

Interactive comment on “Degree-day modelling of the surface mass balance of Urumqi Glacier No. 1, Tian Shan, China” by E. Huintjes et al.

M. Pelto

mauri.pelto@nichols.edu

Received and published: 16 March 2010

Huintjes et. al. (2010) describe a degree day model to assess the mass balance of Urumqi Glacier. The paper describes a method that has merit, but as described the research is still in too early a stage to report out key results with confidence. Two important points illustrate this. Near the beginning of the text it is observed that..“The arid climate causes very large evaporation at the glacier surface so that the effect of sublimation is one of the dominant ablation processes.” This is the last we hear of sublimation. Since it is a crucial variable, how the model deals with sublimation is crucial. A second major issue is that six days worth of test data are used to calibrate the model parameters. This is truly insufficient by any measure for extrapolation of mass balance for an entire hydrologic year. What specific test data is used, over which

C48

days exactly? The degree day model seems to be built around ablation, why not test it against summer balance instead of trying to incorporate winter balance with such a simplistic accumulation scheme? You could start with the known winter balance map.

211-11: Why couldn't the precipitation events be captured, at least at the stakes?

213-3-5: Is this reasonable to assume a constant precipitation rate with elevation? There is field data to assess this. We must be convinced that such a hyperbolic function is reasonable. There must be observations of simultaneous temperature and precipitation type to defend this choice.

214-1: One mean value for each of the 16 states is considered Mean value of what variable, degree day factor? Why given the variable nature of radiation on a daily basis is this considered reasonable?

214-22: Why must the albedo be manually adjusted? Is this a reasonable means to explain the difference of modeled versus measured incoming short wave radiation?

215-10: Why merge the values?

Figure 1: Pixilated image-need better quality.

Figure 5: Results from a mere six days of mass balance are not very good, and do not inspire confidence.

Interactive comment on The Cryosphere Discuss., 4, 207, 2010.

C49