Physical process
State variable
Input variable

Hydrological applications
Climate impact studies applications
Avalanche forecast

Model complexity →

Degree-day	Surface Energy Balance	
	Single-layer	Multi-layer

Snow accumulation/melt
Snow mass
Temperature, Precip

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