



## **Climate-scale sea surface height variability over the Northwest Atlantic slope**

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The Northwest Atlantic continental slope features strong interactions among the western boundary currents of the subpolar and subtropical gyres, and thus the sea level variability over the slope may have important implications for the large-scale ocean circulation. In this study, temporal and spatial sea level variability in the Northwest Atlantic continental slope has been investigated based on a merged satellite altimetry dataset and a monthly temperature and salinity dataset. The altimetric results are compared with steric height anomalies calculated from the temperature and salinity dataset. The study shows significant interannual and decadal sea level variability and secular change, with prominent regional differences and seemingly varying linkages to large-scale atmospheric and oceanic variability in the North Atlantic. The interannual sea level variability in the western Labrador Sea is negatively correlated with the North Atlantic Oscillation primarily via the wintertime deep convection; whereas that over the Laurentian Fan is positively correlated with the North Atlantic Oscillation. The thermosteric height anomalies are negatively (positively) correlated with the winter NAO index in the Labrador Sea (Laurentian Fan); while the halosteric height anomalies show opposite. The along-slope differences in the interannual and decadal variations and the secular trend of the sea surface height anomalies is compatible with an important interior pathway of the Labrador Sea Intermediate Water toward the central North Atlantic Basin reported in literature.