P-041

GSWarm: an example of making a GIS model for everyday use

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Modeling snow processes over terrain with a Geographic Information System (GIS) takes a specific set of skills and a lot of computer processing power and time. These factors are often at odds with how such a model would be used for, say, daily avalanche forecasting. We used the near-surface snow warming statistical and empirical model SWarm as a basis for designing a simple and fast GIS tool. This simple GIS-based warming model, called GSWarm, resulted from (a) published user comments on existing snow and avalanche computer tools, (b) published graphic design principles, and (c) direct forecaster feedback. Using GSWarm as an example, we present key ideas used to provide a simple interface to a complex GIS model, including: (1) Calculating many possible scenarios ahead of time, so hypothesis testing of different weather and snow conditions can be done quickly. (2) Allowing small previews of many results to be seen on one screen, for selection of specific conditions without using input boxes. (3) Providing scaling and visualization help to the user rather than giving a single final result. These ideas represent a unique perspective on snow and avalanche computer model design.