

Physical process

State variable

Input variable

Hydrological applications

Climate impact studies applications

Avalanche forecast

Model complexity

Degree-day

Snow accumulation/melt

Snow mass

Temperature, Precip

Surface Energy Balance

Single-layer

Multi-layer

Snowmelt, Accumulation, Heat diffusion,

Phase change (Sublimation, Refreezing), Liquid water flow

Snow density, Snow mass, Liquid water fraction,

Snow temperature, (Snow age)

Temperature, Precip phase, Wind, Pressure, SWdown, LWdown

Composite snow-soil

Snow-soil energy balance

Surface energy balance

Solar radiation transmission

Percolation

Snow compaction

Snow grain size

Explicit single snow layer

Surface energy balance

Detailed models:

Snow metamorphism

Snow microstructure