



MEETING OF THE METEOROLOGY PANEL (METP) WORKING GROUP MOG

SEVENTH MEETING

Frankfurt, Germany, 11 to 13 April 2018

Agenda Item 3.3: Work required in support of WAFS Developments
3.3.1 Matters related to gridded WAFS products

Improvements to the WAFS Grids in 2022 (Presented by the WAFS Provider States)

SUMMARY

This Information Paper describes the plan to increase temporal, horizontal and vertical resolutions of all WAFS Grids in 2022. An improved dissemination system is also discussed.

1. INTRODUCTION

1.1 METP-WG/MOG/7 SN/12 describes the 10 year plan for the next generation of WAFS Grids for upper winds; upper-air temperature; and humidity; direction, speed and flight level of maximum wind; flight level and temperature of tropopause, areas of cumulonimbus clouds, icing, turbulence and geopotential altitude of flight levels are currently provided for select flight levels, in 3 hour time steps, at 1.25 degree horizontal resolution.

1.2 The horizontal resolution of the WAFS Hazard grids will be upgraded to 0.25 degree in November 2020, per discussion in IP12.

1.3 Further improvements to the grids are necessary to meet the objective (B1-SWIM) and to support the WAFS 10-year plan to provide enhanced gridded data sets that will support B1-AMET objectives. These upgrades will support the following activities: trajectory based operations (B1-TBO), free route operations (FRTO), continuous descent operations (B1-CDO), and improved air traffic flow management (B1-NOPS). These upgrades will be discussed below.

DISCUSSION

2. When the WAFS hazard grids were first introduced in 2010 and deemed operational in 2013, the resolution of WAFS grids was set at 1.25 degrees. This kept the file size low enough for transmission on the old satellite downlink dissemination systems. Today's Internet based dissemination systems can handle the larger file sizes associated with the higher resolution grids.

2.1 The MOG/4 approved increased spatial, temporal and vertical resolutions for the WAFS grids. However, the current SADIS/WIFS Internet based dissemination systems cannot handle the resultant file sizes. Therefore, only the horizontal resolution of hazard grids will be increased in 2020.

2.2 Further vertical and temporal resolution increases will have to wait until a) user adoption of the higher resolution data, and b) sophisticated cloud based services become available in the 2022 time frame. These services will be further discussed in IP11.

2.3 The WAFCs will utilize these cloud based services to provide significantly higher resolution data in 2022.

2.4 The below table details the time steps to be implemented in November 2022 at 0.25 degree resolution.

Upper-air grid point forecasts	1-hourly intervals	3-hourly intervals	6-hourly intervals
Wind, temperature, geopotential altitude	6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23 and 24 hours	27, 30, 33, 36, 39, 42, 45 and 48 hours	54, 60, 66, 72, 78, 84, 90, 96, 102, 108, 114 and 120 hours
Flight level and temperature of tropopause			
direction, speed and flight level of maximum wind			
Humidity			
Horizontal extent and flight levels of base and top of cumulonimbus clouds	6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23 and 24 hours	27, 30, 33, 36, 39, 42, 45 and 48 hours	Not provided
Icing			
Turbulence			

2.5 The below table details the flight levels to be available in 2022.

Flight Level	Geopotential Altitude (FT)	ICAO Standard Atmosphere pressure level (hPa)	Wind	Temperature	Turbulence	Icing	Humidity
FL050	5000	843.1	X	X			X
FL060	6000	812.0	X	X		X	X
FL070	7000	781.9	X	X		X	X
FL080	8000	752.6	X	X		X	X
FL090	9000	724.3	X	X		X	X
FL100	10000	696.8	X	X	X	X	X
FL110	11000	670.2	X	X	X	X	X
FL120	12000	644.4	X	X	X	X	X
FL130	13000	619.4	X	X	X	X	X
FL140	14000	595.2	X	X	X	X	X
FL150	15000	571.8	X	X	X	X	X

FL160	16000	549.2	X	X	X	X	X
FL170	17000	527.2	X	X	X	X	X
FL180	18000	506.0	X	X	X	X	X
FL190	19000	485.5	X	X	X	X	
FL200	20000	465.6	X	X	X	X	
FL210	21000	446.5	X	X	X	X	
FL220	22000	427.9	X	X	X	X	
FL230	23000	410.0	X	X	X	X	
FL240	24000	392.7	X	X	X	X	
FL250	25000	376.0	X	X	X	X	
FL260	26000	359.9	X	X	X	X	
FL270	27000	344.3	X	X	X	X	
FL280	28000	329.3	X	X	X	X	
FL290	29000	314.9	X	X	X	X	
FL300	30000	300.9	X	X	X	X	
FL310	31000	287.4	X	X	X		
FL320	32000	274.5	X	X	X		
FL330	33000	262.0	X	X	X		
FL340	34000	250.0	X	X	X		
FL350	35000	238.4	X	X	X		
FL360	36000	227.3	X	X	X		
FL370	37000	216.6	X	X	X		
FL380	38000	206.5	X	X	X		
FL390	39000	196.8	X	X	X		
FL400	40000	187.5	X	X	X		
FL410	41000	178.7	X	X	X		
FL420	42000	170.4	X	X	X		
FL430	43000	162.4	X	X	X		
FL440	44000	154.7	X	X	X		
FL450	45000	147.5	X	X	X		
FL460	46000	140.6	X	X			
FL470	47000	134.0	X	X			
FL480	48000	127.7	X	X			
FL490	49000	121.7	X	X			
FL500	50000	116.0	X	X			
FL510	51000	110.5	X	X			
FL520	52000	105.3	X	X			
FL530	53000	100.4	X	X			
FL540	54000	95.7	X	X			
FL550	55000	91.2	X	X			
FL560	56000	87.0	X	X			
FL570	57000	82.8	X	X			
FL580	58000	79.0	X	X			
FL590	59000	75.2	X	X			

FL600	60000	71.7	X	X			
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3. **ACTION BY THE METP-WG/MOG**
- a) The METP-WG/MOG is invited to note the information contained in this paper