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Continental Margins of the Arctic Ocean: Implications for Law of the Sea

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A coastal State must define the outer edge of its continental margin in order to be entitled to extend the outer limits of its continental shelf beyond 200 M, according to article 76 of the UN Convention on the Law of the Sea. The article prescribes the methods with which to make this definition and includes such metrics as water depth, seafloor gradient and thickness of sediment. Note the distinction between the "outer edge of the continental margin", which is the extent of the margin after application of the formula of article 76, and the "outer limit of the continental shelf", which is the limit after constraint criteria of article 76 are applied. For a relatively small ocean basin, the Arctic Ocean reveals a plethora of continental margin types reflecting both its complex tectonic origins and its diverse sedimentation history. These factors play important roles in determining the extended continental shelves of Arctic coastal States. This study highlights the critical factors that might determine the outer edge of continental margins in the Arctic Ocean as prescribed by article 76.

Norway is the only Arctic coastal State that has had recommendations rendered by the Commission on the Limits of the Continental Shelf (CLCS). Russia and Denmark (Greenland) have made submissions to the CLCS to support their extended continental shelves in the Arctic and are awaiting recommendations. Canada has yet to make its submission and the US has not yet ratified the Convention. The various criteria that each coastal State has utilized or potentially can utilize to determine the outer edge of the continental margin are considered. Important criteria in the Arctic include, 1) morphological continuity of undersea features, such as the various ridges and spurs, with the landmass, 2) the tectonic origins and geologic affinities with the adjacent land masses of the margins and various ridges, 3) sedimentary processes, particularly along continental slopes, and 4) thickness and continuity of the sediment stratigraphy within the basins. The enclosed nature of the Arctic basin and the undersea ridges that transect the width of the basin result in complex geographies for the coastal States. The relevant fact, therefore, is that the five coastal States surrounding the ocean should have a common understanding of the geological and morphological features and the use of these features in determining the outer edge of the continental margin.