

SEDIBUD WORKING GROUP OBJECTIVE:

To address the question: What are the contemporary sediment fluxes in cold environments?

RATIONALE:

The focus of SEDIBUD is the analysis of source-to-sink fluxes and sediment budgets in changing high latitude and high altitude cold environments. Explicit in this goal is the need to understand how processes and environments will change with changing climate. Space-for-time substitution offers the opportunity to predict future changes, but ONLY if the baseline we use is sound. At present we lack full understanding of contemporary sediment fluxes in cold environments. Establishing contemporary sediment fluxes in a diversity of cold environments can form a baseline from which modeling can operate. At a minimum baseline information must consist of measures of mean annual temperature, total annual precipitation, total annual runoff, annual suspended sediment yield, annual solute yield (atmospherically corrected), and dominant catchment processes.

In establishing firm baselines several overarching issues must be considered * :

- Upscaling issues from source to sink.
- Coupling periglacial and glacial systems to establish holistic sediment budgets.
- Assessment of the significance of changing ground ice conditions on sediment fluxes.
- Development of innovative field methods for cold environment sediment budget investigation.
- Modeling future sediment fluxes.

SEDIBUD HYPOTHESES (by October 2009, hypotheses are currently in review):

1. Changing winter snowfall will be the primary driver of nival and glacial processes and will change catchment fluxes of all types.
2. Glacial and nival catchment fluxes will respond to different climatic forcings, and hence may demonstrate divergent flux responses.
3. The nival freshet will continue, or increase, the dominant period of fluxes, in the absence of glaciers.
4. Active permafrost degradation will have an indirect role during the nival freshet, but should increase fluxes over multi-year scales.
5. Interannual variability in fluxes will continue to be the dominant form of change in watershed fluxes despite ongoing global climate changes.

* Warburton, J. (2007). Sediment budgets and rates of sediment transfer across cold environments in Europe: A commentary. *Geografiska Annaler*, 89A, 95-100.