BOOK OF ABSTRACTS

José M. Fernández-Fernández · Josep Bonsoms
Julia Garcia-Oteyza · Marc Oliva
Editors

EUCOP6 PUIGCERDÀ
18-22 JUNE 2023

EDITORS

José M. Fernández-Fernández (Universidad Complutense de Madrid)
Josep Bonsoms (Universitat de Barcelona)
Julia García-Oteyza (Universitat de Barcelona)
Marc Oliva (Universitat de Barcelona)

DOI: 10.52381/EUCOP6.abstracts.1

Spatial features of coastal dynamics of the Kara Sea

Daria Bogatova (Faculty of Geography, Lomonosov Moscow State University), Natalia Belova (Faculty of Geography, Lomonosov Moscow State University) and Stanislav Ogorodov (Faculty of Geography, Lomonosov Moscow State University).

Abstract

In the Arctic the mean annual air temperature is rising faster than anywhere else in last decades. The permafrost coasts occupy more than fifty percent of the Kara Sea coastline. That is why any human activity in the Kara Sea coastal zone must take into account the permafrost and its reaction to the changing climate. Three key-sites were chosen for investigation of coastal dynamics in the western part of the Kara Sea (the Ural, Yamal and Kharasavey coasts). This area is situated in the continuous permafrost zone with mean annual ground temperatures from -1 to -7°C and permafrost thickness ranges from 50-100 m to 200-300 m. The coastal retreat rates estimation was conducted based on field observations and the analysis of the satellite imagery. Bluff position was derived from the images and fieldwork data from 1980s to 2020s. The virtual transects was drawn every 10 m normally to the general direction of the shoreline. The coastal retreat rates were calculated as the proportion of the retreating area (m2) to the length of line formed by the intersection of transect and coastline.The neighboring points have similar rates of retreat for all sites, which is statistically confirmed. Semivariograms were made to reveal spatial correlations. Three types of semivariograms were obtained during data analysis. The first type is a spatial pattern of one factor that spreads its influence over the entire area. The second one is a uniform alternation of sections (each hundreds of meters long) correlated by the coastal retreat rate. The third type is the absence of spatial correlations. Understanding the spatial features to the coastal dynamics will provide a basis allowing us to predict the evolution of a complex and sensitive Arctic coastal environment in the future. The study was supported by the Russian Science Foundation project No. 22-17-00097