**Summary of SnowModel Output Variables**

SnowModel keeps track of approximately 175 spatially distributed, temporally evolving, snow and other environmental variables that can be output if they are needed for a specific application.

The lists below include the most common output variables.

This first list includes variables commonly output as part of typical SnowModel simulations (**daily outputs, 2D distributions**):

air temperature (deg C)

relative humidity (%)

wind speed (m/s)

wind direction (deg from True North)

incoming solar radiation (W/m2)

total precipitation (rain+snow) (m)

rainfall (m)

snowfall (m)

snow melt (m)

snow sublimation (m)

runoff (m)

glacier melt (m)

snow depth (m)

snow density (kg/m3)

snow-water-equivalent (SWE) depth (m)

The SnowModel post-processing scripts commonly create **yearly values** of these variables:

snow\_onset\_dos day of the start of the core snow period (day of simulation)

snow\_onset\_doy day of the start of the core snow period (day of year, 1-365,366)

snow\_free\_dos day of the end of the core snow period (day of simulation)

snow\_free\_doy day of the end of the core snow period (day of year, 1-365,366)

snow\_first\_dos day of first snow occurrence during the year (day of simulation)

snow\_first\_doy day of first snow occurrence during the year (day of year, 1-365,366)

snow\_last\_dos day of last snow occurrence during the year (day of simulation)

snow\_last\_doy day of last snow occurrence during the year (day of year, 1-365,366)

core\_snow\_days number of days in core snow period = the longest period of continuous snow cover (days)

total\_snow\_days total number of days with snow on the ground during the year (days)

prec\_sum total precipitation (m/yr)

rpre\_sum rain precipitation (m/yr)

spre\_sum solid precipitation (snowfall) (m/yr)

roff\_sum total liquid water reaching the ground surface (includes snowmelt, rain, canopy unload, glacier melt, etc.) (m/yr)

smlt\_sum total melt per day (from the energy balance) (m/yr)

glmt\_sum glacier melt (m/yr)

snod\_max maximum snow depth in the year (m)

snod\_max\_dos day of simulation that snod\_max occurred

snod\_max\_doy day of year (1-365,366) that snod\_max occurred

swed\_max maximum snow water equivalent depth in the year (m)

swed\_max\_dos day of simulation that swed\_max occurred

swed\_max\_doy day of year (1-365,366) that swed\_max occurred

tair\_ave annual average 10-m air temperature (degrees C)

ros number of days with rain on snow, defined to be daily rainfall ≥ 3 mm on snow depths ≥ 1.5 cm (days)

Other fields that are often output during SnowModel runs are in these lists:

**ENERGY BALANCE:**

tair air temperature (deg C)

tsfc surface (skin) temperature (deg C)

qsin incoming solar rad at the surface (W/m2)

qlin incoming longwave rad at the surface (W/m2)

qlem emitted longwave radiation (W/m2)

qh sensible heat flux (W/m2)

qe latent heat flux (W/m2)

qc conductive heat flux (W/m2)

qm melt energy flux (W/m2)

albd albedo (0-1)

ebal energy balance error (W/m2)

**METEOROLOGY:**

tair air temperature (deg C)

relh relative humidity (%)

uwnd meridional wind component (m/s)

vwnd zonal wind component (m/s)

wspd wind speed (m/s)

wdir wind direction (0-360, true N)

qsin incoming solar rad at the surface (W/m2)

qlin incoming longwave rad at the surface (W/m2)

prec precipitation (m/time\_step)

**SNOWPACK:**

snod snow depth (m)

sden snow density (kg/m3)

swed snow-water-equivalent depth (m)

roff runoff from snowpack base (m/time\_step)

rain liquid precipitation (m/time\_step)

spre solid precipitation (m/time\_step)

qcs canopy sublimation (m/time\_step)

canopy canopy interception store (m)

sumqcs summed canopy sublim during year (m)

sumprec summed precipitation during year (m)

sumsprec summed snow precip during year (m)

sumunload summed canopy unloading during year (m)

sumroff summed runoff during the year (m)

sumswemelt summed snow-water-equivalent melt (m)

sumsublim summed static-surface sublimation (m)

wbal water bal error (m)

**BLOWING SNOW:**

snod snow depth (m)

subl sublimation at this time step (m)

salt saltation transport at this time step (m)

susp suspended transport at this time step (m)

subgrid tabler snow redist at this time step (m)

sumsubl summed sublimation during the year (m)

sumtran summed blowing-snow transport for year (m)