Swiss Re

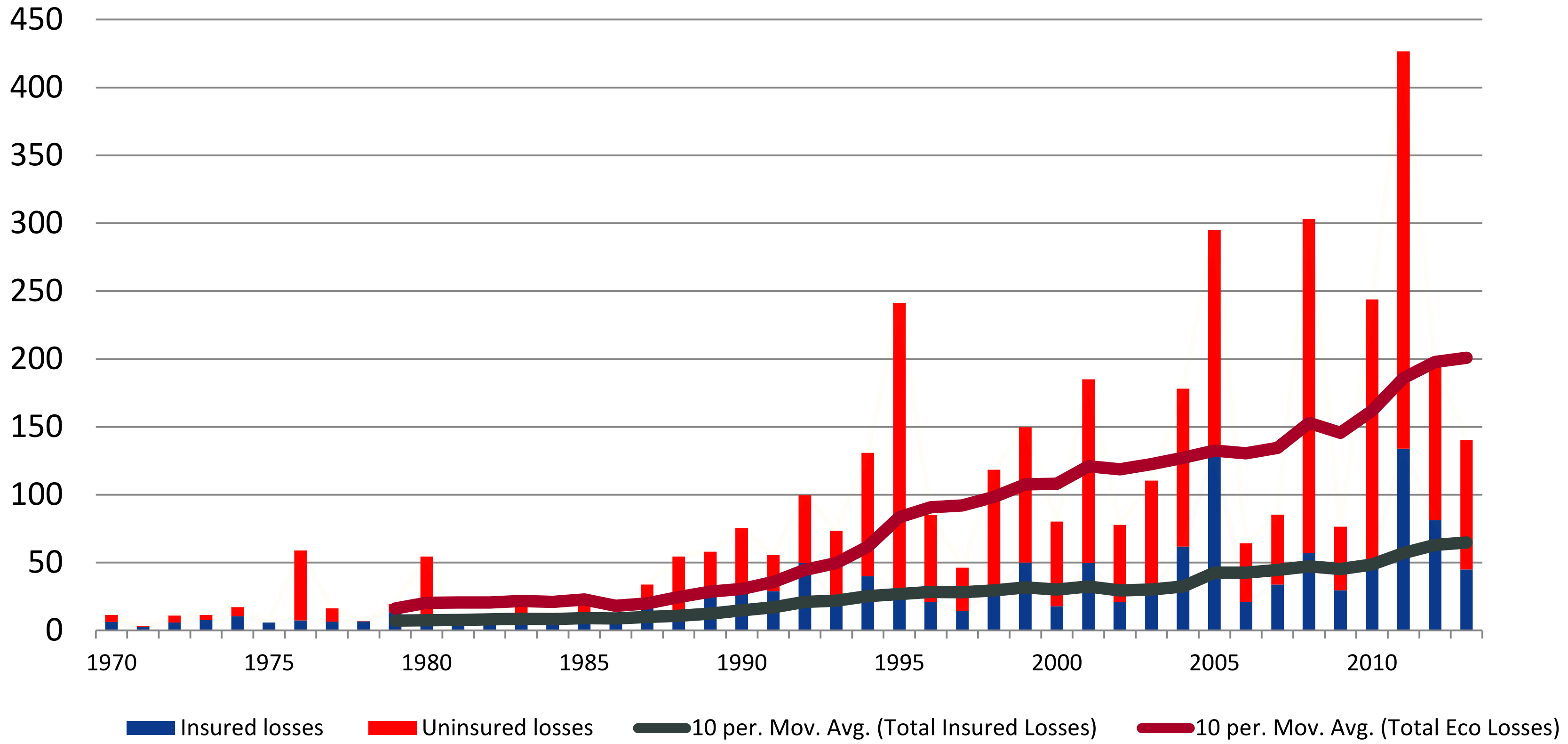
Climate Change and resilience building: a reinsurer's perspective

Southeast Florida Regional Climate Leadership Summit

SWISS RE 150 YEARS

The cost of disasters is widening along with the gap between uninsured and insured losses

Global natural catastrophe losses, 1970-2013 (in USD bn)



Source: Swiss Re *sigma* 1/2014

Climate change is not the main driver for rising natural catastrophe losses in recent decades

Ocean Drive, FL, 1926

Ocean Drive, FL, 2013

Drivers

Growth of wealth

Concentration of values in exposed areas (e.g. coasts)

Increasing vulnerability

Climate change as a potential new driver in future (storms, floods, droughts)

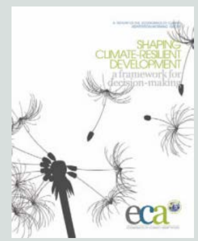
Swiss Re's climate change strategy

Coping with climate change requires both mitigation and adaptation measures

Swiss Re assesses and manages the risk

- Advance (our) knowledge about climate change risk
- Quantify climate change risk
- Integrate climate change risk into underwriting and risk management framework

Swiss Re seizes business opportunities

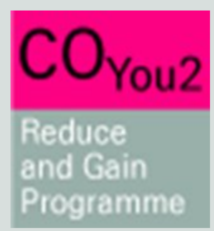


- Develop appropriate solutions for adapting to and mitigating climate change
- Traditional catastrophe insurance
- Weather risk solutions

Swiss Re influences the business environment

- Raise awareness, actively disseminate knowledge to all stakeholders and advocate a long-term, marked-based policy framework, through
- Publications, platforms (e.g. World Economic Forum), Centre for Global Dialogue, speaking engagements

Swiss Re leads by example



- Greenhouse neutral since October 2003
- Reduced emissions per employee by 54.4% by 2013
- CO_{You2} Programme since 2006

Climate-resilient development needs to **assess** and **address** total climate risk

Objectives

- Provide decision makers with the **facts and methods** necessary to design and execute a climate adaptation strategy
- Supply insurers, financial institutions, and potential funders with the **information** required to unlock risk prevention funding and deepen global risk transfer markets

Methodology

1) Follow a rigorous risk management approach to **assess local total climate risk**, the sum of
    - today's climate risk,
    - the economic development paths that might put greater population and value at risk
    - the additional risks presented by climate change
2) Propose and prioritize a basket of adaptation measures to **address** total climate risk on an economic basis

The working group studied 18 regions with diverse climate hazards

Economics of Climate Adaptation (ECA) Working Group, a partnership between the Global Environment Facility, McKinsey & Company, Swiss Re, the Rockefeller Foundation, ClimateWorks Foundation, the European Commission, and Standard Chartered Bank.

South Florida Case Study:
Focus on Risk from Hurricanes

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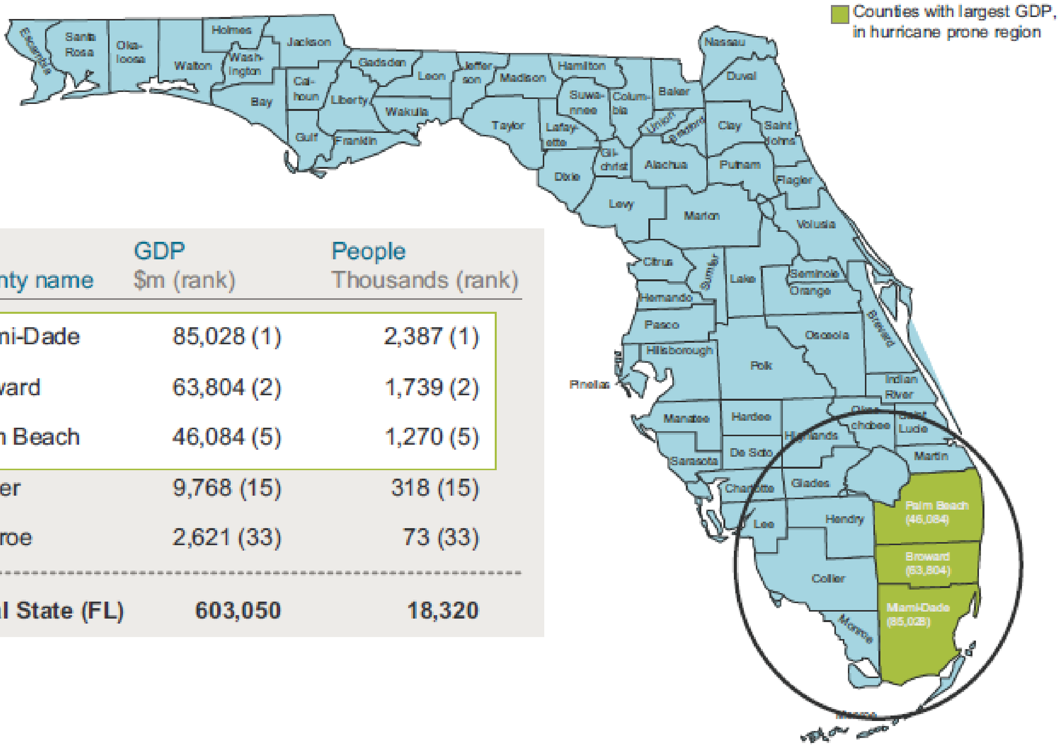
The case study area is home to some of the most populated and economically successful counties in the State



County name	GDP $m (rank)	People Thousands (rank)
Miami-Dade	85,028 (1)	2,387 (1)
Broward	63,804 (2)	1,739 (2)
Palm Beach	46,084 (5)	1,270 (5)
Collier	9,768 (15)	318 (15)
Monroe	2,621 (33)	73 (33)
Total State (FL)	**603,050**	**18,320**

Result: Expected losses by scenarios and by hazard

Example Florida

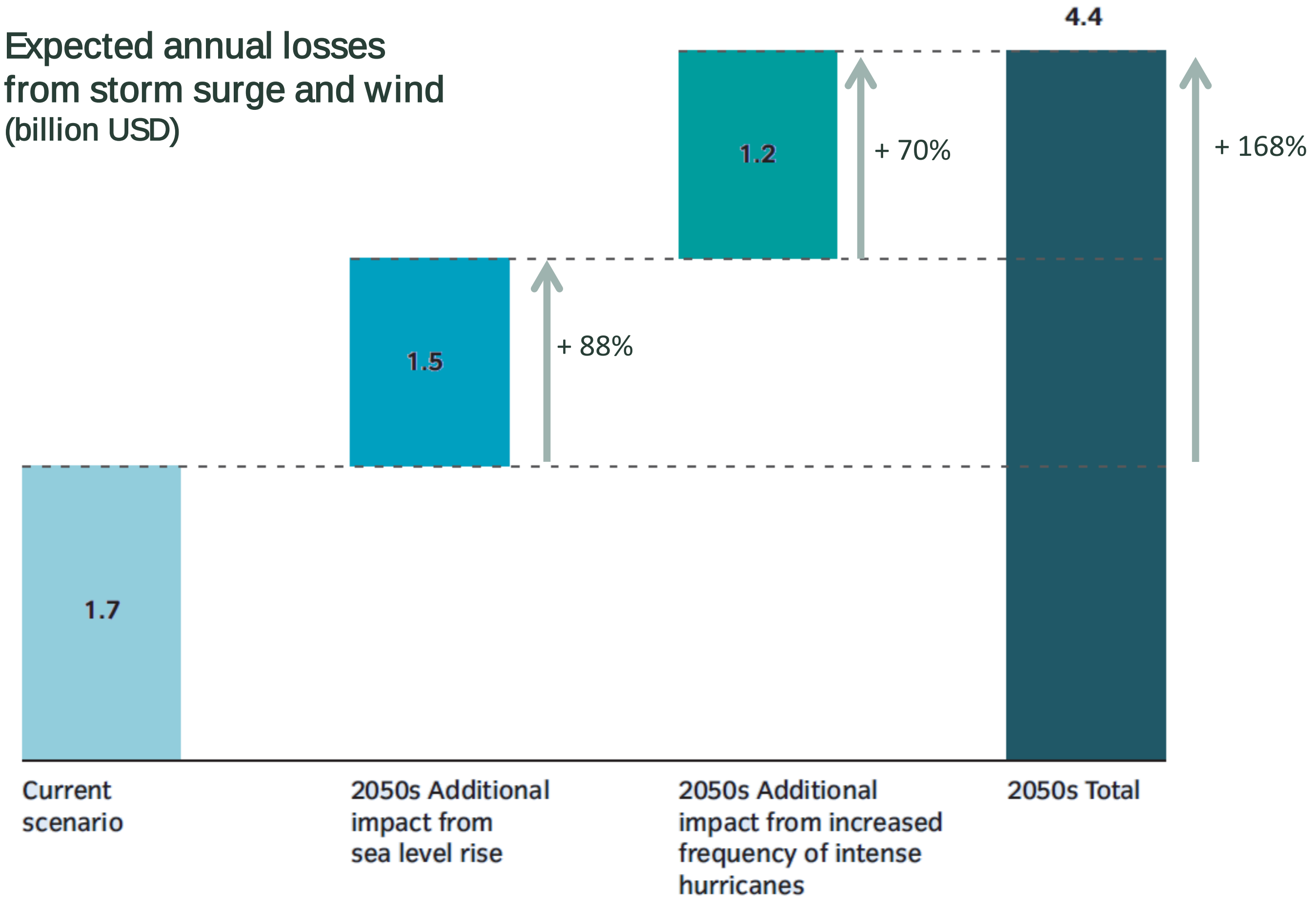
Annual expected loss in 2008 and 2030
$ Billions, 2008 dollars

	2008 Today's Climate	2030 Today's Climate	2030 Moderate change	2030 High change
Total	17	26	30	33
Rain	1	1	2	2
Storm surge				
Wind				
Percent of 3 Counties[1] GDP	8.5	8.4	9.4	10.1

1 2008 Moody's

SOURCE: Swiss Re; team analysis

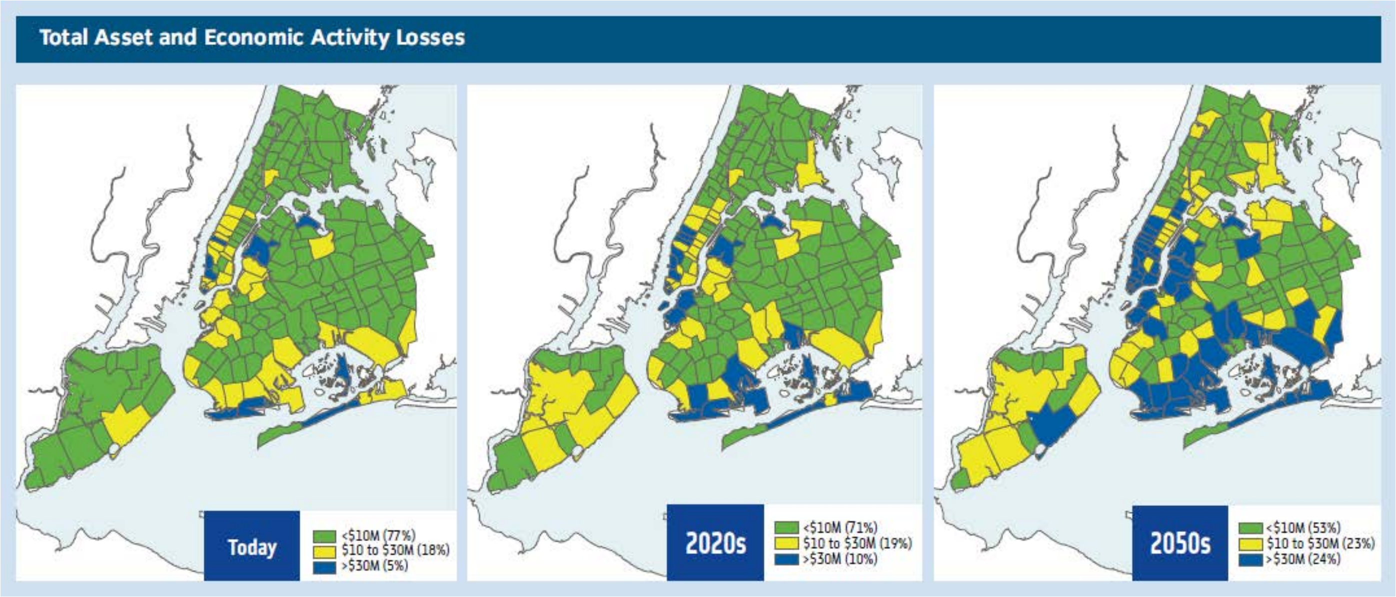
Sea level rise and altered hurricane frequencies significantly increase losses in New York City



Source: www.nyc.gov: A Stronger More Resilient New York

Results

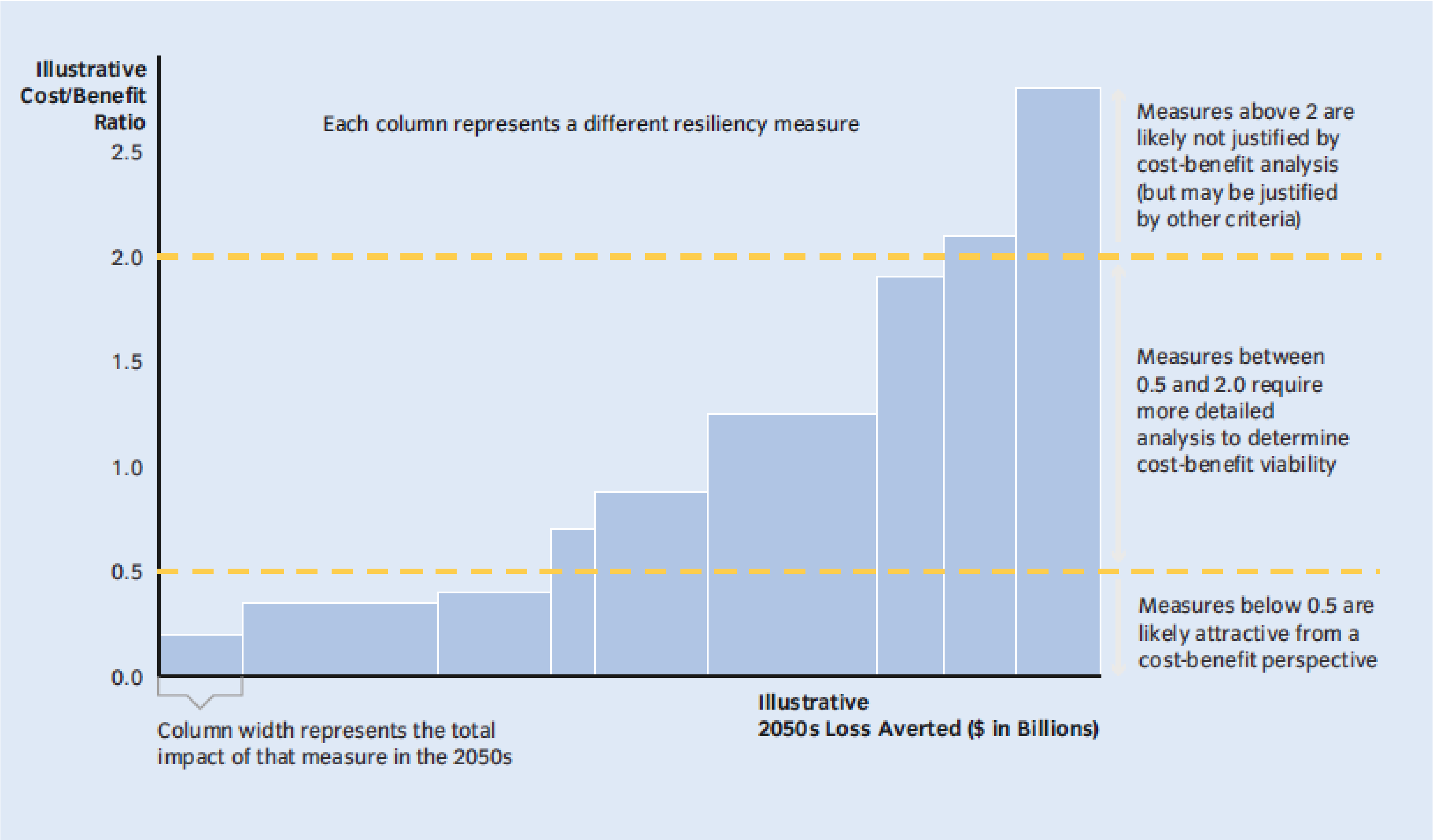
Annual Expected Loss by ZIP code



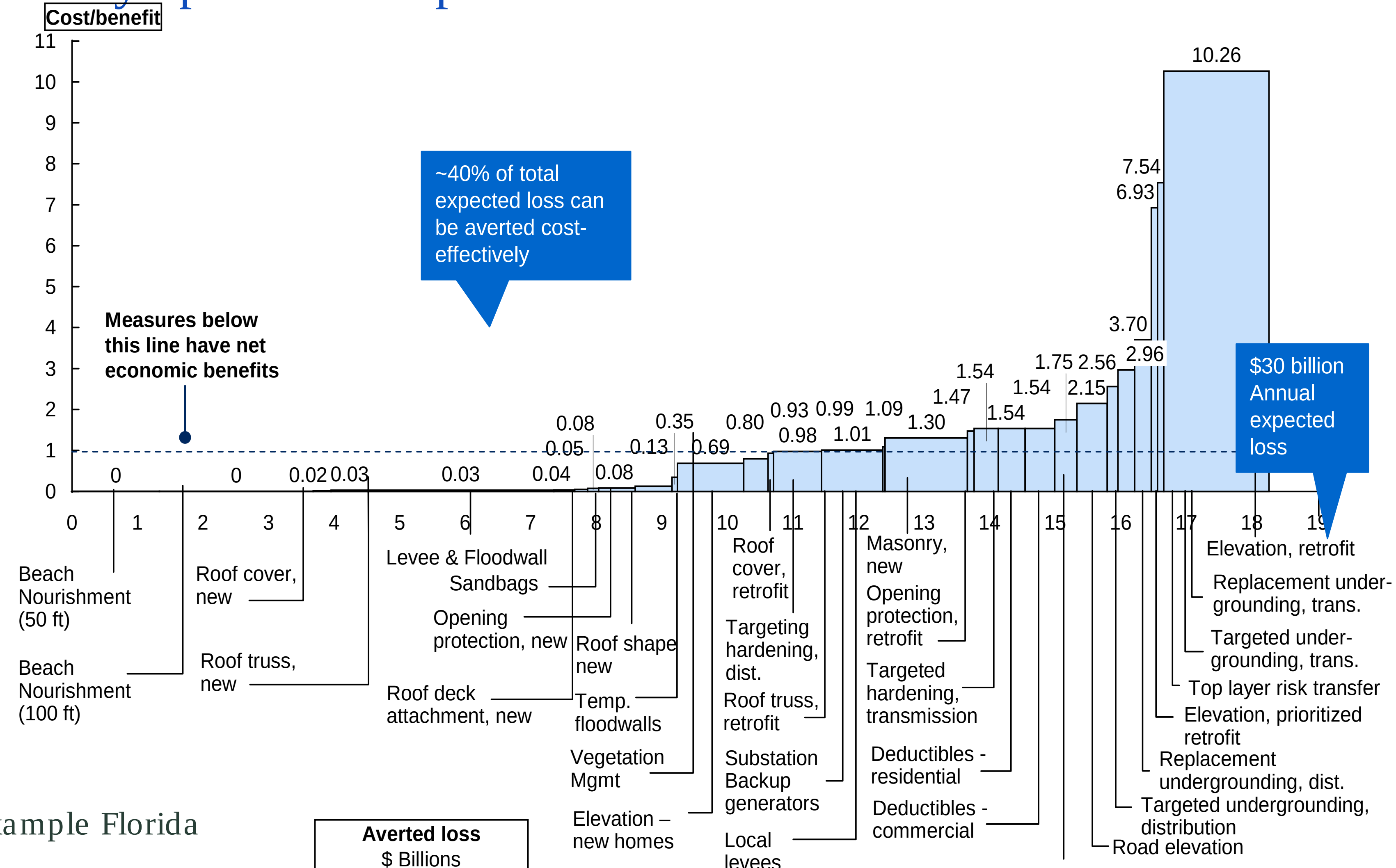
Source: A Stronger, More Resilient New York

- Current drivers of loss: east and south shores of Staten Island, southern Brooklyn and Queens, Brooklyn and Queens waterfront and southern Manhattan.
- Under future scenarios: Same geographic regions, plus northern Queens and the Bronx
- Under 2050s scenario: 400% increase in ZIP codes which have an AEL of USD 30 million

A resilience (adaptation) cost curve



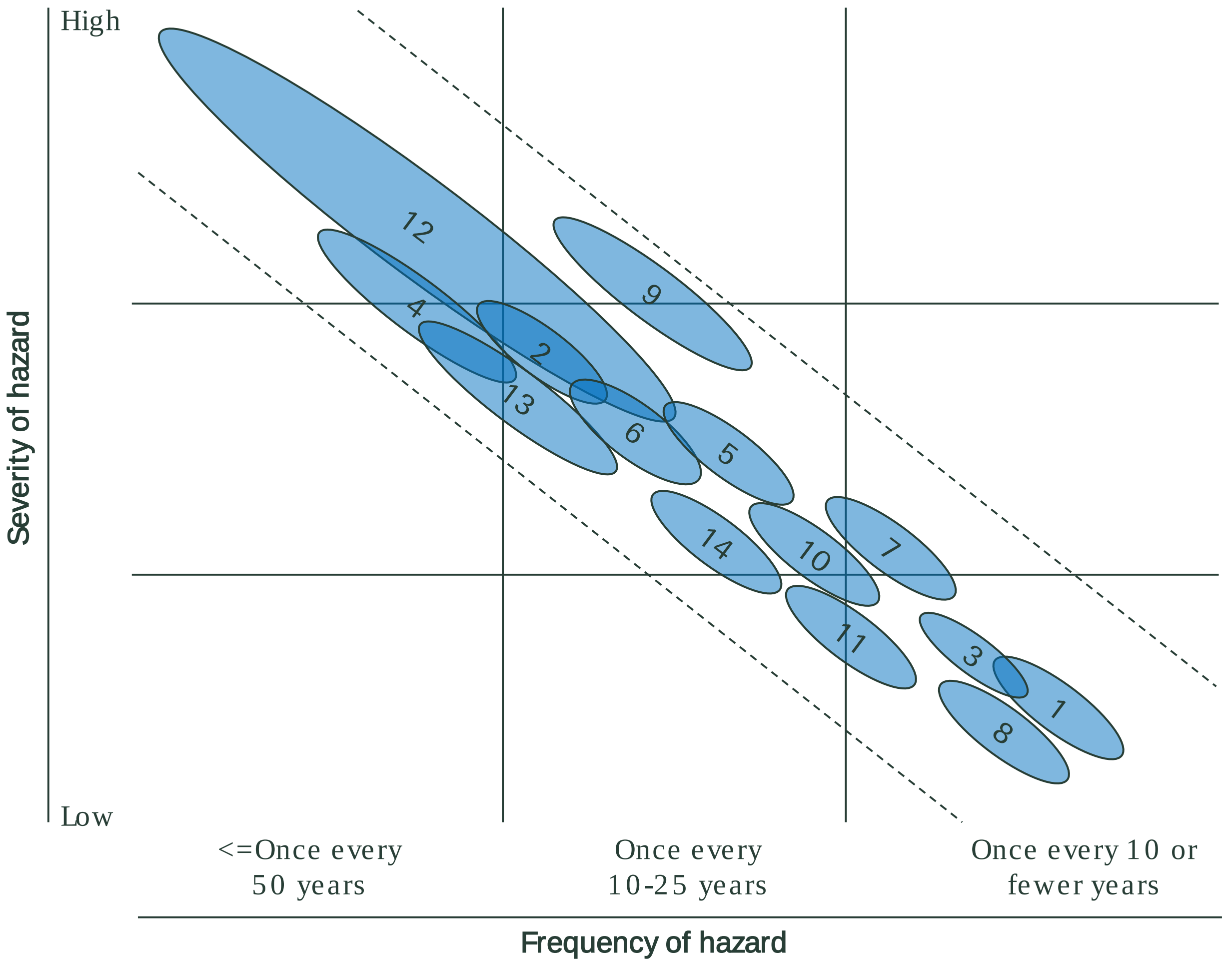
Locally specific adaptation cost / benefit curve



Example Florida

Calculated in 2008 dollars for the average climate scenario

Climate risk is best tackled with a portfolio of adaptation measures



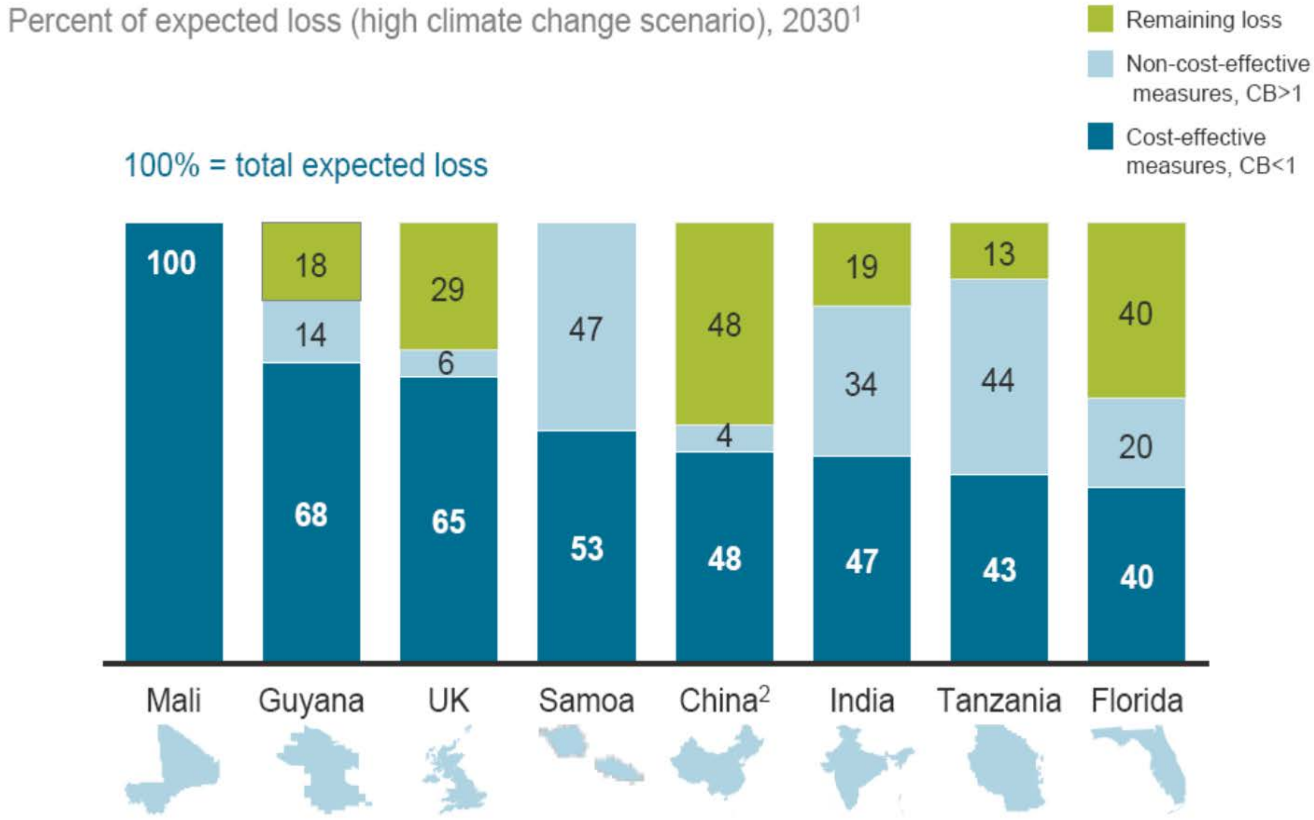
List of potential measures to reduce hurricane damage

1. Sand bags
2. Opening/ masonry
3. Temporary floodwall
4. Levee and floodwall
5. Targeted hardening (utilities)
6. Home elevation
7. Local levees
8. Road elevation
9. Roof (various)
10. Beach nourishment
11. Vegetation management
12. Financial risk transfer
13. Undergrounding (utilities)
14. Substation backup

Example Florida

Source: Team analysis

Global overview:
Expected loss averted by adaptation measures



1 Based upon select regions analyzed within the countries (e.g., Mopti, Mali; Georgetown, Guyana Hull, UK; North and Northeast China; Maharashtra, India; Central regions of Tanzania; Southeast Florida, U.S.)
2 Based upon moderate scenario data and analysis


The Road Ahead:
Closing the protection gap
SWISS RE
150
YEARS

Closing the Gap: Including ex-ante instruments into the overall risk financing strategy

Ex-ante risk financing | **Ex-post financing**



- Private Citizens / Individuals
- Corporations / Commercial Enterprises
- Government's exposure (state budget)

Ex-ante risk financing:

- (Re-)insurance policies
- (Re-)insurance policies
- Reserve funds, parametric reinsurance, catastrophe bonds

- Smaller gap between economic and insured losses
- Reduced financial burden for the government after an event
- Less volatility for the state budget and more planning certainty

Ex-post financing:

- Debt financing
- Budget reallocation
- Donor assistance
- Tax increases
- Others

Including ex-ante instruments in the overall risk financing mix helps a government to lower its financial exposure to catastrophic risks, natural and man-made.

Case study Caribbean: Caribbean Catastrophe Risk Insurance Facility (CCRIF)

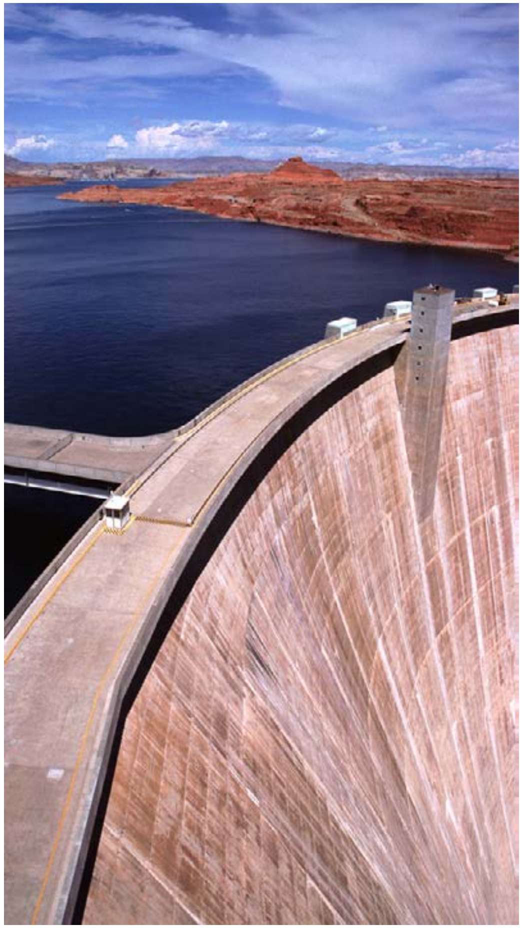
Solution features

- The CCRIF offers parametric hurricane and earthquake insurance policies to 16 CARICOM governments
- The policies provide immediate liquidity to participating governments when affected by events with a probability of 1 in 15 years or over
- Member governments choose how much coverage they need up to an aggregate limit of USD 100 million
- The mechanism will be triggered by the intensity of the event (modelled loss triggers)
- The facility responded to events and made payments:
  - Dominica & St. Lucia after earthquake (2007)
  - Turks & Caicos after Hurricane Ike (2008)
  - Haiti , Barbados, St. Lucia, Anguilla and St. Vincent (2010)

Involved parties

- Reinsurers: Swiss Re and other overseas reinsurers
- Reinsurance program placed by Guy Carpenter
- Derivative placed by World Bank Treasury

Case study Uruguay: Largest Energy Risk Transfer to Protect Against Drought Risk



Solution features

- Insured peril: Drought
- Payments to be used to purchase energy from alternative sources when drought conditions cause lack of hydro power
- Derivative contract: between UTE, Uruguayan state-owned hydro-electric power company, and World Bank Treasury. Risk is then placed in the market
- Payment mechanics:
  - Trigger: Level of rainfall monitored at weather stations
  - Settlement: Market price of brent crude oil
- Time horizon: January 2014– July 2015
- Transaction Size: USD 450 million
- Largest of it's kind in the weather risk management market

Involved parties

- Client: UTE (Uruguayan state-owned power company)
- Arranger: World Bank Treasury
- Risk Takers: Swiss Re and Allianz

Case study United States:
Alabama – First parametric cover for a government in an industrialized country

Solution features

- Insured peril: Hurricane
- Payments to offset economic costs of hurricanes
- Trigger type: Disaster occurring within a defined geographic area ("box") along coast (“cat-in-the-box”)
- Trigger based on wind speed of hurricane eye as it passes through pre-determined box
- Payout in as little as two weeks
- Time horizon: July 2010 – July 2013
- First parametric catastrophe risk transfer for a government in an industrialized country

Involved parties

- Insured: State Insurance Fund of Alabama
- Swiss Re: Lead structurer and sole underwriter

Case study:
Miami Dade County Public Schools–
Custom multi-year structured cover

Solution features

- Insured peril: Named Windstorm and associated flood
- Multi-year structured cover: USD 100m
- Covering indemnified losses from NWS to soften impact to broader school system
  - 3 year coverage with unlimited reinstatements
  - Term Aggregate Deductible
  - Fixed premium over term
  - No claims bonus
- Time horizon: May 2013– May 2016
- Customized multi-year structured risk transfer for major school district

Involved parties

- Insured: Miami-Dade County Public Schools
- Swiss Re: Lead structurer and sole underwriter
- Broker: AJ Gallagher

Legal notice