



Key Points

- There is a large and growing pool of mechanisms to fund natural infrastructure for flood risk reduction.
- Promising new mechanisms include reinsurance, catastrophe & resilience bonds, and green bonds.
- Key local factors determine the best financing approaches for natural infrastructure.
- The biggest opportunities for developing new funding are in redirecting post-disaster recovery towards risk-reducing investments.

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Financing Natural Infrastructure

A new report identifies opportunities for investing in natural infrastructure for coastal defense

Coastal development and climate change are increasing the risks to people and property from flooding. In the past 10 years, insurers have paid out more than US \$200 billion for coastal damages from storms globally.

Coastal wetlands act as natural defenses that protect coastlines by reducing waves, storm surge and flooding. However, we spend thirty times more on building and maintaining gray infrastructure, such as seawalls, than we do on building and restoring natural infrastructure such as reefs and wetlands.

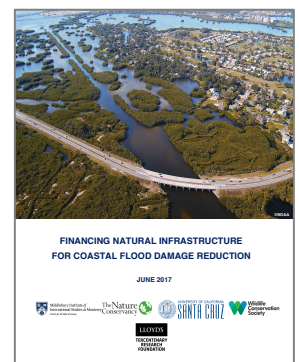
A new report – “*Financing Natural Infrastructure for Coastal Flood Damage Reduction*”- reviews the existing and potential funding avenues for natural infrastructure, examines the barriers that prevent the broader use of these natural solutions, and proposes a framework to identify when and where natural infrastructure financing may be most relevant.

The good news is that there is a large and growing pool of financial tools that could fund natural infrastructure, with wins for both flood risk reduction and conservation. In many cases, the same tools that fund gray infrastructure could also support natural solutions. While government programs for post-disaster funding are well-known, forward looking policies have begun to encourage pre-disaster spending that explicitly supports the use of natural infrastructure for risk reduction.

The report highlights the important role of the insurance industry in both preventative and recovery efforts and in driving innovation towards new solutions. With the development of new financial tools, including catastrophe and resilience bonds, and with a growing community of practice and many project examples, many of the existing barriers to natural infrastructure can be overcome.

Key local factors that help determine when and where natural infrastructure financing may be most relevant.

- **Geography-** The spatial relationship between development and ecosystems.
- **Ecosystems-** The types and conditions of ecosystems present.
- **Known flood risks-** The frequency and severity of floods, and the exposure of people and assets to these risks.
- **Existing natural infrastructure funding-** The financial mechanisms that may be readily deployed in a particular area.
- **Financing system capabilities-** The capacity of the banking, public finance, and insurance sectors.
- **Institutional and socioeconomic capacity-** The financial ability of the community to contribute towards funding risk reduction measures.



Find the report at
www.lloyds.com/coastalresilience



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WHO PAYS

WHO BENEFITS

PUBLIC

PUBLIC

Funds are provided by general taxes, benefits cannot be assigned to any specific beneficiary.

Pre-Disaster Funding

Globally

- Infrastructure spending (e.g. transportation, energy, water) may include flood protection

In the United States

- Army Corps of Engineers
- Coastal Wetlands Restoration Fund
- Estuary Habitat Restoration Act Funds
- Louisiana Coastal Wetlands Restoration
- FEMA Pre-Disaster Mitigation Grants
- Oil Spill Wetlands Restoration Funds
- State Infrastructure Banks

In Europe

- Natural Capital Financing Facility

In Developing Countries

- World Bank Green Climate Fund
- Global Environmental Facility Small Grants
- Mexico Fund for Disaster Prevention

Post-Disaster Funding

In the United States

- FEMA Flood Mitigation Assistance Program

In Developing Countries

- World Bank's Global Facility for Disaster Risk Reduction & Recovery
- World Bank's Crisis Response Window
- World Bank's Catastrophe Deferred Drawdown
- Mexico's FONDEN

PRIVATE

PUBLIC

Public expenditures, either directly or through tax subsidies, provide benefits to a narrow group.

- Tax Expenditures
- Disaster Recovery Deductions
- Deductions for Contributions to Conservation

PRIVATE

PUBLIC

Private funds provide benefits that are greater than the usual return on investment. Decisions about what to fund combine expectations of private return and of broader benefits.

- Pre and Post Disaster Funding
- Green Bonds

PRIVATE

PRIVATE

Private funds provide benefits to a narrow group.

Infrastructure Finance

In the United States

- Special Purpose Districts
- Flood Control Districts
- Storm water Districts
- Tax Increment Financing Districts

Globally

- Public-Private Infrastructure Partnerships

Insurance – Pre-Disaster

In the United States

- FEMA Community Rating System

Insurance – Post-Disaster

Globally

- Insurance and Reinsurance Payouts
- Catastrophe Bonds
- Resilience Bonds

Funding Options for Natural Infrastructure

This table provides a simple economic framework for describing the many approaches to financing natural infrastructure based on where the funding will come from and who will benefit from the reduced flood risk.

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