

THE FOUS12 (FO12) BULLETIN

Reprint of Technical Procedures Bulletin No. 247:
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This bulletin was prepared jointly by the staffs of the Techniques Development Laboratory, NWSH, and the Technical Procedures Branch of the Office of Meteorology and Oceanography, NWSH. New material includes the introduction of thunderstorm probability, 3-hourly temperature, maximum/minimum temperature, and conditional probability of precipitation type guidance in the EARLY (LFM-based) version of the message.

1. INTRODUCTION

The FOUS12 (FO12) bulletin is prepared in two issuances: (1) the EARLY FOUS12, and (2) the FINAL FOUS12 bulletin. The forecasts contained in the EARLY bulletin are highly dependent on output from the LFM-II model and have the advantage of providing guidance at an early hour. The FINAL bulletin is produced from a combination of LFM-II and 7LPE model output, as well as the latest available observational data. All of the forecasts are produced by use of the MOS technique.

The EARLY message contains probability of precipitation, categorical probability of quantitative precipitation, thunderstorm probability (March 15 - September 15), conditional probability of precipitation type (September 16 - May 15), probability of heavy snow (September 16 - May 15), maximum/minimum temperature, 3-hourly temperature, surface wind, categorical probability of cloud amount, and categorical probability of ceiling height and visibility guidance. In contrast, the FINAL message contains probability of precipitation, categorical probability of quantitative precipitation, conditional probability of frozen precipitation (September 16 - May 15), categorical probability of cloud amount, categorical probability of ceiling height and visibility, and surface wind guidance.

The DATE/GMT heading at the beginning of both messages denotes the day and hour at which the conditional probability of precipitation type, conditional probability of frozen precipitation, 3-hourly temperature, surface wind, cloud, ceiling, and visibility forecasts are valid. For the probability forecasts of precipitation, quantitative precipitation and thunderstorms, the time indi-

cates the end of the period over which the forecasts are valid. In contrast, the date group gives only the approximate verification time of the calendar day maximum/minimum temperature guidance.

2. PROBABILITY OF PRECIPITATION (PoP)

The PoP forecasts are for either 6-h (PoP06) or 12-h (PoP12) periods. PoP06 goes out to 36 hours from the initial data times (0000 GMT and 1200 GMT) on both the EARLY and FINAL messages. In contrast, PoP12 goes out to 48 hours on the EARLY message and 60 hours on the FINAL message. Probabilities are rounded to the nearest 10 percent for PoP forecasts of 10 to 100 percent. For PoP forecasts of less than 10 percent, values are rounded appropriately to 0, 2, 5, or 10 percent. A value of 999 denotes a missing forecast. See Technical Procedures Bulletins Nos. 233 and 244 for more information concerning PoP.

3. QUANTITATIVE PRECIPITATION (QPF)

This element is a forecast of quantitative precipitation in both probabilistic and categorical form. Forecasts for 6-h periods (QPF06) for projections of 12-18, 18-24, and 24-30 hours from the initial data times (0000 GMT and 1200 GMT) are available in both the EARLY and FINAL messages. Both messages also contain 24-h period forecasts (QPF24) for 12-36 hours and 36-60 hours from 0000 GMT and for 24-48 hours from 1200 GMT.

Probability of precipitation amount is forecast for categories equal to or more than 0.25, 0.50, 1.00 and 2.0 inches. For the QPF06, only the first three categories are forecast, while all four categories are included in the QPF24 forecasts. Categorical probability forecasts are given before the solidus (/) and the selected "best" category follows. For QPF06, a best category of 1 is less than 0.25, 2 is 0.25-0.49, 3 is 0.50-0.99, and 4 is at least 1.00 inch. In QPF24 the categories are the same for categories 1-3, but category 4 is 1.00-1.99 inches and 5 is at least 2 inches.

All the categorical probability forecasts are rounded to the nearest 10 percent and presented as a single digit. A value of 999/9 indicates

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missing for QPF06, while 9999/9 is the missing indicator for QPF24. A value of "X" for one of the probabilities indicates that the forecast is not available because a prediction equation could not be developed. For more details regarding the QPF forecasts see Technical Procedures Bulletin No. 227.

4. THUNDERSTORM PROBABILITIES (TSTM)

TSTM probability forecasts for 12-h periods appear in the EARLY message only. The forecasts give the probability of a radar echo with an intensity of VIP3 or greater occurring during a 12-h period within the MDR block containing the requested station. TSTM forecasts are valid for most stations east of the Rocky Mountains for projections of 12-24, 24-36, and 36-48 hours following the 0000 GMT and 1200 GMT initial data times.

Probabilities are given to the nearest whole percent in the range of zero to 98. A value of 99 indicates the forecast is missing. Probabilities are not given for stations outside the MDR grid. Technical Procedures Bulletin No. 235 contains further details concerning these forecasts.

5. PROBABILITY OF PRECIPITATION TYPE (PoPT)

The PoPT forecasts in the EARLY message are conditional probabilities valid for specific times 12, 18, 24, 30, 36, 42, and 48 hours after the input data times of 0000 GMT and 1200 GMT. Probabilities are given to the nearest whole percent. The maximum value for each probability is 99. Forecasts are provided for freezing precipitation (freezing rain or drizzle) and frozen precipitation (snow and/or sleet) in that order, followed by a solidus (/) and a "best" category forecast. Best category values of 1, 2, and 3 indicate freezing, frozen, and liquid (rain or mixed types) precipitation, respectively. A value of 9999/9 indicates missing forecasts for both of the probabilities and the best category. For more information concerning PoPT see Technical Procedures Bulletin No. 243.

6. PROBABILITY OF FROZEN PRECIPITATION (PoF)

The PoF forecasts in the FINAL message are conditional probabilities valid for specific times 12, 18, 24, 30, 36, 42, and 48 hours after the input data times of 0000 GMT and 1200 GMT. Probabilities are given to the nearest whole percent ranging from zero to 100. A value of 999 indicates the forecast is missing. See Technical Procedures Bulletin No. 146 for more information concerning PoF.

7. PROBABILITY OF HEAVY SNOW (PoSH)

Probability estimates of the likelihood of 4 inches or more of snow are available only in the EARLY message. PoSH is forecast for a single time period valid 12-24 hours after the initial data time (0000 GMT or 1200 GMT). Forecasts are provided for both conditional and unconditional probabilities of heavy snow in that order, followed by a solidus (/) and a "best" category forecast. There are two categories of snow amount, 4 and 0. Category "4" indicates 4 inches or more of snow are expected, while category "0" means less than 4 inches are expected.

The conditional and unconditional PoSH values are given to the nearest whole percent and range from zero to 98. A value of 99 99/0 indicates missing forecasts for both of the probabilities and the best category. For more information concerning the PoSH guidance see Technical Procedures Bulletin No. 246.

8. MAXIMUM/MINIMUM TEMPERATURES (MX/MN)

MX/MN forecasts appear only on the EARLY message, and are displayed for 12-h intervals out to 48 hours, beginning 24 hours after the initial data time (0000 GMT or 1200 GMT). Although the MX/MN forecasts are given in the bulletin for consecutive 12-h intervals, each forecast is actually valid for a specific 24-h (calendar day) period. For the 0000 GMT forecast cycle the temperatures are shown in MX/MN order, while for the 1200 GMT forecast cycle they are shown in MN/MX order. Each temperature forecast is presented to the nearest whole degree Fahrenheit, and a missing forecast is indicated by a 999. For further information concerning these elements see Technical Procedures Bulletin No. 238.

9. 3-HOURLY TEMPERATURES (TEMP)

The EARLY message also contains 3-hourly surface temperature forecasts valid for specific times 6 to 51 hours after both 0000 GMT and 1200 GMT. Each temperature forecast is presented to the nearest whole degree Fahrenheit, and a missing forecast is indicated by a 999. The initial 3-hourly forecast under each 6-h column heading on the message is for the particular day and time indicated in the heading. The second forecast in that grouping is valid 3 hours later. Technical Procedures Bulletin No. 238 contains more details regarding the 3-hourly temperature guidance.

10. SURFACE WINDS (WIND)

Surface wind forecasts at 6 hour increments for projections of 12 to 48 hours after the initial data times (0000 GMT and 1200 GMT) are given in both the EARLY and FINAL messages. The EARLY message also contains an additional forecast valid 6 hours after 0000 GMT (or 1200 GMT). These are

forecasts of 1-minute average winds at specific times throughout each day (i.e., 0000, 0600, 1200, or 1800 GMT). The direction and speed is encoded in a standard "ddff" format. Wind direction is given in tens of degrees and wind speed is given to the nearest whole knot. A calm wind is denoted by 0000, while 9999 indicates a missing forecast. The surface wind forecasts are explained more thoroughly in Technical Procedures Bulletin No. 229.

11. PROBABILITY OF CLOUD AMOUNT CATEGORIES (CLDS)

Forecasts of four categories of cloud amount (see table below) at 6 hour intervals from 6 to 48 hours after the initial data times (0000 GMT and 1200 GMT) are available in the EARLY message. The FINAL message contains forecasts for projections of 12 to 48 hours. All forecasts are valid for specific times throughout each day (i.e., 0000, 0600, 1200, or 1800 GMT).

The categorical probability forecasts for the four categories are rounded to the nearest 10 percent and displayed as four single digits to the left of the solidus (/). To the right of the solidus, a single digit (1, 2, 3, or 4) indicates the "best" category of cloud amount as chosen by the inflation technique. A missing forecast is indicated by a value of 9999. A value of "X" for one of the categories indicates that the forecast is unavailable because a prediction equation could not be developed. Technical Procedures Bulletin No. 234 contains additional information.

12. PROBABILITY OF CEILING HEIGHT CATEGORIES (CIG)

Forecasts of six categories of ceiling height (see table below) at 6 hour increments from 6 to 48 hours after the initial data times (0000 GMT and 1200 GMT) are available in the EARLY message. The FINAL message contains forecasts for projections of 12 to 48 hours. All forecasts are valid for specific times during each day (i.e., 0000, 0600, 1200, or 1800 GMT).

The categorical probability forecasts are rounded to the nearest 10 percent and displayed as six consecutive single digits under the column heading. A missing forecast is indicated by a value of 999999. A value of "X" for one of the categories indicates that the forecast is unavailable because a prediction equation could not be developed. Technical Procedures Bulletin No. 234 contains additional information.

13. PROBABILITY OF VISIBILITY CATEGORIES (VIS)

Forecasts of six categories of visibility (see table below) at 6 hour intervals from 6 to 48 hours after the initial data times (0000 GMT and 1200 GMT) are available in the EARLY message. The FINAL message contains forecasts for projections of 12 to 48 hours. All forecasts are valid for specific times during each day (i.e., 0000, 0600, 1200, or 1800 GMT).

The EARLY bulletin format.

1. For the 0000 GMT forecast cycle:

HDNG	FOUS12	MOS	FCSTS	EARLY GUIDANCE	10/15/78	0000 GMT
DATE/GMT	15/06	15/12	15/18	16/00	16/06	16/12 16/18 17/00
DCA POP06		30	60	70	100	80
POP12				100		100
QFF06		210/2	310/2	210/2		90
QFF24					9631/5	6420/3*
ISTM				48		39
PORT		0000/3	0000/3	0000/3	0000/3	0000/3
POSH			99 99/0			
MX/MN			71		45	71
TEMP	48 46	49 60	66 68	62 55	51 49	45 58 68 71 65 60
WIND	1714	1514	1411	1008	1309	1412 0717 0615
CLDS	0127/4	0119/4	0119/4	0128/4	0019/4	0039/4 0049/4 0237/4
CIG	000126	012224	X01431	X12232	024320	023330 X01440 X01242
VIS	000018	002125	X01116	X02116	001215	002125 X01117 X01117
C/V	5/6	5/6	4/5	4/3	1/4	2/6 3/3 3/3

Note: The * appears in the message to indicate this QFF24 forecast ends at 60 hours rather than 48 hours after 0000 GMT.

2. For the 1200 GMT forecast cycle:

HDNG	FOUS12	MOS	FCSTS	EARLY GUIDANCE	10/15/78	1200 GMT
DATE/GMT	15/18	16/00	16/06	16/12	16/18	17/00 17/06 17/12
DCA POP06		70	50	50	50	
POP12				100		60
QFF06		100/1	210/1	210/2		70
QFF24						6410/4
ISTM				36		42
PORT		0000/3	0000/3	0000/3	0000/3	0000/3
POSH			99 99/0			
MX/MN			48		71	55
TEMP	69 69	62 55	51 49	55 65	69 70	65 60 58 56 62 70
WIND	1208	0609	0703	0606	0713	0911 1412 0610
CLDS	0039/4	0119/4	0029/4	0029/4	0059/4	0137/4 0129/4 0029/4
CIG	X01440	X12331	012340	023330	X01560	X12232 012330 012231
VIS	X01018	X02116	001225	002115	X01018	X01018 001215 001116
C/V	4/6	4/6	4/5	2/6	3/6	3/6 2/4 3/6

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The categorical probability forecasts are rounded to the nearest 10 percent and presented as six consecutive single digits under the column heading. A missing forecast is indicated by a value of 999999. A value of "X" for one of the categories indicates that the forecast is unavailable because a prediction equation could not be developed. Technical Procedures Bulletin No. 234 contains additional information.

14. BEST CATEGORY OF CEILING AND VISIBILITY (C/V)

The forecast of "best" category for ceiling and visibility is derived from the six-category probability forecasts (CIG and VIS) by use of a threshold probability technique. The best category guidance is indicated by a single digit corresponding to the CIG or VIS categories defined above. The forecasts are valid every 6 hours from 6 to 48 hours after initial data time (0000 GMT or 1200 GMT) on the EARLY bulletin and from 12 to 48 hours after initial data time on the FINAL. The format of the forecast is C/V with the ceiling category (C) shown on the left and the visibility category (V) shown on the right. A missing forecast is indicated by 9/9. For more information concerning this element see Technical Procedures Bulletin No. 234.

The FOUS12 bulletin is available on both Request/Reply (R/R) and the KCRT system. For R/R call:

ZCZC
iii RQ HDNG FO12 DCA FO12
NNNN

In this format the "iii" is the station identifier of the originating station. DCA is given as a sample station; the call letters for any of the stations now receiving the bulletin could be used. In fact, requests may be made in a single request format for up to six stations as:

ZCZC
iii RQ HDNG FO12 DCA FO12 LGA FO12 JFK
FO12 ALB FO12 EKN FO12 RIC FO12 NNNN

On the KCRT System simply request: FO12 DCA or replace DCA with any station needed.

On AFOS System:
type:
and depress:

FPCxxx
ENTER

xxx is location identifier

The FINAL bulletin format.

1. For the 0000 GMT forecast cycle:

HDNG	FOUS12	MOS	FCSTS	FINAL	GUIDANCE	10/15/78	0000	GMT
DATE/GMT	15/12	15/18	16/00	16/06	16/12	16/18	17/00	17/12
DCA POP06		80	60	60	60			
POP12			100		90		90	60
QPF06		421/4	320/3	310/3				
QPF24					8631/5			4210/3
POF	0	0	0	0	0	0	0	0
CLDS	0039/4	0039/4	0118/4	0129/4	0029/4	0048/4	0235/4	
CIG	012222	X13450	X12331	012321	023330	X01441	X01244	
VIS	002225	X02116	X02107	001215	002115	X01117	X01118	
C/V	4/6	3/3	3/3	2/4	3/6	3/3	4/6	
WIND	0610	0713	0713	0414	0311	0611	0511	

2. For the 1200 GMT forecast cycle:

HDNG	FOUS12	MOS	FCSTS	FINAL	GUIDANCE	10/15/78	1200	GMT
DATE/GMT	16/00	16/06	16/12	16/18	17/00	17/06	17/12	18/00
DCA POP06		100	100	60	50			
POP12			100		80		80	60
QPF06		320/3	310/2	310/3				
QPF24							7520/3	
POF	0	0	0	0	0	0	0	0
CLDS	0009/4	0029/4	0019/4	0148/4	0127/4	0129/4	0128/4	
CIG	X13340	011331	023320	X02430	X12232	022330	022221	
VIS	X03115	001225	002225	X01116	X01117	001225	002126	
C/V	4/4	4/4	3/5	3/5	3/6	2/4	3/6	
WIND	1220	0921	0515	1014	0514	0211	0112	

STATION LISTS

A. Eastern Region

BDL	BDR	ILG	DCA	BGR	CAR	PWM
BWI	BOS	ACK	CON	ACY	EWR	ALB
BGM	BUF	JFK	LGA	MSS	ROC	SYR
ISP	AVL	CLT	GSO	HAT	ILM	RDU
CAK	CLE	CMH	CVG	DAY	TOL	YNG
ABE	AVP	BFD	ERI	HAR	IPT	PHL
PIT	PSB	PVD	CAE	CHS	GSP	BTV
IAD	LYH	ORF	RIC	ROA	WAL	BKW
CRW	EKN	HTS				

B. Southern Region

BHM	HSV	MGM	MOB	FSM	LIT	JBR
TXK	AQQ	DAB	EYW	FMY	JAX	MIA
ORL	PBI	PNS	TLH	TPA	AGS	AHN
ATL	CSG	MCN	SAV	BTR	BVE	ESF
LCH	MSY	SHV	GWO	JAN	MEI	MCB
CAO	ABQ	FMN	ROW	TCC	TCS	ZUN
DMN	GAG	MLC	HBR	OKC	TUL	BNA
CHA	MEM	TRI	TYS	ABI	ACT	AMA
AUS	BRO	CRP	DAL	DFW	DRT	ELP
LBB	LFK	MAF	SAT	SJT	SPS	VCT
IAH	GLS	BPT	LAL			

C. Central Region

COS	DEN	GJT	PUB	ALS	MLI	PIA
RFD	SPI	CIR	MDW	ORD	EVV	FWA
IND	SBN	ALO	BRL	DBQ	DSM	MCW
SUX	CNK	DDC	GLD	ICT	RSL	TOP
LEX	SDF	APN	DTW	FNT	GRR	HTL
LAN	MKG	SSM	TVC	MQT	DLH	INL
MSP	RST	STC	COU	SGF	STJ	STL
MCI	OFK	BFF	GRI	LBF	OMA	LNK
VTN	BIS	FAR	ISN	MOT	ABR	FSD
HON	PIR	RAP	EAU	GRB	LSE	MKE
MSN	CPR	CYS	LND	RKS	SHR	

D. Western Region

FLG	INW	PHX	TUS	YUM	EKA	ACV
BFL	DAG	FAT	LAX	LGB	OAK	POM
RBL	SBA	SAC	SAN	SCK	SFO	SMX
BIH	BOI	PIH	LWS	BIL	FCA	GGW
GTF	HLN	HVR	MSO	ELY	LAS	LOL
RNO	TPH	WMC	EKO	AST	BNO	EUG
MFR	OTH	PDT	PDX	RDM	SLE	BCE
CDC	ENV	SLC	ALW	GEG	OLM	SEA
UIL	YKM					