Coastal Resilience Bonds and Tourist Fees to Finance Nature-Based Coastal Resilience Projects
Outline – Coastal Resilience Bond

• Why does coastal resilience matter?
• Who should finance resilience projects?
• Nature-based coastal resilience
• Debt servicing with dedicated visitor tax
• Research question: Is a dedicated visitor tax a feasible revenue source to back coastal resilience debt?
• Ideas for next steps
• Requests for feedback
Why care? Consider the impact and likelihood of global risks

Global Risks Report

The 5 risks that will have the biggest impact in the next 10 years

<table>
<thead>
<tr>
<th>Risk</th>
<th>Rank</th>
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</thead>
<tbody>
<tr>
<td>Weapons of mass destruction</td>
<td>1</td>
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<tr>
<td>Extreme weather events</td>
<td>2</td>
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<tr>
<td>Natural disasters</td>
<td>3</td>
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<tr>
<td>Failure of climate change mitigation &amp; adaptation</td>
<td>4</td>
</tr>
<tr>
<td>Water crises</td>
<td>5</td>
</tr>
</tbody>
</table>

Source: Global Risks Perception Survey 2017-2018, World Economic Forum
Nature – based coastal resilience

• Cost-effectively protect trillions in vulnerable assets
• Ecosystem services provided
  – Water filtration
  – Groundwater recharge
  – Wave attenuation, and others
• Ecosystems of interest include
  – Coastal wetlands
  – Coastal marshes
  – Reefs offshore
  – Mangroves
  – Seagrasses
Paying for nature-based resilience: Coastal conservation spending gap

- Need to act now
- Many ongoing initiatives in this space
  - Public (e.g. pre- and post-disaster spending) and private (green bonds)
  - Risk transfer using insurance mechanisms
  - Revenue-shed approach developed at UNC – Environmental Finance Center
- Spending gap for global coastal ecosystem conservation alone estimated at $350 billion annually
- My research looks at a hypothetical case of raising a fraction of this

Source: Credit Suisse et al. 2014
Who should pay for resilience projects?

- Federal government
- Local municipality
- All stakeholders who benefit
- Whoever can afford
- Debt
- Sharing the financial burden

→ I look at potential contribution from visitors and tourists
How to pay for resilience projects?

Green municipal bonds
- Capital spent on environmental projects
- Higher project impact reporting
- Similar returns as “non-green” bonds
- Attracts environmentally conscious investors
- No metrics or monitoring
- Dedicated revenue source

Coastal Resilience Bond
- Environmental impact bond (EIB)
- Multiple project beneficiaries (investors)
- High/low environmental impact from project → High/low returns to investors
- Metrics and monitoring
- Dedicated revenue source

New Study Shows How Performance-Based Bonds Can Speed Up Coastal Resilience Efforts
EDF and Quantified Ventures outline steps for implementing first-ever environmental impact bond for wetland restoration

August 14, 2019

Environmental impact bonds could help the state of Louisiana — and other coastal areas dealing with land loss and sea level rise — restore its rapidly disappearing coast faster, better and for less money, according to a new report released today by Environmental Defense Fund (EDF) and Quantified Ventures.
Coastal Resilience Bond – Inspired by the Forest Resilience Bond

- Transfer risk of performance to investors
- Conserve public funds
- Channel investment into projects that deliver tangible benefits
- Pay-for-performance
- Attract new investors with an environmental impact mindset

- My research focused on
  - Revenue sources to be used to service debt
  - Magnitude of new revenue source (visitor tax) reasonable
  - Identification of current hurdles

Source: https://tinyurl.com/y9gkpbaw
Debt financing – From what revenue source?

• Dedicated tax collected from visitors or tourists
• Per capita basis
• Example of Houston / Galveston tourist tax
• Revenue used for nature-based, and multi-layered coastal resilience approach

Future research
• Pay-for-performance
• Payments for Ecosystem Services – Carbon
• Institutional and other hurdles
Examples of “tourist tax”

- Concept is not new
  - US, National Park entrance fees, currently at $35 per vehicle at Grand Canyon, generated upwards of $200 million for the federal government for FY16
  - Revenue is spent in part to maintain infrastructure
- Lodging or travel taxes are charged per night at a hotel
  - 47 states, plus Washington DC, USVI, PR have lodging related sales tax, or a specific lodging tax
  - Sales taxes average 5.4% (2.9–7.0%)
  - Dedicated lodging taxes, additional to sales taxes, average 5.9% (1.0–15.0%)
- Airlines charge a segment tax of $3.70 per takeoff and landing, and a “September 11 Security Fee,” which has recently been increased to $5.60 per leg of each flight
What work could be done using capital?

- Debt servicing using tourist or visitor tax
- Houston / Galveston area, 2016
  - 20.7 million visitors
  - 103.7 million room nights
  - Average daily rate: $96
- Started with question: What could be a ballpark revenue source and amount
  - Used idea of $10 per visitor for NYC (Aerts et al. 2014)
  - TX lodging tax rate (6%)
  - Average daily rate
- $10 per person visitor tax
  - Equivalent to $2 per visitor night
  - Effective additional tax rate of 2%
What work could be done using capital?

• Bond amount of $2.12 bln (20yr, 7%, 1.06 DSCR) without cost sharing, leveraging

• Enough to restore
  – All 367 miles TX coastal marshes
  – 100 yard width
  – $4,800 per acre

• Additionally
  – Build 37 mi. seawalls
  – $43 million per mile

• Conclusion: We are in the ballpark
Easier said than done

• Legal issue: Current TX state law
  – Specifically prohibits the use of lodging tax for general infrastructure programs of the city that are not directly related to tourism and hotel activity
  – Every expenditure of this tax must clearly fit within one of nine statutorily provided categories, none of which allow for coastal resilience projects, even if it benefits this sector

• Political pushback
• Economic / behavioral

Over the years, the Legislature has authorized the return of a portion of the state HOT tax collected in six communities — Corpus Christi, Galveston, Port Aransas, Quintana, South Padre Island and Surfside Beach — to clean and maintain public beaches and shorelines within those municipalities.

Source: NOAA 2018
Next steps

- Blended finance (aka. multiple sources of revenue)
- Investigate issues with carbon-market access
- Pay for success – how do we do it in coastal resilience projects?
  - Carbon storage monitoring
  - Actuarial / with-without evaluation of coastal resilience project
Questions

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