bon age from the lake indicate moraine stabilization coincident with the Younger Dryas. Deglaciation is best documented at Waskey and Goat lakes, where the transition from glacial-lacustrine to more organic-rich sedimentation occurred around 9.3 ± 0.2 cal ka. None of our sites shows evidence for a readvance at 8.2 ka. Glaciers retreated to various extents during the middle Holocene. At Waskey Lake, glaciers are sourced in a granitic pluton, and sediment deposited between about 9 and 3 cal ka lacks any indication of granitic rock flour, suggesting that the highest elevations of the Ahklun Mountains were deglaciated during this interval. The onset of Neoglaciation is clearly represented by a return to less-organic-rich sediment at about 3.1 cal ka in Waskey and Cascade lakes, and 4.0 ± 0.5 cal ka in Greyling and Hallet lakes. Moraines older than the Little Ice Age (LIA) have been found in the forefields of glaciers near Waskey and Hallet lakes, although their ages are not well constrained. All glacier forefields exhibit several LIA moraines; the timing, based on lichenometry, does not match between nearby cirques, and some glaciers lack evidence for an advance early during the LIA. The maximum Holocene extent of an outlet of the Harding Icefield is securely dated to between 1660 and 1900 AD at Goat Lake. The mean elevation of glaciers (an approximation of the equilibrium-line altitude) during the lo LIA maximum lowered by about only 40 ± 20 m relative to the mid-20th-century geometries on USGS maps at all five study sties. The relatively restricted LIA advance suggests limited temperature reduction or decreased accumulation-season precipitation.

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Holocene dynamics of spruce-hardwood mosaic stands and open swamp vegetation on the Dorokawa mire, northern Hokkaido, Japan, based on phytolith and pollen analyses

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Phytolith analysis is useful for the reconstruction of vegetation composed of grasses such as reeds, dwarf bamboo and other Poaceae and for trees such as Pinaceae and Ulmaceae. Stomata remains can also be applied to conifer trees identification. The phytolith, and stomata assemblages reflect the local vegetation, because of its short distance dispersion. Pollen data is also applied to the reconstruction of both regional and local vegetation history by using cores from different sized of sedimentary basins. The combination of multi proxies and multi cores for the palaeoecological study contributes to clarifying the detailed dynamics of vegetation. From this view point, we made a palaeoecological study to make clear the local dynamics of mosaic vegetation on the peat mire (Dorokawa mire) and the regional vegetation history in the watershed of the Uryu Experimental Forest of Hokkaido University. Especially, for the local vegetation, we focus on the dynamics of spruce-hardwood mosaic stands, and open grass vegetation using the pollen and phytolith data from multiple cores. The present vegetation on the study area is as follows. The forests on the peat mire forms a mosaic composed of spruce stands (Picea glehnii) and deciduous hardwood stands (Fraxinus mandshurica var. japonica, Ulmus davidiana var. japonica, Alnus japonica etc.). On the other hand, the vegetation on the mountain slopes surrounding the mire are mixed forests composed mainly of fir (Abies sachalinensis) and oak (Quercus crispula). The chronology of this study based on AMS radiocarbon dating and tephrocronology. Pollen data from the mire on the mountain slope show that the forests in the area were dominated by oak, birch and fir since 7000 yr BP. Also, the phytolith and pollen data from the cores on the Dorokawa mire indicate following vegetation history. During the early Holocene, Pooideae grassland without dwarf bamboo had spread on the mire. The Pooideae grassland was replaced by reed (Phragmites) around 8000 yr BP. Between 7000 and 4000 yr BP, ash (Fraxinus) stands existed with wetland herbs such as Lysichiton and reed. From 4000 to 1000 yr BP, sedges became dominant. In the period from 2000 to 1500 yr BP, dwarf bamboo began to increase. The mosaic forests have developed since the colonization of spruce trees on the mire in ca. 1000 yr BP.

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Estimation of turbulent heat flux in the Langtang valley of Nepal Himalaya

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Snow capped areas in the Himalayas are most vulnerable to global warming and are among the least studied areas with connection to the climate change phenomenon. In order to explore different aspects of glacier retreat, this research admits some facts on energy balance and mass balance of snow and glacier in the Langtang region of Nepalese Himalaya with respect to turbulent heat flux, i.e.; sensible heat flux and latent heat flux. Kyangjin meteorological station in the Langtang valley was chosen for this purpose, where meteorological information was available for past six months.

Energy Balance method was used to derive the heat flux components. It was observed that the variation in heat flux trend was consistent to the meteorological parameters and its contribution was high for the energy balance. The latent heat flux (−90 W/m2) was about five times higher than the sensible heat flux (−20 W/m2).

As the contribution of the heat flux to the energy balance is high, it is recommended that these components should not be ignored when dealing with mass and energy balance.

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Dencdrochronology of exposed roots and erosion mapping at Bátaapáti Nuclear Waste Repository, Mecsek Hills, Hungary

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Dendrochronology of roots is applied to measure slope degradation and gully retreat rates in the drainage basin of the Bátaapáti low- and medium-level nuclear waste repository site. Roots of deciduous trees in the temperate climate zone initially grow underground. Surface exposure is due to erosion of overlying soil. Age of the root – or of a wound caused by injury to root cambium – can be dated by dendrochronological methods. (1) Since the first ring of a root can only grow under the surface, the number of the tree rings of a living root defines the maximal age of the exhumation. (2) Uncovered roots can be damaged after being uncovered. Age of damage tohe cambium also is determined by counting the number of overgrown rings, defining the minimal age of exhumation. We measured ages of 82 exhumed roots range from 4 to 42 years. A 0.07–1.08 cm/y slope decline rate has been calculated. There is 0.36 correlation between slope angle and decline rate. Gully retreat rates range from 3 to 523 cm/year, dependent on land use. Forested hilltops yield lowest, while actively cultivated hill-