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| WORLD METEOROLOGICAL ORGANIZATION  COMMISSION FOR BASIC SYSTEMS  -----------------------------  FIRST MEETING OF  INTER-PROGRAMME EXPERT TEAM ON DATA REPRESENTATION MAINTENANCE AND MONITORING  TOKYO, JAPAN, 1 - 5 JULY 2013 |  | IPET-DRMM-I / Doc. 3.2 (4)  (14.VI.2013)  -------------------------    ITEM 3.2    ENGLISH ONLY |

**Satellite-derived winds in BUFR**

*Submitted by J. Ator (USA)*

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**Summary and Purpose of Document**

This document proposes new BUFR Table B and Table D descriptors for use in reporting wind data derived from GOES-R, NPP, and possibly other future satellites as well.

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**ACTION PROPOSED**

The meeting is requested to review the proposed new entries and approve them for validation.

**DISCUSSION**

A new BUFR table D sequence is proposed for the reporting of derived winds and other data from satellites. The sequence is intended to be used for the upcoming GOES-R series which is currently scheduled for launch in 2015. It is also expected to be used for data derived from NPP and other future satellites as well. Simulated data will be used to validate the proposed new descriptors in advance of the availability of live data. We would welcome assistance from other NWP centers as we embark on this validation.

**PROPOSAL**

**Add new entry to Table D:**

|  |  |  |
| --- | --- | --- |
|  |  | ***Satellite-derived winds*** |
| **3 10 067** | 0 01 007 | Satellite identifier |
|  | 0 01 033 | Identification of originating/generating center |
|  | 0 01 034 | Identification of originating/generating sub-center |
|  | 0 02 019 | Satellite instruments |
|  | 0 02 020 | Satellite classification |
|  | 3 01 011 | Year, Month, Day |
|  | 3 01 012 | Hour, Minute |
|  | 2 07 003 | Increase scale and bit width |
|  | 0 04 006 | Second |
|  | 2 07 000 | Cancel increase scale and bit width |
|  | 3 01 021 | Latitude, Longitude (high accuracy) |
|  | 0 07 024 | Satellite zenith angle |
|  | 0 02 153 | Satellite channel center frequency |
|  | 0 02 014 | Tracking technique/status of system used |
|  | 0 02 023 | Satellite derived wind computation method |
|  | 0 08 072 | Pixel(s) type (target type) |
|  | 0 02 028 | Segment size at nadir in X direction (target scene width) |
|  | 0 02 029 | Segment size at nadir in Y direction (target scene height) |
|  | 0 04 025 | Time period or displacement (in minutes) |
|  | 0 10 004 | Pressure |
|  | 0 12 101 | Temperature/air temperature |
|  | 2 07 002 | Increase scale and bit width |
|  | 0 11 001 | Wind direction |
|  | 2 07 000 | Cancel increase scale and bit width |
|  | 0 33 007 | Per cent confidence (for wind direction) |
|  | 2 07 001 | Increase scale and bit width |
|  | 0 11 002 | Wind speed |
|  | 2 07 000 | Cancel increase scale and bit width |
|  | 0 33 007 | Per cent confidence (for wind speed) |
|  | 0 08 041 | Data significance (14 = Expected error) |
|  | 0 11 002 | Wind speed |
|  | 0 08 041 | Data significance (15 = Representative error) |
|  | 0 10 004 | Pressure |
|  | 0 12 101 | Temperature/air temperature |
|  | 0 08 041 | Data significance (Missing = Cancel) |
|  | 0 08 021 | Time significance (4 = Forecast) |
|  | 0 04 004 | Hour |
|  | 0 04 005 | Minute |
|  | 0 04 006 | Second |
|  | 2 07 002 | Increase scale and bit width |
|  | 0 11 001 | Wind direction |
|  | 2 07 000 | Cancel increase scale and bit width |
|  | 2 07 001 | Increase scale and bit width |
|  | 0 11 002 | Wind speed |
|  | 2 07 000 | Cancel increase scale and bit width |
|  | 0 08 021 | Time significance (28 = Start of scan) |
|  | 0 04 004 | Hour |
|  | 0 04 005 | Minute |
|  | 0 04 006 | Second |
|  | 3 01 021 | Latitude, Longitude (high accuracy) |
|  | 2 07 001 | Increase scale and bit width |
|  | 0 11 003 | u-component |
|  | 0 11 004 | v-component |
|  | 2 07 000 | Cancel increase scale and bit width |
|  | 0 11 110 | Tracking correlation of vector |
|  | 0 08 023 | First order statistics (10 = Standard deviation) |
|  | 0 11 002 | Wind speed |
|  | 0 08 023 | First order statistics (Missing = Cancel) |
|  | 0 25 147 | Size of largest cluster (in pixels) |
|  | 0 08 021 | Time significance (29 = End of scan or time of ending) |
|  | 0 04 004 | Hour |
|  | 0 04 005 | Minute |
|  | 0 04 006 | Second |
|  | 3 01 021 | Latitude, Longitude (high accuracy) |
|  | 2 07 001 | Increase scale and bit width |
|  | 0 11 003 | u-component |
|  | 0 11 004 | v-component |
|  | 2 07 000 | Cancel increase scale and bit width |
|  | 0 11 110 | Tracking correlation of vector |
|  | 0 08 023 | First order statistics (10 = Standard deviation) |
|  | 0 11 002 | Wind speed |
|  | 0 08 023 | First order statistics (Missing = Cancel) |
|  | 0 25 147 | Size of largest cluster (in pixels) |
|  | 0 08 021 | Time significance (Missing = Cancel) |
|  | 0 04 004 | Hour |
|  | 0 04 005 | Minute |
|  | 0 04 006 | Second |
|  | 0 08 003 | Vertical significance (satellite observations) (2=Cloud top) |
|  | 0 08 023 | First order statistics (2=Maximum value) |
|  | 0 10 004 | Pressure (Maximum cloud top pressure in target scene) |
|  | 0 12 101 | Temperature/air temperature (Maximum cloud top temperature in target scene) |
|  | 0 08 023 | First order statistics (3=Minimum value) |
|  | 0 10 004 | Pressure (Minimum cloud top pressure in target scene) |
|  | 0 12 101 | Temperature/air temperature (Minimum cloud top temperature in target scene) |
|  | 0 08 023 | First order statistics (10 = Standard deviation) |
|  | 0 10 004 | Pressure (Standard deviation of cloud top pressure in target scene) |
|  | 0 08 023 | First order statistics (Missing = Cancel) |
|  | 0 08 003 | Vertical significance (satellite observations) (Missing = Cancel) |
|  | 0 20 056 | Cloud phase (Dominant cloud phase of target scene) |
|  | 0 12 133 | NWP vertical temperature gradient (+/- 200hpa about pressure assignment of tracer) |
|  | 0 11 111 | NWP vertical wind shear (+/- 200hpa about pressure assignment of tracer) |
|  | 0 12 134 | Low-level inversion flag |

**Add new entries to Table B:**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **F X Y** | Element name | BUFR Unit | BUFR Scale | BUFR Refval | BUFR Bits | CREX Unit | CREX Scale | CREX Bytes |
| 0 11 110 | Tracking correlation of vector | Numeric | 3 | -1000 | 12 | Numeric | 3 | 4 |
| 0 11 111 | NWP vertical wind shear (+/- 200hPa about pressure assignment of tracer) | m/s | 2 | -8192 | 14 | m/s | 2 | 5 |
| 0 12 133 | NWP vertical termperature gradient (+/- 200hPa about pressure assignment of tracer) | K | 2 | 0 | 16 | C | 2 | 4 |
| 0 12 134 | Low-level inversion flag | Code table | 0 | 0 | 2 | Code table | 0 | 1 |
| 0 25 147 | Size of largest cluster (in pixels) | Numeric | 0 | 0 | 10 | Numeric | 0 | 4 |

**Add new code table entry to 0-02-014 (Tracking technique/status of system used)**

71 Nested tracking disabled

**Add new code table entry to 0-20-056 (Cloud phase)**

5 Supercooledliquid water

**Add new code table entries to 0-08-041 (Data significance)**

14 Expected error

15 Representative error

**0-12-134 – Low-level inversion flag**

|  |  |
| --- | --- |
| Code figure | DESCRIPTION |
| 0 | No inversion |
| 1 | Inversion |
| 2 | Reserved |
| 3 | Missing value |