WESTERN REGION TECHNICAL ATTACHMENT
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USING VARIED ENHANCEMENT CURVES TO BETTER EVALUATE FOG AND STRATUS WITH RAMSDIS

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Many examples and uses of the fog-reflectivity product imagery derived from the GOES-8 and GOES-9 imager have been recently documented. (See NWS Western Region TA-Lites 96-1, 96-4, 96-8 and 96-15, and TA 95-25.) Detection of fog and stratus using the RAMSDIS fog-reflectivity product has proven to be an invaluable tool for forecast operations, not only in detecting fog and stratus, but also in distinguishing cloud phase, forest fires and snow cover vs. stratus when used in conjunction with other imager channels. Furthermore, the ability to toggle RAMSDIS's enhancement curves on a given image loop can be significant in making optimum qualitative use of the fog-reflectivity product.

During the nighttime hours, the fog product is displayed on the RAMSDIS fog/reflectivity loop. The default enhancement is a grey, or SVGAVIS (hereafter referred to as VIS), enhancement curve. Figure 1 shows two areas of fog and stratus at 0630 UTC, 11 December 1997, in eastern Oregon and southern Idaho; the first extending from near La Grande, OR (LGD) southward to Rome, OR (P88), and the second from south of Mountain Home AFB, ID (MUO) eastward to near Pocatello, ID (PIH). (Corresponding 0600 UTC surface observations can be found in Table 1.) The VIS enhancement makes it difficult not only to determine the depth of the fog/stratus layer but also to better recognize where development or dissipation of fog/stratus may be occurring. Figure 2 displays the same image with the RAMSDIS fog, or SVGAFOG (hereafter referred to as FOG) enhancement curve. The image with the FOG enhancement more clearly shows the following: (1) The thickest fog/stratus is near Twin Falls, ID (TWF); (2) A region of thinner stratus is present across much of northern Nevada (Surface observations from Winnemucca, NV (WMC) and Elko, NV (EKO) listed in Table 2 confirm this); (3) There is a break in the fog between Burley ID (BYI) and PIH, which was not as apparent with the VIS enhancement.

Conversely, during daylight hours the reflectivity product is displayed on the RAMSDIS fog/reflectivity loop. Figure 3 displays the FOG enhancement at 1900 UTC the same day. Certainly fog and stratus are still discernible through much of the Snake River Valley from PIH into eastern Oregon, confirmed by surface observations in Table 3. It is unclear, however, if the imagery is suggesting the presence of fog farther south between P88 and WMC. The same image with VIS enhancement (Fig. 4) indicates a marked difference

between this region and the stratus to the north, making a clearer distinction between fog/stratus and cloud-free regions during daylight hours. Furthermore, examination of the 1900 UTC visible image (Fig. 5) verifies the absence of clouds or snow cover in the area between P88 and WMC, with snow cover evident over southwestern Idaho and south central Oregon.

This example implies that the fog/reflectivity product can be evaluated with greater certainty if forecasters are able to toggle between the VIS and FOG enhancement curves when displaying the RAMSDIS loop. By pressing Alt-F9 on the RAMSDIS keyboard, the VIS enhancement curve is displayed on the current loop. Here's how your RAMSDIS focal point can implement a hotkey which will change the enhancement curve of the current loop to the FOG enhancement:

(1) At the RAMSDIS keyboard, press Ctrl-Esc to return to the OS2 desktop.

(2) Double click on the "OS2 Window" icon.

(3) Go to the data directory by typing:
CD MCIDAS\DATA

(4) Open the file which contains the Alt-F* hotkey commands (KEYAF.CMD):
E KEYAF.CMD

(5) Insert the following line at the top of the document:
TE KEYAF4 "EU REST SVGAFOG LOOP=YES
(This will set up the Alt-F4 key for the FOG enhancement curve)

(6) Save the file, exit the OS2 window and return to RAMSDIS by double-clicking the MCIDAS icon on the desktop.

(7) At the applications terminal (monochrome screen), type the following to activate the Alt-F4 macro:
"KEYAF.CMD

RAMSDIS is now enabled to toggle between the VIS (Alt-F9 key) and FOG (Alt-F4 key) enhancement curves.

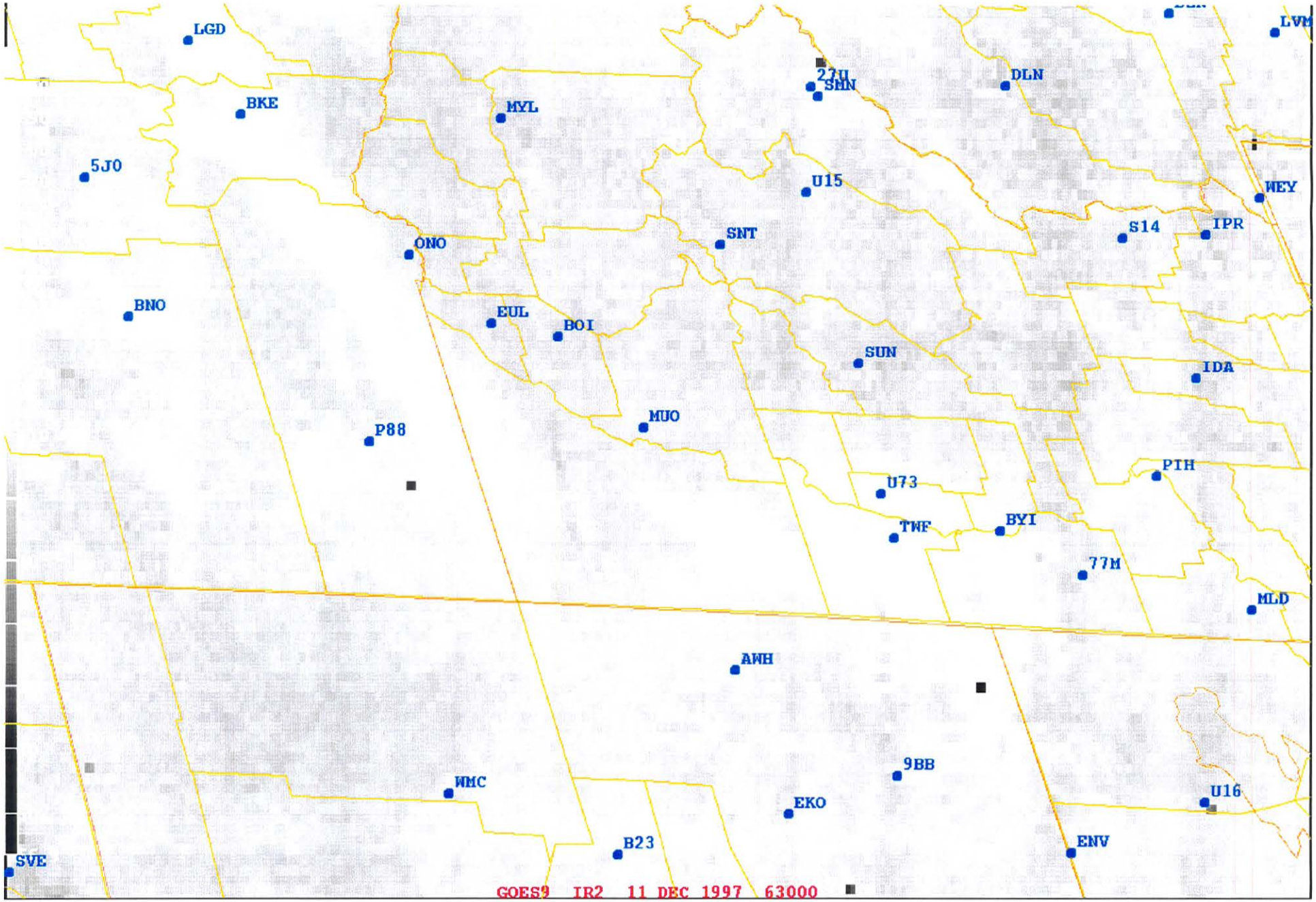

Fig. 1. GOES-9 Fog/reflectivity product image (RAMSDIS grey enhancement curve) for 0630 UTC 11 December 1997.

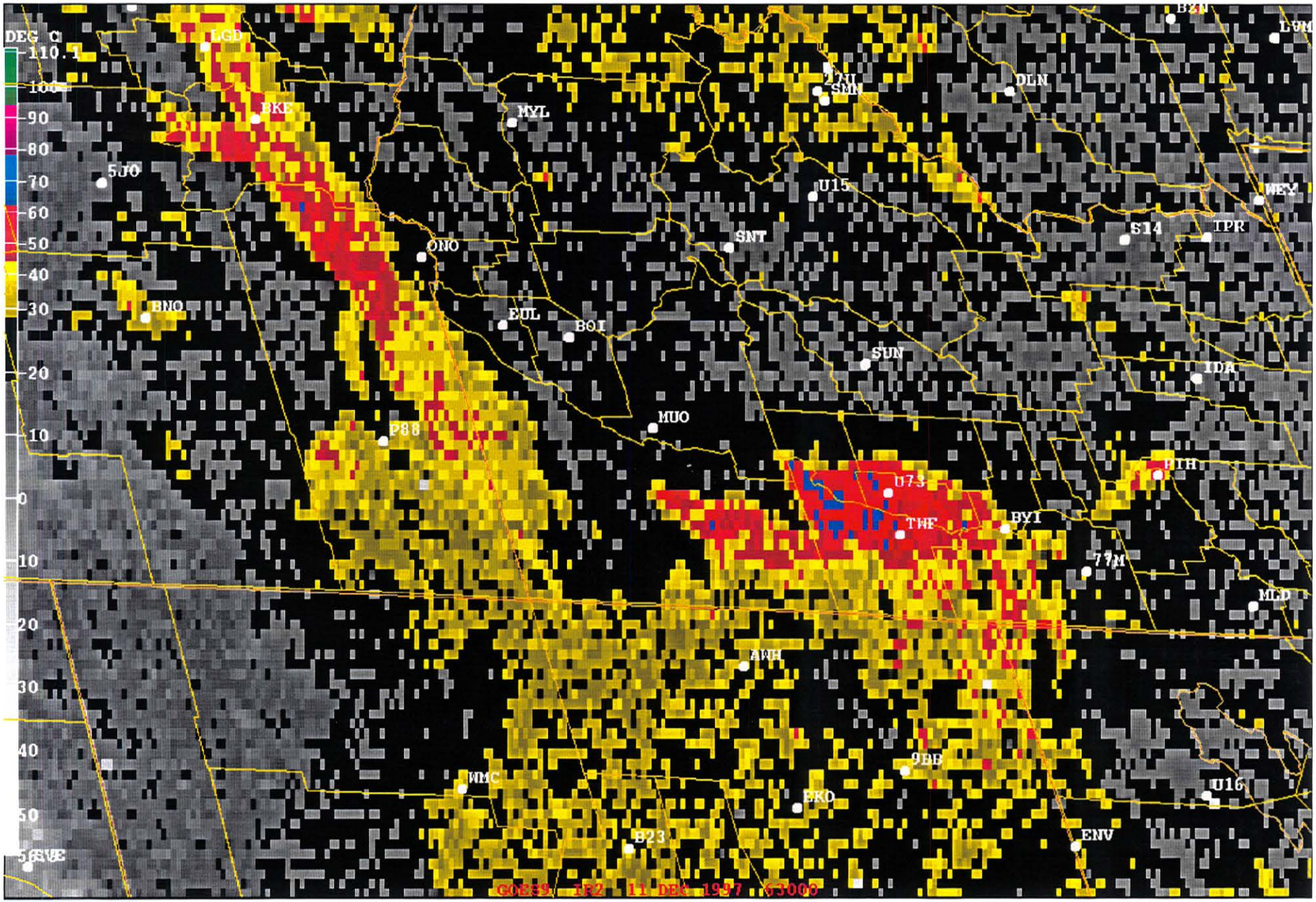

Fig. 2. GOES-9 Fog/reflectivity product image (RAMSDIS fog enhancement curve) for 0630 UTC 11 December 1997.

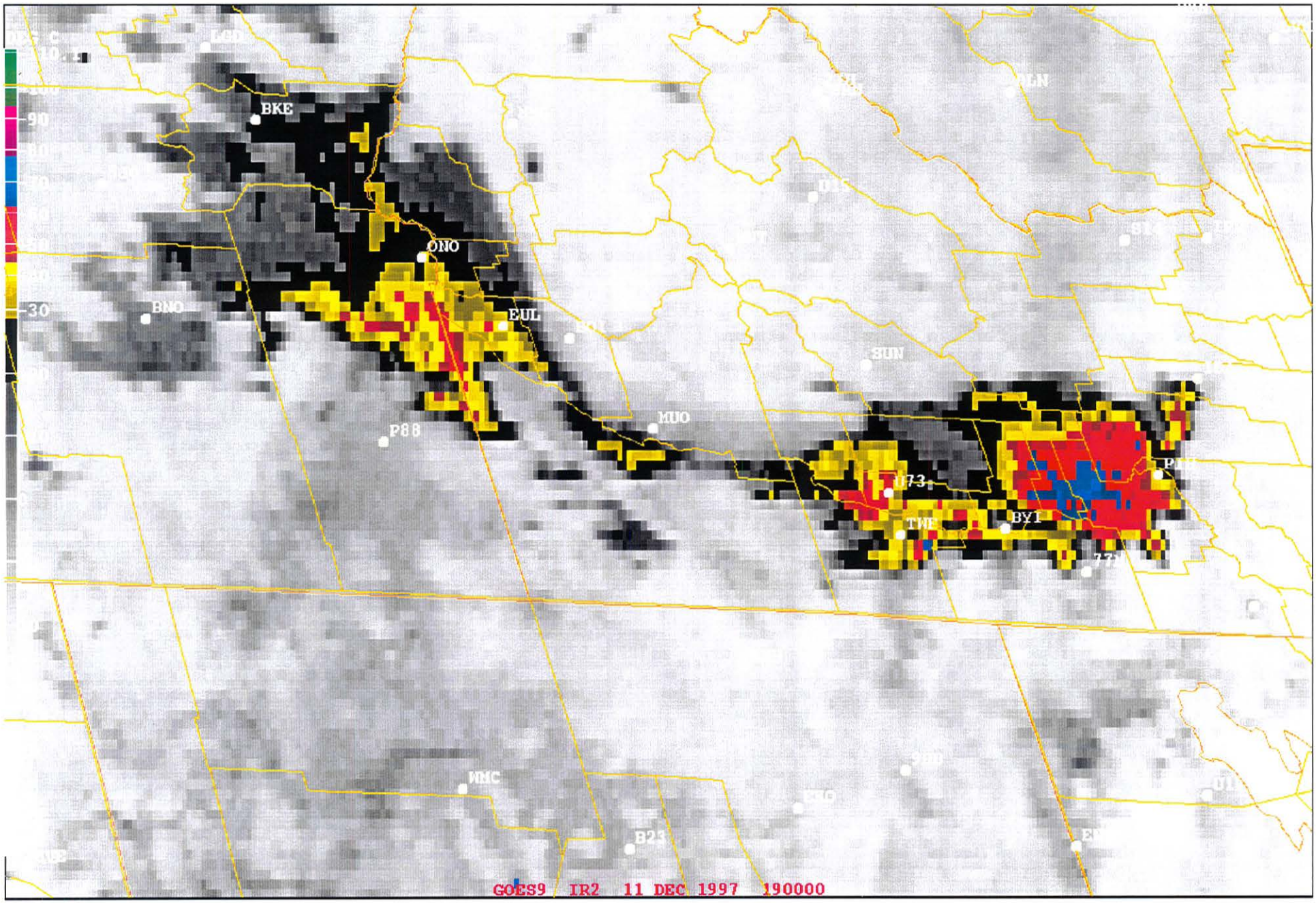

Fig. 3. GOES-9 Fog/reflectivity product image (RAMSDIS fog enhancement curve) for 1900 UTC 11 December 1997.

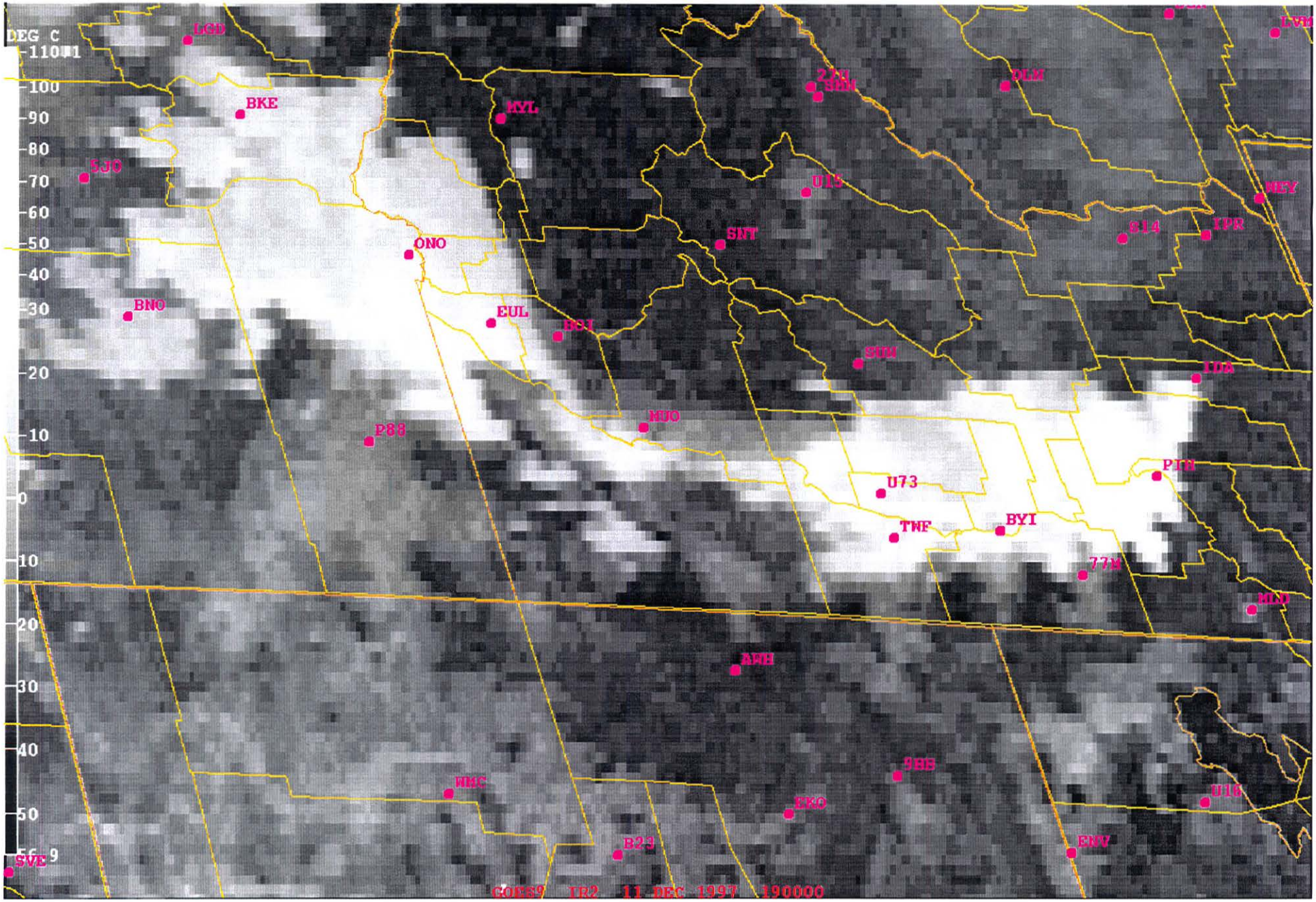

Fig. 4. GOES-9 Fog/reflectivity product image (RAMSDIS grey enhancement curve) for 1900 UTC 11 December 1997.

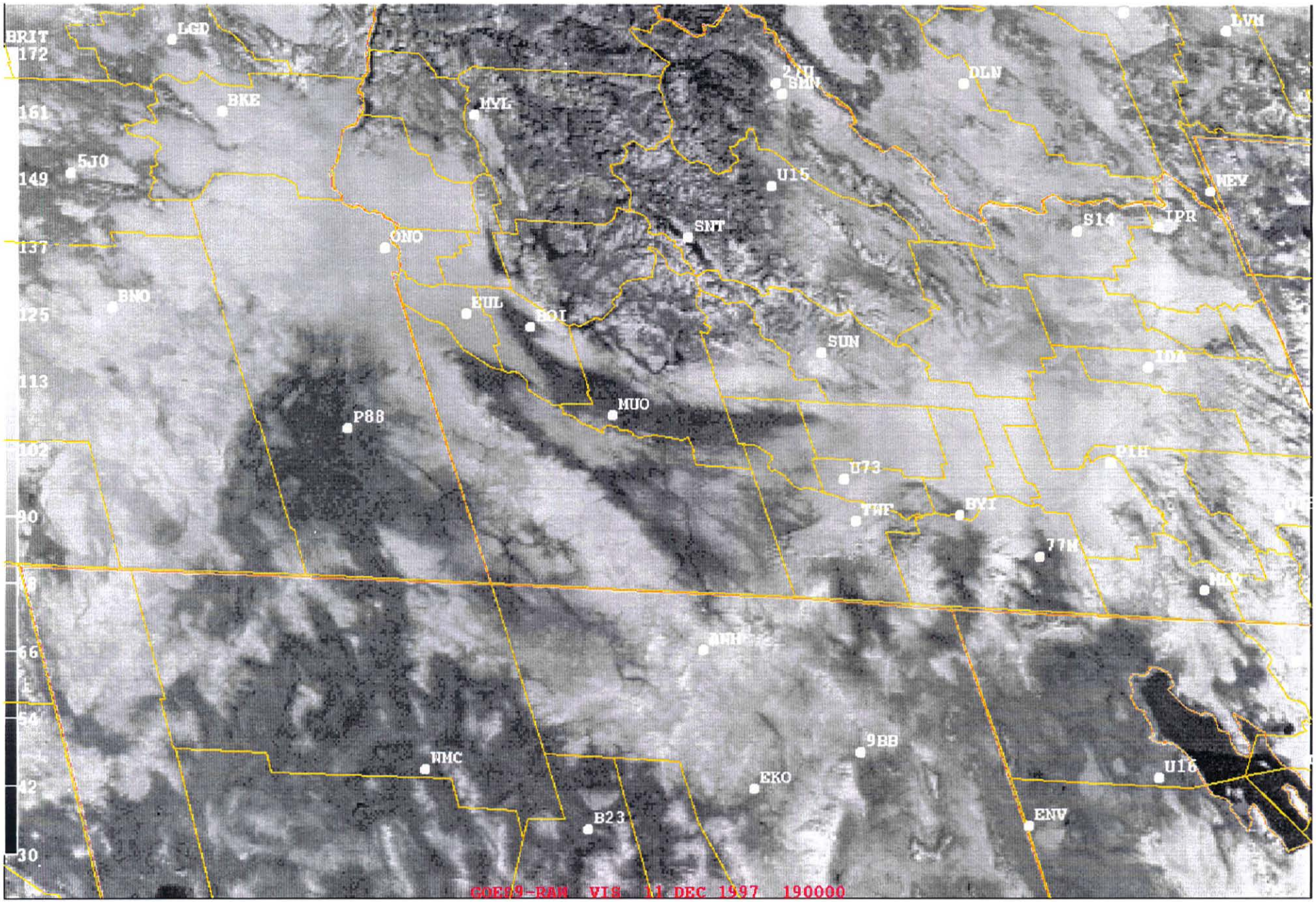

Fig. 5. GOES-9 Visible image for 1900 UTC 11 December 1997.

SURFACE OBSERVATIONS FOR OR/ID/NV FOR 0600 UTC 11 DECEMBER 1997

OREGON

DDHHMM	ID	T	TD	WIND	GG	PSL	VIS	WX	SKY COVER
110550	BKE	26	25	0000		1040.3	10.0		SCT009 SCT013 BKN035
110553	BNO	18	16	3603		1038.6	10.0		OVC002
110555	LGD	30	30	0000		1040.0	3.5		SCT005 SCT015 OVC030
110553	ONO	26	22	3603		1041.7	10.0		CLR

IDAHO

DDHHMM	ID	T	TD	WIND	GG	PSL	VIS	WX	SKY COVER
110556	BOI	23	20	1403		1039.3	10.0		CLR
110548	BYI	23	19	0603		1037.9	10.0		CLR
110555	MUO	23	23	3312		1038.9	6.0	F	CLR
110556	PIH	11	6	0000		1037.6	4.0	H	BKN003 OVC007
110545	SUN	9	-6	0000		1035.9	10.0		CLR
110553	TWF	27	26	2606		1037.9	10.0		OVC007
110553	U73	27	24	1703		1037.9	10.0		OVC008

NEVADA

DDHHMM	ID	T	TD	WIND	GG	PSL	VIS	WX	SKY COVER
110540	AWH	25	8	3513					OVC020
110556	WMC	28	25	0000		1038.3	10.0		OVC045

Table 1. Surface Observations for Oregon-Idaho-Nevada region, 0600 UTC 11 December 1997. Weather elements are: Time, station ID, temperature (F), dew-point temperature (F), packed wind direction and speed (knots), visibility (statute miles), present weather and sky condition.

SURFACE OBSERVATIONS FOR WINNEMUCCA, NV, (WMC) FOR 11 DECEMBER 1997

DDHHMM	ID	T	TD	WIND	GG	PSL	VIS	WX	SKY COVER
102356	WMC	35	25	0000		1036.2	10.0		OVC037
110056	WMC	32	25	1003		1036.6	10.0		OVC039
110156	WMC	32	26	0000		1037.2	10.0		OVC039
110256	WMC	31	26	0503		1037.6	10.0		OVC045
110356	WMC	31	26	3406		1037.9	10.0		OVC045
110456	WMC	30	25	3603		1038.3	10.0		OVC045
110556	WMC	28	25	0000		1038.3	10.0		OVC045
110656	WMC	28	24	0000		1038.9	10.0		OVC045
110756	WMC	25	23	3003		1038.9	10.0		SCT043
110856	WMC	25	23	0603		1039.3	10.0		OVC043
110956	WMC	27	24	0000		1040.0	10.0		OVC043
111056	WMC	24	22	0000		1039.6	10.0		BKN043
111156	WMC	23	22	0000		1039.3	10.0		BKN041
111256	WMC	20	19	3504		1039.6	10.0		CLR
111356	WMC	18	16	1704		1040.3	10.0		CLR
111456	WMC	18	16	1004		1040.3	10.0		CLR
111556	WMC	17	15	0000		1040.6	10.0		CLR
111656	WMC	27	23	0000		1041.0	10.0		CLR
111756	WMC	31	25	1505		1041.0	10.0		CLR
111856	WMC	35	24	0000		1040.3	10.0		CLR

SURFACE OBSERVATIONS FOR ELKO, NV, (EKO) FOR 11 DECEMBER 1997

DDHHMM	ID	T	TD	WIND	GG	PSL	VIS	WX	SKY COVER
102355	EKO	30	18	2905		1034.5	10.0		BKN029
110055	EKO	28	19	2505		1034.9	10.0		OVC040
110155	EKO	28	19	2805		1035.2	10.0		OVC036
110255	EKO	28	19	2308		1035.5	10.0		OVC036
110355	EKO	28	21	2509		1035.5	10.0		OVC040
110455	EKO	28	21	2606		1035.9	10.0		OVC038
110655	EKO	27	19	2003		1036.6	10.0		BKN036
110755	EKO	27	21	0000		1036.9	10.0		OVC036
110855	EKO	27	21	0000		1037.2	10.0		OVC036
110955	EKO	27	19	3304		1037.6	10.0		OVC036
111055	EKO	25	18	3506		1038.3	10.0		BKN034
111155	EKO	21	16	1003		1038.6	10.0		CLR
111255	EKO	18	14	0904		1038.6	10.0		CLR
111355	EKO	14	10	0000		1039.3	10.0		CLR
111455	EKO	14	9	1006		1039.6	10.0		CLR
111555	EKO	18	14	0803		1038.9	10.0		CLR
111655	EKO	21	14	0000		1040.0	10.0		CLR
111755	EKO	27	18	2004		1040.6	10.0		CLR
111855	EKO	30	18	2109		1040.0	10.0		CLR

Table 2. Surface Observations for Winnemucca, NV (WMC) and Elko, NV (EKO), 0000-1900 UTC 11 December 1997. Weather elements are as in Table 1.

SURFACE OBSERVATIONS FOR OR/ID/NV FOR 1900 UTC 11 DECEMBER 1997

OREGON

DDHHMM	ID	T	TD	WIND	GG	PSL	VIS	WX	SKY COVER		
111858	5J0	34	27	3202		1040.0	30.0		SCT120		
111850	BKE	31	28	1109		1041.3	10.0		SCT008	OVC017	
111853	BNO	23	22			1040.3	0.3	ZF	OVC001		
111855	LGD	36	28	1715	21	1040.6	10.0		SCT026		
111853	ONO	29	25	0000		1045.0	9.0		SCT027	OVC038	

IDAHO

DDHHMM	ID	T	TD	WIND	GG	PSL	VIS	WX	SKY COVER		
111856	BOI	31	21	1408		1043.0	10.0		CLR		
111853	BYI	32	21	0208		1041.7	30.0		BKN020		
111847	IDA	7	5	0305		1042.0	7.0		SCT005	SCT025	BKN100
111855	MUO	28	27			1043.0	15.0		SCT030	SCT110	
111856	PIH	18	14	0606		1041.7	2.0	F	OVC005		
111845	SUN	18	7	0000		1038.9	30.0		SCT170		
111853	TWF	30	25	3007		1041.3	10.0		SCT020	BKN025	
111853	U73	26	20	0408		1041.7	10.0		OVC020		

NEVADA

DDHHMM	ID	T	TD	WIND	GG	PSL	VIS	WX	SKY COVER
111855	EKO	30	18	2109		1040.0	10.0		CLR
111856	WMC	35	24	0000		1040.3	10.0		CLR

Table 3. Surface Observations for Oregon-Idaho-Nevada region, 1900 UTC 11 December 1997. Weather elements are as in Table 1.