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Contrasting storm surge barriers and nature-based flood mitigation for port-estuaries

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MONTCLAIR STATE
UNIVERSITY

The Doctoral Program in Environmental Science & Management
and MSU Sustainability Seminar Series Present:

Contrasting storm surge barriers and nature-based flood mitigation for port-estuaries

WHEN: May 5, 4:00 pm

Phillip Orton

Stevens Institute of Technology



Dr. Philip Orton is a Research Associate Professor of ocean engineering at the Stevens Institute of Technology in Hoboken, NJ. He earned his PhD in physical oceanography from Columbia University, and has published over 40 peer-reviewed articles on coastal physical oceanography, storm surges, flood risk assessment, air-sea interaction, sediment transport, and coastal meteorology. He is a member of the NYC Panel on Climate Change, was appointed by New Jersey's Governor to serve on the New Jersey Wetlands Mitigation Council, and is a contributing author for the upcoming Intergovernmental Panel on Climate Change (IPCC) Sixth Assessment Report. He is presently the lead PI on a team with four universities that was awarded a \$1.2 million grant by the National Science Foundation to study the impacts of historical morphological changes such as dredging and wetland landfill on coastal flood hazards.

Deepwater port-estuaries have virtually no accepted and effective nature-based solution for sea level rise, because there is typically too little space for wetlands and deep shipping channels provide relatively friction-free pathways for floodwaters to reach neighborhoods. The Corps of Engineers is evaluating flood risk reduction strategies for the Port of New York and New Jersey and its estuarine waterways, with initial results pointing to gated storm surge barriers as the optimal solution. Jamaica Bay is one relatively unused port sub-estuary where a surge barrier is proposed, and I will demonstrate with computational modeling how a gradual "sedimentary restoration" over several decades can not only reduce future flood impacts, but also reduce the bay's problem with hypoxia. In contrast, storm surge barriers can greatly reduce flood risk, but do not solve the problem of sea level rise and have potential negative effects on estuarine circulation and oxygenation.

For more information contact Jorge Lorenzo-Trueba at lorenzotruej@montclair.edu