Submission: T-2020-158-97

Pan-Arctic precipitation isotope observational network and analysis results

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The areal extent and thickness of the Arctic sea ice have significantly decreased during recent decades, and these changes are projected to continue in the future under global warming forcing. The shrunk sea ice cover and reduced sea ice thickness apparently increase heat and moisture fluxes from the ocean to atmosphere in particular in autumn and early winter, which may locally increase air temperature, moisture, and cloud cover, and in turn remotely cause anomalous climate and weather, such as cold and snowy winters, in the subarctic and mid-latitude terrestrial regions. As a consequence, there might be terrestrial thermal and hydrological changes or regime shifts. However, the linkages between the decreasing sea ice and the Arctic terrestrial hydrothermal conditions are still unclear. For examining these linkages, as well as the impacts of changed hydrothermal conditions on biogeochemical processes, we noted the usefulness of stable water isotope to do back trajectory for the source regions of the precipitation water and installed an isotope observational network covering ocean, land, and atmosphere of the pan-Arctic continent. We will present the preliminary analysis results of the network observations and model simulations, including the details of the observational network.

For examining these linkages, as well as the impacts in the subarctic and mid-latitude