

WMO UNIFIED POLICY FOR THE INTERNATIONAL EXCHANGE OF EARTH SYSTEM DATA

In accordance with Recommendation 3 (EC-73), an initial draft list of Earth system data to be exchanged as core data under the new policy has been developed. The list of recommended data is still in development at this time (mid-July 2021) and will be made available in due course.

In the Table below, the datasets are listed by domain/discipline in the order of appearance in the draft WMO Unified Policy for the International Exchange of Earth System Data, Annex 1. The list includes references to the WMO Technical Regulations, with hyperlinks to the specific page and provision that providing the source of the categorization as "core data".

The "Status" column includes the following three options, namely "C" (current), "N" (new, approved by EC-73) and "P" (submitted to Cg-Ext(2021) for its approval).

This final version of this list will be provided to the Extraordinary Congress in October 2021 along with the draft WMO Unified Policy for the International Exchange of Earth System Data.

1. Initial list of Earth system data to be exchanged as core data

Reference to Annex 1	WMO-No.	Part / Section	Provision	Text of provision	Data Type	Status	Note	Comment
1. Weather-related data								
1.1.1	1160	3	3.2.2.5	Members shall make available internationally through WIS all GBON observations in real time or near-real time according to the overall WMO data policy.	all GBON observations	P	GBON to be submitted to Cg-Ext(2021)	To be effective from 1 Jan 2023
1.1.1	1160	3	3.2.2.9	Where Members operate networks as described in 3.2.2.7 and 3.2.2.8, Members shall make the observations of these networks available internationally according to 3.2.2.5.	surface atmospheric pressure, air temperature, humidity, horizontal wind, precipitation and snow depth	P	GBON to be submitted to Cg-Ext(2021)	To be effective from 1 Jan 2023
1.1.1	1160	3	3.2.2.16	Where networks described in 3.2.2.13 – 15 are operated, 3.2.2.5 shall apply.	upper-air temperature, humidity and horizontal wind profiles	P	GBON to be submitted to Cg-Ext(2021)	To be effective from 1 Jan 2023
1.1.2	1160	4	4.5.2.1	Satellite operators shall ensure near-real-time dissemination of the appropriate data sets, as per the requirements of Members, either by direct broadcast via an appropriately designed ground segment, or by rebroadcast via telecommunication satellites.	not specified	C		
1.1.2	1160	4	4.5.3.4	Satellite operators shall maintain and provide unrestricted access to Level 1B satellite data archives including all relevant metadata pertaining to the location, orbit parameters and calibration procedures used.	Level 1B satellite data archives	N	approved by EC-73	Effective from 1 December 2022

Reference to Annex 1	WMO-No.	Part / Section	Provision	Text of provision	Data Type	Status	Note	Comment
1.1.1	1160	5	5.2.1.2	Members shall provide surface-based meteorological observations from one or more of the following types of station/platform: (a) Surface land stations (see Appendix 5.1.); (b) Surface marine stations (see Appendix 5.2.); (c) Upper-air stations (see Appendix 5.3.); (d) Aircraft meteorological stations (see Appendix 5.4.); (e) Radar wind profiler stations (see Appendix 5.5); (f) Weather radar stations (Appendix 5.6.).	not specified	C		
1.1.1	1160	5	5.4.4	Members operating AMDAR observing systems shall provide measurement of air temperature, wind speed, wind direction, pressure altitude, latitude, longitude and time of observation.	air temperature, wind speed, wind direction, pressure altitude, latitude, longitude	C		
1.1, 1.2, ...,6.2	485	Part I	1.1.2.1	Through GDPFS, Members shall provide and have access to meteorological, hydrological, oceanographic and climatological information supporting a range of operational activities.	meteorological, hydrological, oceanographic and climatological information supporting a range of operational activities	C		
1.2(a)	485	Part II	2.2.1.1	Regional Specialized Meteorological Centres conducting global deterministic NWP shall (a) Produce global analyses of the three-dimensional structure of the atmosphere; (b) Produce global forecast fields of basic and derived atmospheric parameters; (c) Make available on WIS a range of these products; the list of mandatory and highly recommended global deterministic NWP products to be made available is given in Appendix 2.2.1;	Geopotential height, temperature, wind, relative humidity, divergence, vorticity, MSLP, 2-m temperature, 10-m wind, total precipitation	C	Appendix 2.2.1 provides the list of mandatory products to be made available on WIS	
1.2(a)	485	Part II	2.2.1.3	Centres conducting global ensemble NWP shall: (a) Produce global ensemble forecast fields of basic and derived atmospheric parameters; (b) Make available on WIS a range of these products; the list of mandatory and highly recommended global ensemble NWP products to be made available is given in Appendix 2.2.5;	Probability of precipitation, 10-m sustained wind and gusts, and temperature anomalies, Ensemble mean + spread (standard deviation) of geopotential height (500hPa), MSLP and wind speed (850/250hPa)	C	Appendix 2.2.5 provides the list of mandatory products to be made available on WIS	
1.2(a)	485	Part II	2.2.1.X. and 2.2.1.X.1	Centres conducting global numerical sub-seasonal forecasts (Global Producing Centres for Sub-Seasonal Forecasts: GPCs-SSF) shall: Note: Functions are defined for the sub-seasonal (10 days–4 weeks) forecasting activity. (a)With at least weekly frequency, generate SSF products with global coverage;	2-m temperature (map), SST (map), Total Precipitation (map)	N	approved by EC-73 Appendix 2.2.A provides the list of mandatory products to be	Effective from 1 December 2022

Reference to Annex 1	WMO-No.	Part / Section	Provision	Text of provision	Data Type	Status	Note	Comment
				(b) Make available on WIS a range of these products; mandatory products to be made available are listed in Appendix 2.2.A;			made available on WIS	
1.2(a)	485	Part II	2.2.1.5.1	Centres conducting global numerical long-range prediction (GPCs-LRF) shall: Note: Functions are defined for the seasonal (1–6 month) prediction activity. (a) Generate LRF products with global coverage; (b) Make available on WIS a range of these products; mandatory and highly recommended products to be made available are listed in Appendix 2.2.9;	2-m temperature (map), SST (map), Total Precipitation (map)	C	Appendix 2.2.9 provides the list of mandatory products to be made available on WIS	
1.2(b)	485	Part II	2.2.1.2	2.2.1.2 Limited-area deterministic numerical weather prediction Centres conducting limited-area deterministic NWP shall: (a) Produce limited-area analyses of the three-dimensional structure of the atmosphere; (b) Produce limited-area forecast fields of basic and derived atmospheric parameters; (c) Make available on WIS a range of these products; the list of mandatory and highly recommended limited-area deterministic NWP products to be made available, including metadata, is given in Appendix 2.2.3;	Geopotential height, temperature, wind, relative humidity, divergence, vorticity, MSLP, 2-m temperature, 10-m wind, total precipitation	C	Appendix 2.2.3 provides the list of mandatory products to be made available on WIS	
1.2(b)	485	Part II	2.2.1.4	Limited-area ensemble numerical weather prediction Centres conducting limited-area ensemble NWP shall: (a) Produce limited-area ensemble forecast fields of basic and derived atmospheric parameters; (b) Make available on WIS a range of these products; the list of mandatory and highly recommended limited-area ensemble NWP products to be made available is given in Appendix 2.2.7;	Probability of precipitation, 10-m sustained wind and gusts, and temperature anomalies, Ensemble mean + spread (standard deviation) of geopotential height (500hPa), MSLP and wind speed (850/250hPa)	C	Appendix 2.2.7 provides the list of mandatory products to be made available on WIS	
2. Climate								
2.1(b)	1238	1	1.1.14	WMO requires NMHSs to routinely provide basic climate-related data in agreed standard formats, as follows: (a) NMHSs shall provide climatological standard normals and monthly CLIMAT reports;	climatological standard normals and monthly CLIMAT reports	C		
2.1(b)	1238	1	1.7.2	Entities providing observations and data and contributing to the Marine Climate Data System (MCDS) shall share the data on a free, open and unrestricted basis through the appropriate international data centres and systems, including WIS and relevant Intergovernmental Oceanographic Commission (IOC) systems.	observations and data	C		

Reference to Annex 1	WMO-No.	Part / Section	Provision	Text of provision	Data Type	Status	Note	Comment
2.1(c)	1160	5.8	5.8.1	Members making observations for climate applications shall observe the following mandatory ECVs: a) surface observations: atmospheric pressure, air temperature, humidity (water vapour), surface wind speed and direction, and precipitation; b) upper-air observations: air temperature, humidity (water vapour) and wind speed and direction.	ECVs	N	approved by EC-73	Effective from 1 December 2022
2.1(c)	1160	5.8	5.8.2	Members shall exchange both historic data archives and current observations of the mandatory ECVs with a tentative maximum delay of one year.	ECVs	N	approved by EC-73	Effective from 1 December 2022
2.2	558	Part VII	3.2	Members shall provide data and metadata to the appropriate DACs within the MCDS to support the development of metocean climate products.	not specified	C		DACs: Data Acquisition Centres; MCDS: Marine Climate Data System
3. Hydrology								
3.1(a)	1160	7	7.1.3	Members shall provide on a free and unrestricted basis those hydrological data and products that are necessary for the provision of services for the protection of life and property, and the well-being of all peoples.	hydrological data and products (not specified)	C		
3.1(a)	49, Vol. III.	5	5.2.1	Each Member shall disseminate the meteorological observations listed in the table below required for the analysis of the response of a drainage basin to changes in meteorological conditions.	(a) Precipitation – amount and form*, (b) Snow depth, (c) Water equivalent of snow cover, (d) Air temperature, (e) Wet-bulb temperature, (f) Net radiation, (g) Pan evaporation, (h) Surface temperature – snow, (i) Temperature, profiles – snow, (j) Wind: speed, (k) Sunshine duration, (l) Relative humidity	N	approved by EC-73	nationally and internationally, at least in transboundary basins;
3.2	49, Vol. III.	3	3.7.1	In areas where flash floods are a significant risk to human life, the hydrological forecasting service shall provide flash flood forecasts and warnings, based at least on assessment of initial hydrological conditions and expected precipitation intensities.	flash flood forecasts and warnings	N	approved by EC-73	nationally and internationally, at least in transboundary basins
4. Atmospheric Composition								

Reference to Annex 1	WMO-No.	Part / Section	Provision	Text of provision	Data Type	Status	Note	Comment
4.1(a)	1160	6	1.2.2.2	The purpose of GAW shall be to provide data and other information on the chemical composition and related physical characteristics of the atmosphere to support multiple applications, as defined in section 6, in all parts of the globe. This is intended to reduce environmental risks to society, meet the requirements of environmental conventions, strengthen capabilities to predict the state of climate, weather and air quality, and contribute to scientific assessments in support of environmental policy	ozone, greenhouse gases, reactive gases, aerosols, ultraviolet (UV) radiation and total atmospheric deposition	C		No specific datasets listed
5. Cryosphere								
5.1(a)	1160	3	3.2.2.9	Where Members operate networks as described in 3.2.2.7 and 3.2.2.8, Members shall make the observations of these networks available internationally according to 3.2.2.5.	snow depth	P	GBON to be submitted to Cg-Ext(2021)	To be effective from 1 Jan 2023
5.1(a)	1160	8	Appendix 8.1	I.5. Freely available data and ancillary data: Data shall be made freely available and, whenever possible, in (near) real time. In situ ancillary meteorological observations, as required by CryoNet practices, shall also be available with documented quality. II.5 Data shall be made freely available and, whenever possible, in (near) real time.	not specified	C		
6. Ocean								
6.1(x)	49 Vol. I.	Part IV	1.1.3	Members with Marine Meteorological Services shall provide, to the extent possible, maritime users with the meteorological and related oceanographic information (warnings, forecasts, charts, expert advice and climatological data) required for safe navigation and efficient operations, using adequate modes of dissemination.	warnings, forecasts, charts, expert advice and climatological data	C		
6.1(a)	1160	5, App. 5.2	5.2.5	Members making surface marine observations shall include as many meteorological variables as possible among those listed in Attachment 5.1.	Surface marine meteorological observations (list in Attachment 5.1)	C		
6.1(a)	1160	5, App. 5.2	5.2.10	Members shall report and make available surface marine observations in real time.	surface marine observations	C		
6.2(a)	485	Part II	2.2.1.7	Centres conducting global numerical ocean prediction shall: (a) Prepare global analyses of oceanographic parameters; (b) Prepare global forecast fields of basic and derived oceanographic parameters; (c) Make available on WIS a range of these products; the list of mandatory and highly recommended products to be made available is given in Appendix 2.2.13;	Sea-surface elevation, SST, Surface wind, Sea-surface salinity, temperature, mixed layer depth, wind(depth to be determined)	C	Appendix 2.2.13 provides the list of mandatory products to be made available on WIS	
6.2(c)	558	Part 1	1.2	Marine meteorological services for the high seas shall include provision of: (a) Meteorological warnings; (b) Marine forecasts; (c) Sea-ice information services.	Warnings, forecasts, information	C		

2. Initial list of Earth system data to be exchanged as recommended data

(This part of the document is still in development and will be made available in due course.)
