

# Building Business Resilience



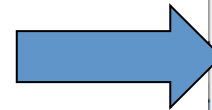


# WEBINAR LOGISTICS

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# PANELISTS



**Meg Arnold**

Valley Vision



**Katy Maher**

Center for Climate and Energy Solutions



**Chris Benjamin**

Pacific Gas and Electric Company



# WELCOME

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**Larry Greene**

Sacramento Metropolitan Air Quality  
Management District



# ARCCA

Alliance of Regional Collaboratives for Climate Adaptation

Formed in 2012, ARCCA is a network of regional collaboratives in California coordinating and supporting climate adaptation efforts to enhance public health, protect natural systems, build economies, and improve quality of life.

**ARCCA encompasses over 80% of the state's population**





ARCCA member regional collaboratives have come together to:

- **Amplify and solidify** their individual adaptation efforts
- **Give a stronger voice to regionalism** at state and federal levels, and ensure that state planning efforts consider regional needs and priorities.
- **Share** information on best practices and lessons learned
- **Identify** successful strategies and opportunities for support and collaboration between regions
- **Empower** collaboration across all sectors and levels of leadership

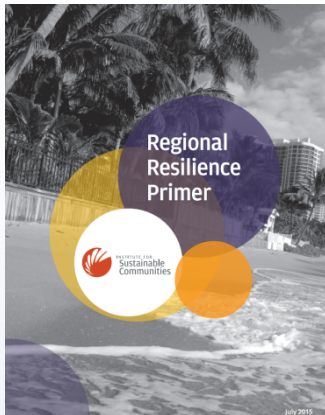


# ARCCA

Alliance of Regional Collaboratives for Climate Adaptation

## Our Work and Successes

- Identified as a resource for state agencies in the Climate Change Research Plan and the Governor's Executive Order B-30-15
- Built a toolkit to support the formation of new collaboratives



Organize and participated in a national training or regional collaboratives hosted by the Institute for Sustainable Communities



Participated in and helped to frame the program for the 1st and 2nd Bi-annual National Adaptation Forums in Denver and St. Louis.

- Shared information and resources on regional collaboration to national audiences at the 2014 National Council for Science and the Environment Conference, the 2015 New Partners for Smart Growth Conference, and the 2015 National Adaptation Forum
- Provided feedback and comments to State of California planning and reports, including the Governor's Office of Planning and Research *Environmental Goals and Policies Report*, the California Natural Resource Agency's *Safeguarding California*, and the Climate Change Research Plan





## CAPITAL REGION CLIMATE READINESS COLLABORATIVE

**Six counties in the Capital Region:**  
El Dorado, Placer, Sacramento,  
Sutter, Yolo, and Yuba



### Goals:

- **Protect and strengthen** the Capital Region's people, economy, resources, and heritage.
- **Build a network** for regional cooperation, bringing together leaders from across sector and jurisdictional boundaries to address climate adaptation.
- **Amplify the voice** of the Capital Region at the state and national level in emerging and ongoing adaptation discussions and planning
- **Help members** identify, apply for and access funding for important regional priorities.





CAPITAL REGION  
CLIMATE READINESS  
COLLABORATIVE

# Members



## UCDAVIS

**POLICY INSTITUTE FOR ENERGY, ENVIRONMENT AND THE ECONOMY**

*Leveraging university expertise to inform better policy*







CAPITAL REGION  
CLIMATE READINESS  
COLLABORATIVE

# Highlights of our work



## The Capital Region Business Resiliency Initiative Disaster Preparedness Toolkit

40% to 60% of small  
businesses **never** reopen  
after a major disaster

...and 57% of  
businesses have **no**  
disaster recovery plan

resilientbusiness.org



Reduce the risk and  
economic impact of  
weather-related  
disasters for small  
businesses in the  
region.



## SACRAMENTO REGION TRANSPORTATION CLIMATE ADAPTATION PLAN



Analyzing climate  
vulnerabilities for the  
region's transportation  
network

Increasing urban  
tree canopy for  
disadvantaged  
communities



## Addressing Climate Change Adaptation in Water Resource Management: A Case Study of the Sacramento Region



Sacramento River (top), Folsom Dam and American River Watershed (bottom)  
Google Earth imagery (2014, 200, 300M, 150, 300M, 75M, 30M, 15M, 7.5M, 3.75M, 1.875M, 937.5M, 468.75M, 234.375M, 117.1875M, 58.59375M, 29.296875M, 14.6484375M, 7.32421875M, 3.662109375M, 1.8310546875M, 0.91552734375M, 0.457763671875M, 0.2288818359375M, 0.11444091796875M, 0.057220458984375M, 0.0286102294921875M, 0.01430511474609375M, 0.007152557373046875M, 0.0035762786865234375M, 0.00178813934326171875M, 0.000894069671630859375M, 0.0004470348358154296875M, 0.00022351741790771484375M, 0.000111758708953857421875M, 0.0000558793544769287109375M, 0.00002793967723846435546875M, 0.000013969838619232177734375M, 0.0000069849193096160888671875M, 0.00000349245965480804443359375M, 0.000001746229827404022216796875M, 0.0000008731149137020111083984375M, 0.00000043655745685100555419921875M, 0.000000218278728425502777099609375M, 0.0000001091393642127513885498046875M, 0.00000005456968210637569427490234375M, 0.000000027284841053187847137451171875M, 0.0000000136424205265939235687255859375M, 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# CAPITAL REGION BUSINESS RESILIENCY INITIATIVE

Presented by Valley Vision

[www.resilientbusiness.org](http://www.resilientbusiness.org)



70,000+ acres • 6,400 structures  
threatened • 365 residences destroyed



~ Valley Fire Incident Information 9/17



# “Unheard-of fire behavior”



~ Cal Fire



“Unprecedented cataclysm”



~ Washington Governor Jay Inslee



“This is the present, and the future, of  
climate change.”



~ Rolling Stone



# Why is business resiliency important?

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Building small business capacity *before* a time of crisis, to create businesses, and an overall community, better prepared to weather any storm.

Resiliency is about protecting 3 major asset groups:

- Your people
- Your facilities
- Your information

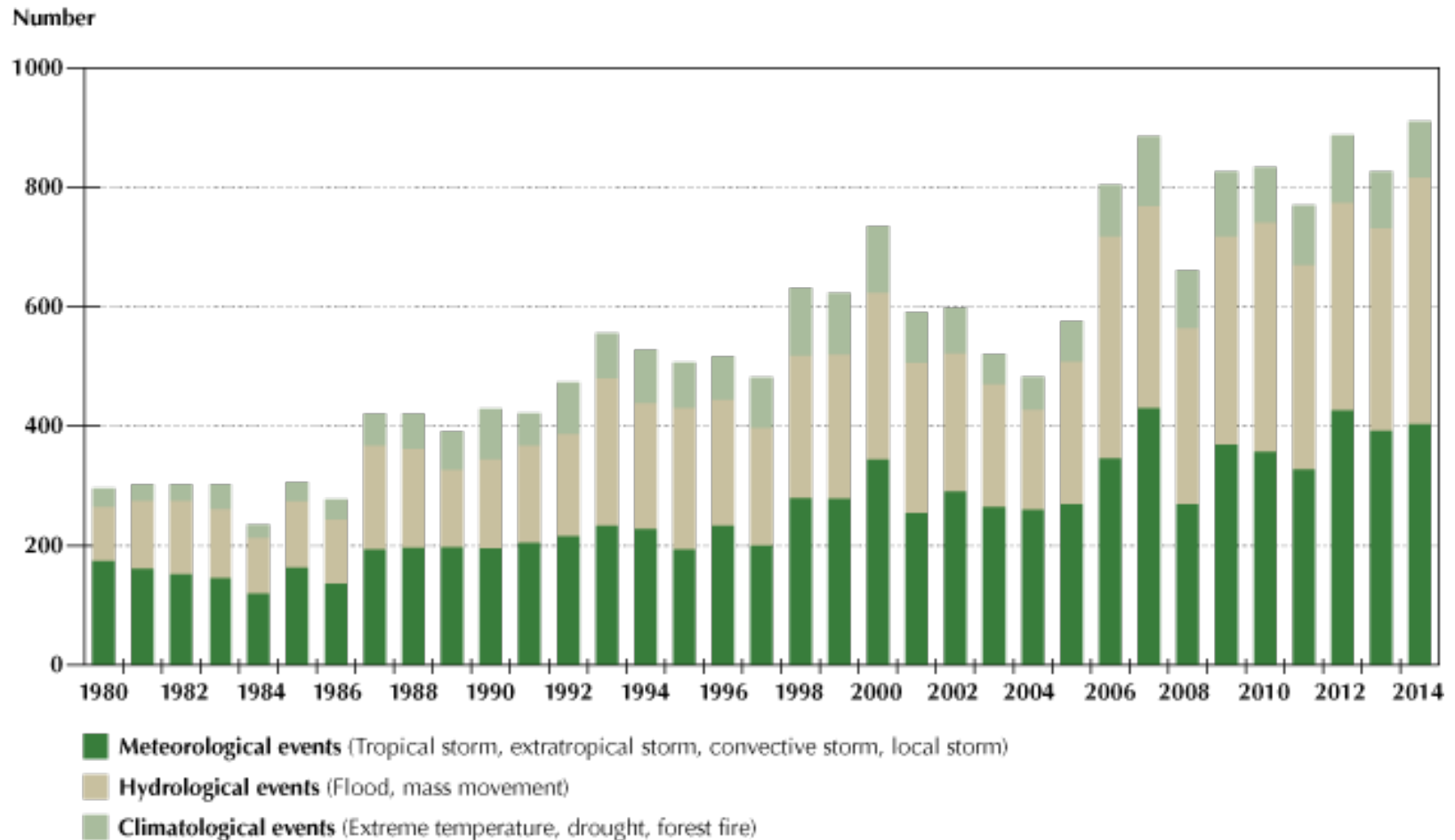
Beyond “four walls” of individual businesses, resiliency is highly interdependent with public infrastructure (power, roads, etc.)



# At a time when disaster threats are on the rise ...

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## Number of Global Weather-Related Loss Events (1980–2014)

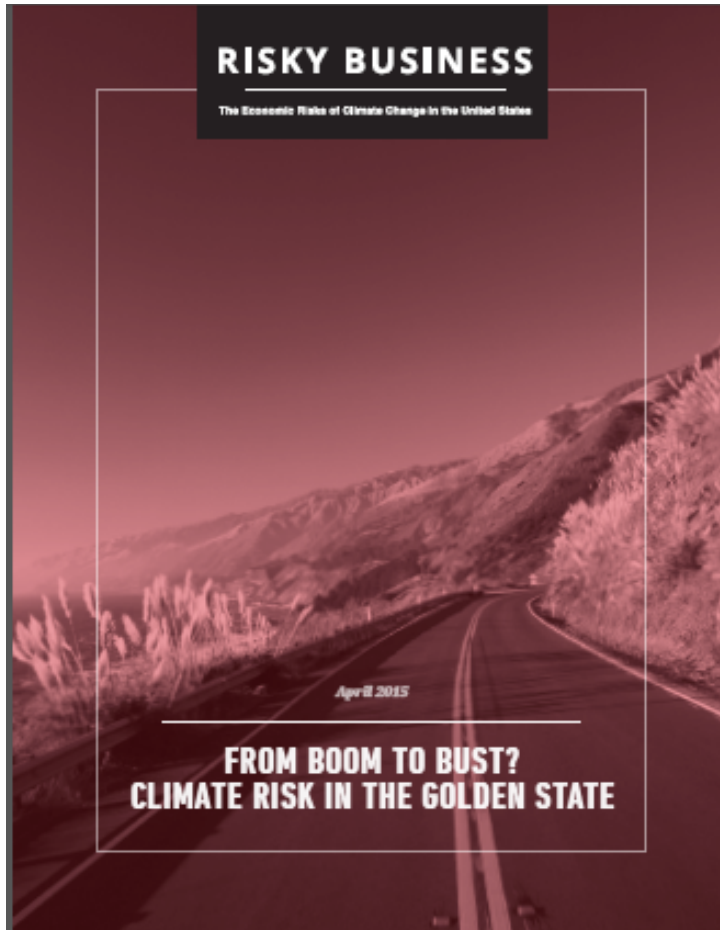


Source: *Weathering the Next Storm*, September 2015, Center for Climate and Energy Solutions



# ...California businesses anticipate state-specific climate impacts

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- ❑ Increase in extreme heat
- ❑ Changes in precipitation
- ❑ Shifting agricultural patterns, crop yields
- ❑ Increasing electricity demand and higher costs
- ❑ Heat-related decline in labor productivity, worsening air quality



# Preparedness Helps Minimize Business Risk

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## Disaster Impacts on Businesses

- ❑ Loss of sales & customers, both immediately and longer-term (reputational impact)
- ❑ Business disruption and downtime
- ❑ Uninsured loss
  - ▣ continuing operations costs
  - ▣ destruction of physical property
- ❑ Supply chain and/or distribution impacts
- ❑ Cash flow and cash balance challenges



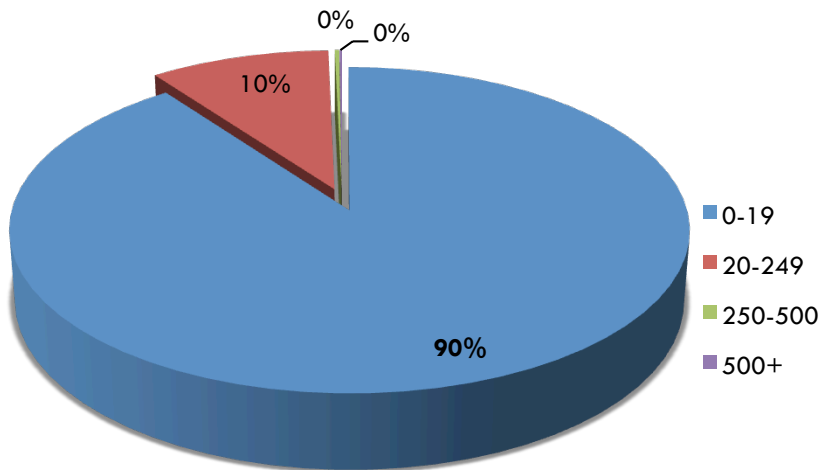
# Small business is critical to our economy

10

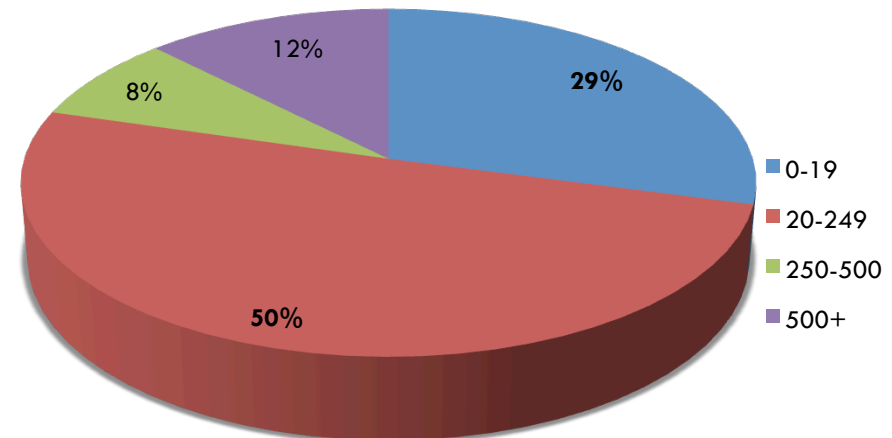
In California's Capital Region:

- Businesses with <20 employees account for **90%** of the region's 60,000 businesses in 2012
- Businesses with <249 employees account for almost **80%** of all private sector jobs

**Total Businesses**



**Total Employees**





# Small business resiliency is essential

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1. Businesses without business resiliency plans are the least likely to re-open or recover after a disaster.
2. Small businesses are the least likely to have put a resiliency plan in place
3. The smallest businesses are **less prepared to rebound** after a disruption
  - More vulnerable to impacts of extreme weather

**~40-60% never reopen** after a major disaster



# The Business Resiliency Toolkit

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# Funders and Project Advisors

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## Channel Partners:



**Technical Advisory Team:** SMUD, Mulvaney's B&L, River City Food Bank, Connect Consulting Services, Association of Sacramento Area Planners

[www.resilientbusiness.org](http://www.resilientbusiness.org) [resilientbusiness@valleyvision.org](mailto:resilientbusiness@valleyvision.org) (916) 325-1630

The Capital Region Business Resiliency Initiative is a project of Valley Vision, a 501(c)3 nonprofit organization. [valleyvision.org](http://valleyvision.org)





# Contact Info

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VALLEY VISION



*Connect. Partner. Impact.*

## Business Resiliency Initiative

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2320 Broadway, Sacramento



# Weathering the Next Storm: A Closer Look at Business Resilience

Katy Maher  
Science Fellow and Resilience Coordinator  
C2ES

*December 2, 2015*



CENTER FOR CLIMATE  
AND ENERGY SOLUTIONS

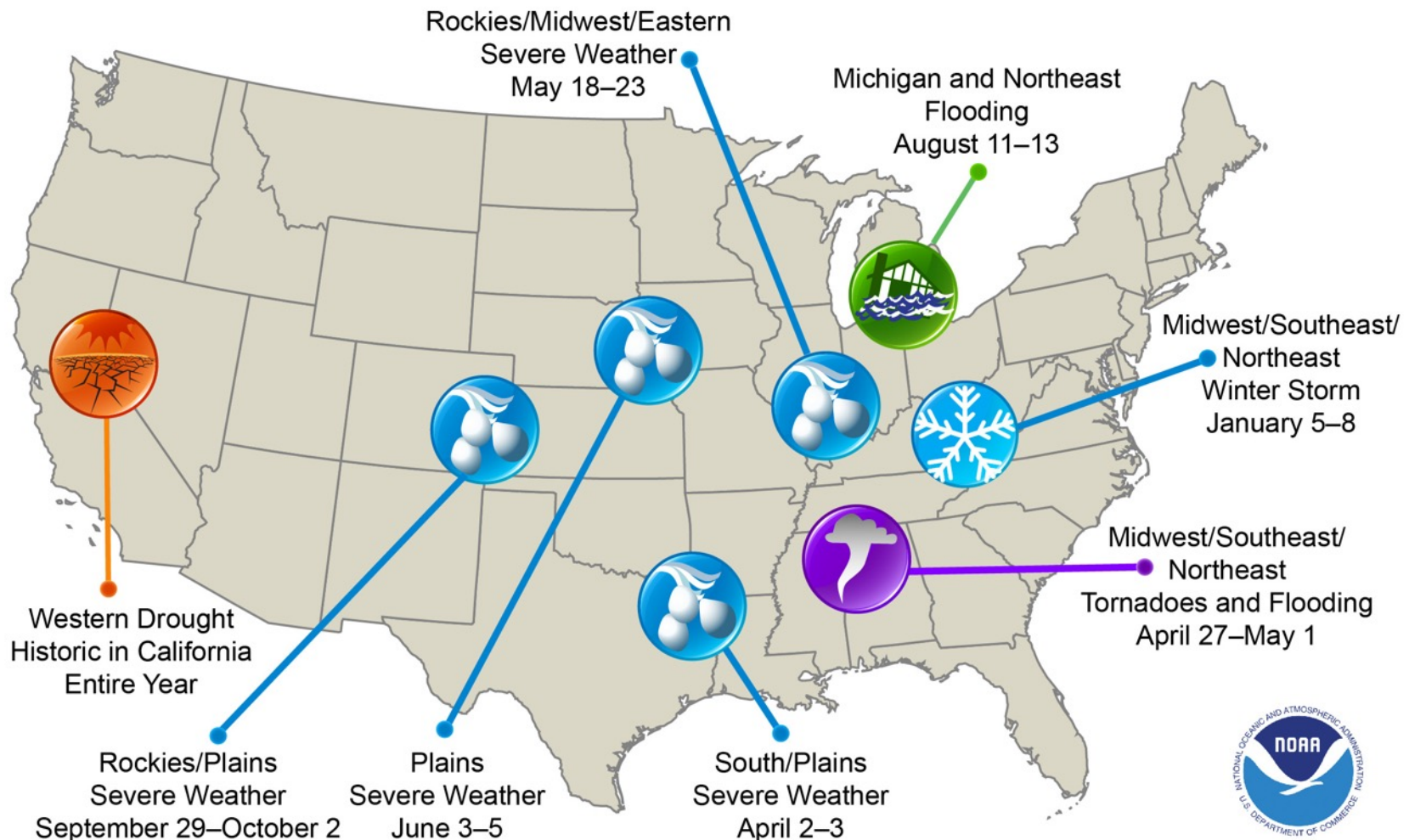
C2ES.ORG



# Weather and climate impacts are costly



## U.S. 2014 Billion-Dollar Weather and Climate Disasters



*This map denotes the approximate location for each of the eight billion-dollar weather and climate disasters that impacted the United States during 2014.*

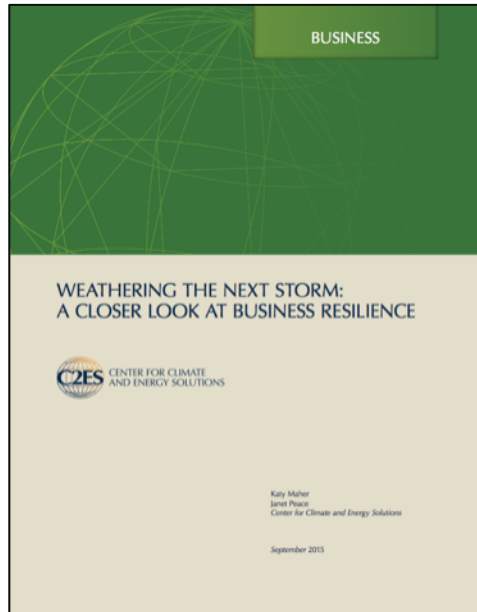




## A Closer Look at Business Resilience



# “Weathering the Next Storm” Report



- Examines how companies perceive extreme weather and climate impacts & their initial risk management steps
- Explores:
  - Strategies companies are using to prioritize and plan for climate risks
  - Data and tools used to evaluate vulnerabilities
  - Key barriers that impede resilience planning
  - Partnerships that bring together stakeholders involved in risk assessment and resilience planning

## Methodology

**I. Review of S&P Global 100** for quantitative trends + examples of best practice in their CDP, financial filings, and annual/sustainability reports

**II. Interviews with global companies** to explore barriers to action, tools, partnerships, and best practices for business resilience

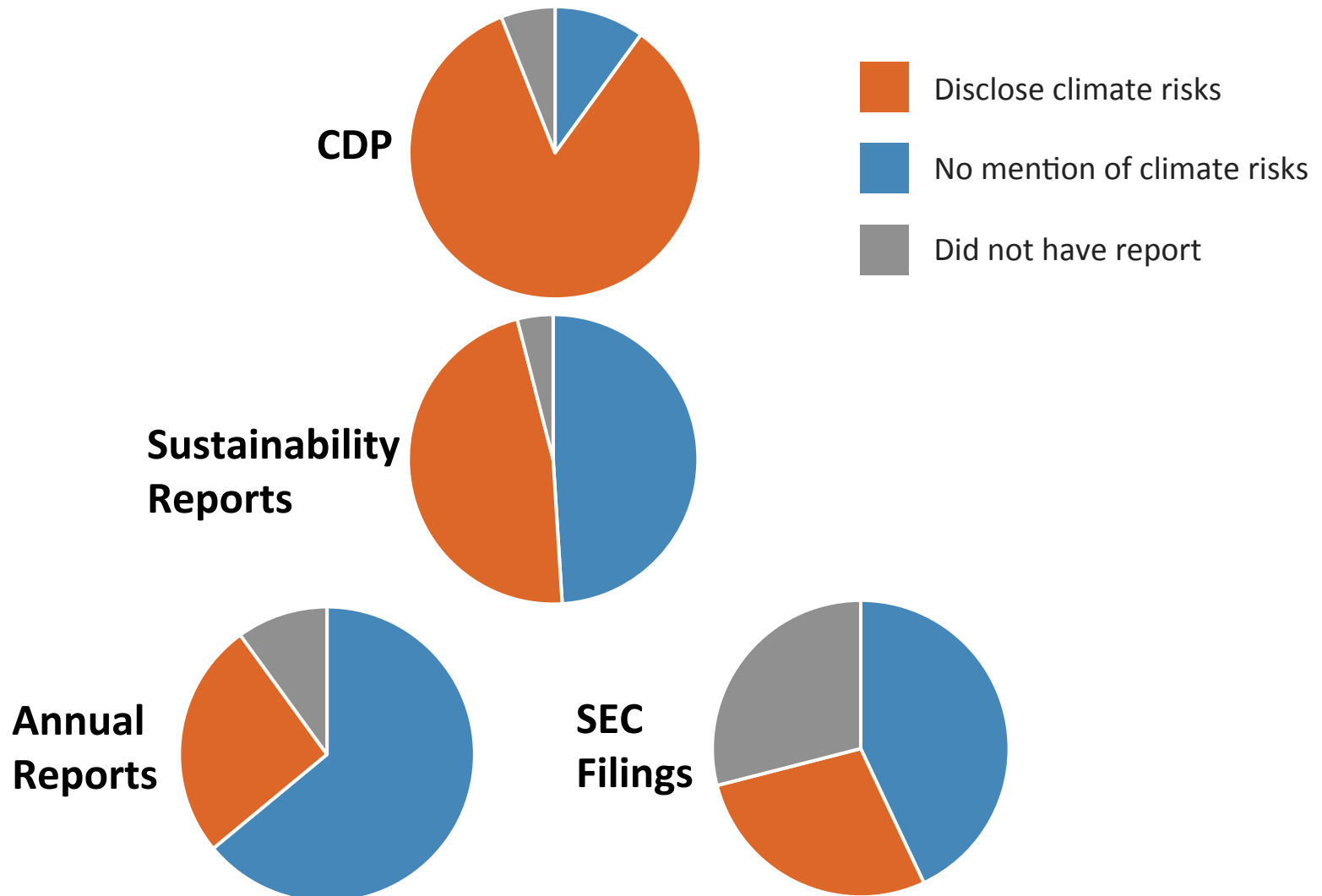
**III. Business workshops** with companies, government agencies, cities, NGOs and experts (July 2014, March and July 2015)



**More than 90% of the world's largest 100 companies see extreme weather and other climate impacts as business risks.**



# Where are companies disclosing climate change risks?





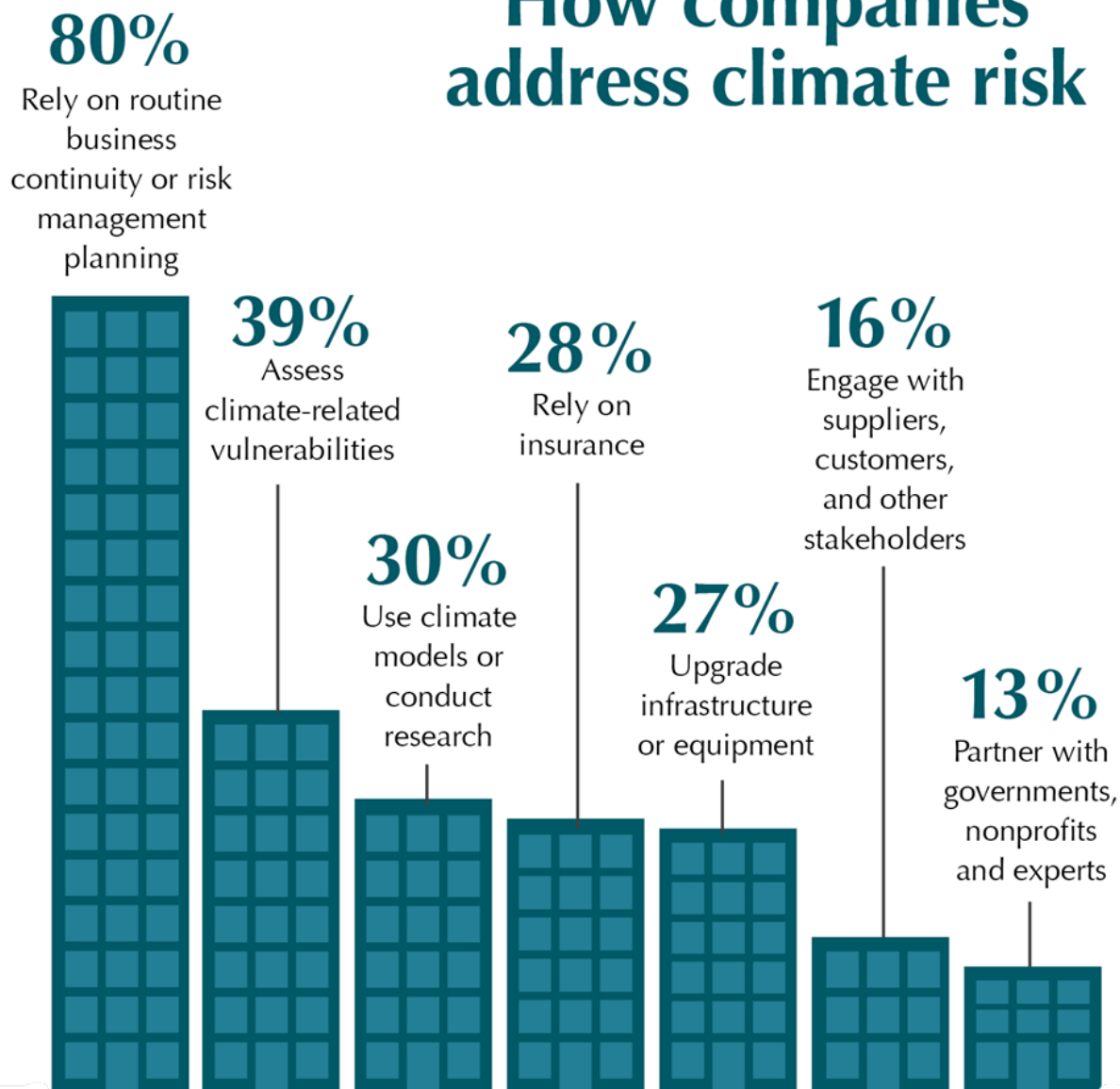
# What are companies concerned about?



- **Extreme weather** events are important, as well as **long-term changes**
- **Precipitation extremes/drought** most common stressor mentioned
  - Future water risks
- Risks are seen as **near-term**
- Disruptions to **production capacity** and impacts on **operational costs**



## How companies address climate risk





## Risks to:

### **BROADER NETWORK**

Public/private electric and water utilities  
and other infrastructure

### **VALUE CHAIN**

Supplies of natural resources  
and raw materials

### **CORE OPERATIONS**

Physical assets,  
production processes,  
emergency  
management,  
operations and  
maintenance

Workforce  
and  
changing  
lifestyles

Customers'  
access to  
product

Customers and demand  
for goods and services

Government-supplied services

Supply  
chain

Other  
inputs into  
production

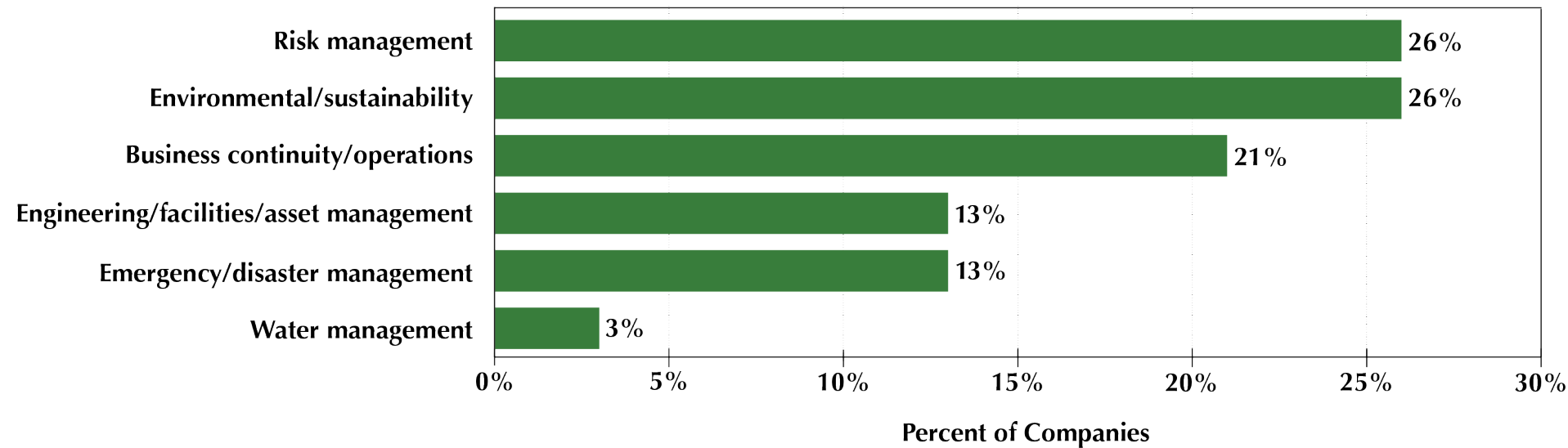
## Businesses see climate change as magnifying existing risks

Climate change can exacerbate threats to a company's core operations, supply and distribution chains, workforce and customers. Seeing existing risks through a climate lens places these risks within a business framework, but some impacts could be overlooked.

**Climate  
change**



# What departments are responsible for addressing climate risks?





## Businesses take two approaches to assessing climate risks

These approaches can complement one another.

### Top-down

Assess climate risks across the whole spectrum of operations.



### Bottom-up

Assess climate risks for a specific region, facility, or threat, such as drought or flooding.



- **Assessing risks to water supply**

- Conducts annual company-wide evaluations of potential risks to water in operations and key agricultural sourcing areas
- Developed integrated water strategy to reduce water usage and replenish supplies

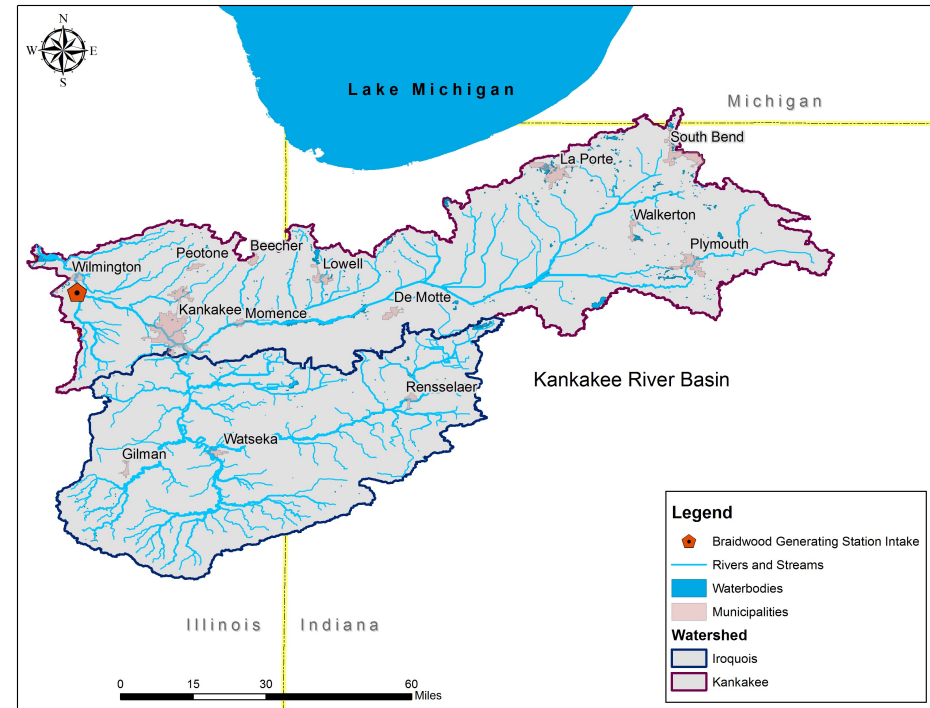
- **Evaluating agricultural risks**

- Conducted climate vulnerability assessment for top six most critical agricultural commodities (cream, sorghum, barley, grapes, agave, sugar)
- Selected one of these six (cream) and implemented a program to improve the sustainability of supply





- **Assessing water-related climate risks to utility**
  - Used WRI's Aqueduct tool to identify locations vulnerable to water risks
  - Conducted water vulnerability assessment for one particular region
  - Developed detailed watershed model to examine how changes in climate would impact water availability
- **Implementing resilience actions**
  - Building new gas-fired, combined-cycle power plants in water-stressed areas that are air-cooled





## Businesses face challenges in addressing climate risks

It's a struggle to connect the dots from science to needed business actions. Many companies are still using historic data that may not take into account future risks. Businesses need:



**Locally-specific  
climate data**



**Guidance to  
translate data  
into specific  
risk scenarios**



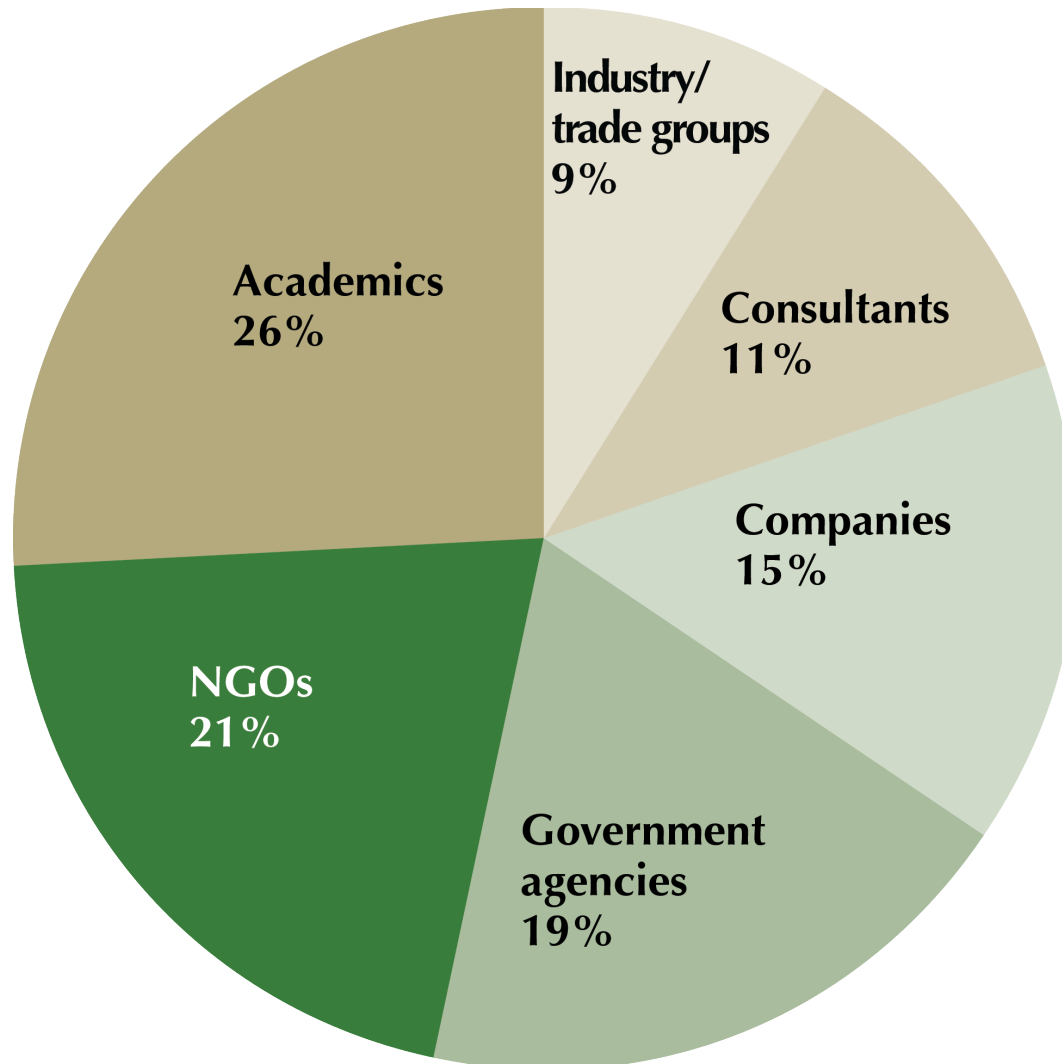
**Approaches  
to fit long-term  
climate impacts  
into a company's  
shorter-term  
financial horizon**



**Connections  
with cities and  
states to work  
on mutual  
challenges**



# Who are businesses partnering with?





- Businesses face risks beyond their fence lines, and cities recognize this risk
- Partnerships in local resilience planning are common, but inclusion of companies in planning process is rare





- Intermediary institutions can play an important role in bringing business voices to urban resilience planning



**Boston Green Ribbon Commission**

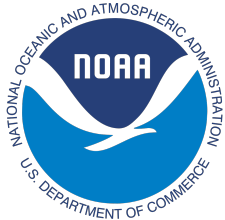
**California Climate Collaboratives**



# Public-Private Partnerships for Resilience



- It has been a challenge to attract private capital to urban resilience projects
- Many resilience efforts at the local level are funded by grants from government agencies or foundations



FEMA

THE  
KRESGE  
FOUNDATION



- Most companies **acknowledge risks** from extreme weather and climate change publicly, but often are **taking more action** than what they are disclosing in reporting documents
- Many companies examine climate as a **magnifier of existing risks**, and may not consider climate as a **standalone risk**
- Some companies address risks through **top-down management**, while others address risks on a **site-by-site** basis, or a **hybrid approach**
- Businesses have opportunities to **partner** with government agencies and other organizations to assess risk and implement resilience
- Improvements in **data, scenario planning, engineering guidance, standards, cost-benefit analyses, and benchmarks** can assist companies in resilience planning





CENTER FOR CLIMATE  
AND ENERGY SOLUTIONS

FOR MORE INFORMATION

[C2ES.ORG](http://C2ES.ORG)

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# Climate Change Resilience and Preparedness

**Chris Benjamin**

Director, Corporate Sustainability

December 2, 2015





# Climate Change Resilience

- **Robust emergency response plans and procedures** to address near-term risks, including storms and wildfires
- **Active engagement** at the federal, state, and local level
- **Risk assessment and operational planning** to assess longer-term risks and prioritize infrastructure investments
- **Staying abreast of the science** through in-house climate change science team

## CURRENTS

NEWS AND PERSPECTIVES FROM PACIFIC GAS AND ELECTRIC  
JUNE 23, 2015

HOME VIDEOS LOCAL PIPELINE SAFETY SOCIAL MEDIA NEXT100

Posted on April 22, 2015

### PG&E Participates in New U.S. Climate Resilience Partnership Between DOE and Utilities





# Risk Assessment: Natural Hazard Asset Performance

- Long-term, multi-year, and holistic assessment of the risks from multiple natural hazard scenarios on PG&E assets:
  - Identifying potential impacts to PG&E assets
  - Enabling the evaluation of climate-change-related risks to facilities and the development of necessary adaptation strategies





# Sample Scenario: Flood

## Scenario

- Assess PG&E assets against FEMA 100- and 500-year flood zone maps

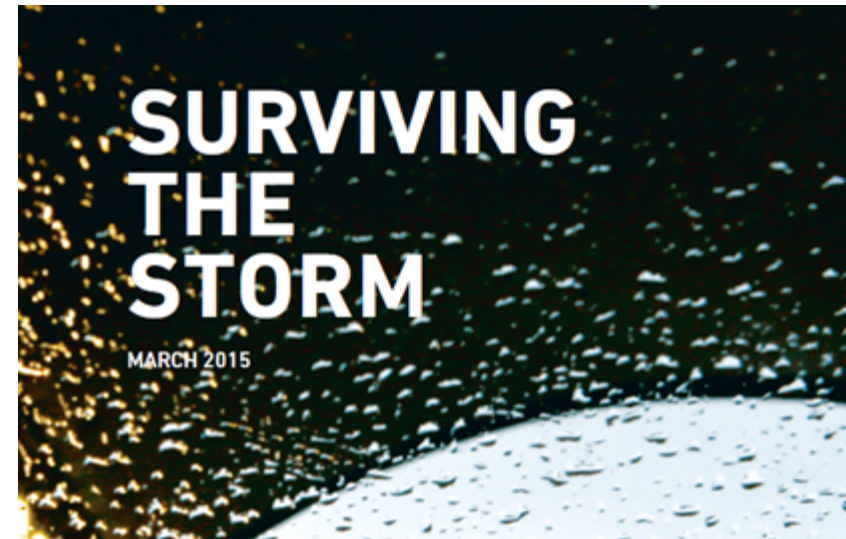
## Status of Risk Assessment

- Reviewing assets and developing risk response plans

## Near-Term Actions Taken

Elevated structures at several PG&E substations:

- San Mateo 115kV GIS building
- Napa Substation Building and Switchgear
- Richmond R Building and Switchgear



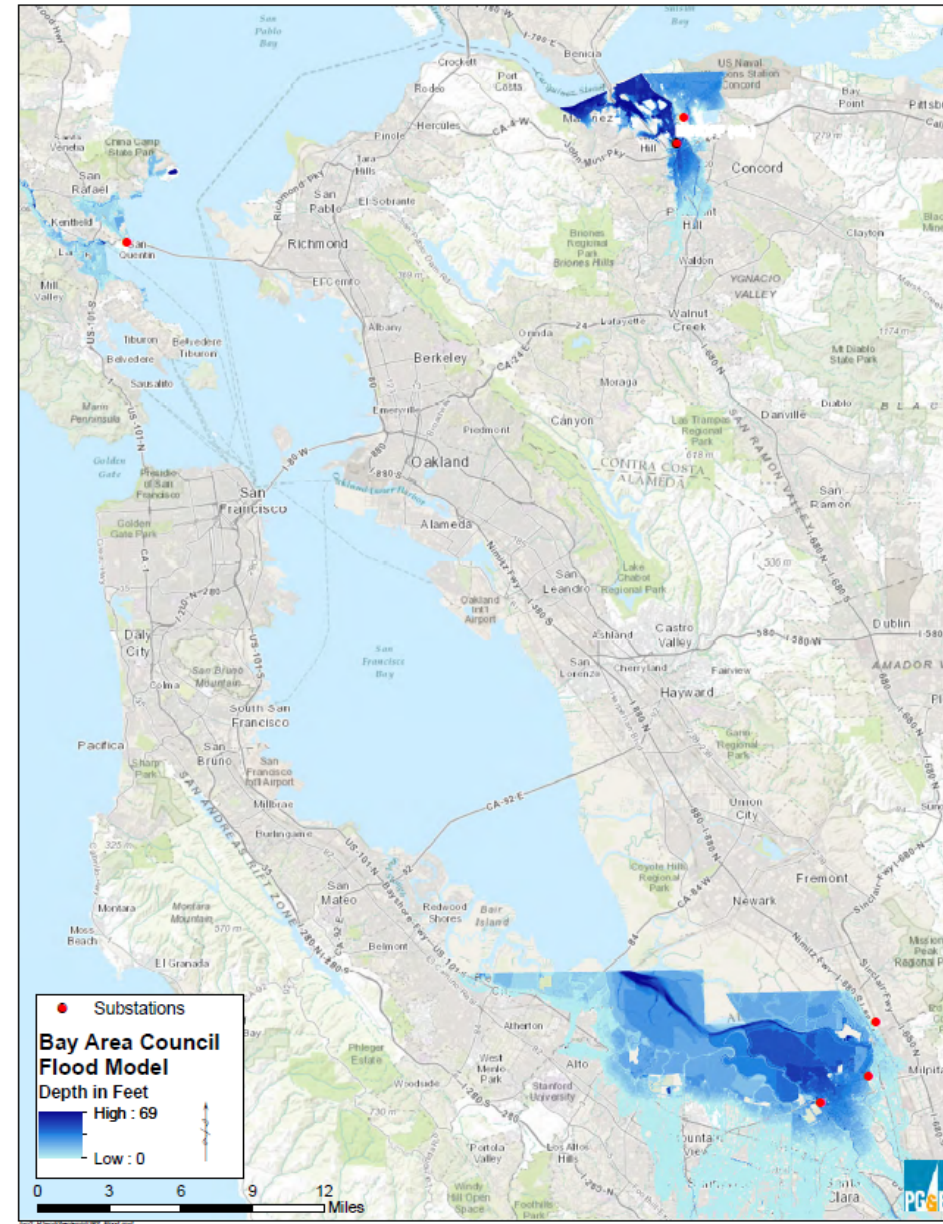
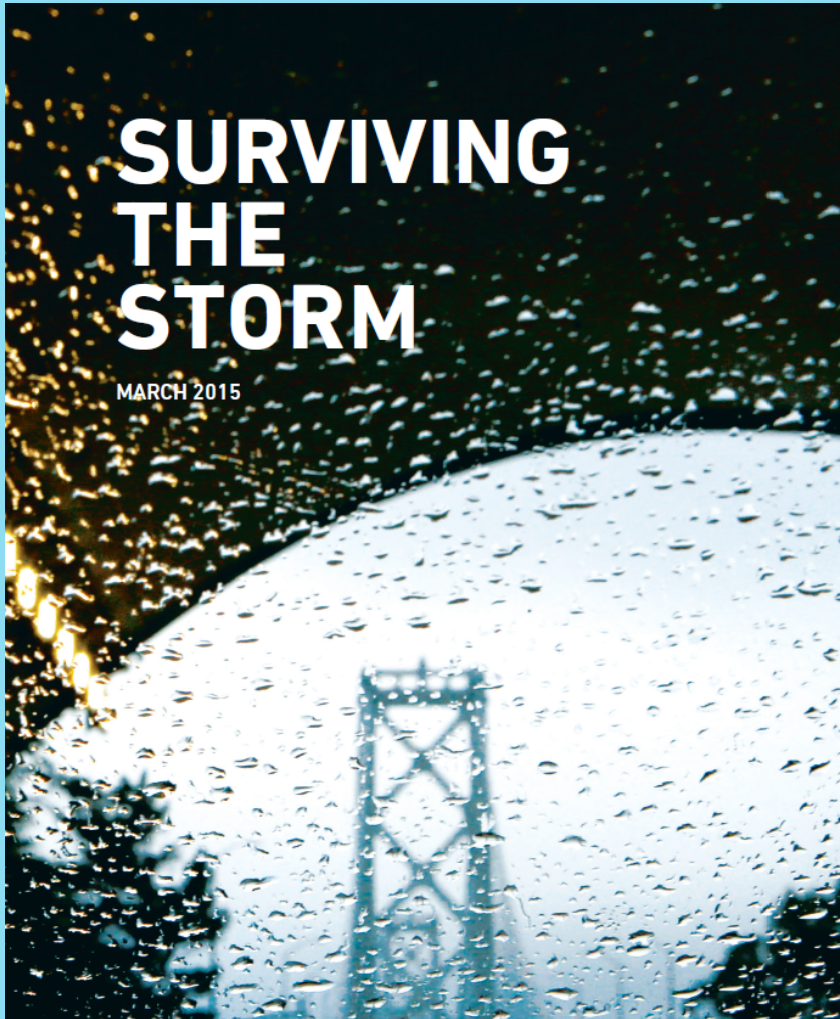
## Partnering on Studies

PG&E participated in a recent Bay Area Council Economic Institute Report, which found that a Superstorm and associated flooding could have a \$10.4 billion impact on the Bay Area economy.

The report included solutions for creating greater regional resilience with a focus on the need for increased investment in flood control.



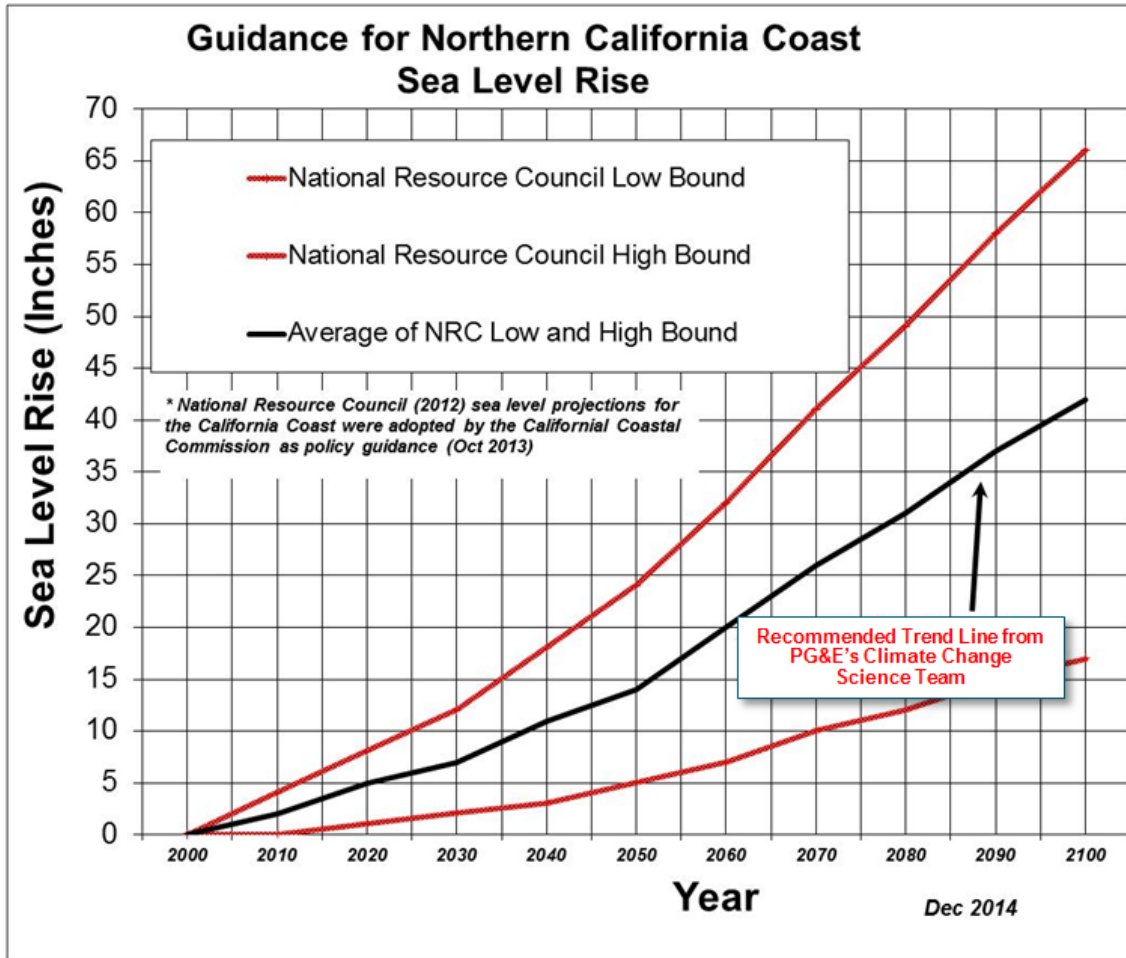
# Surviving the Storm Report







# Sample Scenario: Sea Level Rise <sup>6</sup>



	Trend Line	Low/ High Range
Year	Inches	Inches
2010	2	0 – 4
2020	5	1 – 8
2030	7	2 – 12
2040	11	3 – 18
2050	14	5 – 24
2060	20	7 – 32
2070	26	10 – 41
2080	31	12 – 49
2090	37	15 – 58
2100	42	17 - 66





# Sample Scenario: Sea Level Rise

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## Scenario

- 24 inch sea level rise by 2050

## Status of Risk Assessment

- Reviewing assets and developing risk response plans

## Near-Term Actions Taken

- Participating in local studies and initiatives
- Responded to recent request for state's Sea Level Rise Planning Database, as required under AB 2516

## Engaging in Local Initiatives

PG&E is participating in San Mateo County's effort to identify and assess community assets and natural resources that will be most affected by sea level rise and storm events along the County's bayshore and coastline.

This is one of nearly a dozen local studies and initiatives in which PG&E is participating.



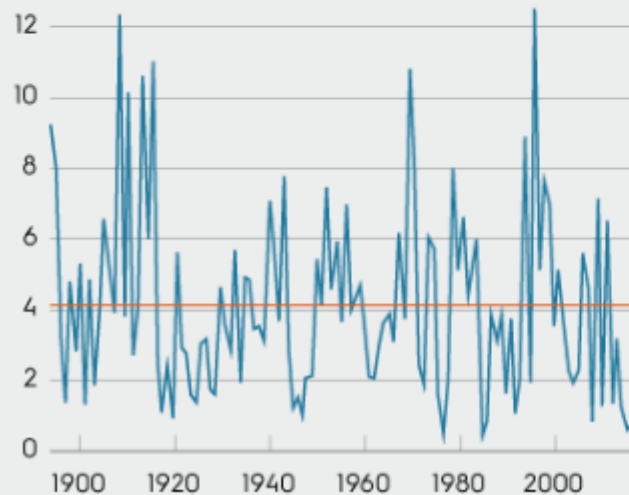
# Low Precipitation and Snow Pack, High Temperatures

## No Rain, High Temperatures

California has always battled drought in many forms, both meteorological drought (caused by below average precipitation rates) and hydrologic drought (caused by below average runoff from water sources). But the last few years have been unique. Precipitation rates are the lowest on record, and temperatures are rising.

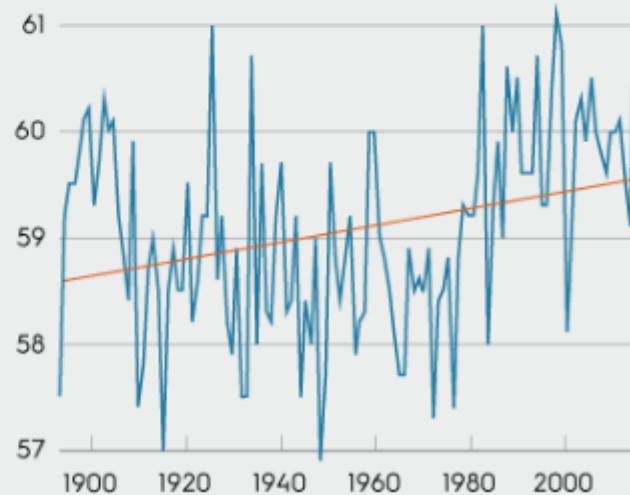
**PRECIPITATION** (Inches)

— Long-term mean



**TEMPERATURE** (Degrees Fahrenheit)

— Trend







# PG&E's Drought Response

- Established Internal Drought Task Force
- Addressing vegetation impacts on gas and electric infrastructure and coordinating with key agencies to prevent and respond to wildfires
- Maintaining dry-cooled power generation
- Reducing water use in our facilities and exceeded 5-year company water conservation goal
- Offering customers a wide range of energy efficiency options to help them reduce their water use
- Strategically managing water supplies to optimize hydropower and the availability of water for fisheries and downstream users' needs

**Severe drought warning:  
Every drop counts.**

**Please help us  
conserve water.**



Together, Building  
a Better California

[pge.com/drought](http://pge.com/drought)

More than 10 percent of our workforce, or nearly 2,300 employees, pledged to take actions such as taking shorter showers, checking for leaks, and installing water-saving aerators.





# Managing Hydro Operations: Longer-Term Planning<sup>10</sup>

- Collaborating on research and developing new modeling tools for forecasting runoff to plan for potential snowpack reductions in the Sierra Nevada Mountains
- Investigated Northern California's aquifers to better understand how they may respond to climate change
- New research with the University of California and DWR on a project to monitor snowpack, climate, soil moisture and other factors on the upper Feather River



PG&E has presented and published several scientific papers on our research into how climate change is impacting the Northern Sierra Nevada and Southern Cascade watersheds that supply our hydroelectric system.

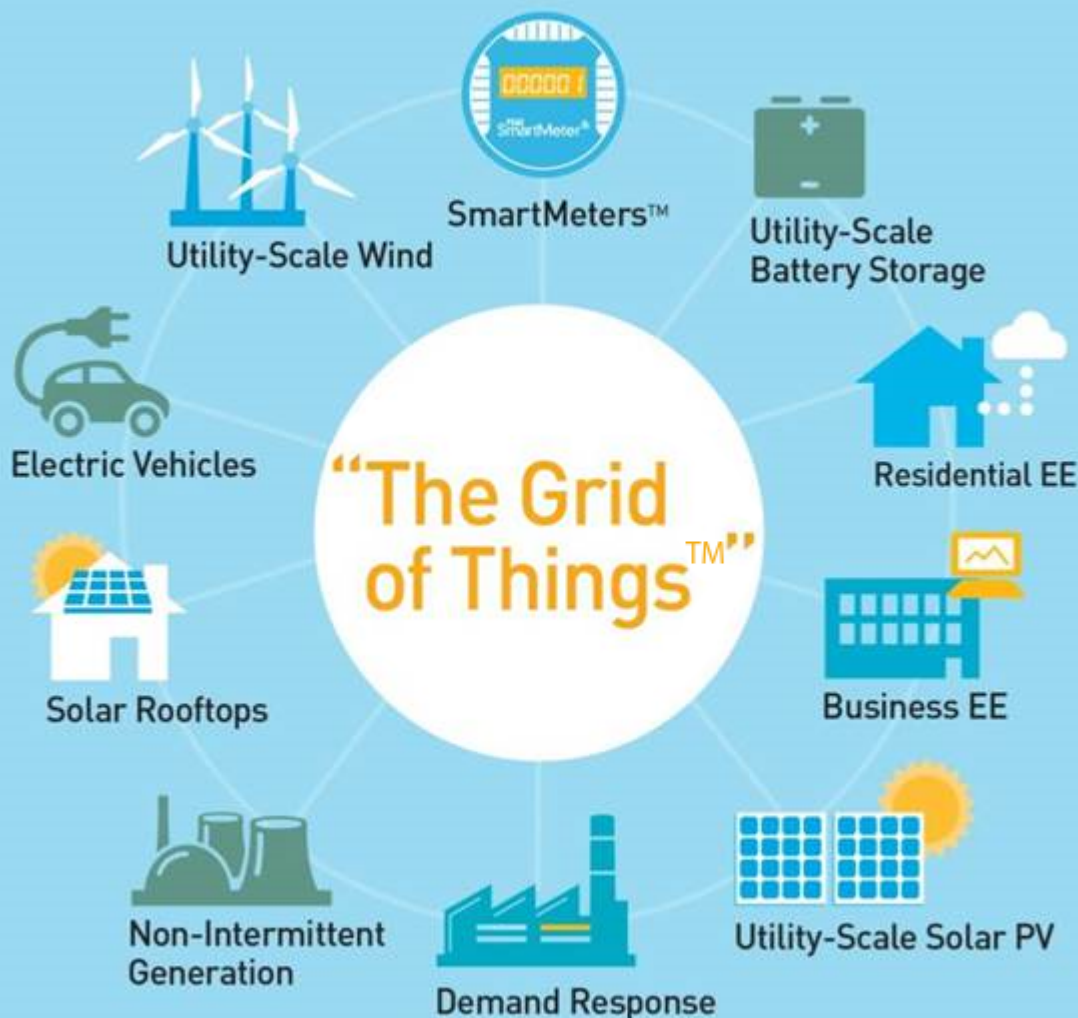




# Looking Forward: Grid of Things™

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A smarter, more flexible, and more distributed grid will be a more resilient system in the face of a changing climate.





# Q&A



**Meg Arnold**  
Valley Vision



**Chris Benjamin**  
PG&E



**Katy Maher**  
C2ES



**Larry Greene**  
SMAQMD



# THANK YOU

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**Learn more about ARCCA:**

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