Geoscientific
Model Development

Supplement of

An improved regional coupled modeling system for Arctic sea ice simulation and prediction: a case study for 2018

Chao-Yuan Yang et al.

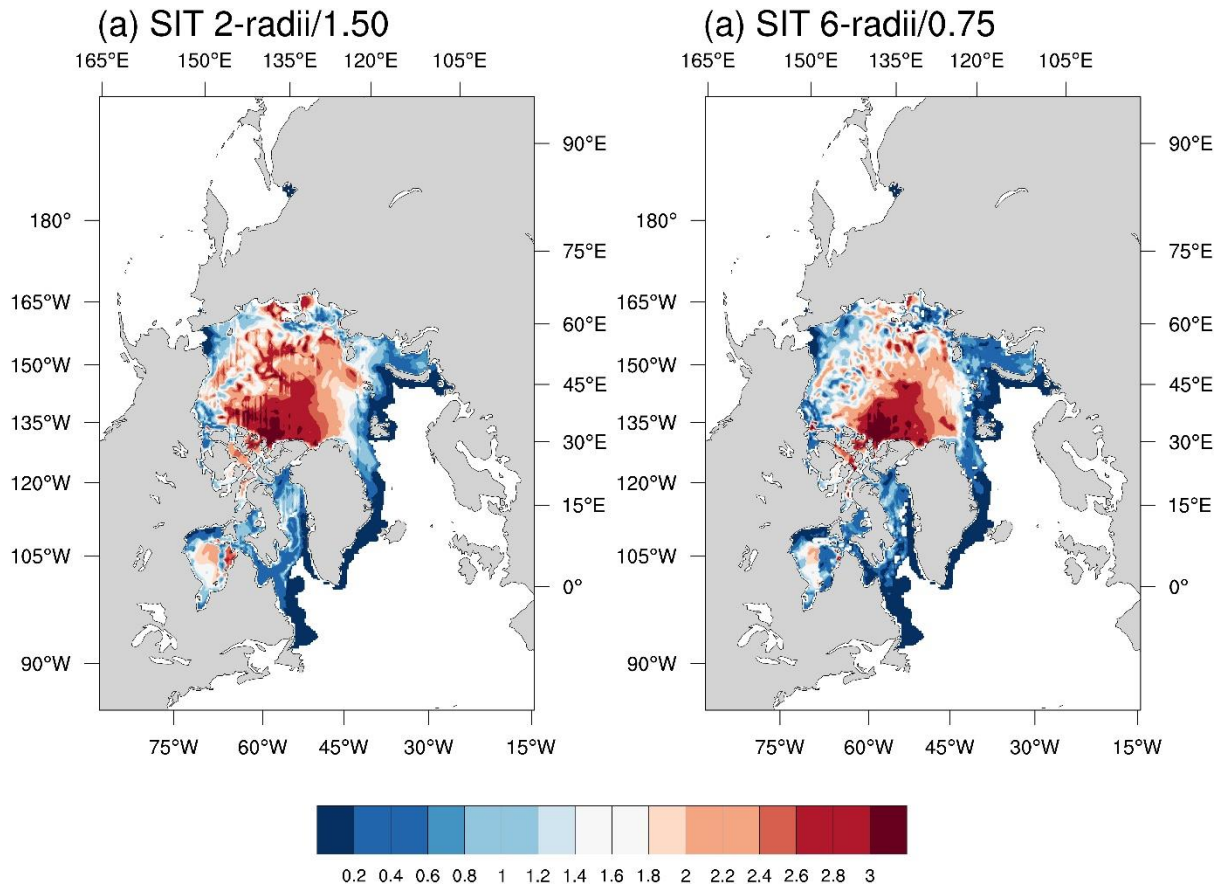*Correspondence to:* Chao-Yuan Yang (yangchy36@mail.sysu.edu.cn) and Jiping Liu (jliu26@albany.edu)

Figure S1 The initial sea ice thickness after data assimilation with (a) 2 localization radii/1.5m ice thickness uncertainty, and (b) 6 localization radii/0.75m ice thickness uncertainty.
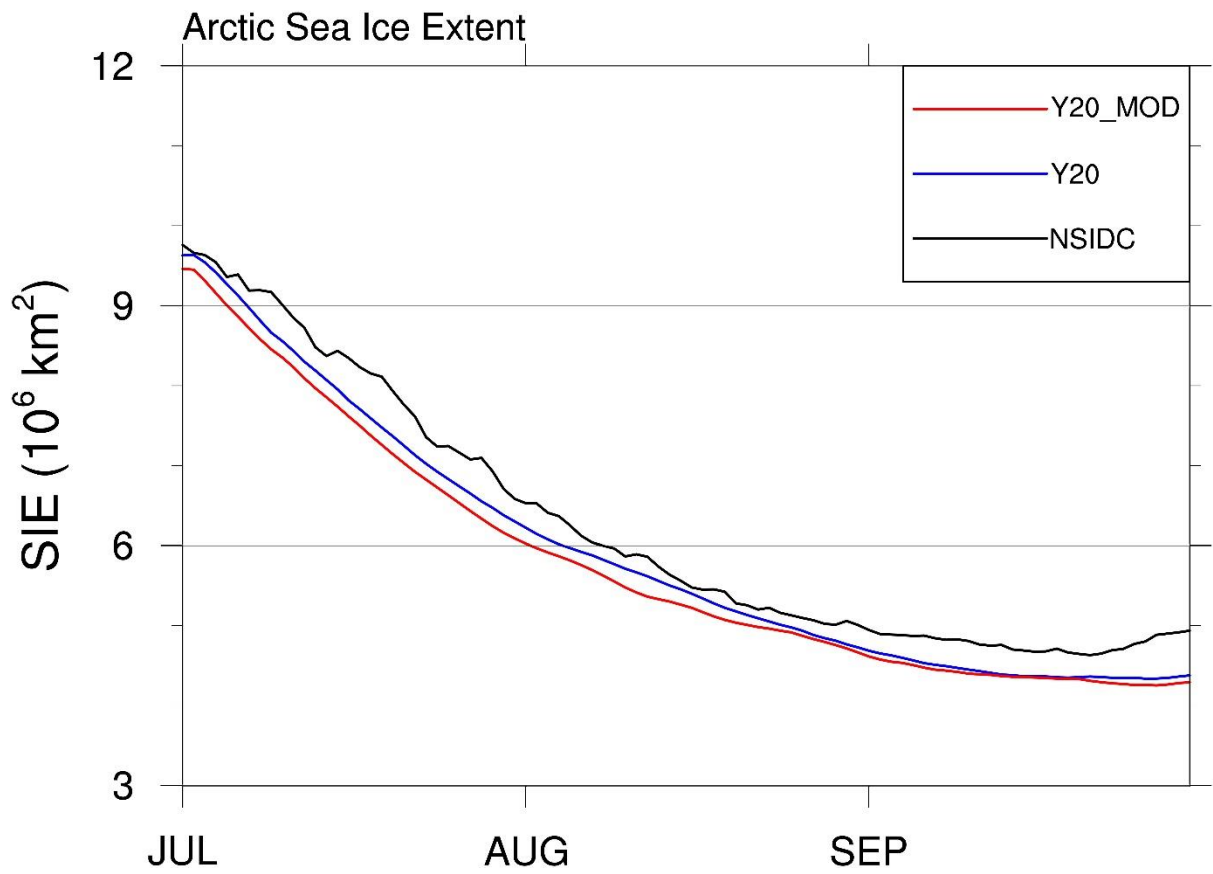
Figure S2 Time-series of Arctic sea ice extent for the observations (black line) and the ensemble-mean of Y20 (blue line) and Y20_MOD (red line).
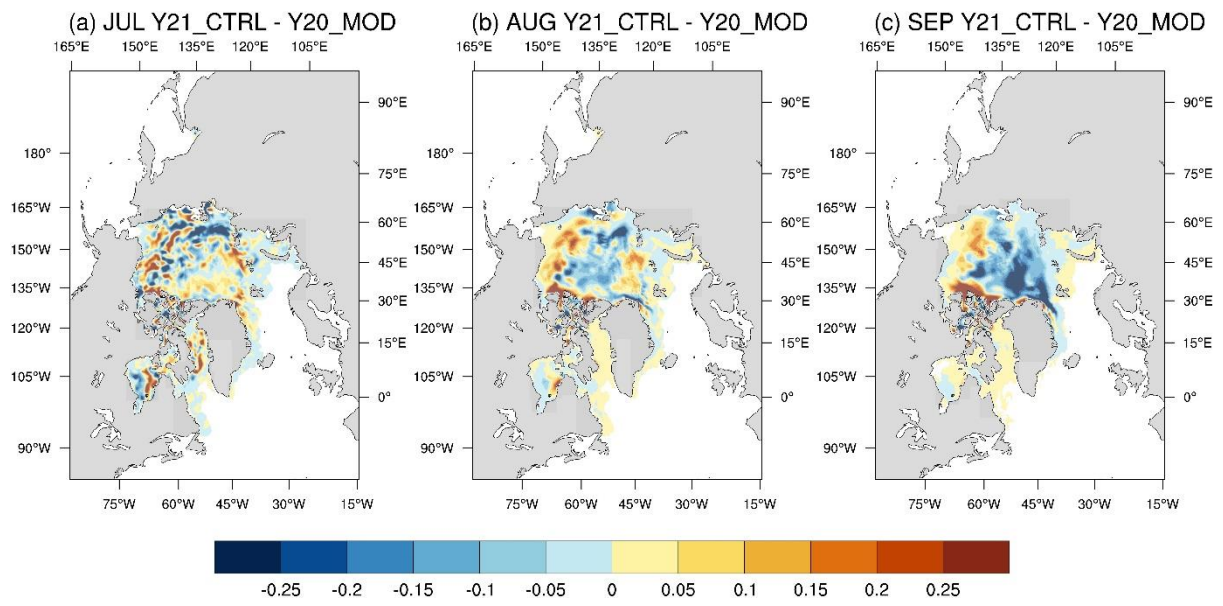
Figure S3 Monthly mean of sea ice thickness difference for (a) July, (b) August, and (c) September between Y21_CTRL and Y20_MOD.
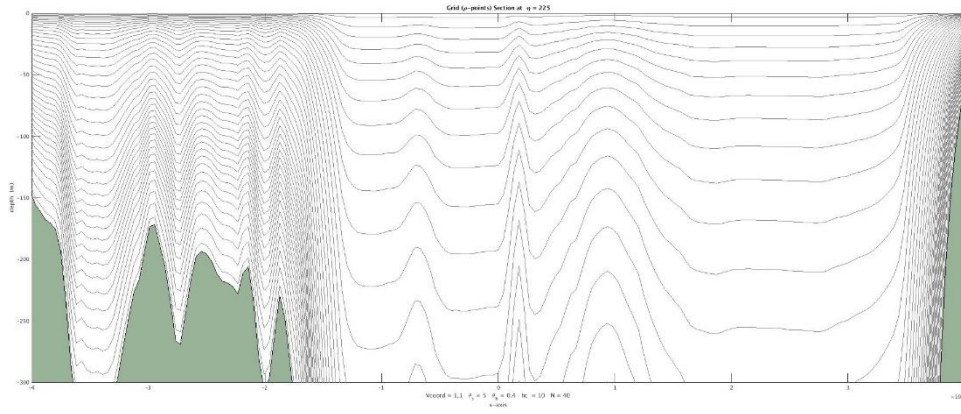
Figure S4 The vertical layer distribution of Y21_CTRL for a cross section near the central
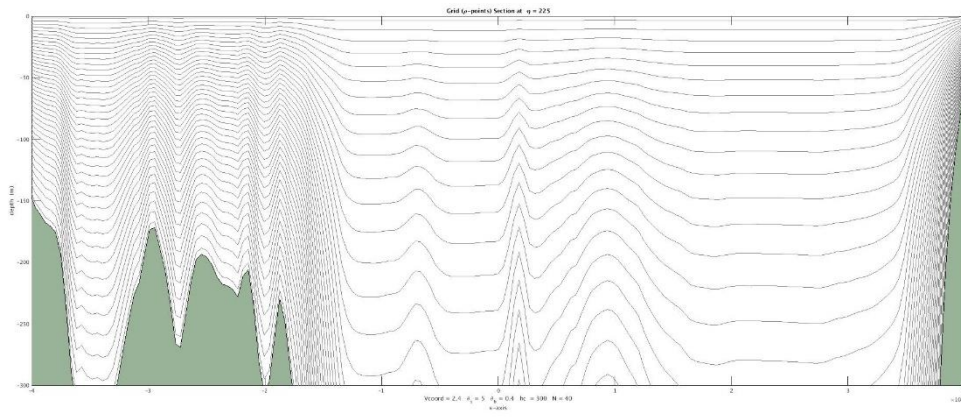
Arctic.

Figure S5 The vertical layer distribution of Y21_VT for a cross section near the central Arctic.
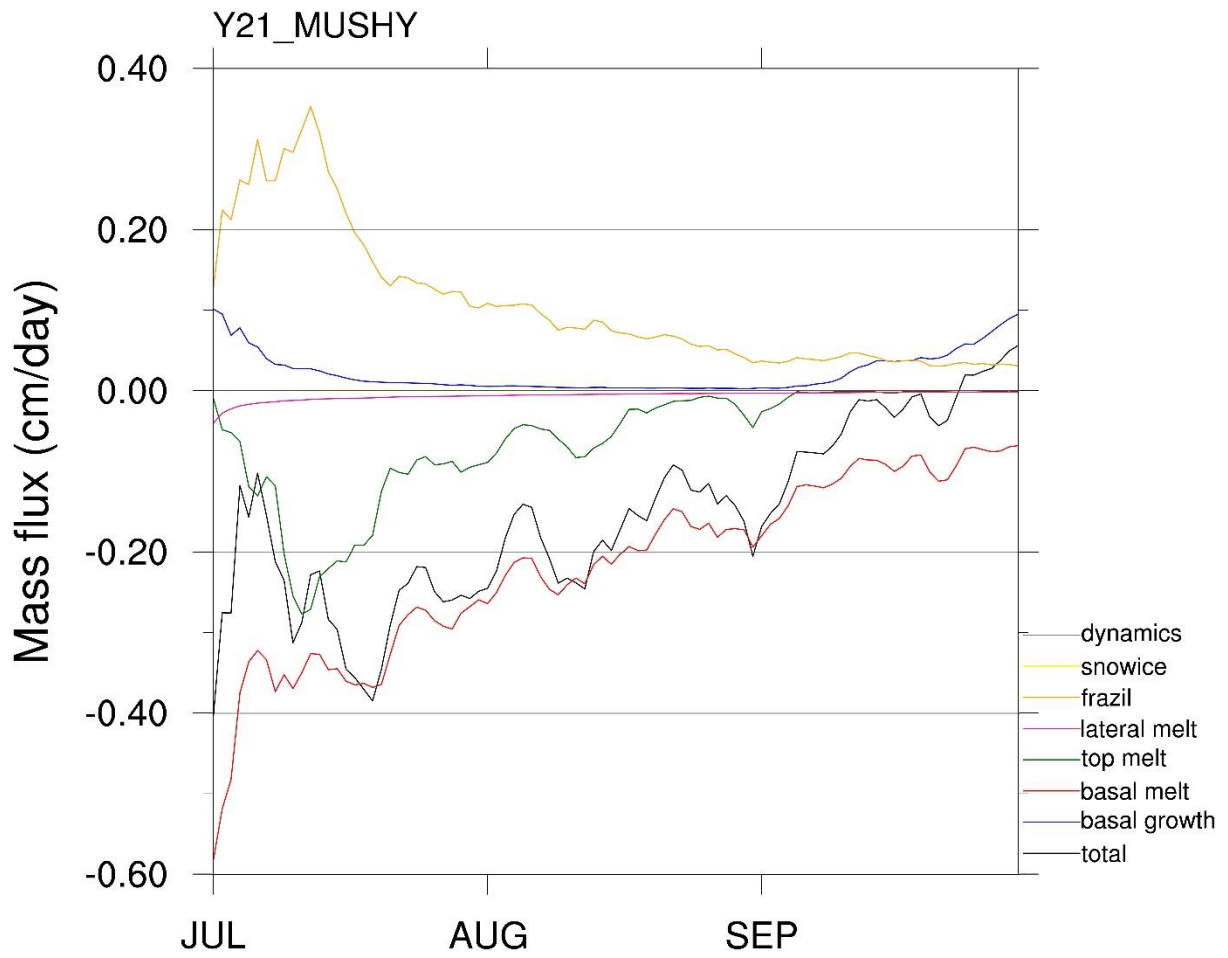
Figure S6 Time-series of sea ice mass budget terms for Y21_MUSHY.