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## **WMO Regional Climatological Centres (RCCs)**

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. The primary 'clients' of an RCC are NMHSs and other RCCs in a Region and in neighbouring areas. RCC responsibilities should be regional by nature and not duplicate or replace services already provided by NMHSs. RCCs serve the regional level of a three-level (climate-related) infrastructure: Global Producing Centres (GPCs, global level), Regional Climate Centres (RCCs, regional level), National Meteorological and Hydrological Services (NMHSs, national level).

The RA VI RCC Network in its initial phase consists of 3 nodes. Each node is composed of a consortium led by a lead institution:

- RA VI RCC node on climate data:

KNMI/The Netherlands (lead), Météo-France/France, OMSZ/Hungary, met.no/Norway, RHMS/Serbia, SMHI/Sweden, TSMS/Turkey;

- RA VI RCC node on climate monitoring:

DWD/Germany (lead), Armstatehydromet/Armenia, Météo-France/France, KNMI/The Netherlands, RHMS/Serbia, TSMS/Turkey;

- RA VI RCC node on long-range forecasting:

Météo-France/France and ROSHYDROMET/Russian Federation (joint lead), met.no/Norway, RHMS/Serbia, TSMS/Turkey.

An implementation plan of the three nodes has been elaborated and approved by the RA VI President. It provides descriptions of the existing and envisaged RCC products and services, and some expected interfaces between the RCC nodes. The implementation plan was sent to all RCC service providers to get a formal commitment from them. After the general approval to the plan by the RA VI Members at the 15<sup>th</sup> WMO RA VI session (RA VI – XV, September 2009), a further elaboration and extension of the RCC service provision has to take place. A pre-operational RCC service provision (RCC pilot phase) has started already on 1<sup>st</sup> June 2009.

The presentation gives an overview of the development from the RCC idea to its implementation, a summary of the RCC products and services, and some up-to-date information about the present state of the RCC network and an outlook into the future. For the RCC on Climate Monitoring, an initial workshop is planned for 2010 at DWD in Offenbach/Germany. An official designation of the RA VI RCC Network is envisaged for the year 2011.



**Regional Climate Centres  
(RCCs) for WMO RA VI**

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*Deutscher Wetterdienst  
Germany*



## Outline

1. Motivation: the RCC idea
2. Overview of RCC history
3. Structure of the RCC network
4. Present state
5. RCC Data Management
6. Future challenges

**The warmest winter in  
Finnish measurement  
history  
3.3.2008**

. According to the statistics kept by the Finnish Meteorological Institute, the mildest winter so far had been the winter of 1924-1925.



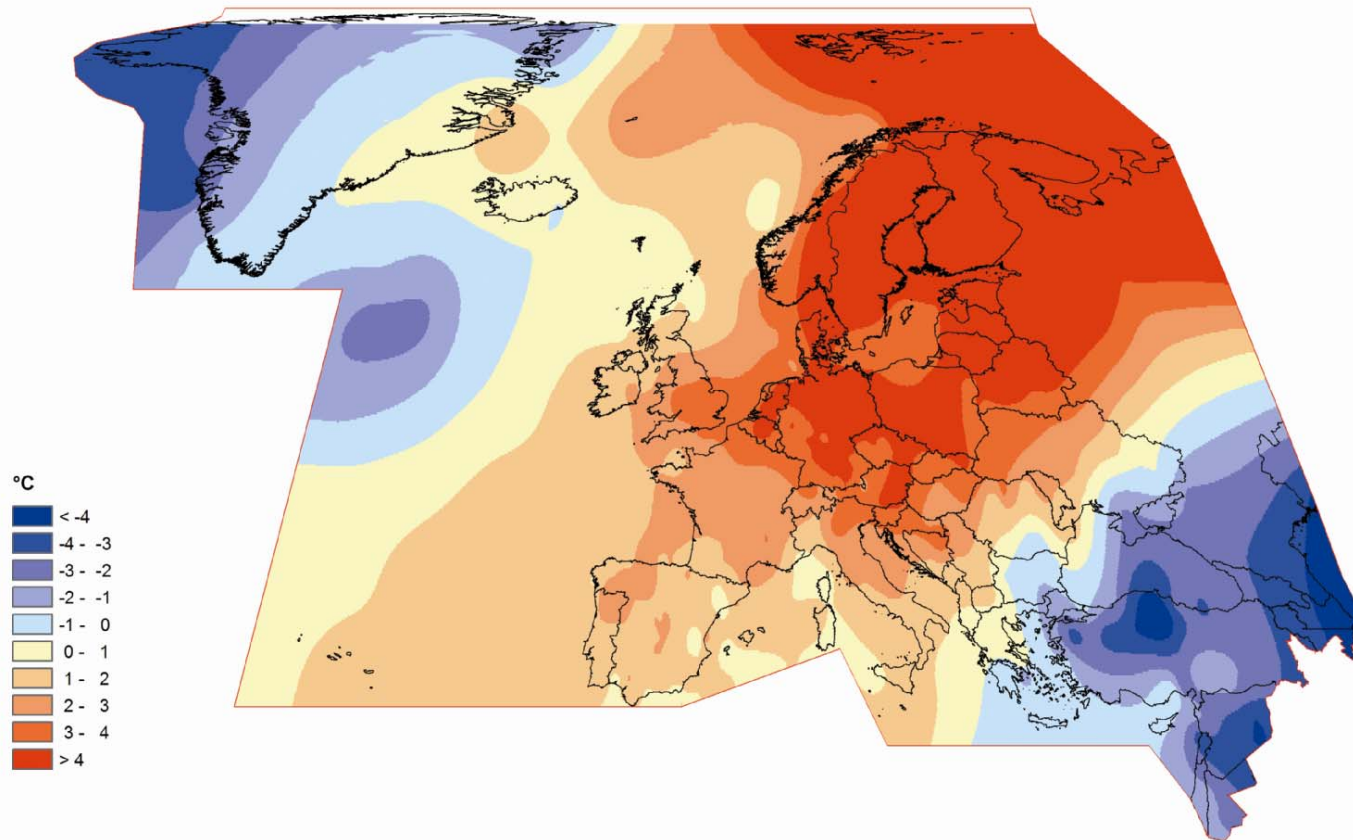
Example:  
Winter 2007/08

but, during  
the same time ...

The entire surface of Lake Sevan (Armenia) became completely covered with ice by 14 January 2008.  
Source: Armstatehydromet, Armenia



## Temperature anomalies RA VI Region January 2008 (Reference period 1961-1990, Source: DWD)



-> Warm event affected more than one country, but not the whole globe





## **(Earth) Climate ranges from local to global ...**

**...sometimes it concerns more than your country,  
but not the whole globe. Nevertheless ...**

**... NMHSs are national (50 countries in RA VI)!**

How to get climate information from other countries in WMO RA VI Region:

Suggestions:

- look at all available websites, publications, climate reviews
- try to find data somewhere and carry out your own analyses
- ask your friendly and helpful colleagues from NMHSs in other countries
- implement a Regional Climate Centre network



## What are RCCs ?

- Regionally (here: RA VI) specialised centres in climatology (Centres of excellence)
- Support Region Members (NMHSs) in providing, improving and extending climate services (esp. cross-national climate events)
- Users of RCCs: mainly NMHSs, other RCCs, but also the public (if national restrictions are acknowledged)

## RCCs should not

- carry out national tasks (no competition with NMHSs)
- duplicate work of NMHSs



## RCC History

- **1997/98:** Outstanding El Niño. Start of development of an RCC concept
- **2001:** Elaboration of a Framework for an RCC structure
- **2003:** Guideline Document (recommendations) for implementation of RCCs
- **2007:** Elaboration of details of RCC services and the formal procedure of RCC designation (CCI team)
- **2008:** Conception and coordination of an implementation plan of an RCC network (WG of Climate-related Matters)
- **2009:** Reference of RCCs in the „Manual on the Global Data Processing and Forecasting System (GDPFS)“, Approval of the revised Manual by CBS. Approval of the implementation plan by RA VI President and RA VI-XV Meeting. Start of pilot RCC service („pre-operational production phase) in June 2009 (until end of 2010).





## RCC Structure: Part of a 3-level structure

**Global level: Global producing centres (GPCs)**

e.g. global data centres or infrastructures

**Regional level: RCCs**

**National level: NMHSs**



## The RA VI RCC Network: The current structure

### RCC node on climate data

Météo-France/France, OMSZ/Hungary, met.no/Norway, RHMS/Serbia, SMHI/Sweden, TSMS/Turkey,

host: KNMI/The Netherlands

### RCC node on climate monitoring

Armstatehydromet/Armenia, Météo-France/France, KNMI/The Netherlands, RHMS/Serbia, TSMS/Turkey

host: DWD/Germany

### RCC node on long-range forecasting

met.no/Norway, RHMS/Serbia, TSMS/Turkey,

hosts: Météo-France/France and Roshydromet/Russian Federation

**Approved implementation plan and pilot operations since 1 June 2009!**



## RA VI RCC products and services (examples)

- Transnational data sets
- Database and archiving services
- Information and Guidance on methodologies and products
- Training
- Climate diagnostic bulletins
- Reference climatologies
- Climate Watch
- Seasonal outlooks
- WebPortals

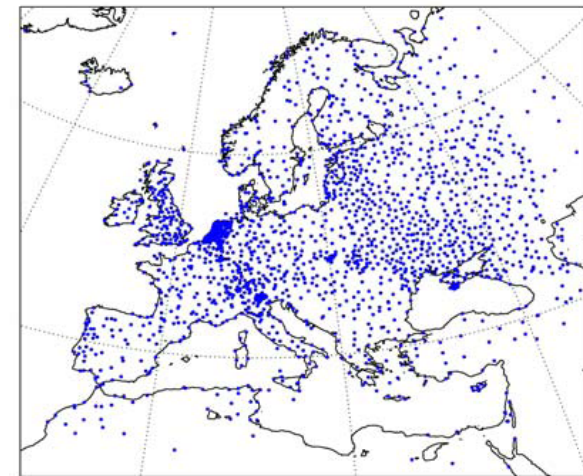
## The RA VI RCC Network: RCC node on Climate Data

ECA/D-, MILLENIUM-, ENSEMBLES-,  
South East European Gridded  
model-, Eastern Mediterranean-,  
BALTEX- and SHARK-datasets

Storage services and data  
management toolkits

Guidance on homogenisation,  
interpolation, QC procedures, use of  
climate indices, DARE, R&D

**For details -> cf. RCC Implementation plan**



ECA/D station density:  
10.000 time series of  
2.700 stations incl. a set  
of 42 extremes indices

**<http://eca.knmi.nl>**



## The RA VI RCC Network: RCC node on Long Range Forecasting

Analyses and interpretation of GPC products: Global, RA VI, South-eastern Europe, Eastern Mediterranean

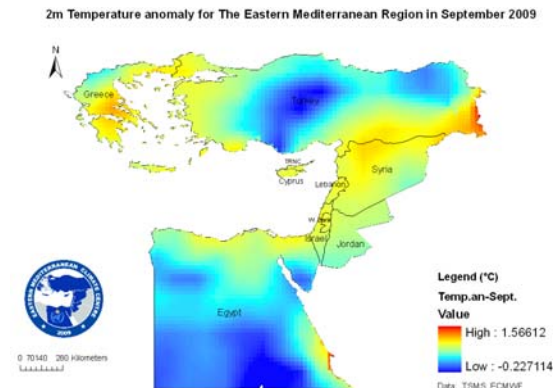
Seasonal outlooks: RA VI, Western Europe, Northwest Europe

Verification datasets

User feedback reports

Training and R&D / (RCOF- support)

**For details -> cf. RCC Implementation plan**



2m temperature anomaly forecast for the Eastern Mediterranean region

<http://emcc.dmi.gov.tr>

## The RA VI RCC Network: RCC node on Climate Monitoring

Annual and monthly climate diagnostic bulletins

Monthly monitoring maps: global, RAVI, Eastern Mediterranean, South Caucasus

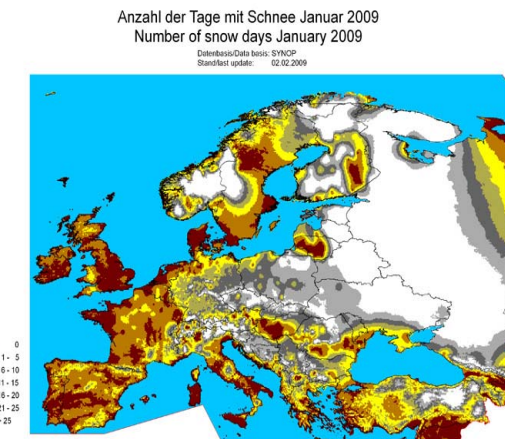
Reference climatologies and trend maps

RA VI climate monitoring WebPortal

Climate Watches (tbd)

Training and R&D

**For details -> cf. RCC Implementation plan**



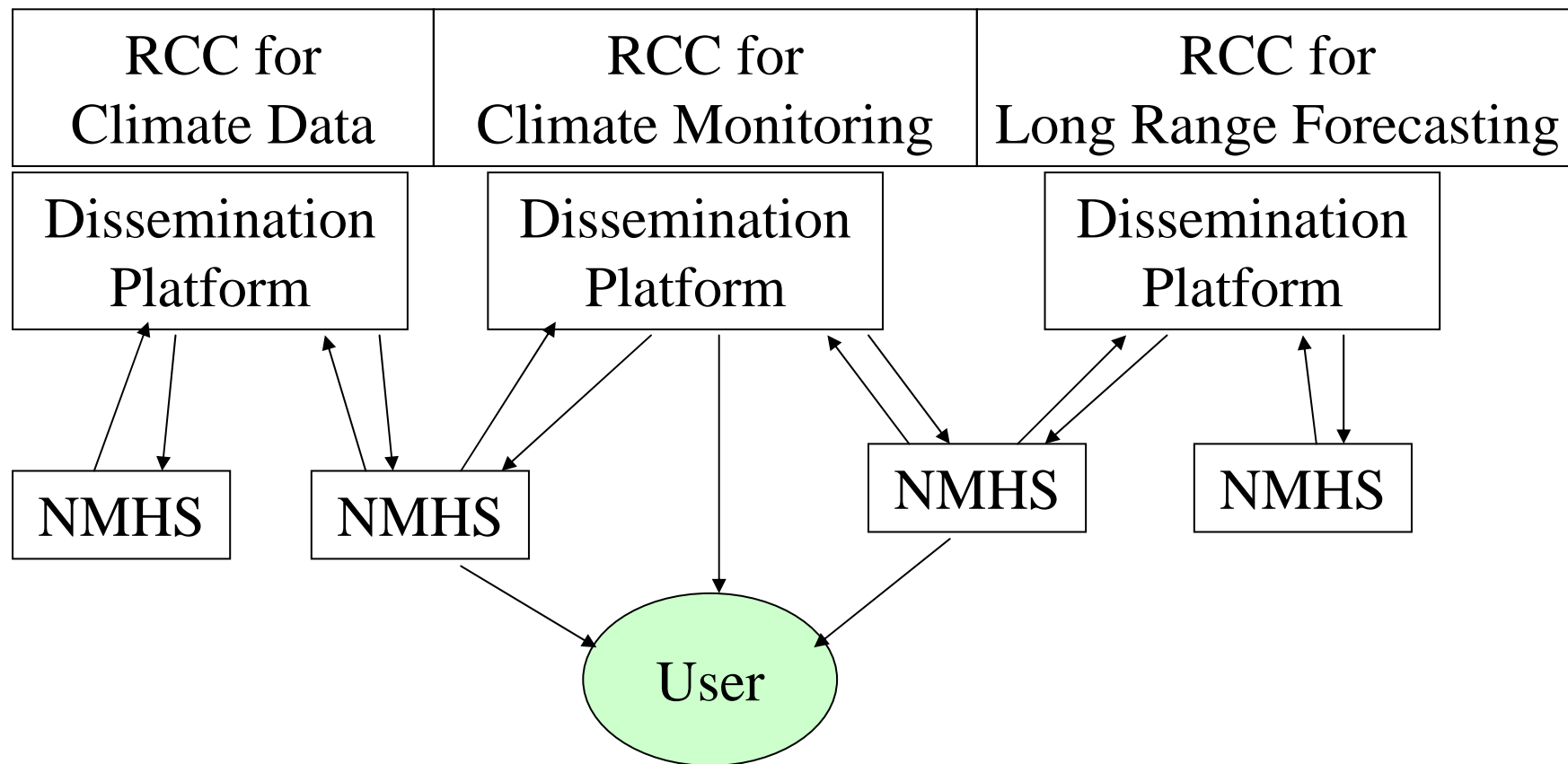
European snow monitoring

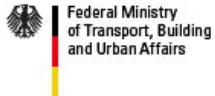
[www.dwd.de/snowclim](http://www.dwd.de/snowclim)

[www.dwd.de/ecsm](http://www.dwd.de/ecsm)



## Information flow of RA VI Regional Climate Centres (RCC)





The Reference for Meteorology



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Homepage | Weather + Warnings | **Climate + Environment** | Special Users | Co-operation | About Us | Responsibilities |

News | Contact | Press | WeatherShop | Services A-Z | Library | Weather Glossary | Job Market | Login | Search

ECSM

[printer friendly version] | [close]

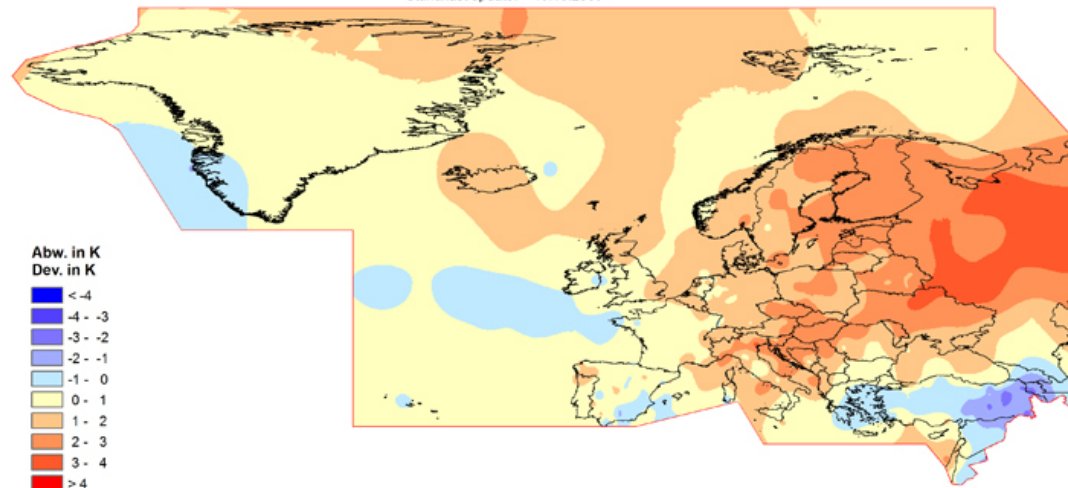
- ▶ Overview
- ▶ Significant Weather Events
- ▶ **Maps Europe**
  - ▶ **Months and seasons**
    - ▶ Normal
    - ▶ years
  - ▶ Maps national
  - ▶ Annual RA-VI Bulletin
  - ▶ Monthly RA VI Bulletin
  - ▶ Links
  - ▶ Description
  - ▶ Contact

## European climate monitoring products - monthly products

Temperature ▾ Anomaly/Percentage ▾ 2009 ▾ september ▾

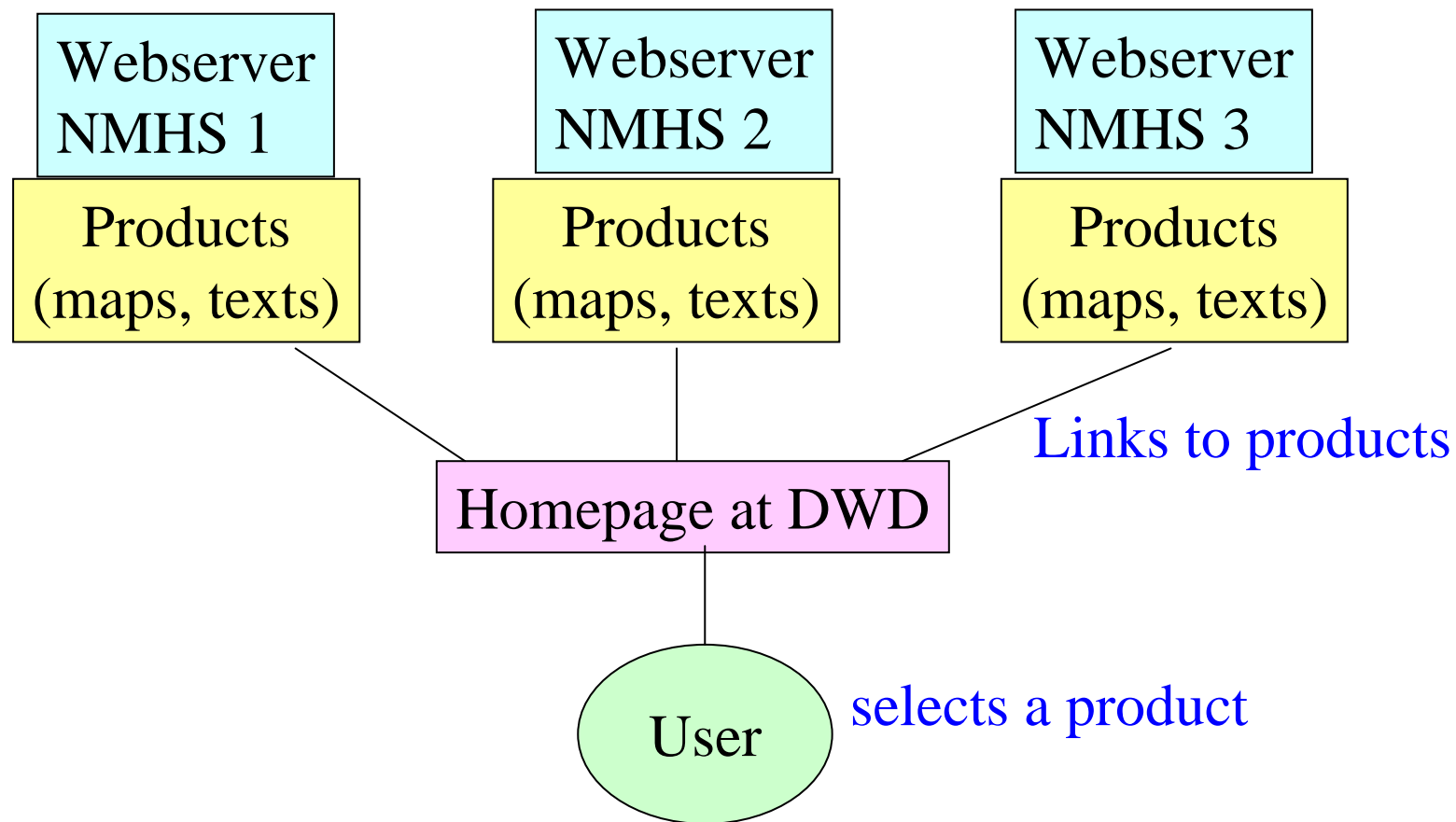
### Temperaturabweichung September 2009 vom Normalwert 1961-1990 Temperature deviation September 2009 (reference period 1961-1990)

Datenbasis: CLIMAT und Schiffsmeldungen  
Data basis: CLIMAT and ship observations  
Stand/last update: 19.10.2009

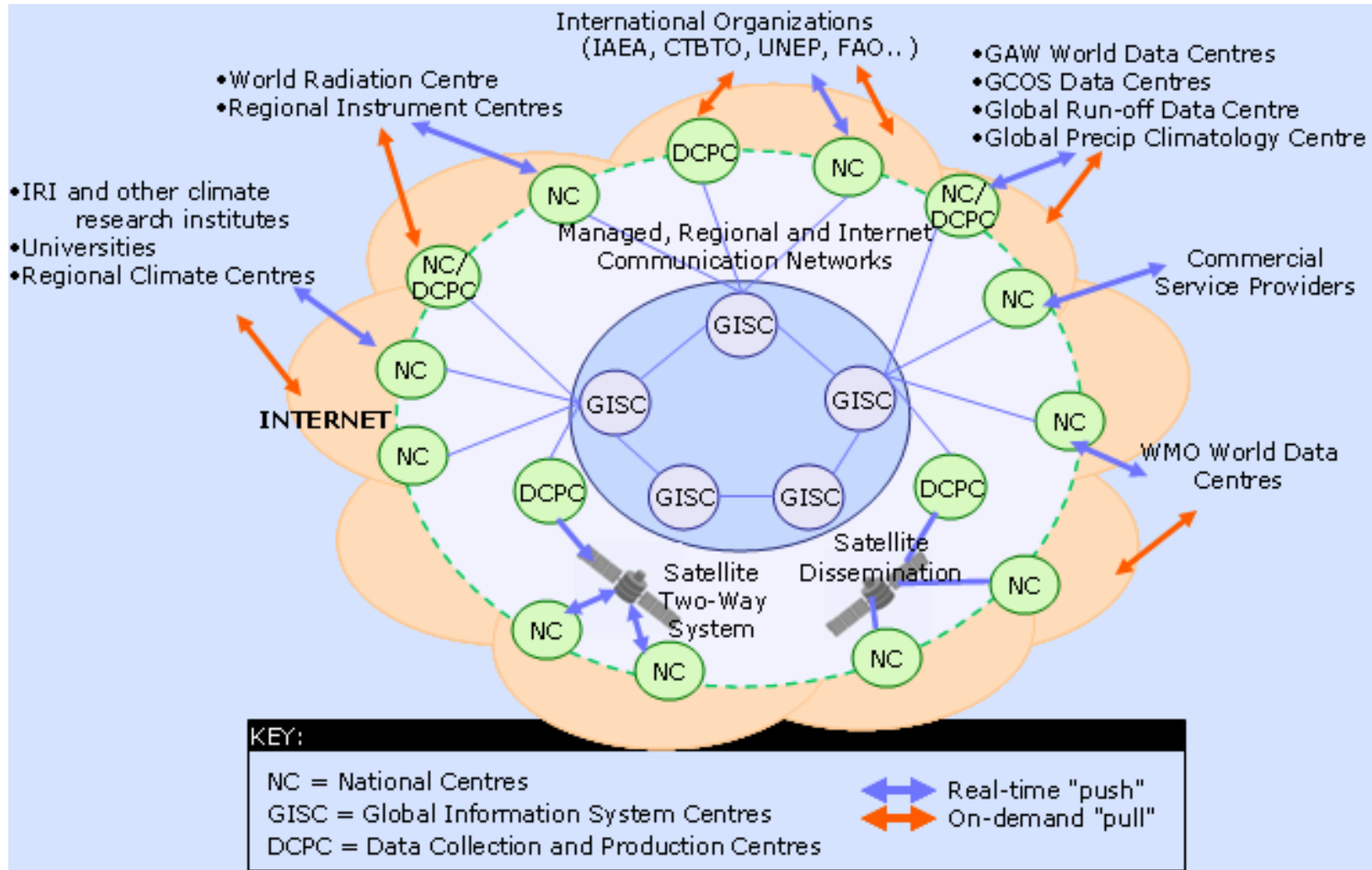




## Basic technical concept of ECSM



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## Future challenges

- extending product suite
- extending number of contributing Members
- defining interfaces between RCC nodes
- exploring user requirements
- establish modern website technology compatible to the WMO Information system

## Future activities

- establish contacts between consortium members within RCC nodes, to GPCs, NMHSs, users, WMO bodies; nomination of a focal point
- detailed concepts (e.g. Climate Watch)
- RCC Workshop (planned for 2010)



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**... and hopefully designation of full-operational RCC network in 2011...**



