**Follow up on IPET-DRMM II Document 2.2(1)**

**New parameters and fixed surface types to represent ground surface conditions in analyses or models**

**Update 3 Final**

**Changes:**

* **Added statement on validation outcome**

**Changes (update 2)**

* **results of terminology review**
* **fix parameter numbers to conform to WMO list of parameters under validation**
* **editorial changes to the names of new levels for improved clarity, as suggested by DWD**

**March 23, 2015**

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Original document reference: <http://www.wmo.int/pages/prog/www/ISS/Meetings/IPET-DRMM_CollegePark2014/Documents/IPET-DRMM-II_Doc2-2-1_parameters_types.docx>

**VALIDATION OUTCOME**

Dr Enrico Fucile of ECMWF kindly validated GRIB data produced on the basis of the proposal as provided below. He stated in an e-mail on April 20, 2015: “We have checked the data and we don’t have any objection for this proposal to be implemented ASAP.”

We therefore request pre-operational status for the new entries.

**DISCUSSION**Meteorological modeling systems use increasingly sophisticated representations of the ground surface to increase detail and accuracy in NWP analysis and forecast products. In this document we propose new parameters and fixed surface types to accommodate the increase in detail of modeling systems that are being implemented at the Canadian Centre for Meteorological and Environmental Prediction (CCMEP). An accurate representation of the state of the surface is useful not only for providing correct boundary conditions for NWP, but may also have uses as a standalone product.

We propose several new parameters to represent surface conditions, as well as several new fixed surface types. We also propose one new Parameter Category for glaciers and inland ice.

It should be noted that one of the proposed parameters, Brightness Temperature, would appear in Product Discipline 0, Parameter Category 5 (Long Wave Radiation). A similar parameter exists in Parameter Category 4 (Short Wave Radiation) but this seems incompatible with the wavelengths associated with Earth surface brightness temperatures.

**PROPOSAL**The tables annexed herewith contain proposed additions to Tables 4.2 and 4.5 of the GRIB2 section of the Manual on Codes. These are necessary to reflect new surface fields being implemented at the CCMEP, and it is hoped that they are sufficiently general for eventual use by other Centres.

Validation status is requested for these additions.

**IPET-DRMM II OUTCOME (from personal meeting notes)**

The proposed code table entries were accepted for validation.

It was pointed out that certain code table numbers had already been taken by other parameters under validation. This is fixed in the proposed code tables in annex of this document.

It was pointed out that the root layer can be defined as a layer between the surface and the already existing “bottom of the root layer” parameter. The proposed root layer parameter has been withdrawn from the proposed code tables in annex.

Validation is contingent on MSC and ECMWF experts confirming or updating the terminology used in the proposed parameter and code table names. **ACTION COMPLETED (SEE BELOW)**.

**RESULT OF TERMINOLOGY REVIEW**

Dr Stéphane Belair (Environment Canada) and Dr Gianpolo Balsamo (ECMWF) reviewed and commented upon the proposal. The only comment requiring a change concerns the proposed soil volumetric ice content parameter. Specifically: *to avoid confusion, specify that the volume is with respect to liquid water.*

The proposal is modified accordingly below.

Annex

Proposed new entries for Code Tables 4.2 and 4.5

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Parameter** | **Product Discipline** | **Parameter Category** | **Parameter number** | **Units** |
| Brightness temperature | 0 | 5 (long-wave radiation) | 7 | K |
| Soil volumetric ice content (water equivalent, see note) | 2 | 0 | 38 | m^3/m^3 |
| Liquid water in snow pack | 2 | 3 | 23 | kg/m^2 |
| Glacier temperature | 2 | 5 (**New parameter category**. Proposed name : glaciers and inland ice) | 1 | K |

*Note: for Parameter 38 (Parameter Category 0), ice volume is expressed as if the ice content were melted to liquid water and then its volume measured in the liquid state. This may be understood in the same manner as water equivalent snow depth.*

|  |  |  |
| --- | --- | --- |
|  | **Entries under validation for Code Table 4.5(Fixed surface types and units)** |  |
| **Code Figure** | **Meaning** | **Unit** |
|  |  |  |
| 174 | Top surface of ice on sea, lake or river | none  |
| 175 | Top surface of ice, under snow cover, on sea, lake or river | none  |
| 176 | Bottom surface (underside) ice on sea, lake or river | none  |
| 177 | Deep soil (of indefinite depth) | none  |
| 178 | Reserved | none  |
| 179 | Top surface of glacier ice and inland ice | none |
| 180 | Deep inland or glacier ice (of indefinite depth) | none |
| 181 | Grid tile land fraction as a model surface | none |
| 182 | Grid tile water fraction as a model surface | none |
| 183 | Grid tile ice fraction on sea, lake or river as a model surface | none |
| 184 | Grid tile glacier ice and inland ice fraction as a model surface | none |