Update on WGNE Blue Book and Web Site

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WMO/ICSU
WORLD CLIMATE
RESEARCH PROGRAMME

WMO
WEATHER PREDICATION
RESEARCH PROGRAMMES

CAS/JSC WORKING GROUP
NUMERICAL EXPERIMENTATION

RESEARCH ACTIVITIES
IN ATMOSPHERIC AND OCEANIC
MODELLING

Edited by G.J. Boer

REPORT No. 18

JANUARY 1993

WMO/TD - No. 533
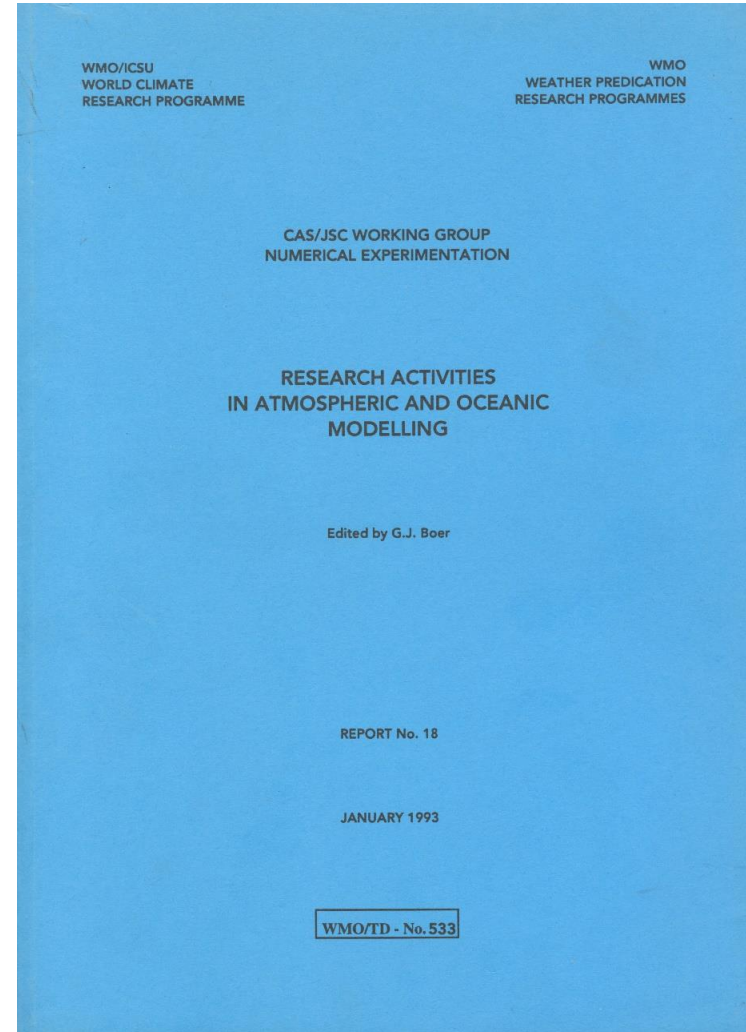
WGNE 36, November 1-4, 2021

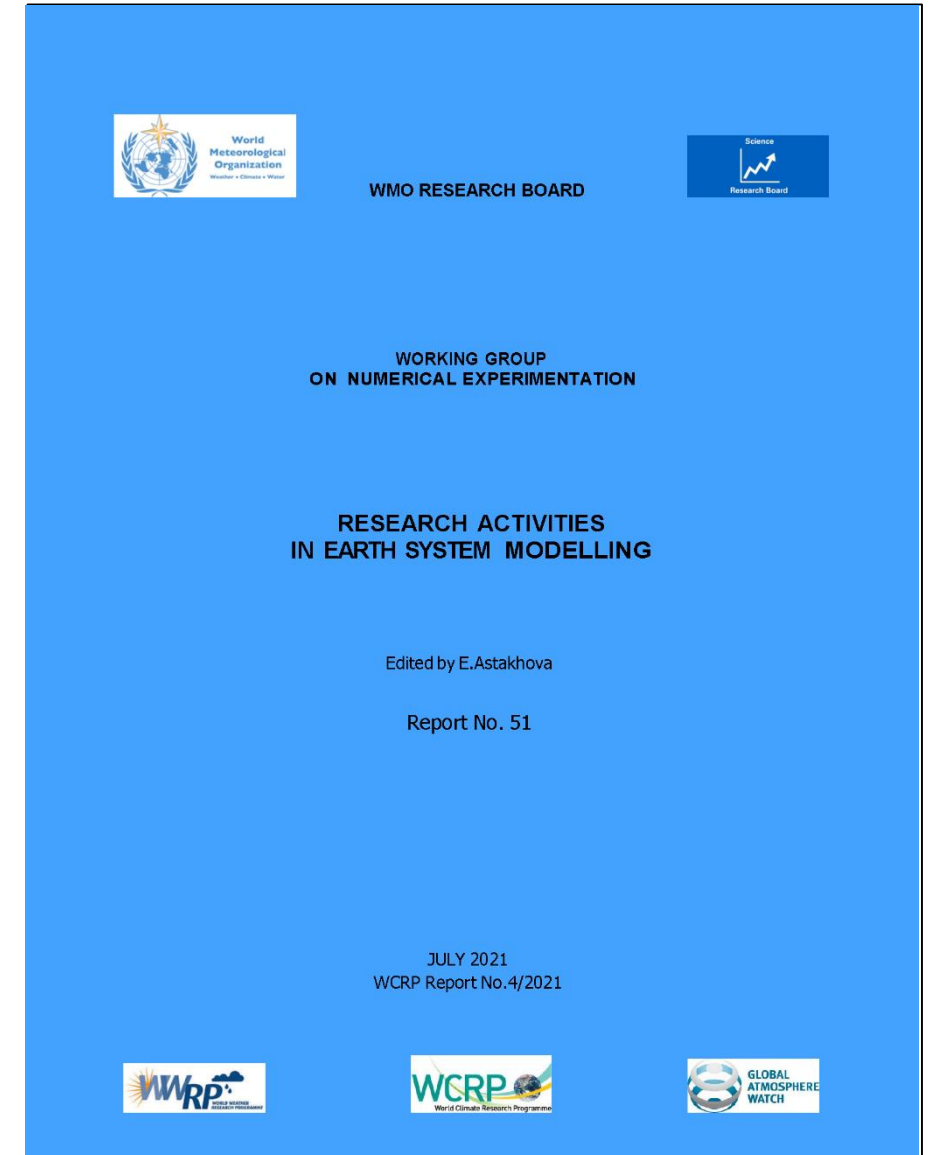**The WGNE Blue book is a nickname for the annual publication prepared under the auspice of WGNE and published by WMO as a WCRP Report since 1992.**

Till 2019 its proper name was
Research Activities in Atmospheric and Oceanic Modelling.

In 2020 it was changed to
**Research Activities in Earth System Modelling.**

Since 2021 it again has blue covers.

World Meteorological Organization

WMO RESEARCH BOARD

Science Research Board

WORKING GROUP ON NUMERICAL EXPERIMENTATION

RESEARCH ACTIVITIES IN EARTH SYSTEM MODELLING

Edited by E.Astakhova

Report No. 51

JULY 2021
WCRP Report No.4/2021

WGNE Blue book 2021

- The call for contributions was sent on February 16, 2021.

- The first deadline was May 10, 2021.

- The deadline was extended to May 31, 2021 (for more than two weeks) because of unfolding COVID-19 pandemic and related measures undertaken around the world and multiple requirements from scientists

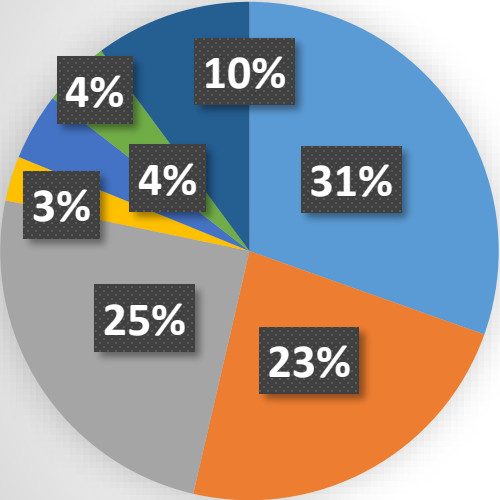- The Blue Book 2021 was published on July 9, 2021 (as usually)

Evolution of the number of contributions
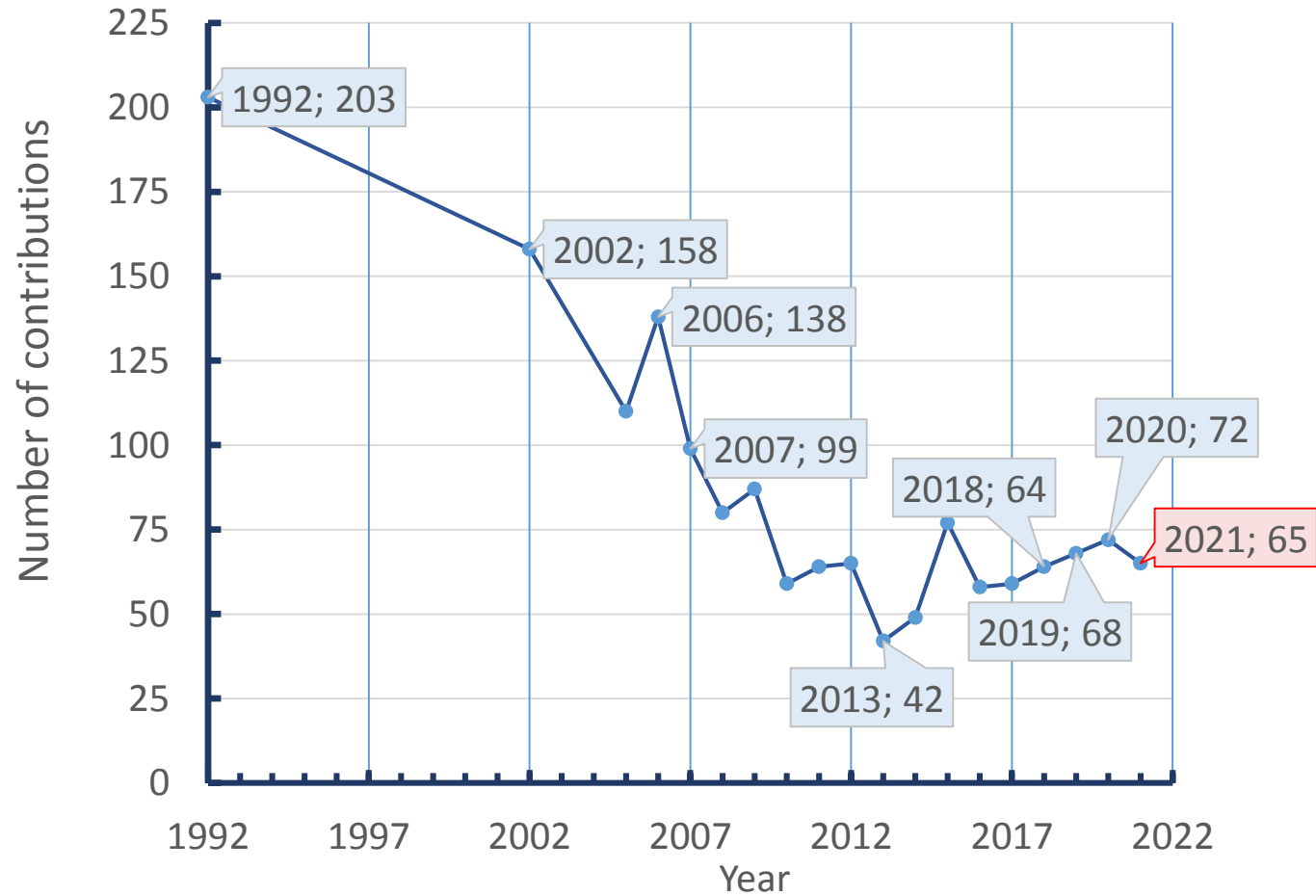
From 60 to 70 contributions in the last years

WGNE36. November 1-4, 2021.
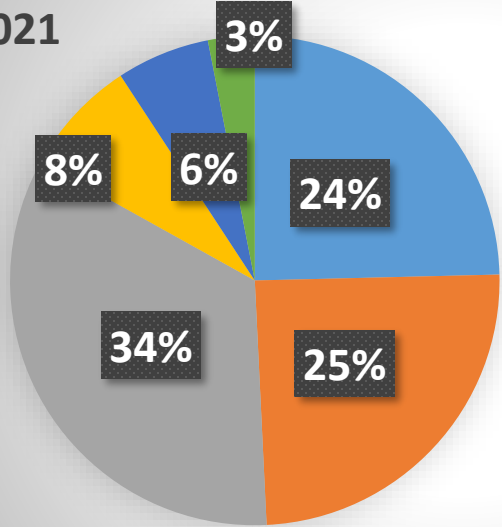
Contributing countries

2019 — 12 countries

- USA
- Russia
- Japan
- France
- Australia
- Canada, Germany
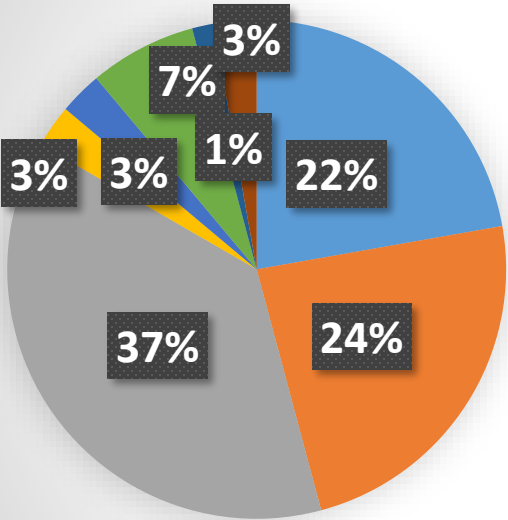- Serbia, Brazil, India, Ireland, China

2019 pie: 31%, 23%, 25%, 3%, 4%, 4%, 10%

2021 — 6 countries

- USA
- Russia
- Japan
- France
- India
- Canada

2021 pie: 24%, 25%, 34%, 8%, 6%, 3%

2020 — 9 countries

- USA
- Russia
- Japan
- France
- Brazil
- India
- Canada
- Australia

2020 pie: 22%, 24%, 37%, 3%, 3%, 7%, 1%, 3%

- Less countries contributed in 2021

- The percentage of papers from the "basic" contributing countries (Japan, USA, Russia) is stable

Distribution of papers over sections (2018-2021)

Total:
2018: 64
2019: 68
2020: 72
2021: 65
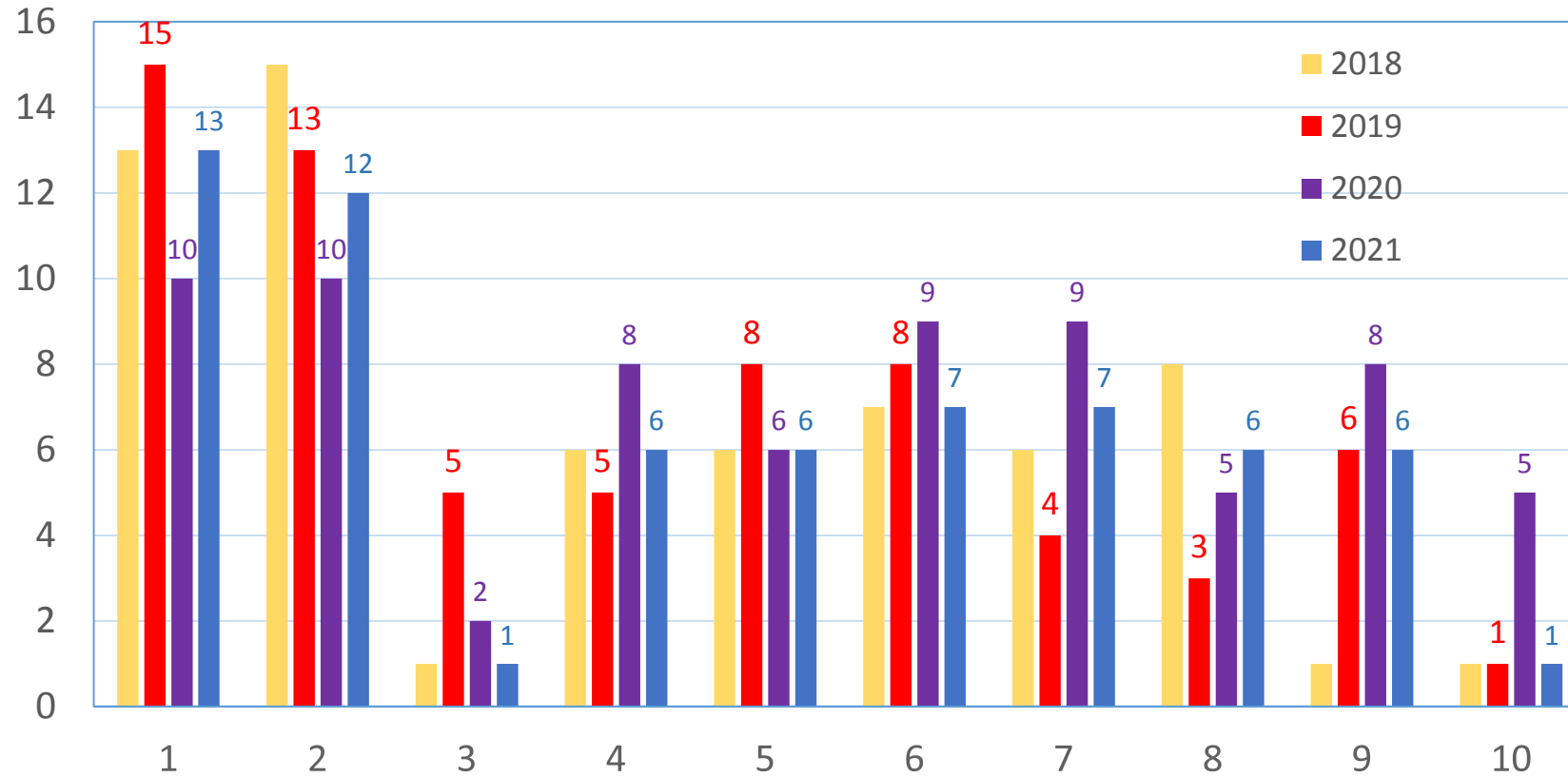
Redistribution of contributions in 2021:

- less papers on verification

- more papers on data assimilation and diagnostic

This year in the WGNE Blue book:

- ➢ **Verification**

Barbara Casati, Eva Mekis, Morten Køltzow.
Adjustment of wind induced solid precipitation undercatch in operational verification practices

- o Winter precipitation measurements from standard instrumentation at synoptic stations are affected by the undercatch of solid precipitation in windy conditions.
- o The under-estimated measurements are discarded by quality control of operational verification systems.
- o NWP systems systematic over-forecast of winter precipitation is obtained.
- o Authors recommend not to discard such observed measurements but adjust them by dividing by the catch efficiency.

This year in the WGNE Blue book:

➢ **Physics**

R. Honnert, R.El Kathib **First and second derivatives for future use in AROME physics**

The idea of this work is to recover the horizontal gradients calculated in the semi-Lagrangian dynamical scheme and to make them available for use in the physical parameterizations

P. Marquet **Computation of moist-air surface entropy at Mauna Loa.**

P.Marquet, A.Bailey. **Comparisons of H2O pathways with moist isentropes**.

This year in the WGNE Blue book:

➤ **Upgrades of JMA NWP system**

Upgrade of JMA's Operational Global NWP System M. Ujiie etal
   (enhanced vertical resolution of GSM, improved land surface analysis,
   upgraded atmospheric data assimilation)

Upgrade of JMA's Global Ensemble Prediction System H. Yamaguchi etal
   (upgraded GSM, incorporate recent Global Spectral Model (GSM)
   developments, an increased ensemble size, improved initperturbations)

Upgrade of JMA's Mesoscale Ensemble Prediction System T.Kakehata etal
   (upgraded initial and lateral boundary perturbations)

Increasing Vertical Resolution and Updating Physical Processes in JMA's Regional NWP System H. Kusabiraki et al

Renewal of the JMA Atmospheric Transport Model on the Volcanic Ash Advisory and Ash Fall Forecast Distribution System T. Shimbori etal

This year in the WGNE Blue book:

> **USA**

- Contributed mostly to data assimilation and ocean modelling section.

- Several papers on the Next Generation Global Ocean Data Assimilation System
  NOAA-NCEP Next Generation Global Ocean Data Assimilation System (NG-GODAS). J. Kim etal

- Describing not only the results introduced to systems but also the plans.

  Plans to Estimate Adaptive Covariance Parameters Using a Neural Network
  Miodrag Rancic, R. James Purser, and Manuel Pondeca

This year in the WGNE Blue book:

➤ **Russia**

- Contributed mostly to data sets, diagnostic investigations and climate studies

- Update on Regional NWP system

COSMO-Ru System: Status and Scientific Projects Including Testing of ICON-NWP G. Rivin etal

- Several papers on modelling polar lows

- Contribution from an early career scientist

A comparison of deep convection detection algorithms based on thresholding techniques applied to Meteosat-11 satellite data for European Russia Shishov A

This year in the WGNE Blue book:

- Focus on Earth System modelling

Diagnosing the ocean-atmosphere coupling schemes by using a mathematically consistent Schwarz iterative method. Olivier Marti etal

Development of UFS Coupled Model Infrastructure. Jun Wan etal

- Interest to clouds, radiation, aerosols

    Replacing OPAC with MERRA2 Aerosols for the UFS. Anning Cheng and Fanglin Yang

    Improved SST–shortwave radiation feedback using an updated stratocumulus parameterization J.Chiba, H.Kawai
    Impact of ice cloud treatment on the OLR in the radiation calculation of JMA global NWP model R. Nagasawa

- Only 2 papers on using neural networks (Russia, USA)

WGNE site wgne.meteoinfo.ru

WORLD METEOROLOGICAL ORGANIZATION
Weather · Climate · Water

Working Group on Numerical Experimentation

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About

"Weather Forecasting Factory" by Stephen Conlin, 1986.

Based on the description in Weather Prediction by Numerical Process, by L.F. Richardson, Cambridge University Press, 1922, and on advice from Prof. John Byrne, Trinity College Dublin. Image: ink and water colour, c. 50 x 38.5 cm.© Stephen Conlin 1986. All Rights Reserved.

Painting with zoom facility.

The link and the image were taken from http://mathsci.ucd.ie/~plynch/Publications/RFFF-WX-02-NoAbs.pdf. Courtesy of Dr. Peter Lynch, School of Mathematics&Statistics, UCD.

LATEST NEWS

o Tipping elements, irreversibility, and abrupt change in the Earth system: extra event focusing on the role of ice sheets. 15 November 2021

o Tipping elements, irreversibility, and abrupt change in the Amazon. Discussion series. 29 November 2021

o ECMWF workshop on Model Uncertainty, 9-12 May 2022, ECMWF,

o Forum on Scenarios for Climate and Societal Futures, 20-22 June, 2022 International Institute for Applied Systems Analysis (IIASA), Laxenburg, Austria

o WCRP Climate Research Forum (Europe and Western Asia): 9 June 2021

The Working Group on Numerical Experimentation (WGNE) has responsibility for the development of Earth system models for use in weather, climate, water and environmental prediction on all time scales, and diagnosing and resolving shortcomings. WGNE's history can be traced back to 1967 when it was formed under Global Atmospheric Research Programme (GARP). In 1985, WGNE evolved under the joint supervision of the Commission for Atmospheric Sciences (CAS) and the World Climate Research Programme (WCRP) into a group aiding the development of atmospheric models for use across cross-timescales. Following the 2020 WMO Constituent Body Reform, it now reports to the newly established Research Board.

WGNE site

➢ NEWS

- Information about meetings&workshops in News is regularly updated
- Less regular input from WMO this year (Less conferences ?)
- Additional information from WGNE members is welcome

➢ NWP SYSTEMS: INFO

- Regular upgrades of the WGNE table (thanks to Günther!)
- Regular updates of information about NWP systems by DWD, ECMWF,JMA, NCEP, RHMC
- Regular upgrades are necessary – may be references to the most recent publications on system upgrades ?

- Do we need section NWP centre reports ?

  Now there are reports for 2016 and 2017 only !

Feedback from WGNE members is needed!

WGNE site

➢ ACTIVITIES
http://wgne.meteoinfo.ru/activities/on-going-activities/

- The information of MJO task and on WGNE projects was updated after WGNE35
(Thanks to Daehyun, Charlotte, Hanna, Ariane, and Tim)

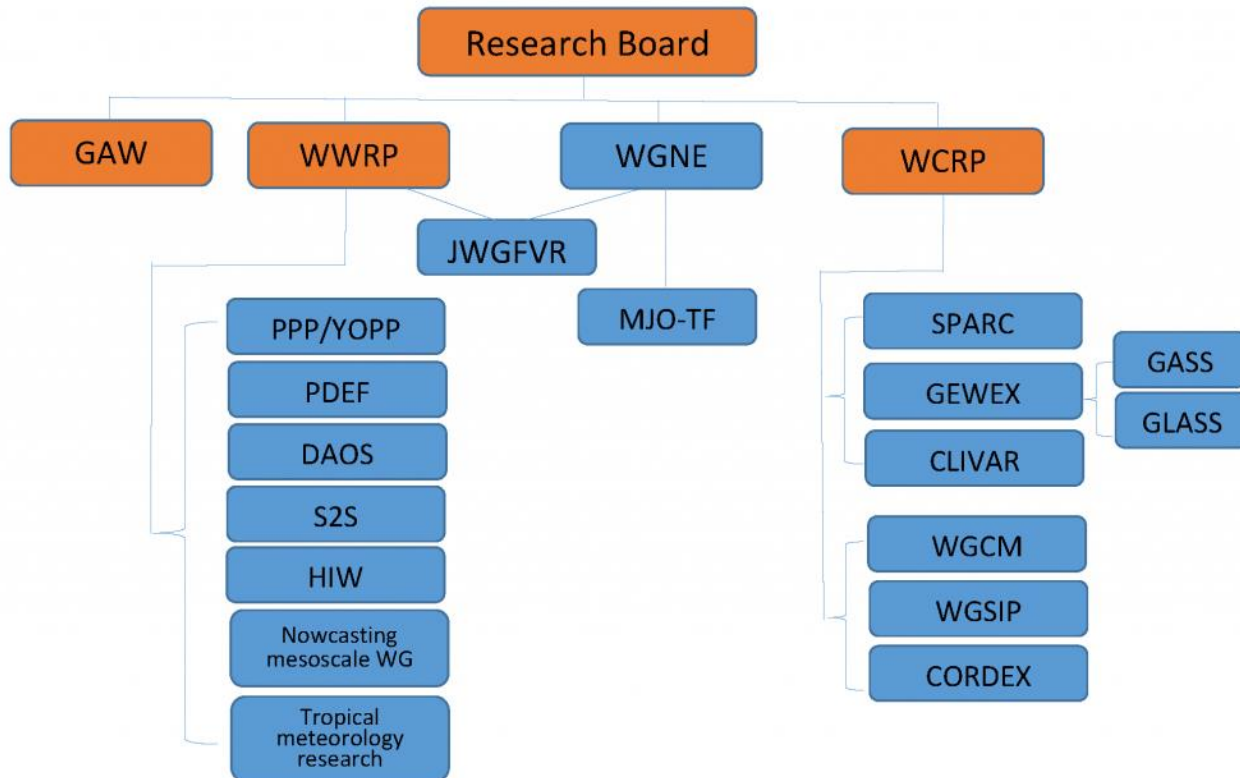- But now again we need to update this page

Feedback from WGNE members is needed!

WGNE site

➢ ABOUT : Relation to other groups and programs
http://wgne.meteoinfo.ru/sample-page/relation-to-other-groups-and-programs/

Should be updated as well

Feedback from WGNE co-chairs is needed!

I want to thank

- the WGNE members (mainly Fanglin and Masashi)
  for their permanent support

- Mary Hart for proofreading the NCEP contributions to the
  WGNE Blue Book

- Everybody for their attention!