WEATHER CLIMATE WATER
TEMPS CLIMAT EAU

Current status of operations of NEACC

Valentina Khan
NEACC/Hydrometcenter of Russia

WMO OMM
World Meteorological Organization
Organisation météorologique mondiale

WMO International Workshop on Global Review of RCC Operations, Pune, India, 12 – 14 November 2018

NEACC background

For RA-VI Region NEACC functions as one of Long-Range Forecast nodes of the RA-VI Regional Climate Network.

For RA-II Region NEACC functions as a Multifunctional Regional Climate Center.

NEACC is a contributor to ArcRCC-n, PARCOF, MEDCOF, SEECOF, FOCRA

NHMSs of CIS

+

Consortium of the Roshydromet organizations:

1. Hydrometeorological Research Centre of the Russian Federation
2. Institute of Global Climate and Ecology
3. Russian Research Institute for Hydrometeorological Information – World Data Centre
4. A.I. Voeikov Main Geophysical Observatory
5. Droughts Monitoring Centre, Russian Research Institute of Agricultural Meteorology
6. Main Computer Centre (Russian Federation)
7. Aviamettelecom (Russian Federation)

The North Eurasia Climate Centre (NEACC) coordinated by the Roshydromet under the auspices of the Commonwealth of Independent States (CIS).

NEACC was formally designated as a WMO RCC NEACC by WMO Executive Council in May 2013 after compliting demonstration phase

WMO OMM

NEACC Operations: Mandatory Functions
Operational Data Services

NEACC is a distributed centre. One of its members is the Russian Institute of Hydrometeorological Information - World Data Centre (located in Obninsk) that supports these activities. NEACC provides link for data system of WDC. Some archives of climate data and normal can be downloaded from web page of NEACC.

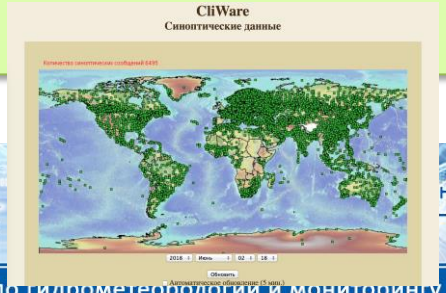
Climate data availability for the sub-region of interest;

- ✓ observational climate data for FSU region (period varies from station to station),
- ✓ climate normals (1961-1990, 1979-2007),

Baseline Climatological Data Sets

- Coordinates of meteorological stations
- AIR TEMPERATURE (Monthly Data)
- PRECIPITATION (Monthly Data)
- AIR PRESSURE (STATION LEVEL) (Monthly Data)
- SUNSHINE DURATION (Monthly Data)
- VAPOUR PRESSURE (Monthly Data)
- DAILY AIR TEMPERATURE AND PRECIPITATION
- THREE-HOURLY METEOROLOGICAL OBSERVATIONS
- DAILY SOIL TEMPERATURE AT DEPTHS TO 320 CM
- SNOW COVER CHARACTERISTICS
- ROUTINE SNOW SURVEYS
- CURRENT RADIOSONDE DATA
- MEAN VALUES FOR POLAR RUSSIAN AEROLOGICAL STATIONS
- INFORMATION ON UNFAVORABLE WEATHER AND HYDROMETEOROLOGICAL HAZARDS THAT RESULTED IN SOCIO-ECONOMIC LOSSES OVER THE AREA OF THE RUSSIAN FEDERATION

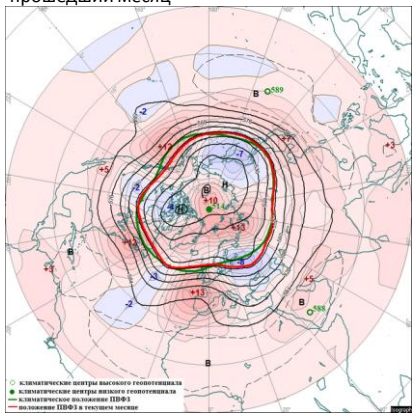
Digital forecast data PLAV and MGO models for period from 2011 up to now are available via web portal



WMO OMM

NEACC Operations: Mandatory Functions
Climate Monitoring

Погодно-климатические особенности за прошедший месяц



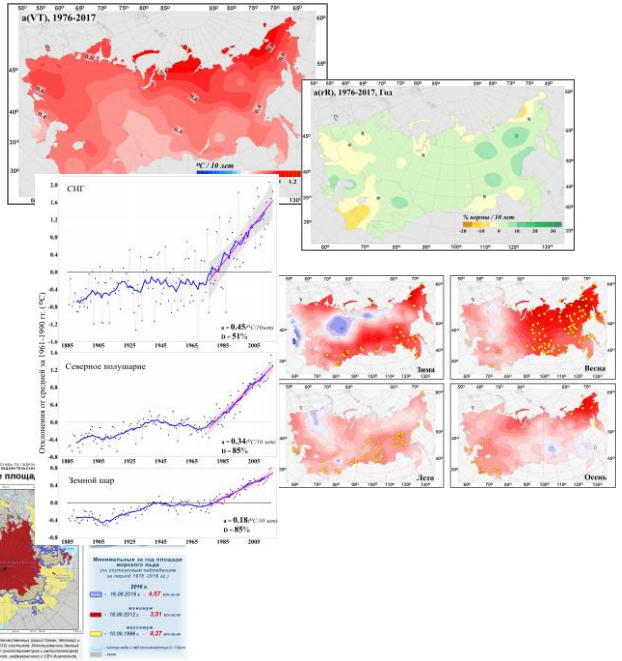
Express monitoring

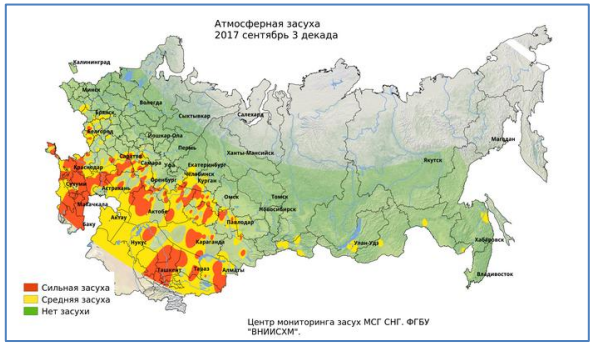
Climate monitoring

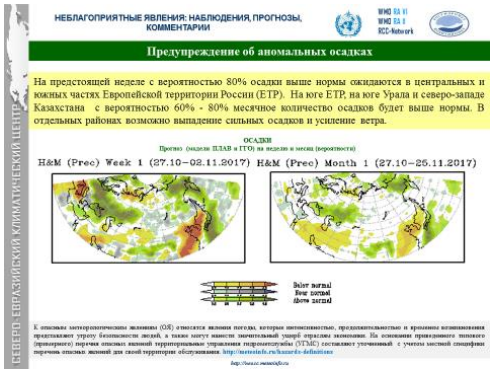
Draught monitoring

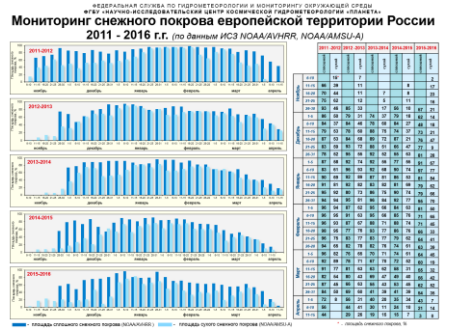
Sea ice and snow cover satellite monitoring

Climate watch advisories









WMO OMM

NEACC Operations: Mandatory Functions
Long Range Forecasting

- Issue of monthly and seasonal forecasts of surface air temperature, H500, T850, PRSLM and rainfall over the Globe, the CIS, RA-VI, the northern part of the PA II WMO and the Arctic region.

-Issue of monthly and seasonal forecasts of the main indices of atmospheric circulation, and online provision of composite maps of meteorological parameters for the positive and negative phases of each index.

-Weekly issue of multimodel forecasts for the CIS territory with lead time up to 1.5 months issued by model SI-AV and MGO.

-Seasonal and subseasonal forecast products are produced on the base of outputs from SI-AV and MGO forecast models.

-Consensus forecasts produced as a subjective judgment of experts who are using different type of forecasts both dynamical and statistical.

-The evaluation of operational forecasts with forecast period up to season is on regular regime

-Verification of consensus seasonal forecasts on the territory of the CIS discussed in qualitative manner during NEACOF sessions.

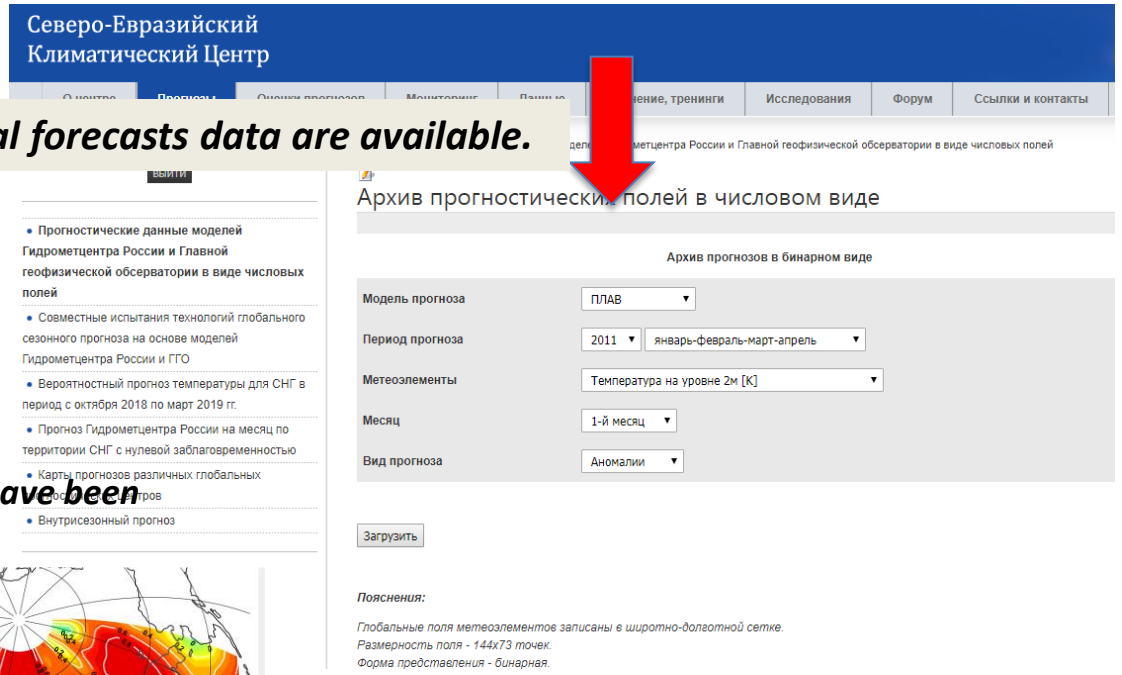
-Monitoring the quality of deterministic and probabilistic forecasts of air temperature, precipitation, H500, T850, and atmospheric pressure at subseasonal time scale.

-The evaluation of hindcasts of updated version of PLAV model for the period 1985-2010.

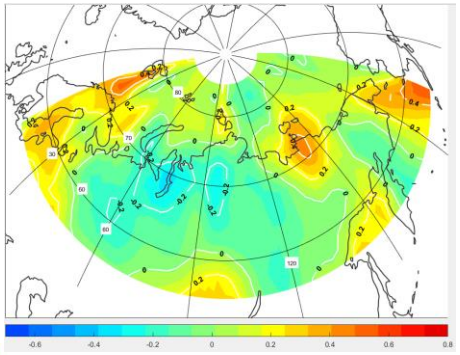
RCC Operations:
Highly Recommended Functions

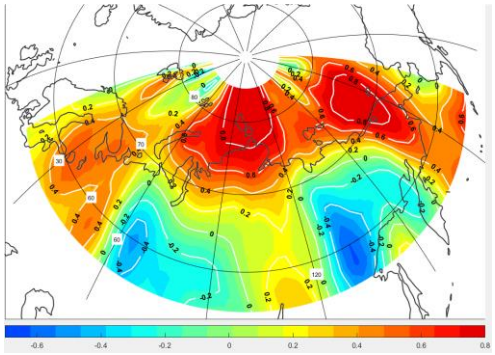
Seasonal forecasts data are available.

Reference materials related to climate prediction and projection are available on NEACC website. Climate projection data are not provided yet but in progress.

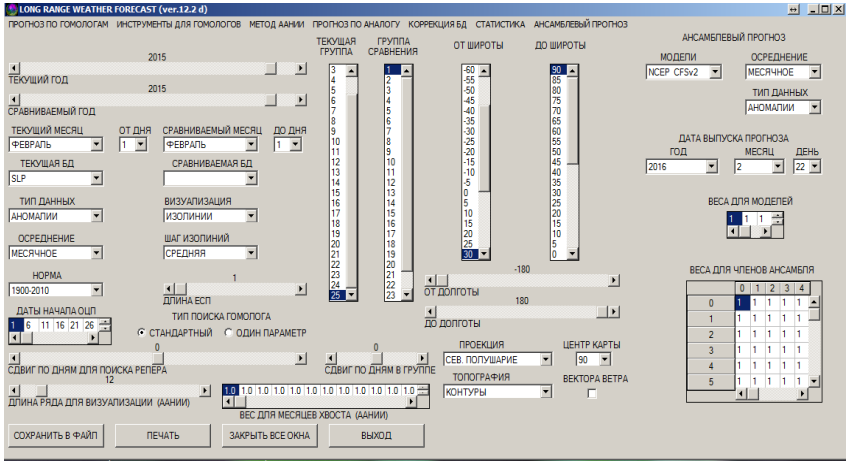


New statistical downscaling approaches have been developed.





Software for objective combination of dynamical and empirical forecasts has been developed and testing.



WMO OMM

Old and new system for long range forecast at Hydrometcentre of Russia (coordinating institution of NEACC)

SL-AV 2008

- Resolution 1,4x1,125°, 28 levels
- Uppermost level at 5 hPa
- Resolution in the stratosphere 1.5-3 km
- SW and LW radiation Ritter, Geleyn 1992 (1+1 spectral band)
- PBL – improved version Geleyn 1982
- 40 min at 8 cores of Cray XC40 (4 months)

SL-AV 2015

- Resolution 0,9x0,72°, 96 levels
- Uppermost level at 0,04 hPa
- Resolution in the stratosphere 500-700 м
- SW radiation CLIRAD SW, LW radiation RRTMG LW (11 + 16 spectral bands)
- PBL Bastak-Duran et al JAS 2014
- 40 min at 480 cores of Cray XC40

WMO OMM

Courtesy of M.Tolstyh

Coupled model components

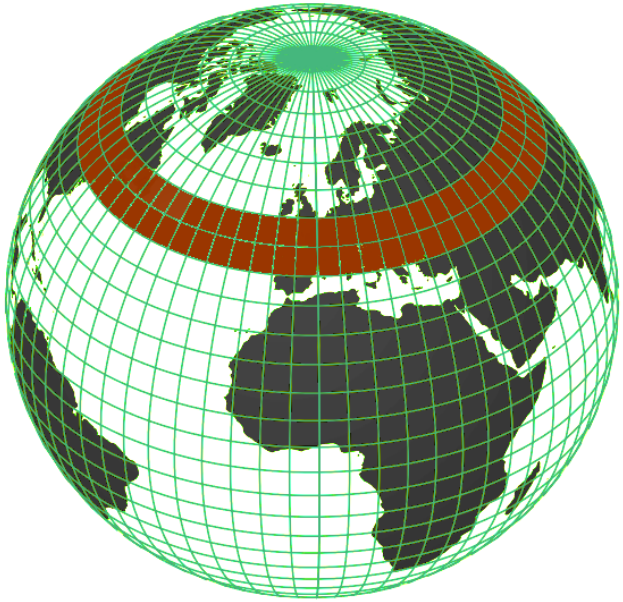
SLAV atmosphere model

0.9°x0.72° (400x250), 85 levels.

Δt = 1440 s.

Lat-Lon, 1D MPI decomposition.

* includes multilayer soil model.

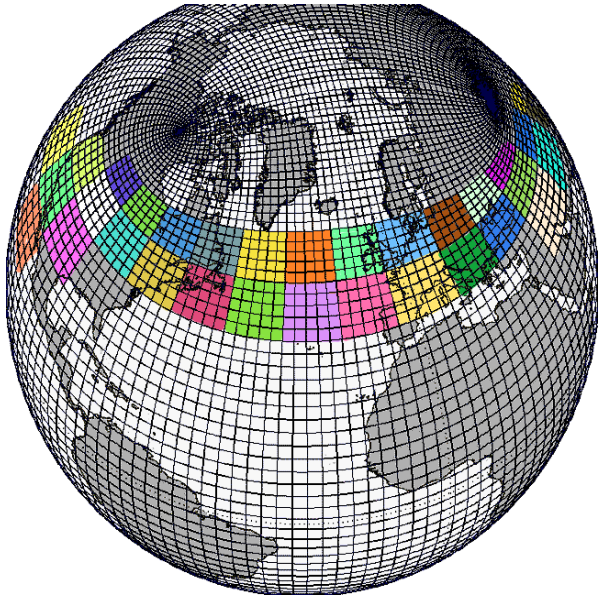


INMIO World ocean model

0.5°x0.5° (720x360), 49 levels.

Δt = 600 s.

Tri-polar grid, 2D MPI decomposition.



Courtesy of M.Tolstyh

Tolstykh et al, GMD, 2017;
Ibrayev et al, Izv AOP, 2012;
Fadeev et al, RJNAMM, 2016.

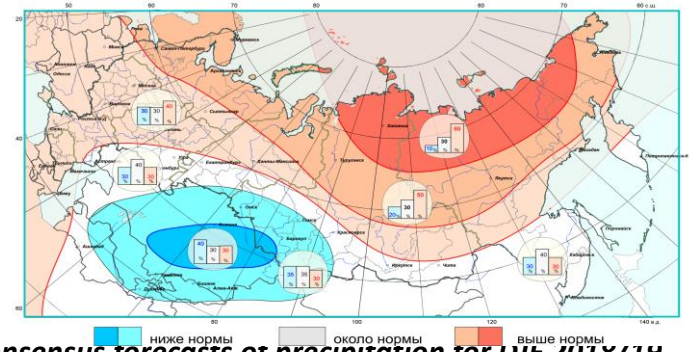
Role of NEACC in RCOF Activities

North EurAsia Climate Centre

Fifteenth Session of North Eurasian Climate Outlook Forum (NEACOF-15)

Moscow, Russia, 6-8 November 2018

Consensus forecasts of air temperature for DJF 2018/19



Consensus forecasts of precipitation for DJF 2018/19

NEACC coordinates the NEACOF sessions since 2011.

NEACC contributes to MedCOF, SEECOF, FOCRA, PRESANORD, PARCOF sessions

WMO OMM

NEACC operations: Mandatory Functions
Training/Guidance in the use of RCC products

- Methodical and technical support of specialists of CIS NMHS in analysis and interpretation of monitoring and forecasting products
- Collaboration with the WMO-RTC Moscow on issues related to distance learning for long-range forecasting
- Training courses
- Expert visits
- Training module in NEACOF sessions

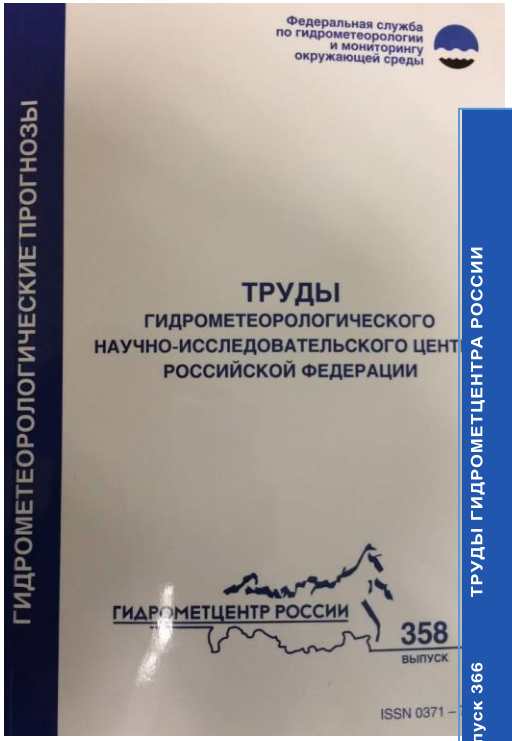
November 7, 2018 г.	
Training module: Introduction to some applications and software packages in support of climate services Chair: V.Mirvis Co-chair: D. Baidulloeva	
10.00-10.30	Evaluation of snow cover to predict the seasonal water content of rivers in Central Asia using the MODSNOW-Tool. Demonstration of basic functions. A. Gafurov, consultant of the CAMP4ASB project
10.30-11.00	Climate Services Toolkit developed by the WMO (Climate Services Toolkit CST). Demonstration of basic functions. V.Khan on behalf of TT CST WMO
11.00-11.30	Program complex "Long-term forecaster" Demonstration of basic functions. V.Yu. Tsepelev (North-Western UGMS, RSHU)

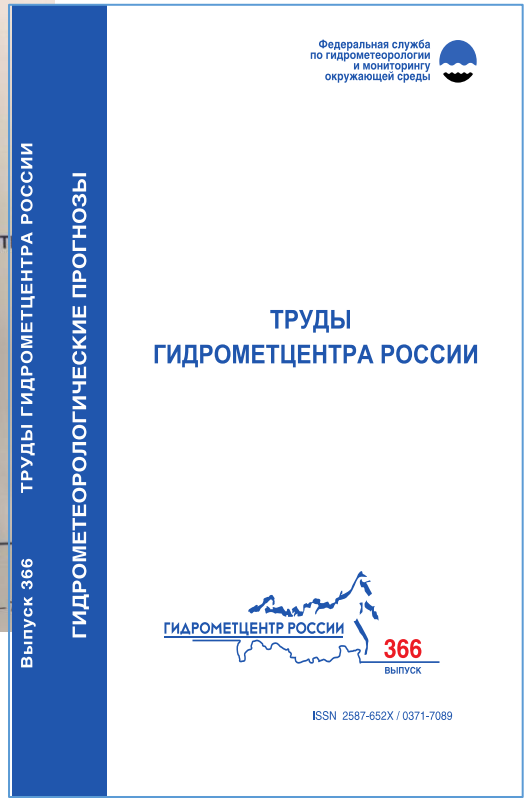
Virtual meetings with chair of TT CST

Feedbacks from participants of NEACOF-15 for improvement of CST functionality

WMO OMM

Special issues of scientific-technical journal “Hydrometeorological Forecasting and Research ” in connection to NEACOF sessions have been published since 2015





УДК 551.5

Редакционная коллегия

д-р техн. наук Р.М. Вильфанд (главный редактор);
д-р геогр. наук А.А. Васильев (заместитель редактора);
д-р физ.-мат. наук П.П. Васильев; д-р физ.-мат. наук А.Р. Иванова;
д-р. геогр. наук И.Н. Кузнецова; д-р физ.-мат. наук А.В. Муравьев;
д-р геогр. наук Е.С. Нестеров; д-р физ.-мат. наук Г.С. Ривин;
д-р физ.-мат. наук Ю.Д. Ресницкий; д-р физ.-мат. наук М.А. Толстых;
д-р геогр. наук В.М. Хан (секретарь редколлегии); д-р физ.-мат. наук Н.П. Шакина;
канд. геогр. наук С.В. Ворц; канд. геогр. наук А.И. Страшная;
д-р техн. наук М.В. Болгов; д-р геогр. наук Н.А. Зайцева; д-р геогр. наук Н.А. Калинин;
д-р геогр. наук А.Д. Клещенко; д-р геогр. наук А.Н. Полевой;
академик НАН Беларуси В.Ф. Логинов; член-корр. РАН и НАН Украины А.Б. Полонский;
канд. техн. наук Л.Р. Варданян, Армения; Dr. Kiuchak Simon O., Kamea Research Professor, Israel

Выпуск журнала посвящен и приурочен к проведению 13-й сессии Северо-Евразийского климатического форума стран СНГ по сезонным прогнозам (СЕАКОФ-13). Обсуждается концепция региональных климатических форумов ВМО и вклад Северо-Евразийских климатических форумов в ее реализацию. В журнал вошли статьи, в которых рассматриваются вопросы технологии выпуска детализированных глобальных вероятностных и детерминистических прогнозов на базе модели общей циркуляции атмосферы ПЛАВ; результаты пятилетнего опыта оперативного прогнозирования ежесуточных и месячных метеорологических параметров на основе модели общей циркуляции атмосферы ГТО; методика сезонного прогноза зимней фазы Арктической осцилляции (АО) с использованием теоремы Байеса; экспериментальной технологии выпуска предупреждений о неблагоприятных прогнозируемых метеорологических явлениях в рамках деятельности Северо-Евразийского климатического центра; результаты проверочных и оперативных испытаний долгосрочного ансамблевого гидрологического прогноза. Тематика настоящего сборника также охватывает вопросы, связанные с исследованием региональных особенностей короткопериодных колебаний климата и мониторингом климатической системы. Завершает коллекцию статей работа с описанием методики расчета климатической уязвимости территории на основе безразмерных климатических индексов.

Сборник рассчитан на специалистов, научных сотрудников, аспирантов и магистрантов, специализирующихся в области долгосрочного метеорологического прогнозирования и мониторинга климатической системы.

Proceedings of Hydrometcentre of Russia

Edited by V.M. Khan

This issue is dedicated and timed to the 13-th session of the North-Eurasian Climate Outlook Forum of the CIS countries (NEACOF-13). The introductory part provides overview of the concept of WMO regional climate outlook forums and the contribution of the North-Eurasian climate forums to its implementation. The journal includes articles which discuss the technology of issue of detailed global probabilistic and deterministic forecasts on the basis of the general circulation model SL-AV; the results of five years period of operational forecasting of weekly and monthly meteorological parameters based on the general circulation model of the MGO model; method of seasonal forecasting of the winter phase of the Arctic Oscillation (AO) using the Bayes theorem; experimental technology of climate watch warnings of possible anomalous large scale meteorological phenomena within the framework of the North-Eurasian Climate Center; results of author and operational testing of the long-term ensemble hydrological forecast. This issue also includes the articles focused on the research of regional characteristics of short-term climate variability and monitoring of the climate system. The collection of articles is completed with a description of the methodology for calculating the climatic vulnerability of the territory on the basis of dimensionless climatic indices.

This issue is intended for professionals, researchers, graduate students and undergraduates specializing in long-range weather forecasting and climate monitoring studies.

Participants of NEACOF-15 are welcomed to submit research papers and technical notes for special issue of the journal for publication at the beginning of 2019.

WMO OMM

User Engagement

NEACC cooperates with regional user CAREC

The CAREC possesses a unique mandate granted by five Central Asian countries with a mission to assist CA states in addressing their national and regional environmental issues.

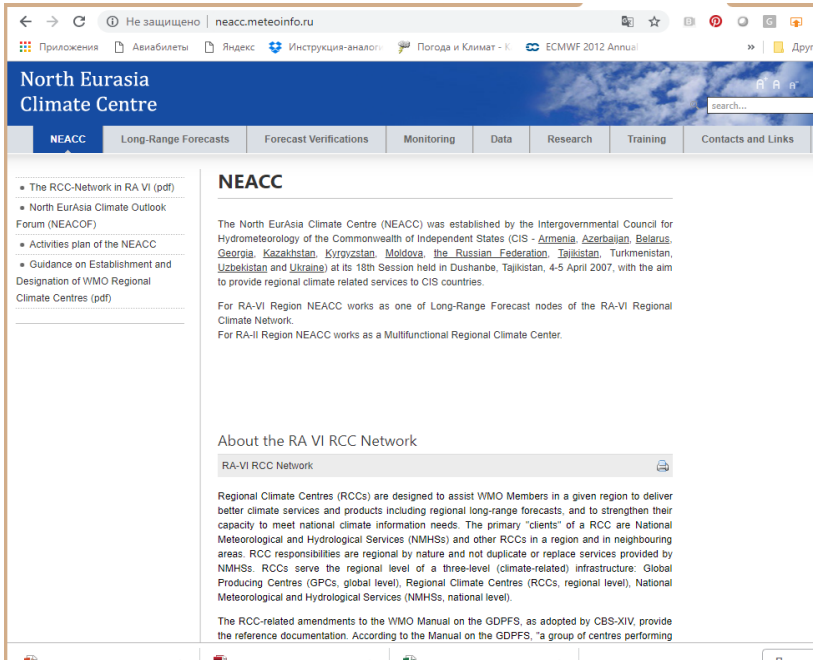
CAREC goals and objectives:

- to promote intersectoral dialogue among national- and local-level authorities, NGO's, local communities, the private sector and donor organizations on issues of environmental sustainability in the Central Asian region;
- to build capacity of accessing international expertise, knowledge, best practices and advanced technologies in the sphere of environmental management and sustainable development, and their application in Central Asian states;
- to enhance the role of the civil society in sustainable development activities in Central Asia;

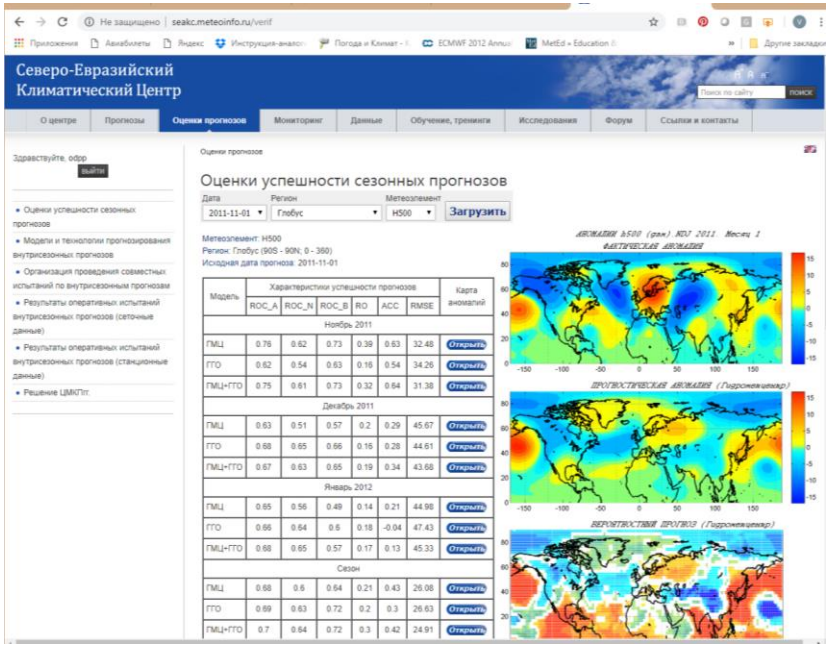
CAREC expresses interest in getting NEACC forecast data, transfer of knowledge, exploit expertise of NEACC experts, participation in NEACOF sessions

NEACC Web Portal

http://seakc.meteoinfo.ru/



http://neacc.meteoinfo.ru/



Difficulties to keep regularly updated English version of NEACC webpage. The Russian version contains much more materials and products.

The web forum resources are available but participants are not active.

WMO OMM

SWOT analysis

Strengths:

Expertise of NEACC and NHMSs of CIS on climate issues based on the same soviet traditions in education for meteorology and climatology .

Russian language for communication with colleagues within consolidated RCC network is a strength and a weakness at the same time

Weaknesses

Skepticism in provision of climate services for stake holders and economy sectors.

Low confidence to forecast products due to low predictability in Northern Eurasia.

Lack of human and financial resources to develop new products.

Opportunities

As NEACC and GPC-Moscow have been coordinated by the same organization, there are good opportunities to develop advanced tailored products based on GPC high resolution data.

High interests from NHMSs and intermediate regional user for collaboration.

Exploitation of Copernicus and Climate Services Toolkit resources.

Threats

Reorganization in Roshydromet may have impact on NEACC activities.

Delaying in implementation and use modern IT technologies in support of NEACC functions

Way Forward

- Keep making efforts on provision of highly recommended functions (sub seasonal forecast products, objective climate watch system, climate change projections, wider topics of CB activities)
- Develop tool for production of objective consensus forecasts
- Continue applied climate research within Russian and international projects
- Increase cooperation with other RCCs and GPCs
- Facilitate use of CST for NHMSs within area of responsibility

WEATHER CLIMATE WATER
TEMPS CLIMAT EAU

Thank you
Merci

Valentina Khan
Coordinator of NEACC and NEACOF
Valentina_khan2000@yahoo.com; khan@mecom.ru

WMO OMM

World Meteorological Organization
Organisation météorologique mondiale