

IC6.2: Optional Job Sheet--Version 2

Strengths and Weaknesses of P-Type Algorithms

Objective: Utilize AWIPS and BUFKIT to determine P-type for a winter precipitation event. In the IC 6 Lesson 1 job sheet you examined soundings using the top-down approach and arrived at P-type forecasts without the aid of algorithms. In this job sheet, you will utilize algorithm output from the same winter weather event.

Data: 24 February 2003 winter storm across Texas. You will be using AWIPS D2D in case review mode and BUFKIT in this job sheet.

Instructions:

AWIPS D2D Case Review Mode Task:

Load the 24 February 2003 Winter Weather AWOC case on your WES machine in case review mode, using the FWD localization. **You will be examining the 18 UTC NAM 40 analysis from 24 February 2003.**

First, set the pane to state scale with cities plotted, and use the volume browser to load NAM 40 model accumulated snowfall. Step forward to the 9 hr forecast valid at 03 UTC on 25 February.

In the same panel as the NAM 40 accumulated snowfall, select the precipitation type icons from the 'Other' menu in the volume browser in Plan View mode and view the 9hr forecast for 03 UTC near Austin, TX.

In the point sounding pane, load a NAM 40 sounding near Austin, TX for the 03 UTC February 25 forecast.

Question 1. What major issues do you see that could lead to error with the Baldwin technique for precipitation type based on this 03 UTC forecast sounding? Explain your reasoning. *Note that the precip type icons indicate frozen precipitation.

One hint is that the technique diagnoses ice pellets when the coldest wet bulb temperature in a saturated layer is < -4 deg C, and the area between -4 deg C and the wet bulb temperature is > 3000 deg. m, and the lowest level layer below freezing is < -3000 deg. m. Or the net area in the lowest 150 mb of the surface is < -3000 deg. m and the surface-based warm layer is < 50 deg. m.

BUFKIT Task: For the same event, you may now examine BUFKIT profiles.

Instructions:

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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/courses/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 a 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
7. BUFKIT will open to the Profile Screen.
8. Select the Model by clicking on the model list: **Eta**.
9. Select the profile site by clicking on the site list: **KDFW**
10. Use the vertical scroll bar to scroll to Forecast Hour **9**.
11. Make sure the control panel in the lower left below the analysis display is indicating: **Overlays**.
12. To determine the Eta post processor solution make sure the option box labeled **Bourgouin Precip Type on Profile** is unchecked. Look for the solution on the bottom left section of the profile panel. Precipitation type will show up as Blue (snow), Green (rain), Red (freezing rain or sleet). **Fill in the table below with the expected P-type.**

Model Run	Site	Forecast Hour	Post Processor (Baldwin)	Bourgouin	Eta Microphysics	Thickness
2/24/03 18z	DFW	F09				
2/24/03 18z	ADM	F09				
2/24/03 18z	ABI	F09				
2/24/03 18z	AUS	F09				

13. To determine the Bourgouin solution, check the box next to **Bourgouin Precip Type on Profile**. Look for the solution on the bottom left section of the profile panel. To see how Bufkit came to this solution, click on the **Precip Type** tab above the main part of the analysis display (upper left). Note the cloud top height and the temperature of the

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cloud top displayed near the bottom of the analysis display. Also note any warning messages that Buikit may identify with the Bourgouin solution. **Write the P-type in the appropriate box.**

14. The Eta Microphysics solution is also displayed on the analysis display, when the **Precipitation Type** tab has been selected. Look in the very upper-right corner of the display for the model output parameter **SNRA**. The **SNRA** parameter is the percent of hydrometeors that are frozen. **Enter this value into the appropriate box above.**
15. Partial Thickness solution. Extra Credit. On the analysis display showing **Precipitation Type**, click on the button in the lower-right corner labeled **Thickness**. Note the nomogram plot of 1000-850 mb thickness (Y-axis) versus 850-700 mb thickness (X-axis). The largest circle is the solution for the current forecast hour with smaller circles representing earlier forecast hours. Hint: The circles may obscure the nomogram solution. In this case, just scroll the forecast hour a few hours ahead or back to view the solution. **Write the P-type in the appropriate box.**
16. **Repeat for 3 other profiles:** Ardmore, OK (ADM), Abilene, TX (ABI), and Austin, TX (AUS) each for the **9 hour forecast**.

After filling out the table, answer the following questions.

Question 2. Explain why the Partial thickness method indicates freezing rain near Austin.

Question 3. In the DFW and ABI soundings, explain the characteristics of the profiles that resulted in all techniques indicating sleet during the ~0-14 hr forecast period.

Question 4. In the AUS sounding, explain why Bourgouin indicated rain/freezing rain at the 9 hr forecast, versus the sleet indicated by the Baldwin and Partial thickness methods.

Question 5. In the ADM sounding and from what you learned in IC 6 Lesson 1 about the strength/depth of the warm layer, do you agree with the

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techniques that indicate sleet in the 0-6 hr forecast timeframe?
Explain why.

Question 6. Based on the information you processed using both D2D and BUFKIT, use the attached map below to draw P-type contours valid at 03 UTC on 25 Februray, 2003.



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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.