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| WORLD METEOROLOGICAL ORGANIZATION  COMMISSION FOR BASIC SYSTEMS  -----------------------------  THIRD MEETING OF  INTER-PROGRAMME EXPERT TEAM ON CODES MAINTENANCE  MARRAKECH, MOROCCO, 15 - 19 APRIL 2019 |  | IPET-CM-III / Doc. 2.4(4)  03.04.2018  -------------------------  ITEM 2.4  ENGLISH ONLY |

MANUAL ON CODES: TABLE-DRIVEN CODE FORMS

FM 94 BUFR/FM 95 CREX

Table D sequence for reporting marine observations from unmanned surface vehicles

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**Summary and Purpose of Document**

New sequence for the reporting of met-ocean observations from unmanned surface vehicles

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**ACTION PROPOSED**

The meeting is requested to review and approve the contents of this proposal for validation status.

**ANNEXES:**

1. Expanded proposed sequence 315011

**DISCUSSIONS**

Observations from unmanned, or autonomous, surface vehicles are currently converted to BUFR and inserted on to the GTS using the sequence for drifting buoys (315009). However, this sequence is inadequate for the full range of observable parameters and sensors on the surface vehicles. Additionally, the use of the incorrect template leads the observations being mis-attributed to drifting buoys, resulting in the location and platform motion being incorrectly flagged by quality control / assurance systems. The sequence proposed in this document seeks to address these issues.

**PROPOSAL**

(Details of proposal)

Add new entry to BUFR Table D

**Category 15 – Oceanographic report sequences**

|  |  |  |  |
| --- | --- | --- | --- |
| Table Reference | Table References | Element Name | Element Description |
| FXXYYY |
| 315011 |  | Met-ocean observations from unmanned surface vehicles |  |
|  | 301150 | (WIGOS identifier) |  |
|  | 001036 | Agency in charge of operating the observing platform |  |
|  | 001085 | Observing platform manufacturer’s model |  |
|  | 001086 | Observing platform manufacturer’s serial number |  |
|  | 003001 | Surface station type |  |
|  | 208032 | Change width of CCITT IA5 field |  |
|  | 001079 | Unique ID for profile | UUID for report, 32 character hex string |
|  | 208000 | Change width of CCITT IA5 field |  |
|  | 301011 | Year, month, day |  |
|  | 301012 | Hour, minute |  |
|  | 301021 | (Latitude/longitude (high accuracy)) |  |
|  | 001012 | Direction of motion of moving observing platform |  |
|  | 001013 | Speed of motion of moving platform |  |
|  | 011104 | True heading of aircraft, ship or other mobile platform |  |
|  | 103000 | Delayed replication of 3 descriptor |  |
|  | 031000 | Short delayed descriptor replication factor |  |
|  | 007031 | Height of barometer above mean sea level |  |
|  | 306038 | Sequence for representation of standard surface marine meteorological observations from moored buoys |  |
|  | 012161 | Skin temperature |  |
|  | 101000 | Delayed replication of 1 descriptors |  |
|  | 031000 | Short delayed descriptor replication factor |  |
|  | 306034 | (Surface current) |  |
|  | 101000 | Delayed replication of 1 descriptor |  |
|  | 031000 | Short delayed descriptor replication factor |  |
|  | 306039 | (Sequence for representation of basic wave measurements) |  |
|  | 101000 | Delayed replication of 1 descriptors |  |
|  | 031000 | Short delayed descriptor replication factor |  |
|  | 306033 | (Surface salinity) |  |
|  | 101000 | Delayed replication of 1 descriptor |  |
|  | 031000 | Short delayed descriptor replication factor |  |
|  | 306041 | (Depth and temperature profile (high accuracy/precision)) |  |
|  | 101000 | Delayed replication of 1 descriptors |  |
|  | 031000 | Short delayed descriptor replication factor |  |
|  | 306004 | (Depth, temperature, salinity) |  |
|  | 101000 | Delayed replication of 1 descriptor |  |
|  | 031000 | Short delayed descriptor replication factor |  |
|  | 306005 | Sub-surface current measurements |  |
|  | 105000 | Delayed replication of 5 descriptors |  |
|  | 031000 | Short delayed descriptor replication factor |  |
|  | 041001 | pCO2 |  |
|  | 008043 | Atmospheric chemical or physical constituent type |  |
|  | 015028 | Mole fraction of atmospheric constituent / pollutant in dry air |  |
|  | 008043 | Atmospheric chemical or physical constituent type |  |
|  | 013080 | Water pH |  |
|  | 104000 | Delayed replication of 4 descriptors |  |
|  | 031000 | Short delayed descriptor replication factor |  |
|  | 041005 | Turbidity |  |
|  | 041003 | Dissolved nitrates |  |
|  | 022188 | Dissolved oxygen |  |
|  | 041002 | Fluorescence |  |
|  | 101000 | Delayed replication of 1 descriptor |  |
|  | 031000 | Short delayed descriptor replication factor |  |
|  | 306040 | (Sequence for representation of detailed spectral wave measurements) |  |
|  | 104000 | Delayed replication of 4 descriptors |  |
|  | 031000 | Short delayed descriptor replication factor |  |
|  | 008021 | Time significance |  |
|  | 004025 | Time period or displacement |  |
|  | 014017 | Instantaneous long-wave radiation |  |
|  | 014018 | Instantaneous short-wave radiation |  |

**Annex –Expanded proposed sequence 315011**

315011

Met-ocean observations from unmanned surface vehicles

|  |  |  |
| --- | --- | --- |
| **Table References** | | **Element Name** |
| **FXXYYY1** | **FXXYYY2** |
| *Identification* | | |
| 301150 |  | (WIGOS identifier) |
|  | 001125 | WIGOS identifier series |
|  | 001126 | WIGOS issuer of identifier |
|  | 001127 | WIGOS issue number |
|  | 001128 | WIGOS local identifier (character) |
| 001036 |  | Agency in charge of operating the observing platform |
| 001085 |  | Observing platform manufacturer's model |
| 001086 |  | Observing platform manufacturer's serial number |
| 003001 |  | Surface station type |
| 208032 |  | Change width of CCITT IA5 field |
| 001079 |  | Unique ID for report |
| 208000 |  | Change width of CCITT IA5 field |
| *Date, time, location and motion* | | |
| 301011 |  | Year, month, day |
|  | 004001 | Year |
|  | 004002 | Month |
|  | 004003 | Day |
| 301012 |  | Hour, minute |
|  | 004004 | Hour |
|  | 004005 | Minute |
| 301021 |  | (Latitude/longitude (high accuracy)) |
|  | 005001 | Latitude (high accuracy) |
|  | 006001 | Longitude (high accuracy) |
| 001012 |  | Direction of motion of moving observing platform |
| 001013 |  | Speed of motion of moving platform |
| 011104 |  | True heading of aircraft, ship or other mobile platform |
| *Basic meteorological observations* | | |
| 103000 |  | Delayed replication of 3 descriptor |
| 031000 |  | Short delayed descriptor replication factor |
| 007031 |  | Height of barometer above mean sea level |
| 306038 |  | Sequence for representation of standard surface marine meteorological observations from moored buoys |
|  | 010004 | Pressure |
|  | 010051 | Pressure reduced to mean sea level |
|  | 007033 | Height of sensor above water surface |
|  | 012101 | Temperature/air temperature |
|  | 012103 | Dewpoint temperature |
|  | 013003 | Relative humidity |
|  | 007033 | Height of sensor above water surface |
|  | 008021 | Time significance |
|  | 004025 | Time period or displacement |
|  | 011001 | Wind direction |
|  | 011002 | Wind speed |
|  | 008021 | Time significance |
|  | 004025 | Time period or displacement |
|  | 011041 | Maximum wind gust speed |
|  | 004025 | Time period or displacement |
|  | 007033 | Height of sensor above water surface |
|  | 002005 | Precision of temperature observation |
|  | 007063 | Depth below sea/water surface (cm) |
|  | 022049 | Sea-surface temperature |
| 012161 |  | Skin temperature |
| *Surface currents* | | |
| 101000 |  | Delayed replication of 1 descriptors |
| 031000 |  | Short delayed descriptor replication factor |
| 306034 |  | (Surface current) |
|  | 002031 | Duration and time of current measurement |
|  | 003010 | Method of sea/water current measurement |
|  | 002040 | Method of removing velocity and motion of platform from current |
|  | 022005 | Direction of sea-surface current |
|  | 022032 | Speed of sea-surface current |
| *Surface waves* | | |
| 101000 |  | Delayed replication of 1 descriptor |
| 031000 |  | Short delayed descriptor replication factor |
| 306039 |  | (Sequence for representation of basic wave measurements) |
|  | 022078 | Duration of wave record |
|  | 022070 | Significant wave height |
|  | 022073 | Maximum wave height |
|  | 022074 | Average wave period |
|  | 022071 | Spectral peak wave period |
|  | 022076 | Direction from which dominant waves are coming |
|  | 022077 | Directional spread of dominant wave |
| *Surface salinity* | | |
| 101000 |  | Delayed replication of 1 descriptors |
| 031000 |  | Short delayed descriptor replication factor |
| 306033 |  | (Surface salinity) |
|  | 002033 | Method of salinity/depth measurement |
|  | 007063 | Depth below sea/water surface (cm) |
|  | 022064 | Salinity |
| *Temperature profile* | | |
| 101000 |  | Delayed replication of 1 descriptor |
| 031000 |  | Short delayed descriptor replication factor |
| 306041 |  | (Depth and temperature profile (high accuracy/precision)) |
|  | 002032 | Indicator for digitization |
|  | 102000 | Delayed replication of 2 descriptors |
|  | 031001 | Delayed descriptor replication factor |
|  | 007062 | Depth below sea/water surface |
|  | 022043 | Sea/water temperature |
| *Temperature and salinity profile* | | |
| 101000 |  | Delayed replication of 1 descriptors |
| 031000 |  | Short delayed descriptor replication factor |
| 306004 |  | (Depth, temperature, salinity) |
|  | 002032 | Indicator for digitization |
|  | 002033 | Method of salinity/depth measurement |
|  | 103000 | Delayed replication of 3 descriptors |
|  | 031001 | Delayed descriptor replication factor |
|  | 007062 | Depth below sea/water surface |
|  | 022043 | Sea/water temperature |
|  | 022062 | Salinity |
| *Current profile* | | |
| 101000 |  | Delayed replication of 1 descriptor |
| 031000 |  | Short delayed descriptor replication factor |
| 306005 |  | Sub-surface current measurements |
|  | 002031 | Duration and time of current measurement |
|  | 103000 | Delayed replication of 3 descriptors |
|  | 031001 | Delayed descriptor replication factor |
|  | 007062 | Depth below sea/water surface |
|  | 022004 | Direction of current |
|  | 022031 | Speed of current |
| *pCO2* | | |
| 105000 |  | Delayed replication of 5 descriptors |
| 031000 |  | Short delayed descriptor replication factor |
| 041001 |  | pCO2 |
| 008043 |  | Atmospheric chemical or physical constituent type |
| 015028 |  | Mole fraction of atmospheric constituent / pollutant in dry air |
| 008043 |  | Atmospheric chemical or physical constituent type |
| 013080 |  | Water pH |
| *Dissolved nitrates, oxygen and turbidity* | | |
| 104000 |  | Delayed replication of 4 descriptors |
| 031000 |  | Short delayed descriptor replication factor |
| 041005 |  | Turbidity |
| 041003 |  | Dissolved nitrates |
| 022188 |  | Dissolved oxygen |
| 041002 |  | Fluorescence |
| *Spectral wave measurements* | | |
| 101000 |  | Delayed replication of 1 descriptor |
| 031000 |  | Short delayed descriptor replication factor |
| 306040 |  | (Sequence for representation of detailed spectral wave measurements) |
|  | 022078 | Duration of wave record |
|  | 022082 | Maximum non-directional spectral wave density |
|  | 106000 | Delayed replication of 6 descriptors |
|  | 031001 | Delayed descriptor replication factor |
|  | 022080 | Waveband central frequency |
|  | 022069 | Spectral wave density |
|  | 022086 | Mean direction from which waves are coming |
|  | 022087 | Principal direction from which waves are coming |
|  | 022088 | First normalized polar coordinate from Fourier coefficients |
|  | 022089 | Second normalized polar coordinate from Fourier coefficients |
| *Radiation* | | |
| 104000 |  | Delayed replication of 4 descriptors |
| 031000 |  | Short delayed descriptor replication factor |
| 008021 |  | Time significance |
| 004025 |  | Time period or displacement |
| 014017 |  | Instantaneous long-wave radiation |
| 014018 |  | Instantaneous short-wave radiation |