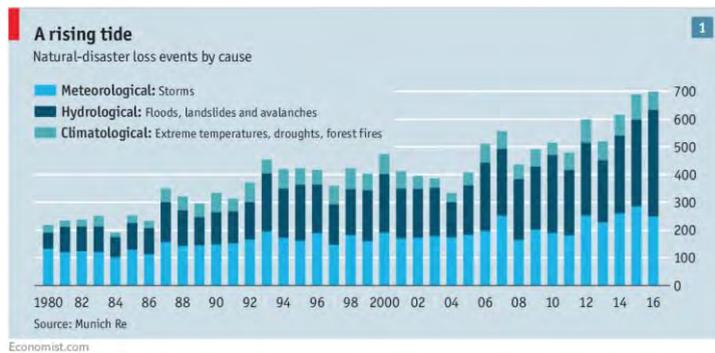


Land Restoration Performance Securities:

Mobilizing capital to advance climate change resiliency, species conservation, emissions reduction

The Case for Flood Resiliency Investment

- According to researchers at ETH Zurich, climate change has made record rainfall, like that seen during Hurricane Harvey, increasingly likely.¹⁰
 - Floods have caused a greater loss of life and property, and have disrupted more families and communities in the United States than all other natural hazards combined.²
 - In the past 2 years, the city of Houston has endured four separate “100-year rainstorms” and a 167% increase in heavy downpours⁷
- Additionally, unchecked development on natural flood drainage ecosystems makes flooding even more likely and more severe when it occurs
 - According to research by Texas A&M, from 1992-2010, Houston’s Harris County lost 29% of its wetlands due to overdevelopment caused by a lack of zoning laws³
 - Hurricane Harvey caused \$125 billion in damage⁵ of which \$600 million has been attributed to the loss of natural wetlands.³
 - Professor Samuel Brody at TAMU calculates that each new square metre of pavement in Houston contributes ~\$4,000 worth of flood damage.³
- On top of flooding concerns, loss of wetlands threatens native species of plants and animals and removes natural carbon sinks³



Land Restoration is an Under-Utilized Solution

- The most common response to increasing flood risk is resiliency infrastructure, but this comes with limitations
 - Does not reduce concrete coverage of wetlands
 - Does not address species disruption
- Restoring land to its natural habitat (“Land Restoration”) achieves flood mitigation goals while also recovering habitat for species protection and creating carbon sinks on previously developed land
- Despite benefits, US has begun restoring less than 2% of its 15,000 watersheds.

Sluggish investment in land restoration is attributable to inability to monetize beneficiaries

- Environmental benefits are a public good
- Reduction in flooding frequency and severity benefit damage payors (insurance and governments), especially catastrophic insurance and governments that function as payors-of-last-resort

Mitigation Banking – Necessary but Insufficient

- Mitigation banking is an established tool to monetize environmental public good
- Section 404 of the Clean Water Act gave the US Army Corps of Engineers the ability to issue permits that allowed for negative impacts to waters or wetlands as long as “permittees [mitigated] these impacts through the creation, restoration, enhancement, or preservation of wetlands.”⁸
- The tool was created in order to replace the function served by the affected watershed by creating an equivalent habitat with the same, or similar, biodiversity and ecosystem services
- As of 2013, wetland mitigation banking was a \$3 billion industry with almost 1 million acres of wetland rehabilitated¹¹
- Texas allows different watersheds to be combined into larger mitigation areas, which increases the efficacy of flood mitigation
- Once a mitigation bank’s plan has been approved, a portion of the credits may be released for sale, with the rest coming once operational milestones are met
- To date, mitigation banking is a tool for protecting undeveloped land, NOT a tool for incentivizing restoration of heavily developed areas; credits awarded are not large enough to generate a rate of return for a restoration project unless damage payors are also monetized

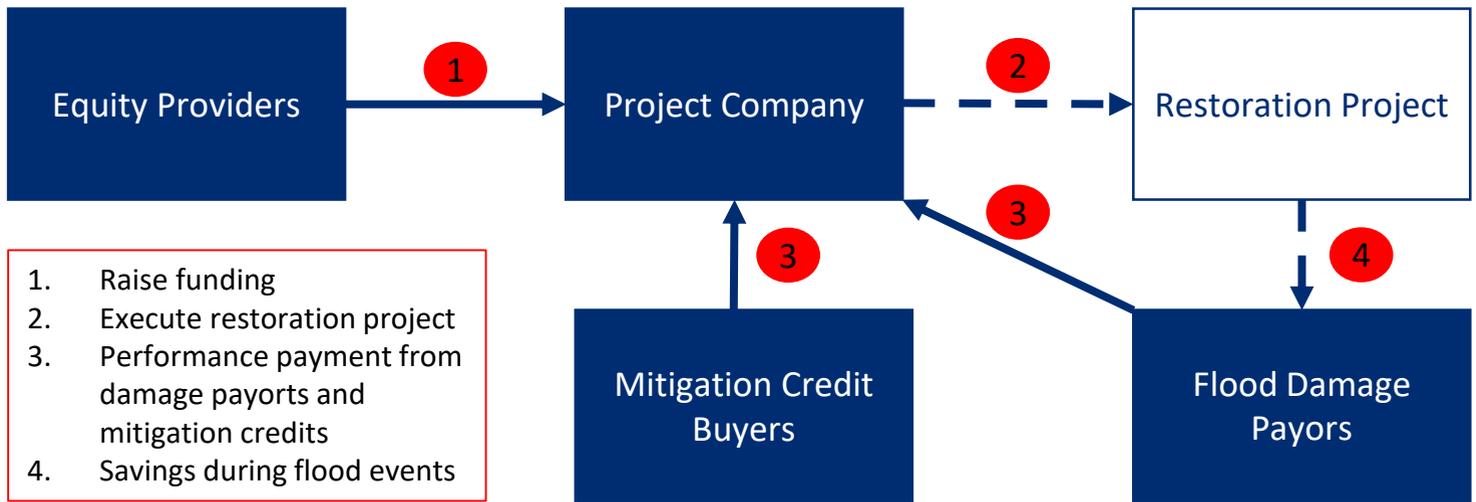
The Challenge: Monetizing Damage Payors

- Damage payors include insurance companies and public sector payors of last resort.
 - Estimated ~\$10 billion of insured damages from Hurricane Harvey
 - In November 2017, the administration asked Congress to approve an additional \$44 billion in funding for FEMA after Harvey, Irma, Maria, and the California wildfires
- Flood damage liabilities are hard to finance
 - Historically infrequent, unpredictable, and high impact events (Houston area flood plans use 1/100 year and 1/500 year probabilities)
 - Climate change and overdevelopment causing rapid changes to probability and severity of flood events (three “500 year floods” in Houston area over the last five years)
 - No maturity of size cap on the damage liability for payors-of-last-resort (FEMA does not get to write a 20 year capped damages policy)

Our Proposal: Use a pay-for-performance security to mobilize capital from damage payors for investment in land restoration

Land Restoration Performance Securities:

Mobilizing capital to advance climate change resiliency, species conservation, emissions reduction



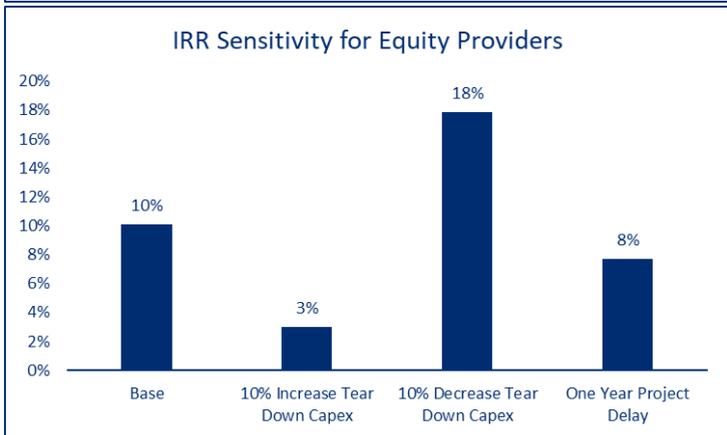
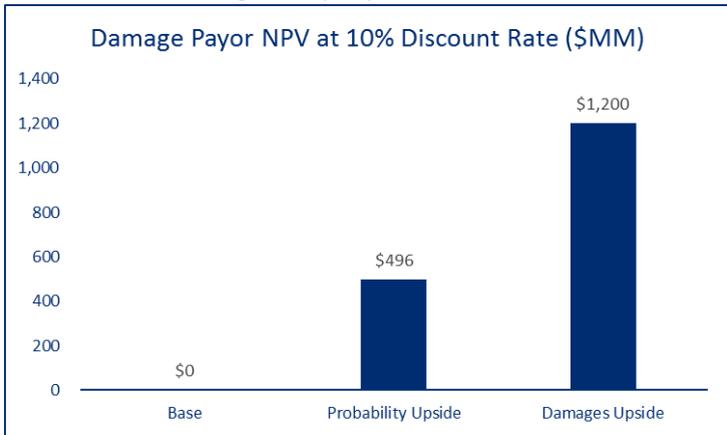
1. Raise funding
2. Execute restoration project
3. Performance payment from damage payors and mitigation credits
4. Savings during flood events

Pay-For-Performance (PFP) Unlocks Damage Payors

- Project company raises equity to fund purchase and restoration of developed land
- Project company earns revenue from mitigation credits and a one time performance payment from the PFP security with flood damage payors
- Under the PFP security, damage payors make one payment at the completion of restoration activities. Damage payors earn a rate of return on that payment via future flood damage savings.
 - Damage payors take no project execution risk – one time payment only at completion of the restoration activity
 - Priced to a base case expected savings stream and a 10% rate of return (based on 5-yr ROE of publicly listed insurance companies in the United States)
 - Savings generating rate of return have no maturity date or size cap – matches liability characteristics
 - Upside for the damage payors if flooding frequency or severity is greater than expected in base case – damage payors earn higher returns as climate change impacts flooding profile in target areas

Illustrative Project Assumptions

- 15% required rate of return for capital markets
- 10% required rate of return for damage payors (based on insurance company five year return on equity)
- 8,000 acres purchased; \$106k per acre cost to acquire and restore land based on Harris County home buyout program
- Assume one year for restoration activity
- \$1.7k annual mitigation credit revenue per acre – pricing calculated using data from the similarly sized Pineywoods Mitigation Bank
- Expected savings of \$1.00 per \$1.00 invested in restoration (\$1 invested avoids \$2 in damages). Based on data from Houston area and Midwest programs
- Performance payment of \$1.2 billion (versus \$848 million of restoration capex) – NPV break even for damage payors if ~15% chance of flooding event per year



	Sources of Return	Allocated Financial Risk
Equity Providers	<ul style="list-style-type: none"> • Pass through of performance payments from damage payors • Pass through of mitigation credit revenue 	<ul style="list-style-type: none"> • Time to complete project • Cost to complete project • Credit risk on performance and mitigation credit payors
Flood Damage Payors	<ul style="list-style-type: none"> • Avoided damage claims during flooding events 	<ul style="list-style-type: none"> • Less frequent / severe flooding than expected • Inaccurate flood damage modeling