UNIVERSITY of HOUSTON

Adaptation to a Changing World:

Climate Change Law and Legal Approaches to Adaptation

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What is Adaptation?

- In general, adaptation focuses on anticipating the effects of climate change and taking steps to minimize their harm (or maximize their benefits)

- By contrast, mitigation simply emphasizes approaches to limit greenhouse gas emissions to minimize the extent of future climate change.

- To think about for next week's classes: does climate engineering fall into either category?

Why Adaptation?

- Key assumptions include: “mitigation efforts won’t take effect quickly enough, and some climate change effects are inevitable.”
- These climate change effects could appear within lifetime of particular projects and actions (e.g., public infrastructure).
- Adaptation efforts could limit or ameliorate these effects.

Adaptation Steps

- Key tasks of adaptation planning include:
  - Assess the likely effects of climate change to an area
  - Identify the most vulnerable systems
    - Exposure
    - Sensitivity
    - Adaptive capacity
  - Involve all stakeholders
  - Prioritize responses based on likely or observed effects

Suite of Possible Adaptation Responses

- “No regret”
- Profit opportunity – beware of vagaries of cost/benefit analysis
- Win-win
- Low regret strategies
- Avoiding unsustainable investments
- Averting catastrophic risk

The Bigger Picture

Climate change, to some extent, redefines the axioms underlying environmental law (and other areas)

"Stationarity is dead"

Mitigation is global, adaptation is local

Fight to preserve, or conciliate to save?

Adaptation and mitigation don't necessarily mix: one may frustrate the other, and moral hazard risk.

Real world implications

Adaptive infrastructure – the sad tale of State Highway 87

Adaptive management: sea level rise

Imminent Geohazard Potential
Present Critical Environments: Salt and freshwater wetlands, including beaches, tidal flats, and marshes. Along Gulf of Mexico shoreline, including beaches and foredunes.

High Geohazard Potential
Future Critical Environments: Areas expected to become critical environments in 60 years' time (2062) if historical rates of relative sea-level rise and shoreline change continue and if development or restoration projects do not affect natural processes.

Moderate Geohazard Potential
Upland: Upland areas generally less than 5 feet above sea level that are not expected to become critical environments during the next 60 years (2062), but may be affected by storm surge caused by tropical storms or category-one hurricanes.

Low Geohazard Potential
Island Core Upland: Centrally located upland areas generally more than 5 feet above sea level and not expected to become critical environments in 60 years time (2062).

Map provided by the Bureau of Economic Geology, University of Texas at Austin
(key adapted from original)

Adaptation to sea level rise: Defend or retreat?

Adaptation to sea level rise: island nations

Tuvalu, Palau: what adaptation options do you have?

- Sand transfer (island triage)

- Harden beaches and protect water supplies

- Relocate (refugees)

Adaptive Agriculture

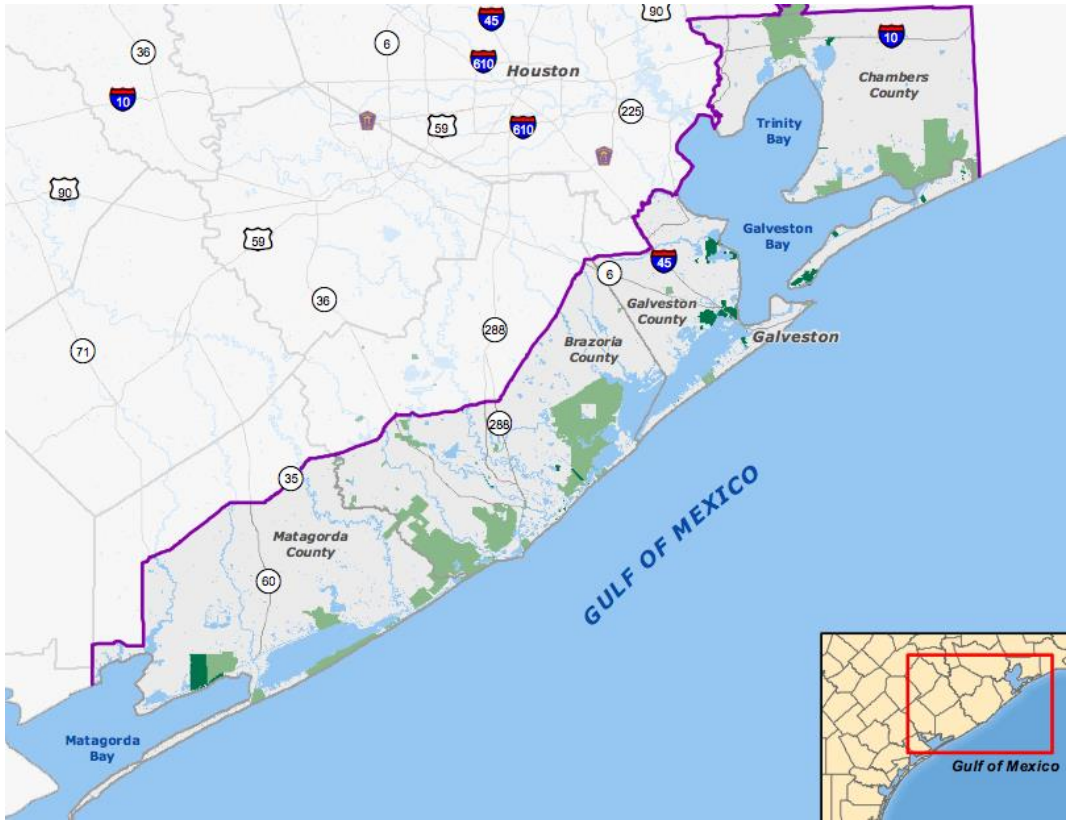
- Stationarity especially critical here
- Options:
  - Change sowing dates
  - Plant different species
  - Move to more resilient water systems and irrigation
  - Enhance salt tolerance of crops
  - Reduce risk of silvicultural fires and breed trees to resist pests

Adaptive Water Management

- Increase and protect supplies
  - More storage capacities with dams and aquifer storage
  - Remove invasive species
  - Desalinization
  - Water transfer infrastructure
  - Trading and prospecting
- Manage and control demand
  - Plan to increase efficiency
  - Drip agriculture
  - Increase cost of water

Adaptive management: enlisting natural resources to the effort

Lone Star Coastal Recreational Area



Also the NJ Blue Acres program, RESTORE Act funding for coastal marshes, and Georgia wetlands program.

Adaptation Strategies: Financial Tools

- Insurance market adjustments
- Weather derivatives
- On international level,
  - Catastrophe bonds
  - Pooling cash reserves among nations (Caribbean)
  - Global Index Insurance Facility (World Bank)

Adaptation Debate in Texas

Questions?

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