



The Fall 2019 Physical Oceanography Seminar series presents:

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Title: Dynamics and Spatio-temporal Variability of the Mid-Atlantic Bight Cold Pool

Abstract: The Mid-Atlantic Bight (MAB) Cold Pool is a bottom-trapped cold (below 10°C) and fresh (lower than 34 psu) water mass, that is isolated from the surface by the seasonal thermocline, and is located over the mid- and outer-shelf of the MAB. Recent studies have revealed that spatio-temporal variability of the Cold Pool exerts strong influence on the MAB ecosystem, especially on the recruitment and settlement of several cold-temperatures fish species. Following the Cold Pool definition, we put forward a method that includes three criteria to capture and quantify the Cold Pool characteristics, based on a 50-year (1958-2007) high-resolution regional ocean model hindcast simulation. The seasonal, inter-annual and long-term variability of Cold Pool characteristics and its summer progression are investigated.

Based on the persistence time, volume and volume-averaged temperature, a Cold Pool Index (CPI) is defined and computed in order to represent the strength of the Cold Pool. Anomalous strong and weak years are investigated using a composite analysis according to the CPI values. The correlation analysis between the Cold Pool temperature and the north-south shift of the Gulf Stream position shows that the spring Cold Pool temperature has a significant positive correlation with the annual Gulf Stream index. The Cold Pool temperature also has a positive response to the winter NAO, with the Cold Pool temperature lagging the NAO by approximately 2 years. The possible mechanistic link between the Cold Pool temperature, Gulf Stream position and the NAO are discussed.