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)

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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)
```