

PACIFIC REGION TECHNICAL NOTES

81-018
August 26, 1981

The PUPA Program

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The satellite group of the Pacific Weather Centre has initiated the Pacific Upper air Analysis program or the PUPA program.

At present the two main goals of the PUPA program are:

- a) To generate internal office "reference fields". Using these fields the duty prognostication may evaluate the model initial fields.
- b) To provide training and develop more expertise in support of any future PWC-CMC bogussing program.

To date the Satellite Meteorologists have acquired considerable expertise inferring features of the wind field from the evolving cloud patterns as seen on the satellite still imagery and the animated sequences. The Satellite Analysis Chart depicts the "system cloud patterns" and the important wind field features. The Satellite EXCN/4 verbally describes these depicted features. Both the Satellite Analysis Chart and the Satellite FX are routinely issued every six hours and are valid on the main synoptic hours. Figure 1 shows a Satellite Analysis Chart valid at 0615Z, August 24, 1981.

The Satellite Meteorologists now have the benefit of AIREP and TOVS data mapped automatically on 1:10 million polar stereographic maps. Examples are shown in Figures 2-5. The AIREP program uses reports within a layer of 10 thousand feet centered at 35 thousand feet. The assumption is made that the data is valid at 250 mb. The time window is ± 2 hours of the main synoptic hour. The TUXN program has a time window of ± 3 hours.

PUPA PROCEDURE

- A. Using the PWC Surface Analysis Chart a PWC 1000 mb chart is produced (FIELD A).
- B. On the map of AIREPS and Satellite winds, the features of the Satellite Analysis Chart are transposed. The streamlines and isotachs at 250 mb are drawn (FIELD B).
- C. Using the TOVS 1000-250 mb Thickness data a Thickness field is generated (FIELD C). Field B is used as an underlay guidance. Care is taken to ensure that the thickness lines tend to run parallel to strong jets and the thickness gradient

increases near wind maxima.

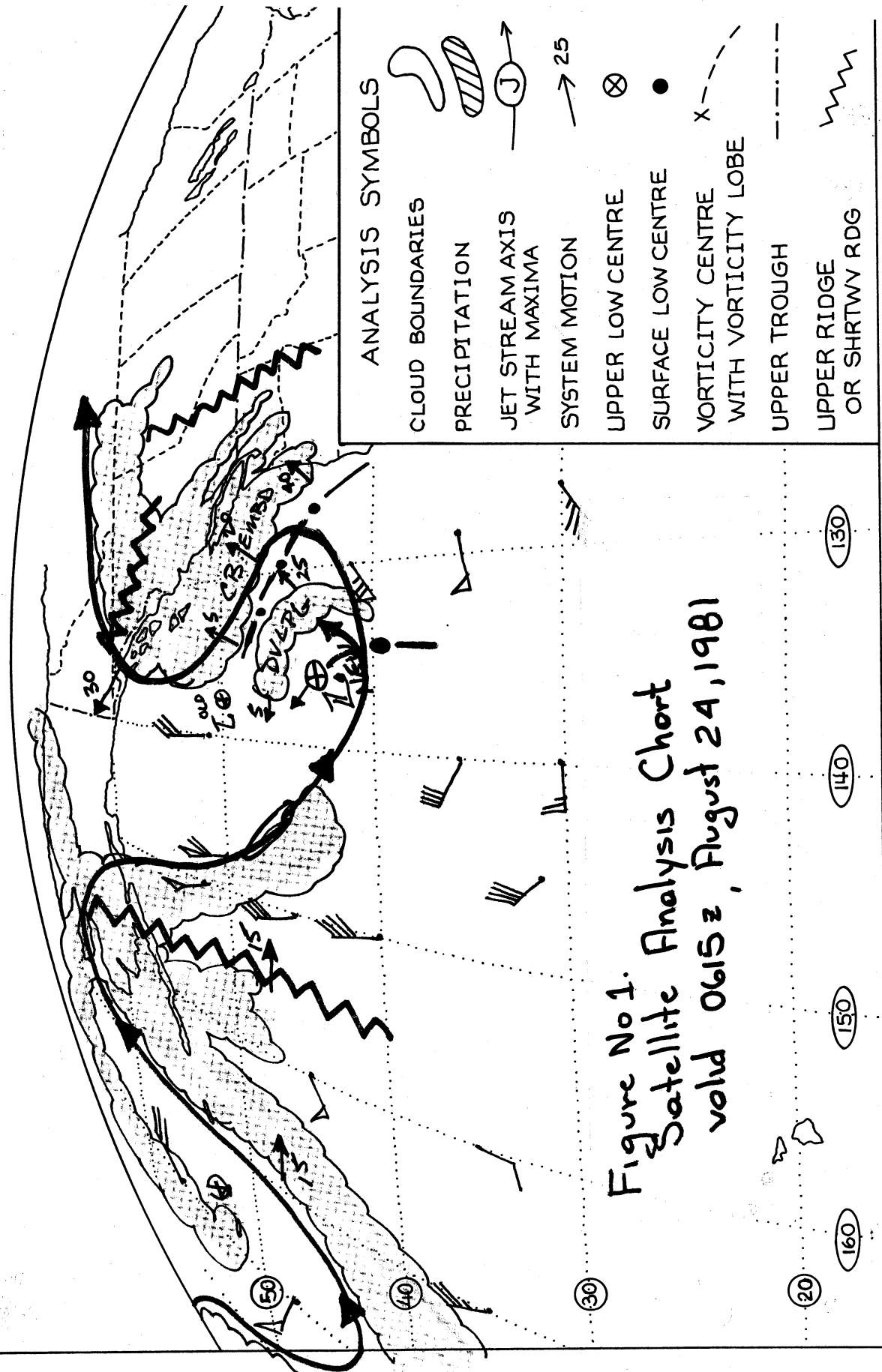
- D. Using Fields A and C, a 250 mb contour field (D) is generated by graphical addition. The fields B and D are made compatible. Note is made of the deviations away from the absolute acceptance of the TOVS Thickness values.
- E. Using the TOVS 1000-500 mb Thickness data a 1000-500 mb Thickness field is generated (E). Consideration is given to the "deviations" mentioned in D. The field is made meteorologically compatible with D.
- F. Using fields A and E, a 500 mb contour field is generated by graphical addition (F).
- G. Using the Satellite Analysis Chart, the areal extent of the major cloud system are depicted. The Precipitable water contours are obtained using the TOVS data and the system cloud areas as guidance. (Field G)

PUPA PRODUCTS

In reality, some of the fields are overlaid on the same chart. The final products are:

- CHART A. 250 mb Streamline Analysis and Isotachs with Satellite Analysis Chart Features Depticted (Figure 2).
- CHART B. 250 mb Contour Field with 1000-250 mb Thickness Field on mapped 1000-250 mb Thickness data (Figure 3).
- CHART C. 500 mb Contour Field with 1000-500 mb Thickness Field on mapped 1000-500 mb Thickness data (Figure 4).
- CHART D. System Cloud Nephanalysis with Precipitable water isopleth field. (Figure 5)

SATELLITE ANALYSIS CHART VALID 0615Z 24 AUG 81



by Larry Funk, Meteorologist, PwC.

30/40 FT. WIND & TEMP.
SATELLITE & AIRREP INFO.
AUGUST 24 1981 0600Z
PACIFIC NORTHERN CENTRE
ATMOSPHERIC DATA

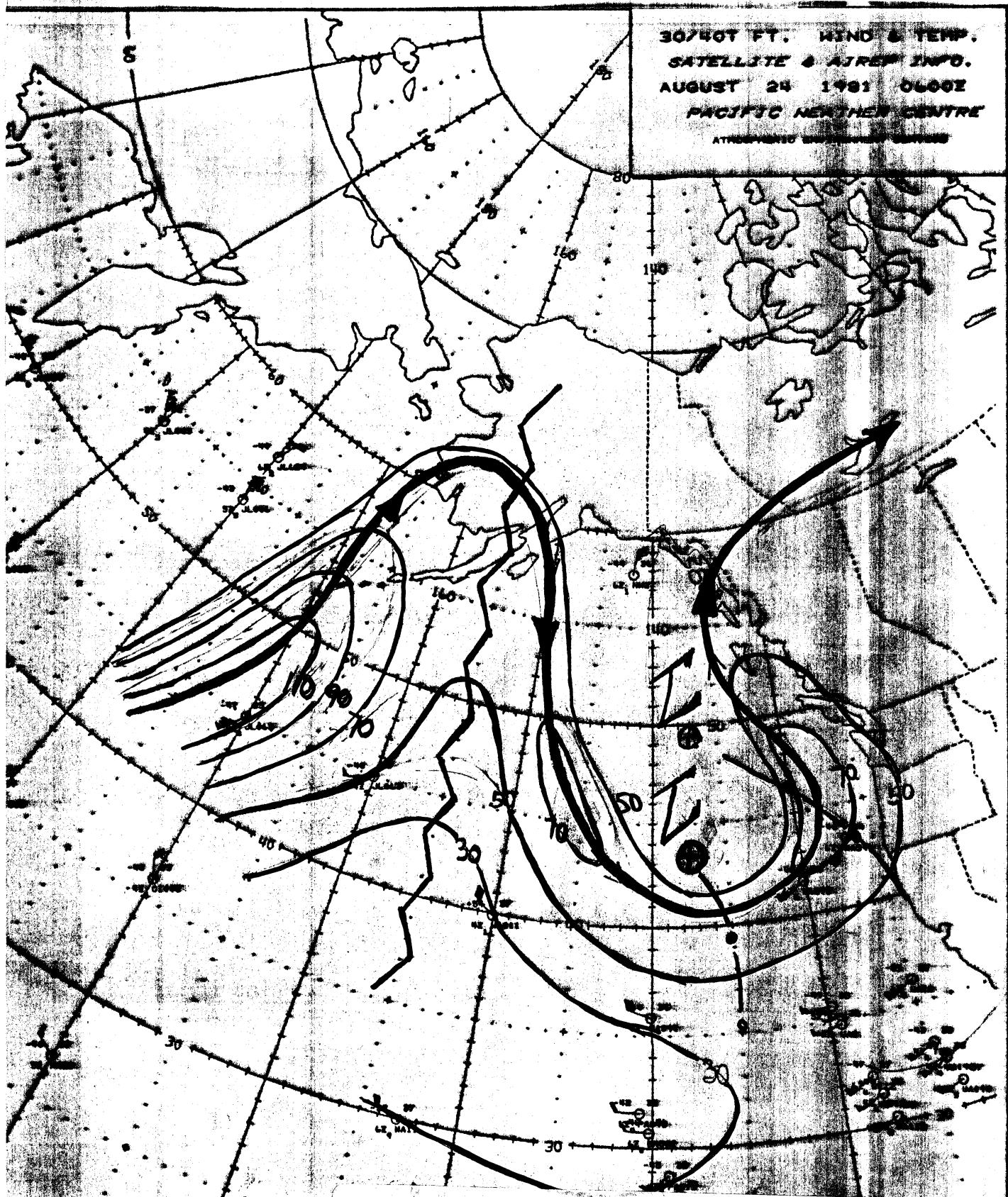
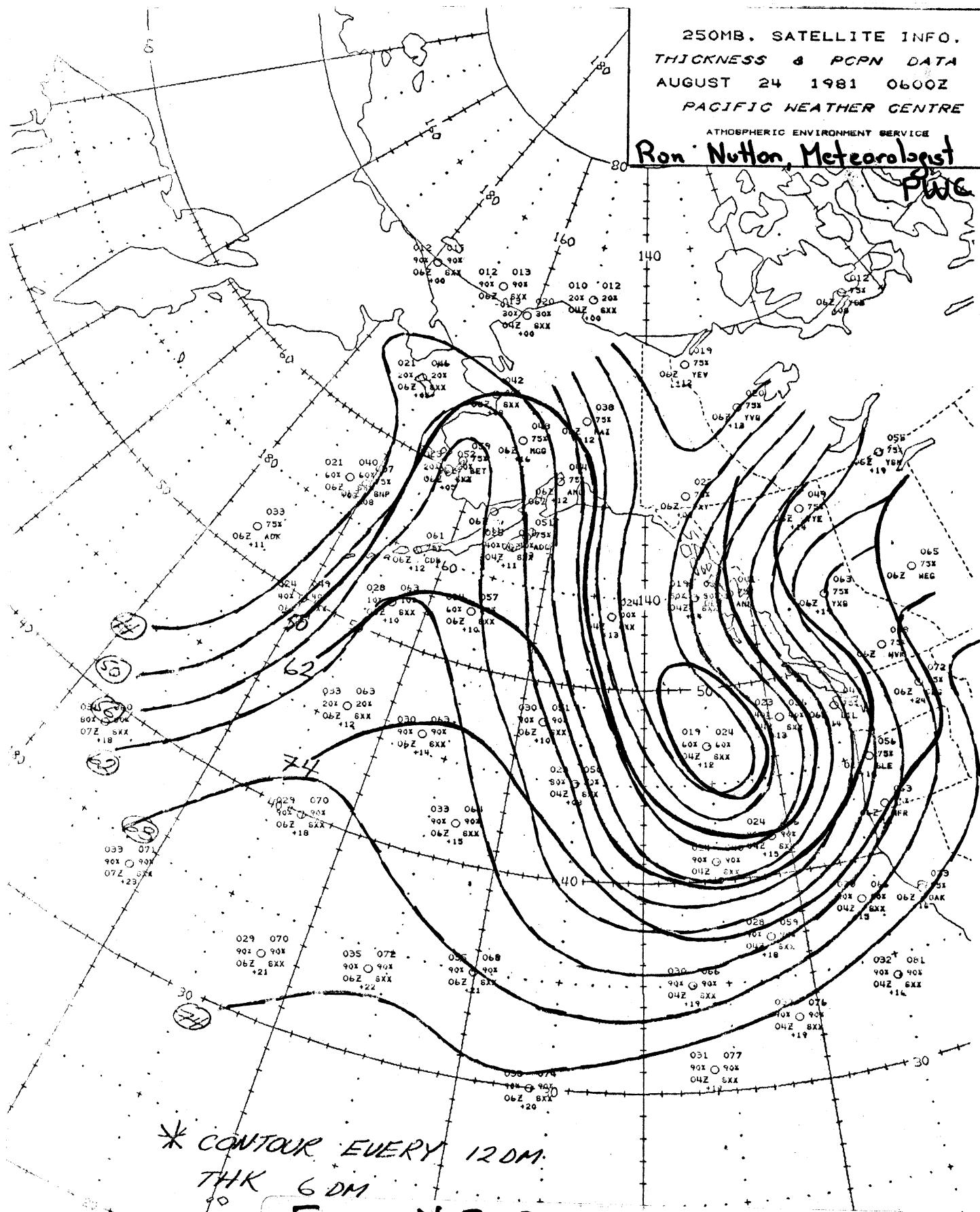


Figure No 2.
Jet Stream Analysis
with Isotachs

250MB. SATELLITE INFO.
THICKNESS & PCPN DATA
AUGUST 24 1981 0600Z
PACIFIC WEATHER CENTRE

ATMOSPHERIC ENVIRONMENT SERVICE
Ron Nutton, Meteorologist



* CONTOUR EVERY 12 DM
THK 6 DM

Figure No 3. 250 mb Contours and
1000-250mb
Thickness Lines

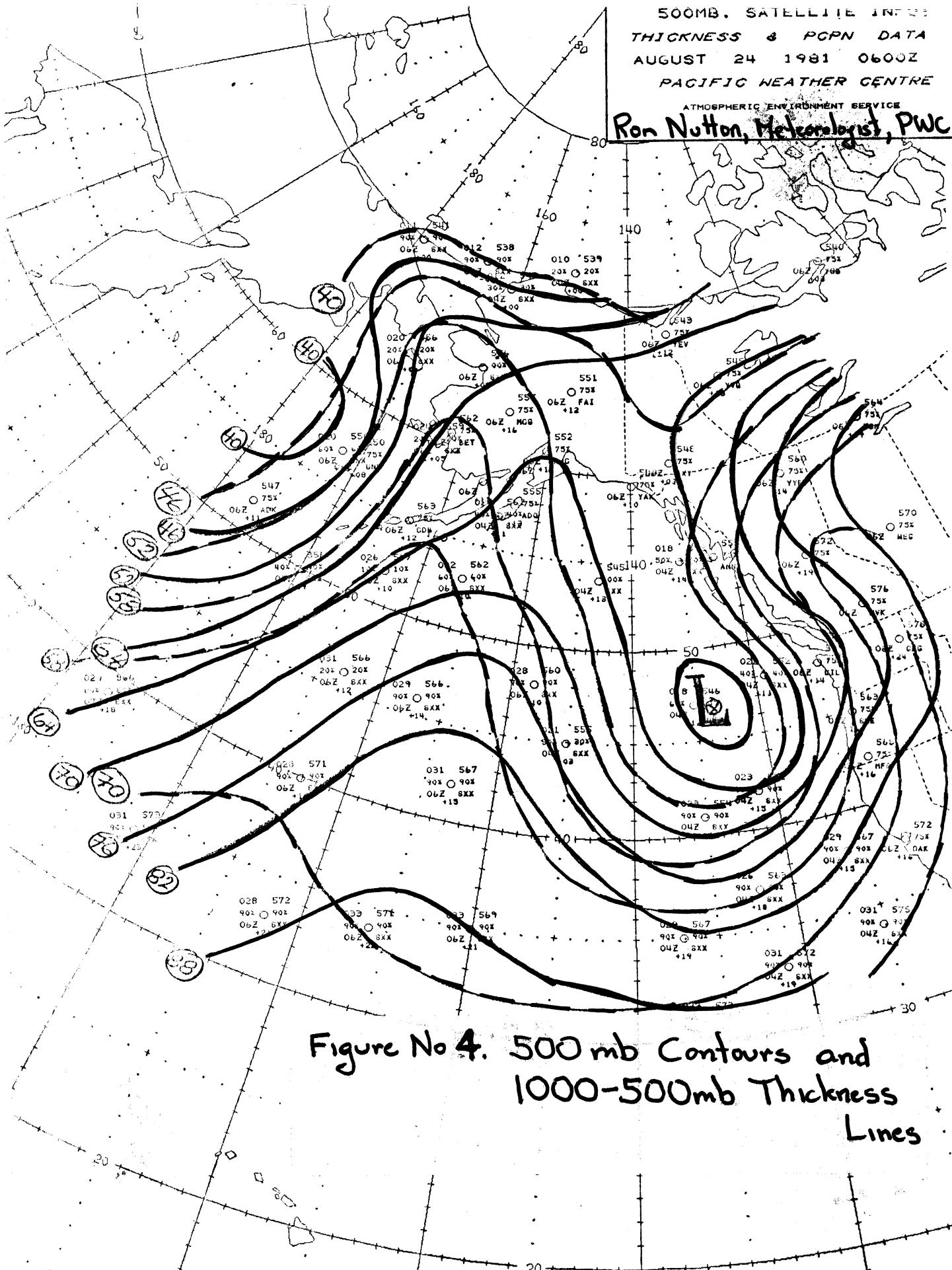


Figure No 4. 500 mb Contours and
1000-500mb Thickness
Lines

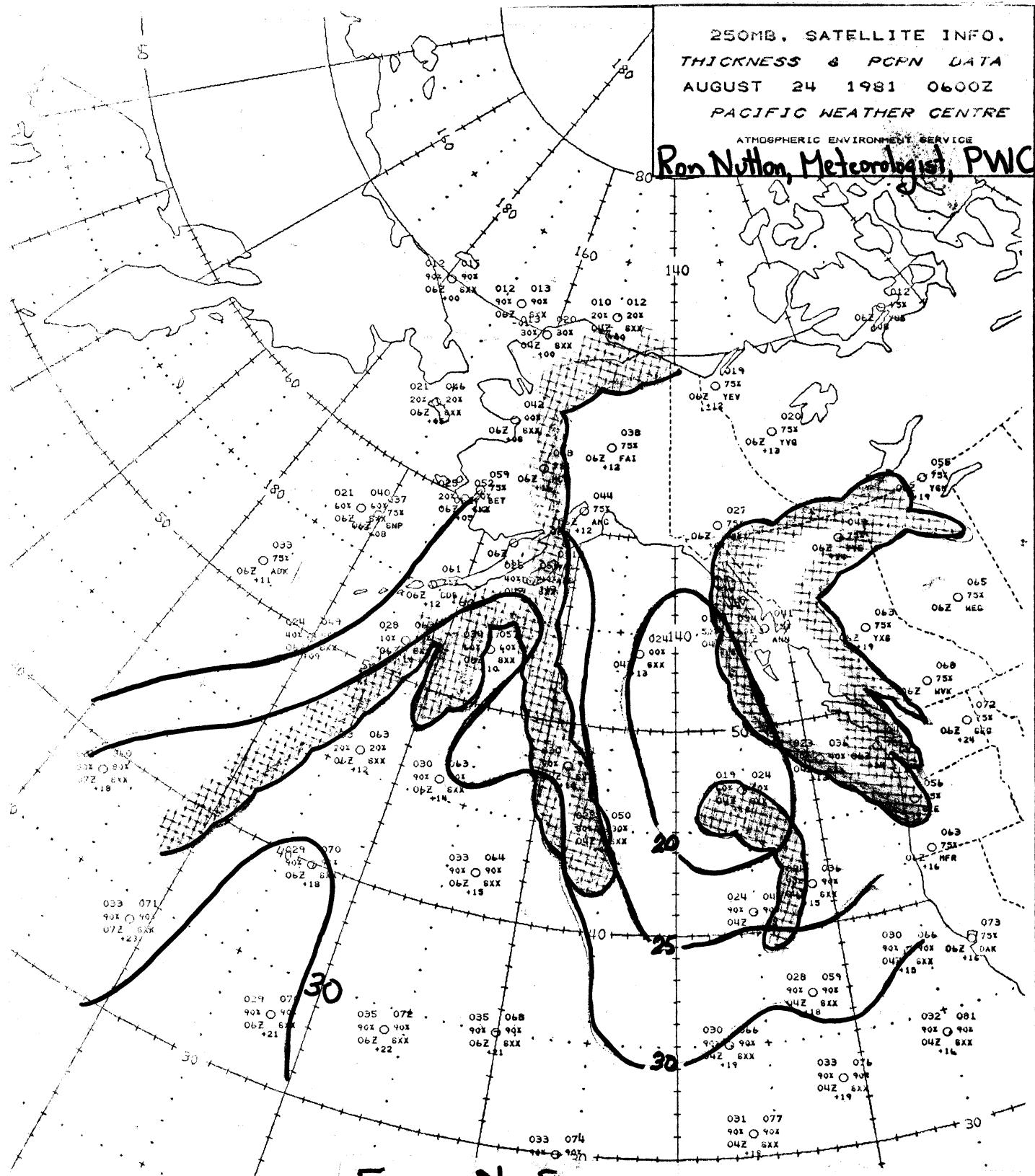


Figure No 5.
System Cloud Nephanalysis
and
Precipitable Water Contours