

Information on Eurasian Arctic sea ice

Dr Vasily Smolyanitsky, head of AARI laboratory of sea ice climate manuals, chair of the WMO/IOC JCOMM Expert Group on Sea Ice, briefed sea ice informational system developed and maintained by the institute. AARI convenes regular monitoring of the state of ice cover for a greater part of the Arctic Ocean with an exception of Canadian Arctic, more attention is paid and the longest monitoring is carried out within the Eurasian Arctic Seas from Barents to Chukchi, as well as within Greenland, Bering and Sea of Okhotsk. Basics of the ice informational system were developed in the first decades of the 20th century when the first shipborne observations on the ice cover were analyzed and averaged (1900s), network of first polar stations was developed (1920s) and finally when a regular ice air reconnaissance for the purposes of the ice charting was started (1932-1992). Investigation of the ice drift patterns became possible with deployment of the North Pole drifting stations (1937, 1951-1991, since 2003), launch of the DARMS (Drifting Automatic Radio Meteorological Station) program in Russia (1953-1972) and cooperation within the IABP program (from 1979). From the end of 1980s the ice information system in the AARI has been maintained in a way similar to present one, when the satellite products from national and foreign space platforms (METEOR, COSMOS, NOAA, EOS, ENVISAT) is the prime source for information used for sea ice cover monitoring and practically all data processing is carried out in a uniform GIS environment.

Further in his presentation Dr Smolyanitsky characterized the main sea ice parameters which the AARI is monitoring and for which the institute maintains climatology or climatic series of data. First of all, these are 10-30 days period assessments of ice extent/area of sea ice propagation and areas of ice massifs for the seas from Greenland to Chukchi, available for some areas and for summer time since 1900s. Next, observational series include information on sea ice total concentration and stages of development distribution, polynyas distribution and fast ice propagation as depicted on regular ice charts for Eurasian Arctic which cover interval 1933-1992 with 10-days periodicity (with gaps in time and space) and interval from 1997 with 10-days periodicity. Annual and seasonal observations of sea-ice phenomena, i.e. dates of stable ice formation/melting/disappearance and level ice thickness, measured at the coastal polar stations, are archived from 1920s. Information on the ice drift characteristics and schema are available with different level of complexity from 1937. Shipborne ice observations from board icebreakers and expeditionary vessels are recorded on a standard basis from 1990s, are complemented by instrumental TV-observations from 2005 and are the source of the most comprehensive data on sea ice (concentration, age, thickness, melt stages, hummocks etc) along sections in the Arctic Ocean. Lastly, North Pole drifting stations are the source of sea-ice geophysical parameters in a point (ice/snow thickness/temperature/salinity profiles).

Most of the above information is available in a form of factual and/or climatological data/database from the ECIMO (Unified System of Information for the World Ocean – Roshydromet program) portal at the AARI web-site (<http://www.aari.ru/projects/ecimo/index.php>) and the WMO project “Global Digital Sea Ice Data Bank” portal at the AARI web-site (<http://www.aari.ru/gdsidb>) and can be considered as a sea-ice SAON element from the side of AARI. Other perspectives for the AARI may include development of a single point sea ice services center for the Russian Arctic, development of an Arctic climate center (common for sea ice, meteorology, etc) as well as renewal and support for a robust and sustained network of polar stations in the Russian Arctic as a part of the future Polar Decade as some of the polar stations located in a critical areas of the Eurasian Sea (e.g. Western Laptev Sea) are still not operative.