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South Cascade Glacier energy and mass balance modelling: a testing ground for paleoclimate application.

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We describe a distributed energy and mass balance model for South Cascade Glacier (SCG), Washington, USA. The SCG is an excellent proving ground for mass/energy balance models due to its long history of glacial and meteorological measurements and a closely monitored, closed hydrological basin. Comparisons are made between high temporal and spatial resolution, detailed modelling approaches and lower resolution, highly parameterized yet still physical approaches. Utilizing data from the 2002-2003 and 2003-2004 mass balance years we constrain optimum modelling techniques for paleoclimate application in which input data may be of low spatial and temporal resolution or extensive downscaling has been applied. Further, this suite of models is compared with Positive Degree Day and Temperature/Radiation Indexed approaches, with implications for tropical Last Glacial Maximum climate application and ice-flow model interface.