

Review of current operational practices for long-range forecasts: RA VI RCC-Network

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on behalf of the RA VI RCC-Network LRF Node**

**First WMO Workshop on
Operational Climate Prediction
9-11 November 2015, Pune, India**



Members of the RA VI RCC-Network Node on Long-range Forecasting:

Co-led by:

- **Météo-France and Roshydromet**

Sub-regional input is provided by:

- **Republic Hydrometeorological Service of Serbia;**
- **Norwegian Meteorological Institute;**
- **Turkish State Meteorological Service**

A catalog of products is available on the RA VI RCC network web site.

RCC Network products and services are accessible online at www.rccra6.org and at the web-sites of the LRF Node members.



GLOBAL CLIMATE BULLETIN
n°197 – November 2015

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- Issued on monthly basis;
- Distributed to RCC users.
Website - elaboration.seasonal.meteo.fr/en;
- (Password protected.
Password provided to every NMHS that requests it);
- Regional weather is considered in the global context

- Analysis of main drivers;
- Post-processing of ARPEGE and ECMWF;
- Other GPCs inputs (individual and MME);
- Circulation patterns and indices;
- Impacts (T2m, Precip);
- Consistency analysis;
- Extreme scenarios;
- Synthesis forecasts

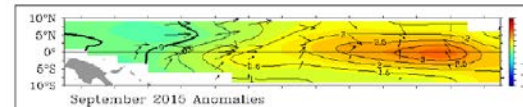


fig.1.1.3: SST Anomalies and Wind anomalies over the Equatorial Pacific from TAO/TRITON.
<http://www.pmel.noaa.gov/tao/jcdisplay/monthly-summary/monthly-summary.html>

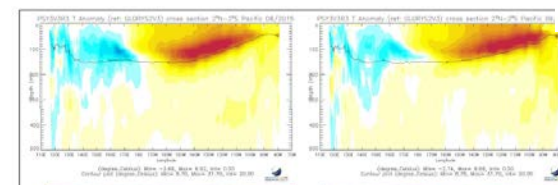
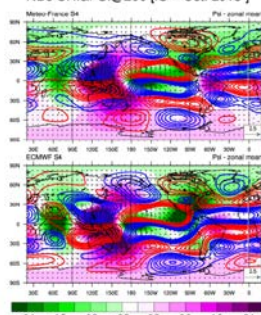
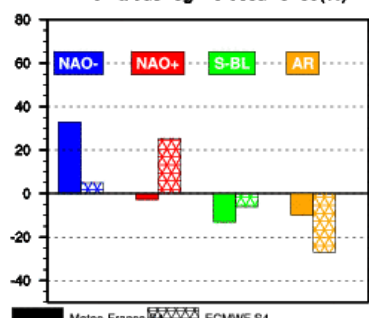


fig.1.2.15: Sea-ice extension in Arctic (left), and in the North Atlantic (right)

NDJ CHI&PSI@200 [IC = Oct. 2015]



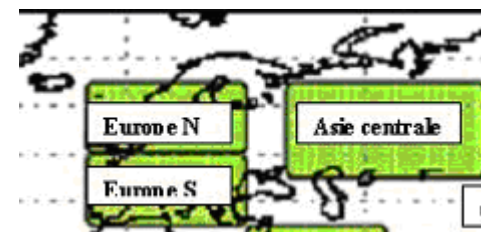
Anomalous regime occurrence (%)



Computed as departure from the 1993-2007 climatology

MODELS	Northern Europe	Southern Europe	Central Europe	Eastern Europe	SEE Region
MF					
ECMWF					
JMA					
synthesis					
Eurosp					
privileged scenario by RCC-LRF node	above normal	above normal	above normal	above normal	above normal

MODELS	Northern Europe	Southern Europe	Central Europe	Eastern Europe	SEE Region
MF					
ECMWF					
JMA					
synthesis					
Eurosp					
privileged scenario by RCC-LRF node	Above normal	Below normal	no privileged scenario	no privileged scenario	no privileged scenario



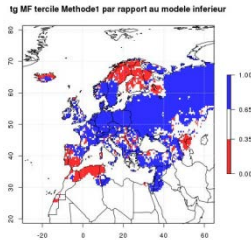
WMO RA VI
RCC Network

normal (Dry) T close to normal T Above normal (Warm) No privilege

normal (Dry) RR close to normal RR Above normal (Wet) No privilege

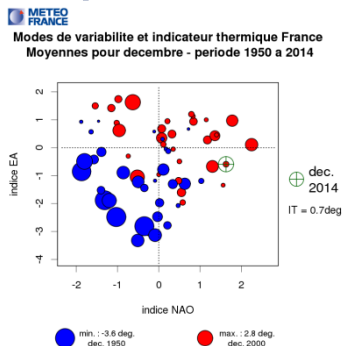
Prospects

- New version of ARPEGE (operational by early 2016)
- Predictability assessment in the monthly bulletin
 - Expected improvement by considering a larger set of climate drivers, known to influence Atlantic-Europe circulation (Atlantic SST patterns, stratosphere, MJO etc...)
- Development of regional products
 - Ongoing work on statistical downscaling over Europe



In blue, significant improvement of T forecast for DJF (comparison between interpolated ARPEGE-S4 and downscaling)

- Development of products combining past events and LRF



*Link between monthly teleconnection indices (NAO, EA) and monthly temperature in France (for DJF, since 1950).
Intended use for LRF, by pointing forecasts of NAO and EA.*

Teleconnection indices at NEACC web-site

даль Google - 9 - 12 н... X 774 · Входящие — Яндекс... X Indices of Circulation X

neacc.meteoinfo.ru/?option=com_content&view=article&id=194

Indices Season Parameter

AOS Winter T at a height of 2 m

EA - East Atlantic Oscillation

WA - West Atlantic Oscillation

EU - Eurasia Pattern

WP - West Pacific Oscillation

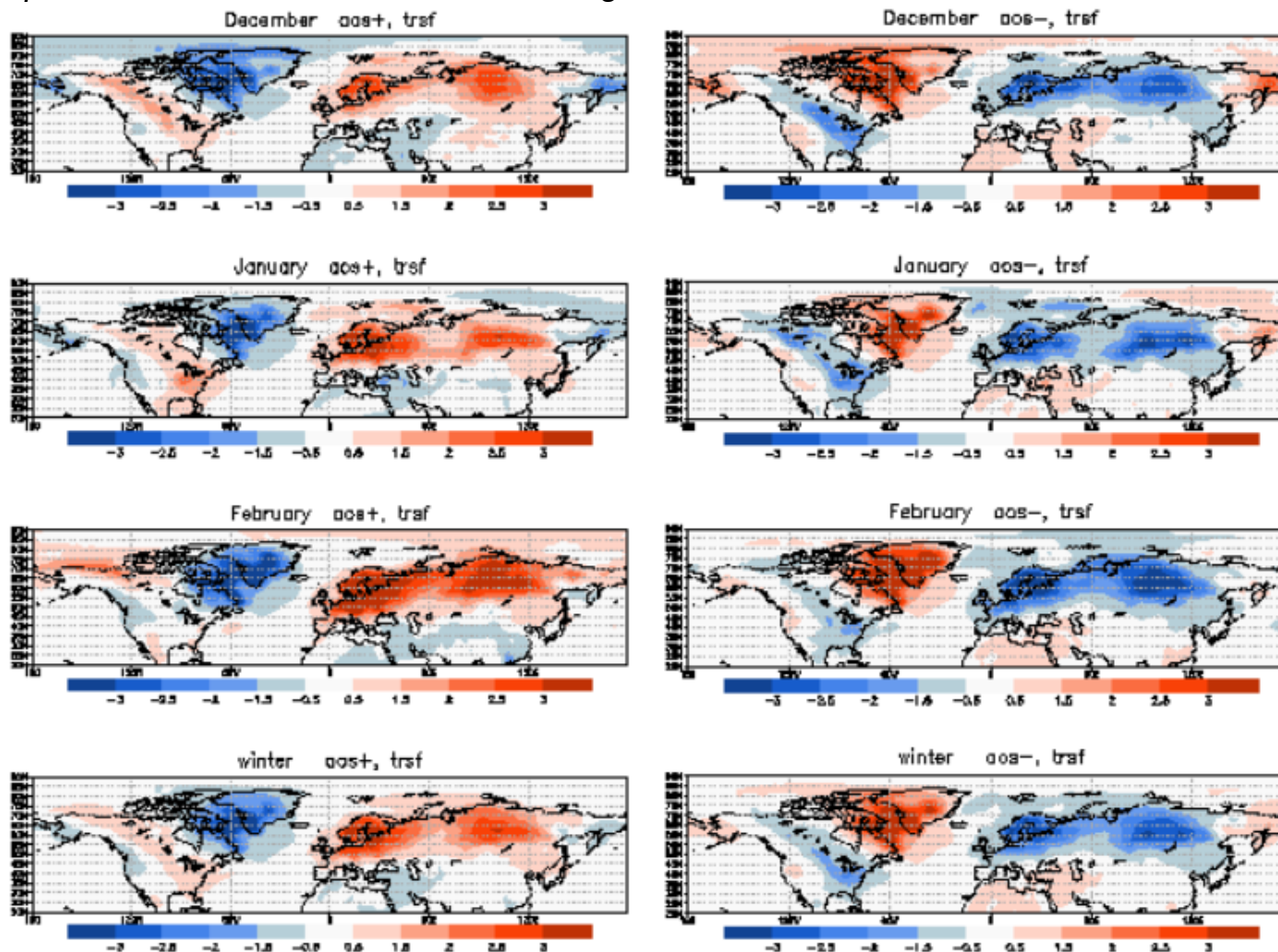
PNA - Pacific–North American Pattern

NAO - North Atlantic Oscillation

POL - Polar Oscillation

AOS - Arctic Oscillation

LEFT and RIGHT - composites of the meteorological fields for positive and negative phases of index. White areas are not significant at 99% confidence level.



Forecasts of teleconnection indices at NEACC web-site

<http://neacc.meteoinfo.ru>

EA - East Atlantic
Oscillation

WA - West Atlantic
Oscillation

EU - Eurasia Pattern

WP - West Pacific
Oscillation

PNA - Pacific–North
American Pattern

NAO - North Atlantic
Oscillation

POL - Polar Oscillation

AOS - Arctic Oscillation



Index	December 2014 – February 2015			
	December	January	February	December-February
EA	-0,78	-0,64	0,26	-0,49
WA	0,96	0,07	0,17	0,29
EU	0,12	0,64	0,05	0,21
WP	-1,01	-1,13	-0,67	-0,96
PNA	-0,28	-0,38	-0,16	-0,26
NAO	1,11	0,5	0,44	0,77
AO	0,13	-0,37	-0,37	-0,2

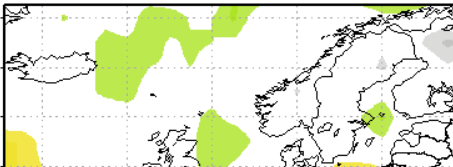
Quartile
thresholds

Index	Q1 (25%)	Q3 (75%)
EA	-0.493	0.485
WA	-0.559	0.494
EU	-0.452	0.458
WP	-0.544	0.501
PNA	-0.386	0.404
NAO	-0.487	0.632
POL	-0.487	0.632
AOS	-0.884	0.87

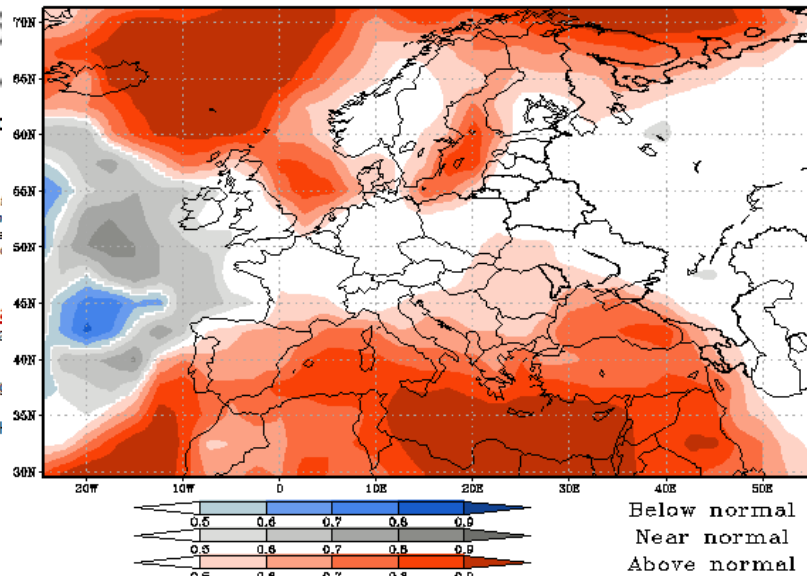
NEACC seasonal outlook: general overview of forthcoming season on the basis of national models, consistency among global providers, interpretation of predicted teleconnection indices

Comparison with the forecasts of other centers		
The forecasts of the Hydrometcenter of Russia and of Main Geophysical Observatory	The foreign forecast centers	
	Similar categories	Opposite categories
Near-surface air temperature – warmer than normal		
- Western Europe (north and south)	APCC, EuroSIP, IRI, LC MMEI	
- Transcaucasia	APCC, EuroSIP, IRI, LC MMEI	
- Turkey	APCC, EuroSIP, IRI, LC MMEI	
- Tajikistan	APC	
-Chukotka	LCI	
-Mongolia (south)	APC	

Composite probabilities of categorical forecast outcomes for precipitation seasonal anomalies (mm/d) Forecast period: November-December



Composite probabilities of categorical forecast outcomes for T2m seasonal anomalies (grad K). Producer: HMC+MGO Forecast period: November-December-January 2015



- Western Europe (south)
-European Russia (north-east)
- Transcaucasia
-Siberia (north)
- Kazakhstan (south-east)
- Uzbekistan, Kyrgyzstan, Turkmenistan, Tajikistan

Outlook of expected c

The outlook includes the results of long-term forecasts of: and of other foreign centers. The outlook of expected on the table. The NEACC site information is of advisory chara regional climate, and

Temperature regime (near-surface air temper:
According to the forecasts of the Hydrometcenter of Russia warmer than normal:
in the south and the north of the Western Europe, in Geor

Note that: over most of North Eurasia the models of the I temperature anomalies.

Precipitation
According to the forecasts of the Hydrometcenter of Russia and Main Geophysical

Operational trial of sub-seasonal forecasts of RHMC and MGO

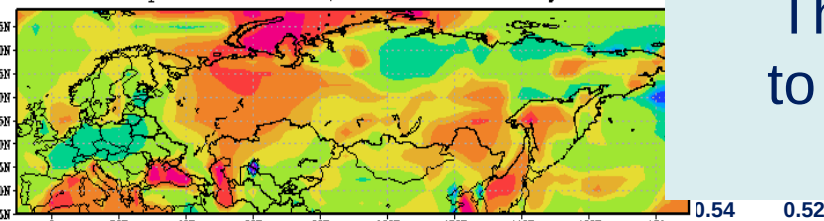
ELEMENT trsf
EUROPE (10-60, 35 - 70)

	RO	Q	MSE	MSSS	AC	RMS	ROC_BN	ROC_NO	ROC_AN	ROC_AG
week1_HMC	0.79	0.40	0.52	0.35	0.52	0.33	0.33	0.33	0.73	0.73
week1_MGO	0.78									

T2m anomalies. Producer: HMC+MGO

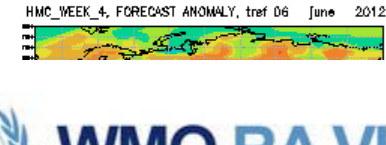
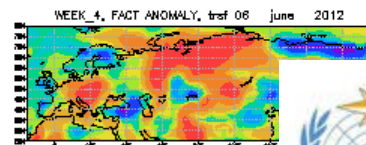
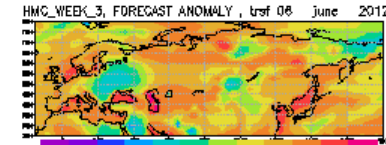
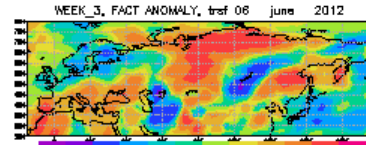
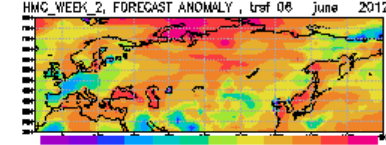
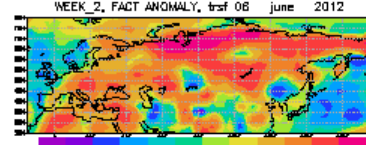
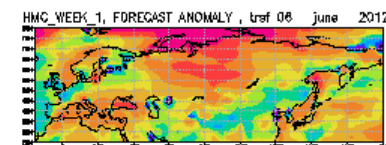
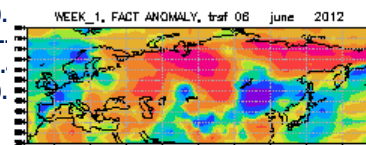
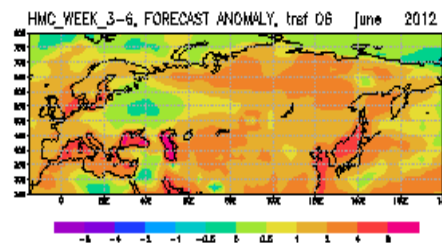
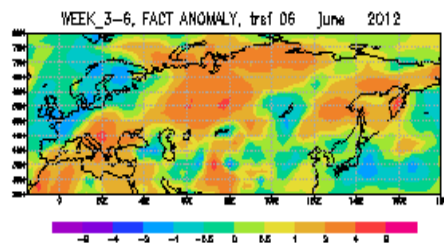
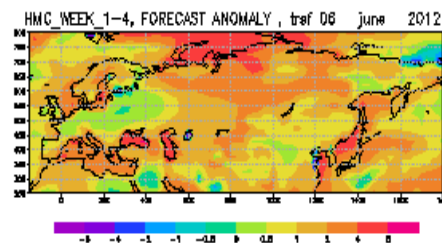
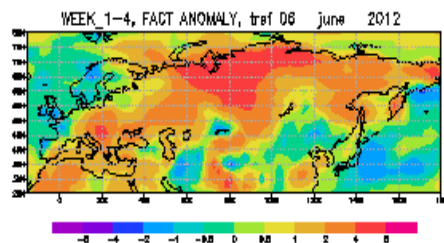
Forecast period - WEEK 2, initial data: 13 june 2012

week2_HMC	0.05									
week2_MGO	0.34									
week3_HMC	0.32									
week3_MGO	0.16									
week4_HMC	0.58									
week4_MGO	0.20									



These forecasts are planned
to be available at the NEACC
web-site in 2016

month1_HMC	0.60									
month1_MGO	0.56									
month2_HMC	0.51	7.42	8.88	-2.70	0.48	2.98	0.45	0.51	0.45	0.49
month2_MGO	0.46	0.93	1.62	0.33	0.61	1.27	0.62	0.57	0.68	0.69

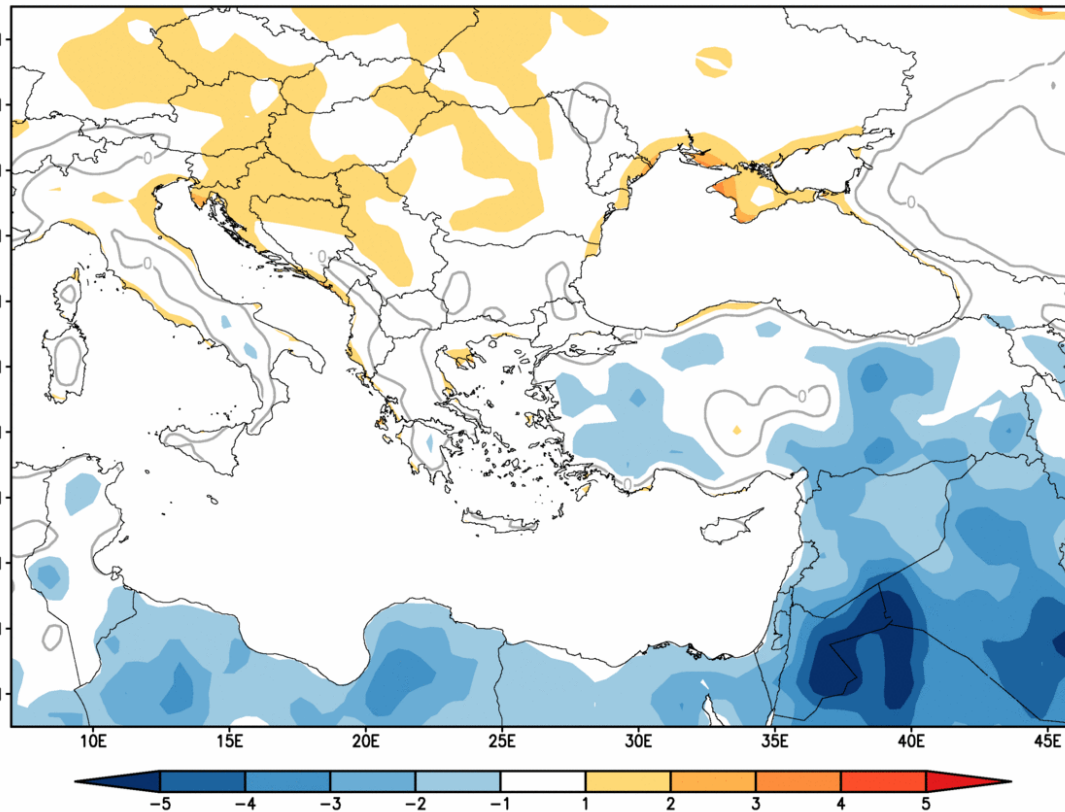


WMO RA VI
Pilot RCC-Network

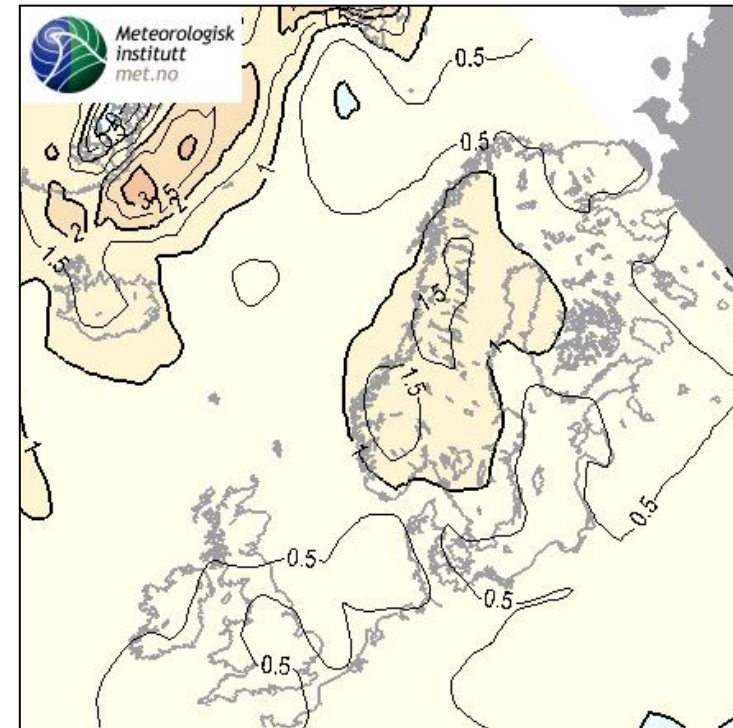
RA VI RCC Network LRF Node: Examples of subregional products from SEEVCC and NMI

RCM-SEEVCCC: Mean 2m temp. anom. (°C) for season SEP–OCT–NOV 2013
Forecast start: 00Z01AUG2013

SEEVCCC



Regional dynamical downscaling using fully coupled atmosphere-ocean regional climate model



Statistical adaptation of LRF to Scandinavia

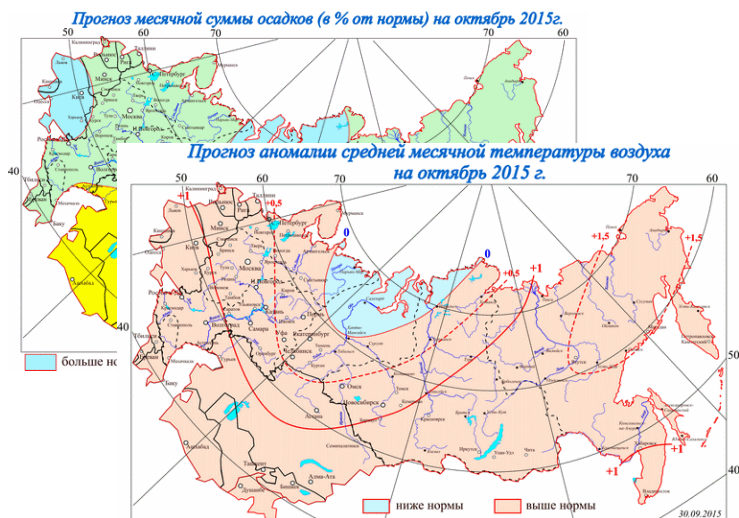
Manual interpretation of numerical LRF guidance

- Support of the Regional Climate Outlook Forums in RA-VI and beyond: SEECOF, NEACOF, MedCOF



SEECOF (Left) and NEACOF (right) participants

- Official forecasts of Roshydromet are different from the regular RCC products



- Forecasters statement in the Global Climate Bulletin might differ from the model guidances

MODELS	Northern Europe	Southern Europe	Central Europe	Eastern Europe	SEE Region
MF					
ECMWF					
JMA					
synthesis					
Eurosip					
privileged scenario by RCC-LRF node	above normal	above normal	above normal	above normal	above normal

MODELS	Northern Europe	Southern Europe	Central Europe
MF			
ECMWF			
JMA			
synthesis			
Eurosip			
privileged scenario by RCC-LRF node	Above normal	Below normal	no privileged scenario

Legend:
■ T close to normal
■ T Above normal (Warm)
■ No pr

WMO RA VI
RCC Network

Thank you !