

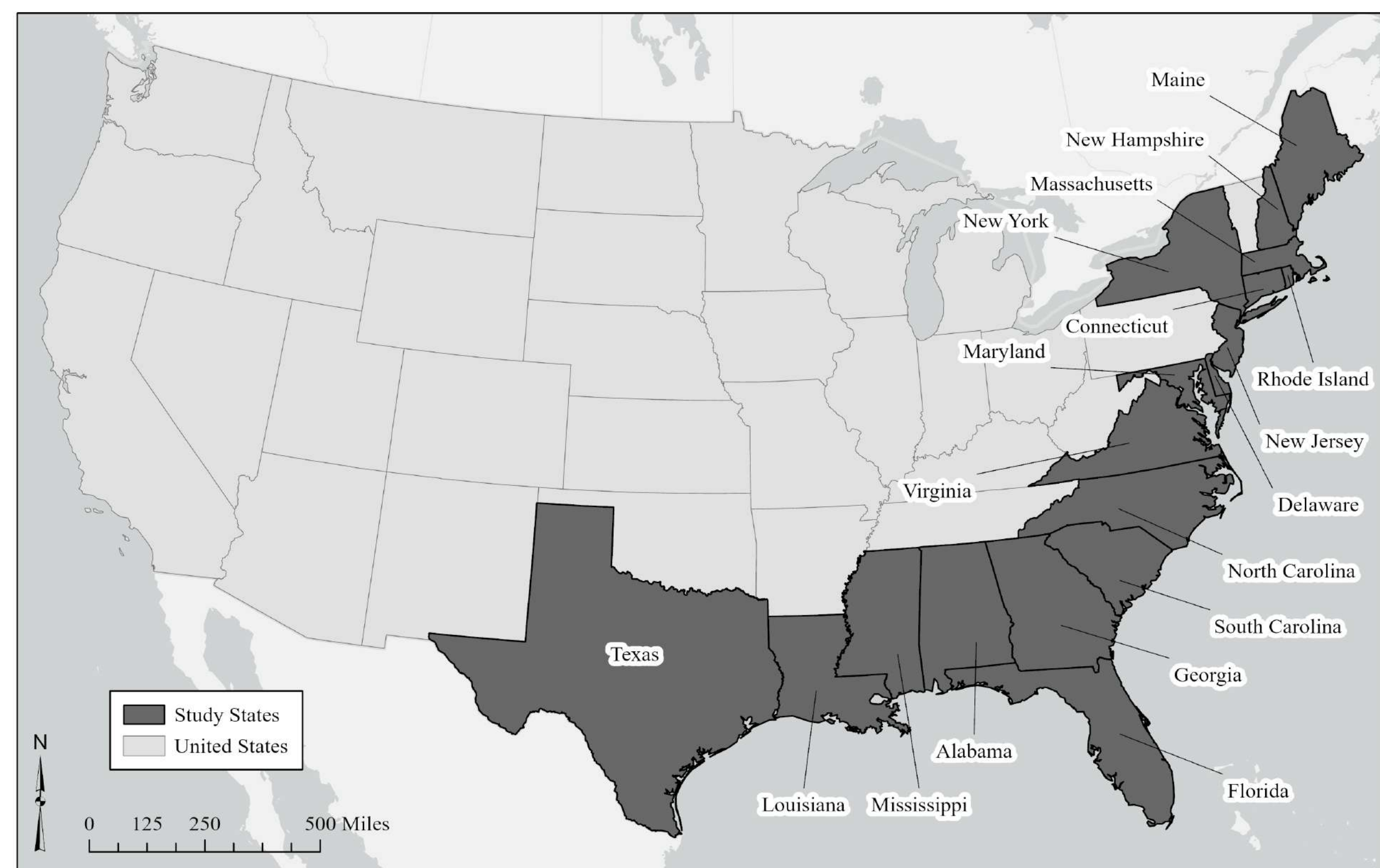
# Trends in the Federal Emergency Management Agency's Flood Mitigation Grants from 2000 to 2020

## Introduction

In the United States, floods are the most common and costliest disasters<sup>1</sup>. Despite the government's efforts to reduce the impacts of flooding, flood losses, and exposure continue to rise due to rapid population growth and accelerated development in flood-prone regions, particularly in low-lying coastal communities<sup>2,3</sup>.

In this poster, we explore the patterns in the timeline, type, project awardees, and amount of the Hazard Mitigation Assistance (HMA) program funds administered by the Federal Emergency Management Agency (FEMA). The descriptive analysis of HMA data provides a data-driven approach to decision-making, and it helps local communities with targeted flood mitigation resource allocation.

## Geographic Scope of the Analysis

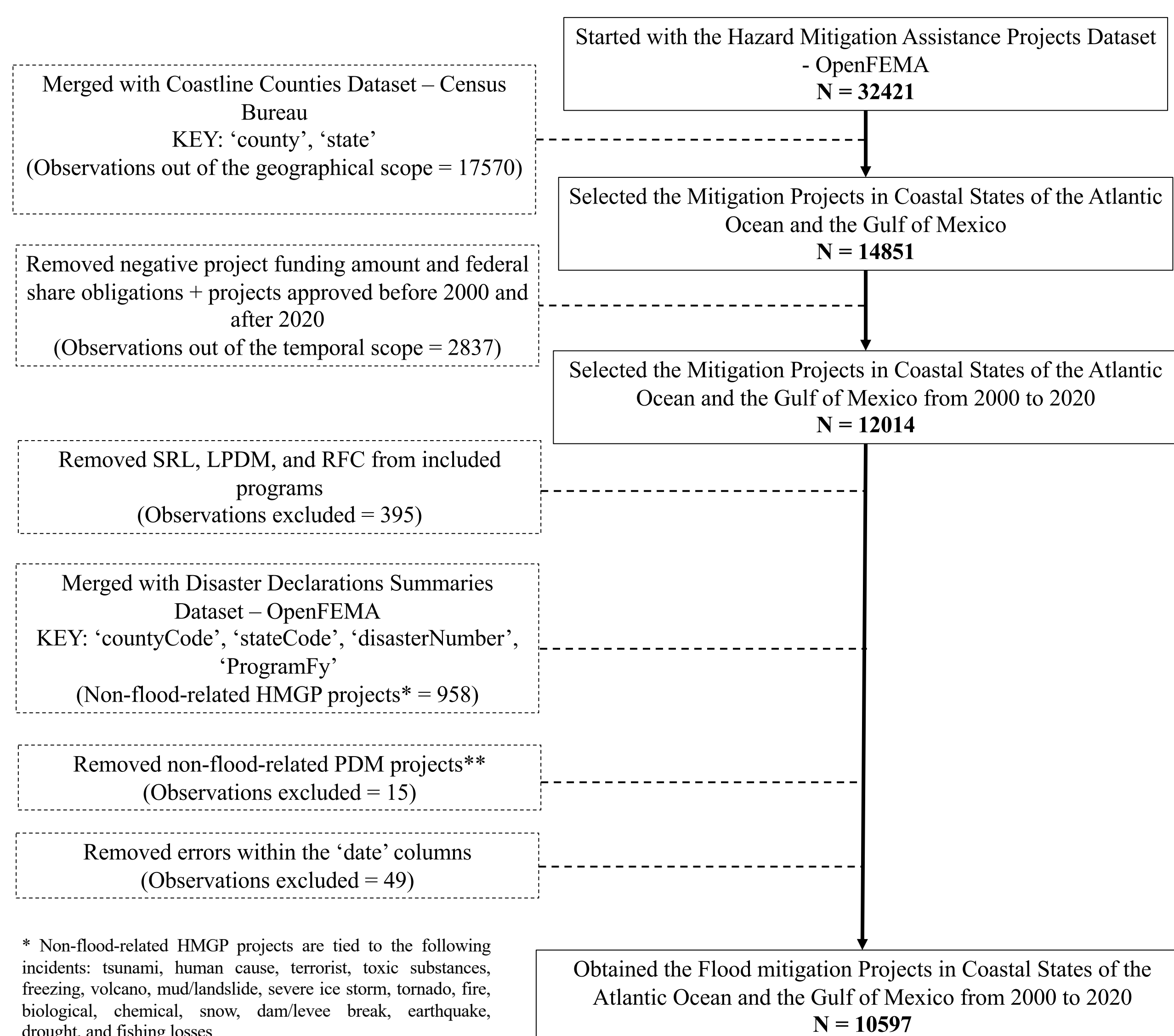


Spatial Reference Datum: NAD 1983 PCS: NAD 1986 Contiguous USA Albers Source: United States State Boundaries 2018 (2019) [Feature Layer], Esri Inc., Redlands, CA [May 11, 2023]

The geographic scope of the analysis is the counties of the Atlantic Ocean and the Gulf of Mexico's coastal states.

## Data Processing

This flow chart shows the steps we took to systematically clean the database.



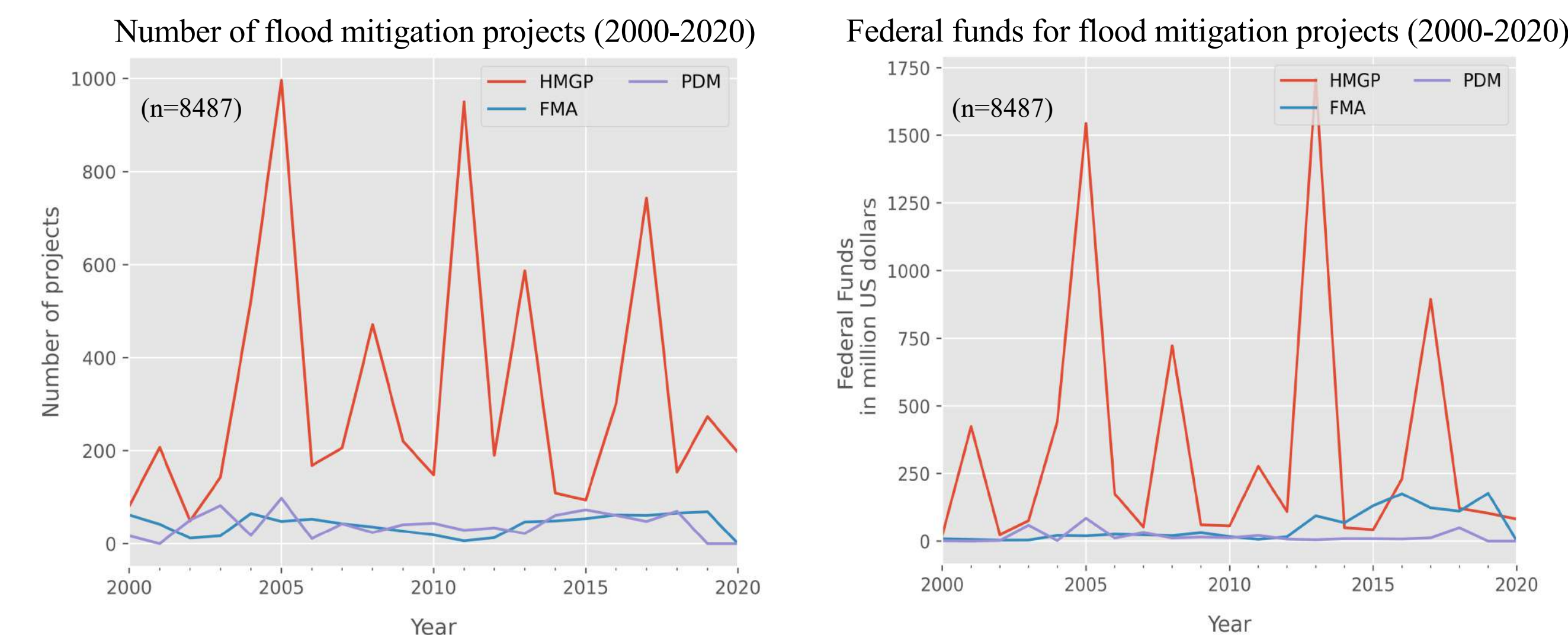
\* Non-flood-related HMGP projects are tied to the following incidents: tsunami, human cause, terrorist, toxic substances, freezing, volcano, mud/landslide, severe ice storm, tornado, fire, biological, chemical, snow, dam/levee break, earthquake, drought, and fishing losses

\*\* Non-flood-related PDM projects are acquisition of private real property due to landslides and structural retrofitting/rehabilitating public structures due to seismic

## Trends and Patterns in the Hazard Mitigation Assistance Programs

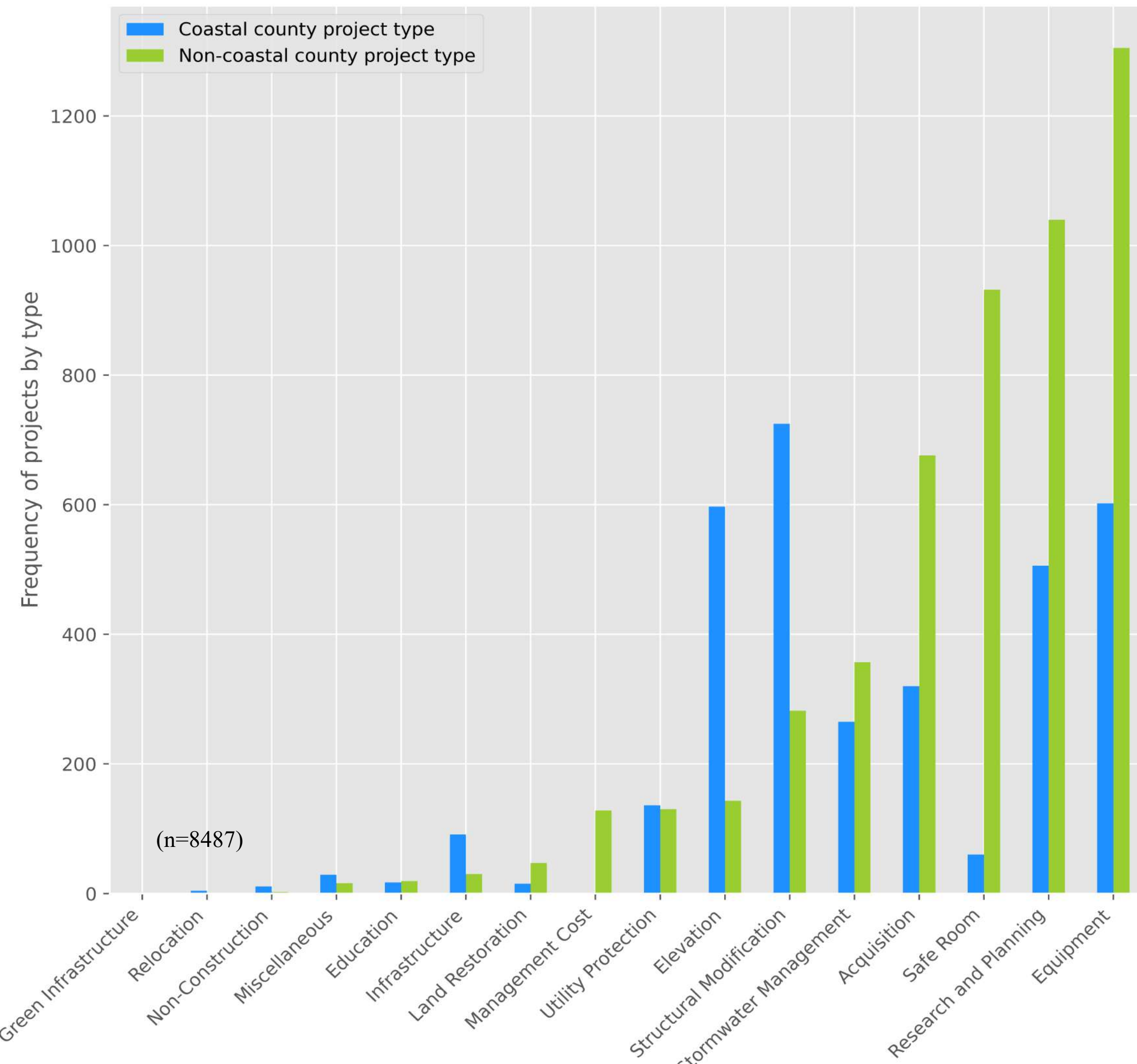
In the United States, a considerable proportion of flood mitigation programs are funded by FEMA through three Hazard Mitigation Assistance grant programs:

- The Pre-Disaster Mitigation (PDM) program (discontinued)
- The Flood Mitigation Assistance (FMA) program
- The Hazard Mitigation Grant Program (HMGP)<sup>4</sup>



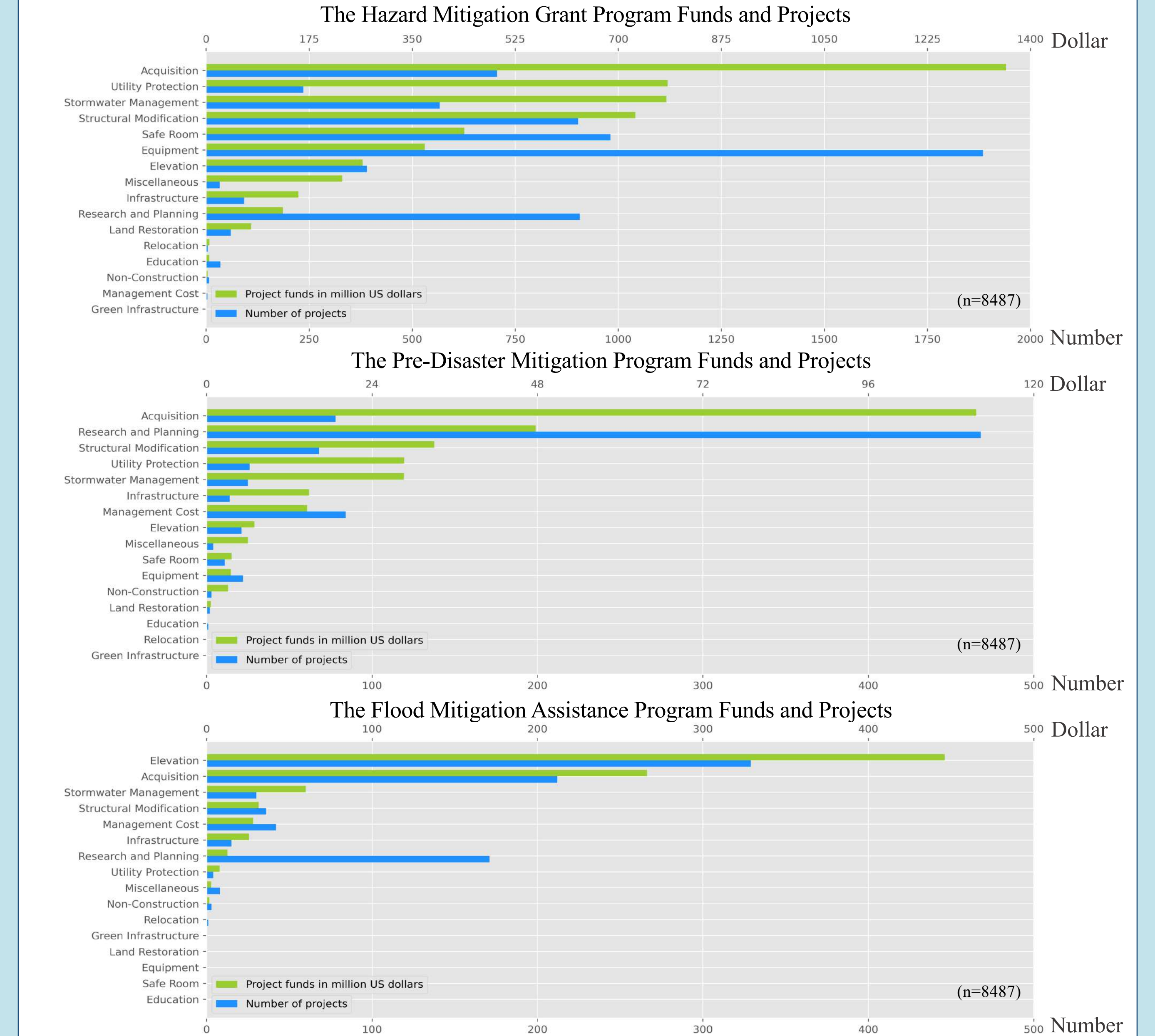
- The Pre-Disaster Mitigation and Flood Mitigation Assistance programs fund pre-disaster mitigation projects. In contrast, the Hazard Mitigation Grant Program's dollars are allocated to post-disaster rebuilding efforts while implementing mitigation activities to alleviate risks of future events.
- The Hazard Mitigation Grant Program accounts for 80% of flood mitigation projects and 82% of flood mitigation funds over two decades.
- The Hazard Mitigation Grant Program's funds increase significantly with a major disaster declaration (e.g., Hurricane Katrina in 2005 and Hurricane Sandy in 2012). Therefore, the number of projects and the amount of HMGP funding fluctuate through the years. For the other two programs, the project number and amount of funds are stable.
- This trend indicates the federal government's reactive and inconsistent approach to mitigating the risks of flood-related disasters.

## Comparing Projects between Coastal and Non-Coastal Counties



- 60% of flood mitigation projects (from all three programs) are awarded to non-coastal counties.
- The most frequently awarded flood mitigation project in coastal counties is flood mitigation structural modification (n = 725), and in non-coastal counties is equipment (n = 1305).

## Flood Mitigation Projects by Program



### The Hazard Mitigation Grant Program

- Most funding is allocated to property acquisition (\$1.4 billion), utility protection (\$784 million), and stormwater management (\$782 million).
- Equipment, utility protection, structural modification, and safe room account for 59% of flood mitigation projects.

### The Pre-Disaster Mitigation Program

- Property acquisition has the largest share of the PDM grants (\$112 million). But compared to the other two programs, the total federal funds allocated to property acquisition projects by PDM is considerably lower.
- About half of awarded flood mitigation projects are related to research and planning activities.

### The Flood Mitigation Assistance Program

- Most funding is allocated to elevation (\$446 million), and property acquisition (\$266 million).
- The most frequently funded flood mitigation projects are elevation (n = 329), acquisition (n = 212), and research and planning (n = 171).

## Conclusion

- The Hazard Mitigation Grant Program (HMGP) has about five times more funding and four times more projects compared to the Flood Mitigation Assistance and the Pre-Disaster Mitigation programs combined.
- On average, HMGP is allocating \$254 million each year to flood mitigation projects **after disasters rather than before**.
- We see significant fluctuations in both the amount and the number of projects funded by HMGP over the years.
- The inconsistent and reactive approach to hazard mitigation limits the ability of local communities to use these mitigation resources effectively and lessens the benefits of federal hazard mitigation assistance.
- Mitigation funds can be utilized more effectively and equitably if local governments are properly informed about them and are better equipped to use mitigation funds before the disasters.



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References and acknowledgments