

Environmental Measurement Symposium

*"The Environment in 2020 :
Past, Present and Future"*

CITIZEN SCIENCE

A decorative graphic on the right side of the slide. It features three blue spheres, each surrounded by concentric white circles, suggesting a signal or data point. These spheres are connected by thin, light blue lines that curve upwards and to the right. The background is a light green with a subtle pattern of small white circles. At the bottom left, there are wavy lines in shades of blue and green, and at the bottom right, there is a blue and white curved shape.

The Environment in 2020 : *Past, Present, and Future*

Citizen Science
Morning Session

INTRODUCTION

Environmental Measurement Symposium

**“The Environment in 2020 :
Past, Present, and Future”**

36th Annual Conference

Virtual

August 4-25, 2020

36th Environmental Measurement Symposium

National Environmental Monitoring Conference

Forum on Environmental Accreditation

NELAC Institute

US EPA

The Environment in 2020 : *Past, Present, and Future*

CITIZEN SCIENCE

Leon F. Vinci, DHA, DAAS, RS
CEO-President
Health Promotion Consultants

36th Annual Conference

Virtual Meeting

August 11, 2020

DEFINITION

- **Citizen Science/Research** is defined as :
“scientific work undertaken by members of the general public, often in collaboration with or under the direction of professional scientists and scientific institutions”
- The term *citizen science* entered the Oxford English Dictionary (OED) June 2014

Citizen Research : Impacts *both* Science & Policy

Science -- data and observations

Citizen Science -- assists local leaders and decision-makers (in public and private sectors) in recognizing risks to environment and health, and taking actions to :

- protect the environment
- improve health
- reduce impacts (to health/environment)
- enhance our lives

Citizen Science
Morning Session

A G E N D A

The Environment in 2020 : *Past, Present, and Future*

Today's Discussion : CITIZEN SCIENCE

CS : Past – Present – Future

CS : EPA's Office of Research & Development

Local Example - Clark Avenue Beach (CT)
Improving Water Quality

Shell Day 2019: Monitoring Coastal Acidification

Panel Q & A

Citizen Science
Morning Session

First Presentation

The Environment in 2020 : *Past, Present, and Future*

THE ENVIRONMENTAL

Past – Present – Future of CITIZEN SCIENCE

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Citizen Science

Today's Discussion :

Past Examples

Present Discussion

Future Opportunities

CITIZEN SCIENCE

PAST

Citizen Science

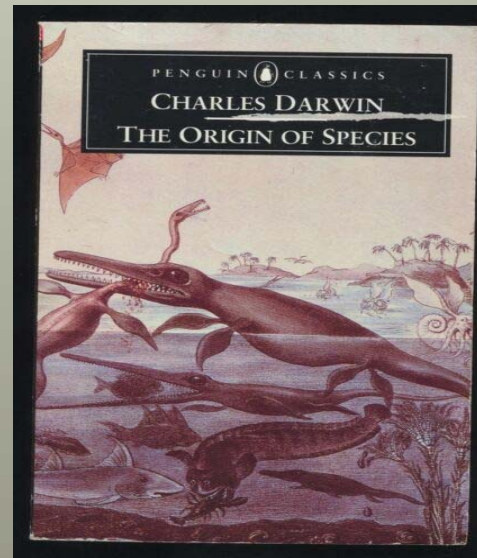
Gentlemen Observers/scientists :



Franklin



Newton



Darwin

CITIZEN SCIENCE ACTION

Passive (action — small 'a')

Action

CITIZEN SCIENCE ACTION

Passive (small 'a')

Engaging in written/vocal science :

Measureable -- Surveys

CITIZEN SCIENCE ACTION

Action -- Field Work

Observations, Measurement

MIT Technology Review

JAN '89

Quoting from R. Kerson in a Wilson Center report :

"The new form of engagement in science received the name "citizen science".

Described how 225 volunteers across the US conducted citizen research in assisting the [Audubon Society](#) in an acid-rain awareness raising campaign. The volunteers collected rain samples, checked for acidity, and reported back to the organization. The information was then used to demonstrate the full extent of the phenomenon.

ACID RAIN

The pH Scale



Acidic

Neutral

Alkaline

pH 0 = Battery Acid
pH 2 = Lemon Juice
pH 2.5 = Soda

pH 4.3 = Acid Rain
pH 5.6 = Clean Rain
pH 7 = Distilled Water

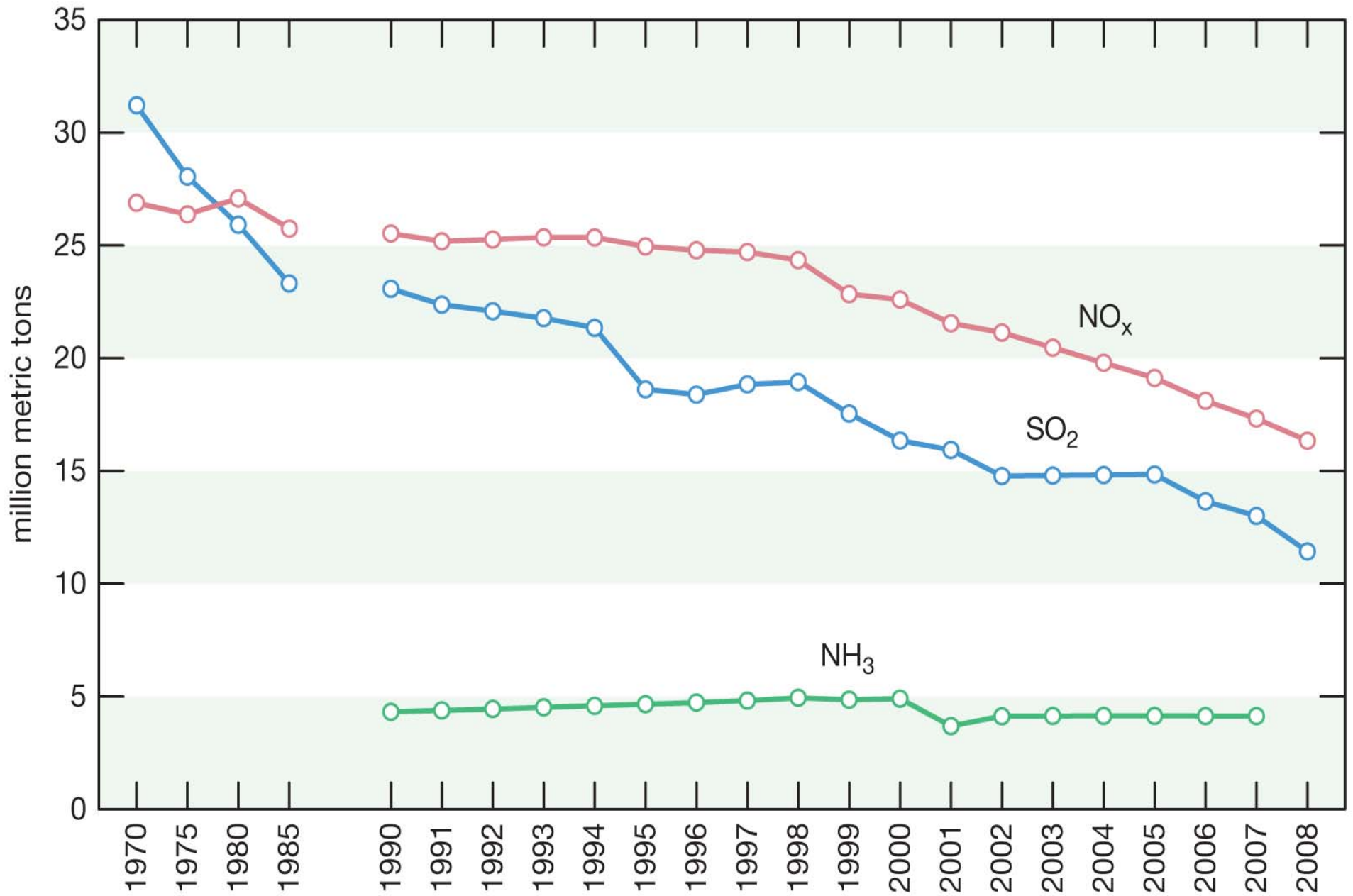
pH 7.4 = Blood
pH 8.1 = Sea Water
pH 9 = Baking Soda

pH 11 = Ammonia
pH 12.6 = Bleach
pH 14 = Liquid Drain Cleaner





U.S. emissions



CITIZEN SCIENCE

PRESENT



Citizens See Smoke



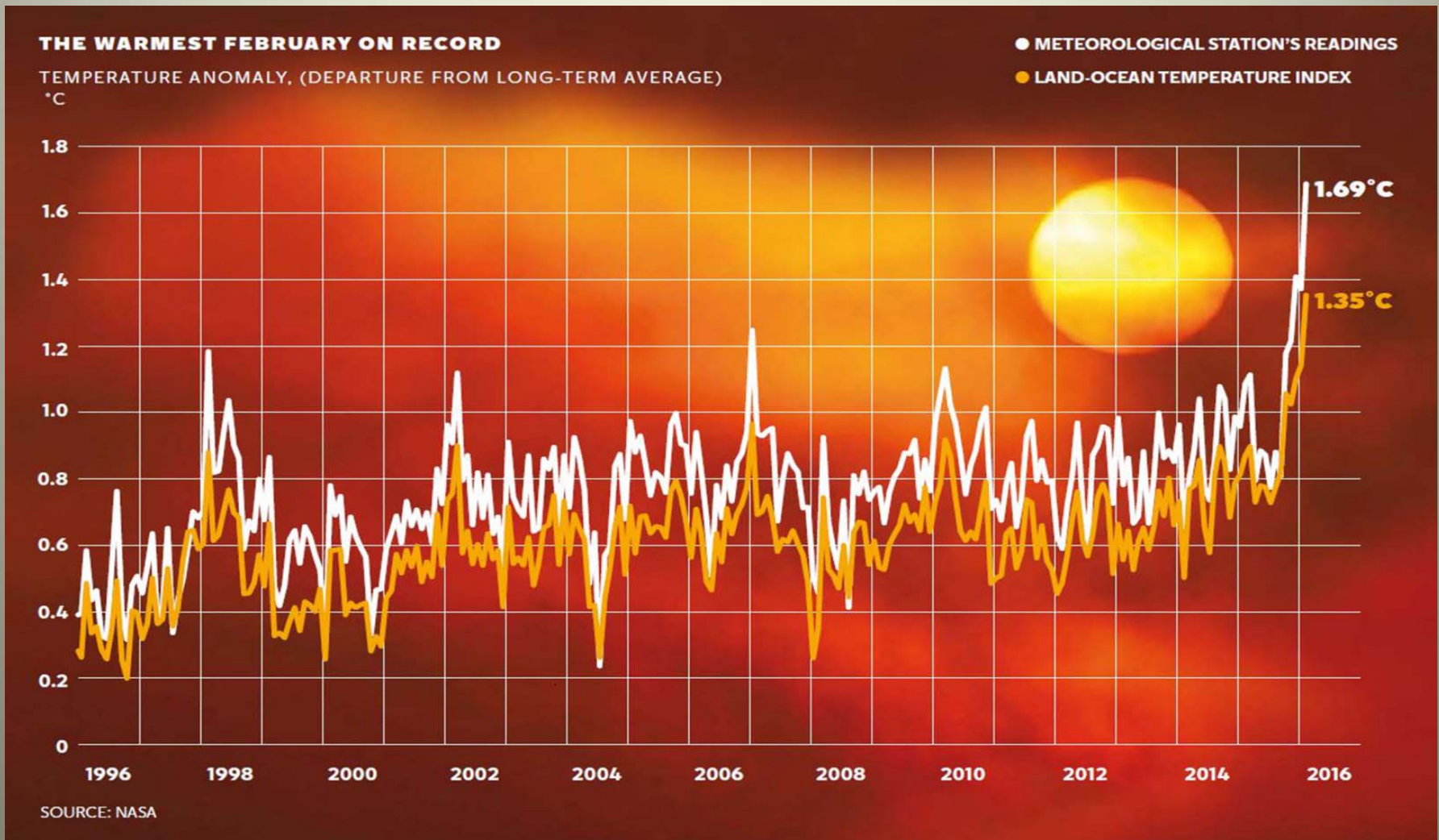
Citizens See Fire



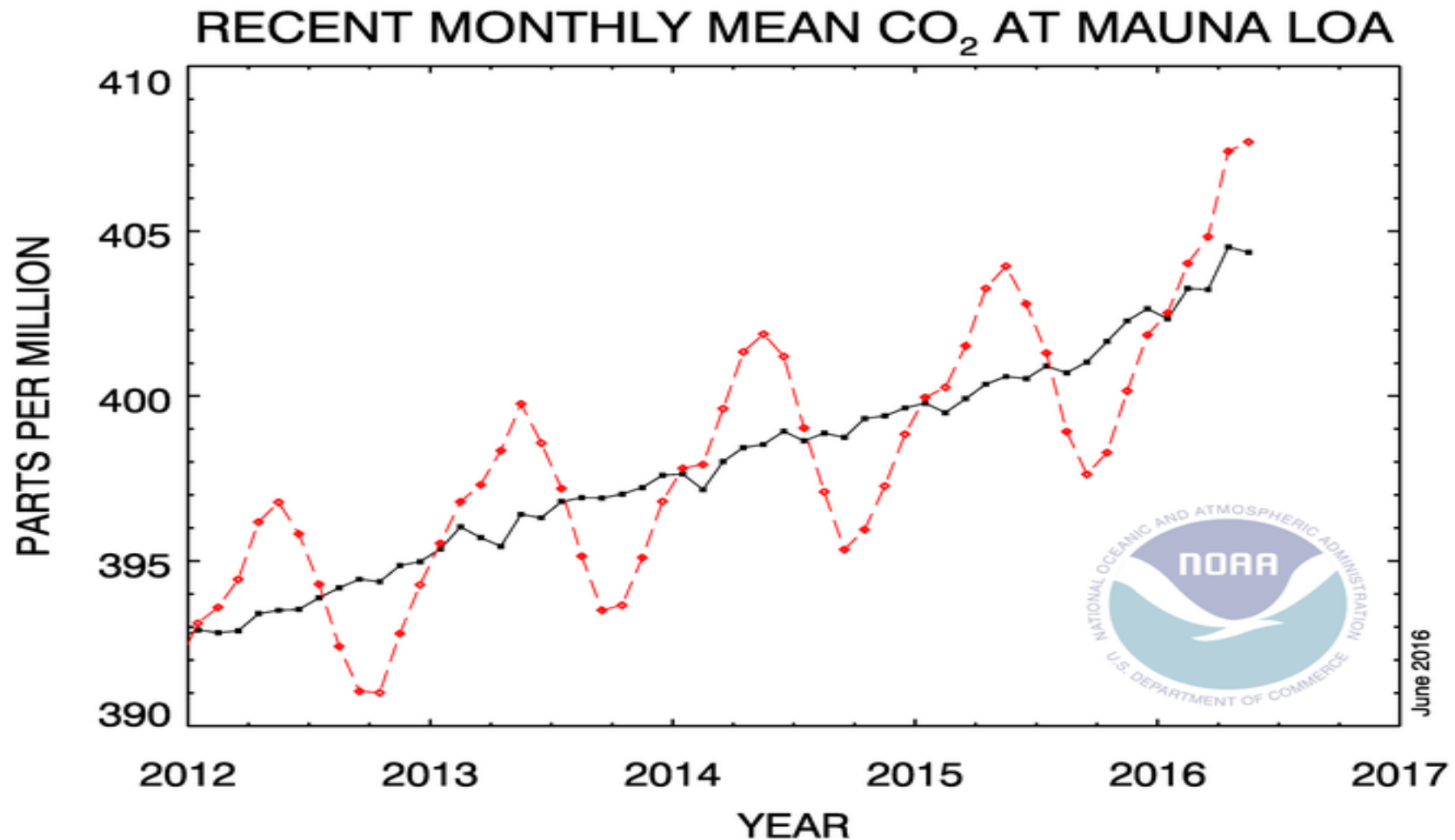
Citizens See Rain



Increased Temperature

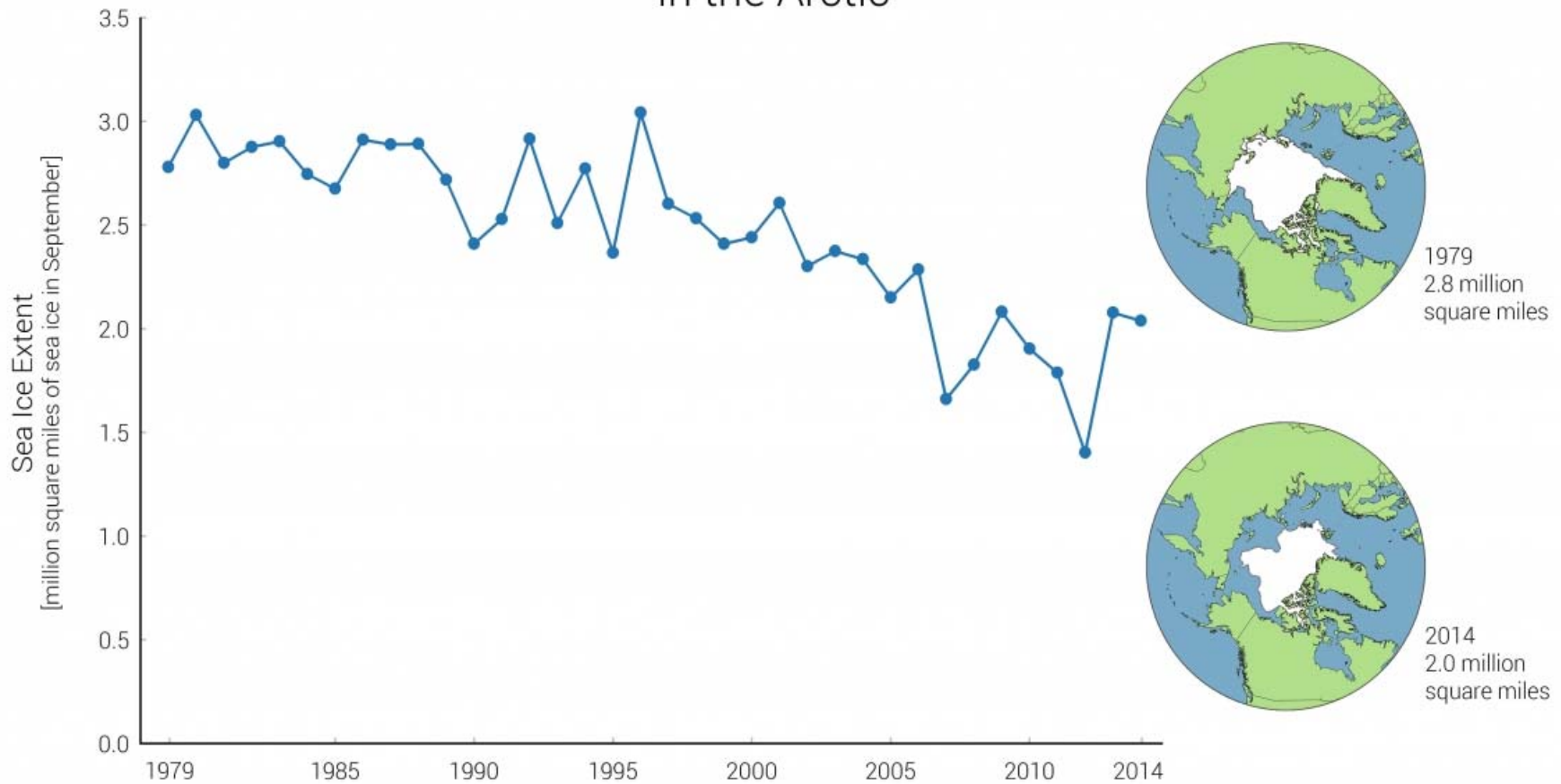


Changes Are Needed



Ice Reduction

September Average Sea Ice Extent
in the Arctic





Jeff Masters, the web's [most widely read](#) meteorologist, [explains](#) (Mother Jones)

"The US and Canada are virtually snow-free ...which is extremely rare for a January day, 2012. The lack of snow in the mountains of the Western US is particularly unusual. I doubt one could find a January day this cloud-free with so little snow throughout the entire satellite record, going back to the early 1960s."

1,000 Year Flood Events (Partial)

Since 2010 (NOAA) :

- 2010, May -- Tennessee Flooding
- 2011, Aug. -- Hurricane Irene
- 2013, Sept. -- Colorado Springs Flooding
- 2014, Aug. -- Baltimore Deluge
- 2015, Mar. -- Nebraska
- 2015, Oct. -- South Carolina Flooding
- 2016, April-Oct Texas, WV, MD*, LA
- 2017, Aug -- Texas, LA (Harvey)
- 2018, May -- Maryland (*Endicott)

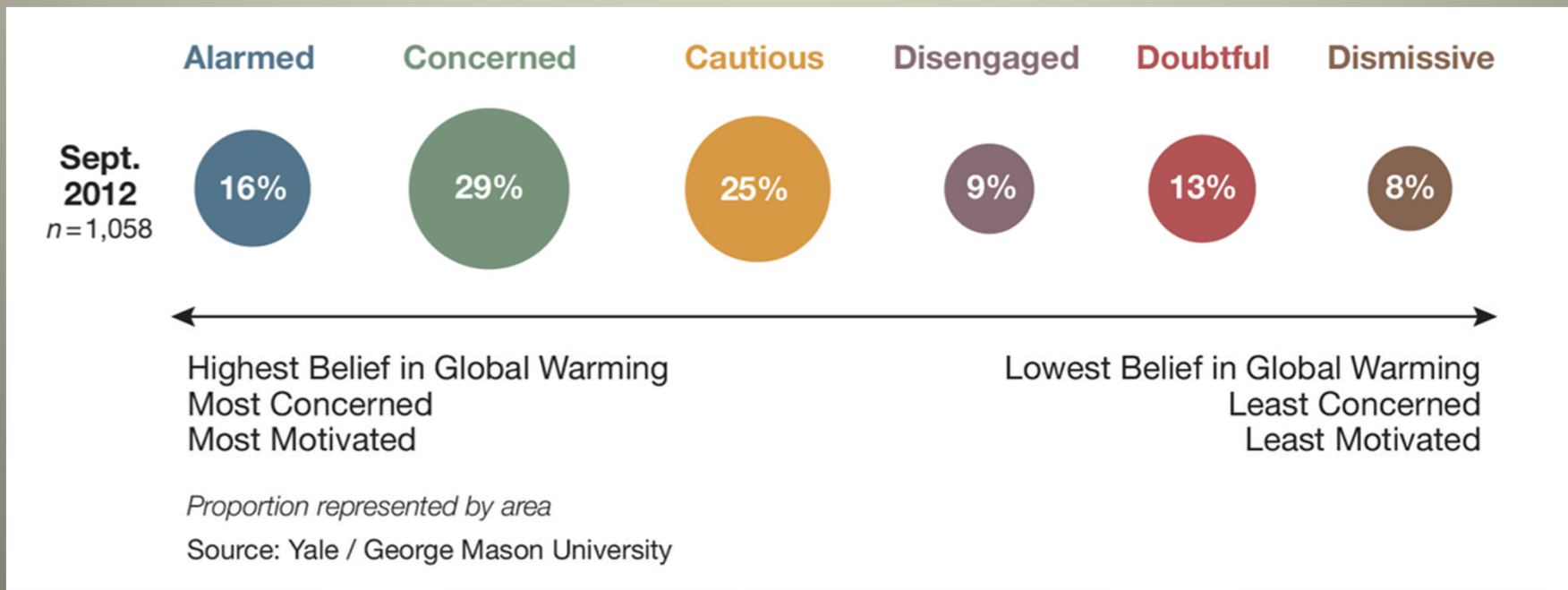
1,000 Year Flood Events (Partial II)

Since 2010 (NOAA) :

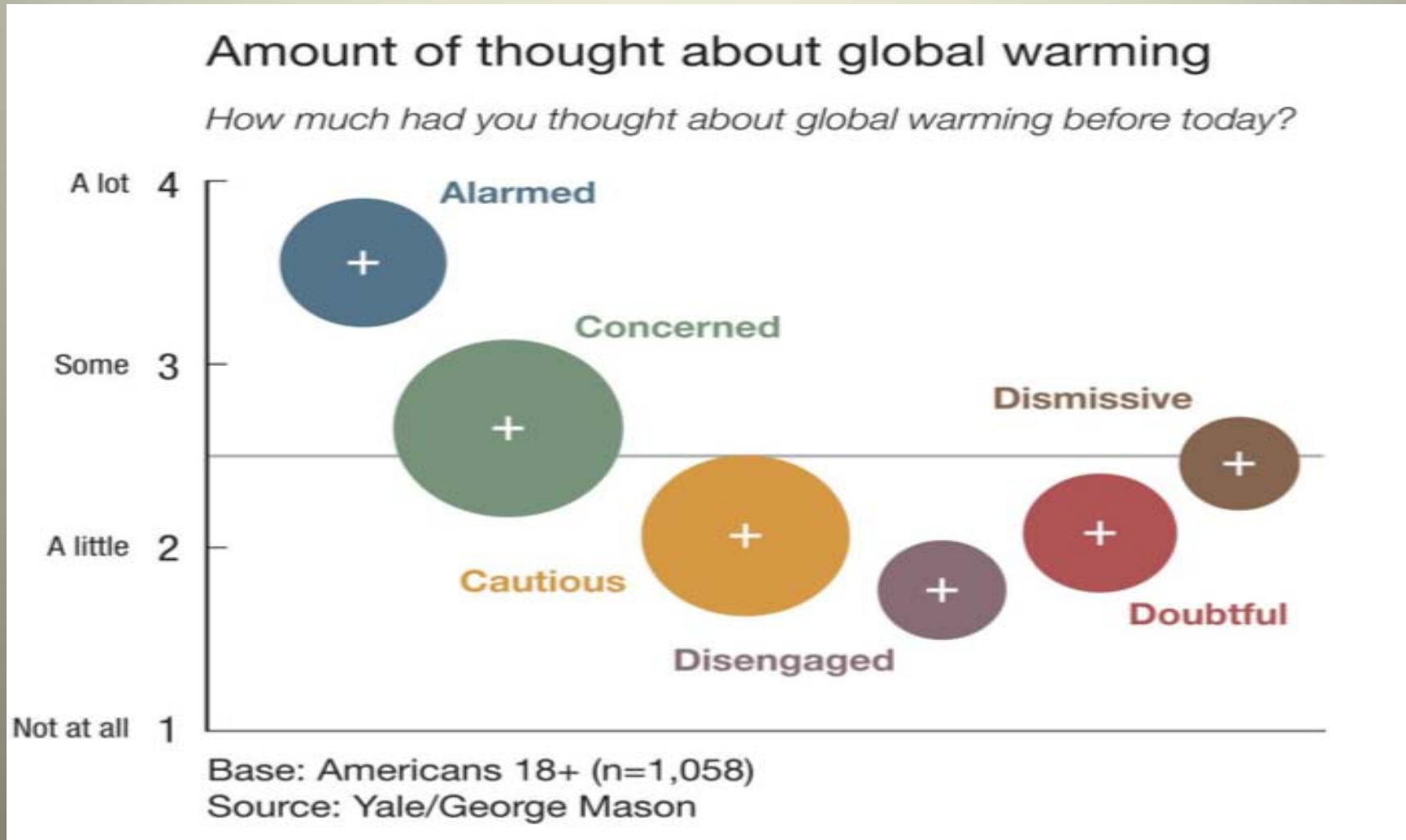
- 2018, June -- Wisconsin/Mich Flooding
- 2018, Aug. -- Colorado
- 2018, Aug. -- Wisconsin Flooding
- 2018, Sept. -- Chesapeake Bay, Virginia
- 2018, Sept. -- NC, SC (Florence)
- 2019, Oct. -- South Carolina Flooding
- 2019, Feb. -- Mississippi Basin MS, LA, MO, IL, IA
- 2019, Aug -- Nebraska
- 2019, --

Climate Change is Here

- What do you think about Climate Change?
- 0 = Dismissive 1= Doubtful 2 = Disengaged
3 = Cautious 4 = Concerned 5 = Alarmed



How does the amount of thought affect the *level of concern* with regard to: Global Warming?



Yale and George Mason University Study

Over Last 5 years : notable increase in public concern for Climate Change

Both political parties agree on Clean Energy as important

The linkage between **Climate and Health** is clear

Although COVID-19 is overwhelming--- the importance of Climate Change remains as a top priority

ChatterGrabber

Mining Tweets for key words: algae blooms, vomiting — gastrointestinal outbreaks, opioid use

#Breathe

Air Quality monitoring by citizens in Kosovo, Pristina.
Severe pollution/smog due to 2 local coal-fired power plants.
(banning car entry)

Microfibre Surveys

Plastic microfibers ubiquitous in ocean waters.
Citizen scientists around the globe taking samples and sending them in for analysis.



shutterstock.com • 633214229

Local Waterway



Stream Sampling



2018

Volunteer data helped the agency characterize water quality at :

3,650 + miles of streams

41 square miles of estuaries

30,000 acres of lakes

½ M \$ worth of service

Without their valuable contributions, Virginia would have a significantly diminished capability to gauge water quality.

SPACE WARP PROJECT

1.6 M people around the world (using human eye) matching shapes/images in the night sky :

classification project = gravitational lensing

RinkWatch

Citizenry around the world looking at outdoor rinks and ponds in their neighborhoods for their frozen condition :

studying the long term effects of climate change (temps).

1400 ponds & rinks NHL : researchers---Wilfrid-L Unv., Ontario

CITIZEN SCIENCE

FUTURE



Center for Wellness and Nutrition

Wellness Wednesday Webinars

YPAR Empowering Youth As Leaders for Change

Register today for the Center for Wellness and Nutrition's mini webinar on innovative programs that improve people's lives through healthy eating and physical activity. The Wellness Wednesday Webinar on February 21st will focus on Youth-led Participatory Action Research (YPAR) as a framework to inspire youth as partners for change and promote community wellness.



Wednesday, February 21st, 2017 12:30—1:00PM PST

REGISTER TODAY!

WEARABLE MONITORS





Colony B

Unravel the secrets of microscopic life! Colony B is a mobile gaming app developed at McGill University that enables you to contribute to research on microbes. Collect microbes and grow your colony in a fast-paced puzzle game that advances important scientific research.

THERMAL SCREENING



MILITARY HEAT-SCREENING COVID-19



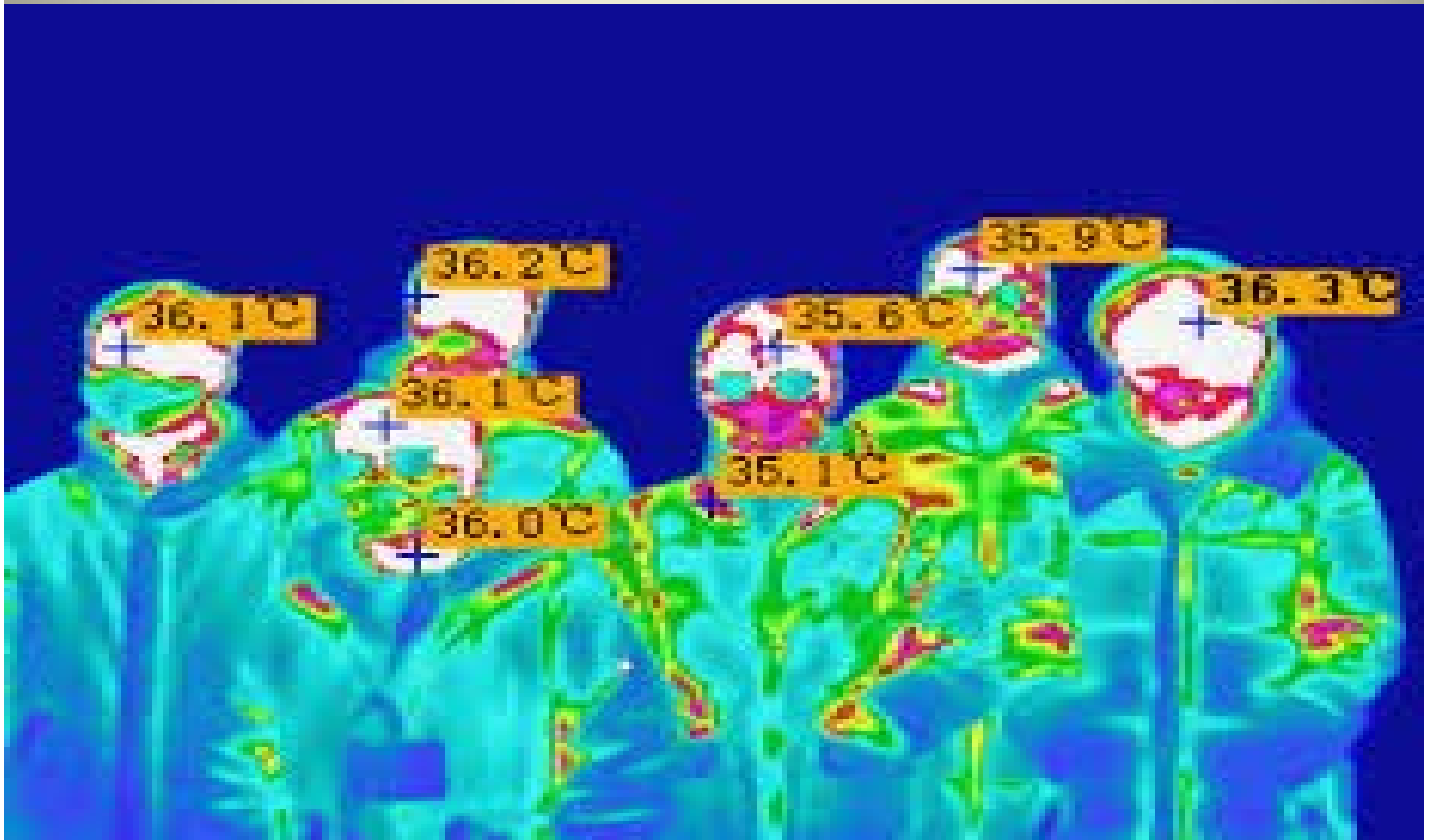
Q R CODES



MONITORING & TRACKING



TRACKING HIGH RISK





TreeSnap

Help our nation's trees and protect human health in the process. Invasive diseases and pests threaten the health of America's forests. With the TreeSnap app, you can record the location and health of particular tree species—those unharmed by diseases that have wiped out other species. Scientists then use the collected information to locate candidates for genetic sequencing and breeding programs. Tag trees you find in your community, on your property, or out in the wild to help scientists understand forest health.

Location: Global

The Thursday Tree Huggers

NY Botanical Garden, Bronx :

monitoring effects of climate change
by logging seasonal changes in plants

bud breaks and unfolding leaves

FACEBOOK Poll

Pop-Up Quiz : Delphi Group Research Study
Carnegie Mellon University

Series of questions to monitor where pandemic is moving, looking at local/national responses

FACEBOOK Poll

Queries :

Symptoms

Demographics

Zip Code

Living at address

Travel

Etc.

Conclusion

- Innovation (use of emerging technology)
- Citizen Education & Engagement
- Citizen Research -- Surveys
- Citizen Science
- Outreach & Sharing Data
- Negotiation -- Policy Impact

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ACKNOWLEDGMENTS :

- CDC and other Federal Agencies : data, reports, and research*
- Dr. J Patz and his Agency at University of Wisconsin, Madison*
 - WHO and their divisions, etc*
 - Internet sites, Stockphoto, etc.*
- Additional Sources, Authors, and Researchers as noted*

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Questions, Thoughts, Comments

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