

Flood Mitigation Bond

Morgan Stanley Sustainable Investing Challenge
April 17, 2015

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Hurricane Sandy in New York City



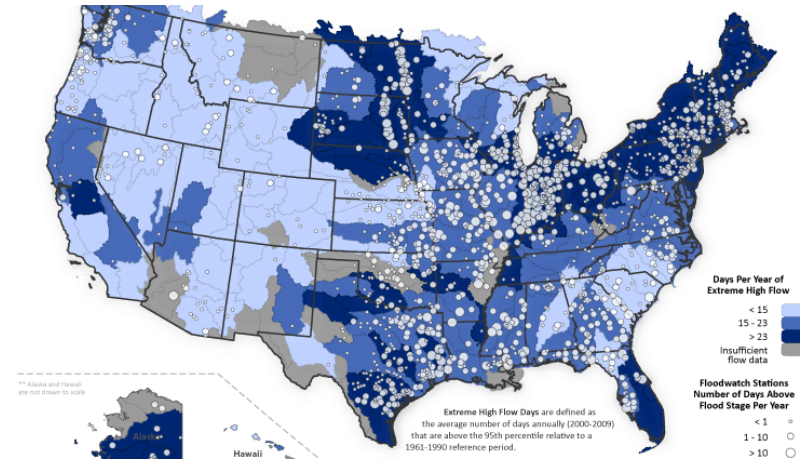
\$19 billion USD in flood damage

40,000+ people displaced in NYC

Consistent Threat of Flooding



Failing grey infrastructure



Increased flooding incidents



Disappearing natural habitats



20 million people & \$2.9 trillion GDP at risk

Natural Infrastructure

A scientifically proven approach to flood mitigation



Wetlands

According to the Army Corps and FEMA, each \$1 spent on natural infrastructure results in future savings of \$4 in comparison to grey infrastructure.



Oyster Beds

This is due to lower project and maintenance costs.

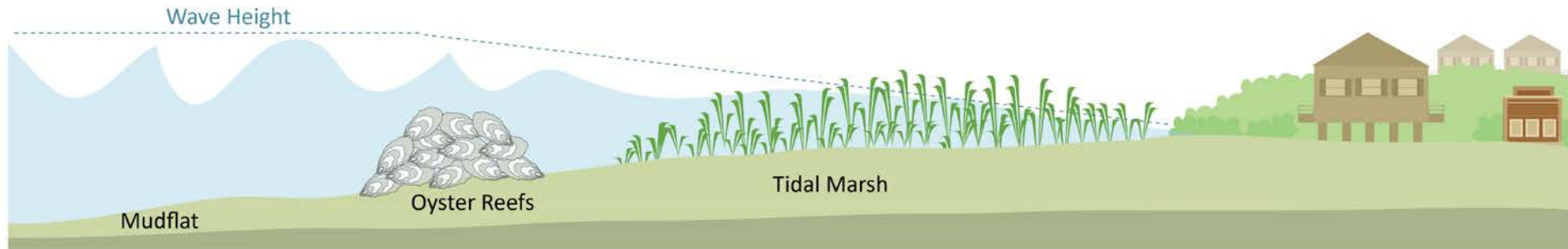


Dunes and Beaches

How Natural Infrastructure Works



Waves decreased with healthy coastal habitats.

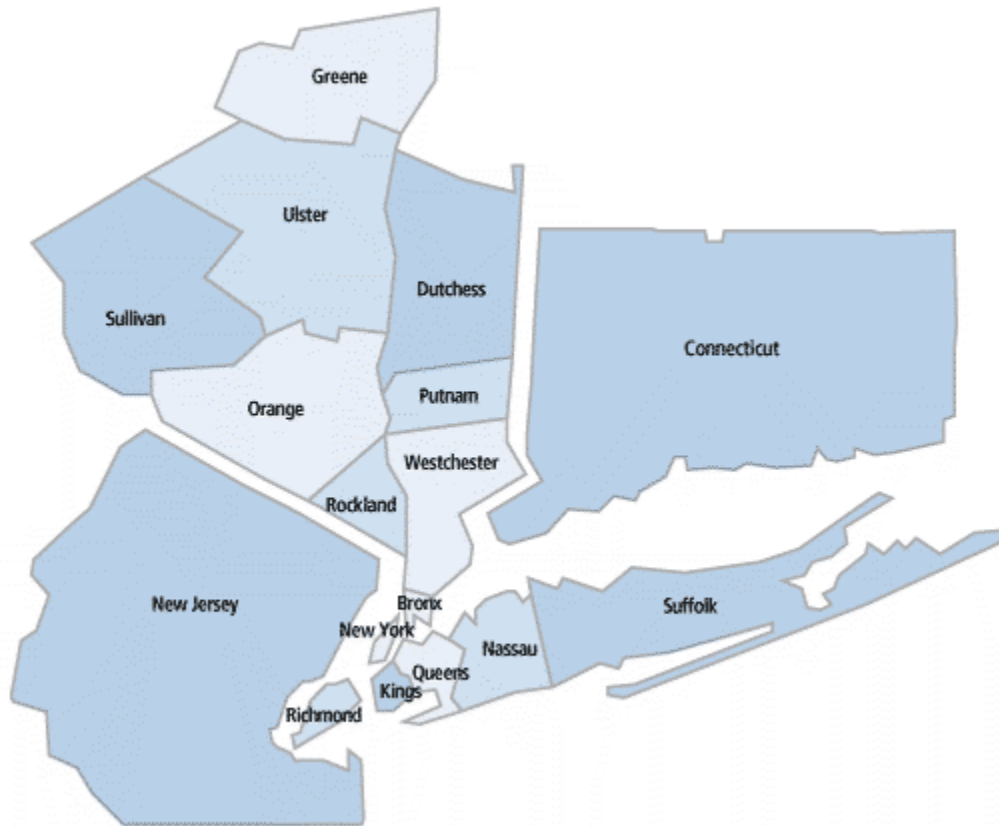


Waves with degraded coastal habitats.



The Opportunity

The New York Tri-State Area



- Demand for capital
- Restoration opportunities
- Political will
- Protecting high value property

Our Solution



- \$200 million bond offering
- 1,700 acres of degraded land restored
- 5.7% coupon + principal, 20 years
- Targeting institutional investors

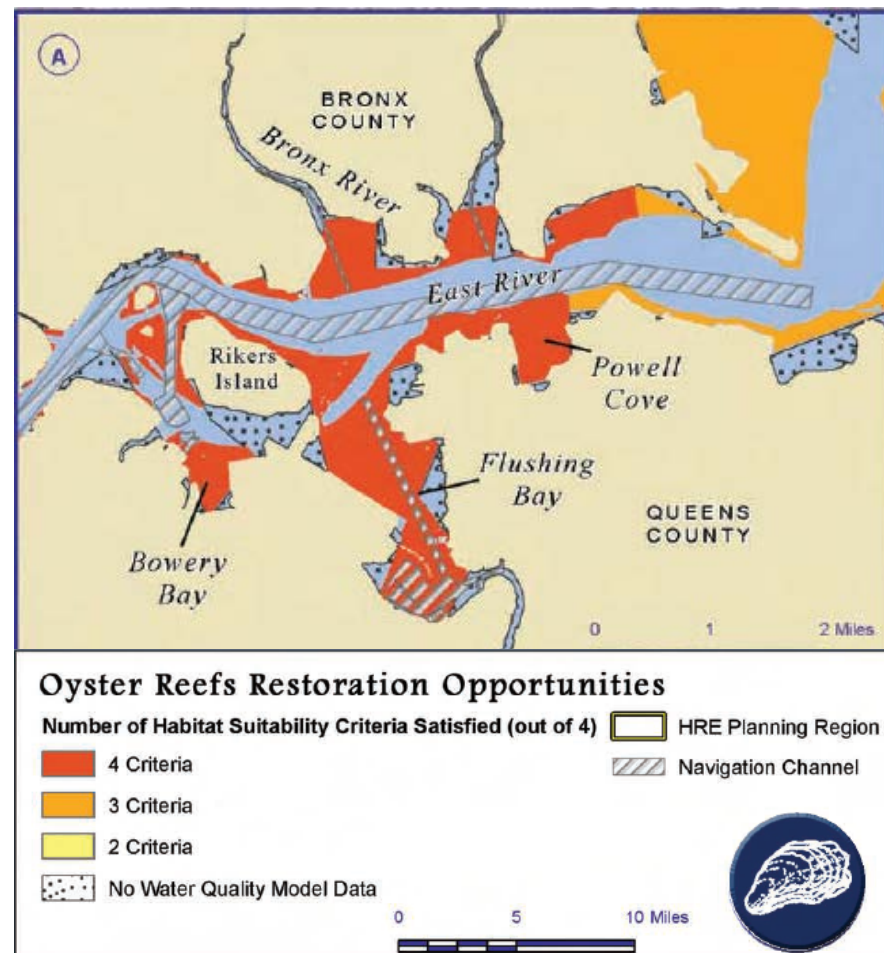
Project Pipeline



14,044 Acres of Wetlands

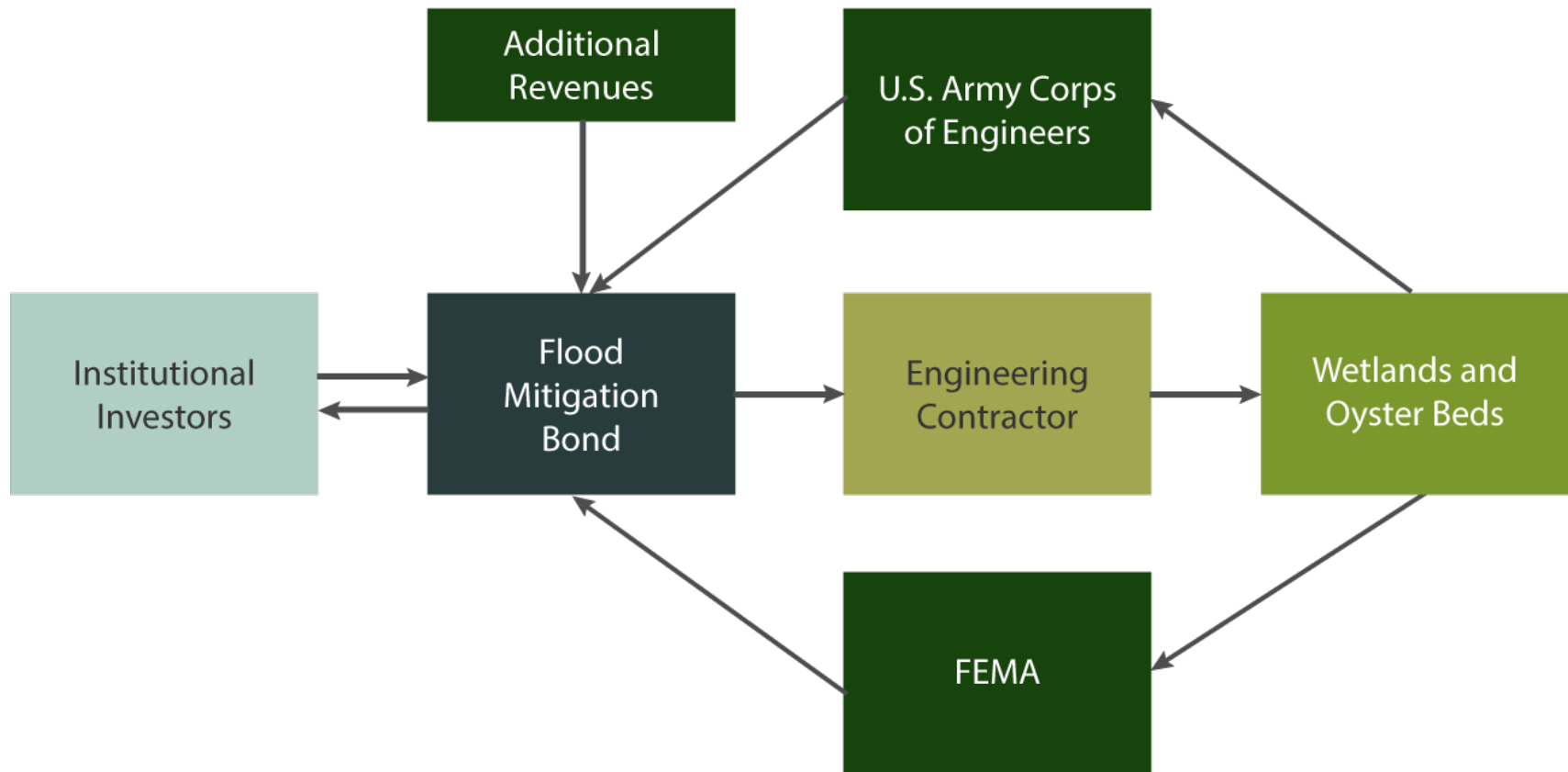


50,000 Acres of Oyster Beds



Source: U.S. Army Corps of Engineers and Port Authority of New York & New Jersey. "Hudson-Raritan Estuary Comprehensive Restoration Plan." March 2009.

Bond Structure



Revenue Stream #1



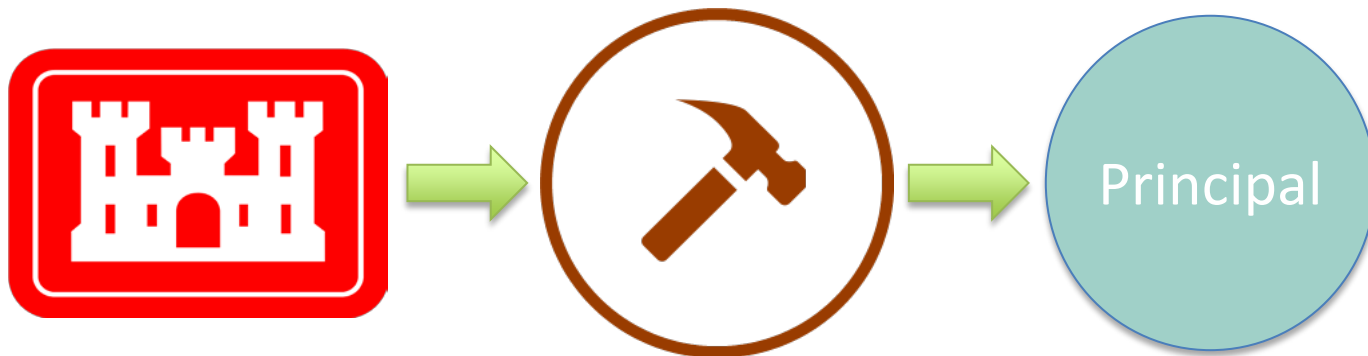
Principal from U.S. Army Corps of Engineers

Benefits to Army Corps

- Decrease in future O&M expenses
- Delayed capital obligations

Benefits to Investors

- Fixed annual payments based on project completion
- Payment from U.S. Federal Government



Revenue Stream #2



5.2% Coupon from the Federal Emergency Management Agency

Benefits to FEMA

- More than \$8.6 million annual savings accrued in perpetuity
- Increased stability and predictability for budget allocations

Benefits to Investors

- \$8.6 million annual savings generated during the life of the bond
- Fixed annual payments based on project completion
- Payment from U.S. Federal Government



FEMA



5.2%

Revenue Stream #3



0.5% Coupon from Additional Revenue

Includes

- Recreation fees, fishing licenses, environmental credits, and oyster sales

Benefits to Investors

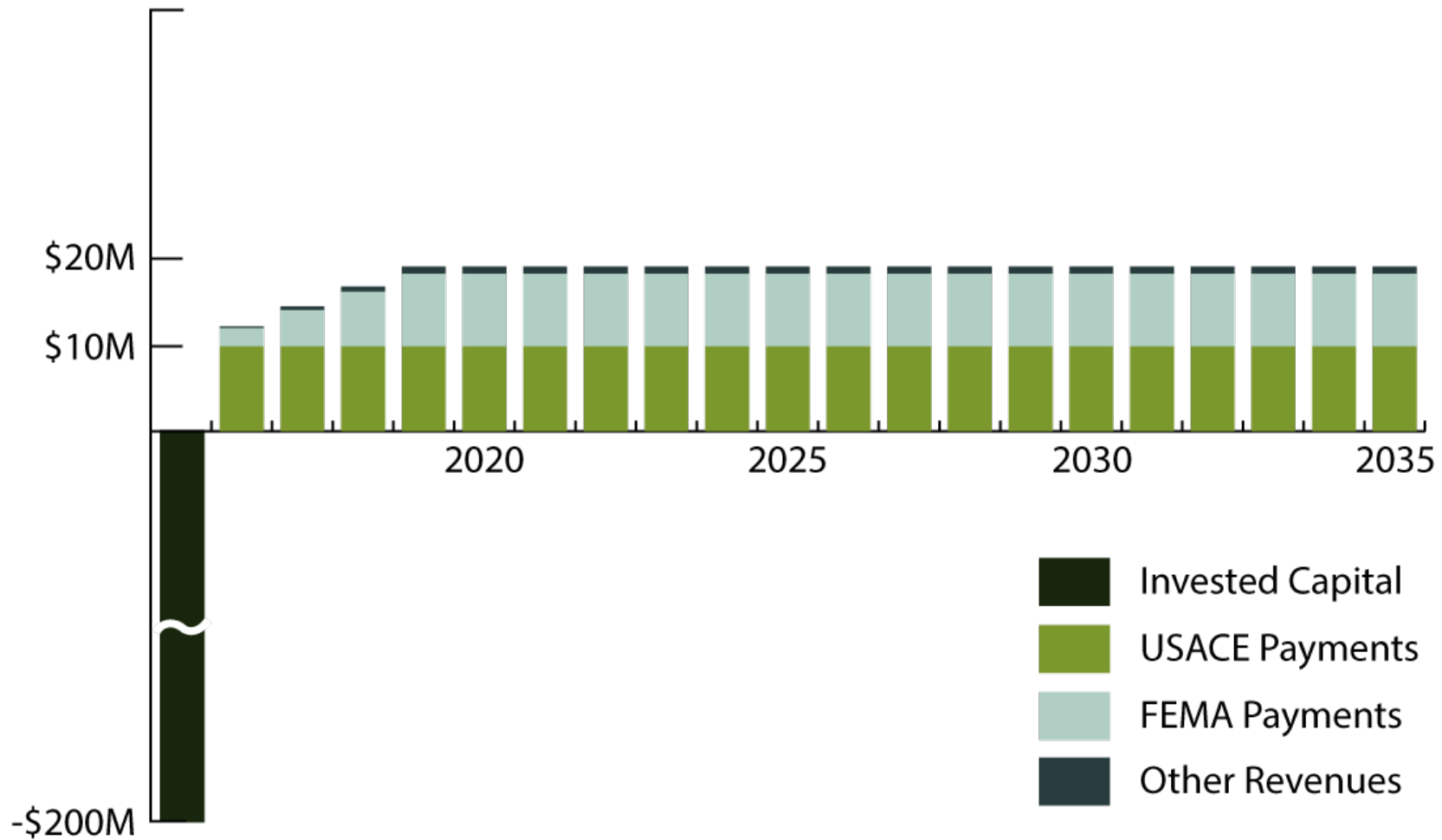
- Additional sources of revenue from monetizing environmental impact benefits



Returns & Distribution



Investor Payment Schedule



Widespread Impact



ENVIRONMENTAL

- 1,700 acres of restored coastline
- Nutrient and pollution uptake and retention
- Wildlife habitat
- Enhanced biodiversity



SOCIAL

- Resilient communities
- Protection for diverse socioeconomic groups
- 1,700 acres available for public use



ECONOMIC

- Job creation
- Increased property values
- Fewer flood related business closures
- Strengthened recreation, tourism, and fishing industry

Risk Management



Risk

Mitigation Strategy

Cooperation of
Key Partners

- Army Corps and FEMA benefit from projects in perpetuity
- Prioritize Army Corps and FEMA high risk areas
- Build consensus with real estate developers, state, and local governments

Volatility of
Flood Events

- Volatility-smoothing through long-term, 20-year duration
- Contract for fixed payments based on project completion

Default on
Payments

- Guarantee from foundation (e.g. Rockefeller Foundation)
- Upfront contracts with Army Corps & FEMA

Performance
Management

- Payments based on historical data and sophisticated modeling
- Partnership with NGO (e.g. The Nature Conservancy) to monitor performance of natural infrastructure

Investment Criteria



Publicly Owned Land



Large Adjacent Areas

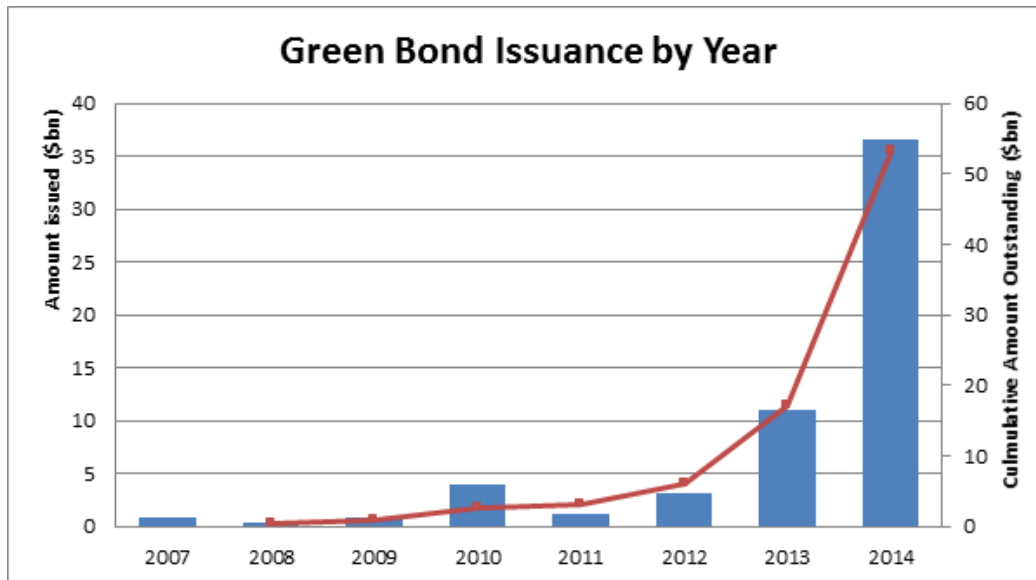


Degraded Sites Suitable for Restoration



FEMA Special Flood Hazard Areas

Scalability: Market



Source: ClimateBonds.Net



Flood Market

- Army Corps spends \$1.17 billion on new infrastructure
- FEMA spends \$4 billion on insurance claim payouts
- Globally, \$20 billion is spent on flood disaster relief each year

Scalability: Geography



Rivers

United States and Global



Coral Reefs

Mexico, Belize, Honduras,
and Guatemala



Mangroves

China, Vietnam, and
Japan

Our Team



Julie Andress

MBA

- Investment banking at Morgan Stanley
- Construction management at GBBN Architects



Meaghan McGrath

MBA/Master of Environmental Management

- Coastal project development at Blue Earth Consultants
- Real assets investing at Sonen Capital



Heather West

MBA/Master of Forestry

- Land investment at Beartooth Capital
- Natural resource management at The Nature Conservancy



Sarah Wilson

MBA/Master of Environmental Management

- Project finance at Bank of America Merrill Lynch
- Entrepreneurship in sustainable food

Questions and Thank You's



**US Army Corps
of Engineers®**



Equilibrium Capital

DBL INVESTORS

DOUBLE BOTTOM LINE VENTURE CAPITAL



NEW ISLAND
CAPITAL



FEMA



Finding the ways that work



The Nature
Conservancy

Protecting nature. Preserving life.®

sonen capital



EKO

Asset
Management
Partners



MILONE & MACBROOM®

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Appendix Slides



Bond Assumptions



Basic information on the bond	
Annual Coupon	5.7%
Duration of bond	20 Years
Size of bond offering	\$201.5MM USD
Fee collected (from principal)	1.1%

Detailed information on the bond	
# of wetland acres restored	500
# of oyster bed acres restored	1200
Cost to restore 1 acre of wetland	\$277K USD
Cost to restore 1 acre of oyster bed	\$52K USD
Property protection per acre of wetlands per year	\$13K USD
Property protection per acre of oyster beds per year	\$5K USD
Proportion of Property Insurance that is Subsidized by FEMA	67%
Construction Period (# of Years)	4
Additional revenue per acre per year	\$500 USD

Competitive Research on Bonds



Issuer Name	Annual Coupon (%)	Offering Size (\$MM)	Duration (Years)
Lowe's Cos Inc	5.50	500	30
Consolidated Edison Co of New York Inc	5.25	125	30
Consolidated Edison Co of New York Inc	5.30	350	30
Archer-Daniels-Midland Co	5.38	600	30
Southern California Edison Co	5.35	350	30
South Jersey Gas Co	5.45	10	30
Connecticut Light & Power Co/The	5.63	100	30
Public Service Co of New Hampshire	5.60	50	30
Verizon Communications Inc.	4.75	850	20
CF Industries Inc	5.15	750	20
Fedex Corp	4.90	500	20
Long Island New York Power Authority	5.00	578	20
Puerto Rico Commonwealth Aqueduct and Sewer Authority	5.25	1800	20
General Electric Capital Corp	4.25	19	20
Average	5.20	470	

Criteria includes:

- Long term duration (20-30 years)
- Non-callable bonds expire at maturity

Target Institutional Investors



Academic



Pension Funds



Foundations



National Flood Insurance Program Payments



FIGURE 5. National Flood Insurance Program Debt Grows

The National Flood Insurance Program has fallen deeper in debt since the pay-outs after Hurricane Katrina and most recently the costs of Hurricane Sandy. As of November 2012, the program was more than \$20 billion in debt to the U.S. Treasury (GAO 2013), and that figure is likely to rise once all the Sandy claims are settled.

Sources: FEMA 2013a; estimate for 2012 NFIP payments for Hurricane Sandy from King 2013; estimate for 2012 NFIP debt based on its borrowing limit of \$30.4 billion set by the Hurricane Sandy Relief Act.

NFIP is one of the largest financial obligations of the U.S. government.

Coastal storm damage reduction Features	Relevant Coastal storm damage reduction and Resilience Processes and Functions Provided	Potentially Important Performance Factors	Potential Coastal Risk Reduction and Socioeconomic and Environmental Resilience Outcomes	Potential Additional Socioeconomic and Environmental Benefits (Direct and Indirect)
Salt Marshes	<ul style="list-style-type: none"> Wave attenuation and/or dissipation Sediment stabilization Raw material provision (sands of particular sizes and mineral proportions) 	<ul style="list-style-type: none"> Wave height Wave period Water level Marsh elevation Marsh continuity Vegetation type Vegetation height Vegetation density 	<ul style="list-style-type: none"> Coastal storm damage reduction Shoreline erosion control Water quality regulation Tourism Recreation Education 	<ul style="list-style-type: none"> Ecosystem diversification (biodiversity) Enhance and diversify food production Nutrient and pollution uptake and retention Provide aesthetic landscapes Provide suitable reproductive habitat and nursery grounds
Beaches	<ul style="list-style-type: none"> Wave attenuation and/or dissipation Nearshore sediment cycle Raw materials (sands of particular sizes and mineral proportions) Store and filter water through sand 	<ul style="list-style-type: none"> Beach slope Berm elevation Sediment grain size Berm width Presence of backing dune Sediment supply Presence of structures Wave height Wave period Water level Storm duration 	<ul style="list-style-type: none"> Coastal storm damage reduction Shoreline erosion control Tourism Recreation Education 	<ul style="list-style-type: none"> Provide unique and aesthetic landscapes Flood protection Improve water quality Ecosystem diversification (biodiversity) Potential beneficial use of dredged material Biological productivity and diversity Wildlife habitat creation and preservation
Dunes	<ul style="list-style-type: none"> Wave attenuation and/or dissipation Supports sediment cycle Raw material provision (sands of particular sizes and mineral proportions) Store and filter water through sand 	<ul style="list-style-type: none"> Dune height Dune crest width Dune field width Variability in dune height Wave height Wave period Water level Storm duration Presence of vegetation Berm width Beach slope 	<ul style="list-style-type: none"> Coastal storm damage reduction Shoreline erosion control Water catchment and purification Aquifer recharge Tourism Recreation Education 	<ul style="list-style-type: none"> Improve water quality Ecosystem diversification (biodiversity) Increase recreational opportunities Reduction of unwanted sediment sources Increase Information and knowledge Generate biogeochemical activity and productivity Wildlife habitat creation and preservation Provide aesthetic landscapes