

IC6.5: Optional Job Sheet--Version 2

Snowfall Forecasting

Objective: Utilize BUFKIT and the internet to assess potential snow ratios using the techniques discussed in the Winter Weather AWOC IC 6 Lesson 5 modules.

Data: BUFKIT Workstation Eta profiles from 11/20/00 Buffalo, NY and 12/10/00 Peoria, IL.

Instructions:

1. Download and install the special version of BUFKIT for AWOC winter (BUFKIT_AWOC_Winter_9.08) from the WDTB AWOC Winter site at http://www.wdtb.noaa.gov/winterawoc/BUFKIT/BUFKIT_AWOC_Winter_9.08.zip.
2. Unzip the file into a temporary directory.
3. Run the program "setup.exe"
4. This setup program will install the special version of Bufkit with all the needed support and data files.
5. Once BUFKIT 9.08 AWOC Winter is installed successfully, go to the Windows start button, click "programs" → BUFKIT_AWOC_Winter_9.08, then click on the icon corresponding to BUFKIT_AWOC_Winter_9.08.
6. You may want to familiarize yourself with the layout of this new version of bufkit by going to the following site:
http://www.wdtb.noaa.gov/tools/bufkit/training/pk_layout/pk_layout.html

Data Analysis--Sounding #1

- With the Winter Weather AWOC BUFKIT loaded on the profile screen, select the model by clicking in the model list: **EtaW**
- Select the site by clicking in the site list on top, and choose **PIA**
- Click on the **Overlays** tab in the Controls panels on the lower left, and turn on the omega field. Scroll ahead to the 24hr forecast valid at 12 UTC on December 11th.

Question 1. What type of snow ratio might you expect from this sounding: Heavy, Average, or Light (circle one)? Explain your reasoning, being sure to discuss the effects from surface temperature, low-level winds, RH profile, and omega fields.

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- Click on the “Overview” button on the top right. A time-height plot will load, with forecast time increasing right to left. Click the reset button. Select the **Contour** tab. Click on the box for “omega”, then click on “snow growth”.

Question 2. When will the heaviest snow fall based on the Dendritic Growth Zone (DGZ) and upward velocities method discussed in the lesson?

Between _____ UTC on _____ through _____ UTC on _____.

Question 3. What are the maximum the vertical velocities in the DGZ during that time (adjust contour interval accordingly to find maximum)?

- _____ $\mu\text{b}/\text{sec}$

Question 4. Where is the core of the strongest vertical velocities located relative to the DGZ--above, below, within (circle one)?

- In the time-height window, click on the **Precip** tab, then click both the “snowfall” and “snow ratio” boxes near the top right of the screen. By default, the snowfall technique is the Max Temp in Profile. Choose **Zone Omega** for the snow ratio technique. This is the Caribou Snow Amount Technique discussed in the IC 6 Lesson 5 module.

Question 5. Based on this technique, what is the range of the expected snow ratio throughout the event?

~ _____:1 - _____:1

Question 6. Did this agree with your reasoning question (#1)? If not, why not?

Question 7. How much snow is expected from this event based on this technique? (to integrate totals, hold down the right click button and drag left to right across snowfall bar graph)

_____ Inches

Question 8. Based on what you see and your previous answers, explain what primary considerations in the zone omega technique are influencing the snow ratio (and thus snow fall amount).

- Click the radio button in the snowfall techniques window such that **max temp in profile** technique is used for snow ratio and accumulation.

Question 9. How much snow is expected from this event based on this technique?

_____Inches

Question 10. Why is the snow ratio so much higher with this technique compared to the Zone Omega Method?

- Click the radio button in the snowfall techniques window for **surface temp**.

Question 11. How much snow is expected from this event based on this technique?

_____Inches

- Finally, click the radio button for a standard 10:1 ratio.

Question 12. How much snow is expected from this event based on this technique?

_____Inches

Data Analysis--Sounding #2

Switch to the BUF sounding by selecting it from the site list. Click the **Overlays** tab on the lower left, and turn on the omega field. Scroll ahead to the 18hr forecast valid at 18 UTC on November 20th.

Question 13. What type of snow ratio might you expect from this sounding: Heavy, Average, or Light (circle one)? Explain your reasoning, and be sure

to discuss the effects from surface temperature, low-level winds, RH profile, and omega fields.

- Click on the “Overview” button on the top right. A time-height plot will load, with forecast time increasing right to left. Click the reset button. Select the **Contour** tab. Click on the box for “omega”, then click on “snow growth”.

Question 14.When will the heaviest snow fall based on the Dendritic Growth Zone (DGZ) and upward velocities method discussed in the lesson?

Between _____ UTC on _____ through _____ UTC on _____.

Question 15.What are the maximum the vertical velocities in the DGZ during that time (adjust contour interval accordingly to find maximum)?

- _____ $\mu\text{b}/\text{sec}$

Question 16.Where is the core of the strongest vertical velocities located relative to the DGZ--above, below, within (circle one)?

- In the time-height window, click on the **Precip** tab, then click both the “snowfall” and “snow ratio” boxes near the top right of the screen. Be sure the snowfall technique radio button displays **Zone Omega**. This is the Caribou Snow Amount Technique discussed in the IC 6 Lesson 5 module.

Question 17.Based on this technique, what is the range of the expected snow ratio throughout the event?

~ _____:1 - _____:1

Question 18.Did this agree with your reasoning in question #13? If not, why not?

Question 19.How much snow is expected from this event based on this technique? (to integrate totals, hold right click and drag left to right across snowfall bar graph)

_____Inches

Question 20.Based on what you see, explain why the snow ratio (and thus snow fall amounts) from this technique is so high.

- Click the radio button in the snowfall techniques window such that **max temp in profile** technique is used for snow ratio and accumulation.

Question 21.How much snow is expected from this event based on this technique?

_____Inches

Question 22.Why is the snow ratio so much heavier with this technique compared to the Caribou Method?

- Click the radio button in the snowfall techniques window for **surface temp**.

Question 23.How much snow is expected from this event based on this technique?

_____Inches

- Finally, click the radio button for a standard 10:1 ratio.

Question 24.How much snow is expected from this event based on this technique?

_____Inches

Using the UWM Neural Network for Snow Ratio

Go to this website: http://sanders.math.uwm.edu/cgi-bin-snowratio/sr_intro.pl This portion of the job sheet is only intended to allow you to become acquainted with a snow ratio neural network website should you want to use it during Winter Weather forecasting shifts. Read through the intro page and when ready, click the "begin forecast". Play around with this tool for your CWA if you wish. If there is no threat of snow in your CWA in real-time, consider picking Point Barrow, AK, (PABR) where it can snow year round and thus you'll get more realistic snow ratio statistics.

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An answer key is available for this job sheet. Please see your local AWOC Winter Weather facilitator to obtain a copy.