

# World Bank Panel: The Role of Governments and Donors in Catastrophe Risk Modeling



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# Agenda

- ❑ Catastrophe Modeling Overview
- ❑ Current Examples of Public-Private Risk Management
- ❑ Opportunities for Governments and Donors



# What Do Catastrophe Models Do?



- ❑ Models and associated software offer convenient integration of
  - **Science:** Meteorology, seismology, structural and civil engineering
  - **Data:** Physical landscape and exposures at risk
  - **Statistics:** Rules for transforming raw losses into “perspectives” of the consumer, insurer, reinsurer
  - **Functionality:** Throughput of data and results, entry of assumptions, reporting capabilities
  
- ❑ Models simulate thousands of seasons and events to provide
  - **Full Range** of scientifically tenable events
  - **Credibility** of large sample sizes not found in the raw historical record
  - **Sensitivity Testing** framework for impacting results by varying assumptions and exposure data

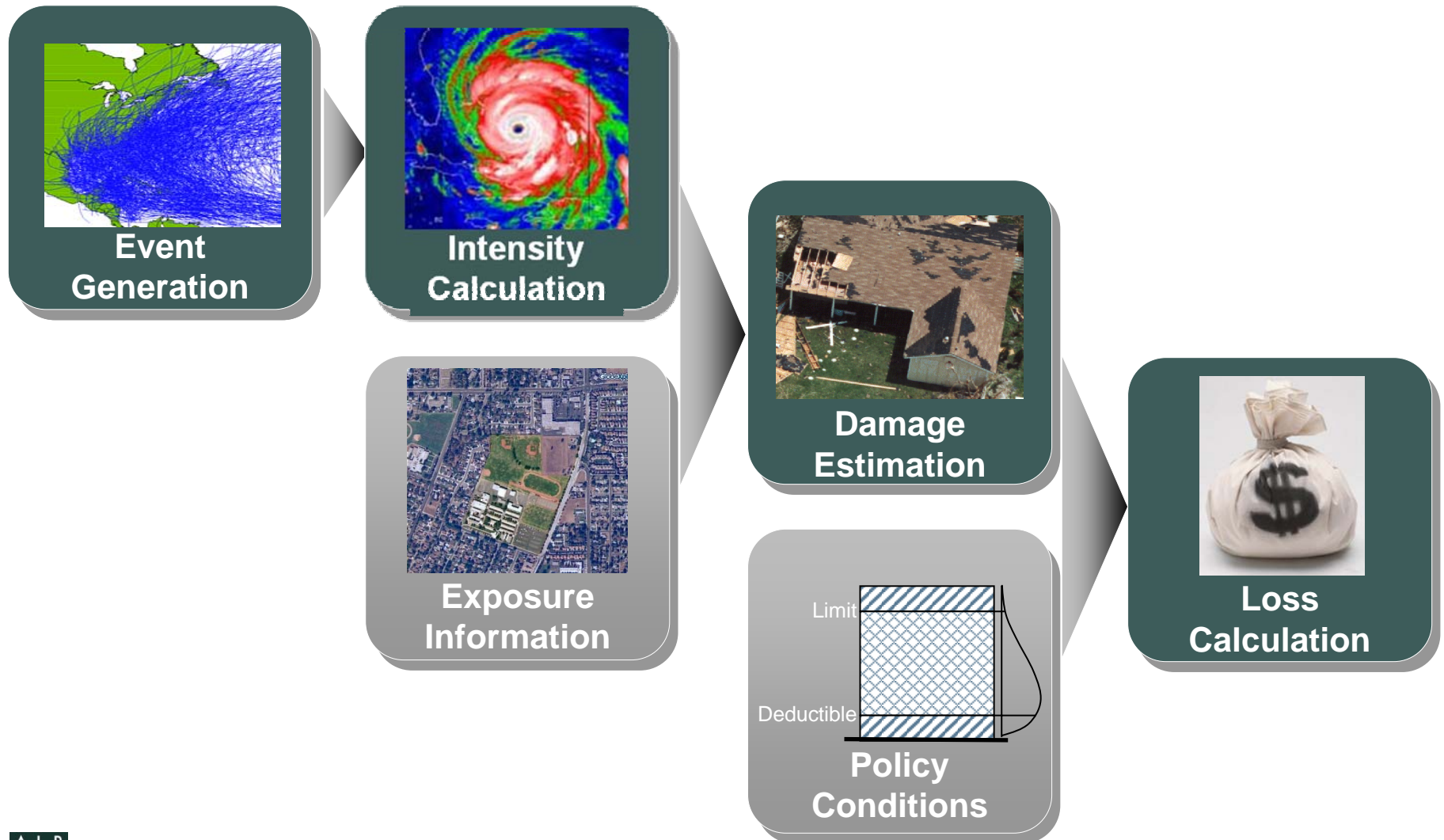


# What Questions are Catastrophe Models Designed to Answer?

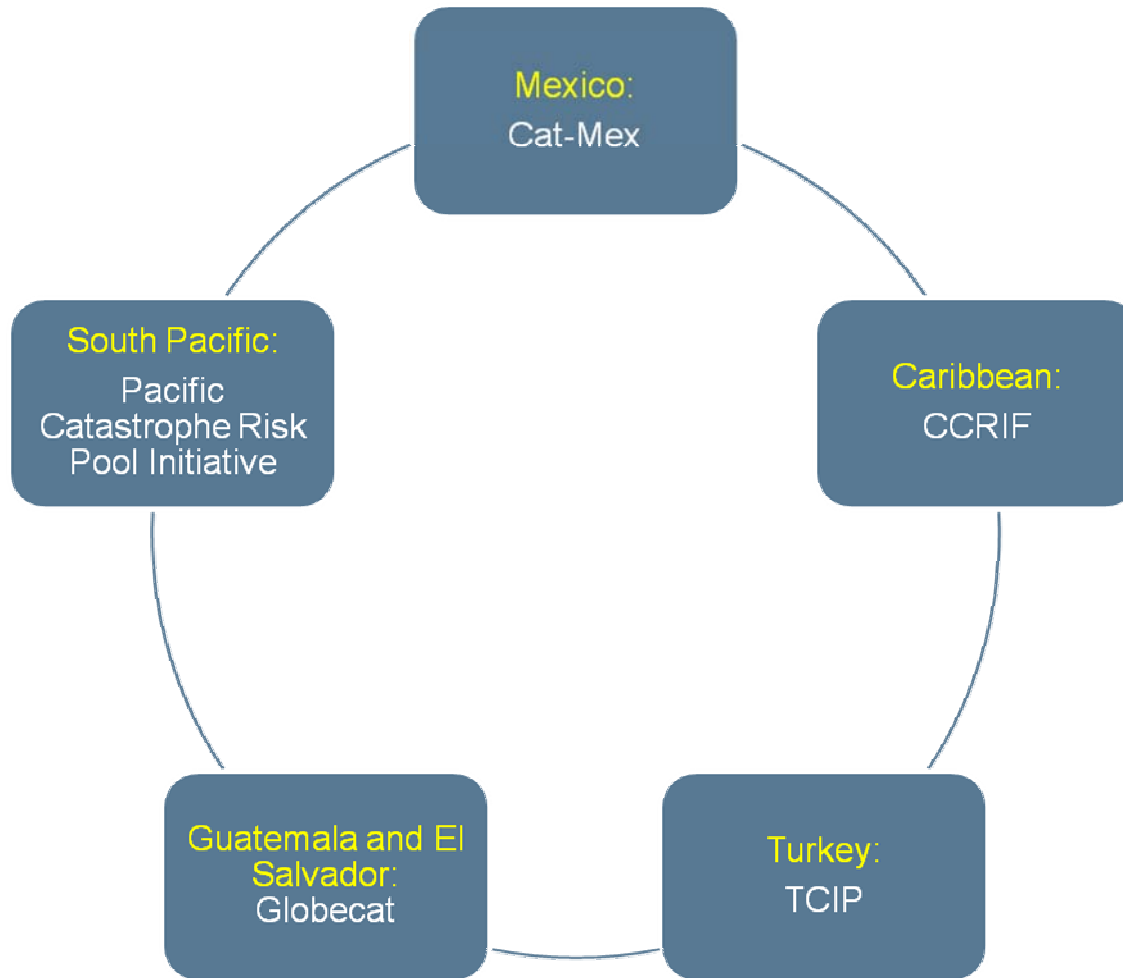
- ❑ Where are future events likely to occur?
- ❑ How big are they likely to be? How frequently are they likely to occur?
- ❑ For each potential event, what will be the property damage and insured losses? What will be the number of people injured?



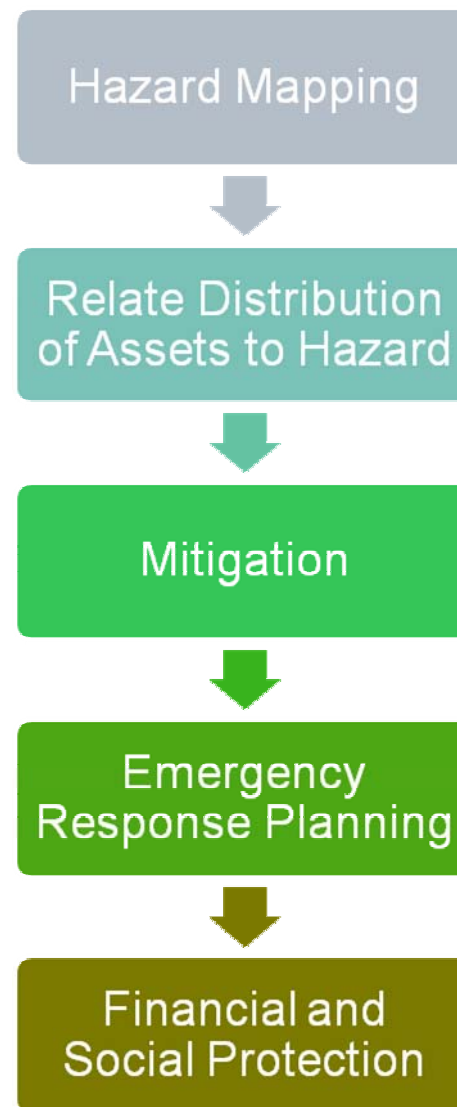
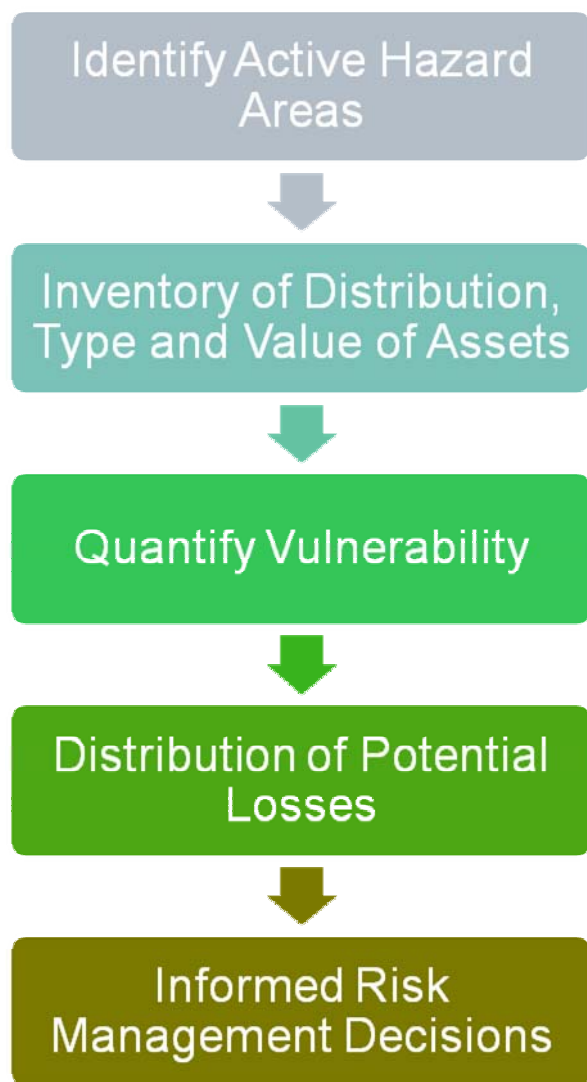
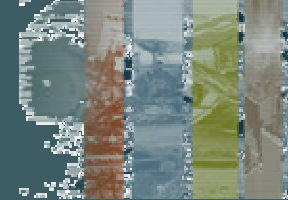
# How Do Cat Models Work?



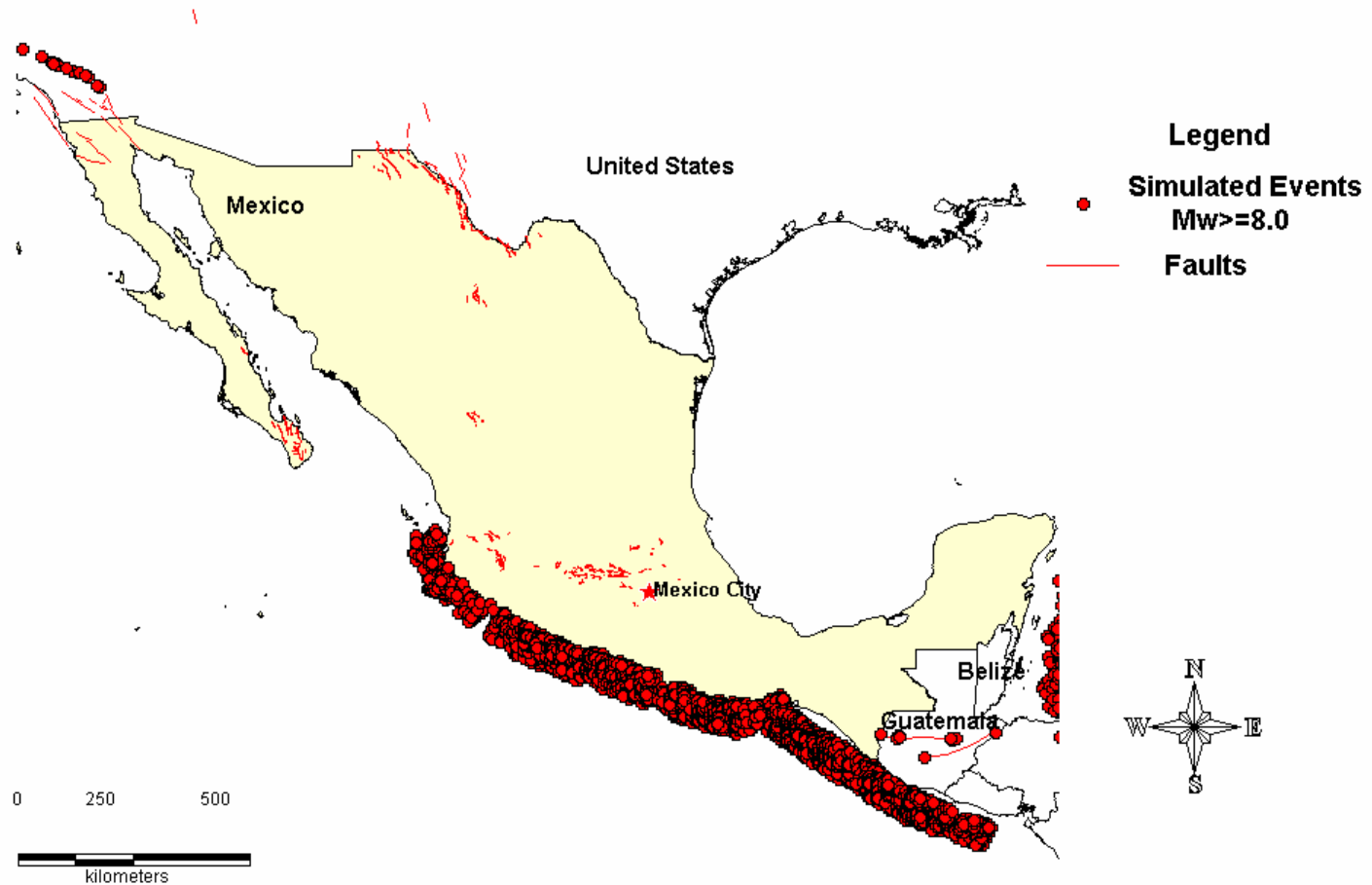
# Public Sector Catastrophe Risk Management Programs



# Cat Models and Potential Applications for Governments and Donors



# Example: Earthquake Hazard Mapping



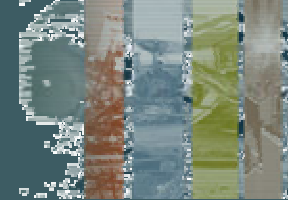
# Example: Earthquake Hazard Mapping (Continued)



- ❑ Map areas of strongest seismicity
- ❑ Potential applications of the data:
  - Identify distribution of population and assets in high risk areas
  - Building code design and enforcement
  - Allocation of emergency response services
  - Assess financial protection strategies



# Opportunities for Governments and Donors



## ❑ Public sector asset databases

- Data sets on public sector assets are not frequently updated and in some cases not compiled.
- Updated public sector exposure databases will enhance the precision of modeled output.

## ❑ Building code

- Enforcement and strengthening serve to reduce vulnerability.
- Models typically assume a high degree of compliance with building codes.

## ❑ Emergency planning and response

- Governments and donors can compare probabilistically model scenarios (e.g. a 1 in 100 year event) to incorporate additional perspectives into emergency planning.
- Real-time post event impact estimates (affected people, financial loss, etc.)

## ❑ Financial protection

- Governments and donors can continue to leverage catastrophe models to acquire financial protection against catastrophic losses.

## ❑ Model development

- Provide financial support for model creation in developing regions where private sector demand for cat models is low.

