

Ice coring projects in Antarctica and the Arctic

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Polar ice cores and borehole measurements provide us with valuable information on the past climate and environment, as well as that on ice sheet and glacier dynamics. Such information is prerequisite to understanding of the mechanisms of climatic and environmental changes, and is expected to contribute to better projections of future climate and sea level. In the next phases of Antarctic glaciological research, National Institute of Polar Research (NIPR) together with Dome Fuji Ice Core Consortium (ICC) plans to perform various activities related to the third deep ice-core drilling in the vicinity of Dome Fuji, in order to obtain the “oldest ice” with age much older than 800 kyr. This is also a contribution to International Partnership in Ice Core Sciences (IPICS), which defines the oldest ice project as most challenging. We plan to (i) investigate glaciological conditions (ice sheet surface conditions, englacial conditions and subglacial conditions) of the candidate site area; (ii) determine the exact location of the drilling site, and (iii) carry out deep drilling at the selected site. In Greenland, NIPR and collaborating universities have participated in international deep ice coring projects. Currently we participate in the East Greenland the East Greenland Ice Core Project (EGRIP). The purposes of the EGRIP are to advance our knowledge on the dynamics and past changes of the Greenland Ice Sheet and to reconstruct the climate and environment changes during the early Holocene, which was known to be warmer than today and should be an excellent analogue to the future Greenland affected by global warming. After the EGRIP, other deep ice coring projects will be carried out in Greenland to obtain spatial information on climate and ice sheet variability. By analyzing ice cores from both polar regions, we expect to understand the mechanisms and impacts of abrupt climate changes as well as glacial-interglacial climate changes.

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