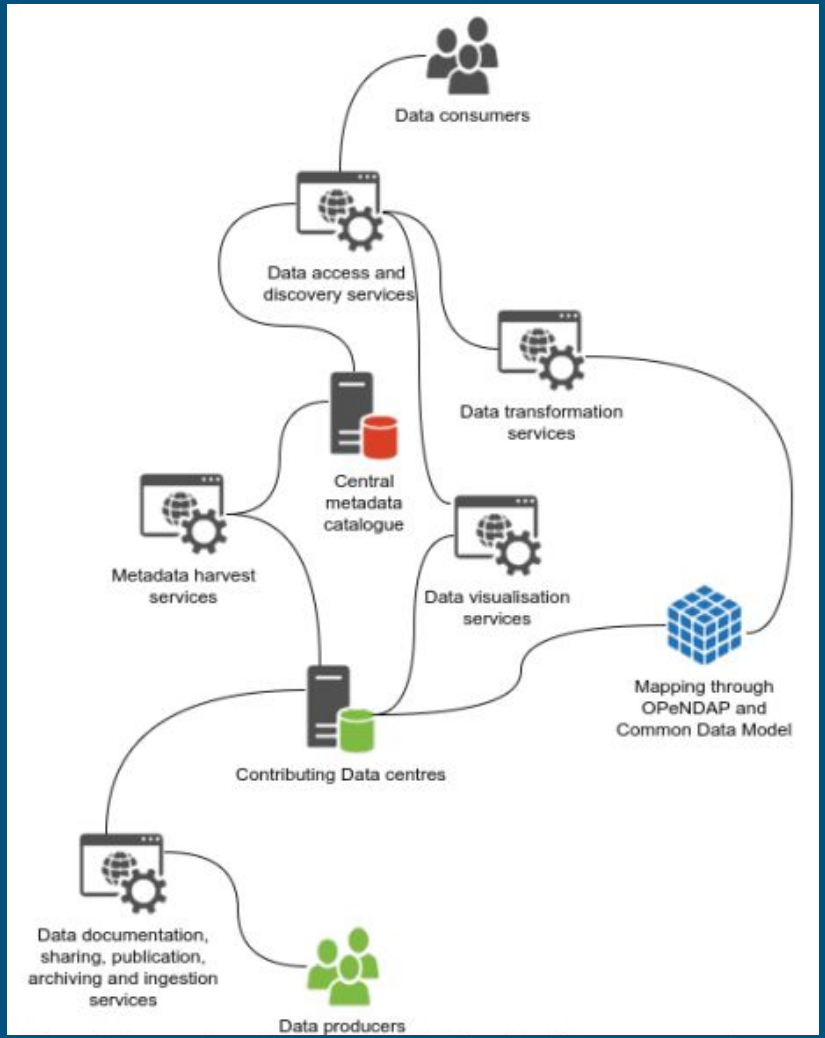
Subset, transform, download

Requires log-in

The data portal

- Distributed data philosophy
- We harvest metadata - information about data
- The physical data is distributed

- Do you have data to ingest in this catalogue? Get in touch!



Questions 1

1. About how to obtain products
The ArcRCC can provide a range of flagship products, e.g. climate bulletin, the consensus statement, the climate watch advisory, long range forecasts and outlooks.

How would you prefer to access these products?

Examples
- Receive email when new product is available (subscribe to mail list)
- Click into a web site and download document
- Access content directly on e.g. mobile device
- Other notification type (twitter, rss feed, other)

Questions 2

2. Web pages general impression

- Meny layout, navigation, data portal search interface .. comments?

3. Feedback, communication

- How would you prefer to get in contact for providing feedback?
  (E.g. General feedback form, log-in access to forum, direct email)

Questions 3

4. Data portal feedback

- Is this relevant to you? What are your needs regarding access to data?
- Do you have data yourselves that should be included in this database?

5. Pan-Arctic vs regional products

- What do you prefer: homogenous Pan-Arctic products, or products tailored for your region?
- The regional contributions may serve as a “hub” for existing products for the region.
  Is this service useful? Should we structure these pointers differently?