Bundesministerium für Verkehr und digitale Infrastruktur

WMO RA VI RCC Network

METEO FRANCE Toujours un temps d'avance

Koninklijk Nederlands Meteorologisch Instituut
Ministerie van Infrastructuur en Milieu

Росгидромет ROSHYDROMET

Deutscher Wetterdienst
Wetter und Klima aus einer Hand

DWD

WMO RA VI RCC Network

Organization

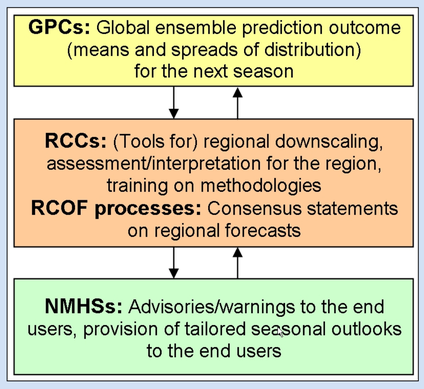
Regional Climate Centres (RCCs) are Centres of Excellence that assist WMO Members in a given region to deliver better climate services and products including regional long-range forecasts, and to strengthen their capacity to meet national climate information needs. The concept of Regional Climate Centres offers excellent opportunities for networking by pooling certain capacities of the NMHSs and other institutes in a region by an efficient systems approach.

WMO RCC services span a set of mandatory functions: climate data, climate monitoring, long range forecasting and training, also highly recommended functions as defined in the Manual on the GDPFS. RCCs are recognized among the key elements of CSIS contributing to the implementation of the Global Framework for Climate Services (GFCS).

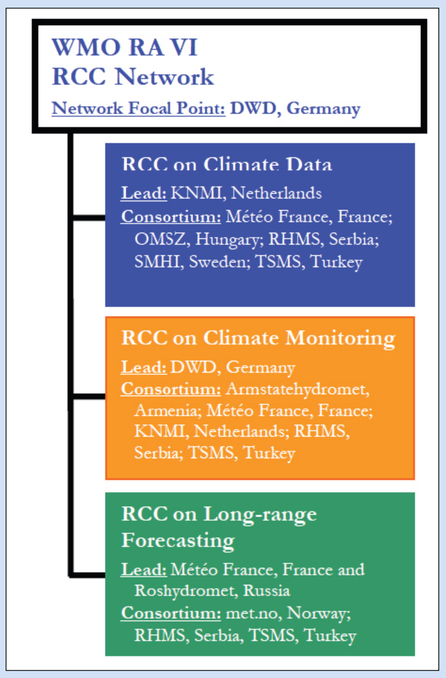
The primary users of an RCC are the National Meteorological and Hydrological Services (NMHSs), other RCCs in the region and beyond, as well as other institutions recognized by the WMO Regional Associations (RAs). NMHSs typically use RCC products to extend or improve their service suite vis-à-vis their end user community.

The RCC in WMO Regional Association (RA) VI (Europe) was designated as a network of three Nodes, consisting of Lead institutions and consortia members. DWD/ Germany has taken the responsibility for the overall coordination of this network.

WMO Regional Association VI (Europe)



Example interaction of the RCCs within the structure of Global Producing Centres (GPCs), National Meteorological and Hydrological Services (NHMSs), and the Regional Climate Outlook Forum (RCOF) processes



The RCC in WMO RA VI as a network of three consortia

RCC Network Node on Climate Data Services (De Bilt)

The **RCC Network Node on Climate Data Services (RCC Node-CD)** provides observational data and derived products to support long-range forecasting, climate modelling and climate monitoring and analysis by developing quality controlled, regularly updated regional data sets and providing database, archiving and data rescue services.

Service overview:
- Quality-controlled, regularly updated regional and sub-regional data sets containing daily station observations (ECA&D), gridded fields (E-OBS), climate indices, trends and return periods, meta data, and documentation of extreme events
- Safe and recoverable storage of these data sets
- Data management and visualization toolkit
- Diagnostics and guidance on data homogeneity
- Guidance on the use of indices and Data Rescue

Research and gaps

The number, extension and quality of available climate data sets have much improved due to new data sources (especially from satellites), progress in numerical reanalysis, changes in data policy, and recent development in quality control, homogenization, and technology of data processing. There is a growing need for sub-daily data for validation of models and satellite retrievals, and for monitoring extremes.

Possible future research topics:
- Intercomparison and merging of new data sets
- Further development of methods of quality control and filling of data gaps, incl. homogenization
- Data rescue and use of historical climate data
- Increasing spatial and time resolution of data
- Improvement of gridding and uncertainty estimation
- Evaluation of climate models with new observations and merged data sets

Training and capacity building

- Seminars of homogenization and interpolation (Hungary)
- Biennial EUMETNET data management workshops
- Training and guidance for implementations serving other regions (SE Asia and South America)

RCC Network Node on Climate Monitoring (Offenbach)

The RCC Network Node on Climate Monitoring (RCC Node-CM) provides operational services for monitoring the climate system by i.a. climate diagnostics, historical reference climatologies at regional and sub-regional levels. This includes a regional Climate Watch System (CWS) for early warning.

Service overview:
- Monthly and annual climate monitoring bulletins
- Monthly, seasonal and annual maps of standard climate parameters and variables (including anomalies, trends, extreme indices) for the entire region, as well as for the Eastern Mediterranean and the South Caucasus sub regions
- Reference climatologies for standard periods
- Reports and climatological assessments of significant weather events
- Operation of a Climate Watch System (CWS)

Research and gaps

The availability of new and extended high-quality climate data sets gives much opportunity to provide more and better climate monitoring products as well. In the light of climate change good climate monitoring products become more and more important, including for monitoring of extremes. They are also needed for assessment and validation of long-range and climate forecasts.

Possible future research topics:
- Development of new or improved climate monitoring products (maps, indices, bulletins, assessments) based on new available data sets
- Quality assessment of these new products
- Attribution of trends in climate variability
- Attribution of extremes to climate change
- Further development of the Climate Watch System
- Sector-specific impacts of climate change

Training and capacity building

- Workshops on Climate Watch implementation
- ECAC/EMS conferences
- Further training on dedicated topics (e.g. statistical evaluation of data)

RCC Network Node on Long-range Forecasting (Toulouse & Moscow)

The **RCC Network Node on Long-range Forecasting (RCC Node-LRF)** provides operational services related to seasonal to inter-annual forecasts by interpretation of products from Global Producing Centres (GPCs), generating relevant regional and sub-regional products, and consensus statements on regional and sub-regional forecasts.

Service overview:
- Regional forecast products based on GPC data and multi-model (MM) ensemble for National Meteorological Services in the region
- Graphs and maps of GPCs model performances
- Monthly and quarterly bulletins analyzing and interpreting GPC products
- Regional and sub-regional seasonal outlooks
- Forecast consistency statements
- Verification datasets
- Contribution to the Regional Climate Outlook Forums in Europe

Research and gaps

Rising awareness of climate change and sector-specific impact-related planning of economic activities increase the demand on long-range forecast products. On the other hand, improvement of prediction models from weekly to centennial scale resulted in more and better information of long-range forecasts.

Possible future research topics:
- Further development of long-range forecast modelling on all climate-relevant scales
- Verification and interpretation of model results
- Forecasting atmospheric circulation patterns and their impact on temperature and precipitation
- Further development and interpretation of downscaling products
- Sector-specific impact forecasts
- Development of new MM products, especially in the context of the future C3S MM

Training and capacity building

- Training workshops on long-range forecasting (back-to-back with Regional Climate Outlook Forums in Europe (MedCOF, SEECOF, NEACOF))

DWD - 5/2017

Deutscher Wetterdienst, Dept. Climate Monitoring, Offenbach, Germany
(lead and co-ordination of the WMO RA VI RCC network)
rcc.cm@dwd.de, www.rccra6.org