SEA ICE OUTLOOK

2023 June Report

By ArCS II Kids

Contributor

Label: ArCS II Kids

Contributors

44 junior high school students at Notre Dame Jogakuin in Kyoto

17 elementary school students in Mombetsu, Hokkaido

20 elementary school students in Setagaya, Tokyo

Organizer

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Executive summary

The Arctic ice extent in this September is expected to be 4.51 million square kilometers. The prediction was made by 10 groups (44 students) of junior high school students and 37 elementary school students.

The groups of junior high school students was given a graph of monthly mean sea ice extent and a sea ice distribution map for the entire Arctic for September since 2002. In addition to this, each group was given supplementary data for parameters on the Arctic climate. Based on these data, each group projected the sea ice extent for September 2023. The elementary school students were given a sea ice distribution map for September. They estimated the sea ice extent for each year based on the map and made a graph of the interannual changes. By looking at the graph, each individual made a prediction of the sea ice extent for September 2023. Finally, the ice extent of the prediction was calculated by averaging the determined values by the 10 groups and 37 individuals.

The maximum and minimum predicted values were 6.43 and 2.65, respectively, but most students predicted values similar to those of 2021 and 2022 (around 4.9 million square kilometers) or in line with the long-term trend (around 4.2 million square kilometers).

Type of Outlook method:

Heuristic

Dataset

Ice concentration: 25km grid data from SSM/I, and 10km grid data from AMSR-E and AMSR2, distributed by Arctic Data Archive System (https://ads.nipr.ac.jp)

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

4.51 million square kilometer

Short explanation of Outlook method.

The prediction was made by 10 groups (44 students) of junior high school students and 37 elementary school students. The groups of junior high school students was given a graph of monthly mean sea ice extent and a sea ice distribution map for the entire Arctic for September since 2002. In addition to this, each group was given supplementary data such as Arctic temperature, precipitation, salmon landings, and changes in the number of polar bear sightings, to predict the sea ice extent for September 2023. The elementary school students were given a sea ice distribution map for September. Based on this, they estimated the sea ice extent for each year and made a graph of the interannual changes. By looking at the graph, each individual made a prediction of the sea ice extent for September 2023. Finally, the ice extent of the prediction

was calculated by averaging the determined values by the 10 groups and 37 individuals.

The 47 values predicted by the 10 groups of the junior high school students and 37 elementary school students were averaged to the predicted values as ArCS II Kids.

Pan-Arctic sea ice extent anomaly

+0.32 (4.51-4.19) million square kilometers

Predicted value of each (million square kilometers)

Notre Dame Jogakuin in Kyoto

First year junior high school students

Grope 1 (Ogura, Kawakami, Kobayashi, Mannen, Kijima): 4.57

Grope 2 (Wada, Inoue, Kimura, Hirasa): 4.70

Grope 3 (Uemura, Kajiyama, Tanaka, Nishimura, Asahi): 4.00

Grope 4 (Ueshima, Ohashi, Kataoka, Matsui, Miyae): 4.00

Grope 5 (Sakakibara, Wada, Uemura, Morishita, Kamisaka): 4.75

Second year junior high school students

Grope 1 (Sanada, Sano, Sakamoto, Ichimura): 4.10

Grope 2 (Shibata, Ohkouchi, Nozawa, Tatsumura): 3.90

Grope 3 (Ogawa, Ogura, Nakagawa, Yamamoto): 4.07

Grope 4 (Ishida, Hiratani, Yamashita, Watanabe): 4.49

Grope 5 (Fujishige, Kawai, Teramura, Yamada): 3.50

Elementary school students in Mombetsu

Kai Iwamoto: 5.46

Shunta Iwamoto: 4.58

Yuta Nagano: 5.22

Saneatu Kadota: 6.43

Miku Yamamoto: 5.46

Ryuusei Kudo: 5.22

Aenta Asano: 4.90

Sora Matsuoka: 4.90
Seiya Ooki: 4.17
Kouta Ooki: 4.98
Takuma Ooki: 5.06
Tsubasa Hashimoto: 5.38
Isamu Aoki: 5.30
Rio Saito: 5.22
Chiori Yanagisawa: 6.03
Jin Mimuro: 4.66
Tika Shibata: 6.43

Elementary school students in Setagaya

Haru Osakabe: 3.62
Yuka Ooki: 4.34
Haruka Yoshida: 4.18
Atsusi Mabuti: 3.46
Aya Imaizumi: 3.29
Yuzuna Yamashita: 4.82
Mio Iwabuchi: 4.34
Shimanuki: 4.41
Moe Kusunoki: 3.78
Shu Imamura: 5.22
Ria Geitu: 3.78
Koutarou Doi: 2.65
Yoshino Harada: 3.45
Shiho Sasanuma: 3.61
Miu Yamashita : 4.90
Shunsuke Fujii: 4.26
Mion Nakamura: 4.18
Haruto Hayashi: 4.34
Eito Inomata: 4.26
Hinata Ikeda: 3.86

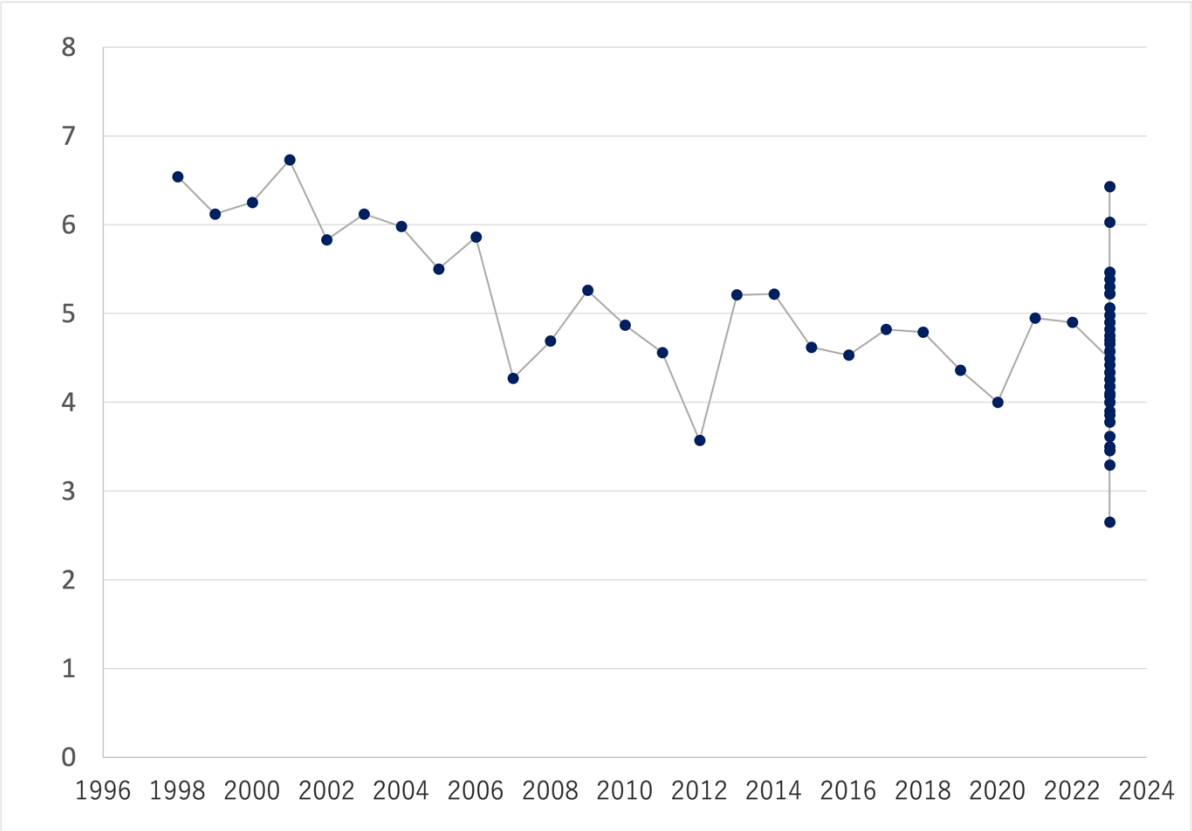

Fig: Interannual change in sea ice extent in September since 1998. Dots in 2023 are predicted values