



Lead Author e-mail: [gleb@iarc.uaf.edu](mailto:gleb@iarc.uaf.edu)

**Title:** RECONSTRUCTION OF WATER CIRCULATION IN THE PACIFIC SECTOR OF THE ARCTIC OCEAN

**Gleb Pantelev**<sup>1</sup>, Takashi Kikuchi<sup>2</sup>, Andrey Proshutinsky<sup>3</sup>, Jinlun Zhang<sup>4</sup>, Oceana Francis<sup>5</sup>

<sup>1</sup>IARC, UAF, USA

<sup>2</sup>Jamstec, Japan

<sup>3</sup>Woods Hole oceanographic institute, USA

<sup>4</sup>Applied physical laboratory, UW, USA

<sup>5</sup>University of Hawaii Manoa, USA

Circulation in the Pacific sector of the Arctic Ocean was reconstructed for 1900-2006, 1972-1978, 1989-1996 and 1997-2006 climate states through the use of modeling data assimilation of the oceanographic (temperature, salinity, velocity), ice and atmospheric data into the data assimilation system based on two models. First model (fully couple ice-ocean Pan-Arctic Ice-Ocean Modeling and Assimilation System (PIOMAS)) employs simplified data assimilation of the ice data. Second model, ( Semi-Implicit Ocean Model (SIOM)) assimilates oceanographic and atmospheric observations and output of the PIOMAS in the ice covered regions. The comparison the reconstructed climatological states with circulation for 2008 (July-October) reveals significant changes in water motion. In particular, the reconstructed circulation patterns identify significant decrease of the absolute sea surface height along the Siberian Shelf and reverse of the flow along the continental slope near the Laptev Sea. The identified changes in the sea surface height may result to the observed increase of the flow through the Bering Strait. The physical processes that can be responsible for these changes are discussed.