Created By: NOAA NWS La Crosse, Wisconsin

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

- Precipitation Type Algorithm
  - Algorithm was designed to use the strengths of the Top-Down Approach (Baumgardt, http://www.crh.noaa.gov/arx/micro/micrope.php), Bourgouin and Ramer algorithms.
  - Traces a hydrometeor vertically toward the surface.

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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)

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.

Sleet:Water ratio

RH to consider a layer saturated

Site

StnID: klse Model: nam Run: 20081015/1200 Cloud RH threshold: 85% Sleet Ratio: 2:1 || CarSnowTool Beta 5.1

Date/hour	FHr	Wind	SfcT	Ptype	SRat	Snow	TotSN	QPF	TotQPF	Sleet	TotPL	FZRA	TotZR	S%	I%	L%
081015/1300Z	1	18006KT	47.1F	RAIN	0:1	0.0	0.0	0.031	0.03	0.00	0.00	0.00	0.00	0	0	100
081015/1400Z	2	20008KT	47.5F	RAIN	0:1	0.0	0.0	0.012	0.04	0.00	0.00	0.00	0.00	0	0	100
					0:1	0.0	0.0	0.000	0.04	0.00	0.00	0.00	0.00	0	0	0
					0:1	0.0	0.0	0.000	0.04	0.00	0.00	0.00	0.00	0	0	0
											0.00	0.00	0.00	0	0	0
											0.00	0.00	0.00	0	0	0
											0.00	0.00	0.00	0	0	0
											0.00	0.00	0.00	0	0	0
													0.00	0	0	0
					0:1	0.0	0.						0.00	0	0	0
081015/2300Z	11	32013KT	53.2F		0:1	0.0	0.						0.00	0	0	0
081016/0000Z	12	31009KT	48.0F		0:1	0.0	0.						0.00	0	0	0
081016/0100Z	13	31009KT	45.7F		0:1	0.0	0.						0.00	0	0	0
081016/0200Z	14	31009KT	45.0F		0:1	0.0	0.0	0.000	0.00	0.00	0.00	0.00	0.00	0	0	0
081016/0300Z	15	31008KT	42.4F		0:1	0.0	0.0	0.000	0.00	0.00	0.00	0.00	0.00	0	0	0
081016/0400Z	16	30007KT	39.7F		0:1	0.0	0.0	0.000	0.00	0.00	0.00	0.00	0.00	0	0	0
081016/0500Z	17	31007KT	37.6F		0:1	0.0	0.0	0.000	0.00	0.00	0.00	0.00	0.00	0	0	0
081016/0600Z	18	31007KT	36.0F		0:1	0.0	0.0	0.000	0.00	0.00	0.00	0.00	0.00	0	0	0

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