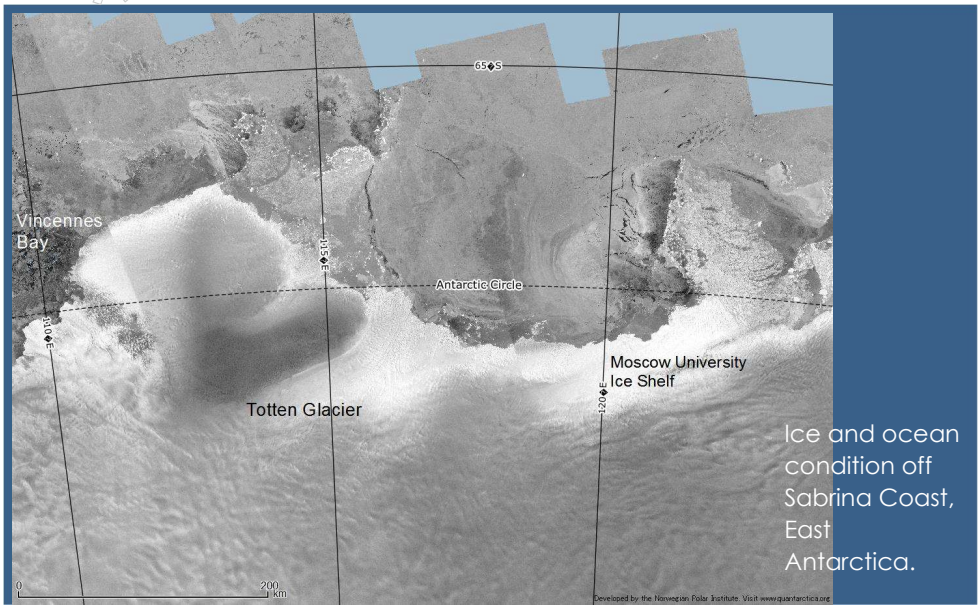
Totten Glacier: warm water melts huge ice



Ice and ocean condition off Sabrina Coast, East Antarctica.

Sensitivity of the East Antarctic ice sheet is one of the biggest unknowns for global sea level rise in the future.

Totten Glacier is one of the biggest glacier in East Antarctica. The glacier system as a whole has a potential of 3.5m rise of global sea level. Recent various research reveals Totten Glacier and nearby glaciers are rapidly changing. Totten Glacier is now losing its ice mass, very likely contributing to a sea level rise. Warm water of the ocean, flowing through a deep channel under the glacier, is considered as the major driver of the rapid ice melting, but yet little is known about the oceanic role in melting the ice.

One of the reasons of rack in observations is the presence of heavy sea ice. Our icebreaker *Shirase* has one of the highest capability of breaking sea ice among the world's icebreakers and can conduct direct observations in the ice-covered ocean. With her break through, we are expecting to contribute to international community at the forefront of climate science.

JARE61 (Nov.2019-Mar.2011)

An innovative operation is planned for this season. Major oceanographic and geophysical observations are planned in front of the Totten Glacier off Sabrina Coast.

Totten Glacier

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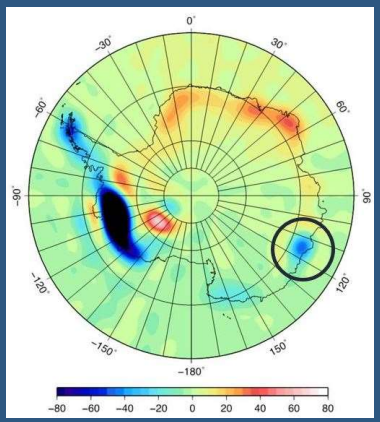
ROBOTICA

Research of Ocean-ice BOundary InTeraction and Change around Antarctica

Prioritized Research Project of the Japanese Antarctic Research Expedition (JARE) Phase IX (2016-2022).

Based on capability of Icebreaker *Shirase*, revealing Interactions and decadal-longer variabilities of climate system in East Antarctica with interdisciplinary observations using autonomous techniques.



Change in mass during the period of 2002-2015. Mass loss at the Totten Glacier region is evident.
Fukuda (2018) Teion-kagaku

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