



Recent changes in the Arctic Ocean: Effects of climate change and long-term variability

I. Polyakov (1), L. Timokhov (2), V. Ivanov (1), I. Dmitrenko (3), S. Kirillov (2)

(1) International Arctic Research Center, University of Alaska Fairbanks, Fairbanks, USA, (2) Arctic and Antarctic Research Institute, St.-Petersburg, Russia (3) IFO-Geomar, Kiel, Germany, (igor@iarc.uaf.edu / Phone: 907-474-2686)

Observations carried out in the 2000s showed that the exceptional warming which entered the Eurasian Basin in 1999 progressed from Fram Strait along the Barents and Laptev slopes and was captured by oceanographic cross-section in the East Siberian Sea thus finding its way towards the Alaskan backyard. Observations carried out in 2007 also documented strong warming of the very surface layer in the eastern Eurasian and Makarov basins. The magnitude of this warming is unprecedented with no analogy in the history of regional instrumental observations. The unique strength and spatial distribution of this warm surface anomaly suggests the important role of oceanic heat in shaping this summer's substantially reduced ice cover of the Arctic Ocean. The intrusion of warm Atlantic water, combined with the on-going reduction of the sea-ice cover, will have major impacts on the unique Arctic fauna and ecosystems. These changes may be linked to long-term (including anthropogenic) climate change and multidecadal variability (~50-80 years).