



# Leveraging Innovative Funding Strategies to Implement Nature-based Solutions to Address Flood Risk

**March 12, 2024**  
**Erin Delawalla, RES**



# Presentation Agenda

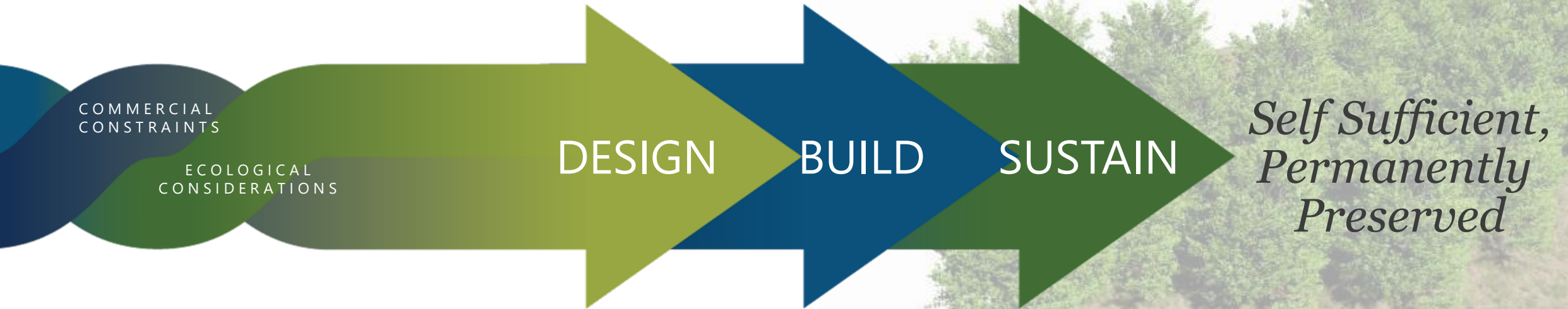
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- Introduction & Framing
- Parametric Insurance as a Tool to Address Extreme Weather Events
- Case Studies on Parametric Insurance
- Flood Resilience Bond Concept
- Case Study: Forest Resilience Bond

# *Introduction & Framing*

# Total Stewardship, Guaranteed Results

*Successful ecological outcomes by leaning into constraints,  
with creative problem solving and total stewardship.*



RES  
Team

## *Behind the Scenes*

- Land acquisition
- GIS specialists
- Environmental, health, safety and security
- Regulatory project managers
- Project controls
- Government affairs
- Public and community relations
- Financial
- Legal

## *On the Ground*

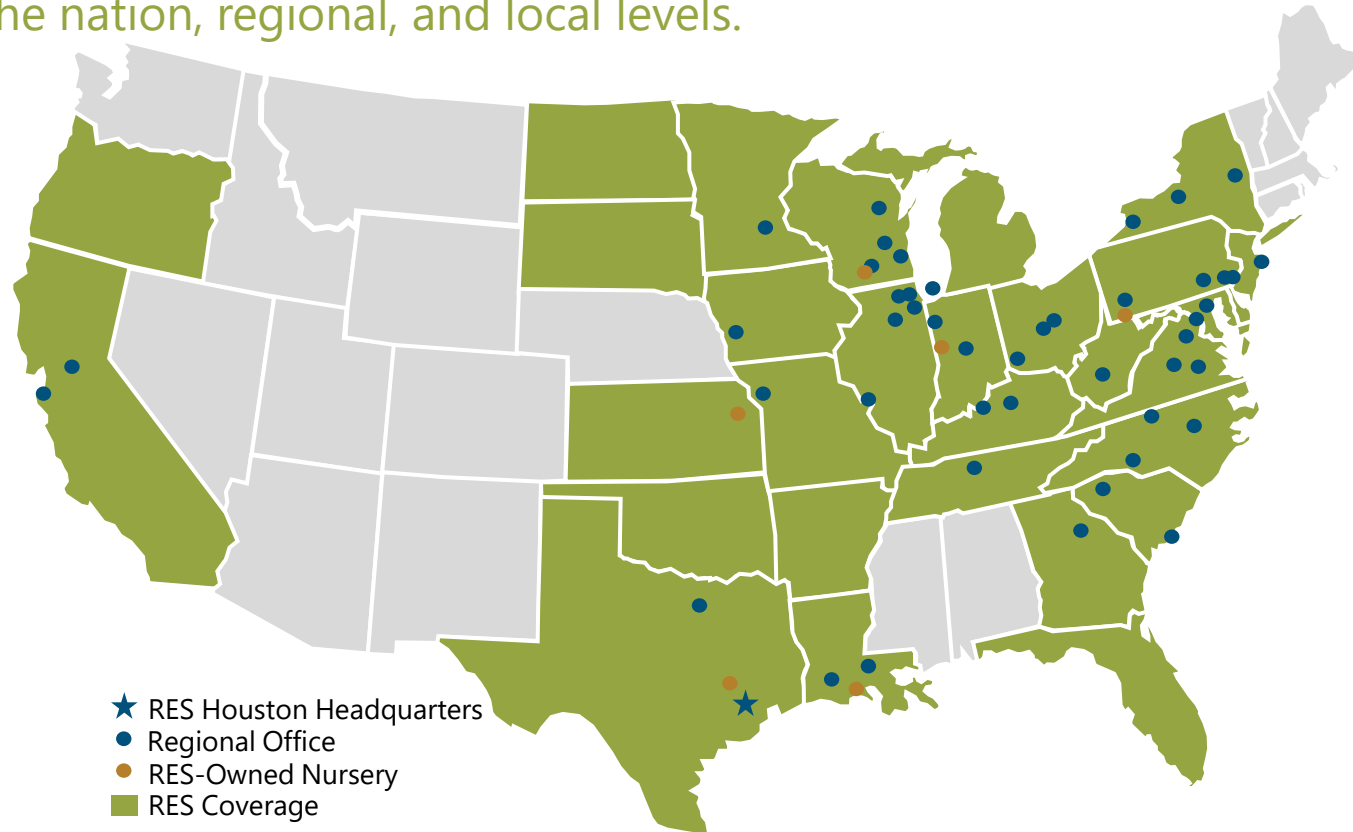
- Certified foresters
- Construction managers
- Engineers
- Field crew members
- Field ecologists
- Hydrologists
- Landscape architects
- Nursery managers
- Rosgen IV certified stream designers
- QA/QC oversight teams
- Superintendents
- Wetland scientists
- Wildlife biologists



# RES Today

Understanding the needs of the resource, client, regulators, and stakeholders at the nation, regional, and local levels.

- In-state teams with locally experiences, industry-leading talent
- Backed by national experts across the ecological disciplines
- Over 770 dedicated staff in 30 operational hubs



## Recognition

Fastest Growing



Ten Years in a Row  
2010 - 2020

Project Merit Awards



Environmental Business Journal  
Six-time Winner

## Milestones

- Founded 2007
- KKR investment, 2016
- Awarded largest PRM mitigation contract in U.S. history, 2018

## Acquisitions

- Applied Ecological Services, 2021
- Blueway, 2020
- Redwing Ecological Services, 2020
- Carolina Environmental Contracting, 2020
- Apache Environmental, 2018
- Angler Environmental, 2016
- EBX, 2014



# Restoring our land and waters.



**406**

*Mitigation sites*



**20,000,000**

*Trees planted*



**62,637**

*Acres of restored and protected lands*



**378**

*Miles of streams restored and conserved*



**15,000**

*Acres of special-status species habitats*



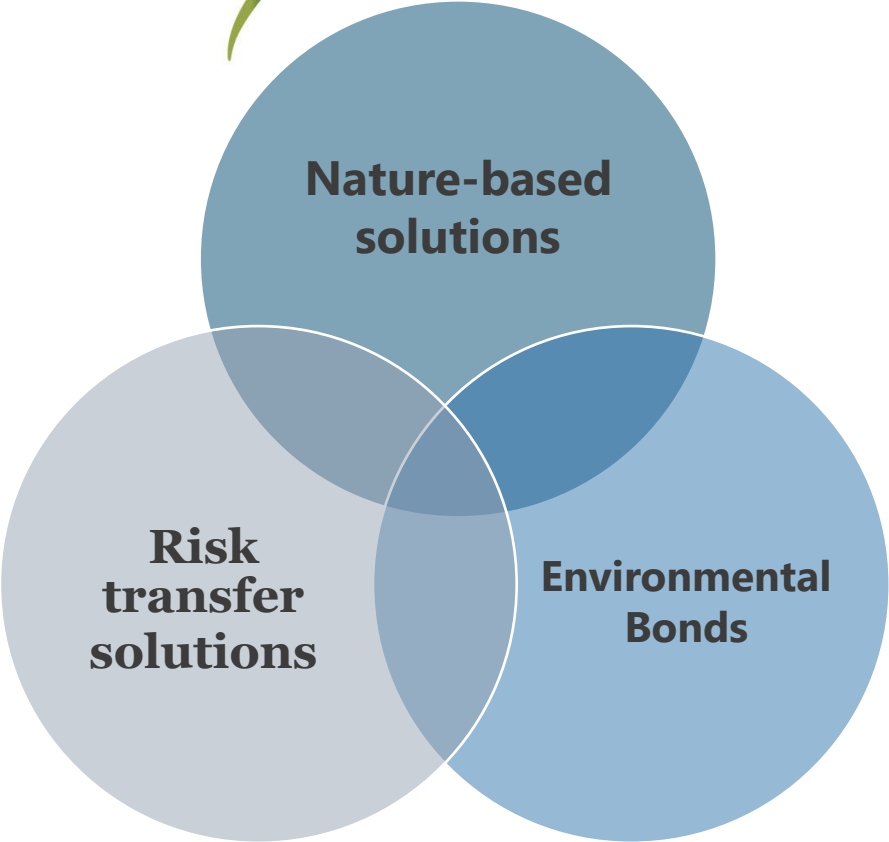
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*Tons of water quality nutrient reductions*



# Collaboration to Address Big Challenges

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# *Parametric Insurance*



# Parametric Insurance 101

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## **What is Parametric Insurance?**

A type of insurance contract that insures a policyholder against the occurrence of a specific event by paying a set amount based on the magnitude of the event, as opposed to the magnitude of the losses in a traditional indemnity policy.

# Using Parametric Insurance for Climate Resilience

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## **What makes Parametric Insurance Uniquely Suited for Communities Seeking Climate Resilience products?**

- Specific payment amount is triggered automatically upon the occurrence of the event (e.g., 500-year storm event, Category 3 hurricane, 7 inches of rain in less than 24 hours)
- No assessment of damages site by site
- No delays for damages assessment
- Funds can be used for any purpose
- Community based catastrophe insurance solutions (CBCI): any community organization, special purpose district or public entity can expand financial protection & risk mitigation solutions for its members.

# Community-based Catastrophe Insurance Solutions

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- **Marsh McLennan launches the First CBCI:**
  - Partnership with the NYC Mayor's Office, EDF, Swiss Re, & the Center for NYC Neighborhoods (an NGO in NYC) funded by the National Science Foundation and Environmental Defense Fund,
  - CNYCN purchased a parametric policy that will provide \$1.1M in recovery funds in the event of a significant precipitation or flooding event
  - Payment is triggered based on an extreme flood event that meets the pre-defined parameters
  - CNYCN will distribute grants up to ~\$15K to community members to cover expenses incurred after a disaster
  - This money could also be used (if desired) to invest in green infrastructure

# CBCI in the Midwest

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- **Parametric insurance policy for Mississippi River Cities & Towns Initiative**
  - Announced at the COP28 in Dubai
  - Still in feasibility stage
  - MRCTI would hold CBCI policy
  - CBCI Policy would pay out on flooding events like 100-year storm
  - Brings “reinsurance” to cities and towns in the basin
  - Premiums would be funded through carbon credit sales
  - Carbon credits generated through restoration of wetlands in Mississippi River floodplains implemented in partnership with Ducks Unlimited
  - Similar to New York City example

# Parametric Insurance to Protect Natural Resources

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- **Parametric insurance policy for Mexico's Quintana Roo (led by TNC and Swiss Re)**
  - Policy paid out if wind speeds above 100 knots are registered within the covered area, with a greater payout tied to greater wind speeds
  - Funds would go toward immediate restoration of the coral reef and beaches if event occurs
  - Paid out in first year due to Hurricane Delta & allowed for the swift deployment of 'reef divers' to immediately begin restoration
- **Policy for Hawaii Coral Reef (led by TNC and Munich Re)**
  - Policy paid out on certain tropical storms
  - Funds would go toward rapid reef repair and restoration

# Using Parametric Insurance for Climate Resilience

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- **Opportunities to leverage Parametric Insurance for Flood Mitigation**
  - Insured parties could use the unrestricted payout to fund gray or green infrastructure
  - Parametric insurance can also serve as a strategy to address risks to existing natural infrastructure
    - Shorelines and bluffs facing erosion on Lake Michigan
    - Restoring eroded river islands
    - Restoring hardwood bottomlands at risk from excess or long-term flooding
  - Premiums could be funded by a partnership organization for a river basin, state governments, collaboration of cities & towns, etc. (anyone who suffers financially during a major flood event)



# Community-based Insurance Approach to Natural Resources

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- **New approach:** Using community structure and link the protection of wetlands to a reduction of flood risk and therefore a reduction in flood insurance premiums
- Underwriters generally do not explicitly incorporate the restoring or the destroying of wetlands in insurance pricing – but this is something the industry has interest in piloting
- Community-based insurance policies could be designed so that they incentivize the protection of wetlands
- Protecting existing wetlands or restoring new wetlands can reduce flood risk

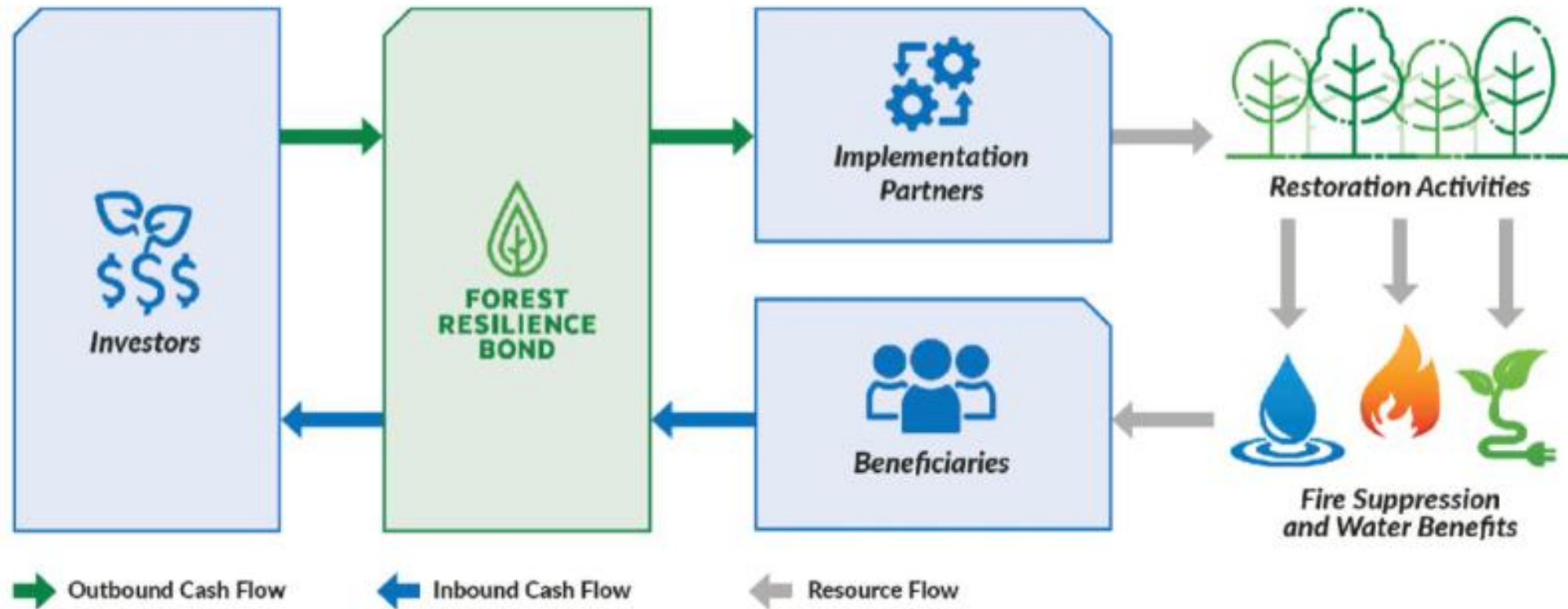




# Forest Resilience Bond



# Resilience Bond Financing



# Resilience Bond Financing

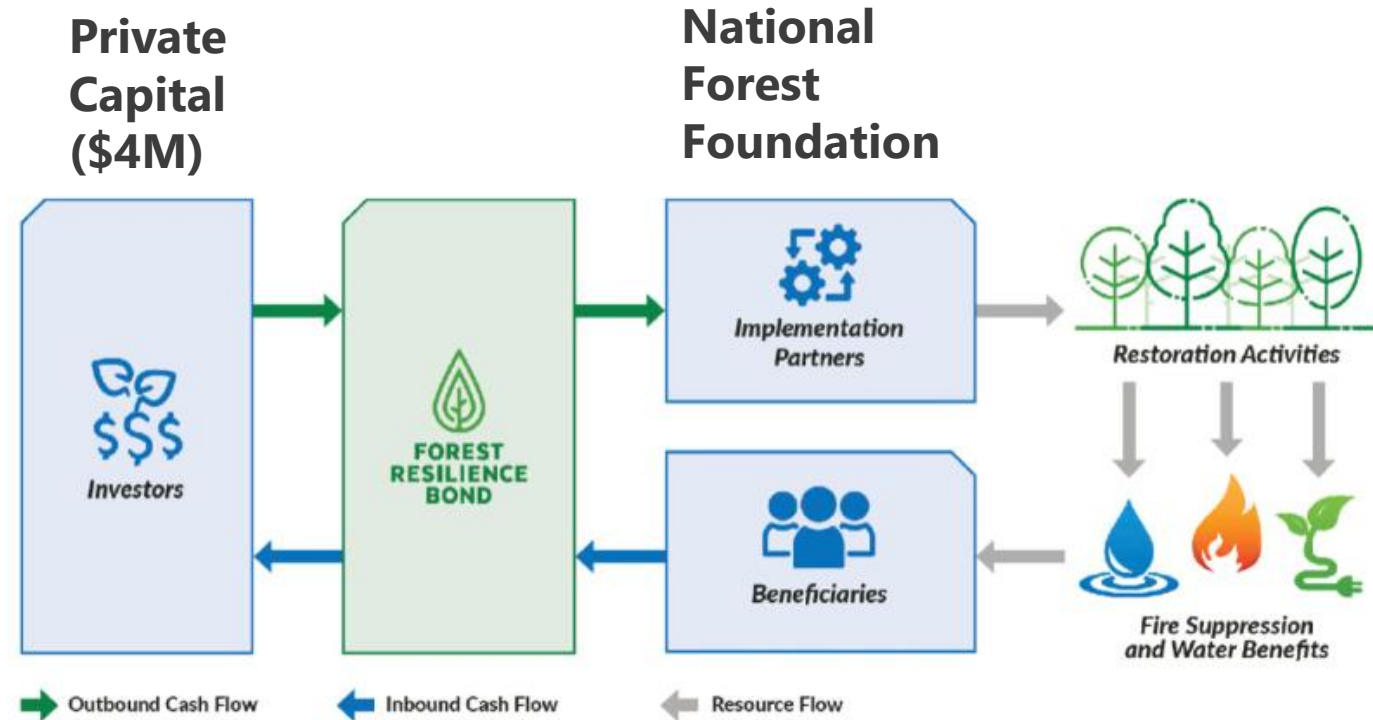
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Specifically, the FRB leverages increasingly scarce public dollars spent on forest restoration through the following mechanisms:

- 1) Sharing of costs (and benefits) across traditional and new stakeholders reduces aggregate costs to each individual stakeholder.
- 2) Tapping private capital maximizes scale of restoration without stressing budgets.
- 3) Accelerating restoration treatments prevents further overgrowth and future costs to stakeholders.

# Project Example

- **Yuba 1 FRB:** 14,545 acre project in Sierra County, CA that encompasses the Tahoe National Forest system lands within the Yuba River watershed
- **Benefits:** Tahoe National Forest accelerated work and completed projects in 4 years instead of projected 10-12 years
- **Increasing Scale:** Yuba 2 FRB (48,000 acres), \$25M



**\$4M + Rate of Return repaid to Investors**

1. **State of CA**
2. **Yuba Water Agency**
3. **Electric Utilities**
4. **Private Corporations**

# Building on Precedent: North Yuba Forest Partnership

9 federal, state, tribal, and NGOs established this Partnership in 2019

Goal is to restore 275,000 acres of public and private lands in Northern California

Plan is to use the FRB to finance more than \$100M of unfunded restoration work across North Yuba Watershed





How does this apply to flooding?

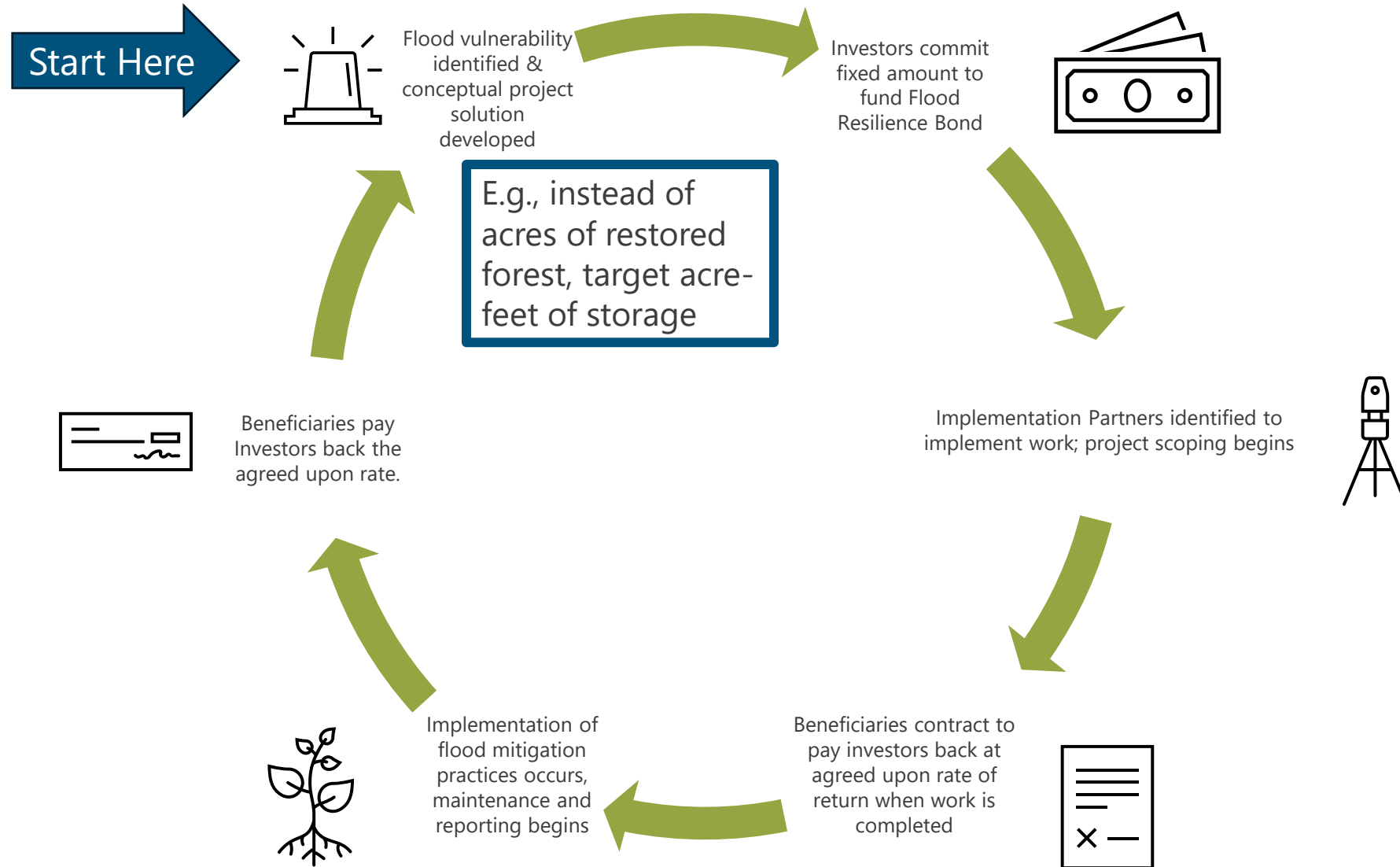
# Flood Resilience Bond\*

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- **We know that we need:**
  - Large scale restoration projects that could address peak flood periods (oxbow wetlands, better access to floodplains, wetland restoration throughout the watershed) AND/OR
  - Distributed infrastructure (riparian buffers, better connection to floodplains on small tributary streams, wetland restoration)
- Investors are out there looking for investable projects: nature-based investors, NGOs, corporations, insurance companies.
- **Could multiple stakeholders come together to fund the FRB, creating a pooling of resources to fund restoration at scale?**

\*A Flood Resilience Bond is conceptual at this stage

# Deploying Private Capital to Address Landscape Flood Risk



# The Importance of the Mississippi River Basin

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- Spans 1.245M square miles
- Touches 31 states and 2 Canadian provinces
- The world's 4<sup>th</sup> largest river basin
- Significant levels of nutrient pollution
- Heavily engineered to function like a highway
- Biologically significant for fish and 60% of all North American birds



MISSISSIPPI RIVER BASIN Topographic map showing the Mississippi River Basin. © Scott Reinhard



# Example Project: Emiquon National Wildlife Refuge

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- Over 6,400 acres of floodplain restoration
- Provides habitat for hundreds of thousands of migratory birds
- TNC acquired the project in 2000; then enrolled 6,400 acres into the Wetlands Reserve Program
- In 2008: Volunteers replanted 300,000 wetland trees and 8,000 pounds of grassland seeds
- Drainage pumps were turned off and one natural lake bed within the Project began to refill (2,000 acres eventually)
- Water management structure allows for excess water to be drained from the preserve to protect adjacent ag land, but also to allow increased flow during flood events

