

Coupled Atmosphere-Ice-Ocean Prediction Systems at Environment Canada

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Abstract

This talk presents the coupled predictions systems in operations at the Canadian Meteorological and Environmental Prediction Center (CCMEP). These systems cover a wide range of temporal and spatial scales: from global medium-range forecasting system, global ensembles, seasonal predictions, as well as the two regional systems covering areas of Canadian interests, namely the East Coast of Canada and the Great Lakes, as well as the Arctic.

With the changing conditions in the Arctic, the need for improved forecasting of meteorological and environmental conditions is increasing. To address the growing needs from our governmental partners, the Canadian Arctic Prediction System (CAPS), a fully coupled high-resolution atmosphere-ice-ocean prediction system, was reinstated in June 2025. This presentation will focus on an investigation of high-resolution coupled atmosphere-ice-ocean interactions along the marginal ice zone using observations from several recent field campaigns. Additionally, we highlight the impact of improvements in model physics and assimilation, such as from atmospheric radiation, sea ice thickness assimilation and the use of a sea ice form drag parameterization.