

Citizen Science Afternoon Session

INTRODUCTION

Environmental Measurement Symposium

***“The Future Landscape
for Science”***

34th Annual Conference

New Orleans, LA

August 6-10, 2018

34th Environmental Measurement Symposium

Forum on Environmental Accreditation

National Environmental Monitoring Conference

NELAC

US EPA

Hyatt Regency

New Orleans, LA

The Future Landscape for Science

CITIZEN SCIENCE

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

34th Annual Conference

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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.

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 : Impacting Policy Makers

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

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

Citizen Science Afternoon Session

A G E N D A

The Future Landscape for Science

Today's Discussion : CITIZEN SCIENCE

Nexus with Climate Change

Identifying Regulatory Gaps

Local Example - Collaboration

Citizen Research & Policy

Panel Q & A

Citizen Science Afternoon Session

First Presentation

The Future Landscape for Science

CITIZEN SCIENCE *and the NEXUS* *with CLIMATE CHANGE*

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COMMENT

‘ Climate is what we expect

..... weather is what we get ’

Mark Twain

Citizen Science and the Nexus with Climate Change

Today's Discussion :

Overview of Climate Change

A Look at Infectious Disease

Citizen Science Nexus

Other Health Areas of Impact Include :

Safe Drinking Water	(Flint, MI)
Nutrition	(Schools, Sugary Foods)
Clean Indoor Air	(Secondhand Smoke)
Energy	(Pipelines, Hydro-fracturing)

CITIZEN SCIENCE

and the Nexus with

CLIMATE CHANGE

Citizens See Fire



Citizens See Smoke



Citizens See Rain



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

September 2014 (AZ - 2)



September 2015 (UT-21)



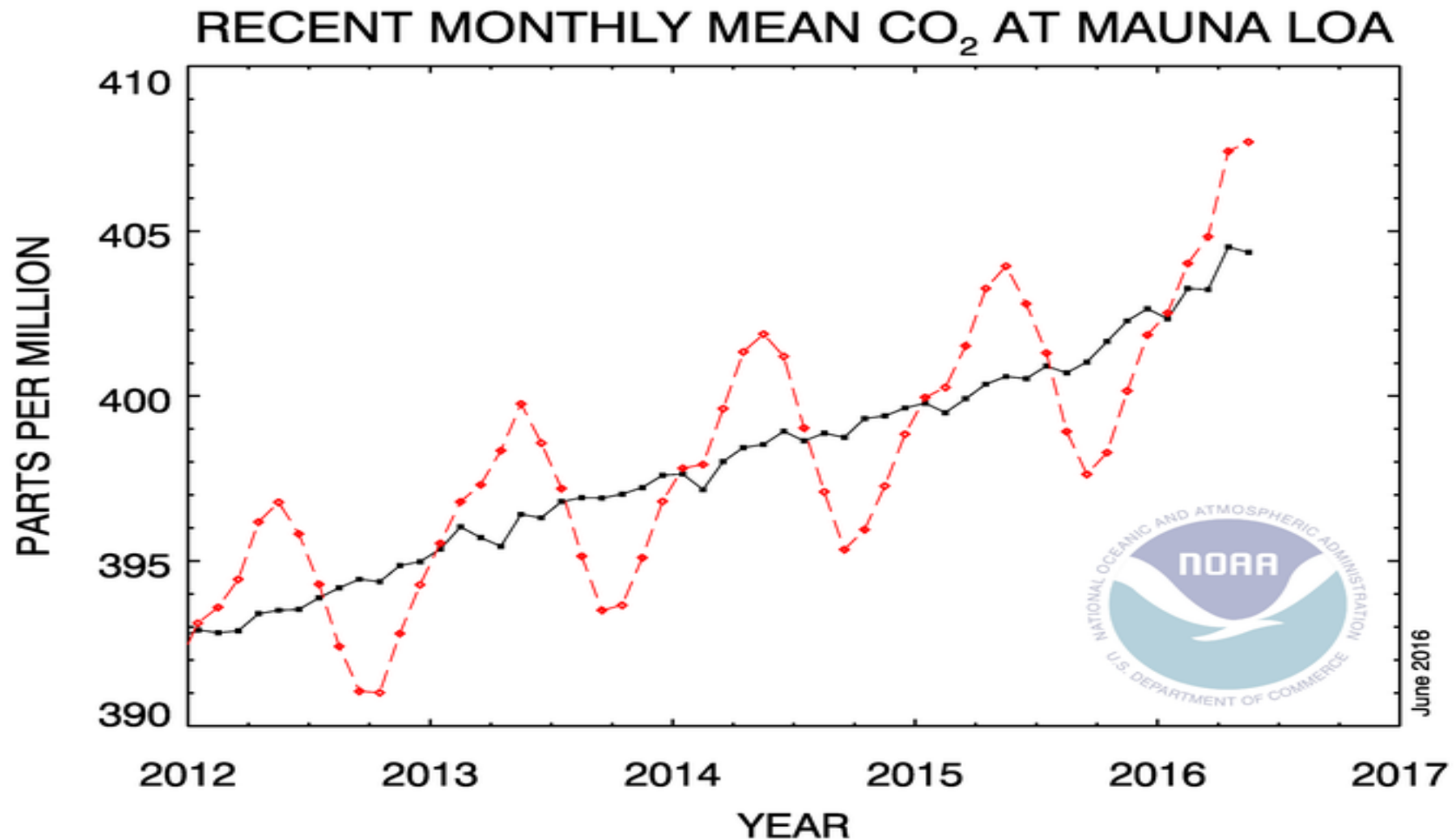
May 2015 (TX – 21)
June 2016 (WVa – 23)



Increased Temperature

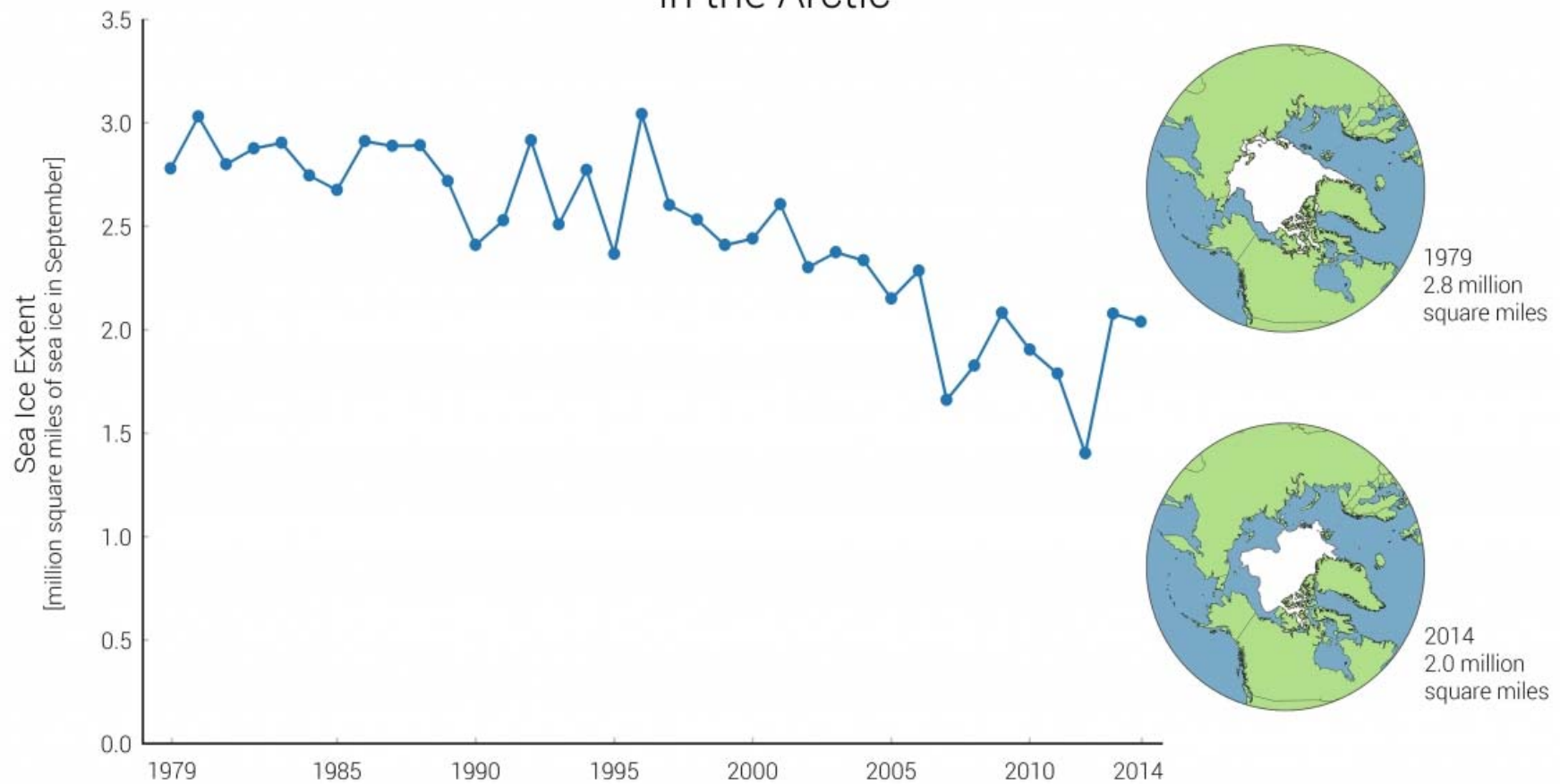


Changes Are Needed



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."

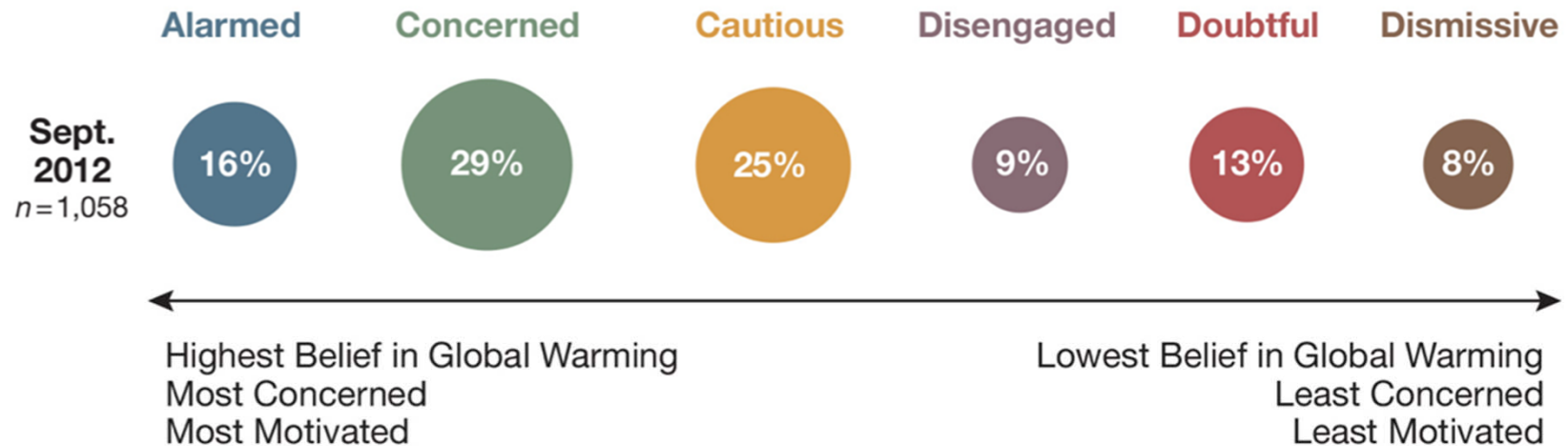
CLIMATE CHANGE *Nexus*

-- Education

- Citizen Science
- Citizen Research
- Citizen Action

Climate Change is Here

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



Proportion represented by area

Source: Yale / George Mason University

Citizen Science : Action



Save the Date

Join **PSR Philadelphia** and **NEHA** for

a *civil salon* examining the nexus between climate change and economics including a discussion and screening of "*This Changes Everything*"

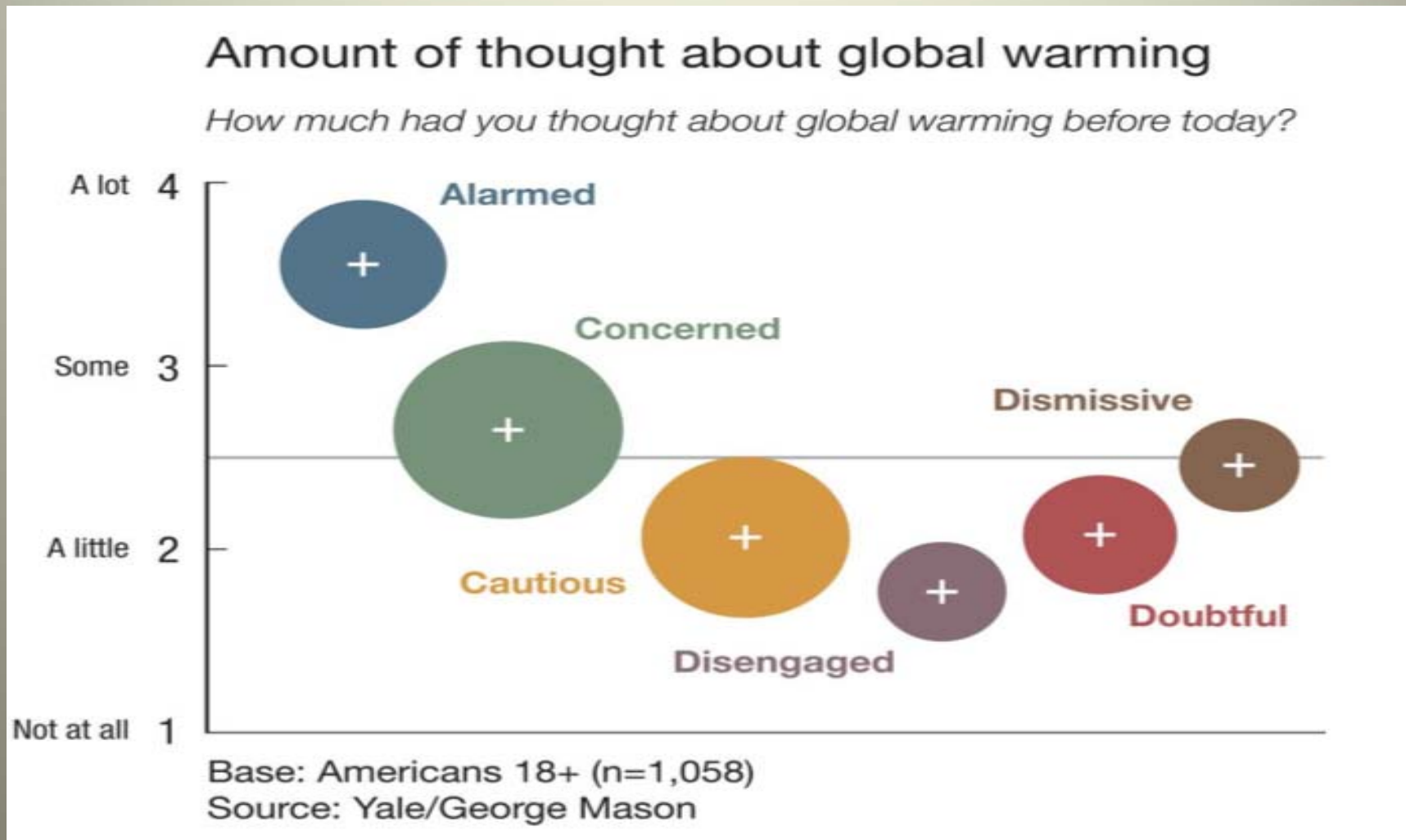
WHEN: Thursday, **February 11**

WHERE: **Friends Center**
1501 Cherry Street

TIME: 5:15 Mix and mingle
5:30 Program and Movie

For more info: psrphila.org

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



Nexus Example :

INFECTIOUS DISEASE

Environmental Impacts

CLIMATE CHANGE

*Temperature Rise*¹

*Sea level Rise*²

Hydrologic Extremes

¹ 3° C by yr. 2100

² 40 cm " "

IPCC estimates

Urban Heat Island Effect

Heat Stress
Cardiorespiratory failure

Air Pollution

Respiratory diseases, e.g.,
COPD & Asthma

Vector-borne Diseases

Malaria
Dengue
Encephalitis
Hantavirus
Rift Valley Fever

Water-borne Diseases

Cholera
Cyclospora
Cryptosporidiosis
Campylobacter
Leptospirosis

Water resources & food supply

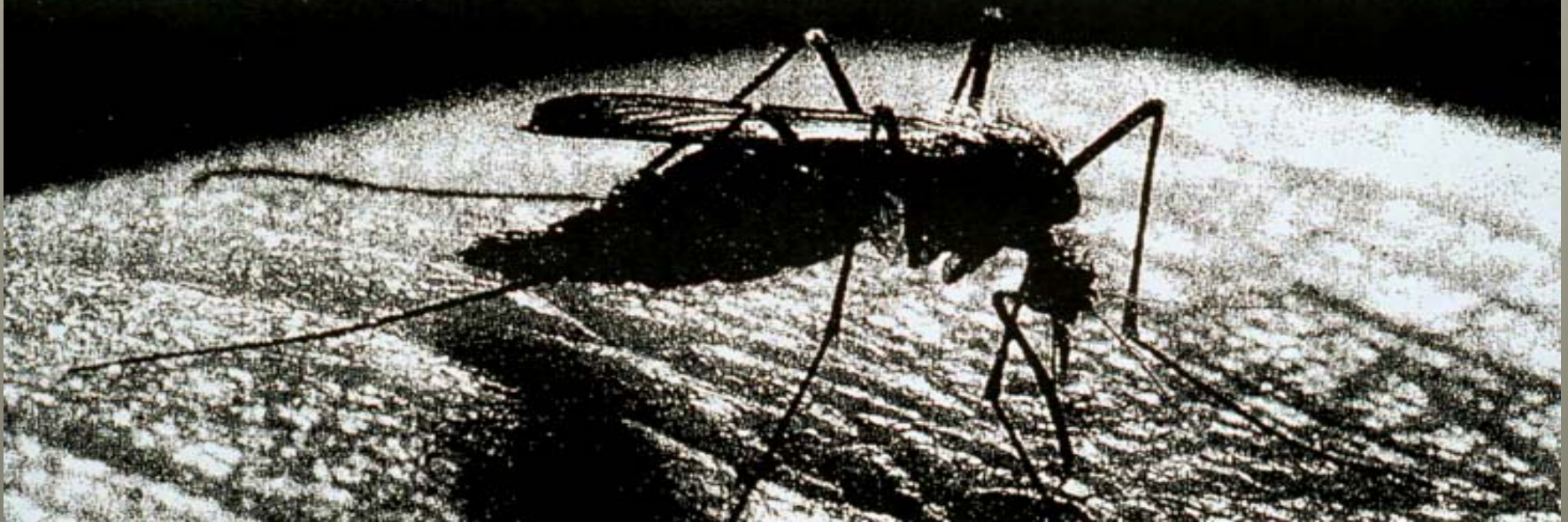
Malnutrition
Diarrhea
Toxic Red Tides

Environmental Refugees

Forced Migration
Overcrowding
Infectious diseases
Human Conflicts

HEALTH PROFESSIONALS AND SCIENTISTS WARN OF SPREADING INFECTIOUS DISEASES.

**Global Warming's greatest
threat may also be the
smallest.**





Zoonoses



- Disruption of ecosystems and natural controls are leading to atypical outbreaks of zoonotic infectious diseases

(i.e., transmitted by, or have reservoirs in, rodents, birds, or insects)

- hantavirus, plague, dengue fever, west nile virus, Zika and arboviruses (ticks and fleas).
- Pine beetle/bark beetle infestations. Forest die-offs.

(e.g., Routt national Forest , Colorado)





Zika Virus Infection

Through June, 2016

U.S. Cases --- from mosquito bites (elsewhere)

July, 2016

New U.S. Cases --- origin : Mosquito bites (FL)

Zika Virus

Discovered :

1947 Uganda : Zika Forest

Today 64 countries (and increasing)

Places
with active
Zika virus
trans-
mission:



Zika Virus

TRAVEL ROUTE :

Uganda ---- Africa ---- SE Asia ---- Micronesia

and French Polynesia ---- South America

and now, North America

Zika Virus

How did it jump to South America ?

[Becoming a Disease of Sporting Events !!]

Strong link to :

World Cup (Soccer)

World Sprint Championship (Canoeing)

*** **

2016 Olympics (Tourist Risk of 3.2 per 100K) 16 cases

Zika Virus

W H O [World Health Organization]

Issued a declaration for :
International Public Health Emergency

(Only the 4th Time)

Zika Virus

2015 – 1st year of widespread contact in
North *and* South America

2013 - 2015 1.7 M Infected : Chikagunya and Zika combined

2017 207,125 specimens processed by CDC labs and
the Laboratory Response Network

31,468 Zika Prevention Kits distributed across
the US and territories

Citizen Science -- Infectious Disease



Emoji



Conclusion

- Citizen Education
- Citizen Engagement
- Citizen Research -- Surveys
- Citizen Science
- Outreach & Sharing Data
- Negotiation

Citizen Research : Impacting Policy Makers

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

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Future (present) Citizen Research Efforts to Protect the Public's Health



Flaring Gas in NoDak

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.*
- Dr. L. Vinci, NEHA Virtual EEK Conference, 2016*
- Additional Sources, Authors, and Researchers as noted*

The Future Landscape for Science

Questions, Thoughts, Comments

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