



# Bringing Climate Resilience to Scale

Amy Luers, Ph.D.  
Executive Director  
Future Earth  
RACC10 , Kyoto 2018

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Research. Innovation. Sustainability.



2010  
RACC 2



# Regional Climate Adaptation

CA Climate Change Center

UC CA- Davis

Union of COncerned Scientists

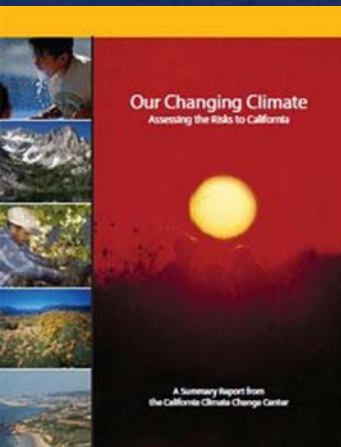
UC California, Berkeley

Santa Clara University

UC California, Merced

Stanford University

UC California, Santa Barbara



DATA ACCESS COMMUNITY

## cal-adapt

Elevation: -170 ft

### Wildfire

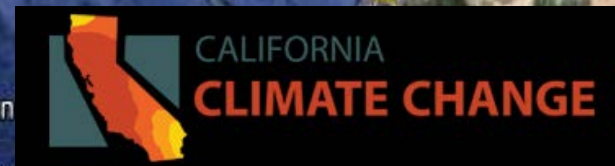
Fire is an important ecosystem disturbance. It promotes vegetation and wildlife diversity, releases nutrients into the soil, and eliminates heavy accumulation of underbrush that can fuel catastrophic fires.

The area projected to be burnt by wildfire toward the end of the century will increase substantially, especially in mountainous areas.

The data in this climate tool display the projected increase in potential area burned given three different climate models and two different scenarios. Darker oranges and reds suggest up to a 10-fold increase in potential area burned.

Please note that these data are modeled solely on climate projections and do not take landscape and fuel sources into account. New fire risk projections are currently being produced that take more landscape information into account.

Use the slider bar to the left to visualize the projected increase





# How to bring Climate Adaptation (resilience) to scale?

# KEY MESSAGE

TO SCALE CLIMATE RESILIENCE

WE MUST STRENGTHEN  
TRANSDISCIPLINARY NETWORKS OF:

METRICS, PEOPLE & DATA





2015



# TRANSDISCIPLINARY NETWORKS OF METRICS

# Climate Resilience on par w/ Mitigation

## Article 7 of the Paris Agreement

**Global Goal** “of enhancing adaptive capacity, strengthening resilience and reducing vulnerability to climate change.”

### QUESTION:

How to effectively operationalize these concepts at a global scale?



# Mitigation:

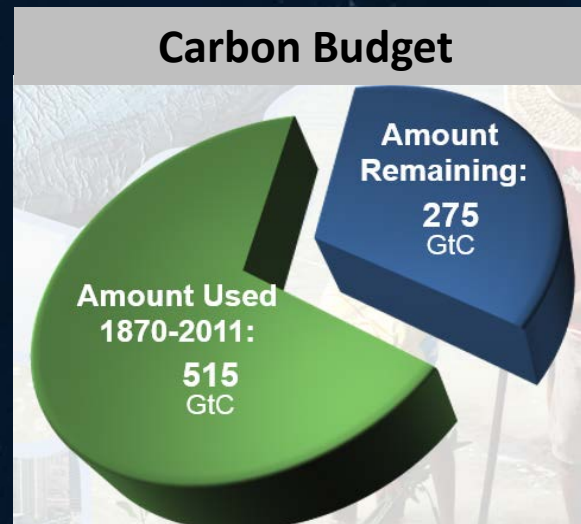
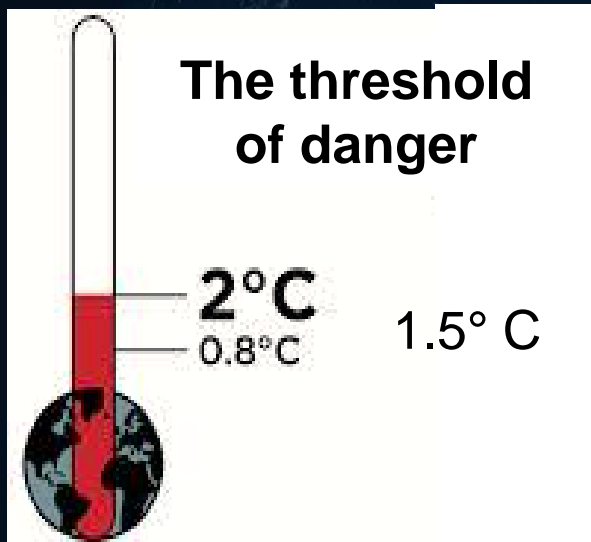
## Quantitative metrics helped to scale action.

*“Avoid **dangerous anthropogenic interference** with the climate system”.*

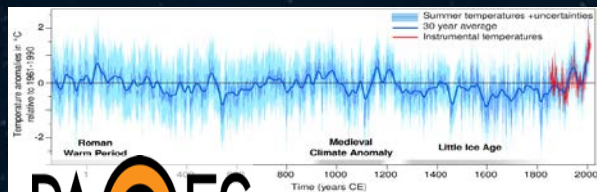
*-UNFCCC 1992*

What is dangerous?

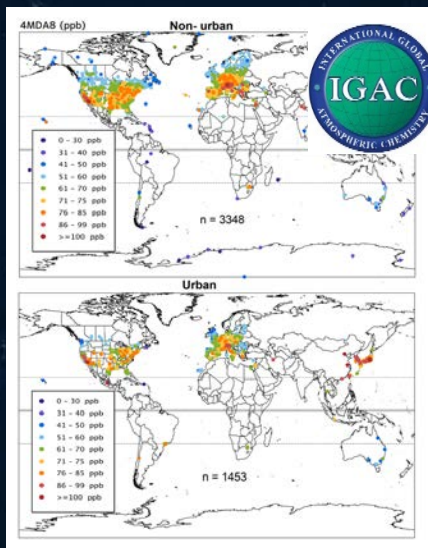
And how do we track progress to this goal?



# 30 years of collaboration in global change research lay the groundwork for policy frameworks



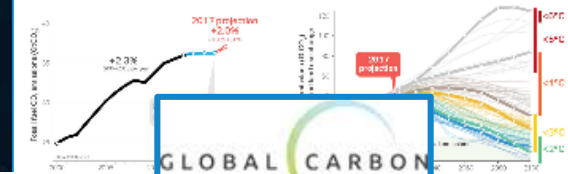
**PAGES**  
PAST GLOBAL CHANGES



### Global Carbon Budget 2017

In 2017, CO<sub>2</sub> emissions from fossil fuels and industry are projected to **grow by 2.0%** (+0.8 to +3.0%). This follows three years of nearly **no growth** (2014-2016)

The **plateau** of last year was not peak emissions after all...



**GLOBAL CARBON**  
project

**Earth System Governance**  
People, Places, and the Planet

# 30 years of collaboration in global change research lay the groundwork for policy frameworks & metric



# Adaptation/Resilience:

Does not have metrics to scale action.

## Article 7 of the Paris Agreement

**Global Goal** “of enhancing adaptive capacity, strengthening resilience and reducing vulnerability to climate change.”

- What defines a resilient, vulnerable, and adaptive place?
- How can we measure progress toward achieving this goal?




# RICH LITERATURE ON PLACE-BASED THAT BUILT UNDERSTANDING OF RESILIENCE



**IHOPE**  
Integrated History and Future of People on Earth

Long-term  
Sustainability  
through Place-  
Based,



Successful place-based  
sustainability research on  
social-ecological systems.



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# METRICS: To scale investment and actions

**Global Goal** “of enhancing adaptive capacity, strengthening resilience and reducing vulnerability to climate change.”

We need METRICS to track progress that is:

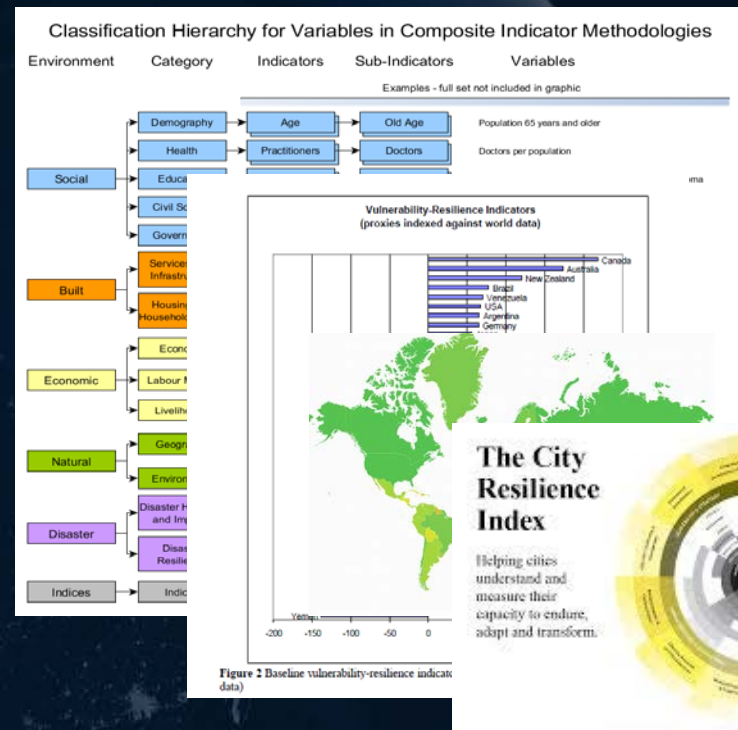
- Place based
- Generalizable
- Globally trackable

# MANY ANALYSES CHARACTERIZE RESILIENCE AND ADAPTIE

## Proxy Indicators determinants of Resilience



Place-based



One-size fits all





# People & Pixels to scale from bottom up

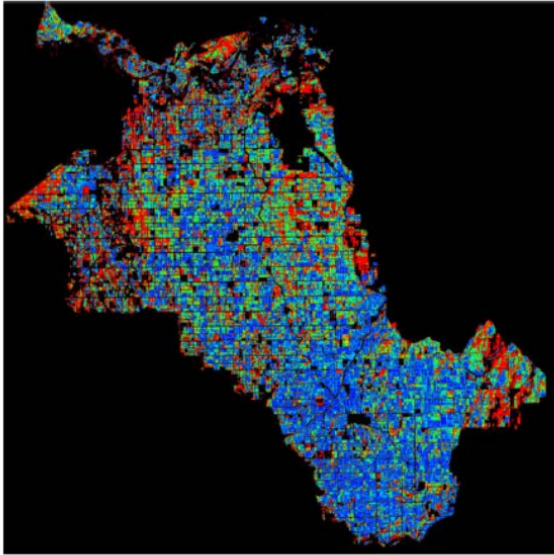


Fig. 3. Vulnerability, Yaqui Valley irrigation district. The most vulnerable are shown in red and the least vulnerable in dark blue.

Yaqui  
Valley

Generalizable  
Place-based





# NEW DATA & ANALYSTICS → NEW APPROACH TO CLIMATE RESILIENCE METRICS

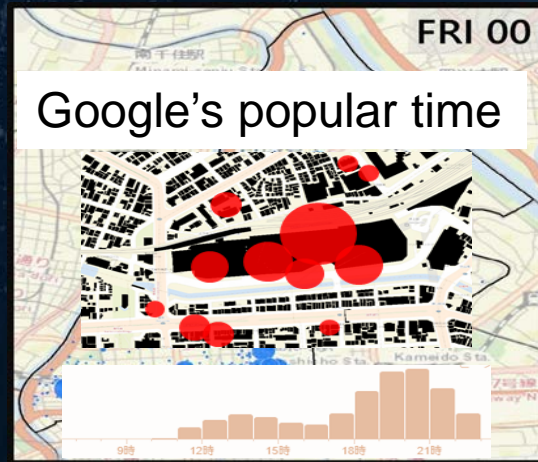
AI for Earth  
Accelerating innovation

AI for Earth is a global coalition of environmental engineering, science and organizations to solve some of the world's most pressing environmental challenges by harnessing the power of AI to advance environmental research, while accelerating innovation.

- AGRICULTURE
- WATER
- BIODIVERSITY
- CLEAN ENERGY

PLANET LABS

The AI Element



THESE METRICS MUST BE CO-DEVELOPED

TRANSDISCIPLINARY RESEARCH NEEDED

RE-THINKING  
RESILIENCE METRICS



DIGITAL  
INNOVATORS

Re-envisioning the world  
Changing Earth and  
social systems

SYSTEMS  
SCIENTISTS

Seek to understand Earth  
and social systems in  
a changing world



# TRANSDISCIPLINARY NETWORKS OF PEOPLE & DATA

# Knowledge-Action Networks



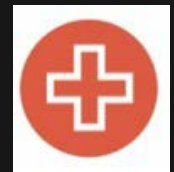
Decarbonisation



Emerging Risks  
& Disasters



Finance  
& Economics



Health



Natural Assets



Ocean



Urban



Water-Energy-  
Food Nexus



SSCP



# Researchers and innovators across the globe collaborating on urban sustainability



Urban Knowledge-Action Network

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# PARTNERSHIP FOR RESILIENCE & PREPAREDNESS

## Building Resilience Through Data

**Goal of the public private partnership:**

*To make it easier for people around the world to find and access data and tools for climate adaptation and resilience planning*

Launched September 2016;



# PREP Partners

## Coordination & Core Partners



WORLD  
RESOURCES  
INSTITUTE



Research. Innovation. Sustainability



United States  
Global Change  
Research Program

## Public Sector Partners



## NGO Partners

AMERICAN SOCIETY OF  
ADAPTATION PROFESSIONALS



## Private Sector Partners



# How to bring Climate Adaptation (resilience) to scale?

## PEOPLE & DATA TO ENABLE THE CO-DEVELOPMENT OF METRICS

The pieces are now there to scale  
we just need to work together  
to make it happen





Thank you!