|  |  |  |
| --- | --- | --- |
| WORLD METEOROLOGICAL ORGANIZATIONCOMMISSION FOR BASIC SYSTEMS-----------------------------THIRD MEETING OFINTER-PROGRAMME EXPERT TEAM ONCODES MAINTENANCEMARRAKECH, MOROCCO, 15 - 19 APRIL 2019 |  | IPET-CM-III / Doc. 2.2(4)05.04.2019-------------------------ITEM 2.2ENGLISH ONLY |

IPET-CM AND TASK TEAMS

FM 92 GRIB

New templates for spatio-temporal changing tiles

*Submitted by Sibylle Krebber, Daniel Reinert, Dörte Liermann (DWD)*

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Summary and Purpose of Document**

Additional template definitions for statistically processed values to complete the set of templates for spatio-temporal changing tiles

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**ACTION PROPOSED**

The team is requested to review the proposed new templates and approve it for implementation within the May 2019 fast-track (FT2019-2) update to the WMO Manual on Codes.

**DISCUSSIONS**

The coding of spatio-temporal tiles at a point in time for deterministic forecasts (Product definition template number 55) and for individual ensemble forecast (Product definition template number 59) is already defined and used by the German weather service DWD. The definitions including a statistical process are missing. To complete the set of tile templates “average, accumulation and/or extreme values or other statistically processed values at a horizontal level or in a horizontal layer in a continuous or non-continuous time interval” for deterministic and ensemble forecast of spatio-temporal changing tiles have to be defined.

**PROPOSAL**

Please add 2 new entries in

**Code table 4.0** – *Product definition template number*

Code figure Meaning

62 Average, accumulation and/or extreme values or other statistically processed values at a horizontal level or in a horizontal layer in a continuous or non-continuous time interval for spatio-temporal changing tiles at a horizontal level or horizontal layer at a point in time

63 Individual ensemble forecast, control and perturbed, at a horizontal level or in a horizontal layer in a continuous or non-continuous time interval for spatio-temporal changing tiles

Please add 2 new templates:

***Product definition template 4.62 – average, accumulation and/or extreme values or other statistically processed values at a horizontal level or in a horizontal layer in a continuous or non-continuous time interval for spatio-temporal changing tiles at a horizontal level or horizontal layer at a point in time***

Octet No. Contents

10 Parameter category (see Code table 4.1)

11 Parameter number (see Code table 4.2)

12 Tile classification (see Code table 4.242)

13 Total number (NT) of tile/attribute pairs (see Notes 1 and 2)

14 Number of used spatial tiles (NUT) (see Notes 1 and 2)

15 Tile index (ITN = {1,…, NUT}) (see Note 1)

16 Number of used tile attributes (NAT) for tile ITN (see Note 1)

17 Attribute of tile (see Code table 4.241)) (A = {A(1),…, A(NAT(ITN))}) (see Note 1)

18 Type of generating process (see Code table 4.3)

19 Background generating process identifier (defined by originating centre)

20 Analysis or forecast generating process identifier (defined by originating centre)

21–22 Hours of observational data cut-off after reference time (see Note 3)

23 Minutes of observational data cut-off after reference time

24 Indicator of unit of time range (see Code table 4.4)

25–28 Forecast time in units defined by octet 24 (see Note 4)

29 Type of first fixed surface (see Code table 4.5)

30 Scale factor of first fixed surface

31–34 Scaled value of first fixed surface

35 Type of second fixed surface (see Code table 4.5)

36 Scale factor of second fixed surface

37–40 Scaled value of second fixed surface

41-42 Year

43 Month

44 Day Time of end of overall time interval

45 Hour

46 Minute

47 Second

48 n – number of time range specifications describing the time intervals used to calculate the statistically processed field

49–52 Total number of data values missing in statistical process

*53-64 Specification of the outermost (or only) time range over which statistical processing is done*

53 Statistical process used to calculate the processed field from the field at each time increment during the time range (see Code table 4.10)

54 Type of time increment between successive fields used in the statistical processing (see Code table 4.11)

55 Indicator of unit of time for time range over which statistical processing is done (see Code table 4.4)

56–59 Length of the time range over which statistical processing is done, in units defined by the previous octet

60 Indicator of unit of time for the increment between the successive fields used (see Code table 4.4)

61-64 Time increment between successive fields, in units defined by the previous octet (see Notes 5 and 6)

*65-nn These octets are included only if n > 1, where nn = 52 + 12 x n*

65-76 As octets 53 to 64, next innermost step of processing

77–nn Additional time range specifications, included in accordance with the value of n. Contents as octets 53 to 64, repeated as necessary

Notes:

(1) See Note 1 under product definition template 4.55.

(2) For more information, see Part B, GRIB Attachment IV.

(3) Hours greater than 65534 will be coded as 65534

(4) The reference time in section 1 and the forecast time together define the beginning of the overall time interval.

(5) An increment of zero means that the statistical processing is the result of a continuous (or near continuous) process, not the processing of a number of discrete samples. Examples of such continuous processes are the temperatures measured by analogue maximum and minimum thermometers or thermographs, and the rainfall measured by a rain gauge.

(6) The reference and forecast times are successively set to their initial values plus or minus the increment, as defined by the type of time increment (one of octets 54, 66, 78, ...). For all but the innermost (last) time range, the next inner range is then processed using these reference and forecast times as the initial reference and forecast times.

***Product definition template 4.63 – Individual ensemble forecast, control and perturbed, at a horizontal level or in a horizontal layer in a continuous or non-continuous time interval for spatio-temporal changing tiles***

Octet No. Contents

10 Parameter category (see Code table 4.1)

11 Parameter number (see Code table 4.2)

12 Tile classification (see Code table 4.242)

13 Total number (NT) of tile/attribute pairs (see Notes 1 and 2)

14 Number of used spatial tiles (NUT) (see Notes 1 and 2)

15 Tile index (ITN = {1,…, NUT}) (see Note 1)

16 Number of used tile attributes (NAT) for tile ITN (see Note 1)

17 Attribute of tile (see Code table 4.241)) (A = {A(1),…, A(NAT(ITN))}) (see Note 1)

18 Type of generating process (see Code table 4.3)

19 Background generating process identifier (defined by originating centre)

20 Analysis or forecast generating process identifier (defined by originating centre)

21–22 Hours of observational data cut-off after reference time (see Note 3)

23 Minutes of observational data cut-off after reference time

24 Indicator of unit of time range (see Code table 4.4)

25–28 Forecast time in units defined by octet 24 (see Note 4)

29 Type of first fixed surface (see Code table 4.5)

30 Scale factor of first fixed surface

31–34 Scaled value of first fixed surface

35 Type of second fixed surface (see Code table 4.5)

36 Scale factor of second fixed surface

37–40 Scaled value of second fixed surface

41 Type of ensemble forecast (see Code table 4.6)

42 Perturbation number

43 Number of forecasts in ensemble

44-45 Year

46 Month

47 Day Time of end of overall time interval

48 Hour

49 Minute

50 Second

51 n – number of time range specifications describing the time intervals used to calculate the statistically processed field

52-55 Total number of data values missing in statistical process

*56-67 Specification of the outermost (or only) time range over which statistical processing is done*

56 Statistical process used to calculate the processed field from the field at each time increment during the time range (see Code table 4.10)

57 Type of time increment between successive fields used in the statistical processing (see Code table 4.11)

58 Indicator of unit of time for time range over which statistical processing is done (see Code table 4.4)

59–62 Length of the time range over which statistical processing is done, in units defined by the previous octet

63 Indicator of unit of time for the increment between the successive fields used (see Code table 4.4)

64-67 Time increment between successive fields, in units defined by the previous octet (see Notes 5 and 6)

*68-nn These octets are included only if n > 1, where nn = 55 + 12 x n*

68-79 As octets 56 to 67, next innermost step of processing

80–nn Additional time range specifications, included in accordance with the value of n. Contents as octets 56 to 67, repeated as necessary

Notes:

(1) See Note 1 under product definition template 4.55.

(2) For more information, see Part B, GRIB Attachment IV.

(3) Hours greater than 65534 will be coded as 65534

(4) The reference time in section 1 and the forecast time together define the beginning of the overall time interval.

(5) An increment of zero means that the statistical processing is the result of a continuous (or near continuous) process, not the processing of a number of discrete samples. Examples of such continuous processes are the temperatures measured by analogue maximum and minimum thermometers or thermographs, and the rainfall measured by a rain gauge.

(6) The reference and forecast times are successively set to their initial values plus or minus the increment, as defined by the type of time increment (one of octets 57, 69, 81, ...). For all but the innermost (last) time range, the next inner range is then processed using these reference and forecast times as the initial reference and forecast times.