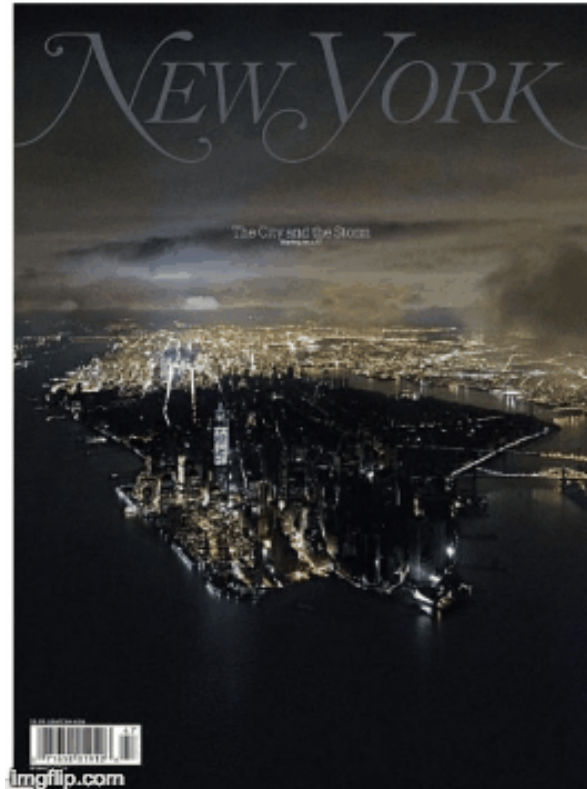


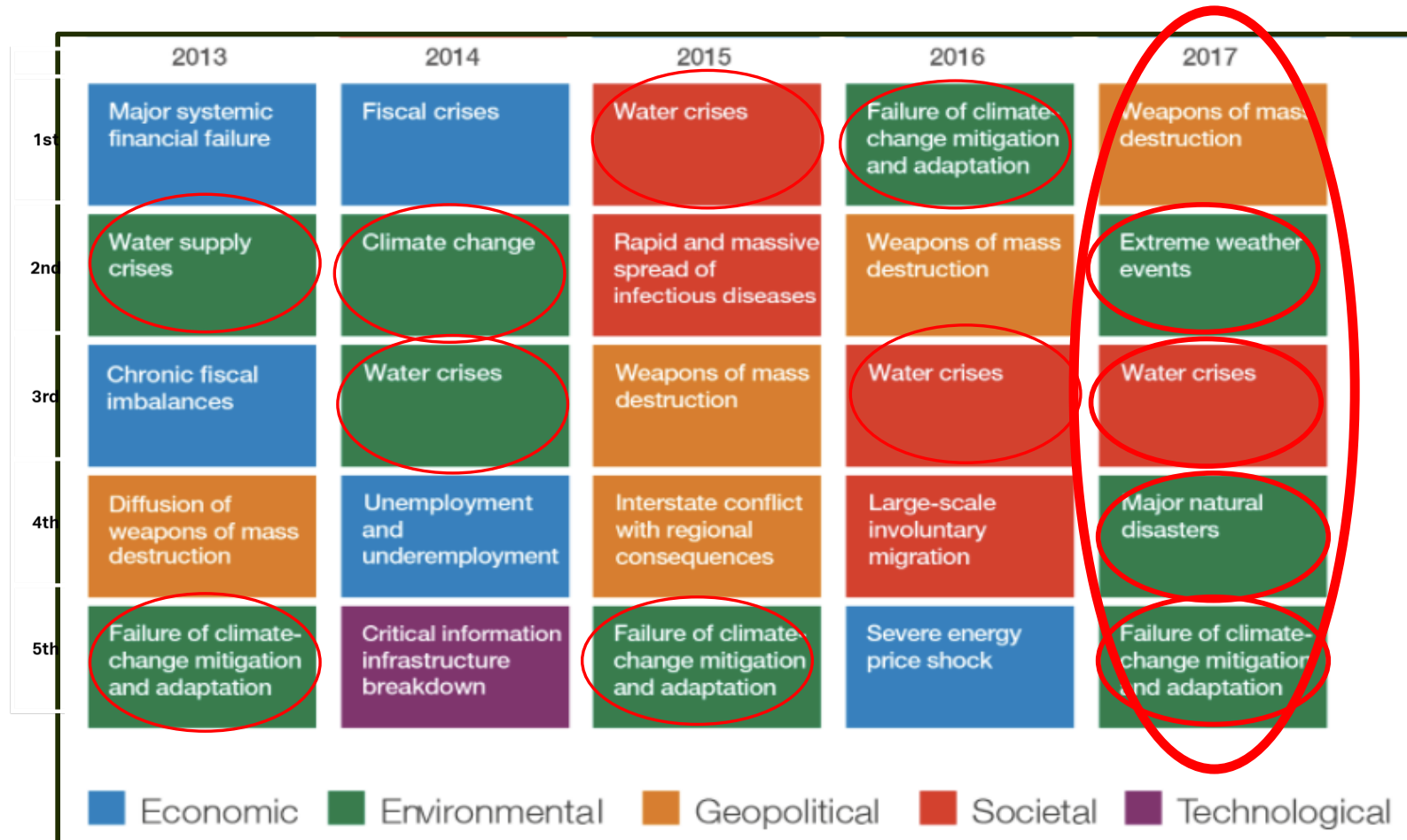
# *Climate Risk & Resilience: New Considerations for Municipal Investing*

## MAGNY

Joyce Coffee  
President, Climate Resilience Consulting

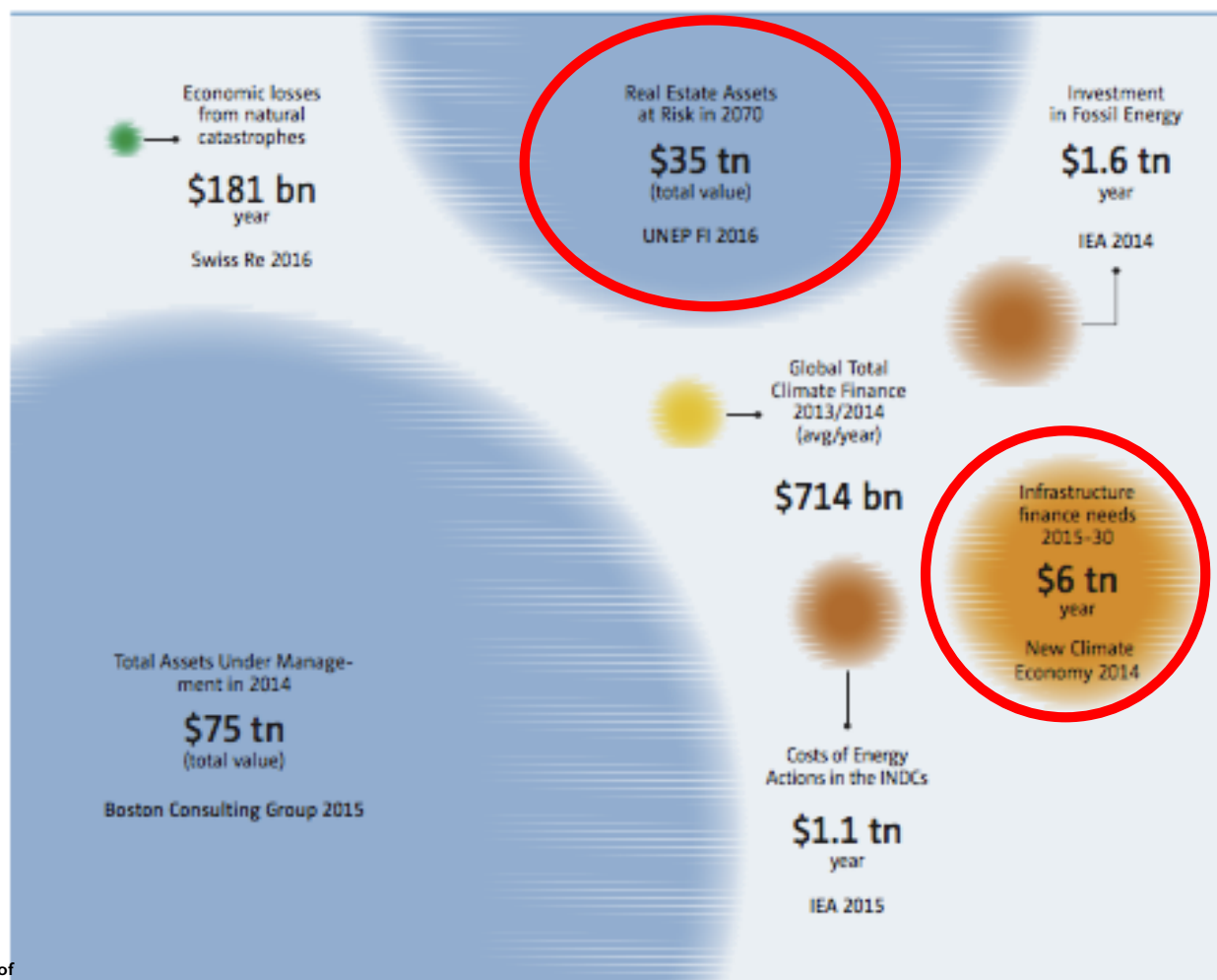


# WEF: Five Global Risks in Terms of Impact



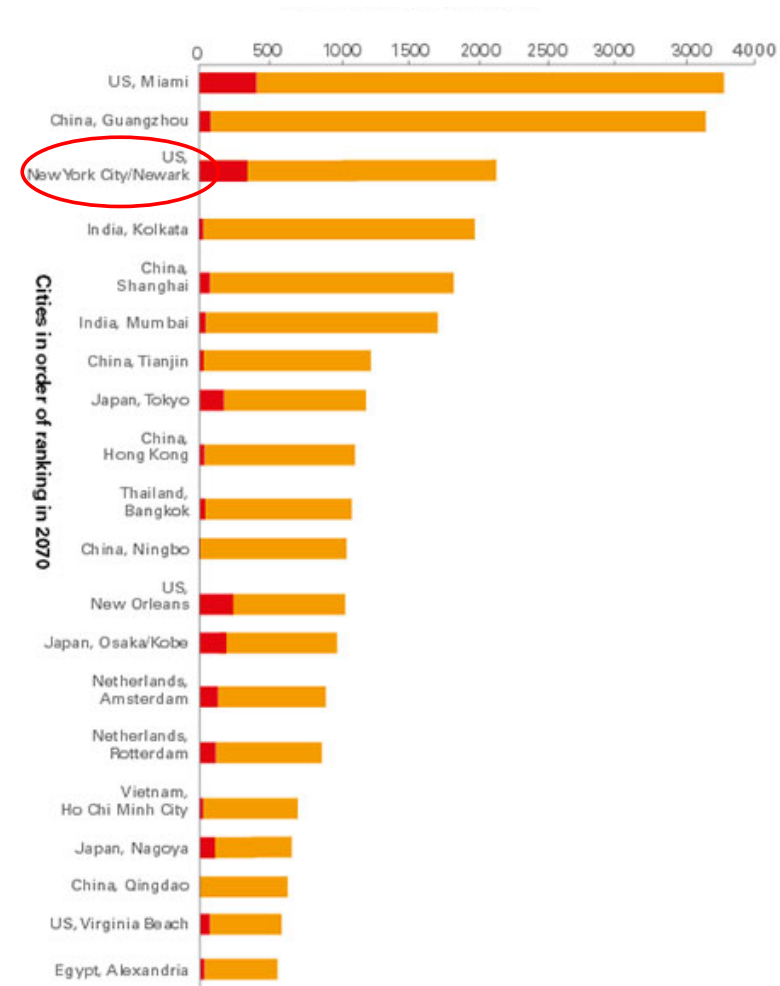
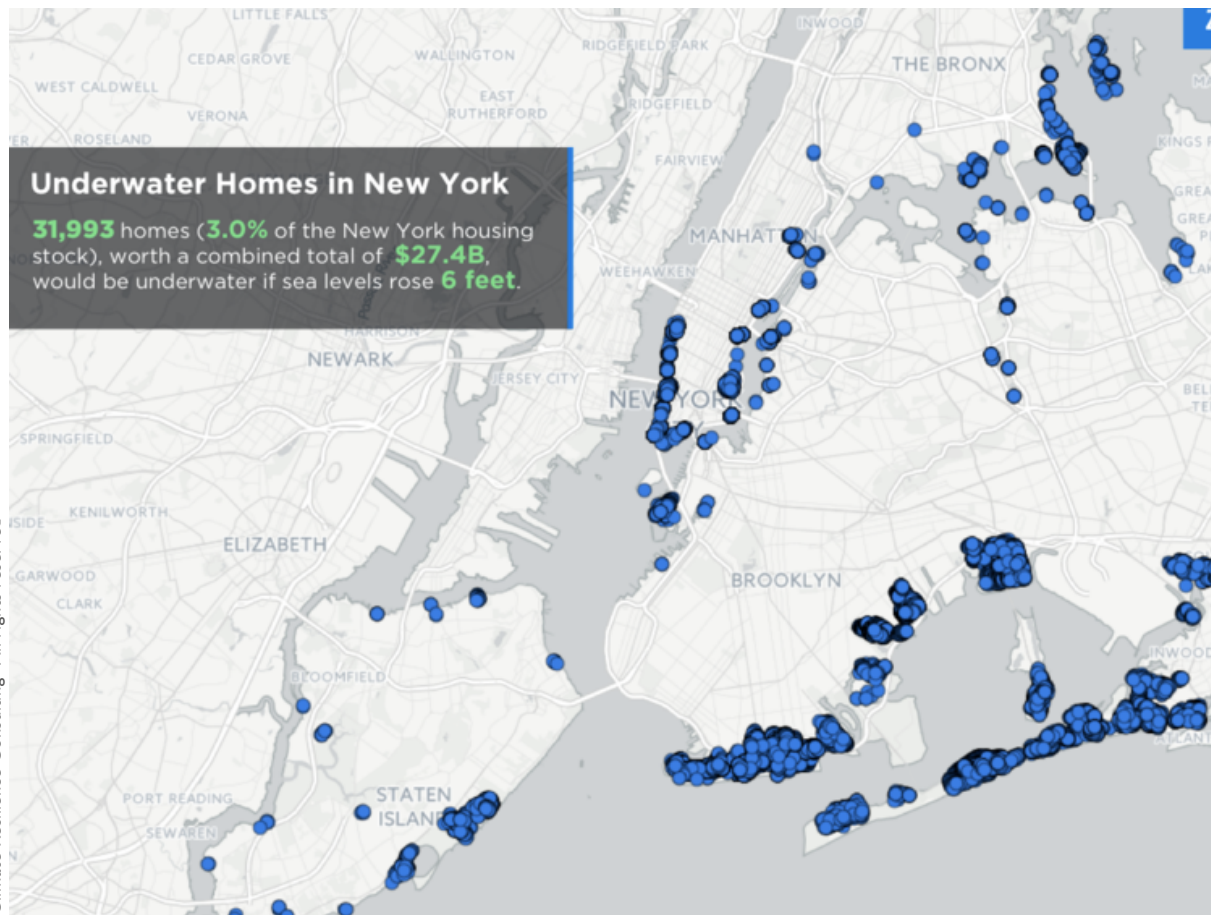
Source: World Economic Forum 2017 Global Risk Perception Survey

# Real Estate and Infrastructure AUM are at Risk



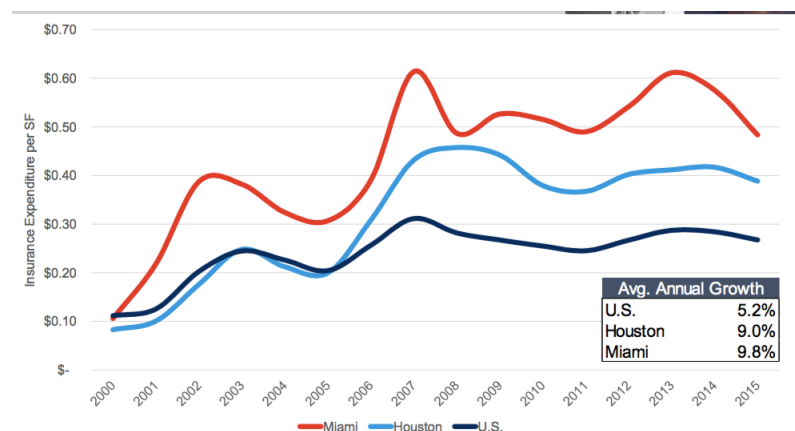
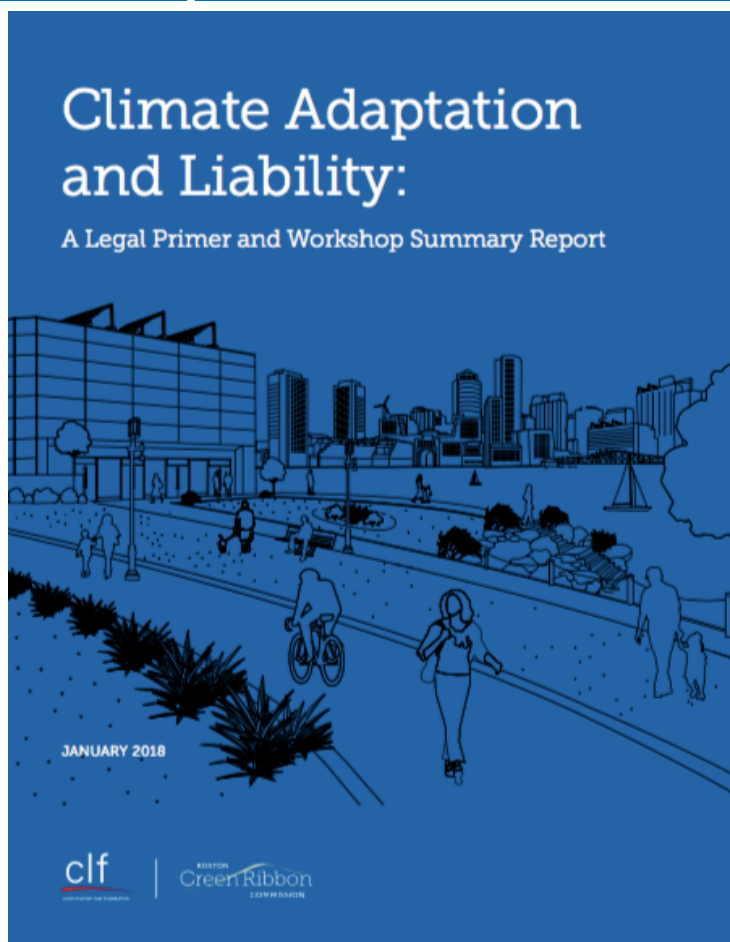
Source: UNFCCC 2016 Biennial review of climate finance

# Sea Level Rise: 32K Homes \$27.4B by 2100



Source Zillow; CEO World Magazine using World Bank Data

# ESG/Risk Related Market Drivers



Sources:  
1. NCREIF Query Tool: Expense Detail search by MSA, National Council of Real Estate Investment Fiduciaries, as of Jan. 24, 2017

Moody's	Standard & Poor's	Fitch	AM Best	Credit worthiness
Aaa	AAA	AAA	aaa	An obligor has EXTREMELY STRONG capacity to meet its financial commitments.
Aa1	AA+	AA+	aa+	An obligor has VERY STRONG capacity to meet its financial commitments. It differs from the highest rated obligors only in small degree.
Aa2	AA	AA	aa	
Aa3	AA-	AA-	aa-	
A1	A+	A+	a+	An obligor has STRONG capacity to meet its financial commitments but is somewhat more susceptible to the adverse effects of changes in circumstances and economic conditions than obligors in higher-rated categories.
A2	A	A	a	
A3	A-	A-	a-	
Baa1	BBB+	BBB+	bbb+	An obligor has ADEQUATE capacity to meet its financial commitments. However, adverse economic conditions or changing circumstances are more likely to lead to a weakened capacity of the obligor to meet its financial commitments.
Baa2	BBB	BBB	bbb	
Baa3	BBB-	BBB-	bbb-	
Ba1	BB+	BB+	bb+	An obligor is LESS VULNERABLE in the near term than other lower-rated obligors. However, it faces major ongoing uncertainties and exposure to adverse business, financial, or economic conditions which could lead to the obligor's inadequate capacity to meet its financial commitments.
Ba2	BB	BB	bb	
Ba3	BB-	BB-	bb-	
B1	B+	B+	b+	An obligor is MORE VULNERABLE than the obligors rated 'BB', but the obligor currently has the capacity to meet its financial commitments. Adverse business, financial, or economic conditions will likely impair the obligor's capacity or willingness to meet its financial commitments.
B2	B	B	b	
B3	B-	B-	b-	
Caa	CCC	CCC	ccc	An obligor is CURRENTLY VULNERABLE, and is dependent upon favourable business, financial, and economic conditions to meet its financial commitments.
Ca	CC	CC	cc	An obligor is CURRENTLY HIGHLY-VULNERABLE.
C	C	C	c	The obligor is CURRENTLY HIGHLY-VULNERABLE to nonpayment. May be used where a bankruptcy petition has been filed.
C	D	D	d	An obligor has failed to pay one or more of its financial obligations (rated or unrated) when it became due.

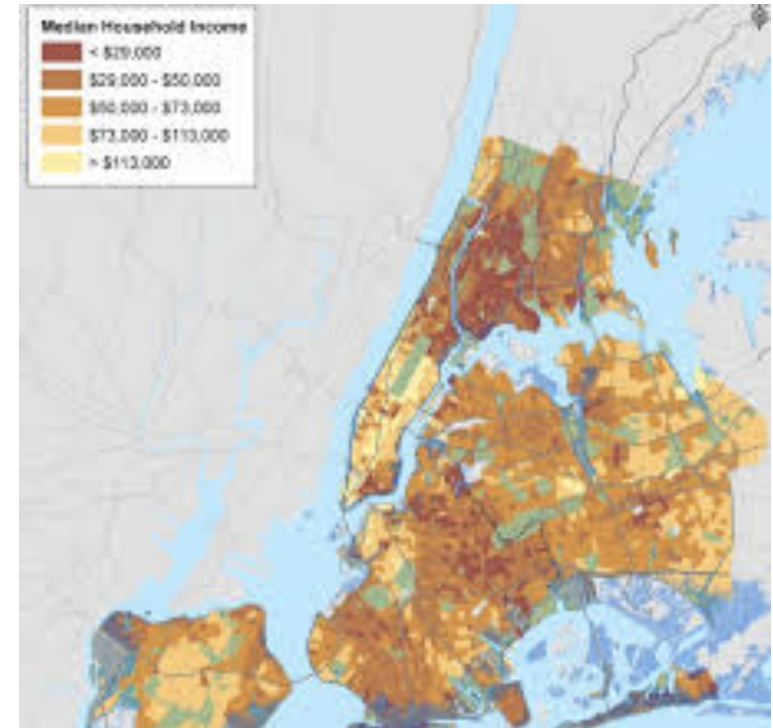
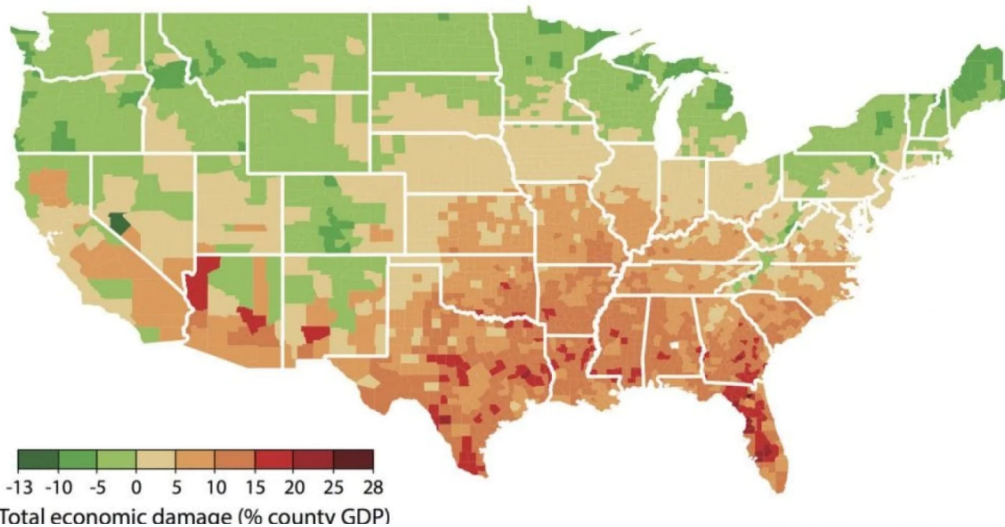


Source: Conservation Law Foundation;  
National Real Estate Advisors; Moody's

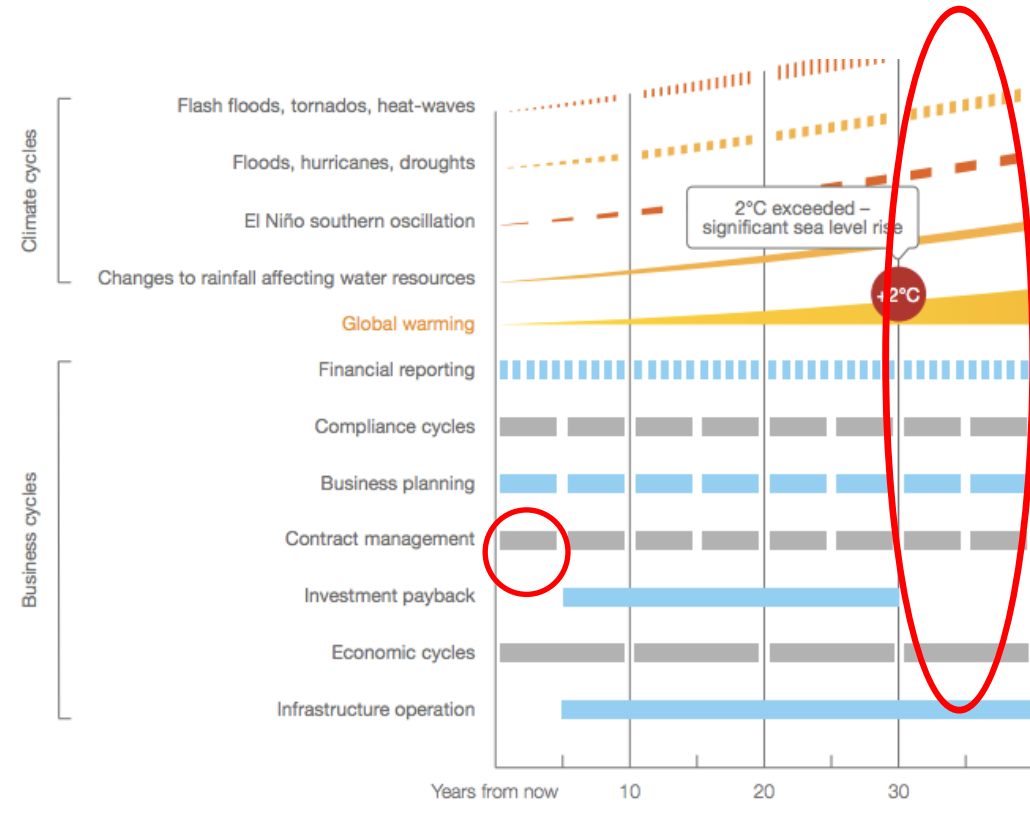
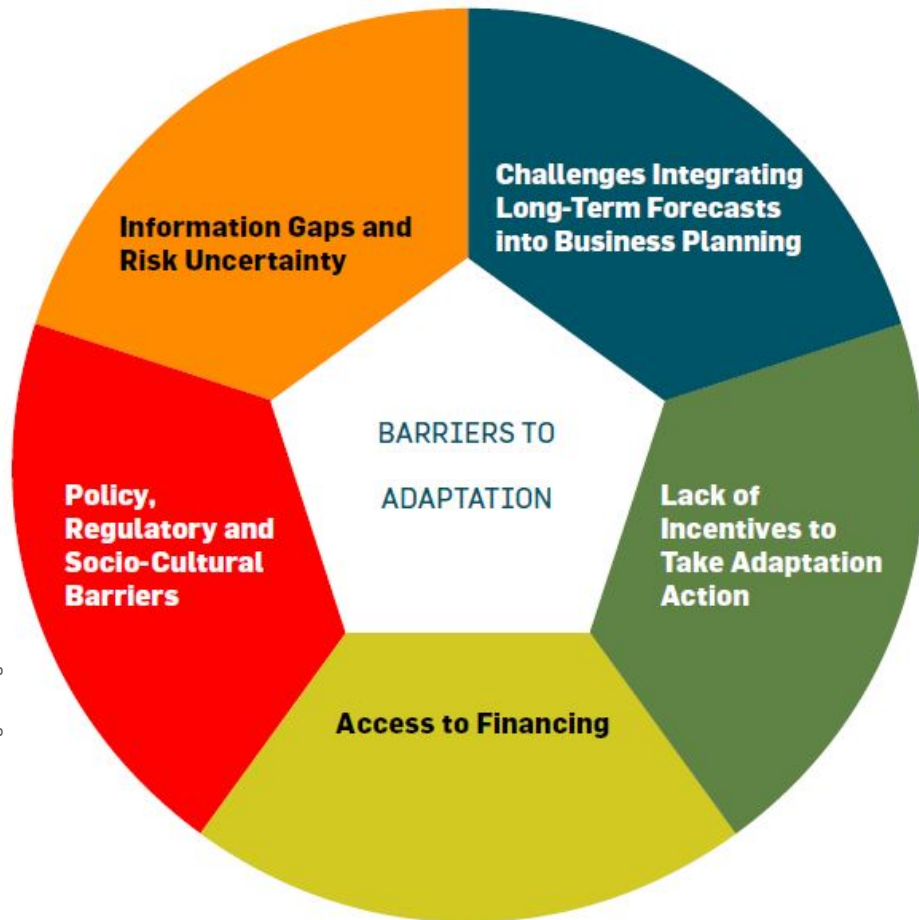


# Equity Cautions: Tales of Two Futures

- Poorest 1/3 of U.S. counties sustain greater economic hardship from hurricanes, rising sea levels & high temperatures



# Issue: Climate Timeframe > Business Timeframe



# Issue: Resilience Is not Easily Measured

## Resilience Measurement

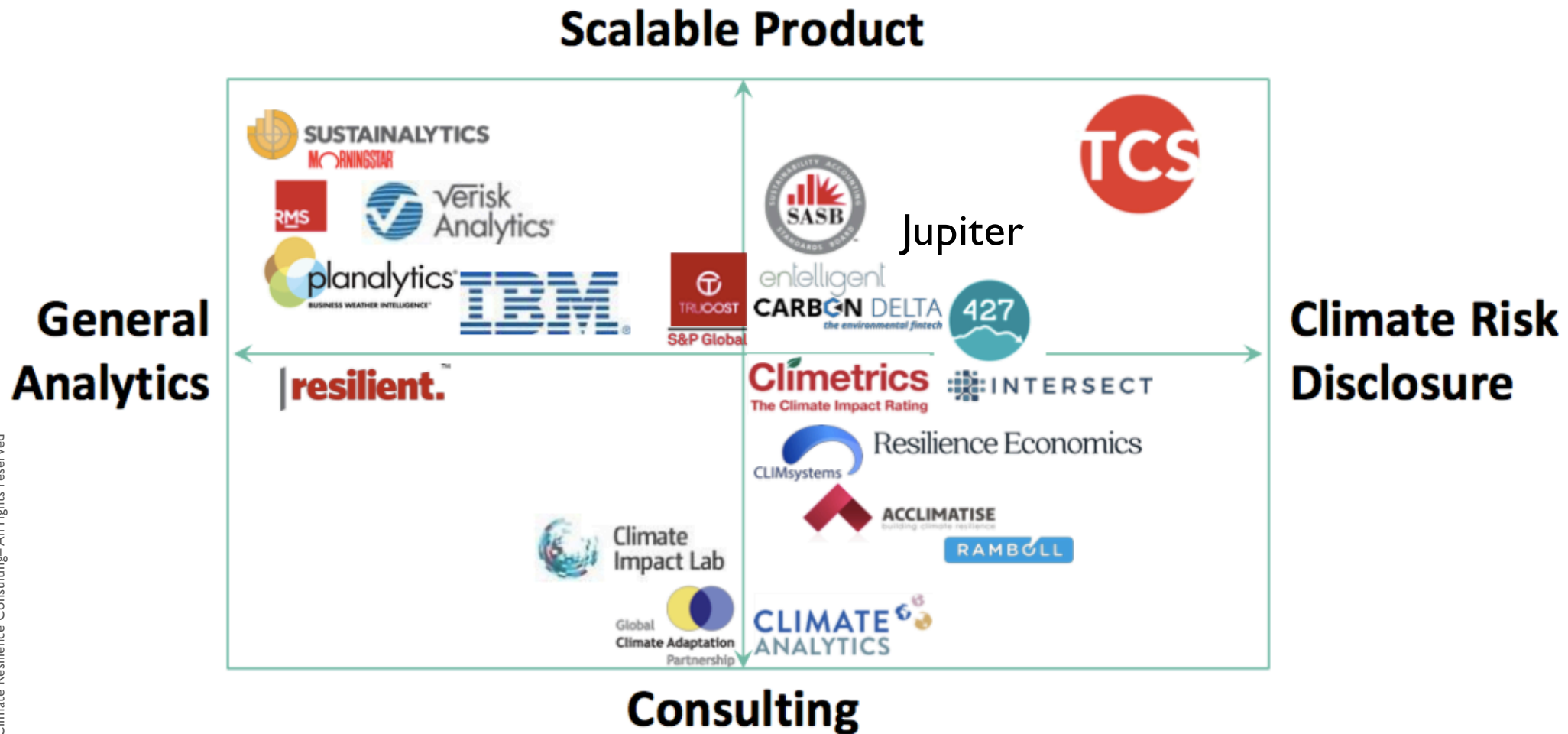
- Government indices and rankings
- Insurance risk ratings
- Risk screening tools
- Scorecards
- Engineering due diligence & design analysis

## • GHG Measurement





# Issue: Lack of Parcel Scale Risk Analytics



Source: The Climate Service

# Issue: Cost Benefit $\neq$ Avoided Loss

## Benefit Cost Ratio (BCR)

Ratio of the cumulative present value of benefits to the cumulative present value of costs. A ratio greater than one means the action is economically feasible (i.e., more benefits than costs)

## Internal Rate of Return (IRR)

The rate that renders the present value of the cost stream (future annual costs) equal to the present value of the benefits stream (future annual benefits). The internal rate of return is compared to the project discount rate and must exceed it for the alternative to be economically feasible.

## Discount rate

The interest rate that is applied in calculating the present value of expected yearly costs and benefits, and represents the opportunity cost of funds. The discount rate is sometimes referred to as the project "hurdle rate".

## Net Present Value (NPV)

The absolute difference between the cumulative present value of benefits and the cumulative present value of costs. (i.e., benefits minus costs)

## Payback Periods

Time required to recoup the costs of initial investment through costs savings attributable to the action alternative.

## Appendix H –Benefit Cost Analysis

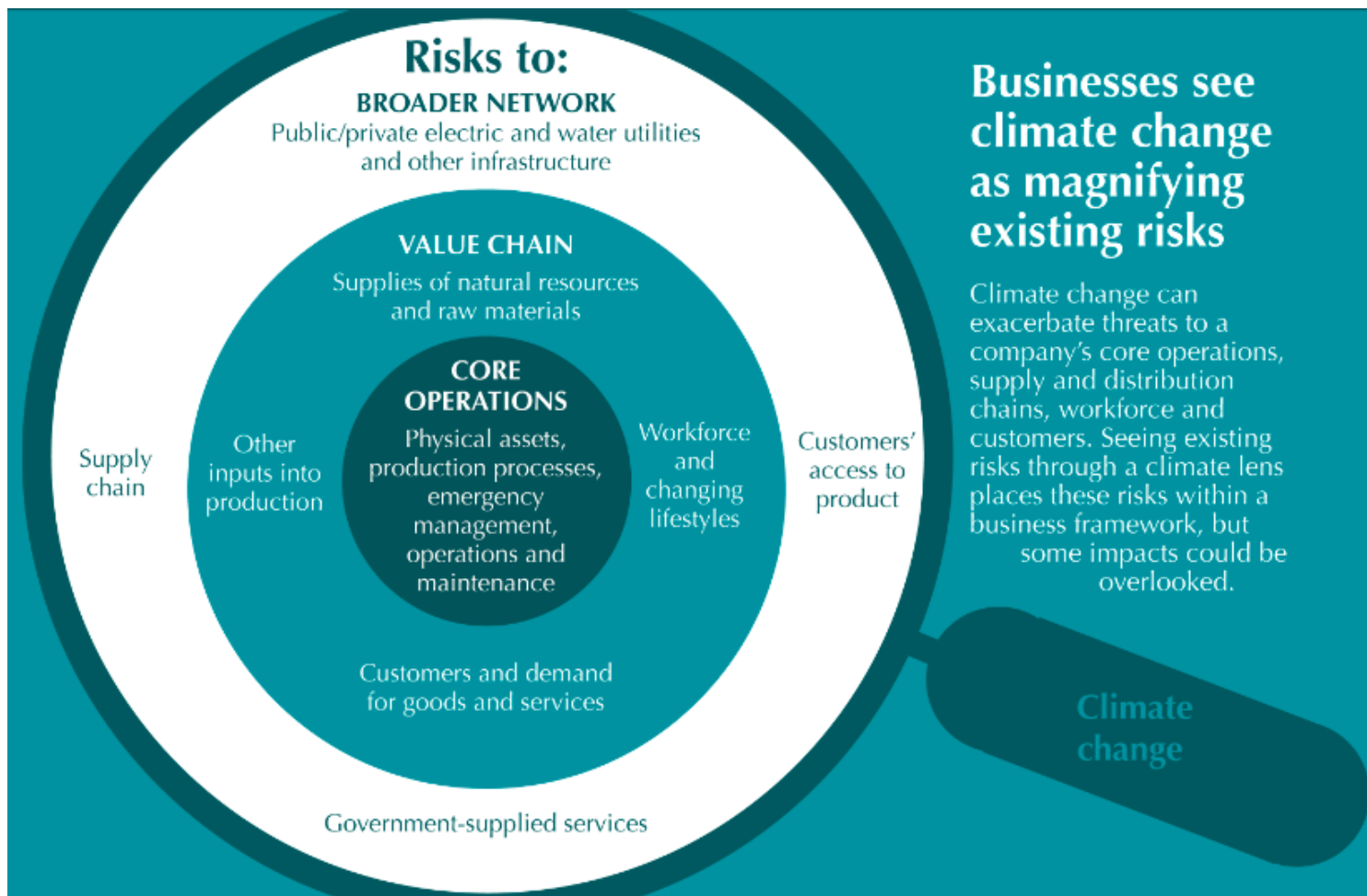
### Appendix H – Phase 2 Benefit-Cost Analysis (BCA) Instructions for Community Development Block Grant National Disaster Resilience (CDBG-NDR) Applicants

In Phase 2, each applicant will complete a benefit cost analysis for any Covered Projects. This CDBG-NDR BCA will provide a sense of the cost efficiency of the proposal, but the BCA score will not be used alone to determine soundness of approach. HUD will not fund any Phase 2 activities for which the benefits to the applicant's community and to the United States as a whole are not demonstrated by the evidence submitted to justify the costs. The standard criterion for funding projects is a net present value above zero (or equivalently, a benefit-to-cost ratio greater than one). However, HUD recognizes that some benefits and costs may be difficult or impossible to quantify, and qualitative descriptions of benefits that cannot be monetized will be taken into account as evidence, as appropriate. Note that quantifying or otherwise accounting for social and ecological benefits and costs is a critical component, as is consideration of all related resources, including leverage. The methodology employed must follow OMB Circular A-94, "Guidelines and Discount Rates for Benefit-Cost Analysis of Federal Programs" (link below).

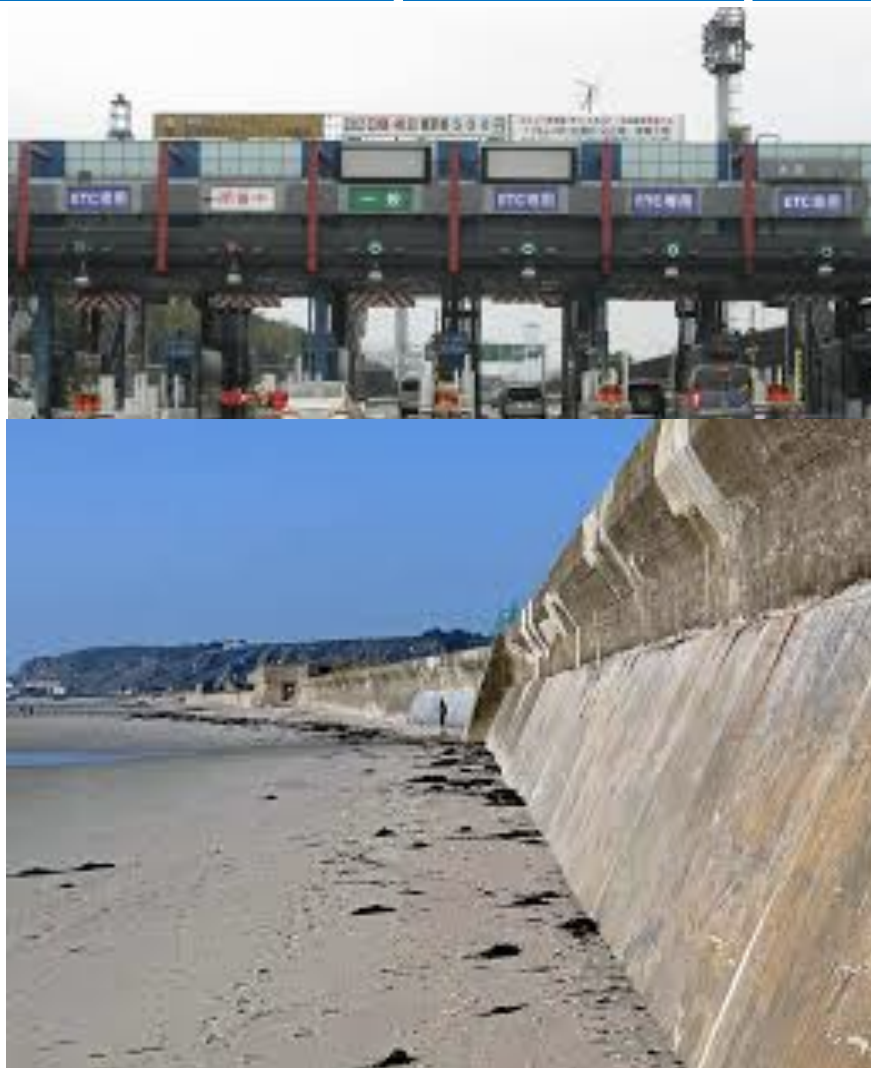
**NOTE: The NDRC NOFA prevails if anything in this presentation conflicts or appears to conflict with the NOFA.**



# Businesses do not Support Muni Resilience



# Issue: Resilience Projects May be Less Bankable



# Climate Resilience Partners



PIONEERED BY THE  
ROCKEFELLER FOUNDATION



INSTITUTE FOR  
Sustainable  
Communities



WINROCK  
INTERNATIONAL



AMERICAN SOCIETY OF  
ADAPTATION PROFESSIONALS

