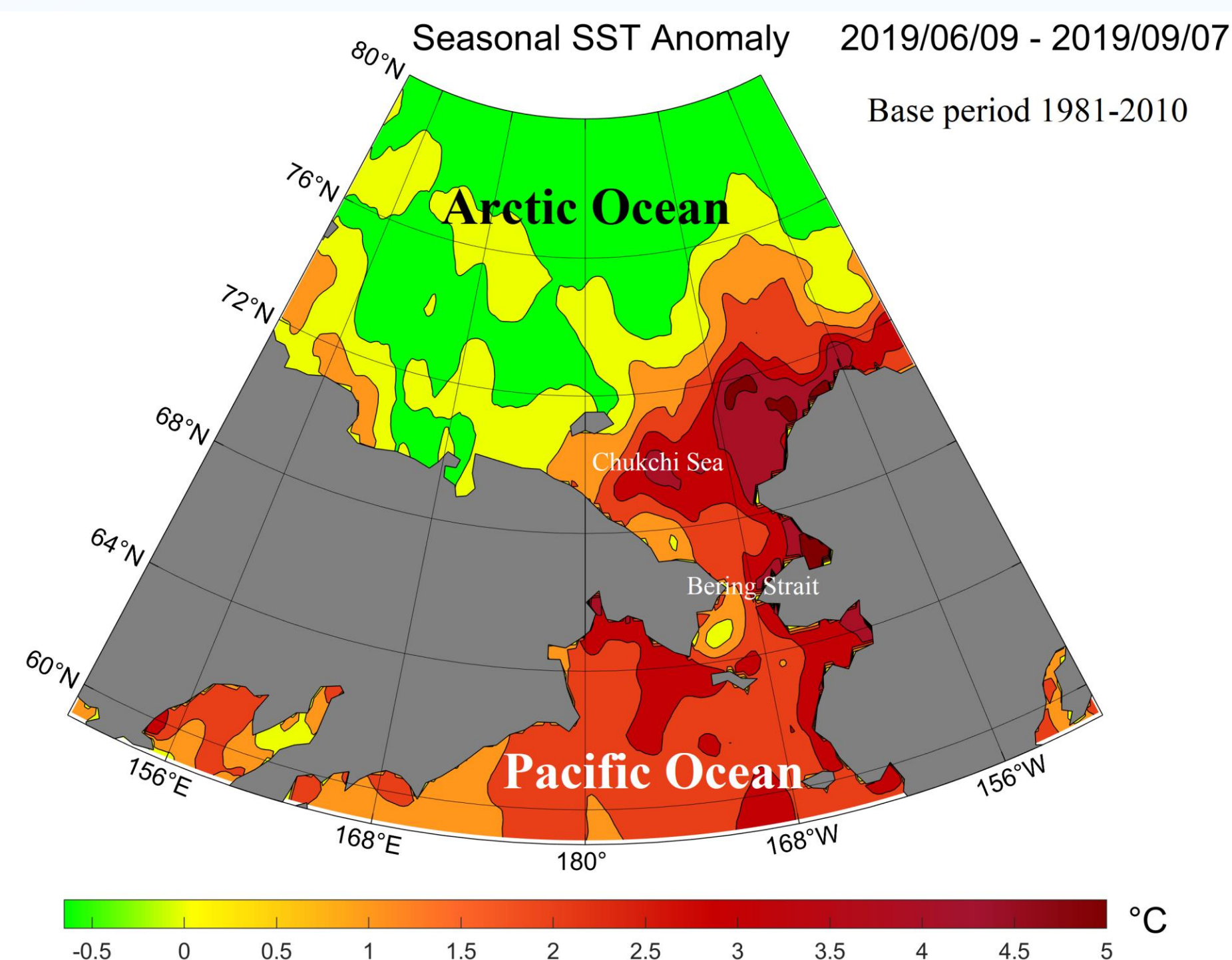


Marine heatwave (MHW) is a discrete prolonged (5 days and more) anomalously warm water event in a particular location and temperature warmer than 90-th percentile based on a 30-year historical baseline period. An Algorithm for MHW could be found in [J. Hobday et al. / Progress in Oceanography 141 (2016) 227-238].

Marine heatwaves, repeating for several years in the waters adjacent to the Arctic basin, can affect the structure of its waters in the regions most in contact with them due to advective heat exchange.

NOAA High Resolution SST data provided by the NOAA/OAR/ESRL PSL, Boulder, Colorado, USA, <https://psl.noaa.gov/data/gridded/data.noaa.oisst.v2.highres.html>

Reynolds, Richard W., Thomas M. Smith, Chunying Liu, Dudley B. Chelton, Kenneth S. Casey, Michael G. Schlax, 2007: J. Climate, 20, 5473-5496.

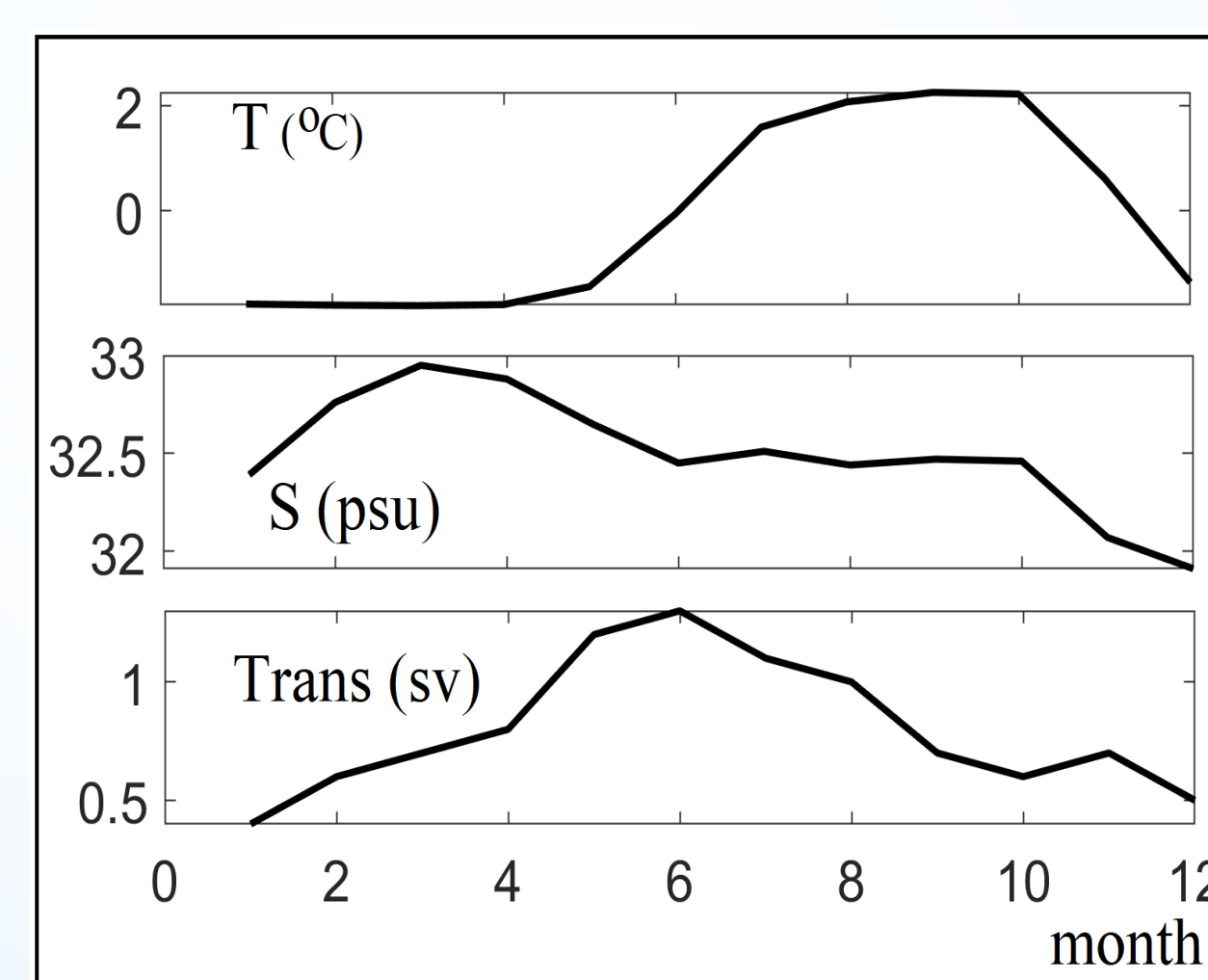


Our study is based on a three-dimensional the coupled regional ocean-ice model (SibCIOM, Golubeva & Platov 2007, J. Geophys. Res. 112 C04S05, 2009, Izvestiya. Atmospheric and Oceanic Physics 45) The model domain includes the Arctic and the Atlantic Ocean north of 20° S. The grid resolution for the North Atlantic is chosen to be 0.5° x 0.5°. At 65° N, the North Atlantic spherical coordinate grid is merged with the displaced poles of the Arctic grid. The horizontal grid size in the Arctic varies from 10 to 25 km with an average grid spacing of about 18 km. The model version used here has 38 unevenly spaced vertical levels with a maximum resolution of 5 m in the upper 20-meter layer. The model is forced by the NCEP/NCAR Reanalysis data (Kalnay et al. 1996, <http://www.esrl.noaa.gov/psd/data/reanalysis/reanalysis.shtml>). Numerical modeling results: an increase in the temperature of the Pacific waters entering the Arctic shelf through the Bering Strait over several years leads to an increase in the heat content of the Chukchi Sea waters, an advective heat transfer by currents in the surface and subsurface layers, and gradual increase in the ocean heat content (OHC) of the Beaufort Sea.

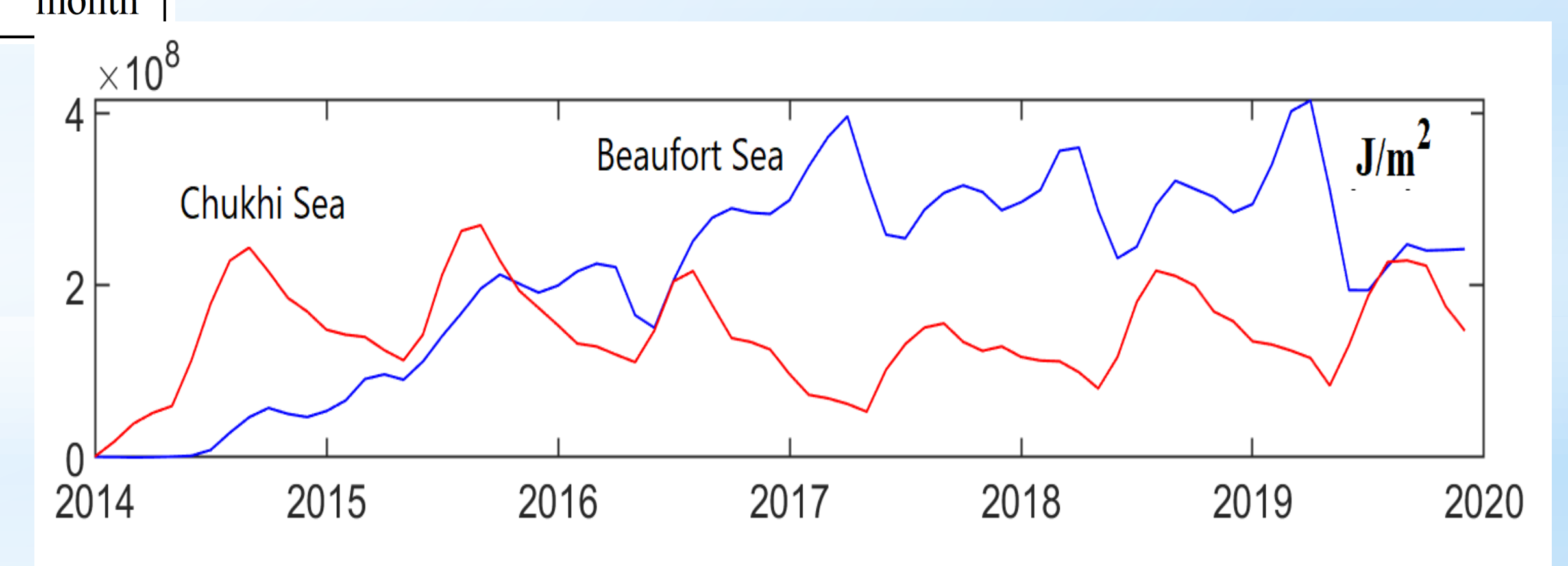
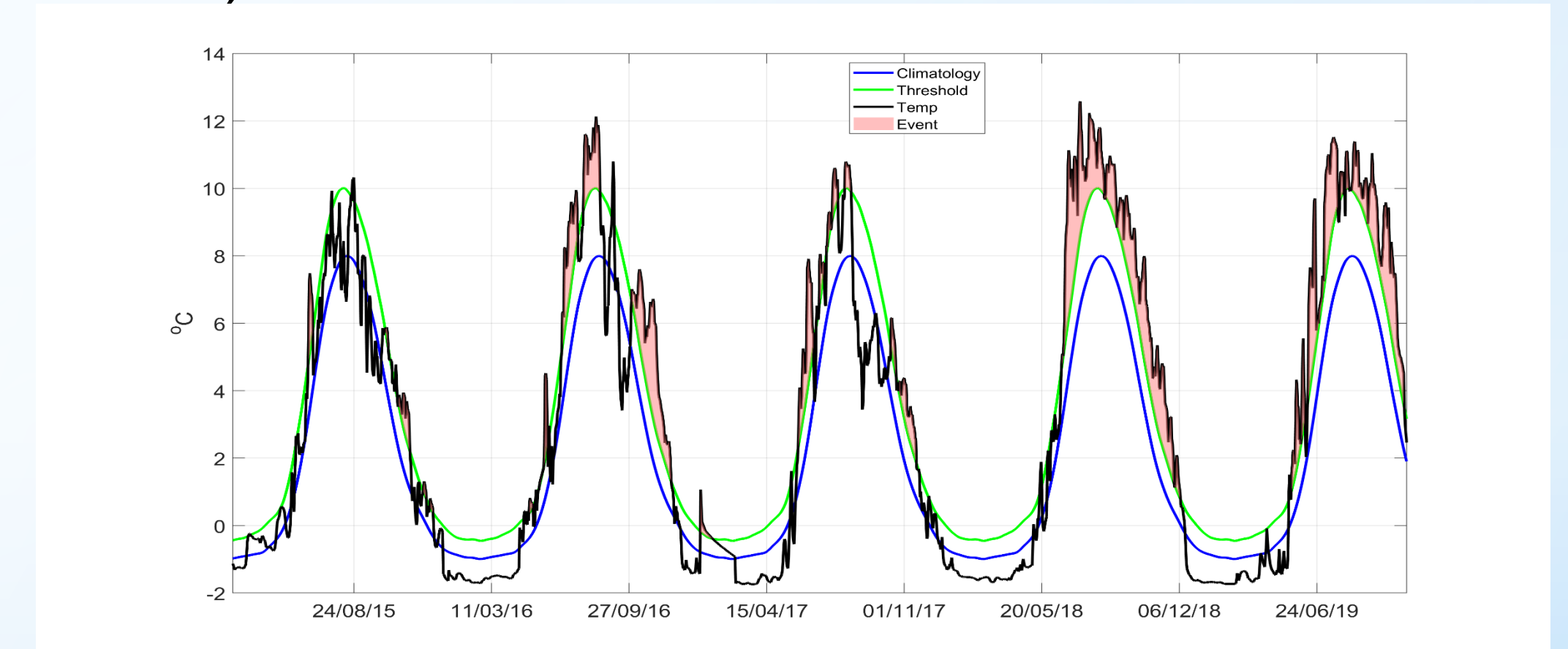
Numerical simulations of the consequences of anomalously warm water inflow through the Bering Strait

Boundary conditions in the Bering Strait

Experiment 1, 2000-2020 period
Monthly Climatology,
R. A. Woodgate, K. Aagaard, 2005,
doi:10.1029/2004GL021880



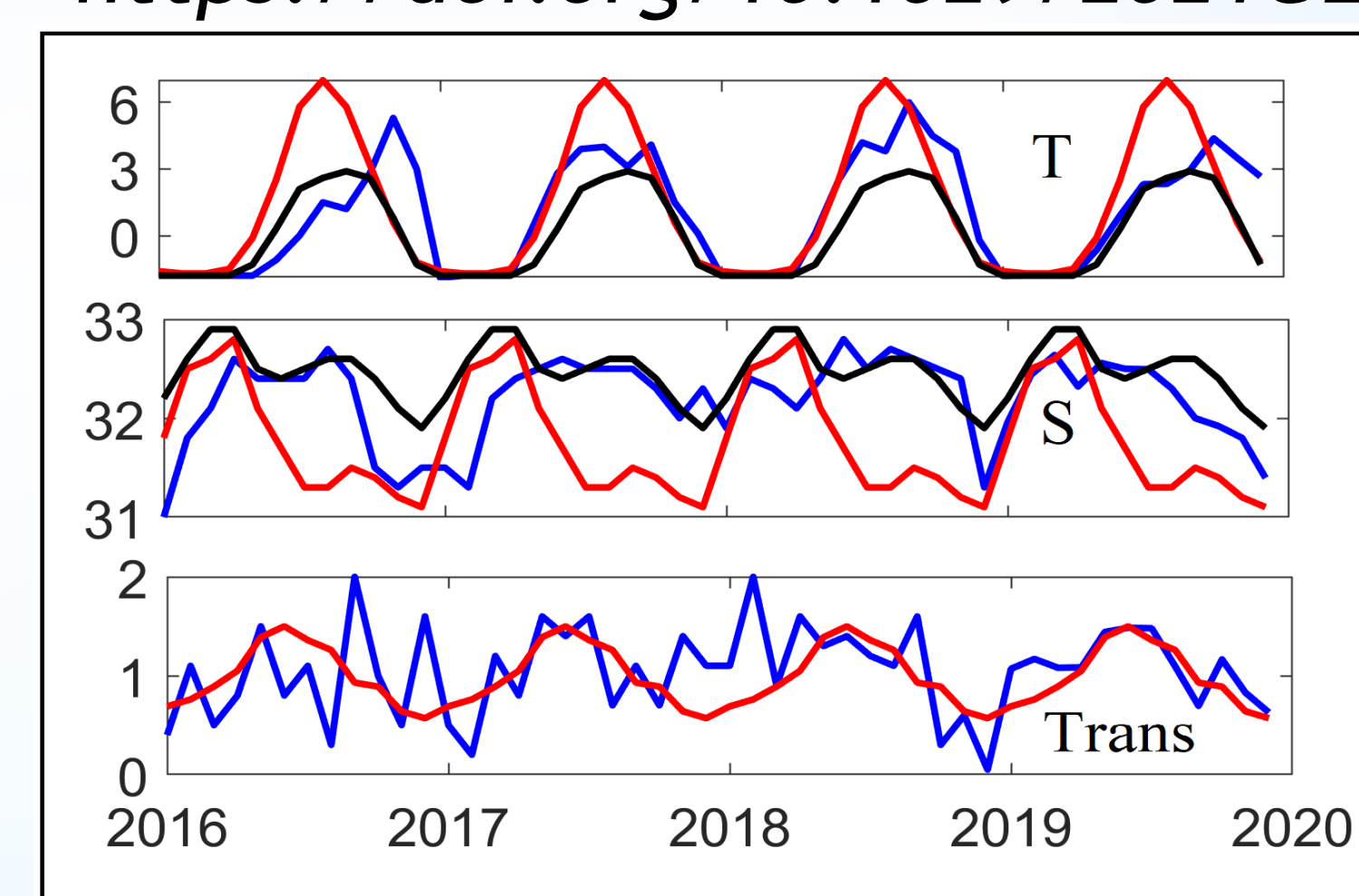
Experiment 2, 2013-2020 period
Temperature anomaly 2.5C (June-November)
added to the monthly climatology
(based on the analysis of MHW in the Bering Strait)



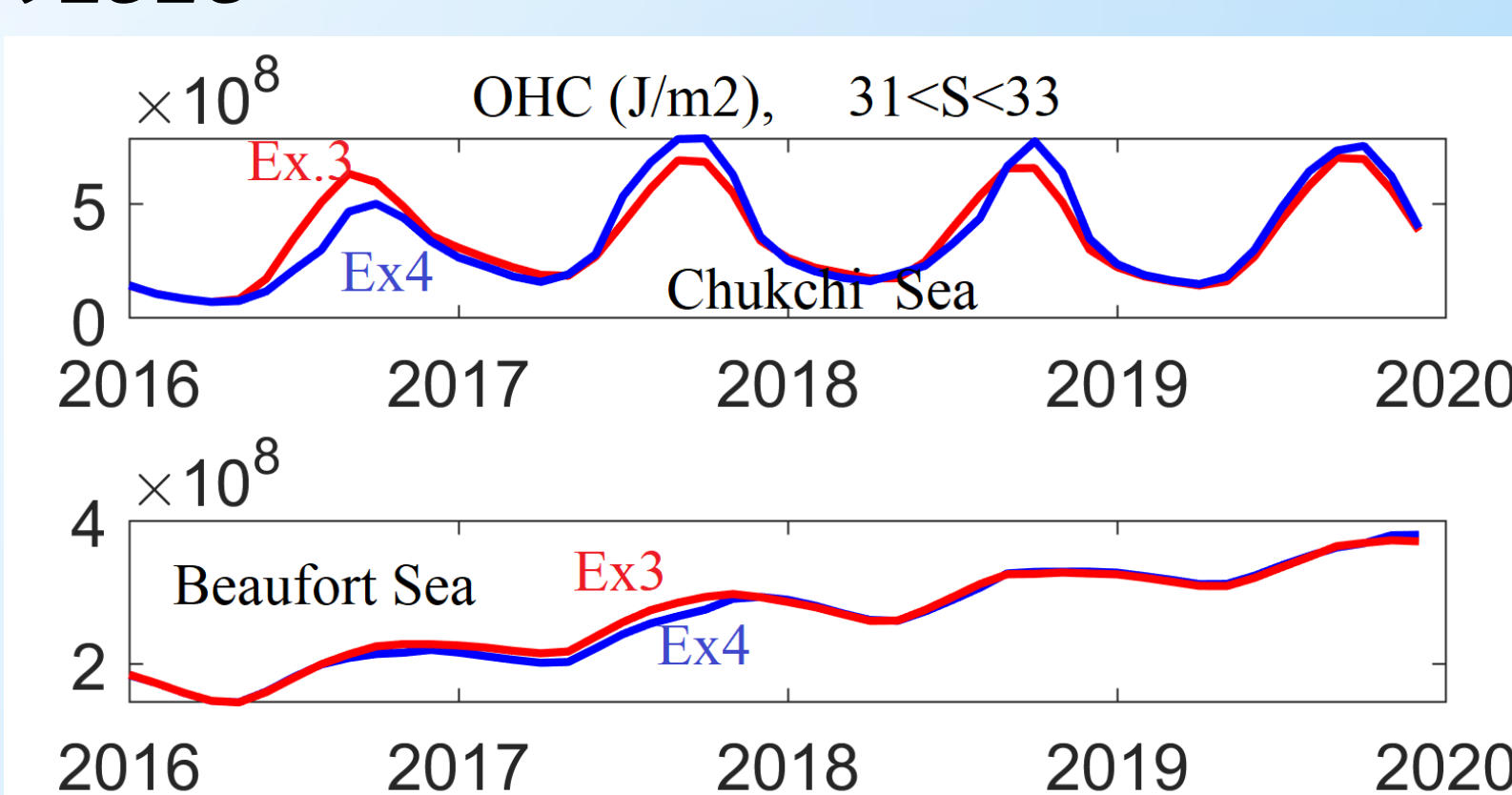
Difference in Ocean Heat Content Exp2.-Exp1.

Exp.4, 2016-2019

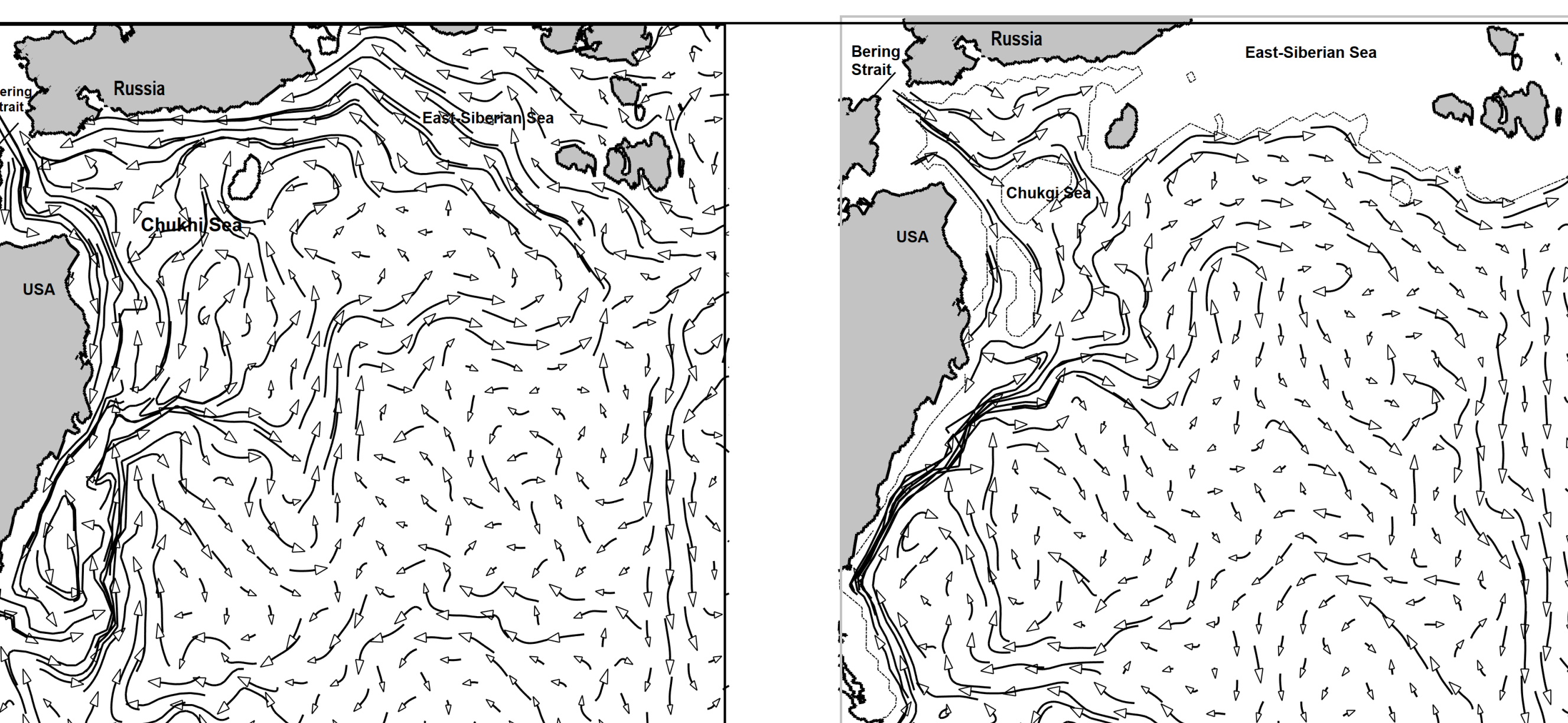
Monthly Data (2016-2019), adapted from
R. A. Woodgate & C. Peralta-Ferriz, 2021,
<https://doi.org/10.1029/2021GL092528>



Blue lines -Ex.4, red and black- ex.3



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(Grants №19-17-00154)



Experiment 3, 2004-2020

New recommended monthly climatology,
Woodgate, R.A., 2018,
doi:10.1016/j.pocean.2017.12.007.

