SEA ICE PREDICTION NETWORK (SIPN)
Pan-Arctic Sea Ice Outlook Core Contributions

by NIPR/UT kimura et al.

July 2015 Report

1. *Contributor Name(s)/Group

   Label: NIPR/UT Kimura et al.

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2. *"Executive summary" about your Outlook contribution (max 300 words)
   Say in a few sentences what your Outlook contribution is and why. To the extent
   possible, use non-technical language.

     The monthly mean ice extent in September will be about 4.67 million square
   kilometers. Our estimate is based on a statistical way using data from satellite
   microwave sensor. We used the ice thickness in December, ice movement from
   December to April, and ice concentration in June. Predicted ice concentration map
   from July to September is available in our website: http://www.1.k.u-
   tokyo.ac.jp/YKWP/2015arctic2_e.html

3. *Type of Outlook projection
   ___dynamic model _X_statistical ___heuristic ____mixed or other: (specify)

4. *September monthly average projection
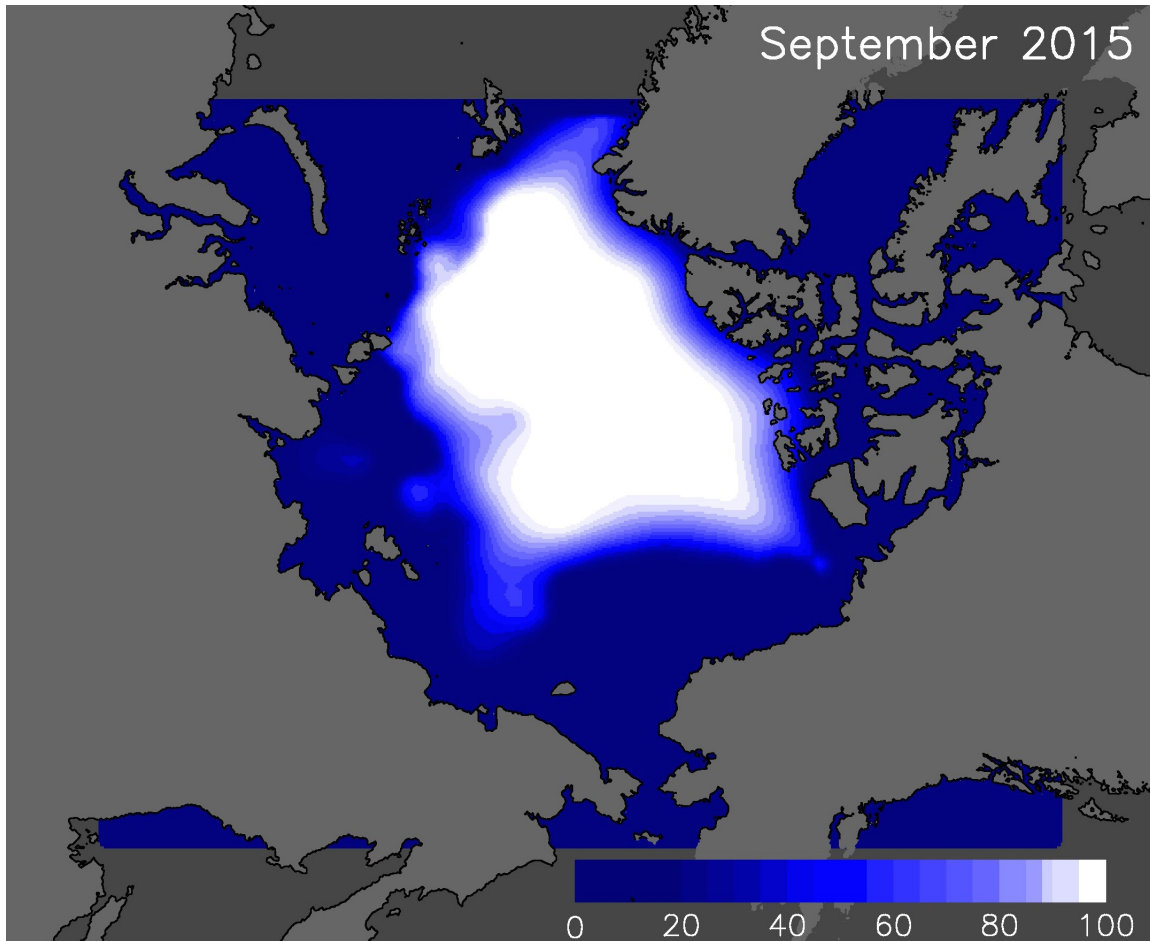
   4.67 million square kilometer

Fig: Predicted monthly mean ice concentration in September 2015.

5. *Short explanation of Outlook method (max 300 words)

   We predicted the Arctic sea-ice cover from coming July 1 to September 30, using the data from satellite microwave sensors, AMSR-E (2002/03-2010/11) and AMSR2 (2012/13-2014/15). The analysis method is based on our recent research (Kimura et al., 2013). First, we expect the ice thickness distribution in spring from redistribution (divergence/convergence) of sea ice during winter through spring. Then, we predict the summer ice area depending on the assumption that thick ice remains later and thin ice melts sooner than the average.
   We distributed particles homogeneously over the Arctic sea ice on December 1, and traced the trajectories of the particles to the end of April by using the satellite derived daily ice velocity. In this procedure, we also take it into account that thickness of sea ice on December 1 calculated by the method of Krishfield et al. (2014). In addition to the ice redistribution during December-April, sea ice concentration during June 15-20 is also used for the prediction. In this report we are showing the predicted ice cover calculated by the multiple regression analysis based

on the ice redistribution during December-April and average sea-ice concentration during June 15-20.

References

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.

Krishfield, R. A., Proshutinsky, A., Tateyama, K., Williams, W. J., Carmack, E. C., McLaughlin, F. A., and Timmermans, M. L., Deterioration of perennial sea ice in the Beaufort Gyre from 2003 to 2012 and its impact on the oceanic freshwater cycle, J. Geophys. Res., 119, 1271-1305, doi:10.1002/2013JC008999, 2014.