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. Overlay the Thickness probability icons which utilize the partial thickness method. Step forward to the 9 hr forecast valid at 03 UTC on 25 February.
In another pane load a point sounding in the center of the max snowfall in southern Oklahoma.

Question 1. Do you notice any potential sources of error with the Baldwin technique for snowfall based on this 03 UTC forecast sounding? Explain your reasoning.

Load a NAM 40 sounding just northwest of Austin, TX in the region where the Partial Thickness method indicates freezing rain for the 03 UTC February 25 forecast.

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

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

1. Download and install the latest version of BUFKIT (version 71.78) from the wdtb BUF-KIT website at http://www.wdtb.noaa.gov/tools/BUFKIT.

2. Unzip the file into a temporary directory.

3. Run the program "setup.exe"

4. This setup program will install Bufkit and all the needed support and data files.

5. 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.

6. View the Profile Screen.

7. Select the Model by clicking on the radio button: **Eta**.

8. Select the profile site by clicking the button at the top: **KDFW**

9. Use the vertical scroll bar to scroll to Forecast Hour **9**.

10. Make sure the control panel is displaying: **Controls**.

11. To determine the Eta post processor solution make sure the option box labeled **Bourgouin Precip Type on Profile** is <u>unchecked</u>. 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 Orange (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				

12. To determine the Bourgouin solution, <u>check the box</u> 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** panel on the data panel section. Note the cloud top height and the temperature of the cloud top displayed near the bottom of the Precip Type panel. Also note any warning messages that Bufkit may identify with the Bourgouin solution. **Write the P-type in the appropriate box.**

13. The Eta Microphysics solution is also displayed on the **Precip Type** panel in the data section. 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.**

14. Partial Thickness solution. Extra Credit. On the **Precip Type** panel, 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.**

15. **Repeat for 3 other profiles**: Ardmore, OK (ADM), Abiliene, TX (ABI), and Austin, TX (AUS) each for the **9 hour forecast**.

After filling out the table, answer the following questions.

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 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.**

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