Caribou Snow Amount Tool

- Designed by Dan Cobb (NOAA/NWS/Grand Rapids MI)
- Uses BUFKIT data as input.
- Output includes:
  - Precipitation Type
  - Snow Ratio, Snow Amount
  - Precipitation Totals for Snow, Sleet, Freezing Rain
  - Percent of hydrometeors reaching the ground in the form of liquid, ice, and snow

- See output for explanation
Caribou Snow Amount Tool

• **Snow Amount Algorithm**
  – Creates the snow amount by assessing the sounding in a top-down approach. The analysis looks at vertical velocity, wet-bulb and dry-bulb temperature, and relative humidity to generate a snow ratio. This is done for every model level from hydrometeor creation down to the surface.
  – Documented in an AMS presentation
    • Weather Analysis and Forecasting/17th Conference on Numerical Weather Prediction 2005
    • Recorded online presentation: [http://ams.confex.com/ams/WAFNWP34BC/techprogram/paper_94815.htm](http://ams.confex.com/ams/WAFNWP34BC/techprogram/paper_94815.htm)

• **Precipitation Type Algorithm**
  – Algorithm was designed to use the strengths of the Top-Down Approach (Baumgardt, [http://www.crh.noaa.gov/arx/micro/microppe.php](http://www.crh.noaa.gov/arx/micro/microppe.php)), Bourgouin and Ramer algorithms.
  – Traces a hydrometeor vertically toward the surface.
The Output Explained

**Snow:Water Ratio, Snow during time step, Run Total Snow Accum**

**Model precipitation during the time step (QPF), Event Total Precip (TotQPF, resets after 6 dry hours)**

**Sleet:Water ratio**

**RH to consider a layer saturated**

**Site**

**Percent of hydrometeors reaching the surface as Snow (%S), Ice (%I), and Liquid (%L). Sleet would add to %I, Freezing rain would add to %L.**

<table>
<thead>
<tr>
<th>StnID: klse</th>
<th>Model: nam</th>
<th>Run: 20081015/1200</th>
<th>Cloud RH threshold: 85%</th>
<th>Sleet Ratio: 2:1</th>
<th>CarSnowTool Beta 5.1</th>
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<tbody>
<tr>
<td>Date/hour</td>
<td>Fhr</td>
<td>Wind</td>
<td>SfcT</td>
<td>Ptype</td>
<td>SRate</td>
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</table>

**Valid time of the output in YYMMDD/HHHH”Z”. Time is UTC. To get local time, subtract 6h during DST, 5h otherwise.**

**Model precipitation during time step in the form of sleet or ice pellets, Run Total Precip from Sleet**

**Model precipitation during time step in the form of freezing rain, Run Total Precip from freezing rain**