

## NEW INVENTORY OF ICE SHORES IN THE WESTERN RUSSIAN ARCTIC

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Hydrographic studies aimed at the detection of changes of ice shores in the western Russian Arctic and a preliminary analysis of their character, possible reasons and typical indicators were performed by interpreting spaceborne multitemporal (IN)SAR data obtained over the Russian Arctic in 1993 – 1998 and comparing them with available topographic maps. Studies revealed drastic changes in glacier extent that occurred in the Russian High Arctic in the second part of the XX-th century. Frontier parts of nearly all tidewater glaciers have retreated several hundreds to thousands of meters and shorelines have changed significantly. The maximum retreat of ice shores was recorded at Vera Glacier on North Novaya Zemlya that has receded 4,7 km between 1952 and 1998. Very interesting exceptions to the common glacial retreat in the Arctic were recognized in SAR interferograms: fronts of several large tidewater glaciers, e.g. Brounova, Eastern, Impetuous glaciers have advanced by several kilometres comparing to their positions in 1950-s. High planimetric accuracy of our hydrographic determinations was verified by comparing with the results of field surveys using a ship radar in September-October 2001. General lowering of the glacier surface has been revealed by measuring the height of ice walls. All change values (linear, areal and volumetric) are documented in the form of a new inventory of ice shores in the western Russian Arctic, which represents one of basic components of a regional coastal reference database RECORD.

Frontal velocities of nearly 100 glacier snouts were precisely measured from the ERS-1/2-SAR interferograms for the first time in the history of their explorations. The velocities of several glaciers were measured several times using different interferograms and the results were very consistent. The frontal velocities of 10 test glaciers were surveyed during the field campaign 2001 using precise geodetic equipment and compared with the INSAR velocities measured in the lab. In spite of harsh environment, the spatial correlation between the INSAR velocities and those surveyed in the field was quite high, though the INSAR velocities were somewhat lower than those from geodetic surveys. The revealed tachometric differences of up to 40% are explained. Corrected values of frontal glacier velocities were included in the inventory of ice shores. Several important conclusions on the amount, character and origin of current changes of ice shores in the Russian Arctic have been derived. A wide range of useful features as well as the attractive appearance and up-to-daintiness of our inventory makes it an ideal basis for scientific and administrative activities in the study region.