

Protection of North American Marine Ecoregions:
An Analysis of Marine Protected Area Coverage in the United
States, Canada, and Mexico

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ABSTRACT

Following the decline of ocean productivity, Marine Protected Areas (MPAs) have become a cornerstone of resource conservation. However, protected areas are not evenly spread across each distinct ecological region, or “ecoregion,” of the ocean. Consequently, ubiquitous anthropogenic pressures affect marine ecoregions differentially. To determine which marine regions lack protection in North America, I overlapped a three-tiered (divided by scale of ecological processes) marine ecoregion model with MPAs that fall within the United States, Canada and Mexico. Subsequently, I analyzed the management strategy of MPAs within the United States and created a protection classification system (increasing in protection strength from I – V) to further explore national marine conservation.

MPA coverage of large-scale, or Level 1, marine ecoregions (n=1) ranged from 0.0% (the Arctic Basin) to 97.85% (the Virginian Atlantic) with an average coverage of 30.14%. Coverage of smaller-scale ecoregions—those of levels 2 and 3—was similar. Ecoregion MPA coverage differed dramatically between the United States and Canada and Mexico; MPAs in the U.S. covered level 1 ecoregions by an average of 54%, while those in Canada and Mexico covered ecoregions by an average of 0.79% and 1.8%, respectively. As a result, marine protection—as defined by MPA coverage—is greatest in temperate waters of the United States, but is limited in both Arctic and tropical waters.

However, most MPAs in the United States are loosely protected (class IV) and restrict few human activities, while only 0.14 % are strictly protected, class I MPAs. Therefore, to combat continued anthropogenic impacts, marine conservation efforts should focus on both creating new protected areas in the Arctic and tropical regions, while establishing stricter management policies in existing MPAs in temperate, U.S. waters.