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Review the recommendation from WMCs Workshop

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WMO OMM

World Meteorological Organization Organisation météorologique mondiale

Recommendations from the WMCs Workshop (Extracted from S/GDPFS Collaborative Framework)

7.1.5 Ensure there are adequate coordination mechanisms between WMCs/RMSCs to support Members

As the user requirement process evolves, sustainable and well-defined coordination mechanisms will be required that enable effective communication between WMCs and WMCs/RSMCs. There are already some effective coordination mechanisms in place, including the SWFDPs and the WGNE, that can be adapted. Some suggested actions were identified to facilitate coordination:

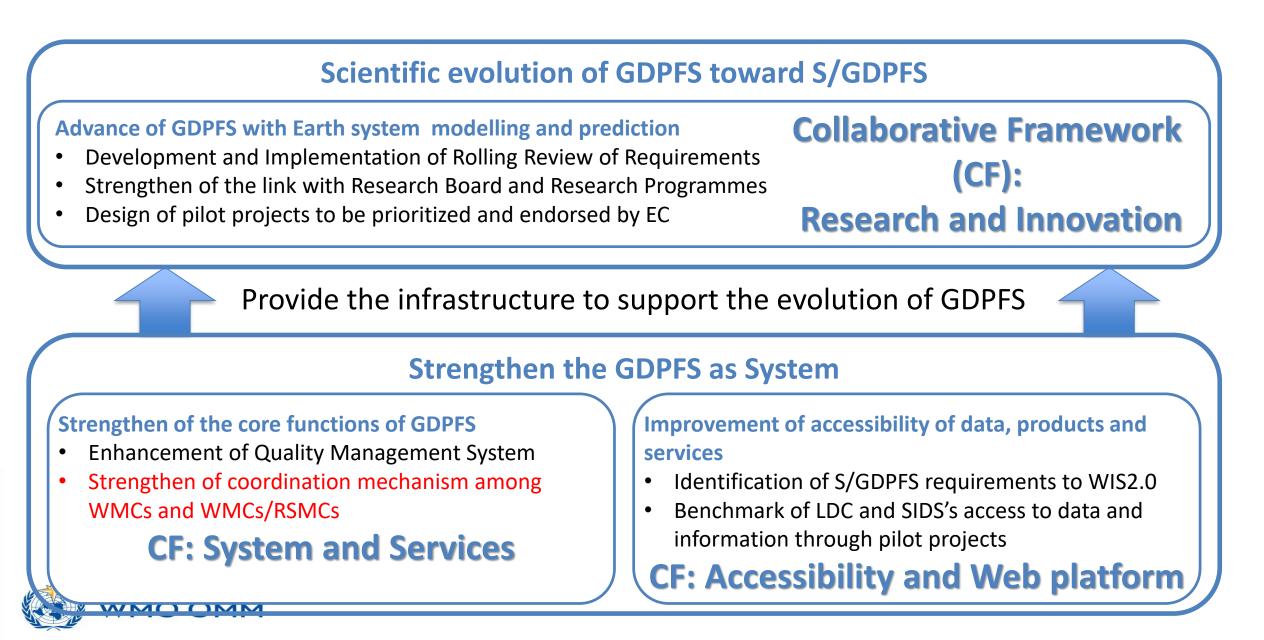
- develop catalogues of products and services, and share on-going activities;
- ensure that the types of products are consistent for interoperability reasons;
- enhance/develop the quality assurance process of products and services;
- collaborate to produce multi-model products (e.g. TIGGE)

The WMC Workshop also agreed on a "skeleton" of activities to facilitate coordination (Decision 40 (EC-70)). For example, WMCs could nominate representatives that would facilitate coordination through an e-platform. Furthermore, regular scheduling of the WMC Workshop should be considered.

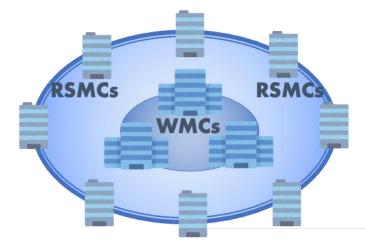
Other issues that would need to be addressed include the interaction and responsibilities of WMCs and RSMCs with all six Regional Associations, and the need for better clarity and coordination between weather (RSMC) and climate (RCC) responsibilities in the seamless approach.



Future Integrated Seamless GDPFS Collaborative Framework



Coordination mechanism among WMCs and WMCs/RSMCs



WMC Beijing: Provision of high-resolution NWP grid data

- WMC Beijing is running its Global Forecast System (named CMA-GFS) 4 times a day with <u>4DVAR, and providing</u> the GRIB2 data to the Members through the GISC-Beijing. The data is sufficient to nest a limited-area NWP
- Available Output of CMA-GFS
 - Spatial resolution: horizontal: 0.25deg; vertical: 87 layers up to 0.1hPa("60km)
 - Variables: Geopotential height, Temperature, Wind, Pressure, Humidity, Precipitation, and many more Forecast range: 120/240h
 - Step: every 3h from 0h to 120h, every 6h from 120h to 240h
- Issuance frequency: 4 times/day, 00/12UTC to 240h; 05/18UTC to 120h Domain: Global
- Latency about 4.5h~5.5h
- Data volume about 68G/da
- Special services for the WMO Members through CMACAST Licensine conditions: free/open data

References Links to a website on which the data are provided : http://data.wi Documents on the service:

Environment of Changement climatique Canada Dimon Change Canada WMC Melbourne: Provision of high-resolution NWP grid data

Meteorological Service of Canada Provision of NWP grid data

- · Access to many NWP models including:
- Regional Deterministic 10km, 33 pressure levels, 84h forecast, 4 runs/day
- Global Deterministic 15km, 33 pressure levels, 240h forecast, 2 runs/day
- Global Ensemble 50km, 10 pressure levels, 384h forecast, 2 runs/day
- Regional Ensemble 10km, 10 pressure levels, 72h forecast, 4 runs/day
- Available via MSC open data portal open-data/msc-data.
- Data available trough interoperable web services and software API, or as raw gridded files.
- open-data/msc-data.
- Free, but need to attribute data to the originator:

Canadä

WMC ECMWF: Provision of high-resolution NWP grid data ECMWF runs global deterministic (9km) and ensemble (18km resolution) forecasts four times a day From January 2022 ECMWF made a wide range of this forecast data openly available (free of charge) at high resolution of 0.4 deg

- Forecasts from 00/12 UTC: Output 3-hourly to 6 days, then 6-hourly to 10 days (deterministic) and 15 days (ensemble Forecasts from 06/18 UTC: Output 3-hourly to 3 days (deterministic), 6 days (ensemble) Pressure Levels (hPa): 1000, 925, 850, 700, 500, 300, 250, 200, 50

- Pressure covers (proj): 1000, 525, 680, 740, 500, 500, 520, 200, 50
 Surfare fields including 10m works), The memprature, precipitation, covers waves
 The set of data exceeds the requirements defined in the GDP/S Manual 485
 Full list of forecast contables provided on the ECAWF web site <u>https://www.accmef.int/en/locecasts/datasets/</u>
 full accession of forecast contables provided on the ECAWF web site <u>https://www.accmef.int/en/locecasts/datasets/</u>

Full resolution data (e.e. to nest a limited-area NWP) is available to WMD members for official use at handline charge only

- ECMWF to start a pilot project to provide full resolution (0.1 degrees) forecast fields free of charge to NMHS of WMO Members prioritized by SOFF in 2022 This will enable them to initialize LAMs (including WRF, KON, HARMONIE); data to be provided for sub-regions (planned to be via ftp pull
- Plans from 2023 to include CAMS meteorological fields on model-levels (137 levels) at 0.4 deg via A
- From 2023 ECMWF seasonal forecast (1 deg resolution) with no delay via Cimat References
- ECMWF website https://www.ecmwf.int/ Documentation; User Guide to ECMWF fores
- asts: Training courses and elearning

WMC Moscow: Provision of high-resolution NWP grid data

- Currently, no high-res data is provided. It is planned to provide them. Global fields will not be sufficient to run nested LAM. Separate regional data with more variables, finer time step and vertical levels allowing LAM run will be available upon request from NMHSs.
- Specification: Horizontal resolution 0.5 degree lat-lon; 27 vertical isobaric levels; 00 and 12 UTC runs; forecast range: 120 hr for 00UTC, 240hr for 12UTC run. Global fields; 3-hour step up to 78 hrs, then 6-hour step up to 120 hrs, then 12hrs. List of variables: H, T, U, V, RH, MSLP, T2M, RH2M, U10M, V10M Prec, SWE, Psurf, Tsurf.
- Additional variables for running LAM: more vertical levels; 4 hydrometeors, soil T and W; step of 1 hour up to 78 hrs.
- Free access for both global/regional fields; regional fields will be password protected and available upon request for WMO member NMHSs.
- Data will be available at ftp.meteorf.ru and a document will be prepared.

WMC Offenbach

- Operations Bulletin

considered.

References

Global ICON Deterministic and Ensemble NWP

Det: 13 km horizontal resolution, 90 levels, 180 h forecast time

Produce own Global NWP as well as own regional models.

data can be made available, is dependent on resources.

Specification of high-resolution NWP data:

No special services provided.

- ACCESS NWP Data Information

- Provide most data to WMO for deterministic, minimal for ensemble models.

- Most parameters considered compliant (deterministic better than ensemble). All

- Resolution, Forecast range, Time steps, Frequency all more finer than required.

- Free/open data is available, special services would need to be individually

- → Ens: 40 km horizontal resolution, 40 members, 180 h forecast time available at open data legional Det and Ens for ➔ Provision of ICON EPS verification measures to the Lead Centre on
- Europe with higher resolution and update frequency Verification of Ensemble Prediction Systems at JMA
- Data access

- Grib Data via DWD Open Data Server (for last 24 hrs) http://opendata.dwd.de/weather/nwp/icon/grib/
- Visualization as Maps and Meteograms
- on https://dwd.de/wmc

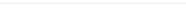
More information: https://www.dwd.de/EN/ourservices/wmc/wm

- · Access to different NWP models products :
 - Global operational numerical weather prediction model ARPEGE -Resolution 0.5° on the globe and 0.1° over Europe
 - High resolution and limited area operational numerical weather prediction model - AROME - Resolution 0.025° or 0.01° over Western Europe
 - Global statistical products based on surface fields from the global French numerical ensemble weather prediction model - PEARP - Resolution 0.5
 - · Open data but not sufficient to initialize a high-resolution model
 - Reference : http://dcpcpnp-int-p.meteo.fr/openwis-userportal/srv/en/main.home





See documentation for list of levels and variables See the licence



Deutscher Wetterdienst 🕥

WMC Toulouse: Provision of high-resolution NWP grid data

Current Status (1/5)

- Existing effective coordination mechanism
 - SWFP: Since SWFP moves from INFCOM to SERCOM, the involvement of GDPFS becomes less. But one member is invited to AG-SWF as a representative of WMCs.
 - A mechanism to consolidate opinions of WMCs may be lacking.
 - WGNE: Members from all WMCs participate in WGNE. No member representing SC-ESMP.
 - Two SC-ESMP members are WGNE members, but they represent JWGFVR and WCRP.
 - A process to review user requirements from RB (and SERCOM) is lacking.



Current Status (2/5)

Suggested actions

- develop catalogues of products and services
 - Catalogues are being consolidated on the GDPFS Web Portal
- share on-going activities
 - No clear mechanism to share on-going activities among WMCs
 - Do we need more information in addition to the reports to WGNE? WGNE36 meeting presentations — WGNE
 - GPCs-LRF, GPCs-SSF may share them at ET-OCPS meetings and OCP-3.
- ensure that the types of products are consistent for interoperability reasons
 - It is not ensured. The quality of the meta data is poor. But this will be addressed by an expert group under SC-ESMP for the next intersession period.
 - Interoperability among Earth system domains has never been discussed before.

Elena Astakhova :	Update on NWP activity at the Hydrometcentre of Russia
François Engelbrecht:	Center report
Günther Zängl :	Resolution-dependence of forecast quality in the global ICON model, and resulting plans for a resolution upgrade in 2022
Romain Roehrig et al. :	(Two) Ongoing efforts in the French NWP/climate modelling community
Tim Graham, Keir Bovis, Nigel Wood :	Next Generation Modelling Systems (NGMS) Programme
Nils Wedi :	ECMWF selected highlights 2021
Ariane Frassoni :	Model development overview at INPE/CPTEC
Fanglin Yang :	NCEP/EMC Update for WGNE-36
Peter Lauritzen :	Center update for NCAR
Ron McTaggart-Cowan:	WGNE-36 centre update: Canadian Meteorological Centre
Carolyn Reynolds for William Crawford:	U. S. Navy Earth System Prediction Capability (ESPC) Global Coupled Subseasonal Forecast System: Overview and Impacts of Including Analysis Correction-based Additive Inflation (ACAI)
Oscar Alves :	Center report
Masashi Ujile:	Center report from JMA
Jian Sun:	Recent NWP activities in CMA

Current Status (3/5)

Suggested actions

- enhance/develop the quality assurance process of products and services
 - The centres' compliance review process is being developed.
 - It is not clear if there is any additional mechanism to address this action.
 - Lead Centres for verifications provide the consolidated verification results against upper-air and surface observation.
- collaborate to produce multi-model products (e.g. TIGGE)
 - LC-LRFMME and LC-SSFMME produce multi-model products.
 - Integration of TIGGE/S2S data archive is ongoing.
 - No GDPFS activity to produce MME products for short to medium range forecasts.



Current Status (4/5)

• The WMC Workshop also agreed on a "skeleton" of activities to facilitate coordination (Decision 40 (EC-70)).

- They were reviewed in the previous slides.

- For example, WMCs could nominate representatives that would facilitate coordination through an e-platform.
 - Focal points of most of WMCs are identified on the GDPFS Web Portal.
 - But SNS-type communication tool is not available.
- Furthermore, regular scheduling of the WMC Workshop should be considered.
 - There is no regular schedule of the WMC Workshop.



Current Status (5/5)

- Other issues that would need to be addressed include the interaction and responsibilities of WMCs and RSMCs with all six Regional Associations,
 - The provision of high-resolution NWP is one of such issues. The communication between WMCs/RSMCs and RAs may need to be strengthened.
- and the need for better clarity and coordination between weather (RSMC) and climate (RCC) responsibilities in the seamless approach.
 - This has not been discussed.



WEATHER CLIMATE WATER TEMPS CLIMAT EAU

Thank you Merci



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