

# **MODELING POTENTIAL FUTURE RISK**

TO ENVISION PATHS TOWARDS FUTURE RESILIENCE

**David Lallemand | Understanding Risk Forum 2014**

# What Shakespeare says about Disasters

"This is the excellent foppery of the world, that when we are sick in fortune, often the surfeit of our own behaviour, we make guilty of our disasters the sun, the moon and the stars [...]. An admirable evasion of whoremaster man, to lay his goatish disposition on the charge of a star." King Lear, Act1, Scene 2.

# Modeling Potential Future Risk to Envision Paths Towards Future Resilience

or

(Avoiding Goatish Behavior by Taking Control of our  
Risk Trajectory)

- Understanding Changing Risksapes
- Modeling Changing Risksapes
- Controlling Changing Risksapes

# Changing Riskscapes

- Dynamic processes of urbanization are dramatically changing the global landscape of risk.
- The equivalent of all the urban infrastructure and housing built in the past 6000 years will be rebuilt... in the next 20 years! (Goethert 2013)
- Hypothesis: Urban risk is increasing more rapidly still than urban population.
- Risk sensitive urban planning and policy offers a unique opportunity to control current trends in urban risk, BUT, only if leaders are informed of their likely risk trajectories and the methods to control them.

# Understanding Changing Riskscapes

- How are dynamic processes of urbanization changing the risk profile of cities?
- Focusing on two *dynamic process*:

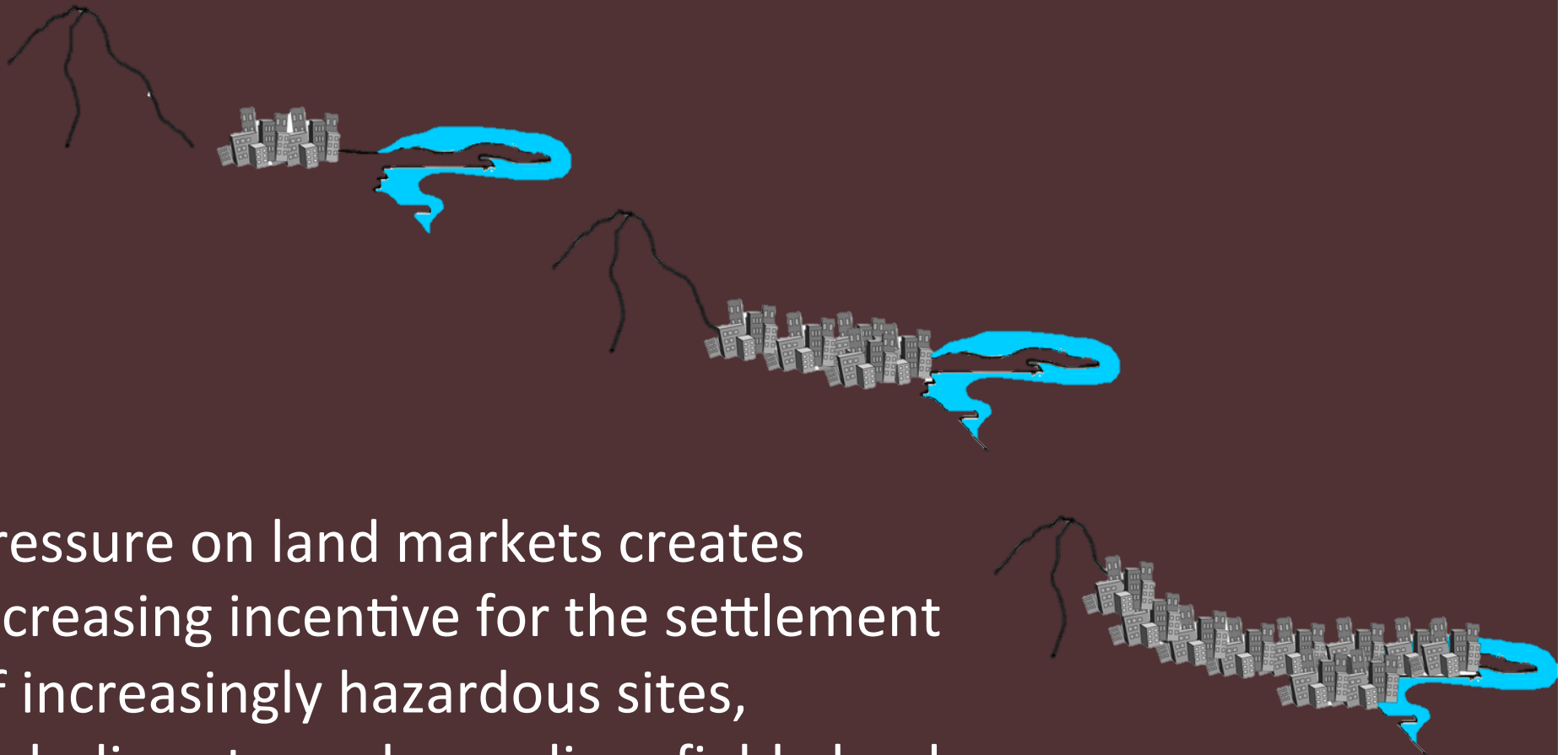


Changing Exposure

Changing Vulnerability

- Earthquake risk as case study (changing riskscapes not driven by changing hazard)

# Understanding Changing Riskscapes

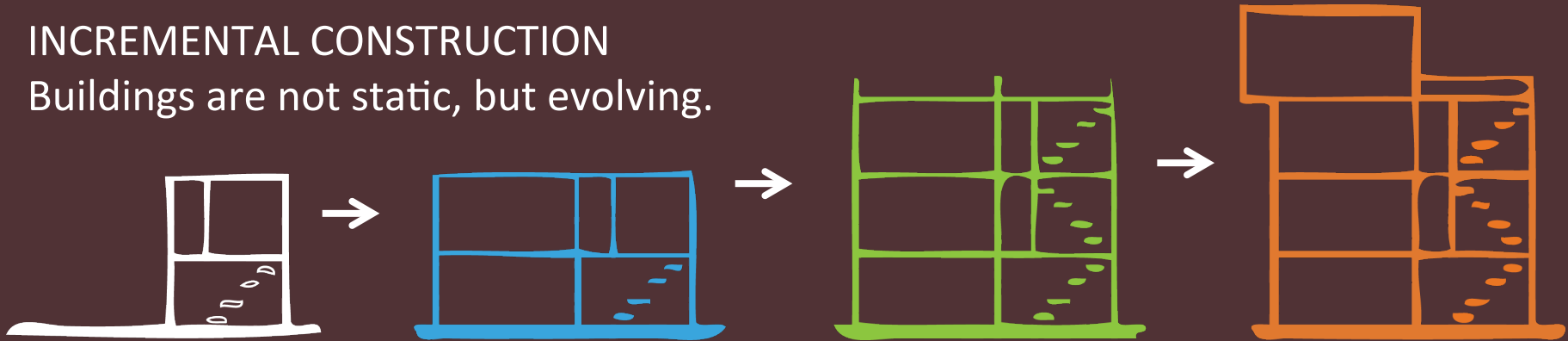


Pressure on land markets creates increasing incentive for the settlement of increasingly hazardous sites, including steep slopes, liquefiable land (reclaimed), flood zones, etc

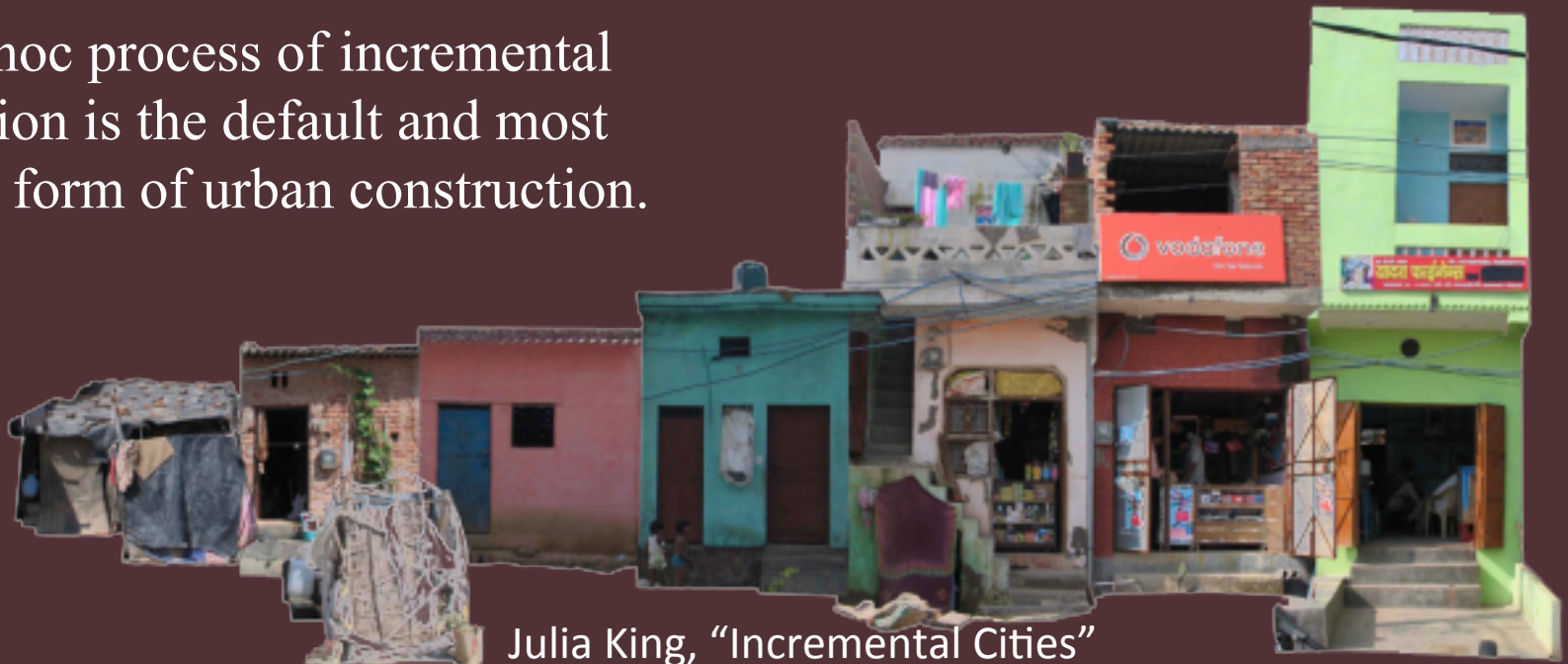
# Understanding Changing Riskscapes

## INCREMENTAL CONSTRUCTION

Buildings are not static, but evolving.



The add-hoc process of incremental construction is the default and most prevalent form of urban construction.

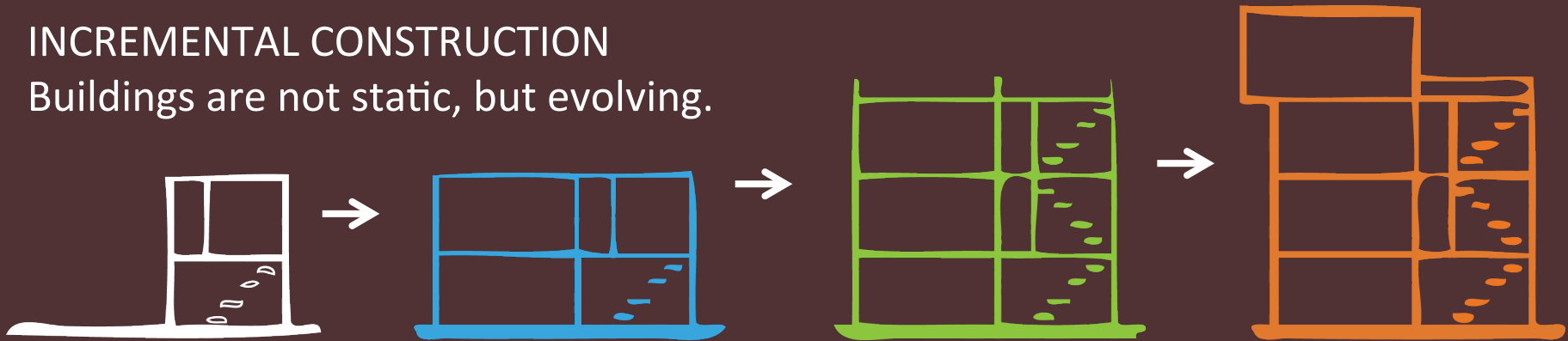


Julia King, "Incremental Cities"

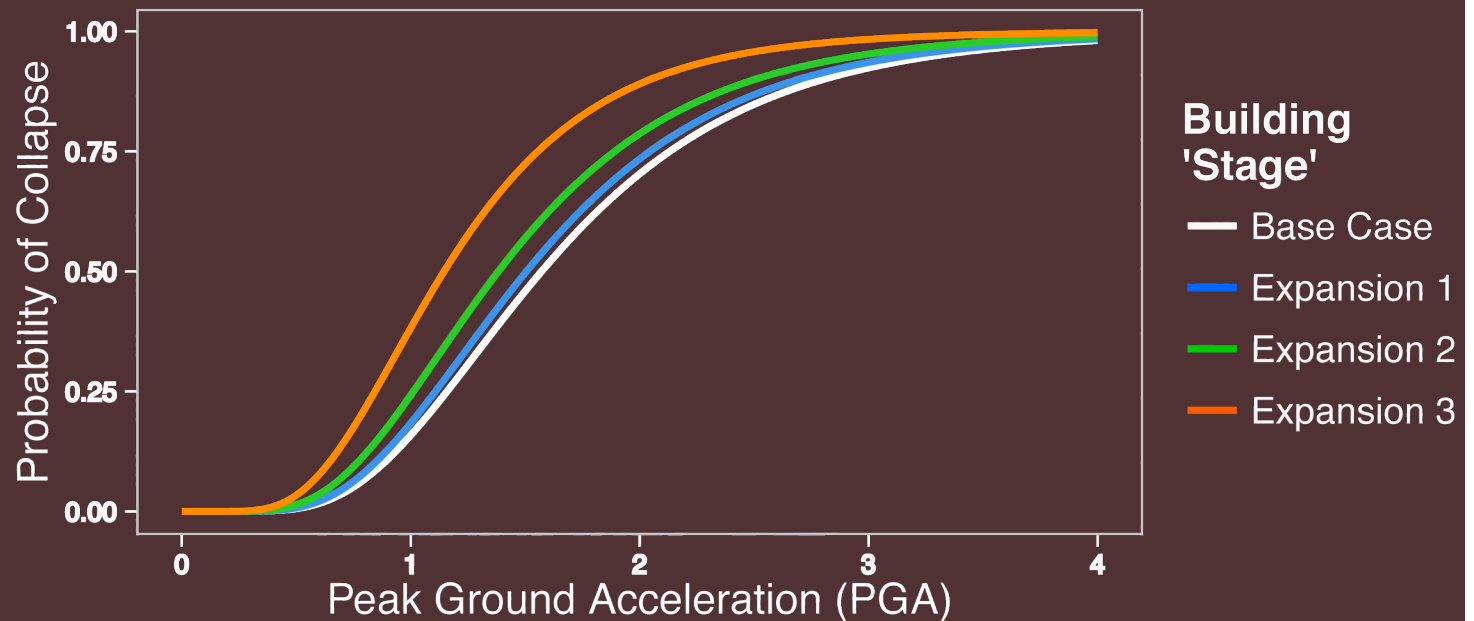
# Understanding Changing Riskscapes

## INCREMENTAL CONSTRUCTION

Buildings are not static, but evolving.



What does this mean for building vulnerability?





# Understanding Changing Risksapes



April 24<sup>th</sup>, 2013

Source: Munir Uz Zaman Agence France-Presse

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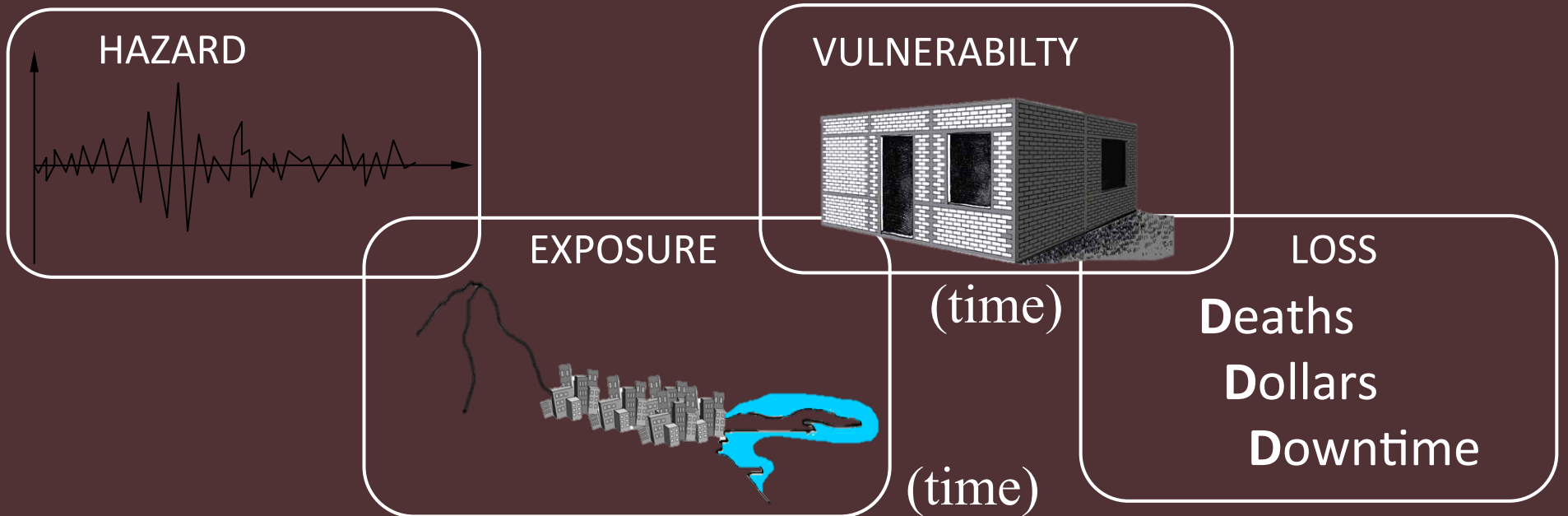
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April 24<sup>th</sup>, 2013

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# Modeling Changing Risksapes



# Modeling Changing Risksapes Kathmandu Case Study



Photo by Anne Sanquini

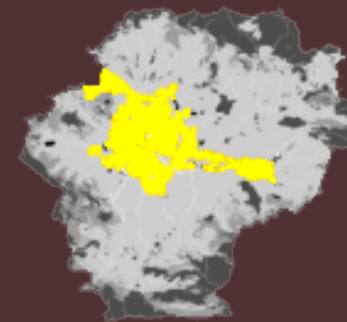
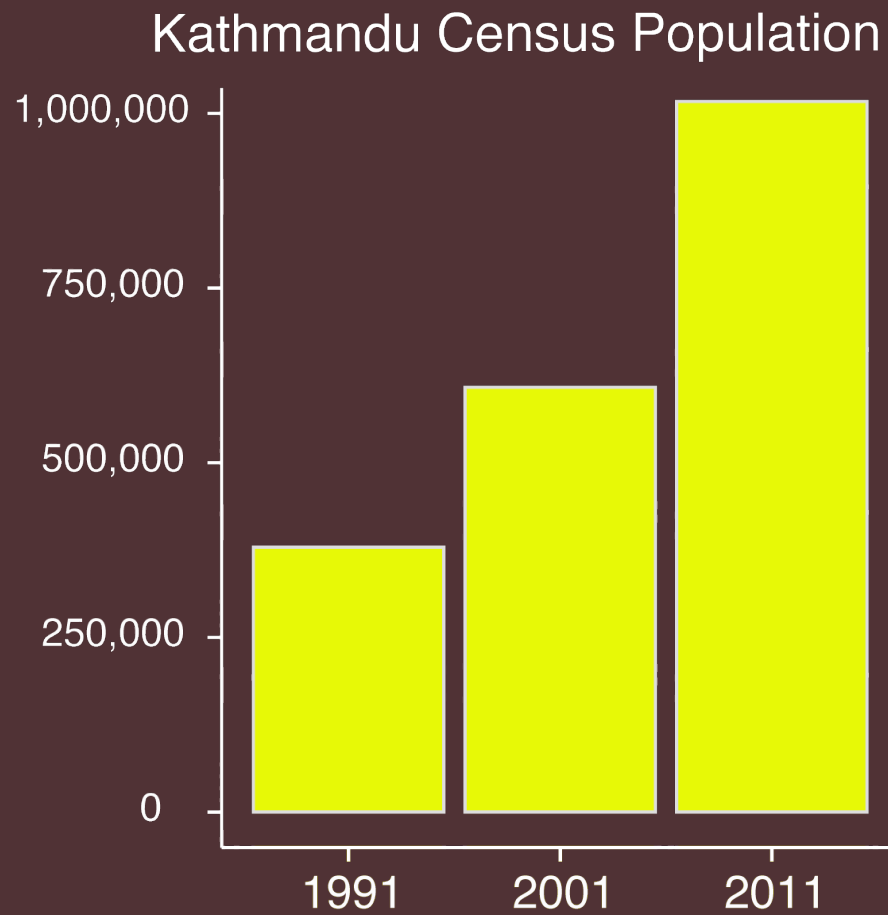
# Modeling Changing Risksapes

Incrementally increasing vulnerability?



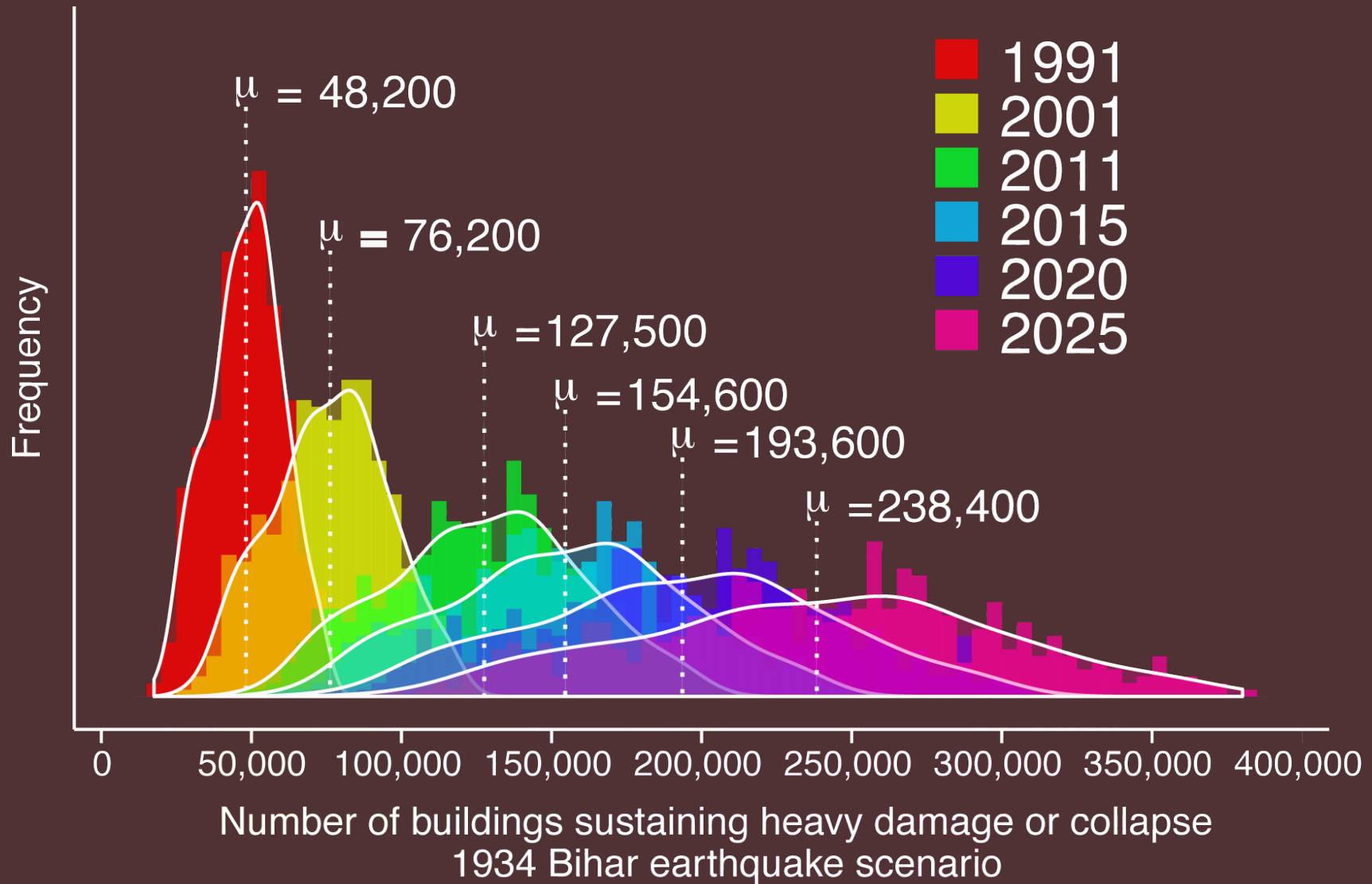
Photo by Anne Sanquini

# Modeling Changing Risksapes

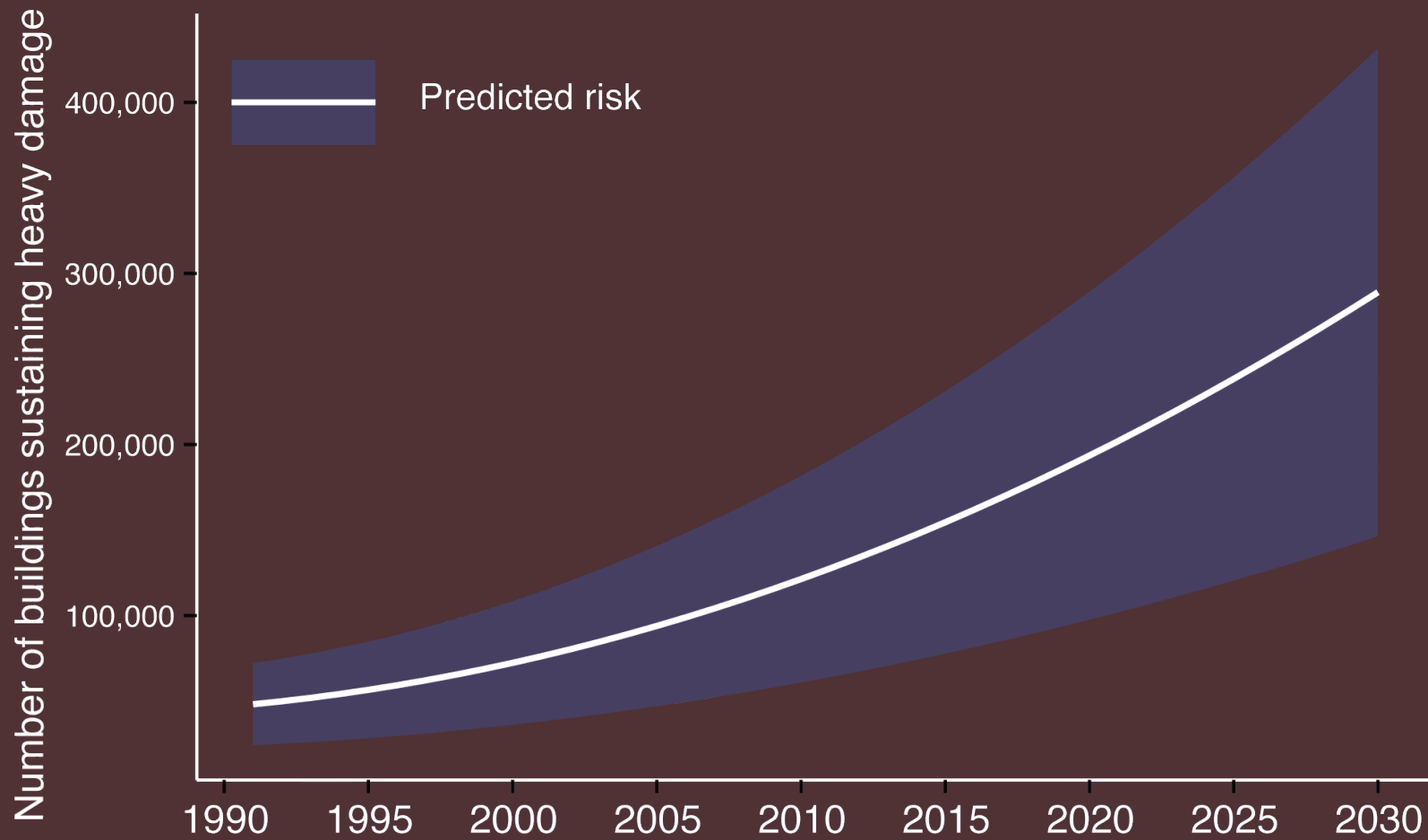




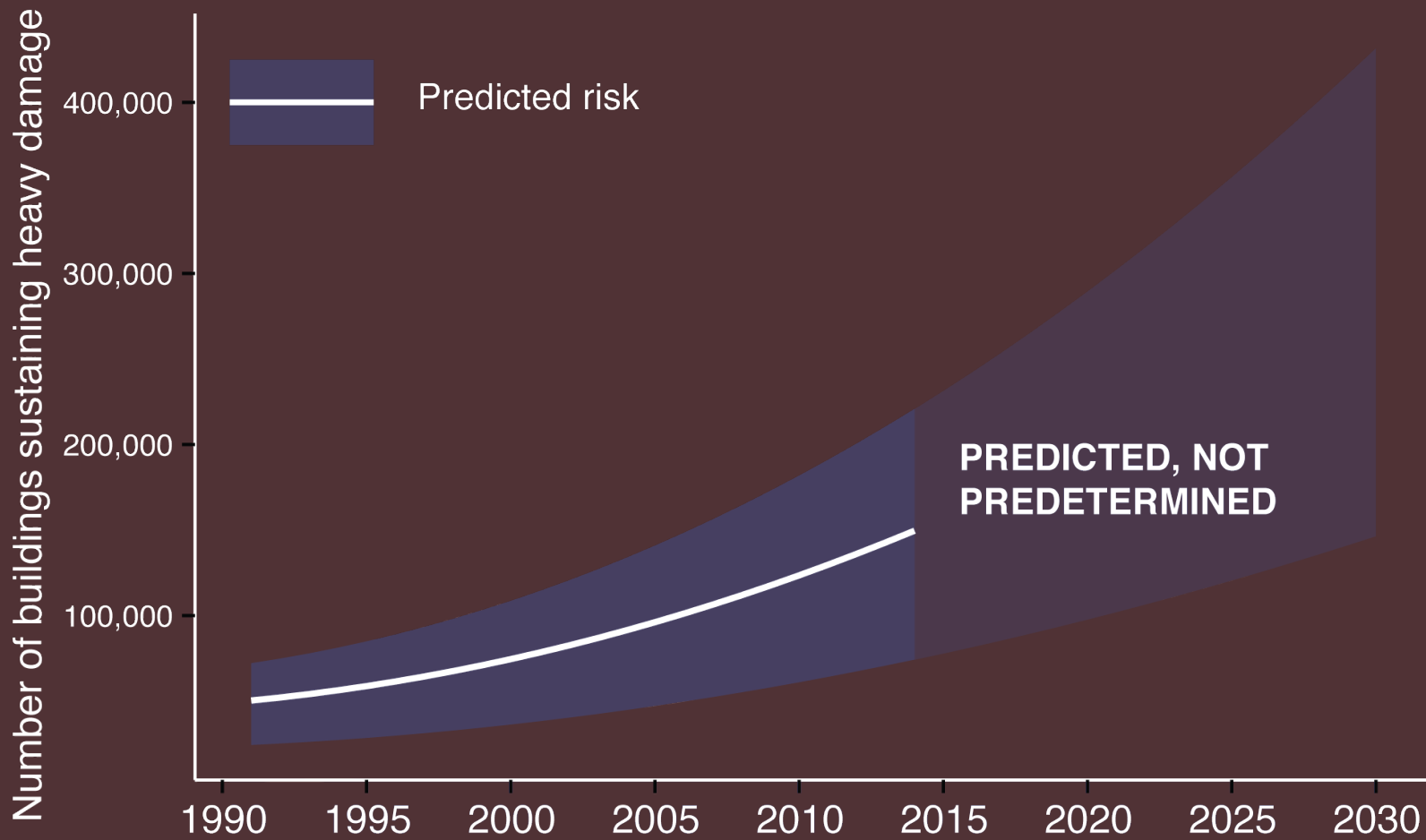
# Modeling Changing Risksapes



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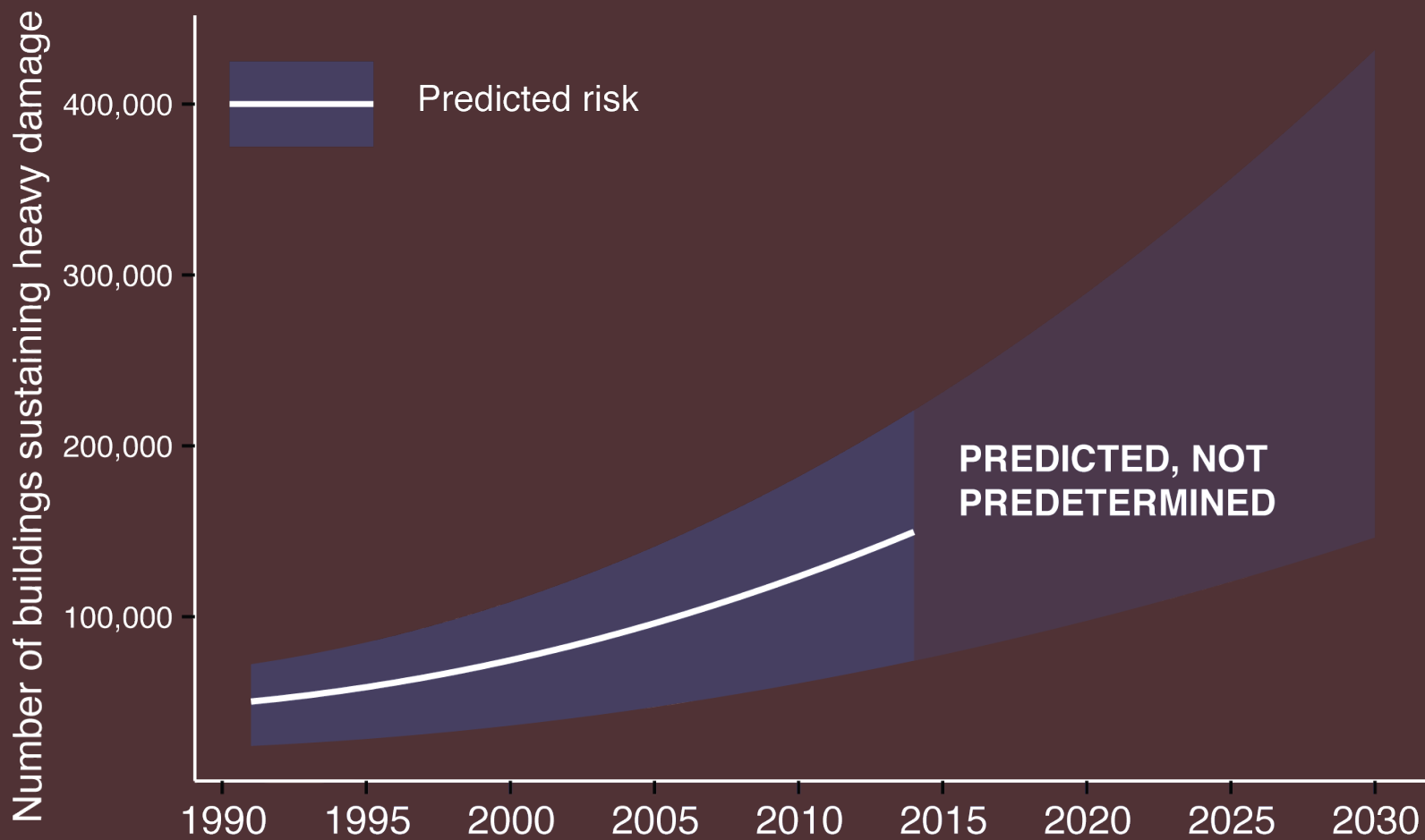


# Controlling Changing Risksapes



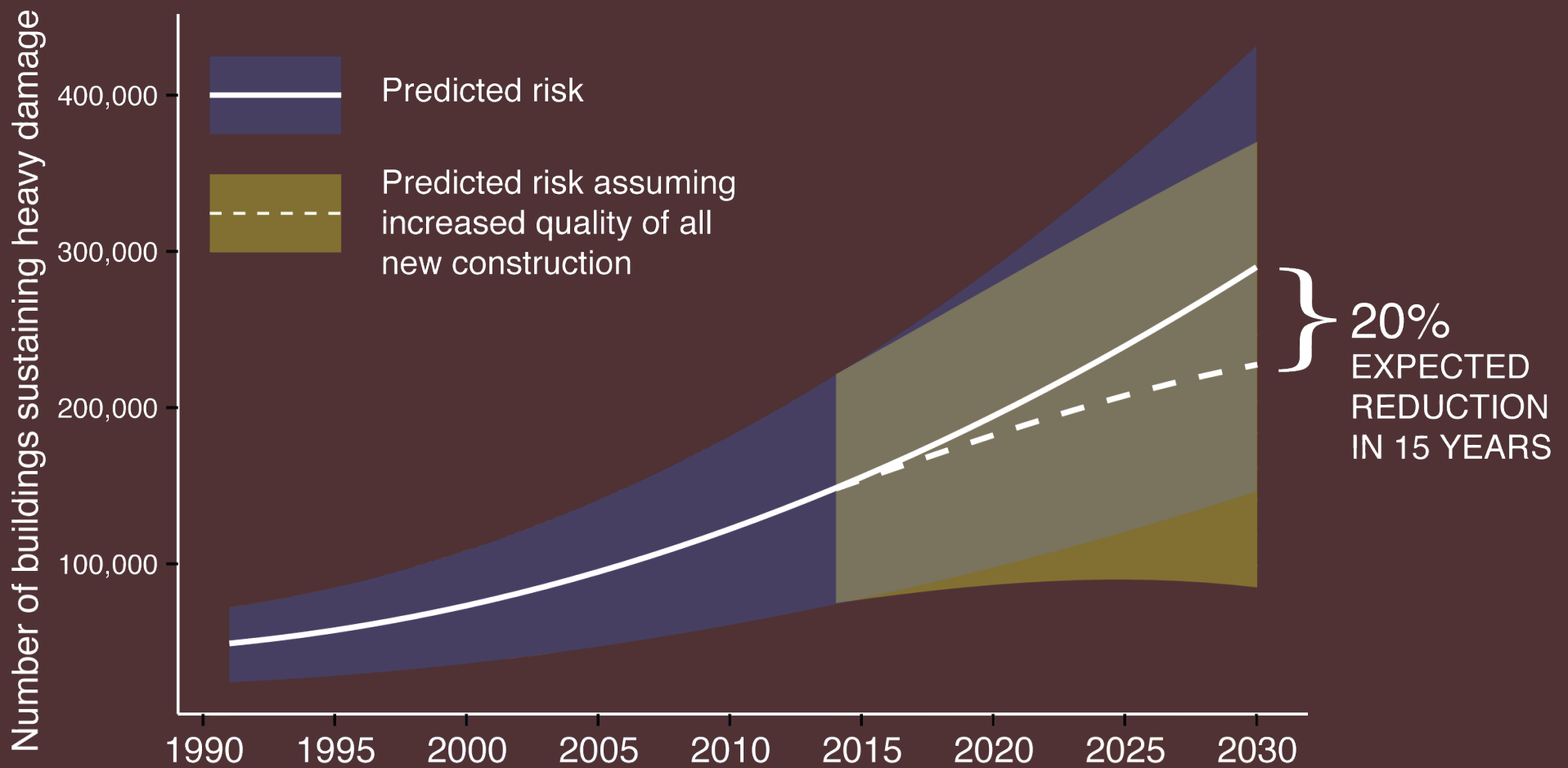
# Controlling Changing Risksapes

What if all new construction is better designed for earthquakes?



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# Controlling Changing Risksapes

## Key Messages:

- The risk of growing cities is changing dramatically, and mostly for the worse.
- Focus on low-hanging fruit: the risk not yet created.
- Measure the future impact of today's decisions.