SEA ICE OUTLOOK
2021 July Report

By UTokyo (Kimura et al.)

Contributor
   Label: UTokyo (Kimura et al.)

   Contributors
      Noriaki Kimura (The University of Tokyo, Japan)
         kimura_n@aori.u-tokyo.ac.jp
      Hiroyasu Hasumi (The University of Tokyo, Japan)

Executive summary
   Monthly mean ice extent in September will be about 4.66 million square kilometers. Our estimate is based on a statistical way using data from satellite microwave sensor. We used the accumulated sea ice convergence based on the 212 days backward tracking of the ice from June 30 to December 1.

Type of Outlook method:
   statistical

Dataset
   Ice velocity: Daily sea-ice velocity of Kimura Dataset (Kimura et al., 2013), during December 1 and June 30 for all AMSR-E/AMSR2 years.

   Ice concentration: 10km grid data by Arctic Data Archive System (https://ads.nipr.ac.jp)

Prediction of September pan-Arctic extent as monthly average in million square kilometers.
   4.66 million square kilometers

Short explanation of Outlook method.
   We predicted the Arctic sea-ice cover from coming July 1 to November 1, using the data from satellite microwave sensors, AMSR-E (2002/03-2010/11) and AMSR2 (2012/13-2020/21). First, we estimate the accumulated sea ice convergence from June 30 to December 1 of the preceding year based on the backward tracking of sea ice. Then, we predict the summer ice area depending on the relationship between the ice convergence and summer ice concentration. The analysis method is based on our research (Kimura et al., 2013) showing the possible relation between the ice convergence and ice thickness.

Pan-Arctic sea ice extent anomaly million square km.
   +0.17 (4.66-4.49)

Reference
   Kimura, N., A. Nishimura, Y. Tanaka and H. Yamaguchi, Influence of winter sea ice motion on summer ice cover in the Arctic, Polar Research, 32, 20193, 2013.
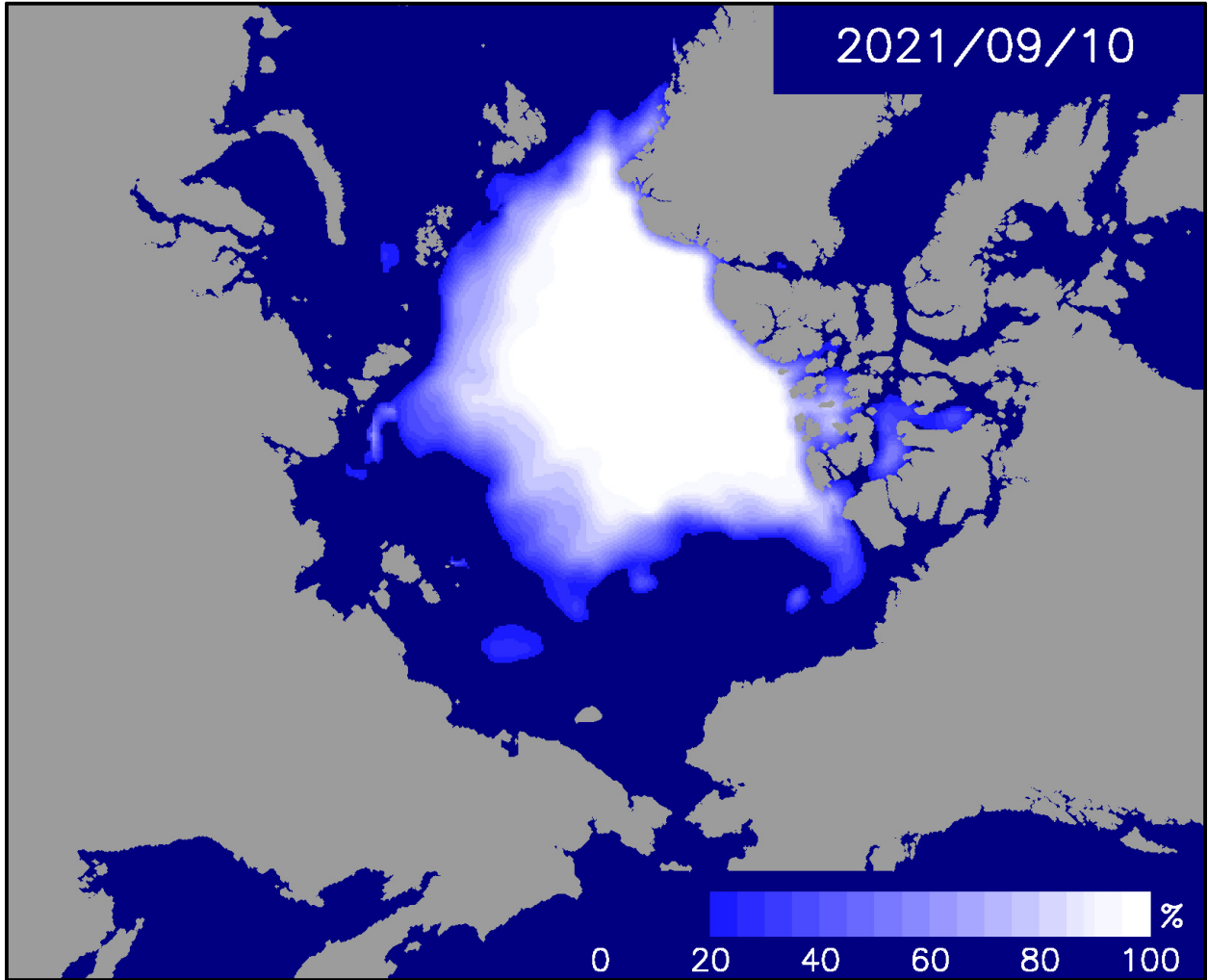
Fig: Predicted ice concentration on September 10 2021.