



New York – New Jersey Harbor and Tributaries Coastal Storm Risk Management Study New York Bight Ecological Model (NYBEM)



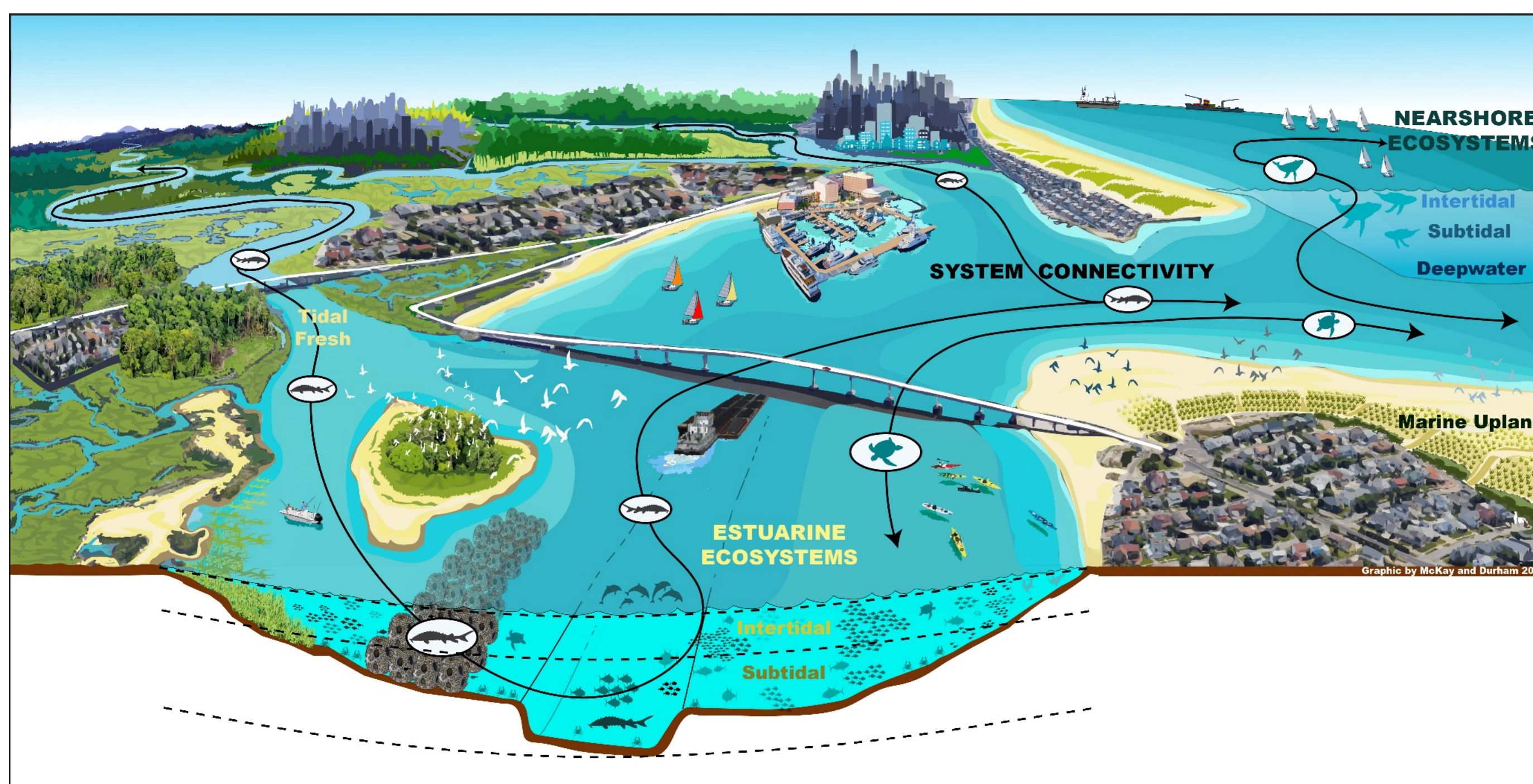
US Army Corps of Engineers®
New York District

Why do we need a model?

Effects of the proposed infrastructure on regional ecosystems are hard to quantify with existing tools. The New York Bight Ecological Model (NYBEM) was developed to provide a general description of the *relative* environmental effects of large-scale coastal storm risk management alternatives, which can inform the feasibility process. The models are being developed in three phases, which adapt to new information and data as project planning proceeds.

What is included in the NYBEM?

The NYBEM has been developed through a series of workshops with technical staff from federal, state, and local agencies. The model assesses six ecosystem types defined by tidal and salinity ranges, which span from marine deepwaters to tidal freshwaters.



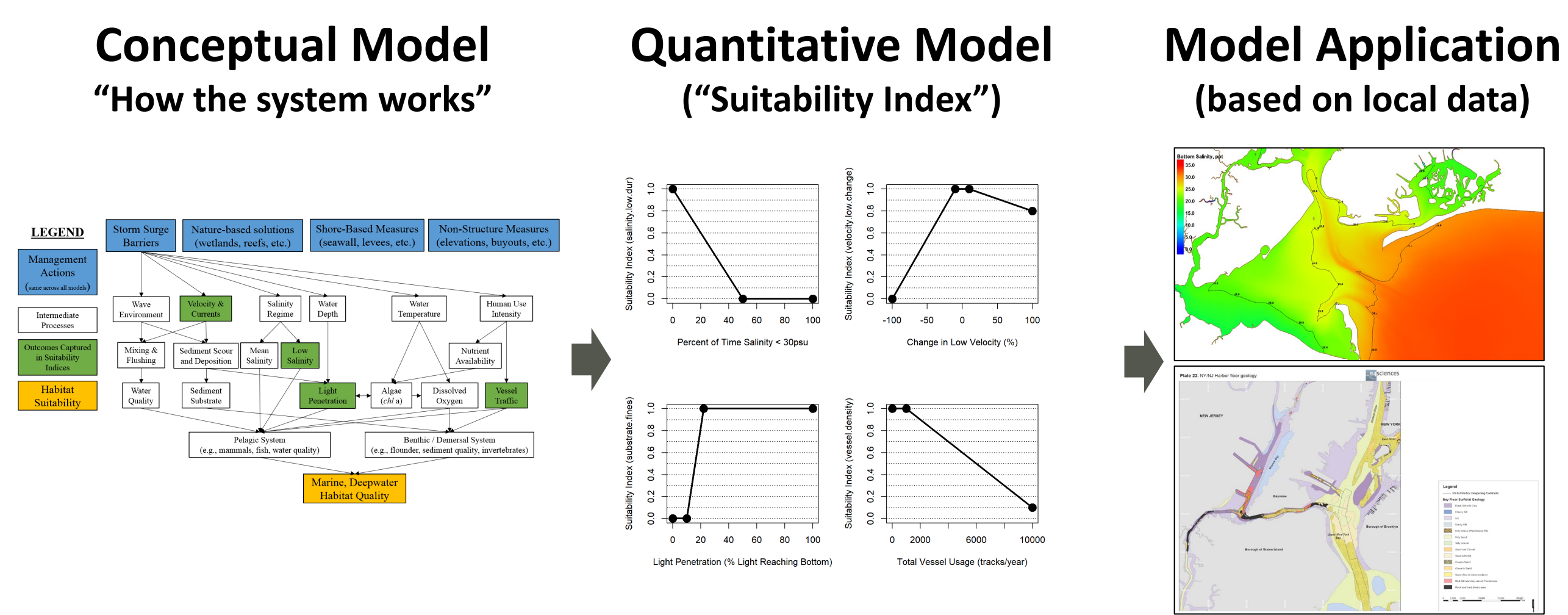
	Interim Report (Feb 2019)	Draft Feasibility Report (Sep 2022)	Final Feasibility Report (Summer 2024)
Type of Decision	Preliminary screening	Alternatives analysis	Design and operation of recommended alternative
Scope of Environmental Effects	Direct	Direct + Indirect	Direct + Indirect + Cumulative
Spatial Extent of Environmental Effects	Project footprint	Offsite hydrodynamic change	Mitigation requirements
Analytical Effort	Rapid screening	Moderate	Detailed

How does the model “work”?

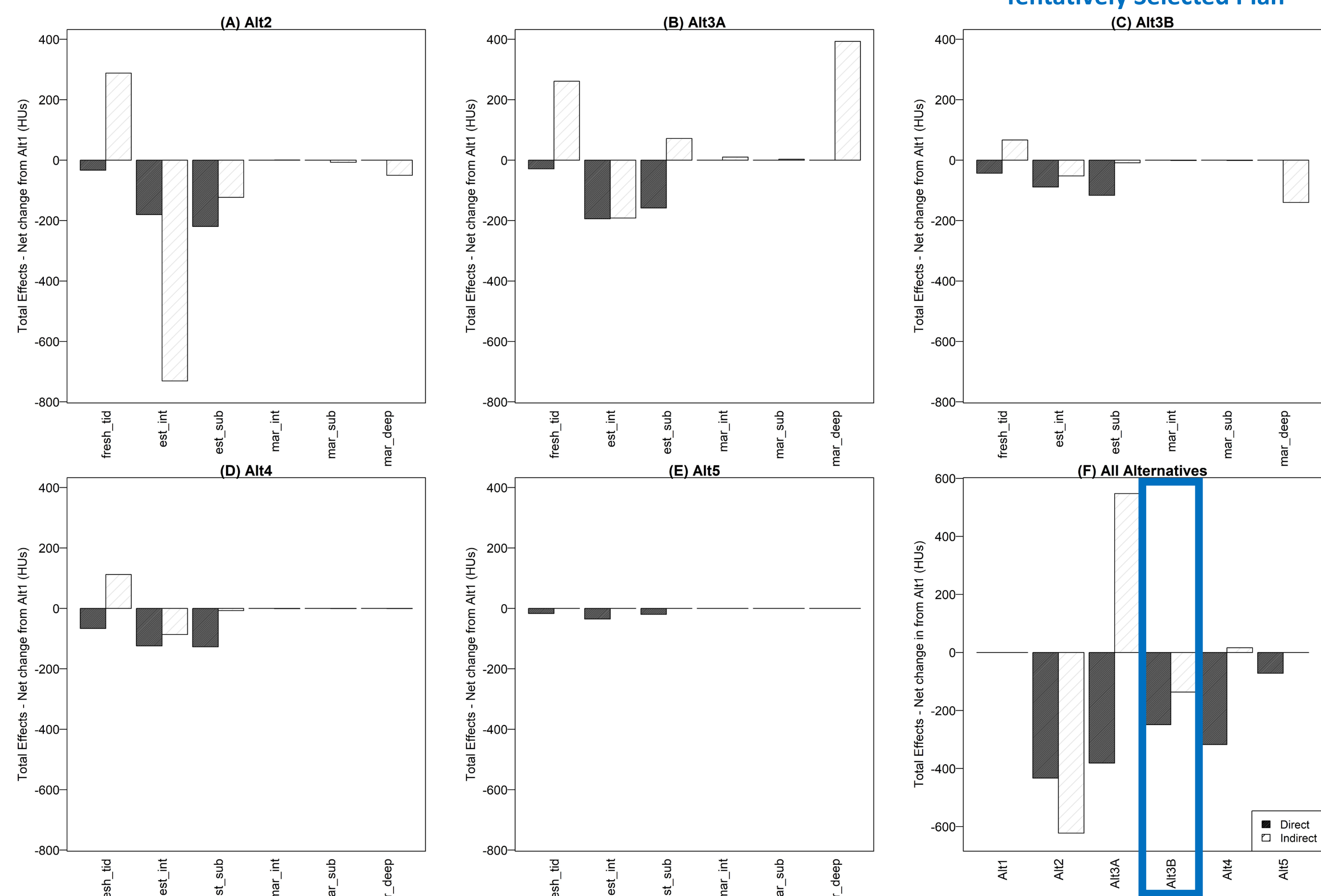
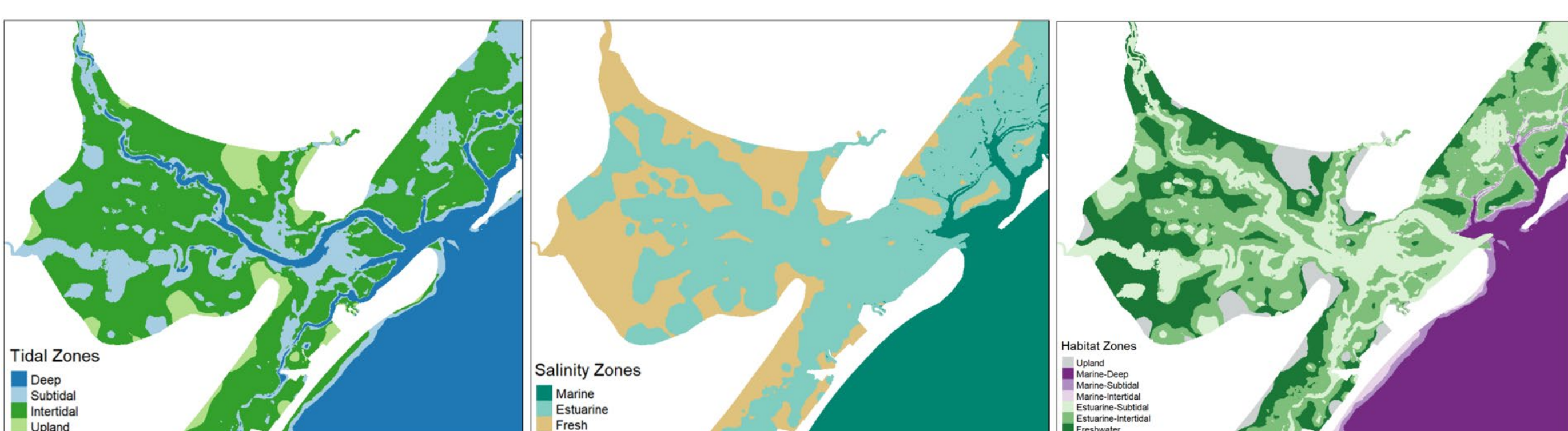
A detailed model is constructed for each ecosystem based on a unique set of ecological outcomes, processes, and stressors. These ecological processes are translated into “suitability indices,” which describe the ecosystem’s condition on a zero to one scale (bad to good, respectively). Local data and hydrodynamic models are then used to estimate how ecosystem condition would change under different scenarios.

Use of the models on the NYNJHATS

These models provide data on two different types of project effects. First, the direct effects of a project can be examined by assessing how the footprint intersects with local ecosystems. Second, the indirect effects of a project can be examined by looking at how water flow changes far from the site and how that would alter regional ecosystems.



The NYBEM maps ecosystems based on tidal and salinity limits, and then assesses the condition of each patch. These maps allow us to estimate the extent and quality of ecosystems at large scales under changes like sea level rise and with different coastal storm risk management features.



Summary of direct and indirect effects of HAT study alternatives. Values represent net change in habitat units from the existing condition (Alt1) summarized by ecosystem type.

fresh_tid	Tidal Freshwater	est_int	Estuarine, intertidal
est_sub	Estuarine, subtidal	mar_int	Marine, intertidal
mar_sub	Marine, subtidal	mar_deep	Marine, deepwater

Your opinion matters! Public feedback is an important part of the Environmental Impact Statement process.

Public comments help inform the Environmental Impact Statement and Alternative designs.

Please send comments to: nynjharbor.tribstudy@usace.army.mil

To learn more about NYBEM, scan this QR code with your smartphone device →

