

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

Tibor Vegh

A Community on Ecosystem Services, December 6th 2018



THE UNIVERSITY
of NORTH CAROLINA
at CHAPEL HILL

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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

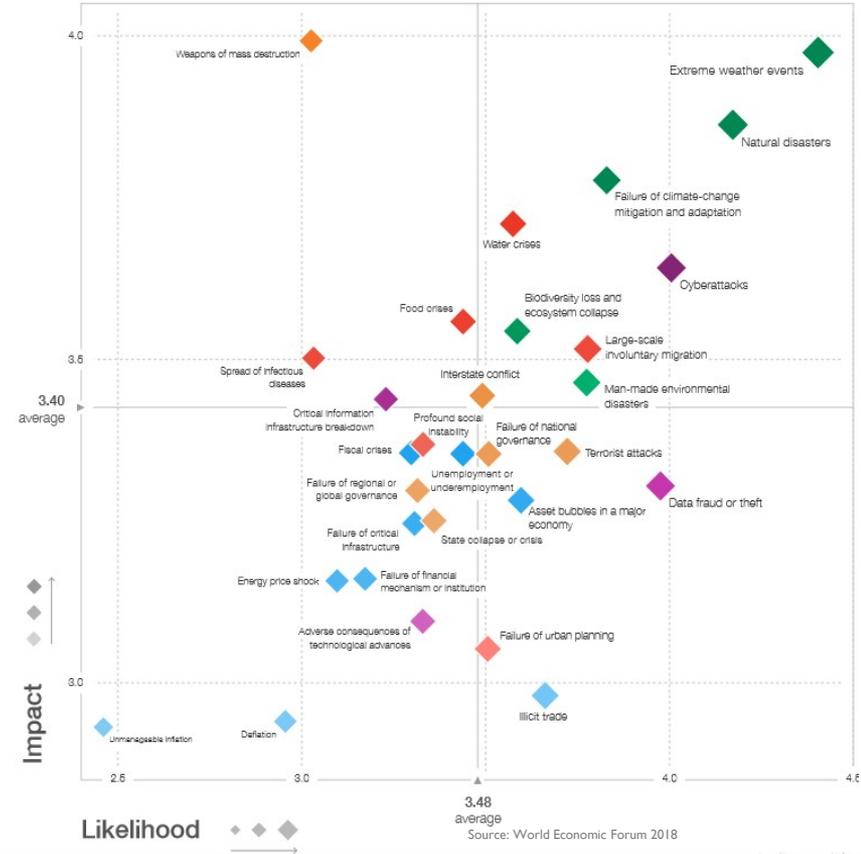
Global Risks Report

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

rank

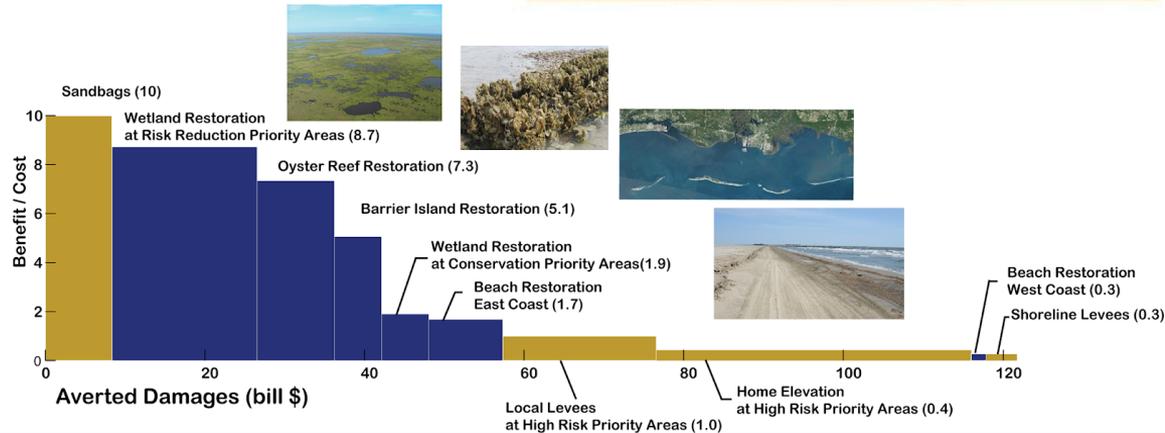
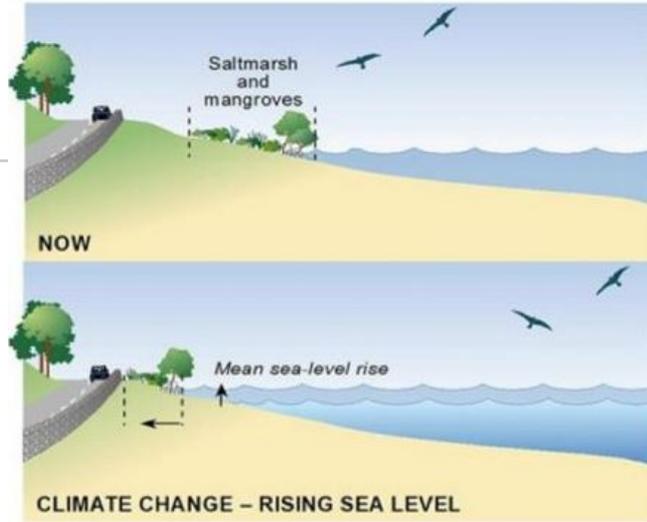
Weapons of mass destruction	1
Extreme weather events	2
Natural disasters	3
Failure of climate change mitigation & adaptation	4
Water crises	5

Source: Global Risks Perception Survey 2017-2018, World Economic Forum



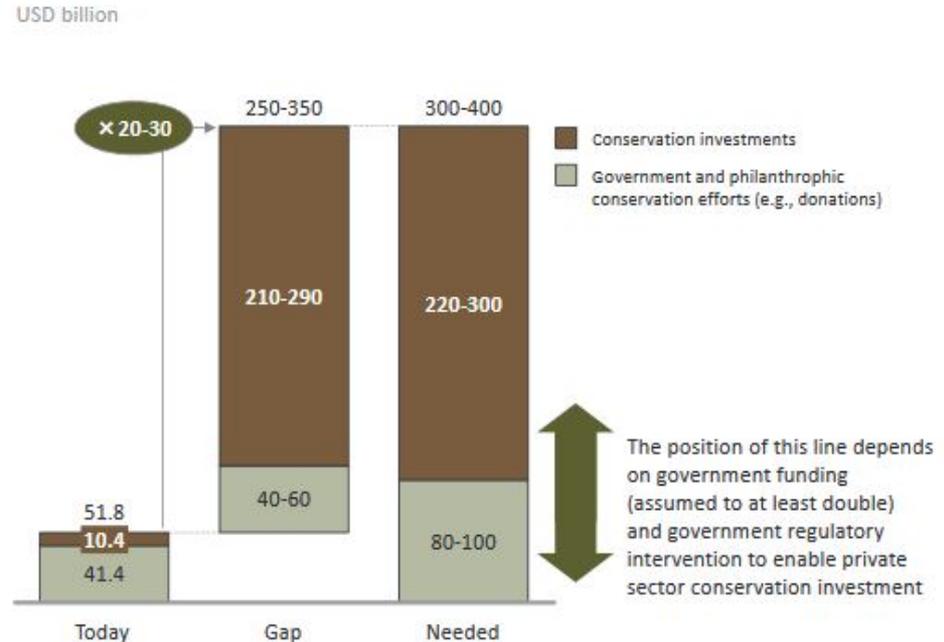
Nature – based coastal resilience

- 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

AP

Top Stories

Big oil asks government to protect it from climate change

By WILL WEISSERT August 22, 2018

PROVIDENCE, R.I. — Rhode Island has received \$280,000 in federal funding to help protect the coastline from rising seas and storm surges as part of \$29 million in grants announced Friday through the newly created National Coastal Resilience Fund.



Search NOAA sites



NEWS & FEATURES

NFWF, NOAA announce \$28.9 million in grants for the 2018 National Coastal Resilience Fund

New partnership will protect coastal communities and enhance habitat for fish and wildlife

Oceans & Coasts | coastal restoration

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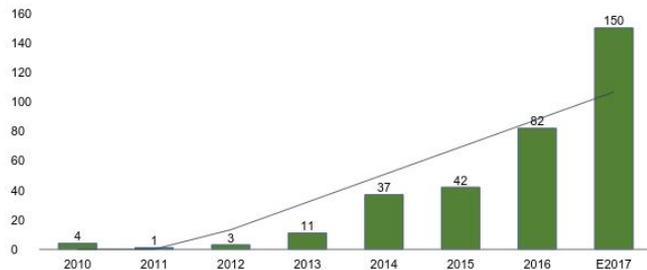
November 9, 2018 — The National Fish and Wildlife Foundation, NOAA and their partners today announced \$28.9 million in new grants for the restoration or expansion of natural features such as coastal marshes and wetlands, dune and beach systems, oyster and coral reefs, mangroves, forests, coastal rivers, and barrier islands that help minimize the impacts of storms, rising sea levels

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

Amount of green bonds issued since 2010



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, 2018

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.

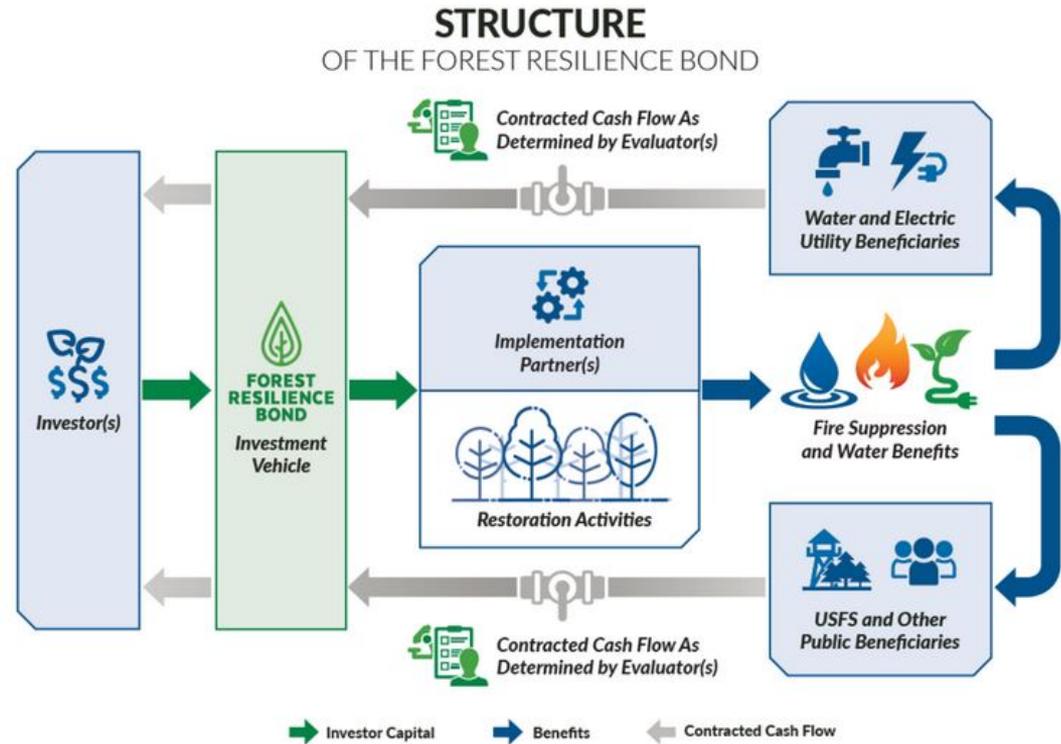
Media contact

Elizabeth Skree
(202) 572-3382
Contact



Coastal Resilience Bond – Inspired by the Forest Resilience Bond

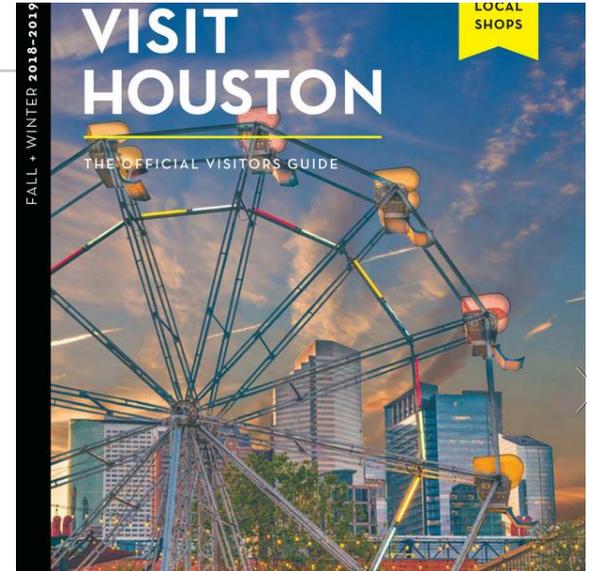
- Transfer risk of performance to investors
- Conserve public funds
- Channel investment into projects that deliver tangible benefits
- Pay-for-performance
- Attract new investors with an environmental impact mindset
- My research focused on
 - Revenue sources to be used to service debt
 - Magnitude 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

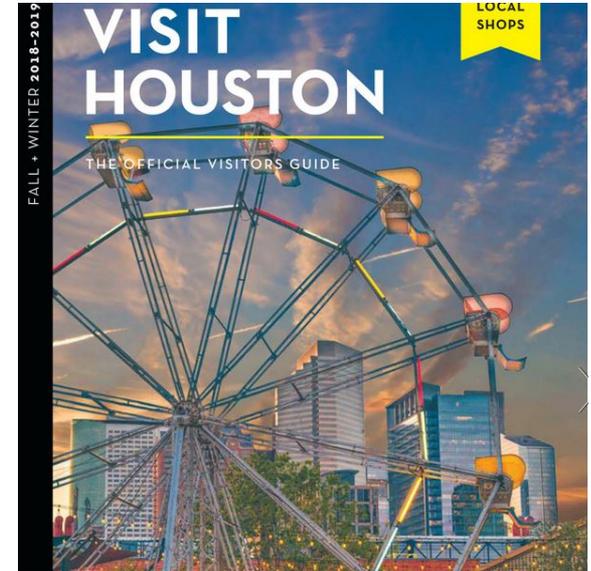


FARE DETAILS

Miles	
Miles Redeemed	9,500 Miles
Air Transportation Charges	
Taxes, Fees and Charges	
United States - September 11th Security Fee(Passenger Civil Aviation Security Service Fee) (AY)	\$5.60 USD
Total Taxes, Fees & Charges:	\$5.60 USD
	9,500 Miles +
Total:	\$5.60 USD

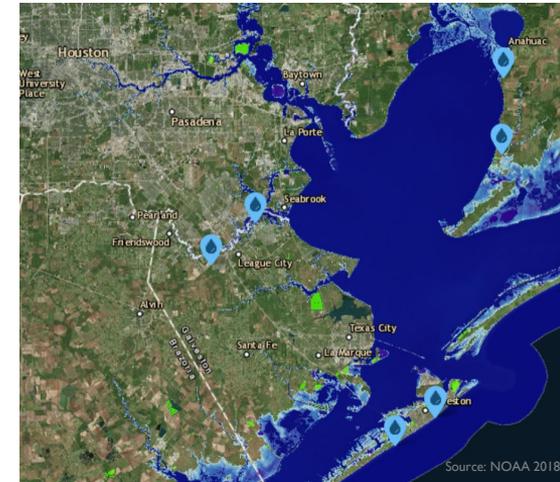
What work could be done using capital?

- 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%



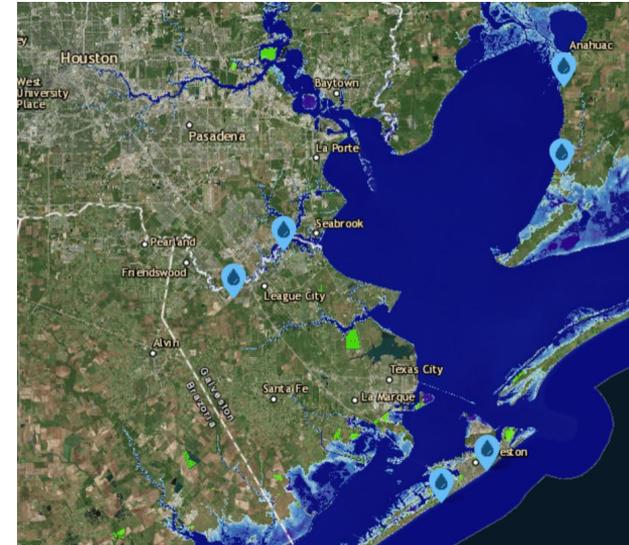
What work could be done using capital?

- 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.

Next steps

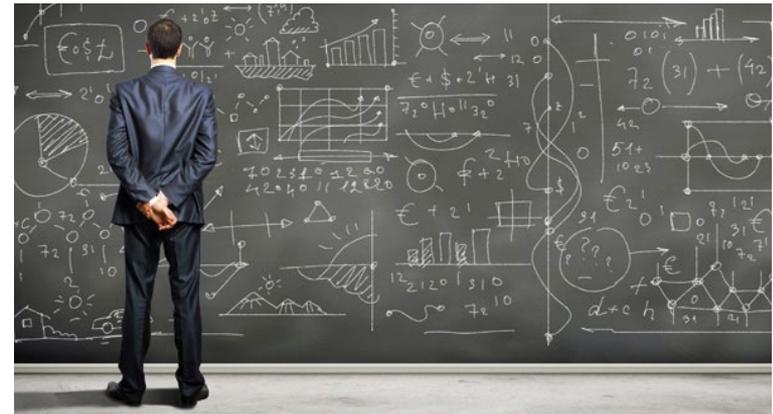
- Blended finance (aka. multiple sources of revenue)
- Investigate issues with carbon-market access
- Pay for success – how do we do it in coastal resilience projects?
 - Carbon storage monitoring
 - Actuarial / with-without evaluation of coastal resilience project

Newly Approved Protocol for Wetland Carbon Finance 11/24/15

Coastal Wetland Restoration Can Now Earn Carbon Credits Globally

A landmark methodology has been approved for the restoration of coastal wetlands everywhere to generate finance on the carbon market.

WASHINGTON, D.C. – A new methodology to encourage coastal restoration across the globe has been approved by [Verra](#) (formerly known as the Verified Carbon Standard or VCS). The [Methodology for Tidal Wetland and Seagrass Restoration \(VM0033\)](#) is the first globally applicable greenhouse gas accounting methodology for coastal wetland restoration, and will allow salt marsh, seagrass, mangrove, and other tidal wetland restoration projects to earn carbon credits.



Questions

Get in touch: tv34@live.unc.edu or 919-613-8721



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