HGA

RISK MANAGEMENT AND CAMPUS RESILIENCE

Learning Objectives

1. Describe a risk assessment tool that can help you identify, assess, and prioritize risks for your campus.
2. Identify unique conditions on your institution's campus that are at risk under certain climate change projections
3. Prioritize which risks are most critical, i.e. those that are most likely, have the greatest potential impact, and for which your institution is currently least prepared.
4. Discuss how to introduce resilience planning your institution, including stakeholders who should be involved with identifying risks and ways to integrate planning for those risks into ongoing campus planning processes.

Agenda

- Risk Management & Resilience: An Introduction
- Resilience at UCLA
- Q&A
- Risk Management & Building Resilience: Your Institutions

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How does risk management differ from resilience?

RISK MANAGEMENT

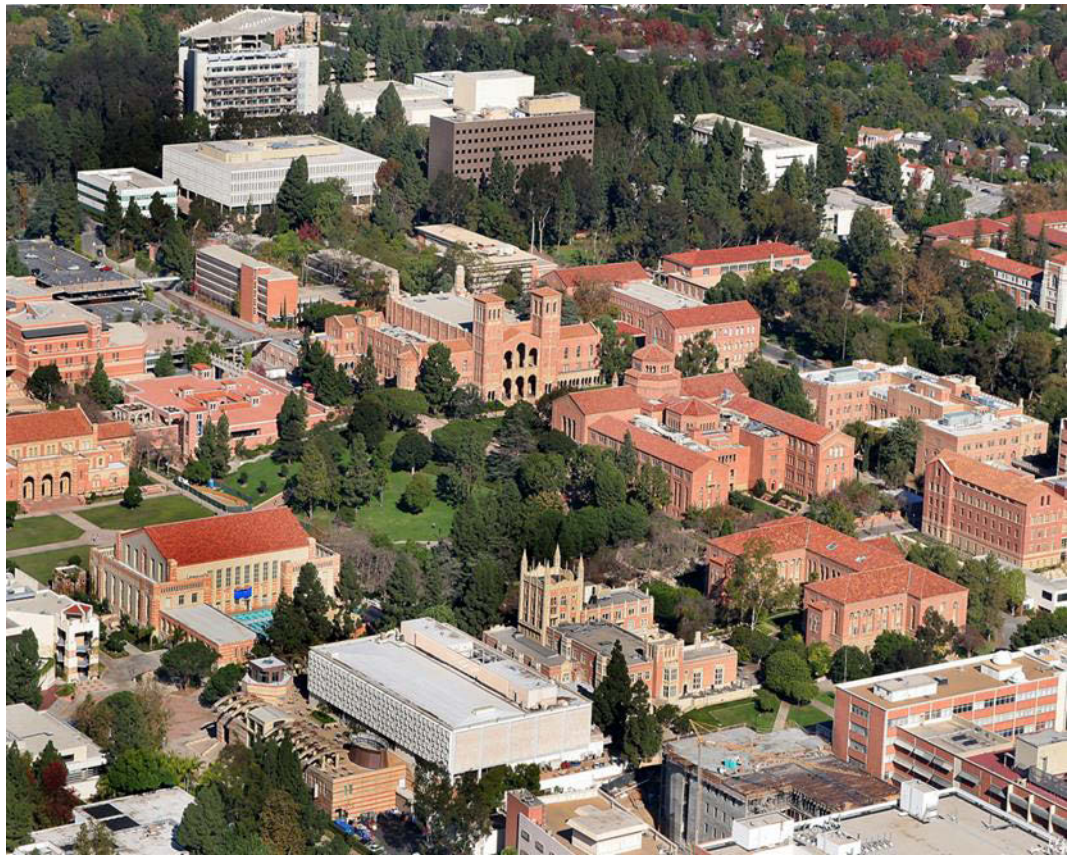
- Reduce or eliminate long-term risk to life and property from hazard events (acute risks)

RESILIENCE

- Capacity to ***adapt to*** and ***recover quickly from*** chronic stresses and acute shocks

Resilience at UCLA

- 419 acres
- Highly compact urban campus
- On a hillside, one of the “cooler” micro ecosystems in LA
- 45,000+ student enrollment
- 13,500 beds on campus, (5000 coming)
- 80,000 daily population
- Five hospitals – three adjacent
- 42 megawatt “Trigen” Power Plant
- Lean staff
- Earlier Disaster Response Plan – “send them home!”



UCLA Risks: Mapped onto HGA Tool (Disclaimer)

Risk	Acute	Chronic
Natural Disaster – Seismic/Fire	X	
Climate	X	X
Security – Cyber/Violence/Etc	X	X
Infrastructure – Water/Energy/Solid & Liquid Waste*	X	X
Local Pollution		X
Human Health	X	X

Flood – Learned the Hard Way

UCLA's Approach

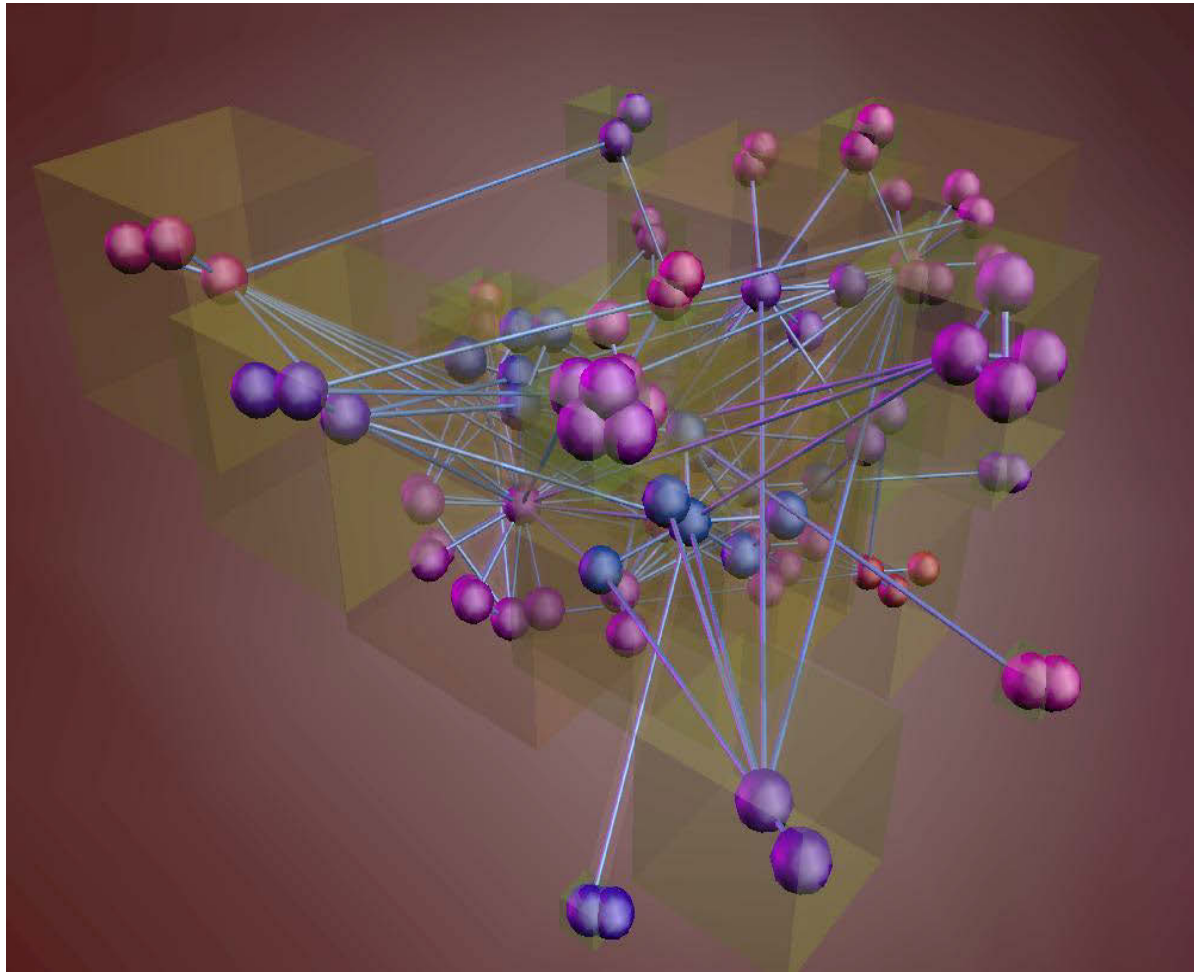
- Leveraging Strengths to Overcome Weaknesses
- Connecting Sustainability and Emergency Planning Work
- Building Networks and Partnerships – Across the Campus and Community
- Utilizing Faculty and Student Research
- Facilities Upgrades

Leveraging Risks, Liabilities and Opportunities

- On-Campus Population
- Energy Supply Redundancy
- Water

Outcomes Focused – “Be a Protein”

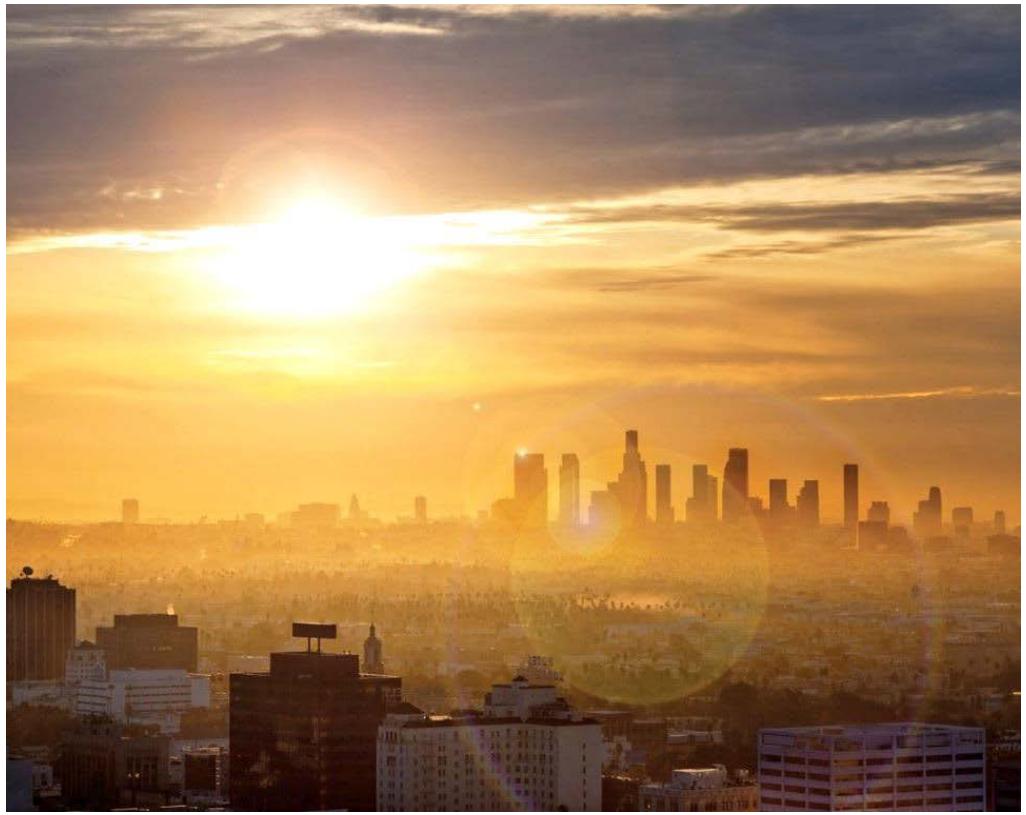
- Blend the Strengths from all University (other) sectors
- “Fusion” of disciplines
- Build a “critical mass” of research, education and operations expertise



Support Through Core Mission – Sustainable LA Grand Challenge

Goals:

- Power 100% of energy and transportation needs with renewable energy;
- Obtain 100% of water supply from sources within LA County;
- and enhance ecosystem health together with human health and wellbeing.



Local Climate Impacts

WHAT DOES CLIMATE CHANGE MEAN FOR SOUTHERN CA?

Local Climate Impacts

Temperatures

Snow

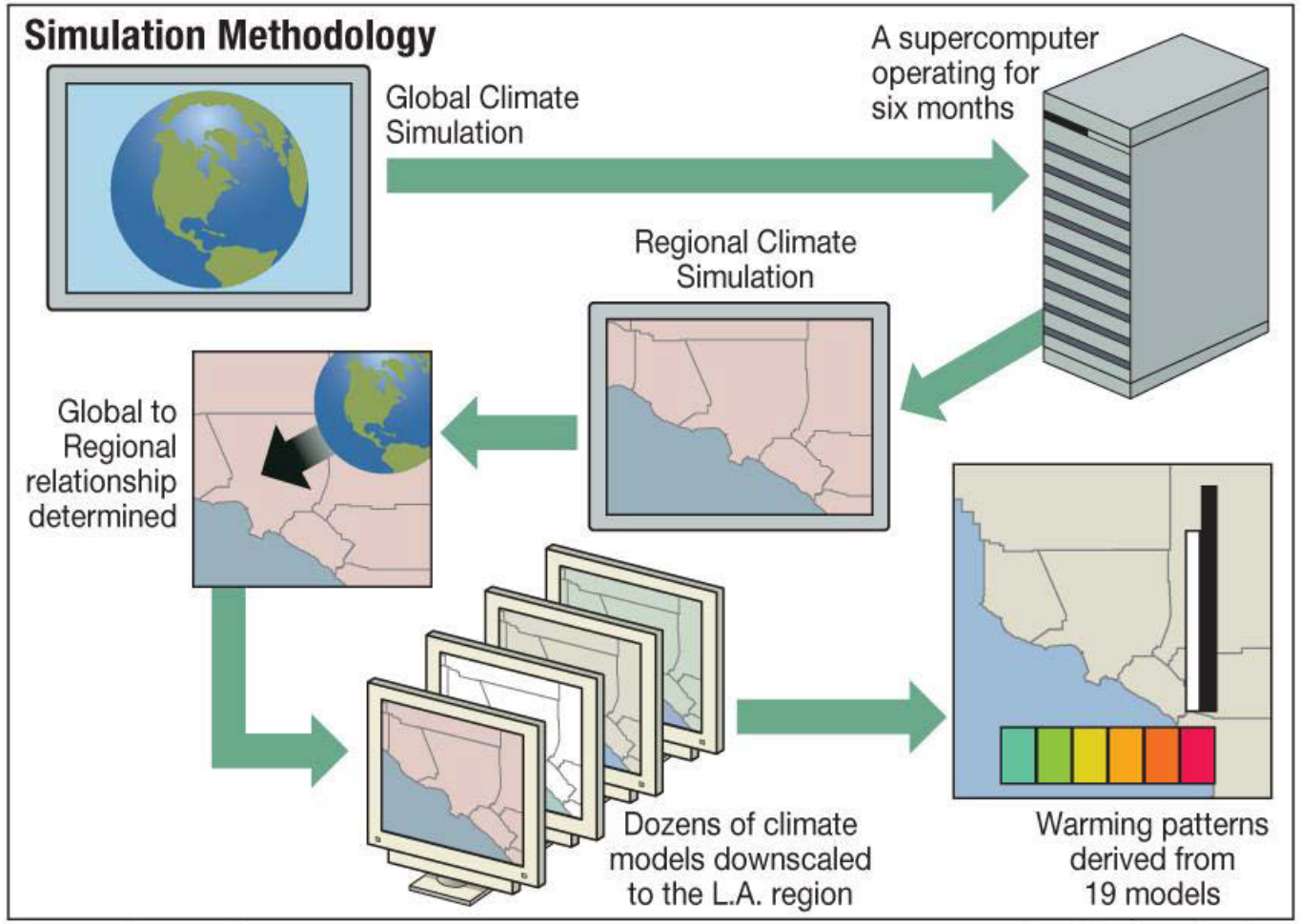
Water resources

Ecosystem effects

Sea level rise

Fire

Groundbreaking Climate Modeling

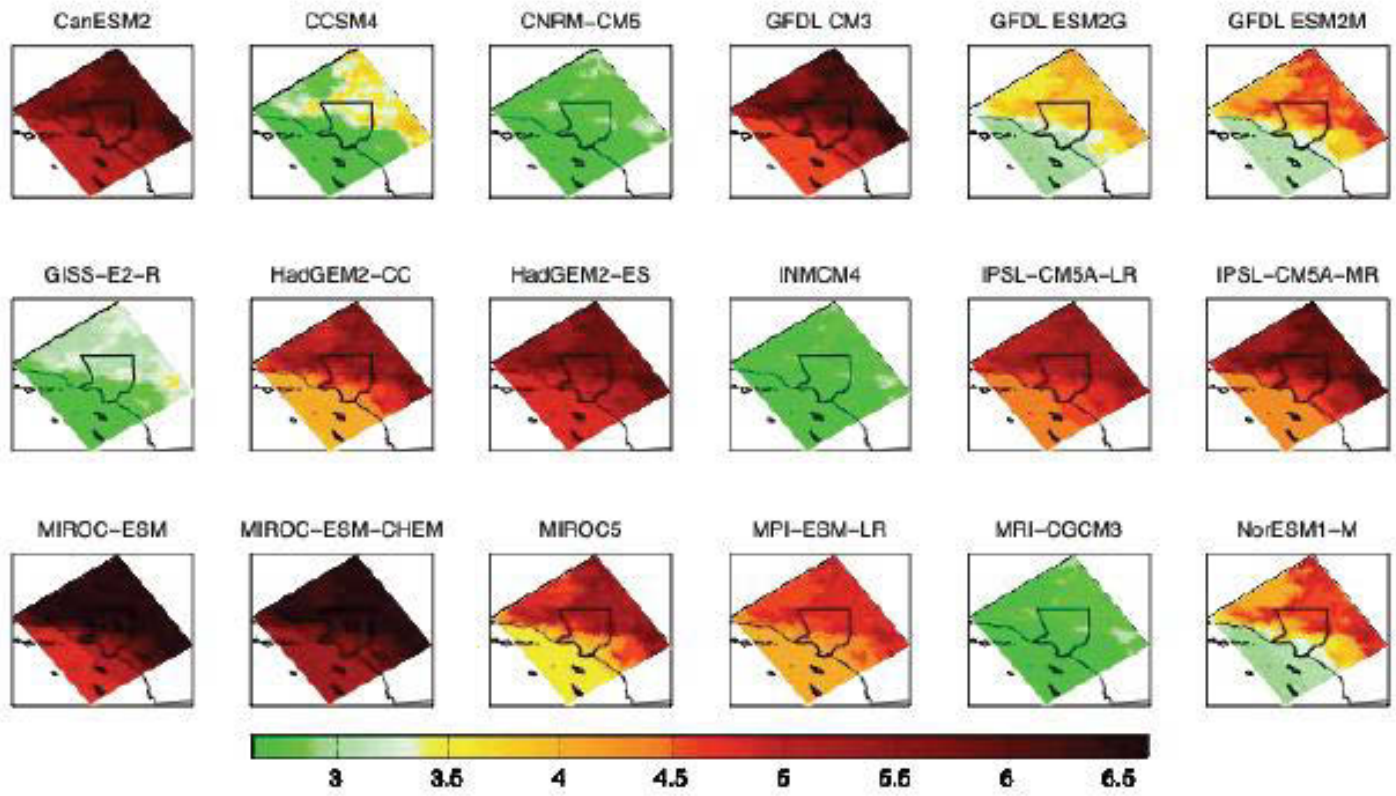


Source: UCLA LARC study, 2012

Graphic by Steve Greenberg

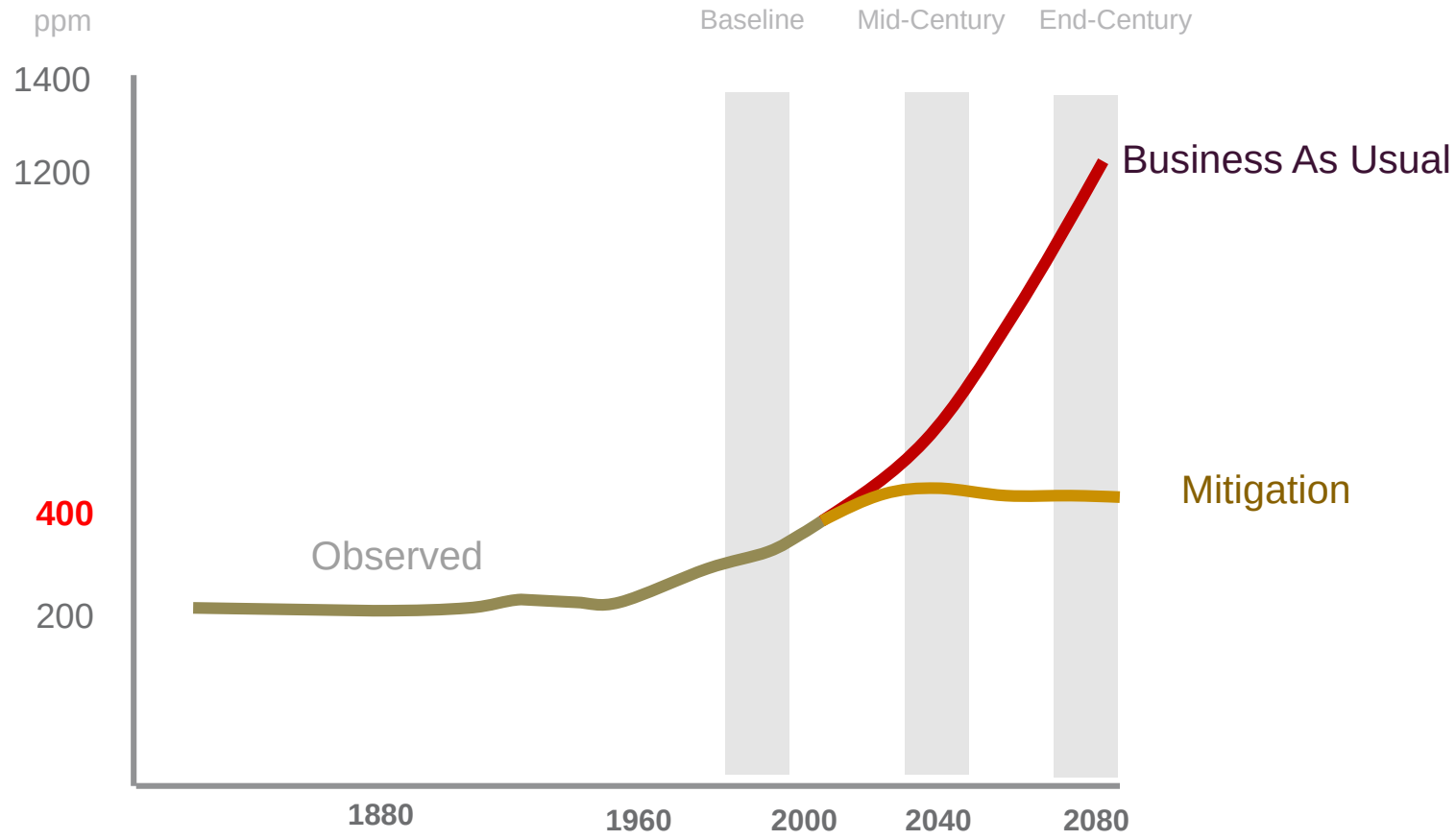
Groundbreaking Climate Modeling

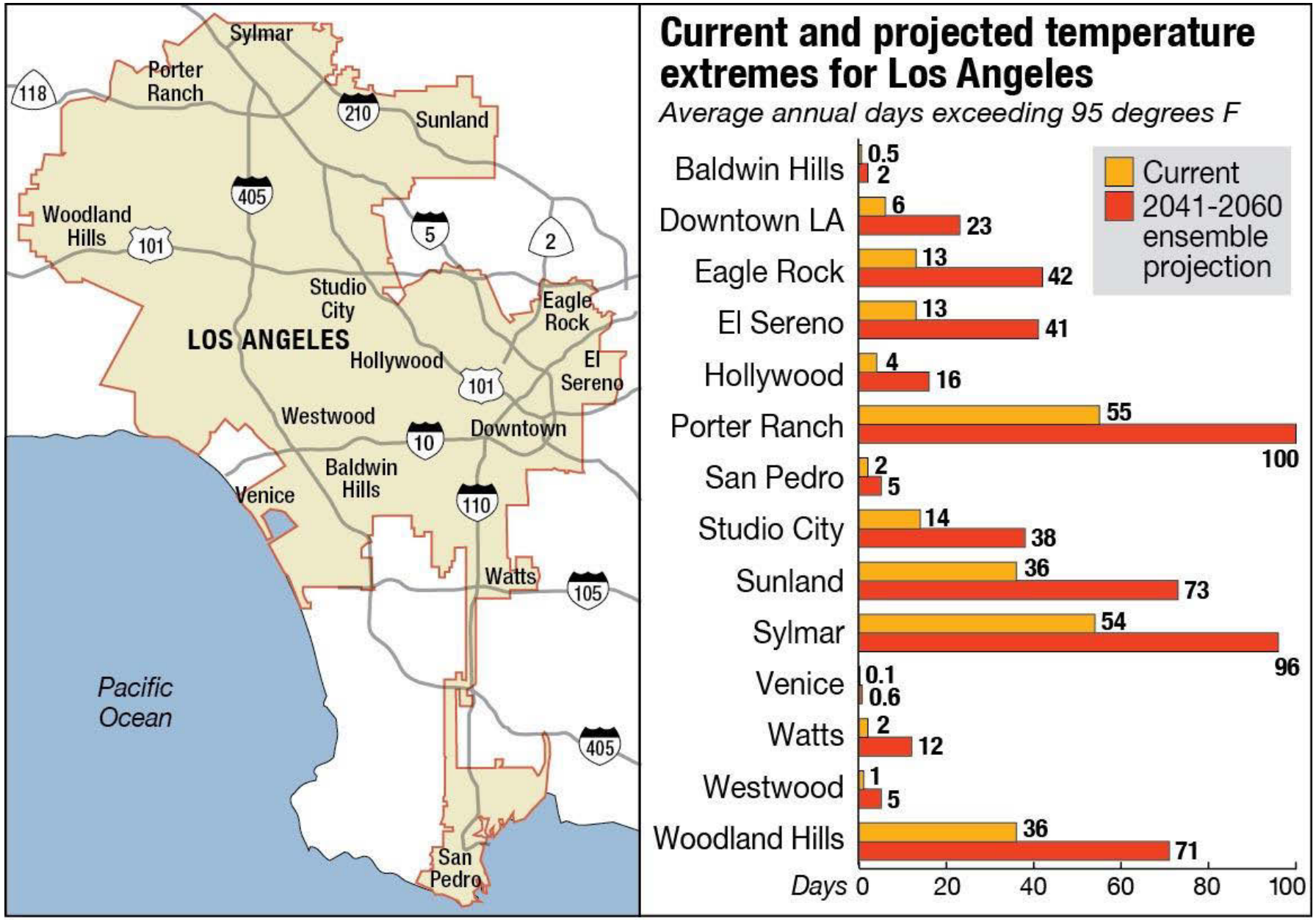
~30 GLOBAL CLIMATE MODELS APPLIED TO THE LOS ANGELES REGION



Groundbreaking Climate Modeling

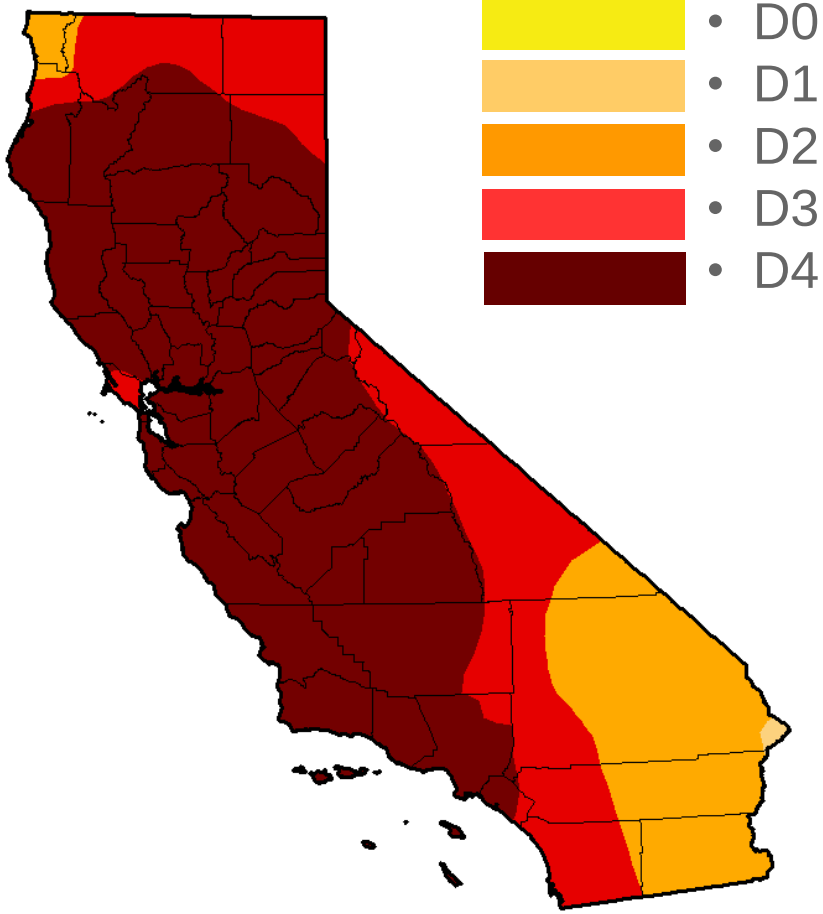
FUTURE CLIMATE PROJECTED FOR TWO SCENARIOS





Source: UCLA LARC study, 2012; chart based on the mean/average projected by the 18 climate models

Reduced Snowpack

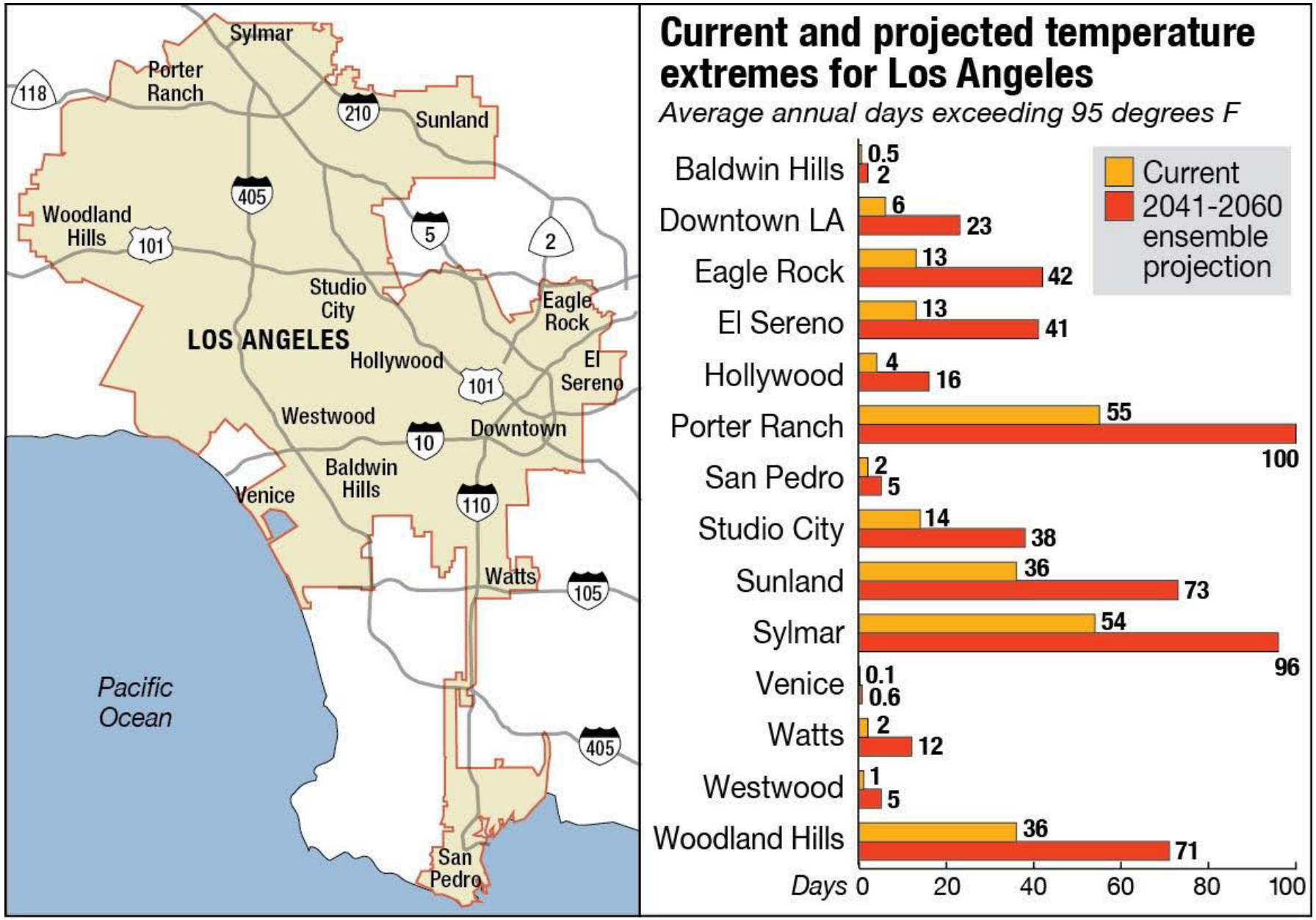


Intensity:

- D0 - Abnormally Dry
- D1 - Moderate Drought
- D2 - Severe Drought
- D3 - Extreme Drought
- D4 - Exceptional Drought

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary.

Author(s):
•Brad Rippey, U.S. Department of Agriculture



Source: UCLA LARC study, 2012; chart based on the mean/average projected by the 18 climate models

Q&A

Risk Assessments – Your Institution

EVENTS / RISKS

CLIMATE

Event / Risk
Extreme/Intense Precipitation Events
Temperature Extremes
Drought
Dew Point Changes
UV light

NATURAL DISASTER

Event / Risk
Extreme Wind (straight line, tornado)
Excessive Snow
Excessive Ice
Groundwater Contamination
Hail
Lightning
Seismic
Flash flooding
Fire

INFRASTRUCTURE

Event / Risk
Power Failure
Communications Failure
Water System Failure
Sewer/Storm System Failure
Damage to Utilities
Burst Pipe/Leaks

SECURITY

Event / Risk
Active threat
Cyber attack
Theft - staff
Theft - general
Personal safety & security - general
Personal safety & security - staff

LOCAL POLLUTION CONTROL

Event / Risk
Radon
Pests
Hazardous Materials
Outdoor Air Quality
Moisture Control/ Mold

OTHER

Event / Risk
Zombies
Protests
Lack of staff capacity

LEVEL OF CONCERN

CLIMATE

Event / Risk	Level of Concern
Extreme/Intense Precipitation Events	Moderate
Temperature Extremes	Moderate
Drought	Low
Dew Point Changes	Moderate
UV light	High

NATURAL DISASTER

Event / Risk	Level of Concern
Extreme Wind (straight line, tornado)	High
Excessive Snow	Moderate
Excessive Ice	Moderate
Groundwater Contamination	Low
Hail	Low
Lightning	Low
Seismic	Low
Flash flooding	Low
Fire	Moderate

INFRASTRUCTURE

Event / Risk	Level of Concern
Power Failure	Moderate
Communications Failure	Low
Water System Failure	Low
Sewer/Storm System Failure	Low
Damage to Utilities	Low
Burst Pipe/Leaks	Moderate

SECURITY

Event / Risk	Level of Concern
Active threat	High
Cyber attack	Low
Theft - staff	Low
Theft - general	Moderate
Personal safety & security - general	High
Personal safety & security - staff	Moderate

LOCAL POLLUTION CONTROL

Event / Risk	Level of Concern
Radon	Low
Pests	High
Hazardous Materials	Moderate
Outdoor Air Quality	Low
Moisture Control/ Mold	High

OTHER

Event / Risk	Level of Concern
Zombies	Low
Protests	Moderate
Lack of staff capacity	Moderate

IMPACT

CLIMATE

Event / Risk	Human	Assets	Business
Extreme/Intense Precipitation Events	Low	Low	Low
Temperature Extremes	Moderate	Moderate	Moderate
Drought	Low	Low	Low
Dew Point Changes	Moderate	Moderate	Moderate
UV light	Low	High	Moderate

NATURAL DISASTER

Event / Risk	Human	Assets	Business
Extreme Wind (straight line, tornado)	High	High	High
Excessive Snow	Moderate	Moderate	Moderate
Excessive Ice	Moderate	Moderate	Moderate
Groundwater Contamination	Moderate	Low	Moderate
Hail	Low	Low	Low
Lightning	Low	Low	Low
Seismic	Low	Moderate	Low
Flash flooding	Low	Low	Low
Fire	High	High	High

INFRASTRUCTURE

Event / Risk	Human	Assets	Business
Power Failure	Moderate	Moderate	Moderate
Communications Failure	Low	Low	Moderate
Water System Failure	Low	Low	Low
Sewer/Storm System Failure	Low	Low	Moderate
Damage to Utilities	Low	Moderate	Moderate
Burst Pipe/Leaks	Low	High	Moderate

SECURITY

Event / Risk	Human	Assets	Business
Active threat	High	High	High
Cyber attack	Low	Moderate	Moderate
Theft - staff	Low	Moderate	Moderate
Theft - general	Low	Moderate	Low
Personal safety & security - general	High	Low	Moderate
Personal safety & security - staff	High	Low	Moderate

LOCAL POLLUTION CONTROL

Event / Risk	Human	Assets	Business
Radon	Moderate	Low	Low
Pests	Low	High	Moderate
Hazardous Materials	Moderate	Low	Low
Outdoor Air Quality	Moderate	Low	Low
Moisture Control/ Mold	Moderate	High	Moderate

OTHER

Event / Risk	Human	Assets	Business
Zombies	High	Low	Low
Protests	Low	Low	Moderate
Lack of staff capacity	Moderate	Moderate	Moderate

PREPAREDNESS

CLIMATE

Event / Risk	Building	Staff	Services
Extreme/Intense Precipitation Events	High	High	High
Temperature Extremes	Moderate	High	Moderate
Drought	High	High	High
Dew Point Changes	Moderate	High	Moderate
UV light	Moderate	High	Moderate

NATURAL DISASTER

Event / Risk	Building	Staff	Services
Extreme Wind (straight line, tornado)	Moderate	High	High
Excessive Snow	High	High	High
Excessive Ice	High	High	High
Groundwater Contamination	Moderate	High	High
Hail	High	High	High
Lightning	Moderate	High	High
Seismic	Low	Moderate	High
Flash flooding	High	High	High
Fire	Moderate	High	High

INFRASTRUCTURE

Event / Risk	Building	Staff	Services
Power Failure	Low	Moderate	High
Communications Failure	Low	Moderate	High
Water System Failure	Moderate	High	High
Sewer/Storm System Failure	Moderate	High	High
Damage to Utilities	Moderate	High	High
Burst Pipe/Leaks	Low	Moderate	High

SECURITY

Event / Risk	Building	Staff	Services
Active threat	Low	Moderate	High
Cyber attack	High	High	High
Theft - staff	Low	Low	Moderate
Theft - general	Low	Low	High
Personal safety & security - general	High	High	High
Personal safety & security - staff	High	High	High

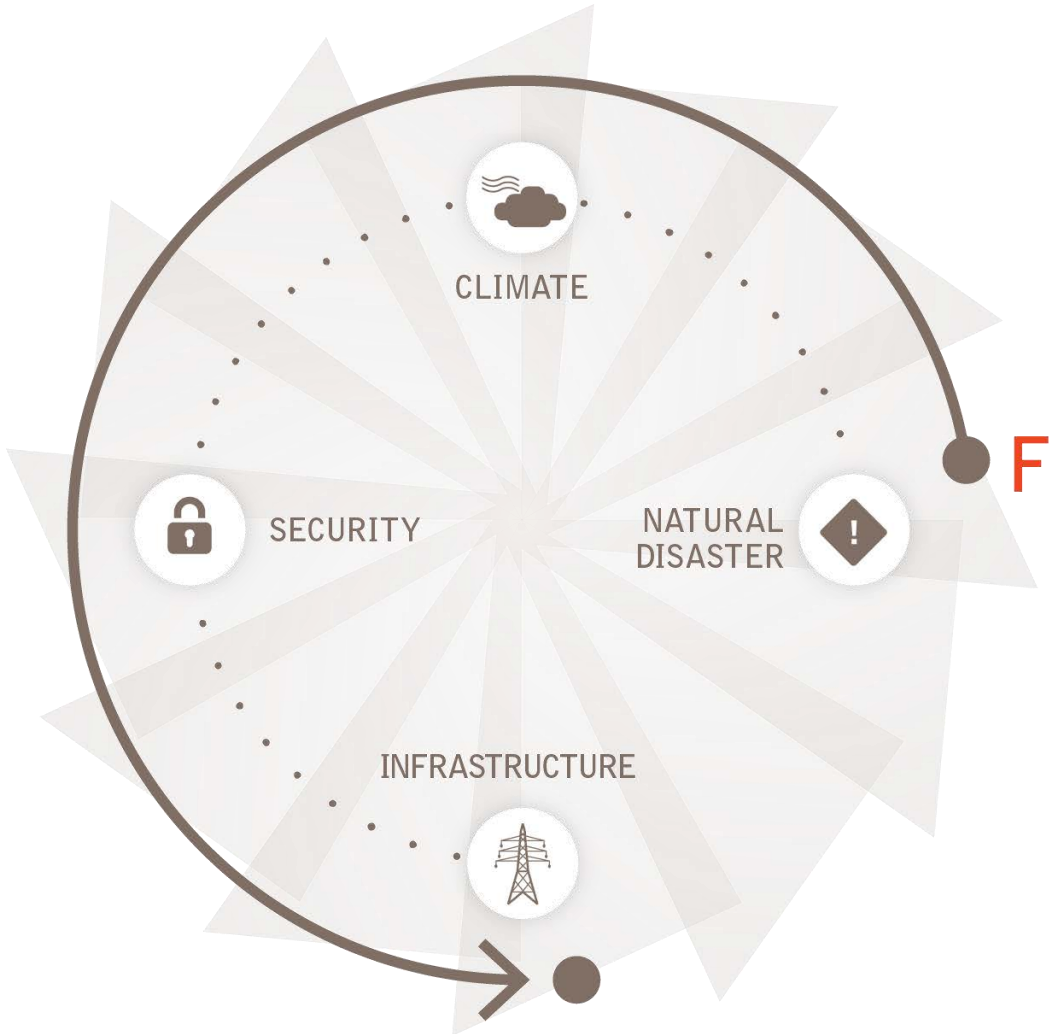
LOCAL POLLUTION CONTROL

Event / Risk	Building	Staff	Services
Radon	High	High	High
Pests	Moderate	Low	High
Hazardous Materials	High	High	High
Outdoor Air Quality	High	High	High
Moisture Control/ Mold	Low	Moderate	Moderate

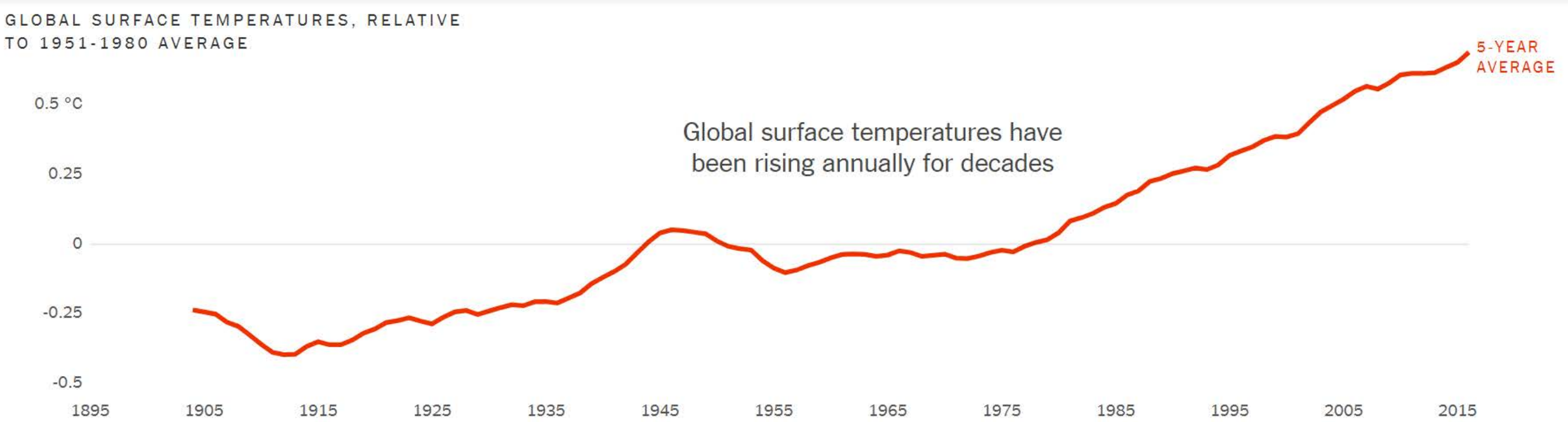
OTHER

Event / Risk	Building	Staff	Services
Zombies	Low	Low	Low
Protests	Low	Moderate	High
Lack of staff capacity	Low	Moderate	Moderate

	RISK	LEVEL OF CONCERN	SEVERITY = (MAGNITUDE - MITIGATION)						RISK
			HUMAN IMPACT	ASSETS IMPACT	BUSINESS IMPACT	PREPAREDNESS	STAFF RESPONSE	SERVICES RESPONSE	
	RISK	*Likelihood & owner concern*	*Possibility of injury or death*	*Physical losses and damages*	*Interuption of services*	*Bricks & Mortar - Design Mitigation*	*Staff emergency planning/response*	*Other agencies/ external response*	Relative threat*
		1 = Low 2 = Moderate 3 = High	*1 = Low 2 = Moderate 3 = High*	*1 = Low 2 = Moderate 3 = High*	*1 = Low 2 = Moderate 3 = High*	*3 = Low 2 = Moderate 1 = High*	*3 = Low 2 = Moderate 1 = High*	*3 = Low 2 = Moderate 1 = High*	0 - 100%
CLIMATE	Extreme/Intense Precipitation Events	Moderate	Low	Low	Low	High	High	High	22%
	Temperature Extremes	Moderate	Moderate	Moderate	Moderate	Moderate	High	Moderate	41%
	Drought	Low	Low	Low	Low	High	High	High	11%
	Dew Point Changes	Moderate	Moderate	Moderate	Moderate	Moderate	High	Moderate	41%
	UV light	High	Low	High	Moderate	Moderate	High	Moderate	61%
NATURAL DISASTER	Extreme Wind (straight line, tornado)	High	High	High	High	Moderate	High	High	72%
	Excessive Snow	Moderate	Moderate	Moderate	Moderate	High	High	High	33%
	Excessive Ice	Moderate	Moderate	Moderate	Moderate	High	High	High	33%
	Groundwater Contamination	Low	Moderate	Low	Moderate	Moderate	High	High	17%
	Hail	Low	Low	Low	Low	High	High	High	11%
	Lightning	Low	Low	Low	Low	Moderate	High	High	13%
	Seismic	Low	Low	Moderate	Low	Low	Moderate	High	19%
	Flash flooding	Low	Low	Low	Low	High	High	High	11%
	Fire	Moderate	High	High	High	Moderate	High	High	48%

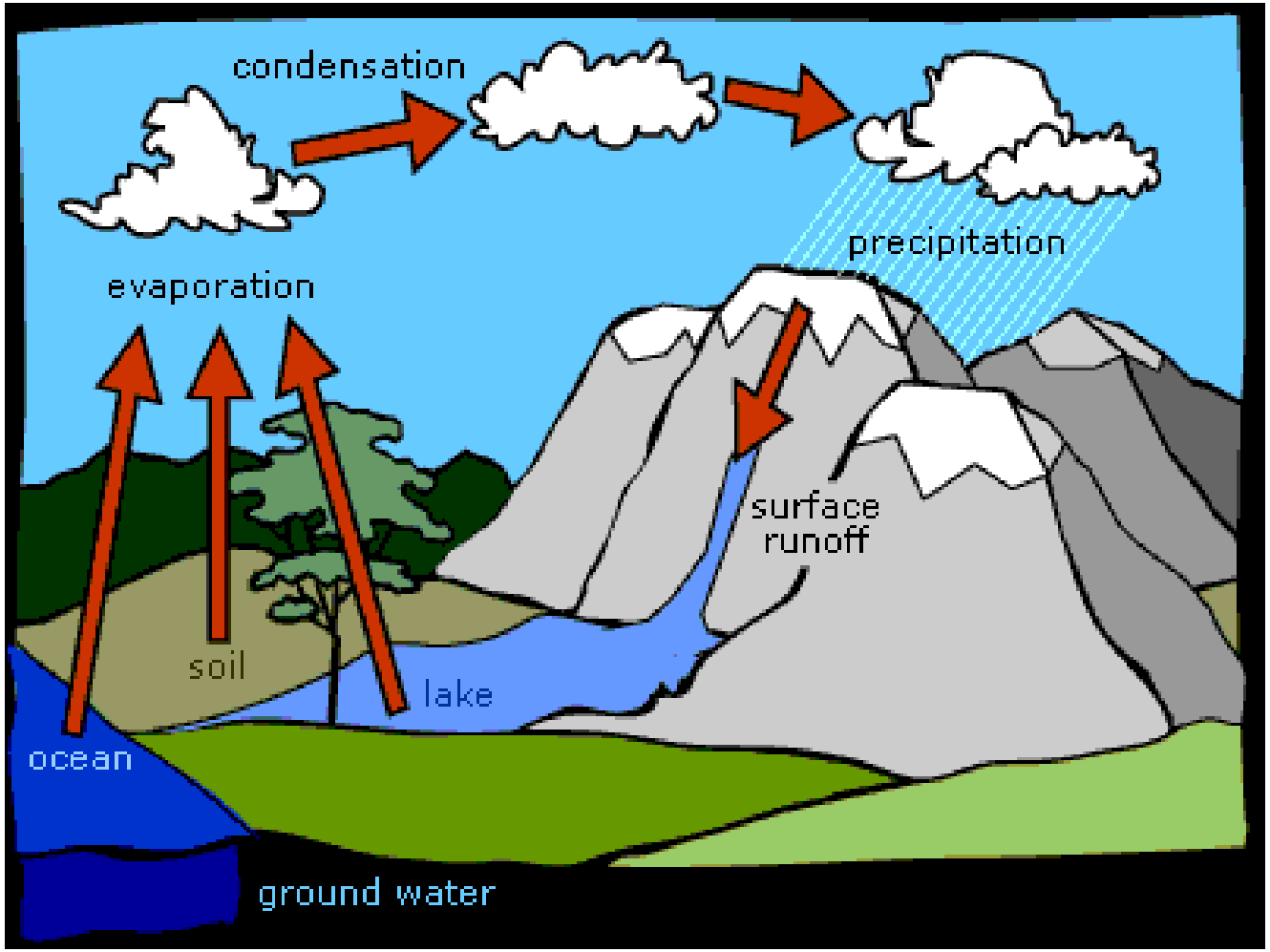


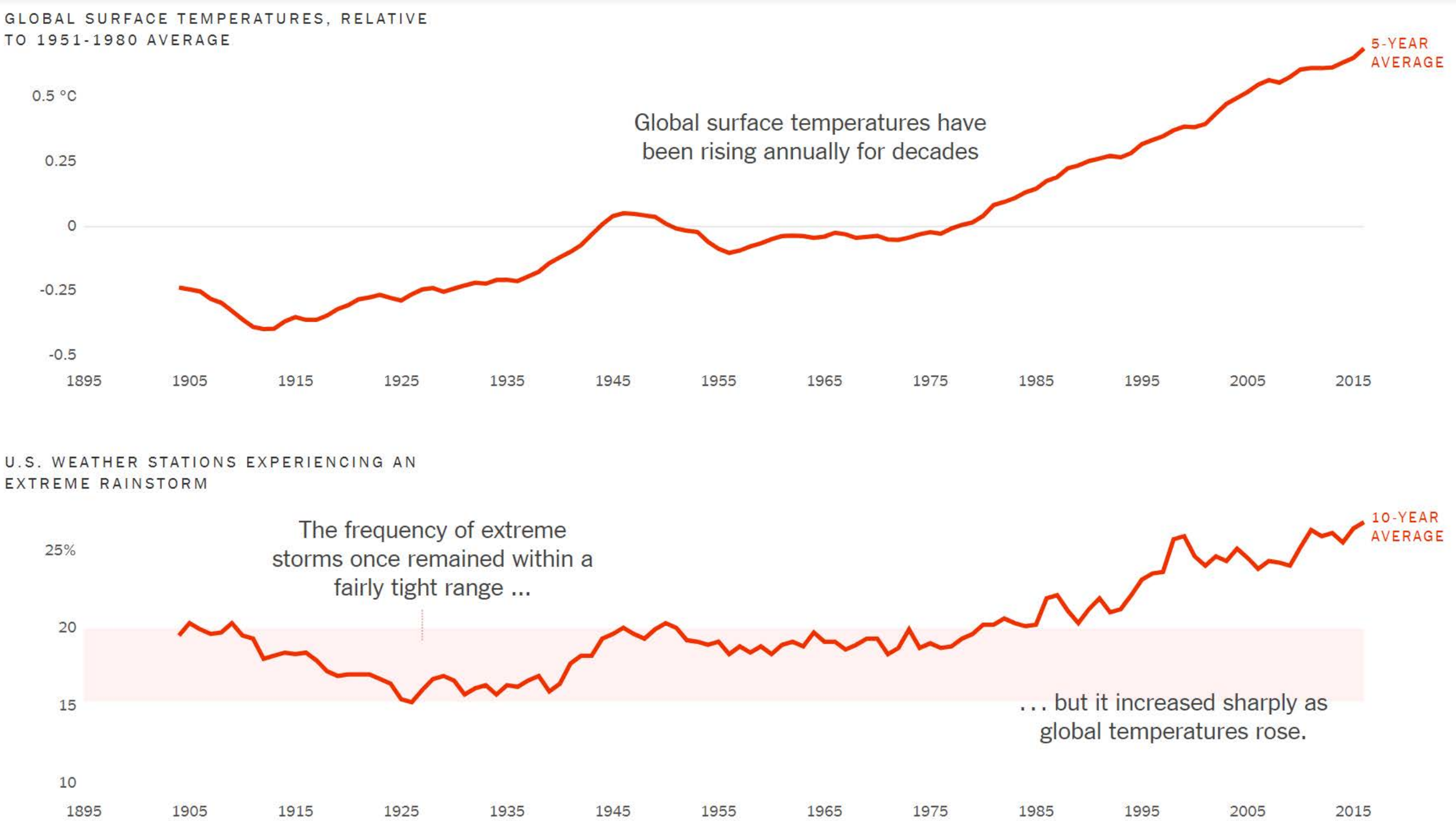
FORECAST
RISKS


GLOBAL SURFACE TEMPERATURES, RELATIVE TO 1951-1980 AVERAGE
5-YEAR AVERAGE
Global surface temperatures have been rising annually for decades
0.5 °C
0.25
0
-0.25
-0.5
1895
1905
1915
1925
1935
1945
1955
1965
1975
1985
1995
2005
2015

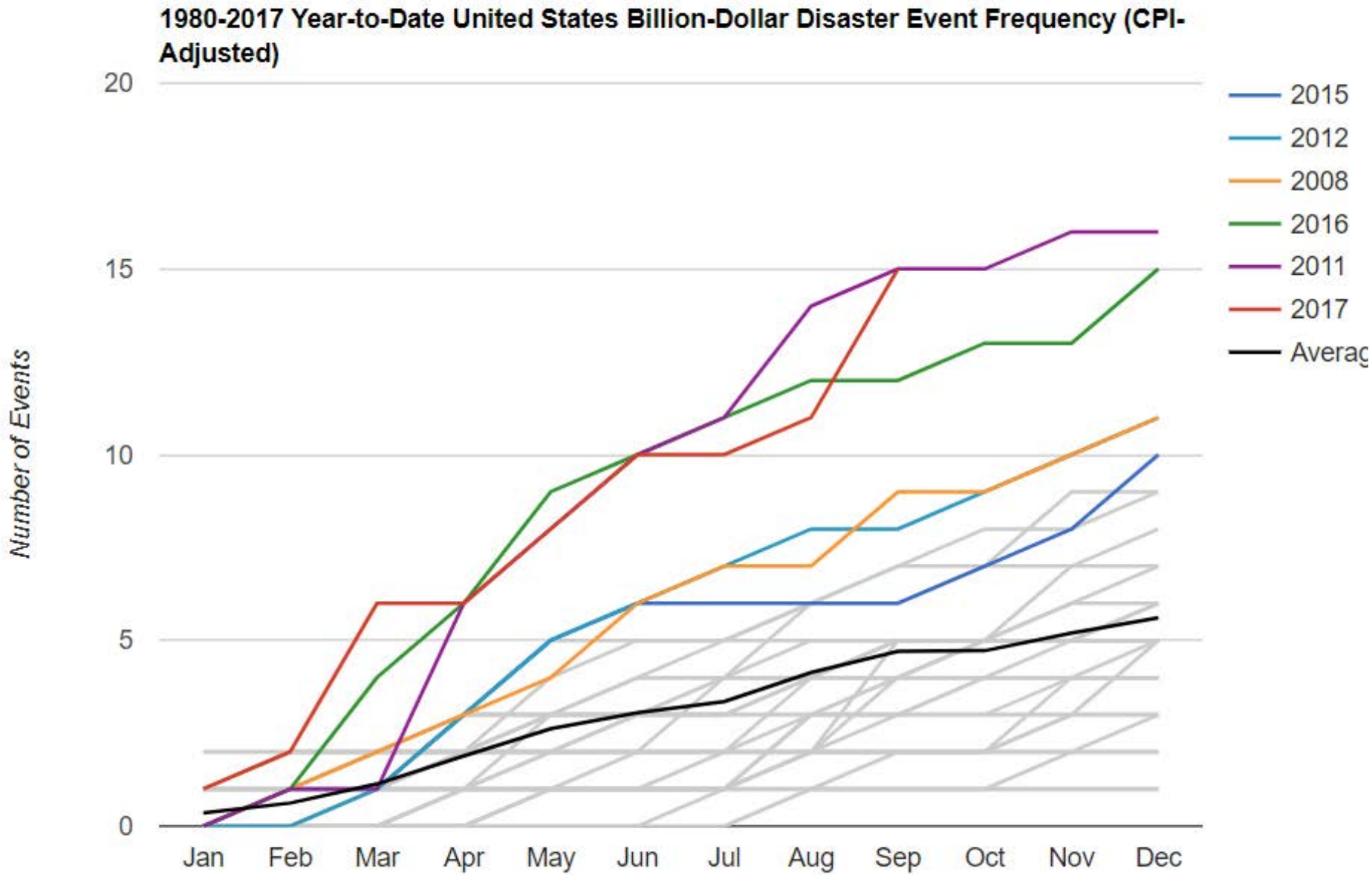
Warmer air holds more moisture

WHY DOES THIS MATTER?




GLOBAL SURFACE TEMPERATURES, RELATIVE TO 1951-1980 AVERAGE
5-YEAR AVERAGE
0.5 °C
0.25
0
-0.25
-0.5
Global surface temperatures have been rising annually for decades
1895
1905
1915
1925
1935
1945
1955
1965
1975
1985
1995
2005
2015
U.S. WEATHER STATIONS EXPERIENCING AN EXTREME RAINSTORM
10-YEAR AVERAGE
25%
20
15
10
The frequency of extreme storms once remained within a fairly tight range ...
. . . but it increased sharply as global temperatures rose.
1895
1905
1915
1925
1935
1945
1955
1965
1975
1985
1995
2005
2015

United States ▾ Frequency ▾ Update



Event statistics are added according to the date on which they ended. Statistics valid as of October 6, 2017.

What are the top risks at your institution?

CLIMATE

INFRASTRUCTURE

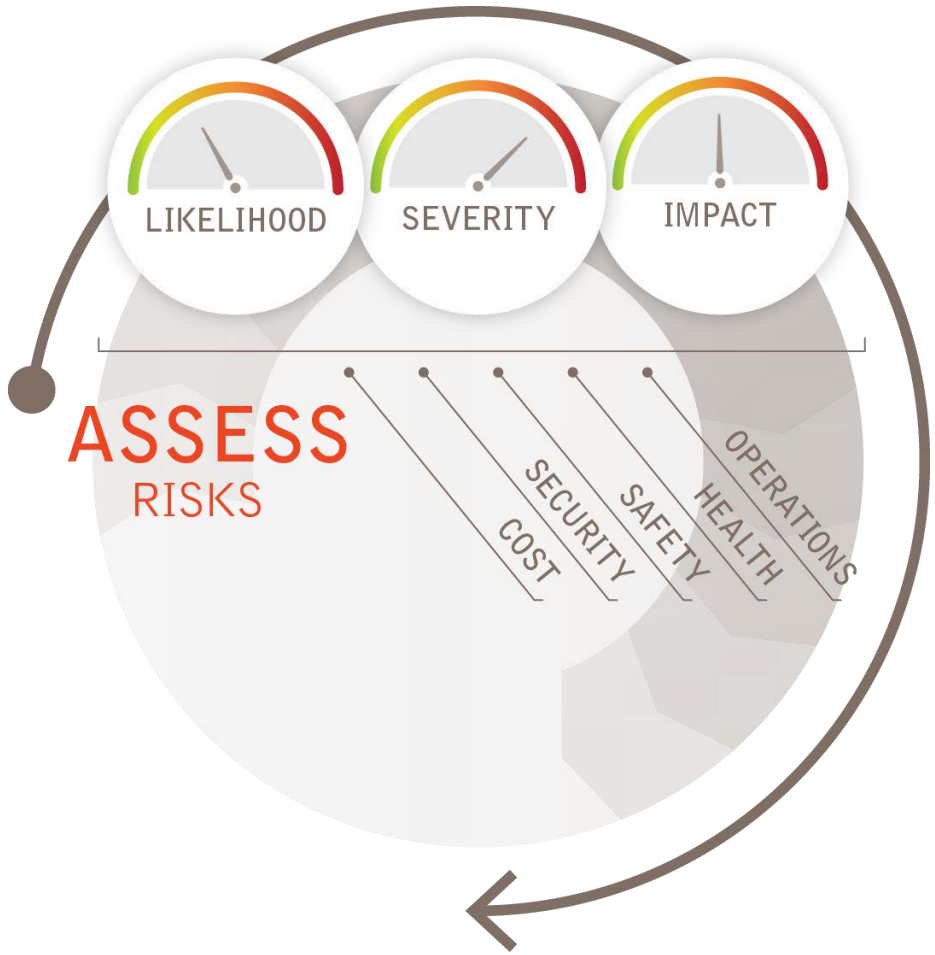
NATURAL DISASTER

SECURITY

LOCAL POLLUTION

What are the top risks at your institution?

- If you have a hazard mitigation/risk management plan for your institution, what are some of the top risks?
- Who are some of the stakeholders you could engage to identify or confirm top risks?


LIKELIHOOD
SEVERITY
IMPACT
ASSESS
RISKS
COST
SECURITY
SAFETY
HEALTH
OPERATIONS

What is the likelihood this risk will occur?

- What data might you use to understand this? Has it happened before? Somewhere nearby?
- Who are some of the stakeholders you could engage to identify likelihood?
- Are there risks that have low likelihood but are still of high concern because of the potential impact?

What are the potential impacts?

- Human: possibility of death or injury
- Property/Assets: physical losses or damages, cost to replace/repair
- Business
  - Interruption of operating hours
  - Employees unable to work, students unable to get to campus (or leave campus)
  - Additional community members coming to campus for shelter
  - Interruption of critical supplies or services
- Who are some of the stakeholders you could engage to understand impacts?

How prepared is your institution to respond?

- Infrastructure mitigation
- Staff training & response, supplies on hand
- Campus services response
- Outside services response (fire/police, insurance, contractors, etc.)
- Who are some of the stakeholders you could engage to understand current preparedness, and strengthen future preparedness?

Takeaways & Discussion

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