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ARCA project: Arctic present Climatic change and pAst extreme events

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Understanding the mechanism behind the release of large volumes of cold and fresh water from melting of ice caps is critical for climate studies. The project ARCA (Arctic present Climatic change and pAst extreme events) aims to study this complex system from the point of view of paleoclimatic and of present-day air-sea-ice interaction processes. Activities of ARCA project include (a) support to an international scientific drilling campaign (CORIBAR, https://sites.google.com/site/ipynicestreams/coribar) and analyses of resulting data, (b) intensive campaigns aimed to study the energy balance at the surface interaction processes and air-sea-ice (along the edge of the tidewater glaciers that overlook the Kongsfjorden), (c) the acquisition / data sharing for monitoring the dynamics of large outlet glaciers of Greenland, and d) realization of a distributed structure based on the concepts of brokering approach, with nodes managed by the various participants and the central infrastructure implemented at CNR.
The work of analysis and synthesis of data allow to correlate the main events of past meltwaters climatic conditions. The possible anthropogenic influence on these processes have been investigated by reconstructing the recent history of the last 150 years through the analysis of sediments and ice cores collected in the area of Kongsfjiorden.
Furthermore, present-day hydrological and dynamic properties of seawater in the Svalbard and Fram strait region areas have been studied using underwater instruments as part of a marine observatory that consists of moored instruments and interoperable open access database. Land-based and atmosfersic measurements are also considered.

ARCA activities and the state of the art are here shown. Arca is supported by Italian Ministery of Education, University and Research.