

Meteorological and snow/ice data around the Greenland ice sheet (1980-2019) calculated by the high-resolution polar regional climate model NHM-SMAP

*Masashi Niwano¹, Akihiro Hashimoto¹

1. Meteorological Research Institute

In order to understand the ongoing abrupt changes in the climate conditions around the Greenland ice sheet (GrIS), we have developed the physically based high-resolution (1 hr interval and 5 km horizontal resolution) polar regional climate model NHM-SMAP (Niwano et al., 2018, 2019). Recently, we have conducted long-term climatic calculations from 1980 to 2019 around the GrIS using the model, and submitted the data to the GrIS surface mass balance model intercomparison project GrSMBMIP (Fettweis et al., in review). Now, the data are available for a wide variety of studies around the GrIS. In this contribution, we present available meteorological and snow/ice physical properties from the data, and discuss possible future collaborations using the data.

References:

Fettweis, X., Hofer, S., Krebs-Kanzow, U., Amory, C., Aoki, T., Berends, C. J., Born, A., Box, J. E., Delhasse, A., Fujita, K., Gierz, P., Goelzer, H., Hanna, E., Hashimoto, A., Huybrechts, P., Kapsch, M.-L., King, M. D., Kittel, C., Lang, C., Langen, P. L., Lenaerts, J. T. M., Liston, G. E., Lohmann, G., Mernild, S. H., Mikolajewicz, U., Modali, K., Mottram, R. H., Niwano, M., Noël, B., Ryan, J. C., Smith, A., Streffing, J., Tedesco, M., van de Berg, W. J., van den Broeke, M., van de Wal, R. S. W., van Kampenhout, L., Wilton, D., Wouters, B., Ziemen, F., and Zolles, T. (in review, 2020): GrSMBMIP: Intercomparison of the modelled 1980–2012 surface mass balance over the Greenland Ice sheet, *The Cryosphere Discuss.*, doi:10.5194/tc-2019-321.

Niwano, M., Aoki, T., Hashimoto, A., Matoba, S., Yamaguchi, S., Tanikawa, T., Fujita, K., Tsushima, A., Iizuka, Y., Shimada, R., and Hori, M. (2018): NHM-SMAP: spatially and temporally high-resolution nonhydrostatic atmospheric model coupled with detailed snow process model for Greenland Ice Sheet. *The Cryosphere*, 12, 635-655, doi:10.5194/tc-12-635-2018.

Niwano, M., Hashimoto, A., and Aoki, T., 2019: Cloud-driven modulations of Greenland ice sheet surface melt, *Sci. Rep.*, 9, 10380, doi:10.1038/s41598-019-46152-5.

Keywords: Greenland ice sheet, polar meteorology, polar climatology, glaciology, surface mass balance, polar regional climate model