OS41E-0484 Sensitivity of Volume Transport Estimates to Different Definitions of the East Greenland Coastal Current

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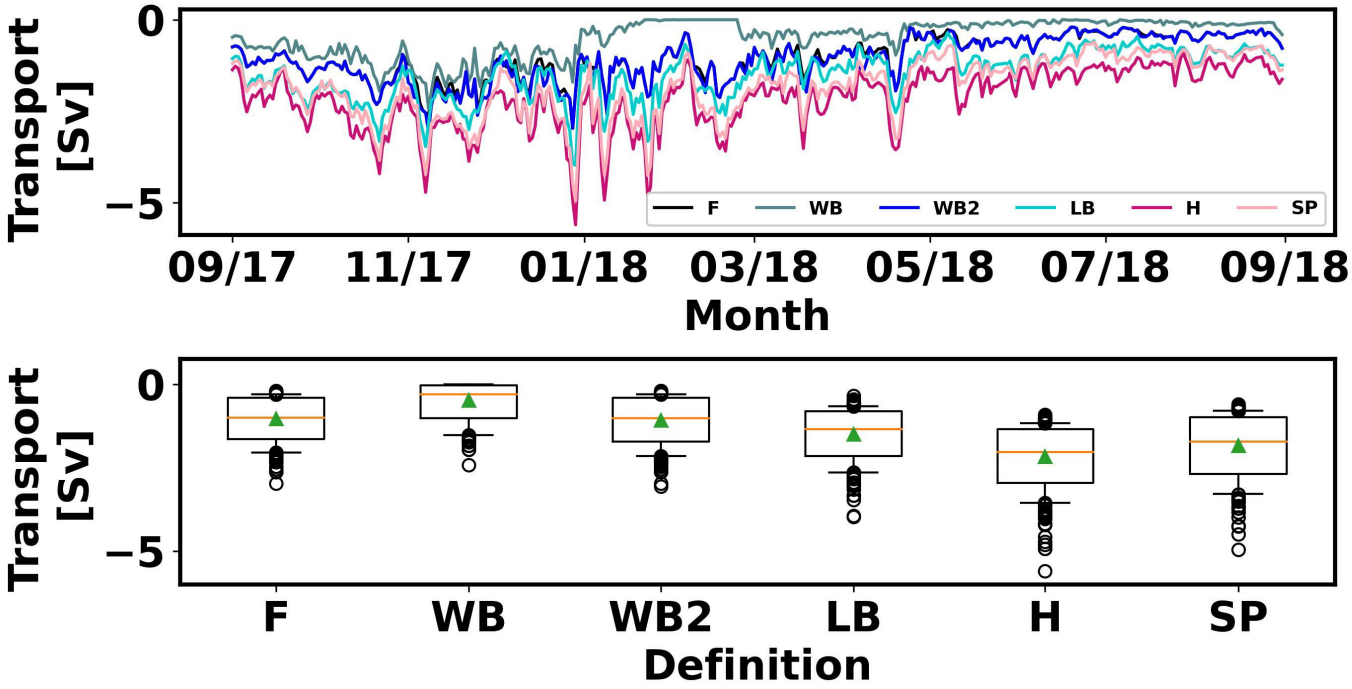
08:30 - 12:20
Hall B-C (Poster Hall) (Convention Center)

Abstract

The east Greenland shelf contains southward currents that carry relatively cold and fresh water of Arctic origin that are important to the Arctic's freshwater budget and the Atlantic Meridional Overturning Circulation (AMOC). Near the shore lies a current named the East Greenland Coastal Current (EGCC), which is a surface intensified southward jet estimated to have a 0.5-2.0 Sv volume transport. The EGCC carries fresher water than the East Greenland Current (EGC), which is found at the shelf break. Due to sparse observations, little understanding exists of the EGCC mean flow, variability, or drivers north of Denmark Strait. Moreover, literature definitions of the EGCC are inconsistent. Therefore, a high-resolution numerical simulation of the region is being used to study the EGCC, with a focus north of Denmark Strait. The performance of five proposed EGCC definitions is assessed by computing volume transport time-series and analyzing velocity cross sections at five model sections along the east Greenland shelf. In addition, the proposed EGCC definitions are applied to an observational time-series at 60°N from the OSNAP East extension. Results show that the mean EGCC transport values differ by up to ~3 Sv at the southern sections (south of 66°N) and ~0.6 Sv at the northern sections (north of 66°N). EGCC definitions based on a specific isohaline performed well in the southern sections but include part of the EGC in the northern sections and, on some occasions, exclude the bottom part of the EGCC. EGCC definitions based on velocity thresholds work better to capture the EGCC but can extend too far towards the EGC. Therefore, we recommend using an EGCC definition based on a velocity threshold and including a criterion on distance from the shore.



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