

**GFS-BASED MOS GUIDANCE FOR THE WESTERN PACIFIC - THE SHORT-RANGE ALPHANUMERIC
MESSAGE FROM THE 0000/1200 UTC FORECAST CYCLES**

by
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1. INTRODUCTION

This Technical Procedures Bulletin (TPB) describes the format and contents of the MOS short-range alphanumeric message generated during the 0000 and 1200 UTC forecast cycles of the Global Forecast System (GFS) for sites in the western Pacific Ocean. This document contains descriptions of forecasts for time-specific surface temperature and dew point, total sky cover, surface wind direction and speed, and probability of precipitation (PoP) for 6- and 12-h periods. Guidance is provided for projections of 6 to 72 hours for most weather elements. Implementation of this guidance is scheduled for May 2005. At that time, only wind guidance will be available. As changes are made to the bulletin format and as guidance for additional weather elements becomes available, this document will be updated. Note that a particular element line (see Sections 3 - 8) is not included in the message when all of the forecasts in that line are unavailable.

2. MESSAGE HEADING

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PGUM  GFS MOS GUIDANCE  2/01/2004  0000 UTC
DT /FEB  1                /FEB  2                /FEB  3                /
HR  06 09 12 15 18 21 00 03 06 09 12 15 18 21 00 03 06 09 12 18 00
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The message heading shown above (see Figs. 1 and 2 also) identifies the station for which the guidance is valid, the forecast cycle, and the day and hour for which the forecasts are valid. In this example, the message is valid for Guam International Airport (PGUM). All stations are identified by the ICAO four-character identifier.

The "GFS MOS GUIDANCE" appearing on the same line as the station call letters identifies the message contents. The date and the forecast cycle during which the message is issued follow this information. The form of mm/dd/yyyy where mm is the month (1 through 12), dd is the day (1 through 31), and yyyy is the four-digit year is used. The forecast cycle is identified by the standard 0000 or 1200 UTC. In this example, the MOS guidance for PGUM was issued from the 0000 UTC forecast cycle of the GFS on February 1, 2004.

The DT and HR lines denote the dates and hours at which the forecasts are valid. The DT line indicates the days of the month. Note that the month is denoted by the standard three or four letter abbreviation. For temperature, dew point, sky cover, wind direction, and wind speed, the date and hour denote the specific time that the forecasts are valid. These forecasts are valid every 3 hours until 60 hours after initial time and then every 6 hours until 72 hours after initial time. For PoP the time indicates the end of the period over which the forecasts are valid.

3. TMP - SURFACE TEMPERATURE

PGUM	GFS MOS GUIDANCE															2/01/2004				0000 UTC			
DT	/FEB 1					/FEB 2					/FEB 3					/							
HR	06	09	12	15	18	21	00	03	06	09	12	15	18	21	00	03	06	09	12	18	00		
TMP	85	80	76	76	77	76	84	80	82	81	77	77	76	77	83	81	83	80	77	76	83		

Time-specific 2-m temperature forecasts are valid every 3 hours from 6 to 60 hours, and then every 6 hours to 72 hours after 0000 and 1200 UTC. These forecasts are valid at 0600, 0900, ..., 2100, 0000 UTC, and so forth. Each temperature forecast is presented to the nearest whole degree Fahrenheit; a missing forecast is indicated by a 999. Note that only three characters are available for the temperature forecasts. Thus, two consecutive forecasts of 100 degrees or more appear with no spaces between them.

4. DPT - SURFACE DEW POINT

PGUM	GFS MOS GUIDANCE															2/01/2004				0000 UTC			
DT	/FEB 1					/FEB 2					/FEB 3					/							
HR	06	09	12	15	18	21	00	03	06	09	12	15	18	21	00	03	06	09	12	18	00		
	...																						
DPT	73	75	74	74	73	74	74	73	73	74	73	74	73	74	74	74	73	73	73	74	75		

Time-specific 2-m dew point forecasts are valid every 3 hours from 6 to 60 hours, and then every 6 hours to 72 hours after 0000 and 1200 UTC. These forecasts are valid at 0600, 0900, ..., 2100, 0000 UTC, and so forth. Each dew point forecast is presented to the nearest whole degree Fahrenheit; a missing forecast is indicated by a 999. Three characters are available for the dew point forecasts.

5. CLD - TOTAL SKY COVER CATEGORIES

PGUM	GFS MOS GUIDANCE															2/01/2004				0000 UTC			
DT	/FEB 1					/FEB 2					/FEB 3					/							
HR	06	09	12	15	18	21	00	03	06	09	12	15	18	21	00	03	06	09	12	18	00		
	...																						
CLD	OV	SC	CL	FW	BK	BK	OV	OV	BK	SC	SC	SC	BK	BK	OV	OV	OV	SC	SC	BK	BK		

Forecast categories of total sky cover (see the following table) are available in plain language for projections at 3-h intervals from 6 to 60 hours, and then every 6 hours to 72 hours after the initial data times (0000 and 1200 UTC). All forecasts are valid for specific times (i.e., 0600, 0900, 1200, and so forth). Two characters identify the category (CL - clear; FW - few; SC - scattered; BK - broken; OV - overcast); a missing forecast is denoted by XX.

Total Sky Cover Categories

- CL - clear;
- FW - > 0 to 2 octas of total sky cover;
- SC - > 2 to 4 octas of total sky cover;
- BK - > 4 to < 8 octas of total sky cover;
- OV - 8 octas of total sky cover or totally obscured.

The categorical guidance is prepared by using probability forecasts of the same categories. The categorical guidance displayed in the message is chosen

by a technique that produces as many forecasts of each of the five categories as occur in the observational data used for development of the guidance.

6. WDR - SURFACE WIND DIRECTION / WSP - SURFACE WIND SPEED

PGUM	GFS MOS GUIDANCE												2/01/2004				0000 UTC					
DT	/FEB 1				/FEB 2				/FEB 3				/									
HR	06	09	12	15	18	21	00	03	06	09	12	15	18	21	00	03	06	09	12	18	00	
	...																					
WDR	06	06	07	07	07	08	08	08	08	08	07	08	08	08	08	08	08	07	07	07	08	08
WSP	13	07	08	08	08	08	13	13	12	09	10	10	08	08	13	14	12	10	10	08	14	

Surface wind direction (WDR) and speed (WSP) forecasts are given at 3-h intervals for projections of 6 to 60 hours, and then every 6 hours to 72 hours after the initial data times (0000 and 1200 UTC). These are forecasts of the 10-m winds (a 2-minute average) at specific times throughout each day (i.e., 0600, 0900, 1200 UTC, and so forth). The wind direction is given in tens of degrees and varies from 01 (10 degrees) to 36 (360 degrees). The normal meteorological convention for specifying wind direction is followed. The wind speed is given in knots; the maximum speed allowed in the message is 98 knots. For both direction and speed, missing forecasts are denoted by 99. A calm wind is indicated by a wind direction and speed of 00.

7. P06 - PROBABILITY OF PRECIPITATION IN A 6-H PERIOD

PGUM	GFS MOS GUIDANCE												2/01/2004				0000 UTC				
DT	/FEB 1				/FEB 2				/FEB 3				/								
HR	06	09	12	15	18	21	00	03	06	09	12	15	18	21	00	03	06	09	12	18	00
	...																				
P06							0	0	29	33	1		9	65	74		3	2	0		

The P06 forecasts are for the probability of 0.01 inches or more of liquid-equivalent precipitation (PoP) occurring during a 6-h period. The 6-h PoP's are valid for intervals of 6-12, 12-18, 18-24, 24-30, 30-36, 36-42, 42-48, 48-54, 54-60, 60-66, and 66-72 hours after the initial data times (0000 and 1200 UTC). In the message, the forecast values are displayed under the ending time of the 6-h period. The probability is given to the nearest percent. Values range from 0 to 100%. A missing forecast value is indicated by 999.

8. P12 - PROBABILITY OF PRECIPITATION IN A 12-H PERIOD

PGUM	GFS MOS GUIDANCE												2/01/2004				0000 UTC				
DT	/FEB 1				/FEB 2				/FEB 3				/								
HR	06	09	12	15	18	21	00	03	06	09	12	15	18	21	00	03	06	09	12	18	00
	...																				
P12							0		53				10		87				5		

The P12 forecasts are for the probability of 0.01 inches or more of liquid-equivalent precipitation (PoP) occurring during a 12-h period. The 12-h PoP's are valid for intervals of 6-18, 18-30, 30-42, 42-54, and 54-66 hours after 0000 and 1200 UTC. In the message, the forecast values are displayed under the ending time of the 12-h period. The probability is given to the nearest percent. Values range from 0 to 100%. A missing forecast value is indicated by 999.

9. AVAILABILITY

The GFS MOS guidance is available at approximately 0415 and 1615 UTC from the 0000 and 1200 UTC runs, respectively, of the GFS model. The guidance is disseminated in an alphanumeric messages to NWS AWIPS and Family of Services (FOS) circuits with the following two-line WMO header:

FOPA21 KWNO - Pacific Region
 MAVPA1

10. STATION LIST

As of January 2005, the GFS MOS guidance was to be available for 13 sites in the western Pacific. The user may check the following home page for the station list:

<http://www.nws.noaa.gov/mdl/synop/stadrq.html>

Figure 1. Sample 0000 UTC message.

PGUM	GFS MOS GUIDANCE																2/01/2004				0000 UTC			
DT	/FEB 1				/FEB 2				/FEB 3				/											
HR	06	09	12	15	18	21	00	03	06	09	12	15	18	21	00	03	06	09	12	18	00			
TMP	85	80	76	76	77	76	84	80	82	81	77	77	76	77	83	81	83	80	77	76	83			
DPT	73	75	74	74	73	74	74	73	73	74	73	74	73	74	74	74	73	73	73	74	75			
CLD	OV	SC	CL	FW	BK	BK	OV	OV	BK	SC	SC	SC	BK	BK	OV	OV	OV	SC	SC	BK	BK			
WDR	06	06	07	07	07	08	08	08	08	07	08	08	08	08	08	08	07	07	07	08	08			
WSP	13	07	08	08	08	08	13	13	12	09	10	10	08	08	13	14	12	10	10	08	14			
P06			0		0		29		33		1		9		65		74		3	2	20			
P12					0				53				10				87				5			

Figure 2. Sample 1200 UTC message.

PGUM	GFS MOS GUIDANCE																2/01/2004				1200 UTC			
DT	/FEB 1				/FEB 2				/FEB 3				/FEB 5											
HR	18	21	00	03	06	09	12	15	18	21	00	03	06	09	12	15	18	21	00	06	12			
TMP	76	76	79	82	85	80	76	76	77	76	84	80	82	81	77	77	76	77	83	84	77			
DPT	73	75	74	74	73	74	74	73	73	74	73	74	73	74	74	74	73	73	73	74	75			
CLD	BK	BK	OV	BK	OV	SC	CL	FW	BK	BK	OV	OV	BK	SC	SC	SC	BK	BK	OV	OV	SC			
WDR	07	08	08	08	06	06	07	07	07	08	08	08	08	07	08	08	08	08	08	06	07			
WSP	08	08	13	13	12	09	10	10	08	08	13	14	12	10	10	08	08	08	12	13	10			
P06			0		35		0		8		63		71		3		1		15	25	6			
P12					37				10				79				2				30			