



World Meteorological Organization
Organisation météorologique mondiale

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Notre réf.: WDS/DPFS/GDPFS-NWP/2012

GENÈVE, le 4 avril 2012

Annexe: 2 (disponibles en anglais seulement)

Objet: Rapport annuel mixte d'activité technique de l'OMM sur le Système mondial de traitement des données et de prévision (SMTDP) et les travaux de recherche connexes sur la prévision numérique du temps pour 2011

Suite à donner: Faire parvenir votre contribution à ce rapport **au plus tard le 30 mai 2012**

Madame, Monsieur,

Le rapport annuel mixte d'activité technique de l'OMM sur le Système mondial de traitement des données et de prévision (SMTDP), combiné avec le compte rendu des travaux de recherche sur la prévision numérique du temps, permet aux Membres de se tenir au courant de la situation concernant les installations, les activités de recherche et les prestations des centres du SMTDP, situation qui évolue constamment au gré des besoins et des progrès de la technique. Le rapport en question renseigne les experts de terrain et les chercheurs sur: 1) les moyens et installations dont disposent ces centres, notamment en ce qui concerne les systèmes d'analyse et de prévision et leurs applications spécialisées dans le domaine de la prévision numérique du temps; 2) les activités de recherche-développement que mènent les centres dans divers domaines (compréhension des processus physiques, modèles numériques et techniques de prévision opérationnelle). En outre, cette étude générale permet à l'Organisation d'apporter un soutien adéquat à l'échelle mondiale, régionale et nationale, grâce au Système mondial de traitement des données et de prévision.

Aux: Représentants permanents (ou directeurs des Services météorologiques ou hydrométéorologiques) des Membres de l'OMM (PR-6634)
Directeur du CEPMMT
Directeur de l'ACMAD

cc: Présidents et vice-présidents de la Commission des sciences)
de l'atmosphère et de la Commission des systèmes de base)
Membres du Groupe de gestion de la CSA)
Membres du Comité scientifique mixte de la CSA pour le GASO)
du PMRPT)
Présidents des groupes de travail relevant du GASO du PMRPT) (pour information)
Membres du Groupe de gestion de la CSB)
Membres du GASO du STDP relevant de la CSB)
Agents de liaison des centres météorologiques régionaux)
spécialisés (CMRS) pour les interventions en cas d'éco-urgence)
et/ou pour la modélisation inverse)

Dans ce contexte, j'ai le plaisir de vous informer que les rapports soumis par les Membres pour 2010 et ceux relatifs aux années précédentes (la liste des pays concernés figure à l'annexe I) ont été rassemblés et mis en ligne sur le site Web de l'OMM à l'adresse suivante: http://www.wmo.int/pages/prog/www/DPFS/ProgressReports/2011/2010_GDPFS-NWP.html

Les Membres sont maintenant invités à établir et à communiquer au Secrétariat de l'OMM leur contribution au Rapport annuel mixte d'activité technique de l'OMM sur le Système mondial de traitement des données et de prévision et les travaux de recherche connexes sur la prévision numérique du temps pour 2011.

Afin de faciliter la fourniture d'informations sur les activités d'exploitation menées par votre centre et/ou consortium de centres du SMTDP et les activités connexes de recherche sur la prévision numérique du temps – de la prévision immédiate à la prévision à longue échéance en passant par la prévision à échéance prolongée – et ses applications spécialisées (par exemple pour les vagues océaniques, les ondes de tempête, les glaces de mer, le transport et la désagrégation des polluants de la mer, les cyclones tropicaux, le transport et la dispersion des polluants atmosphériques, le rayonnement solaire ultraviolet, la qualité de l'air, les fumées, les tempêtes de sable et de poussière, etc.), un formulaire type de contribution a été conçu (disponible sous forme électronique sur le serveur ftp de l'OMM à l'adresse suivante: ftp://ftp.wmo.int/Documents/PublicWeb/www/gdpfs/GDPFS-NWP_Annualreports10/TEMPLATE_2011.doc; la table des matières et les instructions figurent dans l'annexe II). Je voudrais saisir cette occasion pour vous remercier de la contribution que vous apportez depuis de nombreuses années à ce rapport et j'engage vivement les pays qui n'ont pas encore apporté leur contribution ou qui n'ont pas procédé aux mises à jour nécessaires à le faire sans tarder dans l'intérêt de tous les Membres de notre Organisation.

Je vous serais reconnaissant de bien vouloir remplir le formulaire et faire parvenir votre contribution nationale (y compris ceux d'entre vous qui font partie d'un consortium de centres du SMTDP), **sous forme électronique uniquement**, au Secrétariat de l'OMM dans les plus brefs délais, de préférence **avant le 30 mai 2012**. Vous pouvez l'envoyer par courriel (dpfsmail@wmo.int) ou sur CD (de préférence en Word 2003 ou dans d'autres formats compatibles) à l'attention de Mme Pascale Gomez.

Veuillez agréer, Madame, Monsieur, l'expression de ma considération distinguée.



(J. Lengoasa)
pour le Secrétaire général

GDPFS / NWP REPORTS

ECMWF (2010)	Kazakhstan (2007)
Algeria (2009)	Kenya (2010)
Argentina (2010)	Kyrgyzstan (2004)
Armenia (2009)	Latvia (2007)
Australia (2009)	Lithuania (2009)
Austria (2010)	Madagascar (2008)
Belarus (2005)	Malaysia (2010)
Belgium (2008)	Montenegro (2008)
Bolivia (2010)	Morocco (2006)
Bosnia and Herzegovina (2008)	Mozambique (2010)
Botswana (2010)	Netherlands (2010)
Brazil (2010)	Oman (2008)
Bulgaria (2006)	Pakistan (2010)
Canada (2010)	Panama (2005)
Chile (2008)	Peru (2007)
China (2010)	Poland (2009)
Côte d'Ivoire (2004)	Portugal (2006)
Croatia (2006)	Republic of Korea (2009)
Cyprus (2009)	Romania (2009)
Czech Republic (2010)	Russian Federation Moscow (2010)
Denmark (2010)	Russian Federation Khabarovsk (2010)
Ecuador (2008)	Russian Federation Novosibirsk (2010)
Egypt (2008)	Saudi Arabia (2008)
Estonia (2008)	Serbia (2008)
Fiji (2010)	Singapore (2010)
Finland (2010)	Slovakia (2007)
France (2010)	Spain (2010)
Georgia (2004)	Sri Lanka (2010)
Germany (2010)	Sweden (2010)
Greece (2010)	Switzerland (2010)
Hong Kong, China (2010)	Thailand (2010)
Hungary (2008)	The former Yugoslav Republic of Macedonia (2010)
India (2010)	Tunisia (2003)
Indonesia (2009)	Turkey (2009)
Iran, Islamic Republic of (2006)	United Kingdom of Great Britain and Northern Ireland (2010)
Ireland (2010)	United Republic of Tanzania (2009)
Israel (2009)	United States of America (2007)
Italy (2010)	Uruguay (2008)
Japan (2010)	Uzbekistan (2008)

WORLD METEOROLOGICAL ORGANIZATION
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**ANNUAL JOINT WMO TECHNICAL PROGRESS REPORT ON THE GLOBAL DATA-
PROCESSING AND FORECASTING SYSTEM (GDPFS) INCLUDING NUMERICAL WEATHER
PREDICTION (NWP) RESEARCH ACTIVITIES**

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EXPLANATORY NOTES

to the suggested contents of Annual Joint WMO Technical Progress Report on the Global Data-Processing and Forecasting System (GDPFS) and Numerical Weather Prediction (NWP) Research Activities

The WMO progress report will be jointly compiled annually by the WDS and AREP Departments of the WMO Secretariat on the basis of contributions from WMO Members and/or GDPFS centres.

The publication will begin with an introduction prepared by the WMO Secretariat explaining the major purposes of the publication with the appropriate references.

Each individual contribution should contain appropriate parts of the following items.

1. **Summary of highlights.** This should reflect the major changes in the data-processing and forecasting system during the last year.
2. **Equipment in use at the centre.** This paragraph should contain information on the major data-processing units, especially in the large centres. Here and in the following paragraphs the information for the first national contribution to the Progress Report should be given in a complete form to avoid too many references. In the next contribution, the information can be restricted to the indication of major changes during the year being reported on.
3. **Data and products from GTS in use.** It is suggested that only the bulletin headings with the basic information (SYNOP, SHIP, TEMP, SATEM etc.) and the types of products (GRID, GRIB, facsimile charts etc.) received through the GTS or other means and used at the centre will be indicated in this paragraph. The daily statistics for each type of bulletin and the product should be included, if such statistics are available. For example, SYNOP-500, TEM-600, GRID-20.
4. **Forecasting system.** There are several aspects of this system since some centres run several models which have different approaches to the data assimilation, use different numerical techniques and so on. Consequently, this paragraph is divided into several sub paragraphs.
 - 4.1 **System run schedule.** It is suggested that the general structure of a prognostic system should be described in the paragraph with an indication of models in operational use, including those for specialized applications, the run schedule and the forecast ranges.
 - 4.2-4.6 These sub-paragraphs are a series of similarly structured texts describing different operational sub-systems of a numerical weather forecasting system: Medium-range forecasting (section 4.2); Short-range forecasting (section 4.3); Nowcasting and very-short-range forecasting (section 4.4), Specialized numerical predictions for various sector specific applications, including sea waves, storm surge, sea ice, marine pollution transport and weathering, tropical cyclones, air pollution transport and dispersion, solar ultraviolet (UV) radiation, air quality forecasting, smoke, sand and dust, etc. (section 4.5), extended-range forecasting (section 4.6) and long-range forecasting (section 4.7). Each sub-paragraph contains the same components starting with data assimilation and objective analysis, description of the model, of operational techniques for application of NWP products, and a section on Ensemble Prediction Systems if used for that range. List of products available for WMO members should be indicated. All sub-paragraphs should include information regarding any performed research activities in the related field.

The list of suggested items in each sub-paragraph is given for 4.2 (it is assumed that for 4.3-4.7 they will be similar).

4.2 *Medium range forecasting system (4-10 days).*

4.2.1 *Data assimilation objective analysis and initialization*

4.2.1.1 *In operation*

- . Assimilated data,
- . Assimilation cycles, including cut-off time,
- . Method of analysis (e.g. 3 D-VAR, 4D-VAR)
- . Analysed variables
- . First guess
- . Coverage
- . Horizontal resolution
- . Vertical resolution (levels)
- . Initialization (non linear normal mode, diabatic etc.)

4.2.1.2 *Research performed in this field*

4.2.2 *Model*

(If no model is operationally runs for this time range, indicate, if any, the other GDPFS centre and its model from which you use products)

4.2.2.1 *In operation*

- . Basic equations
- . Independent variables
- . Dependent variables
- . Numerical technique (in horizontal, vertical and in time), hydrostatic or non hydrostatic
- . Integration domain (in horizontal and vertical)
- . Horizontal and vertical resolution
- . Time step
- . Orography, gravity wave drag, bathymetry (ocean models)
- . Horizontal diffusion
- . Vertical diffusion
- . Planetary boundary layer
- . Treatment of sea surface earth surface and soil
- . Radiation
- . Convection (deep and shallow)
- . Atmospheric moisture
- . Boundaries
- . Type of ocean model (deep and shallow waters)
- . Source of input (e.g. wind etc.) data (ocean models).

4.2.2.2 *Research performed in this field*

4.2.3 *Operationally available Numerical weather prediction products.* This item should contain a brief description of variables which are outputs from the model integration and the list of products available for WMO Members on Internet and on GTS. *(If no model is operationally runs for this time range, indicate the list of products, if any, you use from another GDPFS centre)*

4.2.4 *Operational techniques for application of NWP products.* This item should include only a brief description of automated (formalized) procedures in use for interpretation of NWP output (MOS, PPM, Kalman filter, Expert System, etc.) for example, "the MOS from ECMWF NWP is used to derive extreme temperatures and daily precipitation".

4.2.4.1 In operation

4.2.4.2 Research performed in this field

4.2.5 *Ensemble Prediction System (Number of members, initial state perturbation method, number and different models used, perturbation of physics, post-processing: calculation of indices, clustering).* This item should be a brief but clearer description of the techniques used for the ensemble prediction system, including the main post-processing techniques applied.

4.2.5.1 In operation

4.2.5.2 Research performed in this field

4.2.5.3 *Operationally available EPS products.* This item should contain a brief description of variables which are outputs from the EPS integration and the list of products available for WMO Members on Internet and on GTS.

5. Verification of prognostic products. Centres producing standard scores are requested to produce an annual summary for insertion in the WMO Progress Report on the GDPFS. The recommended content of this summary is given below:

VERIFICATION SUMMARY FOR INCLUSION IN THE ANNUAL WMO PROGRESS REPORT ON THE GDPFS

RSMC error	Z 500	NH, SH: against analysis 4 extra tropical standard area: against observations
RMS vector wind error	W 250	Same areas
RMS vector wind error	W 250	Tropics: against analysis
RMS vector wind error	W 850	Tropical standard area: against observations

Forecast range: 1, 3 and 5 days

All values to be the average of the monthly values over the year.

For ensemble system, provide annual and seasonal averages of the Brier Skill Score at 24, 72, 120, 168 and 240 hours for Z500 and T850.

6. Plans for the future (*next 4 years*)

6.1 Development of GDPFS.

6.1.1 Indicate major changes in the data processing and forecasting system which are expected in the next year.

6.1.2 Indicate major changes in the data processing and forecasting system which are envisaged within the next 4 years.

6.2 Planned Research activities in NWP, Nowcasting, Long-range Forecasting and Specialized Numerical Predictions. Indicate your planned research and development efforts in the area of understanding of physical processes, models, EPS and other techniques for the next 4 years.

6.2.1 Planned Research Activities in NWP

6.2.2 Planned Research Activities in Nowcasting

6.2.3 Planned Research Activities in Long-range Forecasting

6.2.4 Planned Research Activities in Specialized Numerical Predictions

7. Consortium (if appropriate)

There are a number of GDPFS Centres participating in Consortia. Those Centres participating in and/or responsible for a Consortium should indicate it in this item. Details on the system and/or model developed and/or operated by a Consortium, including approaches to the data assimilation, use of different numerical techniques and so on, should be reported in sub-paragraphs 7.1-7.7, using a similar approach as described in item 4.

7.1 System and/or Model

7.1.1 In operation

7.1.2 Research performed in this field

7.2 System run schedule and forecast ranges

7.3 List of countries participating in the Consortium

7.4 Data assimilation, objective analysis and initialization

7.4.1 In operation

7.4.2 Research performed in this field

7.5 Operationally available Numerical Weather Prediction (NWP) Products

7.6 Verification of prognostic products

7.7 Plans for the future (next 4 years)

7.7.1 Major changes in operations

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8. References: Give references to the sources where more detailed descriptions of different components of the data processing and forecasting system can be found, including WEB sites addresses.