Enabling development of deep-water offshore wind power

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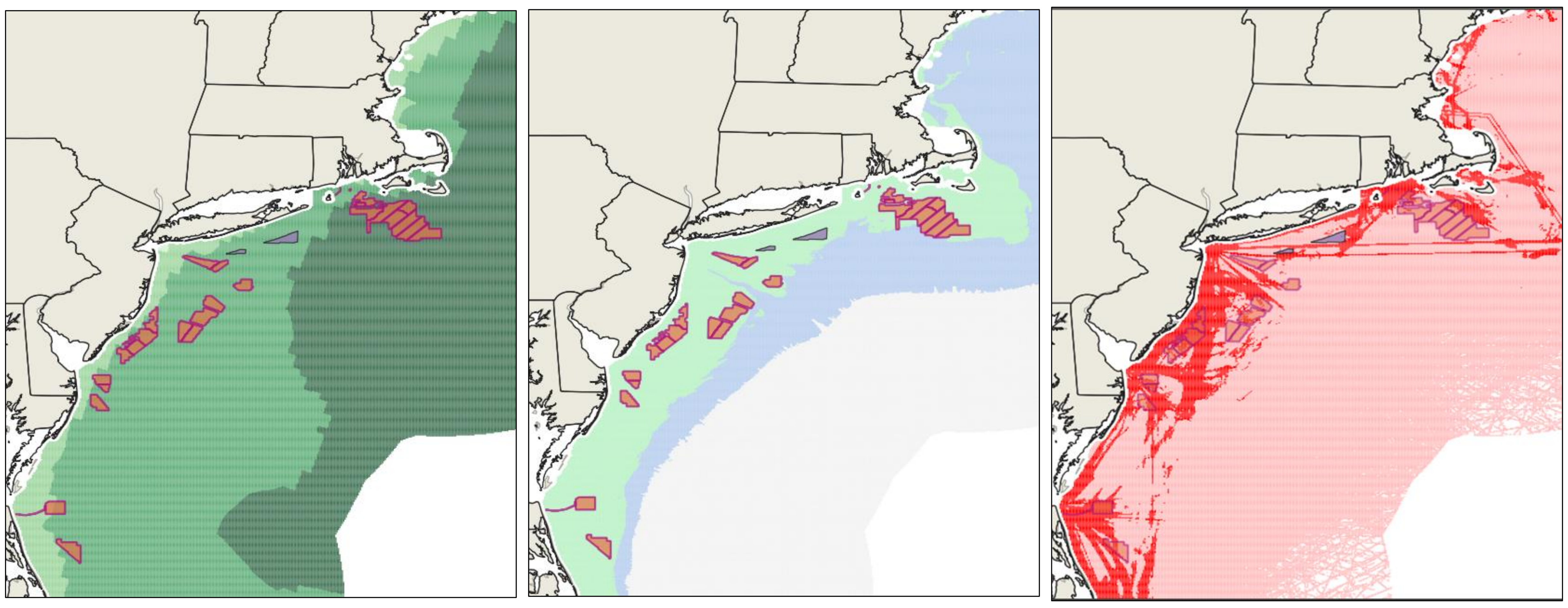
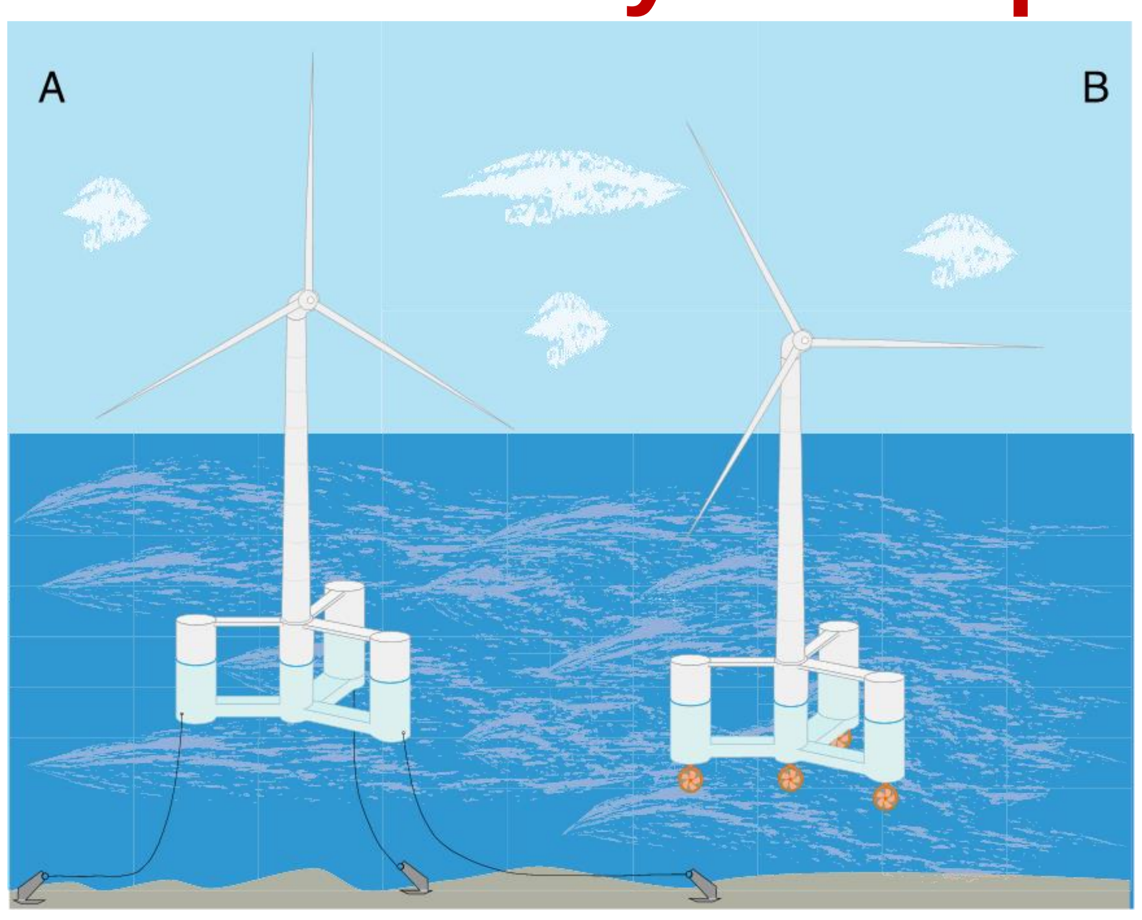
Introduction

Q: How can we manage the physical and institutional challenges to offshore wind deployment?

A: Deploy with dynamic positioning and understand where the most suitable sites are



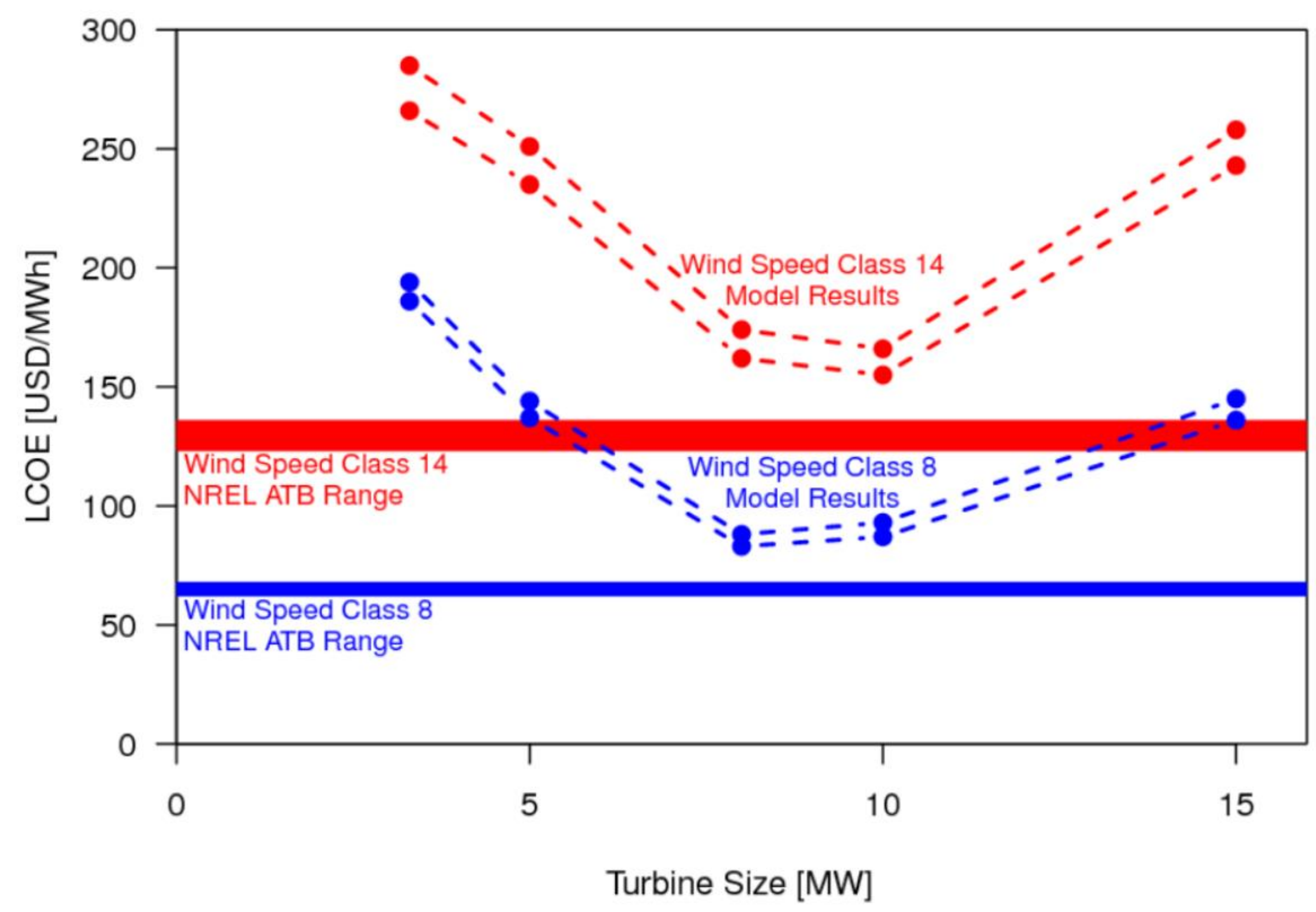
Method 1: Techno-economic models for dynamic positioning



+Eliminates depth limit
+Reduces environmental impact
+Facilitates ease of installation and decommissioning

-Reduces energy output to power dynamic positioning (DP) thrusters

Results: Largest turbines not dominant

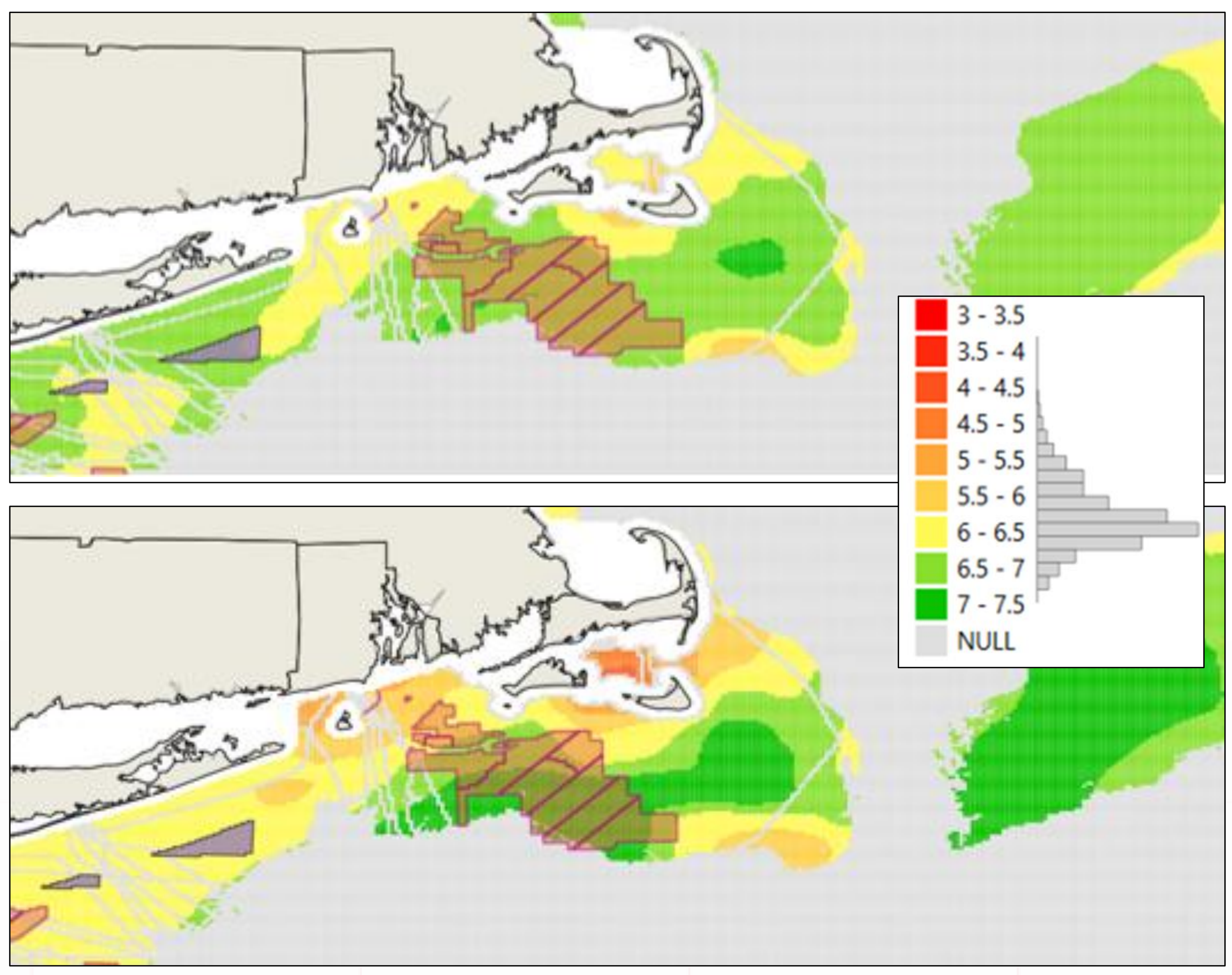


Method 2: Multi-criteria models

Objective	Plant Metric (Z_n)
Min	Plant Overnight CAPEX
Max	Annual Electricity to Shore
Max	Annual Hydrogen to Shore
Min	Area of Disturbed Seabed
Min	Length of Submerged Moorings
Min	Average Vessel Presence
Min	Average Fishing Effort
Min	Plant Visual Impact

$$Suitability\ Score_i = \beta_1 Z_{1,i} + \beta_2 Z_{2,i} + \cdots + \beta_n Z_{n,i}$$

Certain plant scales are suitable based on location



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