The SEDIBUD (Sediment Budgets in Cold Environments) Programme: Current activities and future key tasks

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Projected climate change in cold regions is expected to alter melt season duration and intensity, along with the number of extreme rainfall events, total annual precipitation and the balance between snowfall and rainfall. Similarly, changes to the thermal balance are expected to reduce the extent of permafrost and seasonal ground frost and increase active layer depths. These effects will undoubtedly change surface environments in cold regions and alter the fluxes of sediments, nutrients and solutes, but the absence of quantitative data and coordinated process monitoring and analysis to understand the sensitivity of the Earth surface environment is acute in cold climate environments.

The International Association of Geomorphologists (I.A.G./A.I.G.)SEDIBUD (Sediment Budgets in Cold Environments) Programme was formed in 2005 to address this existing key knowledge gap. SEDIBUD currently has about 400 members worldwide and the Steering Committee of this international programme is composed of ten scientists from eight different countries: Achim A. Beylich (Chair) (Norway), Armelle Decaulne (Secretary) (France), John C. Dixon (USA), Scott F. Lamoureux (Vice-Chair) (Canada), John F. Orwin (Canada), Jan-Christoph Otto (Austria), Irina Overeem (USA), Thorsteinn Saemundsson (Iceland), Jeff Warburton (UK), Zbigniew Zwolinski (Poland).

The central research question of this global group of scientists is to:

Assess and model the contemporary sedimentary fluxes in cold climates, with emphasis on both particulate and dissolved components.

Initially formed as European Science Foundation (ESF) Network SEDIFLUX (2004-2006), SEDIBUD has further expanded to a global group of researchers with field research sites located in polar and alpine regions in the northern and southern hemisphere. Research carried out at each of the close to 50 defined SEDIBUD key test sites varies by programme, logistics and available resources, but typically represent interdisciplinary collaborations of geomorphologists, hydrologists, ecologists, permafrost scientists and glaciologists. SEDIBUD has developed manuals and protocols (SEDIFLUX Manual, available online, see below) with a key set of primary surface process monitoring and research data requirements to incorporate results from these diverse projects and allow coordinated quantitative analysis across the programme. Defined SEDIBUD key test sites provide data on annual climate conditions, total discharge and particulate and dissolved fluxes as well as information on other relevant surface processes. A number of selected key test sites is providing high-resolution data on climate conditions, runoff and sedimentary fluxes, which in addition to the annual data contribute to the SEDIBUD metadata database which is currently developed. Comparable datasets from different SEDIBUD key test sites are integrated and analysed to address key research questions as defined in the SEDIBUD Objective (available online, see below).

Defined SEDIBUD key tasks for the coming years include (i) The continued generation and compilation of comparable longer-term datasets on contemporary sedimentary fluxes and sediment yields from SEDIBUD key test sites worldwide, (ii) The continued extension of the SEDIBUD metadata database with these datasets, (iii) The testing of defined SEDIBUD hypotheses (available online, see below) by using the datasets continuously compiled in the SEDIBUD metadata database.

Detailed information on the I.A.G./A.I.G. SEDIBUD Programme, SEDIBUD meetings, SEDIBUD publications and SEDIBUD online documents and databases is available at the SEDIBUD website under

http://www.geomorph.org/wg/wgsb.html.