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Department of Atmospheric Sciences Seminar Announcement

Department of Atmospheric Sciences, S.O.E.S.T., University of Hawai'i at Mānoa
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Detecting and Characterizing Simulated Sea Breezes Over the U.S. Northeast Coast with Implication for Offshore Wind Energy

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You are invited to our weekly online Atmospheric Sciences Spring 2022 seminars via Zoom meeting.
When: February 9, 2022 at 3:30PM HST
Meeting admission: 3:15PM HST

Register in advance for this meeting:

<https://hawaii.zoom.us/j/9568775>

After registering, you will receive a confirmation email containing information about joining the meeting.
Please save this information for future seminars.

Abstract:

With the vastly planned offshore wind farm construction along the U.S. East coast, identifying and understanding key coastal process, such as sea breezes, has become a critical need for the sustainability and development of the U.S. offshore wind energy. In this study, a new two-step identification method is proposed to detect and characterize three types of sea breezes (pure, corkscrew and backdoor) over the U.S. Northeast coast from a year-long WRF simulation. The results suggest that the proposed detection method can identify the three different types of sea breezes in the model simulation. Key sea breeze features, such as the calm zone associated with pure sea breezes and coastal jets associated with corkscrew sea breezes, are evident in the sea breeze composite imagery. In addition, the simulated sea breeze events indicate a seasonal transition from pure to corkscrew sea breeze between March and August as the land-sea thermal contrast increases. Furthermore, the location and extension of the sea breeze front are different for each type of sea breeze, suggesting that the coastal impact of sea breeze varies with sea breeze type. From the wind energy perspective, the power production associated with a 10 megawatts offshore wind turbine would be approximately 3 to 4 times larger during a corkscrew sea breeze event than the other two types of sea breezes. This highlights the importance of identifying the correct type of sea breeze in numerical weather/wind energy forecasting.