

## Toward coordinated observational and modeling studies on the polar oceans

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The polar oceans are the most under-sampled regions of the World Ocean. This fact has also inhibited progress of polar ocean modeling because of the difficulty in adequately validating modeling results. However, ocean general circulation models have rigorously been validated against various phenomena in extra-polar regions and now stand as a very reliable tool to simulate and understand basic physics of the ocean. The number of sampling in the polar oceans is steadily increasing but still significantly limited. We can now utilize ocean models to reveal the feature of the polar oceans over large spatio-temporal scales from such limited observation. Such modeling results could also be applied to planning new observation. Here, two examples are introduced for such coordinated observational and modeling studies: one is targeted at deep water formation and outflow around Antarctica, and the other is targeted at processes in coastal polynyas in the Arctic Ocean. Both examples show interactive progress of observational and modeling studies on the polar oceans. This kind of synthetic approach is not only useful but also indispensable for future studies. We also need to further facilitate and accelerate such interaction by establishing a platform for polar ocean observation and modeling.