The Global SEDIBUD Programme: Coordinated Study and Quantification of Sedimentary Fluxes and Budgets in Changing Cold Climate Environments

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Amplified climate change and ecological sensitivity of polar and high-altitude cold climate environments has been highlighted as a key global environmental issue. 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 depth. These effects will undoubtedly change surface environments in cold environments and alter the fluxes of sediments, nutrients and solutes, but the absence of data and analysis to understand the sensitivity of the surface environment are acute in cold environments.

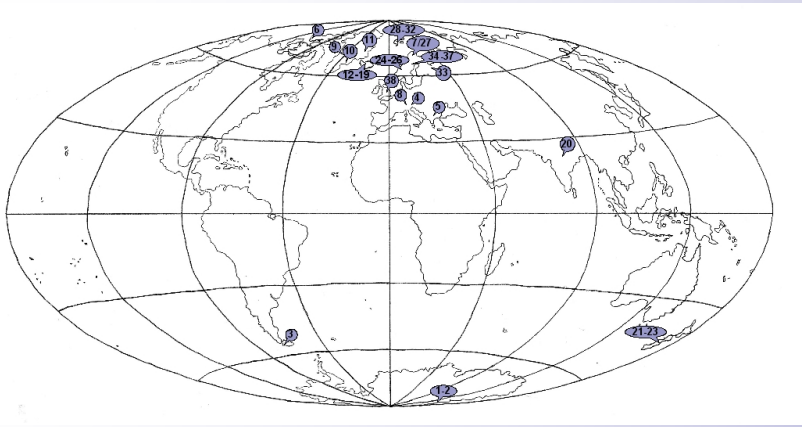
The *SEDIBUD (Sediment Budgets in Cold Environments)* Programme of the International Association of Geomorphologists (I.A.G./A.I.G.), building on the ESF SEDIFLUX Network, was formed in 2005 to address this key knowledge gap. SEDIBUD has currently about 400 members worldwide and the Steering Committee of this international programme is composed of ten scientists from nine different countries. The central research question of this global group of scientists is to:

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

Research carried out at 38 defined SEDIBUD key test sites varies by programme, logistics and available resources, but typically represent interdisciplinary collaborations of geomorphologists, hydrologists, ecologists, and permafrost scientists and glaciologists with different levels of detail. SEDIBUD has developed a key set of primary research data requirements intended incorporate results from these varied projects and allow analysis across the programme. 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 are providing high-resolution data on climatic conditions, runoff and fluvial fluxes, which in addition to the annual data contribute to the SEDIBUD Metadata Database. To support these efforts, the SEDIFLUX Manual has been produced to establish common methods and data standards. Comparable datasets from different SEDIBUD key test sites will be analysed to address key research questions of the SEDIBUD programme as defined in the SEDIBUD Working Group Objective (see I.A.G./A.I.G. SEDIBUD Website at http://www.geomorph.org/wg/wgsb.html).

Spatial distribution of SEDIBUD Key Test Sites



Antarctica
1. Joyce Glacier, Garwood Valley
2. Garwood Glacier, Garwood Valley

Argentina
3. Laguna Potrok Aike

Austria
4. Pasterze

Bulgaria
5. Musala area

Canada
6. Cape Bounty

Finland
7. Kidisjoki

Germany
8. Reintal

Greenland
9. Kangerlussuaq-Strømfjord
10. Mittivakkat glacier catchment
11. Zackenberg

Iceland
12. Botn í Dýrafirði
13. Reykjarströnd
14. Tindastöll
15. Fnjóskadalur-Bleiksmýrardalur
16. Hofsjökull, northern forefield
17. Austdalur
18. Hrafndalur
19. Örravatnrústir

India
20. East Dabka Watershed (Kumaon Himalaya)

New Zealand
21. Douglas Glacier
22. Godley Valley
23. Unnamed Valley

Norway
24. Erdalen
25. Bødalen
26. Vinstradalen
27. Tana catchment
28. Dynamiskbekken (Svalbard)
29. Ebbaelva (Svalbard)
30. Hørbyeelva (Svalbard)
31. Kaffiøyra (Svalbard)
32. Scottelva (Svalbard)

Russia
33. Mezen

Sweden
34. Latnjavagge
35. Kärkevagge
36. Kårsavagge
37. Låktavagge

United Kingdom
38. Moor House

SEDIBUD Steering Committee:

- Achim A. Beylich (Chair) (Norway)
- Armelle Decaulne (Secretary) (France)
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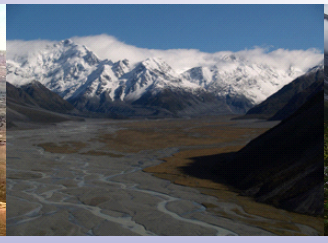
Moore House field site, UK (Photo: Jeff Warburton)



Godley Valley field site, New Zealand (Photo: John F. Orwin)

Erdalen field site, Norway (Photo: Katja Laute)

Kärkevagge field site, Sweden (Photo: John Dixon)

Tindastöll field site, Iceland (Photo: Helgi Páll Jónsson)