Snowmelt runoff applications
Climate studies applications
Avalanche forecast

Model complexity

Degree-day	Snow Energy Budget	Single-layer	Multi-layer
• Depth of snow melted • Degree-day factor • Positive degree-day	• Snowmelt from Energy balance • Radiative transfer energy • Albedo • Snow surface temperature • Mass balance snowmelt • Snow water equivalent • Sublimation/refreezing • Liquid water retention	Snow Energy Budget parameters + • Radiation absorption • Thermal conductivity • Snow heat capacity • Dry/Wet albedo • Roughness • Snow mass redistribution • Snow depth • Snow density and viscosity • Liquid water fraction	Snow Energy Budget parameters + Single-layer parameters + • Solar radiation transmission • Vertical gradient of temperature • Vertical gradient of density • Retention of liquid water • Snow grain size-evolution **Multi-layer + micro structure of snow:** • Snow metamorphism (grain size, dendricity, sphericity) • Snow compaction