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## Eddies and the distribution of eddy kinetic energy in the Arctic Ocean

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Mesoscale eddies are important for many aspects of the dynamics of the Arctic Ocean. These include the maintenance of the halocline and the Atlantic Water boundary current through lateral eddy fluxes, shelf-basin exchanges, transport of biological material and sea ice, and the modification of the sea-ice distribution. Here we review what is known about the mesoscale variability and its impacts in the Arctic Ocean in the context of an Arctic Ocean responding rapidly to climate change. In addition, we present the first quantification of eddy kinetic energy (EKE) from moored observations across the entire Arctic Ocean, which we compare to output from an eddy resolving numerical model. We show that EKE is largest in the northern Nordic Seas/Fram Strait and it is also elevated along the shelfbreak of the Arctic Circumpolar Boundary Current, especially in the Beaufort Sea. In the central basins it is 100-1000 times lower. Except for the region affected by southward sea-ice export south of Fram Strait, EKE is stronger when sea-ice concentration is low compared to dense ice cover. Areas where conditions typical in the Atlantic and Pacific prevail will increase. Hence, we conclude that the future Arctic Ocean will feature more energetic mesoscale variability.