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Draft Proposal for the SRNWP Interoperability 'Standard Output Format'

Deliverable 1 of the SRNWP Interoperability Programme is to provide a report *documenting the standard output format and including a list of parameters for which the output format is to be applied*. This document contains an initial proposal for the parameter lists in that format and sets out the issues that need discussing at the meeting.

Standard Output Format Parameter List

The parameter list needs to be sufficient to allow achievement of deliverable D4 which will deliver '*enhancements to existing software tools to enable all LAMs to process data from the four global model providers.[…] Enhancements to existing software to enable all LAMs to process data from any other LAM.*'
Thus, there is a requirement for 3 separate lists.
1. Parameters to be exchanged for post-processing/verification/forecaster visualisation purposes.
2. Parameters required for LAM to start from any other global model or LAM.
3. Parameters required for LAM to use boundary conditions from any other global model or LAM.

It is proposed that surface fields have a separate list.
A starting point for each of these lists is proposed below.

Parameters to be exchanged for post-processing/verification/forecaster visualisation purposes
On A-grid. At highest resolution model can produce. Regular grid.
High Priority
1. Surface Pressure (Pa)
2. Mean Sea Level Pressure (Pa)
3. 2m dewpoint
4. 10m u-wind component (m/s)
5. 10m v-wind component (m/s)
6. 2m temperature (K)
7. 2m Visibility
8. Large scale precipitation amount (kg m^{-2} timestep^{-1})
9. Convective precipitation amount (kg m^{-2} timestep^{-1})
10. Total Cloud Amount (%)
11. Land sea mask (at one t/s) (0 to 1)
12. Orography (at one t/s) (gpm)
13. Wind Gust (over time period?) (m/s)
These parameters should be supplied at 3-hourly intervals from T+0 to T+48.
Lower Priority
1. Geopotential Height at 1000,925,850,700,500 & 250hPa
2. Temperature at 1000,925,850,700,500 & 250 hPa
3. Wind at 1000,925,850,700,500 & 250 hPa
4. Relative Humidity at 1000,925,850,700,500 & 250 hPa
5. Low cloud amount
6. Medium cloud amount
7. High cloud amount
8. Model level data at radiosonde sites (nearest gridpoint or interpolated?)

Parameters to allow a LAM to start from any other global model or LAM

1. U component of wind on model levels
2. V component of wind on model levels
3. Temperature on model levels
4. Surface Pressure/ Pressure on model levels (if available)
5. Specific humidity on model levels
6. Orography
7. Land sea mask

Optional
8. Turbulent Kinetic Energy (only on BL levels for UM)
9. Specific cloud water content
10. Specific cloud ice content
11. Density on model levels
12. Total Cloud Cover on model levels

Parameters specifically for lateral boundary conditions

Identical to the start file list.

Surface Parameters
1. Surface temperature
2. Soil Temperature
3. Sea surface temperature
4. Ozone
5. Land-sea mask

Issues
This section highlights the major decisions that need to be made. It is *not* an exhaustive list.

Horizontal grid projection
      The options are:
1. rotated latitude/longitude projection
2. native model projection - this will require a full set of documentation to accompany the model output from each Consortium to allow the appropriate conversions.
3. latitude/longitude grid

Horizontal grid resolution
1. Choose a fixed horizontal grid resolution
   This can be fixed at a particular value, say 0.1 degrees as has been decided in the TIGGE-LAM project, or left at the resolution of the native model fields. If a specific horizontal resolution is chosen, then the method of interpolation appropriate for each parameter should be discussed and stipulated in the standard output format. For example, use area-averaging for precipitation fields rather than bi-linear interpolation.
2. Leave fields as per native model and provide full documentation allowing other consortia to convert as needed.

Horizontal grid type and staggering
1. Which grid should the parameters be exchanged on?

It doesn't matter whether parameters are supplied on staggered grids or not. However it is important that this information is able to be conveyed within the standard output format.

Vertical grid
The options are:
1. Define the standard output format to contain model data on pressure levels
2. Leave model data on the native vertical grid. This will involve supplying documentation for each model to allow each Consortium to do the necessary transformations.

Technical Aspects

It has already been decided that GRIB2 will be the underlying file format to the standard output format.
1. Create a new GRIB parameter table especially for SRNWP Interoperability? Or will using existing WMO parameter definitions suffice.