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REPORT ON THE SECOND MEETING OF THE GIFS-TIGGE WORKING GROUP

University of Reading

22 March 2006

(Prepared by Philippe Bougeault)

1. Introduction

The Second Meeting of the GIFS-TIGGE WG took place at the University of Reading on 20 March 2006. This was a short meeting, with a few of observers, which was held in the context of the THORPEX kick-off workshop. The meeting was preceded and followed by plenary sessions which included participants from all THORPEX Working Groups.

The meeting started with a short talk by Baudouin Raoult explaining the technical status of the project. GRIB2 samples of all parameters have been prepared at ECMWF and await validation by other partners. The TIGGE Internet site is nearly ready. A precise description of all parameters is being prepared, and this will be updated as appropriate. There will be a facility for all partners to provide comments and questions on the details of the database, through the Internet site. Trial exchanges of data have been conducted with CMA and NCAR. The LDM data exchange software has been tested favourably and is now the preferred solution for Phase 1. It has been decided that data exchange will involve individual GRIB files, not structured files as previously announced.

2. Data base content

The following decisions were made on the remaining open issues.

1. The accumulation will be from the start of the forecasts for all fluxes and precipitations. The Units will be those of time-integrated fluxes (detailed specifications will be available on the Internet site soon). The SST field will contain the skin temperature for both sea and land.

2. The soil moisture field was discussed in some detail, and it was agreed on the following definition: Averaged soil moisture content on the top 20cm of the soil layer - Units will be kg/m^3. To allow the interpretation of this quantity, the min and max value of the same quantity for each grid point (proxy of wilting point and field capacity) will be provided only

for the control member of the each forecast (as decided for orography and the land sea mask).

3. The CIN was discussed. In view of both serious requirements and difficulty of production, it was agreed to retain this parameter, but with the understanding that many partners will not be able to produce it at the beginning. Software to compute CIN was provided by Zoltan Toth and will be made available.

4. The group gave full consideration to the new requirements expressed by the PDP WG in the first plenary (22 March 2006). It was decided to accept to this request and to trade-off one pressure level fields to keep the total volume of the data base constant - the 600 hPa level will not be provided therefore. Based on the PDP WG request, the new parameters are:

   Geopotential at 50 hPa
   Theta, u and v on the PV=2 surface
   PV on the theta=320K surface

5. It was agreed that TCW will contain the total atmospheric column water under the three phases (vapour, liquid, ice)

6. The flux sign convention will be positive downward.

7. There may be difficulty in the lack of homogeneity for the CAPE computation. It was decided to exchange our CAPE algorithms to assess the extent of the problem.

8. It was further clarified that the initial state (t=0) is an integral part of all forecasts, all members,etc.This means that for all accumulations, all values should be zero for t=0.

9. We confirmed that all partners are encouraged to provide also their deterministic forecast (as an additional control) projected on the same horizontal grid and resolution as the ensemble members.

10. Each partner will need to provide (via the Internet site) a logical description of its ensemble (how many members and controls, etc..) so that the ECMWF team can check if the metadata system allows proper description of the whole dataset without any ambiguity. As recommended by Zoltan Toth (by phone) it was agreed to coordinate this action with the ET-EPS group of the CBS which has initiated a similar survey.

Partners were reminded to provide names of technical points of contact (if not yet done).

3. Discussion on TIGGE-LAMs

According to the 2005 workshop and to the TIP, LAM EPS should be an integral part of TIGGE. This is also very important for the development the Global Interactive Forecasting Systems generally. The WG has decided to devote attention to this in 2006 and we had a first discussion on the best way to initiate a TIGGE-LAM component.

It was agreed that the priority to realise the GIFS is to facilitate exchange of initial and boundary conditions between ALL global ensembles and ALL LAM ensembles by defining standard formats for this operation. However, we should not ignore the scientific issues.

With regard to the scientific aspects, several assessments are needed:

1. Assessment of the impact of mismatch between the physical parameterizations of global and regional models

2. Assessment of the need to define bias corrections

3. Assessment of the impact of large mismatch in horizontal resolution

4. Determination of the best way of generating perturbations for LAM EPS

The whole THORPEX community is urged to explore these issues.

Regarding technical aspects, it was mentioned that the concept of data concentration (Phase 1 of global TIGGE) does not work for the LAM component because of the volume of data and the real-time needs. Rather, the group advocated a concept whereby global model providers would make their global products available on their Internet Site for a limited time, together with tools to prepare initial and boundary conditions on any limited area domain on request. This should be completed by a common internet site to exchange meta-data on the global models and LAMs specifications (ie, we more or less anticipate on Phase 2).

The urgency for the BeiJing08 project was stressed.

The group also recognized a number of technical issues (some of them with science impacts).
Will GRIB2 support the variety of projection and grid systems used by LAMs? Maintenance of software to interpolate from any global grid to any LAM grid would have a high cost for the community. Perhaps it is preferable to have a common lat-lon intermediary? There is a need to agree a standard list of all necessary initial and boundary fields to drive a LAM, and agree on units, formats, etc.. Also agree the content of a common database for Lam EPS outputs.

The agreed way forward was:

1. To gather material on the data exchanged on current projects (ie WRF, BeiJing08, MAP D-Phase) as a starting point

2. To set up a TIGGE-LAM group composed of specialists and scientists involved in the demo projects, to discuss and agree the above issues.

3. To appoint a leader for this group (perhaps from the WRF community, or among one of the many European multi-model LAM projects)

4. To start discussions by email, then provoke a meeting in 2007 - to keep good liaison between GIFS-TIGGE WG and the new group

Other actions agreed by the group:

1. Deliver TIGGE presentations at the Landshut conference

2. Organize an evening meeting of the GIFS-TIGGE WG at the Landshut Symposium

3. Prepare a common paper to advertise the TIGGE approach and opportunities for the science community at large (for BAMS?) as soon as accumulation of data in the data base has started (October 2006?)

4. Organize a TIGGE User workshop at the end 2007 or 2008, venue and framework tbd. In the plenary, the SERA WG commented that they want to be associated to this event.

4. Membership of the GIFS-TIGGE WG

We were reminded by the IPO Director the general policy for THORPEX WG membership: the mandate is for three years, any member can be renewed only once, and every year (from year 4) one third of the WG should be renewed.

We discussed how this would be implemented in the GIFS-TIGGE WG. There was a general feeling that members might rotate in a natural way just because they take new duties in their organization or for personal reasons. Another specific constraint for GIFS-TIGGE is that most members are in fact representing NWP centres, so the choice should be left to these centres do designate their representatives. The group agreed that this issue is not urgent, and that as a first approximation the co-chairs should be trusted to organize the rotation in the best interest of the project.

5. Next meeting of the GIFS-TIGGE WG

Next GIFS-TIGGE full session should be organized in March 2007 (an invitation from China was received after the end of the WG meeting).

6. Additional comments from Warren Tenant

I would just like to clarify my proposal for extracting LAM input from the TIGGE database as I see some concern being noted here

You have a web interface to select your region, dates (e.g. drop down menu of current dates), output frequency (e.g. a drop down menu of hourly, 3-hourly etc), format type (GRIB2 or other if needed/available), ensemble members (e.g. all, only controls, specify only one centre). The drop-down menus would prevent unrealistic demands being placed on the system.

The request then contacts the centres and produces a temporary directory of data on a regular lat-lon frame at the global ensemble model resolution. It could well be a block with zero's in the middle as GRIB2 will compress these zero's extremely effectively. This would also help to have all outputs the same including an initial field (for which you would probably want the full domain anyway). We could also add a warning popup window that recommends a minimum resolution for your LAM based on the global ensemble resolution plus any other foremost issues.

It would then be up to the users to create their own LAM configuration input etc. I do not think it is fair to expect global providers to be able to configure data for any shape and size LAM, although as suggested we could perhaps provide some standard output for known experiments

It is up to providers of course how much resources they have to do this additional work. We could also provide various tools to do some of these conversions, but I think it is fair to assume that if someone has the ability to run a LAM, they can surely construct their own LBCs and initial conditions without too much difficulty.

A more general point that I would like to make is that our WG should be careful not to place restrictions on users based on our own feelings or possible misunderstanding of the users needs. We can certainly suggest or recommend "good usage" of the system, but we should not block experiments (crazy as they may sound) for reasons other than that of a physical constraint like bandwidth, storage capacity etc.

7. Progress since the Working Group meeting

Since the second meeting I have been discussing the membership of the TIGGE-LAM group with various organizations, and a draft membership will be circulated soon. We would welcome advice from the EB regarding this membership.

The TIGGE Internet site at ECMWF (http://tigge.ecmwf.int) has been constructed and will soon be opened to TIGGE data providers for final definition and agreement on the global data exchange.