Supplementary Material

Ziying Yang[1, 2], Jiping Liu[3], Mirong Song[1], Yongyun Hu[4], Qinghua Yang[3], Ke Fan[3]

[1]Institute of Atmospheric Physics, Chinese Academy of Sciences, Beijing 100029, China
[2]University of Chinese Academy of Sciences, Beijing 101408, China
[3]School of Atmospheric Sciences, Sun Yat-sen University, and Southern Marine Science and Engineering Guangdong Laboratory (Zhuhai), Zhuhai 519082, China
[4]Department of Atmospheric and Oceanic Sciences, School of Physics, Peking University, Beijing 100087, China

Correspondence to: Jiping Liu (liujp63@mail.sysu.edu.cn)

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Figure S1 to S4

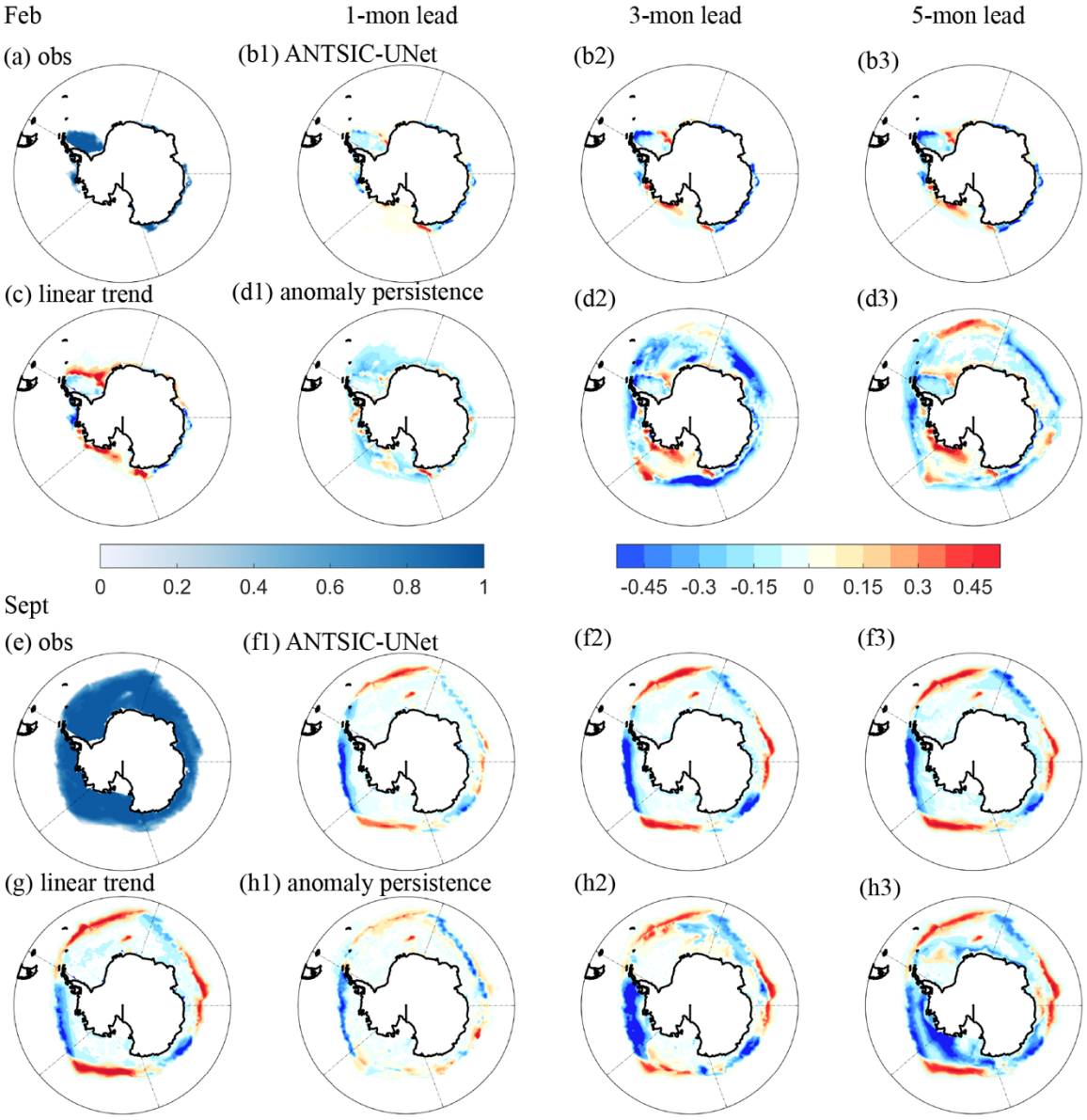

Figure S1. The monthly mean sea ice concentration of the NSIDC observations for (a) February and (e) September, and the errors predicted by ANTSIC-UNet (b1-b3, f1-f3), the linear trend model (c and g), and anomaly persistence model (d1-d3, h1-h3) at lead time of 1, 3, and 5 months for February (upper panel) and September (lower panel) for 2017.

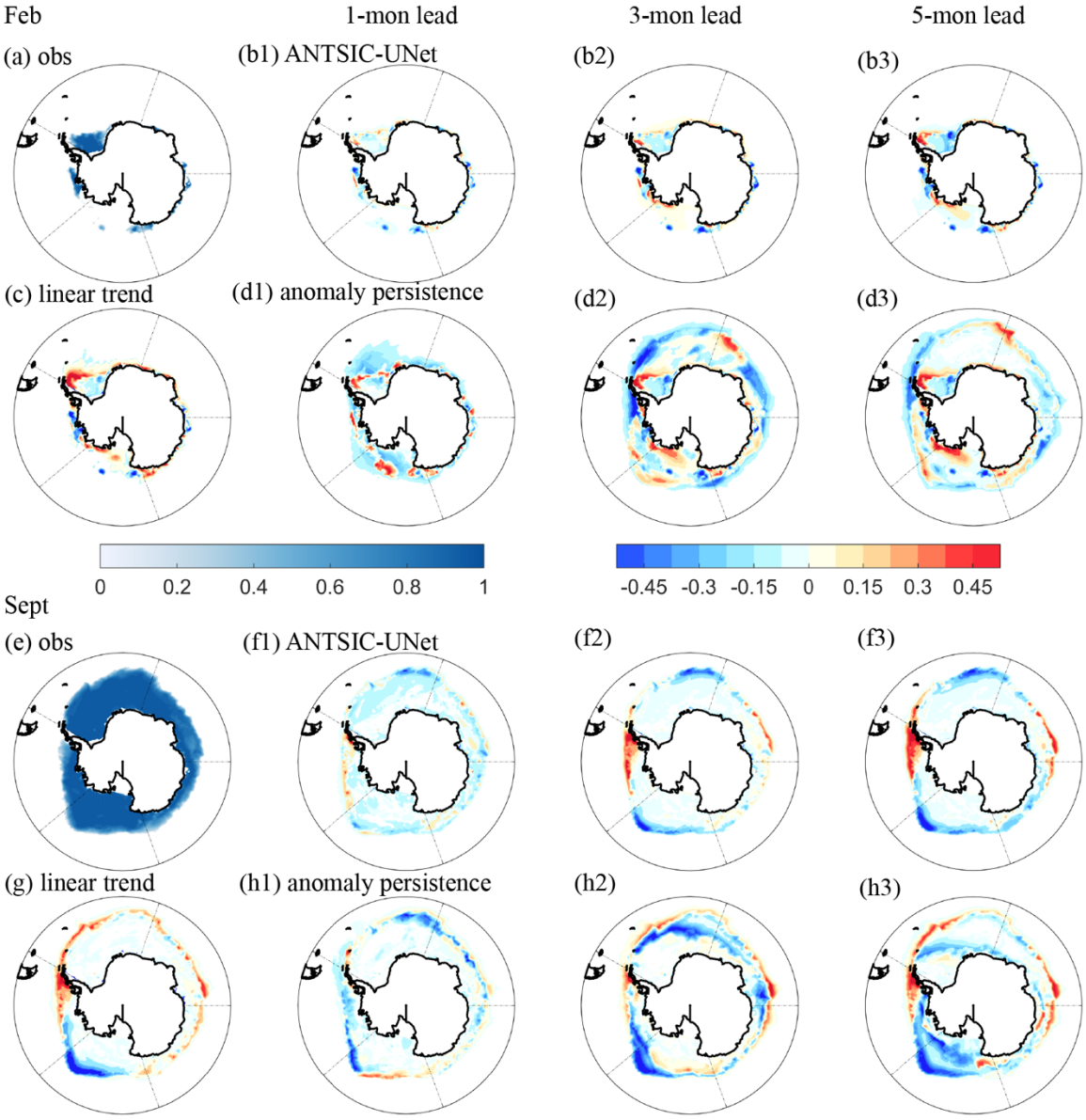

Figure S2. Same as figure S1 but for 2022.

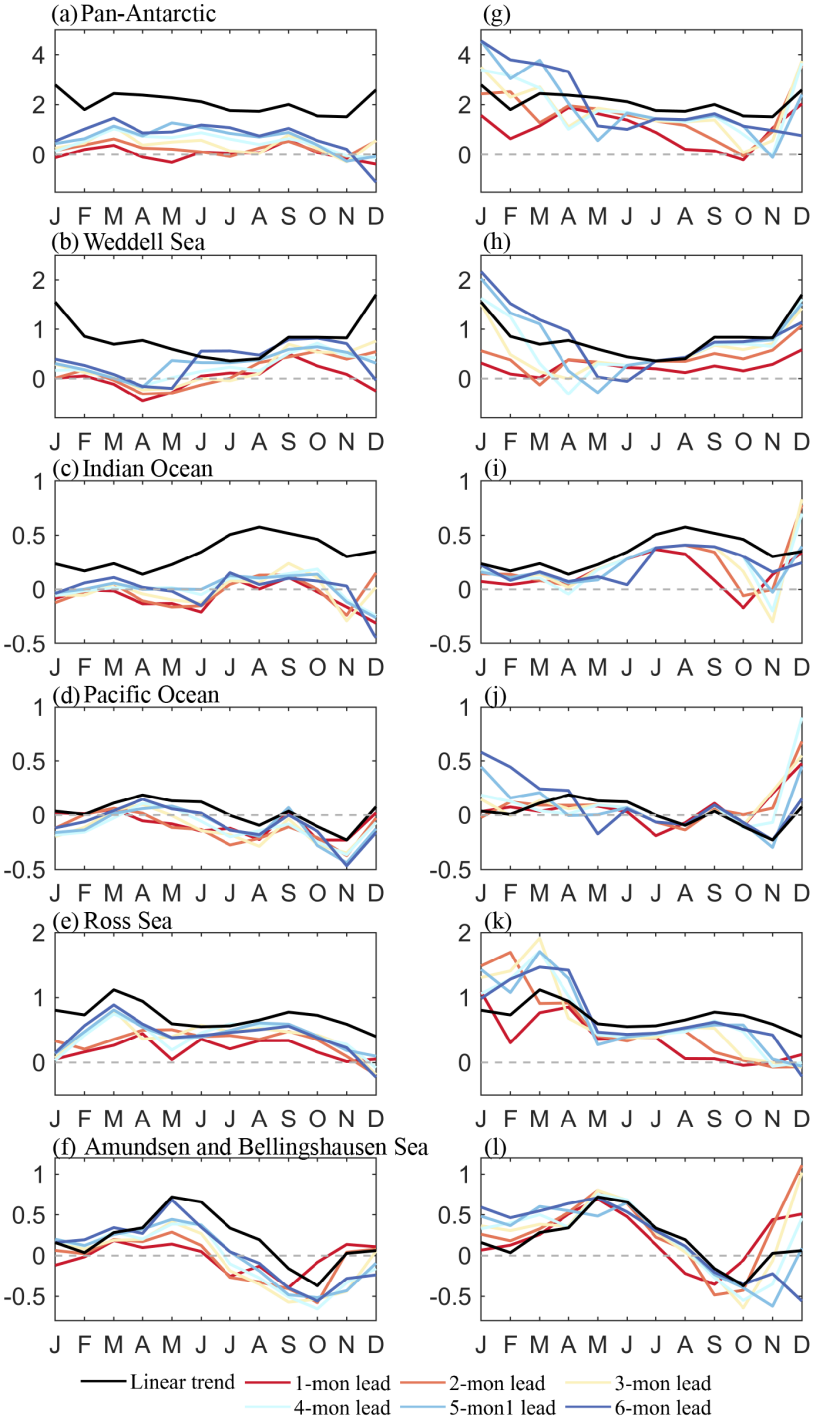

Figure S3. Seasonality errors of the Pan- and regional Antarctic monthly mean SIE (SIC > 15%) between NSIDC observations and ANTSIC-UNet (a-f) and anomaly persistence model (g-l) predictions at different lead times for 2017. The black lines show the seasonality SIE errors between observations and linear trend model. (units: million square kilometers)

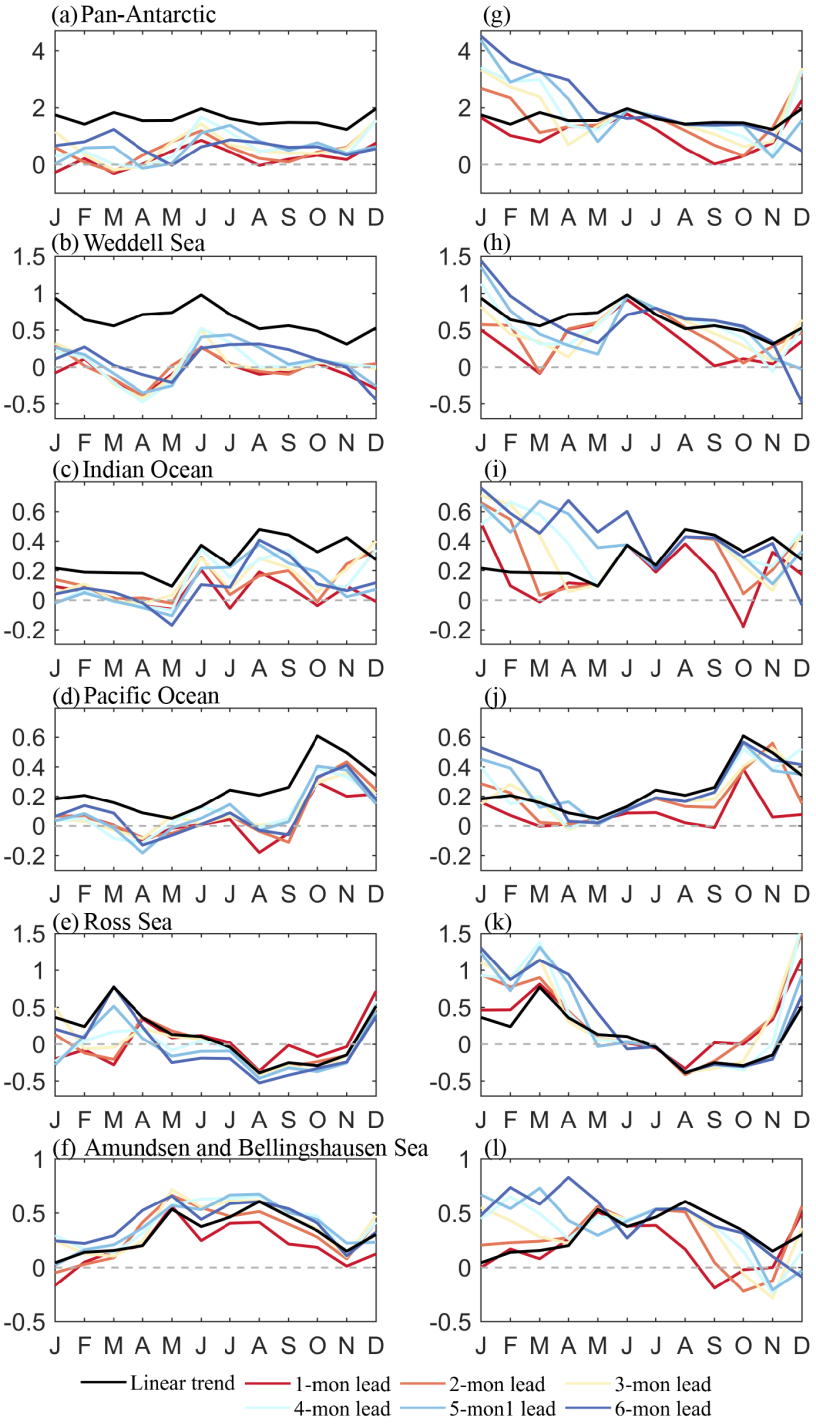

Figure S4. Same as figure S3 but for 2022.