

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:

- Download and install the latest version of BUFKIT (version 71.78) from the wdtb BUFKIT website at <http://www.wdtb.noaa.gov/tools/BUFKIT>.
- Unzip the file into a temporary directory.
- Run the program "setup.exe"
- This setup program will install Bufkit and all the needed support and data files.
- Once BUFKIT 71.78 is installed successfully, go to the Windows start button, click "programs" → BUFKIT_AWWT_Simulations_Release_2, then click on the icon corresponding to BUFKIT_AWWT_Simulations_Release_2.

Data Analysis--Sounding #1

- With the Winter Weather AWOC BUFKIT loaded on the profile screen, select the model by clicking on the radio button: **EtaW**
- Select the site by clicking in the drop down menu at the top, and choose **PIA**
- Click the "Controls" button on the lower left, and turn on the omega field. Scroll ahead to the 24hr forecast valid at 7 AM 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.

- 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. 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. How strong are the vertical velocities in the DGZ during that time?

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

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" button, then click both the "snowfall" and "snow ratio" buttons near the top right of the screen. By default, the snowfall technique radio button should be **DGZ x Omega**. 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, explain why the snow ratio (and thus snow fall amount) from this technique is so low.

- 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 Caribou 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 drop down menu from the profile window. Click the "Controls" button on the lower left, and turn on the omega field. Scroll ahead to the 18hr forecast valid at 1 PM 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.

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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. 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. How strong are the vertical velocities in the DGZ during that time?

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

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” button, then click both the “snowfall” and “snow ratio” buttons near the top right of the screen. By default, the snowfall technique radio button should be DGZ x 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.

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- 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.

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

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