

Taming the Tide: Engineering for Coastal Resilience

THE PROBLEM: How Tides and Surges Threaten Coastlines

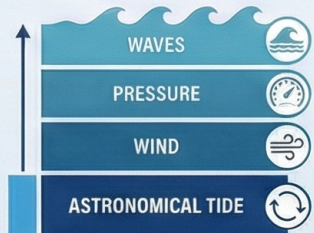


Sun & Moon Alignment Creates Extreme "Spring Tides"



When the sun and moon are aligned (full/new moon), their combined gravity creates the highest tides.

Storm Surge Components Magnify Coastal Flooding

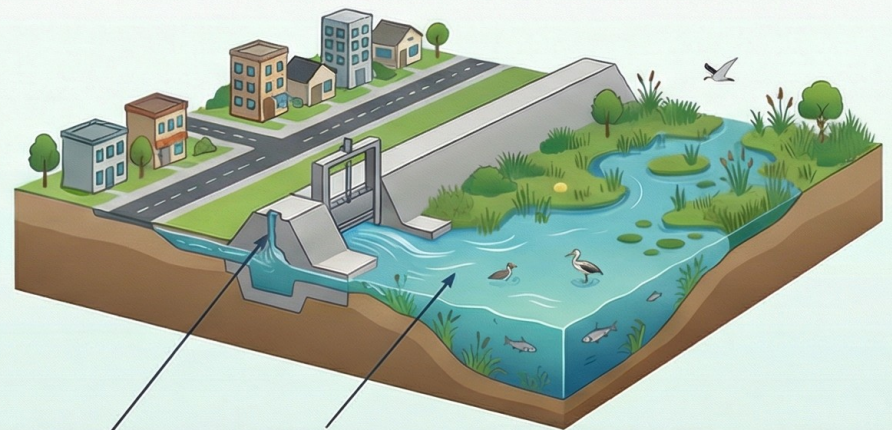


Total water level is a combination of the astronomical tide, wind, pressure, and waves.

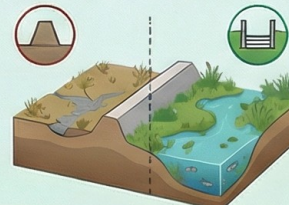


Case Study: Chronic Flooding in Greenwich, NJ
During high tide, critical infrastructure like roads (levees) are regularly overtopped and leak.

THE SOLUTION: Engineering for Protection and Restoration

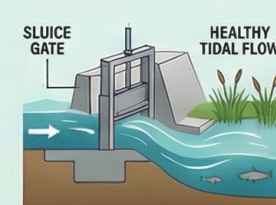


The Challenge: Balancing Flood Control vs. Ecosystem Health



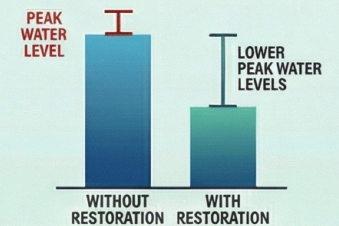
Restricting tidal flows protects property but degrades valuable upstream wetland habitats.

Solution: Managed Tidal Flow with Sluice Gates



Modern gates can be installed in levees to restore healthy tidal flow to wetlands.

RESTORATION CAN REDUCE OVERALL FLOOD RISK



Models show that restoring full tidal flow can lower peak water levels during moderate rainfall events.