

Requested output from EUROSIP component models

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Introduction

This document describes the output that is requested from each component model for the EUROSIP system. If there are difficulties in providing certain fields, then they may be omitted, although we hope that this will only be necessary occasionally.

General description

The dataset archived at ECMWF will include both monthly mean and daily data (in some cases six hourly). The preferred option is for the partners to provide the daily/high frequency data to ECMWF, who will then calculate the monthly mean data using standard software. This ensures consistency in the archived data.

For accumulated fields, the monthly means are independent of the "sampling frequency", but this is not so for instantaneous fields such as temperature. ECMWF will calculate monthly means using the "standard sampling" defined below where possible. The actually used sampling frequency is always written into the grib header of the monthly mean data, but this information does not form part of the MARS descriptor for the data - we have no way of archiving monthly means of the same quantity calculated in different ways.

Data should be provided on the original model grid, assuming that the grid can be handled correctly by MARS.

Ocean data is not requested as part of the EUROSIP requirement, although it typically is required for scientific projects such as DEMETER, ENSEMBLES, CHFP etc.

Different models can have different variables to represent the same physical quantities. Where a model variable is functionally equivalent to that requested, then it can be used directly. ECMWF will archive it with the same parameter number but a different code table, to keep track of its exact definition. For example, Met Office 1.5m temperature is considered equivalent to 2m temperature. Where a model uses several variables to give full information, ECMWF will archive all of the relevant variables (eg 2mT over land and 2mT gridbox average).

SST can either be supplied directly, or we will diagnose it from the surface temperature field and the land-sea mask. 2mT (average over last 24 hours, param 55) is calculated by ECMWF from the 6h data. Total precip (param 228) can be supplied instead of LSP/CP, otherwise ECMWF will calculate it from LSP/CP. Soil moisture should be provided for all available sub-surface layers where a multi-layer scheme is used.

Sea-ice concentration has been added as a new required field, because of the increasing importance of loss of arctic sea-ice. Even for models which use only imposed climatological values, it will still be useful to know what the concentration is, to help interpret the results of each model in the overall multi-model context.

Because this is a new requirement, it does not apply to existing systems (System 3 or earlier for ECMWF, Met Office and Météo-France), but is requested for future systems.

The list consists of basic fields, which are requested from all of the models, plus also additional fields which ECMWF are willing to process and archive. As a general policy, ECMWF are happy to archive additional fields, as long as (i) they have only a small impact on the number of fields archived and the data volumes; (ii) appropriate grib codes exist or can easily be created; and (iii) the definition of the field is stable, and it is envisaged that the field will be provided for a long time into the future. If the number of EUROSIP partners, number of ensemble members and/or number of fields per integration grow rapidly compared to the capacity of our data handling systems, then the policy for archiving additional fields might become more restrictive.

Basic fields

1. Surface fields

Step 0 only:

172 land-sea mask
129 geopotential of surface orography

Every 6 hours:

167 2 metre temperature (or nearest equivalent)
168 2 metre dewpoint temperature
165 10 metre u wind
166 10 metre v wind
151 mean sea level pressure
164 total cloud cover

Every 24 hours:

31 sea-ice concentration
39 volumetric soil moisture level 1
40 volumetric soil moisture level 2
41 volumetric soil moisture level 3
42 volumetric soil moisture level 4
(or 6 total soil moisture)
139 surface temperature
141 snow depth (water equivalent)
51 Tmax at 2 metres (over previous 24 hours)
52 Tmin at 2 metres (over previous 24 hours)

Every 24 hours, accumulated:

142 large scale precipitation
143 convective precipitation
(or 228 total precipitation)
144 snow fall
146 surface sensible heat flux
147 surface latent heat flux
169 surface solar radiation downwards

- 175 surface thermal radiation downwards
- 176 surface solar radiation
- 177 surface thermal radiation
- 178 top solar radiation
- 179 top thermal radiation
- 180 east-west surface stress
- 181 north-south surface stress
- 182 evaporation

2. Pressure level fields

Every 12 hours:

- 129 geopotential
- 130 temperature
- 133 specific humidity
- 138/155 vorticity/divergence
- or 131/132 u/v wind components

Basic pressure levels:

925, 850, 700, 500, 400, 300, 200, 50 hPa

If this list has to be reduced, then 400 and 300 hPa are the levels that should be omitted.

3. Additional surface fields

Every 6 hours:

- 186 low cloud cover
- 235 skin temperature

Every 24 hours:

- 33 snow density
- 49 10m wind gust (max in period)
- 78 total column liquid water
- 79 total column ice water
- 137 total column water vapour
- 170 soil temperature L2
- 183 soil temperature L3
- 236 soil temperature L4
- 243 forecast albedo
- 83.174 net primary productivity

Every 24 hours, accumulated:

- 189 sunshine duration
- 205 runoff

4. Additional pressure level fields

The same parameters as above, but at additional pressure levels. Possible values include 1000 and 100 hPa, and 10 hPa or higher if the stratosphere is well resolved.