



The National Climate Assessment: Process, outcomes & how you can contribute

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Today's Discussion

- Learning about the process that led to the production of the NCA
- Sharing some of the outcomes from the draft 2013 NCA report
- How to submit official comments on the NCA Draft Report & the importance of your contributions
- Beyond the NCA: Connecting the dots

Climate change threatens health



“Climate change is one of the most serious public health threats facing our nation. Yet few Americans are aware of the very real consequences of climate change on the health of our communities, our families and our children.”

– Dr. Georges Benjamin, Executive Director,
American Public Health Association

Health in the NCA Objectives

- The NCA will present a comprehensive picture of the changes in regions and sectors that occur in response to climate variability and change, including **effects on public health** and human well-being, the economy, infrastructure, and the environment. This information will help decision makers throughout the country design adaptation policies, help citizens prepare themselves for climate change impacts, and help everyone understand how their everyday decisions impact the climate and the environment.

US Global Change Research Program

Legal Requirements

GCRA Mandate:

“To provide for development and coordination of a comprehensive and integrated United States **Research Program** which will assist the Nation and the world to **understand, assess, predict, and respond** to human-induced and natural processes of global change.”



United States
Global Change
Research Program



National
Climate
Assessment

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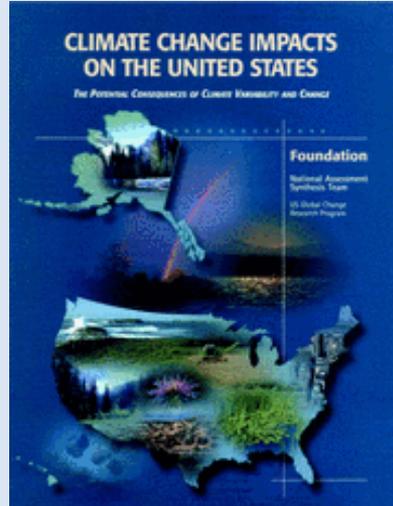
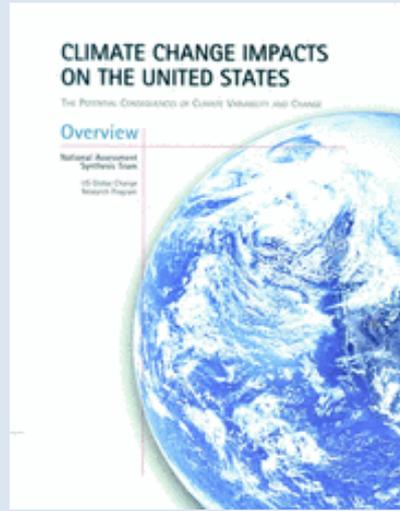
National Climate Assessment: GCRA (1990), Section 106

...not less frequently than every 4 years, the Council... shall prepare... an assessment which –

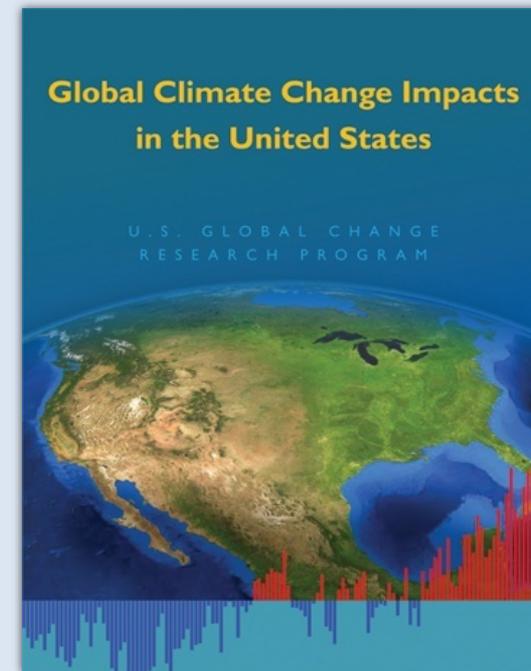
- **integrates, evaluates, and interprets** the findings of the Program (USGCRP) and discusses the scientific uncertainties associated with such findings;
- **analyzes the effects of global change** on the natural environment, agriculture, energy production and use, land and water resources, transportation, human health and welfare, human social systems, and biological diversity; and
- analyzes current trends in global change, both human-induced and natural, and **projects major trends for the subsequent 25 to 100 years.**

Previous National Climate Assessments

Climate Change Impacts on the United States (2000)



Climate Change Impacts in the United States (2009)



<http://nca2009.globalchange.gov/>

The “New” National Climate Assessment



Goal

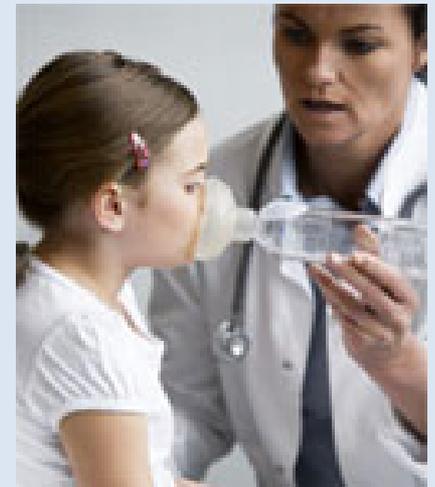
- Enhance the ability of the United States to **anticipate, mitigate, and adapt** to changes in the global environment.

Vision

- Advance an **inclusive, broad-based, and sustained process** for assessing and communicating scientific knowledge of the impacts, risks, and vulnerabilities associated with a changing global climate in support of decision-making across the United States.

Goals for the NCA

- A **sustained process** for **informing an integrated research program**
- New approaches to development and use of **scenarios at multiple scales**
- **Evaluation** of the implications of alternative **adaptation and mitigation options**
- **Community building** within regions and sectors that can lead to enhanced resilience



NCA Process

- Established a diverse 60-member federal advisory committee – the **NCADAC** (National Climate Assessment and Development Advisory Committee) - responsible for developing the 2013 report & advising on sustained NCA process
- Hosted workshops focused on assessing impacts and vulnerabilities in 8 regions and 13 sectors, evaluating the state of climate science, and identifying research needs; multiple listening sessions with scientists and decision-makers
- Developed new regional climate histories and projections for all 8 regions

NCA Process (con't)

- NCADAC selected 240 authors from academic, public and private sectors to write the 30 chapters of the 2013 report
- NCADAC workgroups initiated multiple kinds of engagement activities, website, communications and engagement plan, e-newsletters, workshops, Federal Register Notices, “Climate Conversations” and the first ever Request for Information from the public

NCA Process (con't)

- Initiated development of the first national indicator system to evaluate global change and the ability to adapt/respond
 - to communicate key aspects of the physical climate, impacts, vulnerabilities, and preparedness; to inform decision makers and the public
 - relationship to changes in climate, feedbacks, or impacts
 - address questions important to multiple audiences including non-scientists, resource managers, and state and municipal planners in a conceptually unified framework.
 - nationally important, and ideally should be scalable, so that they can be presented at appropriate spatial and temporal scales
 - **indicator system will include both *current* indicators and *leading* indicators**



Public Health Representation in NCA Authorship

- **Human Health - Chapter 9**

- Coordinating Lead Authors (CLA)

- Kim Knowlton (NRDC and Columbia University)
 - George Luber (CDC)

- Lead Authors (LA)

- John Balbus (NIH)
 - Howard Frumkin (University of Washington)
 - Mary Hayden (NCAR)
 - Jeremy Hess (Emory)
 - Michael McGeehin (Research Triangle Institute)
 - Nicky Sheats (Thomas Edison State College, NJ)

- Contributing Authors

- Lorraine Backer, CDC
 - Kristie L.Ebi
 - Rick Ostfeld, Cary Institute
 - Emily Zielinski-Gutierrez, CDC
 - C.Ben Beard, CDC
 - Edward Maibach, George Mason U
 - Christine Wiedinmyer, NCAR
 - Lewis Ziska, USDA

- **Health involvement in other chapters**

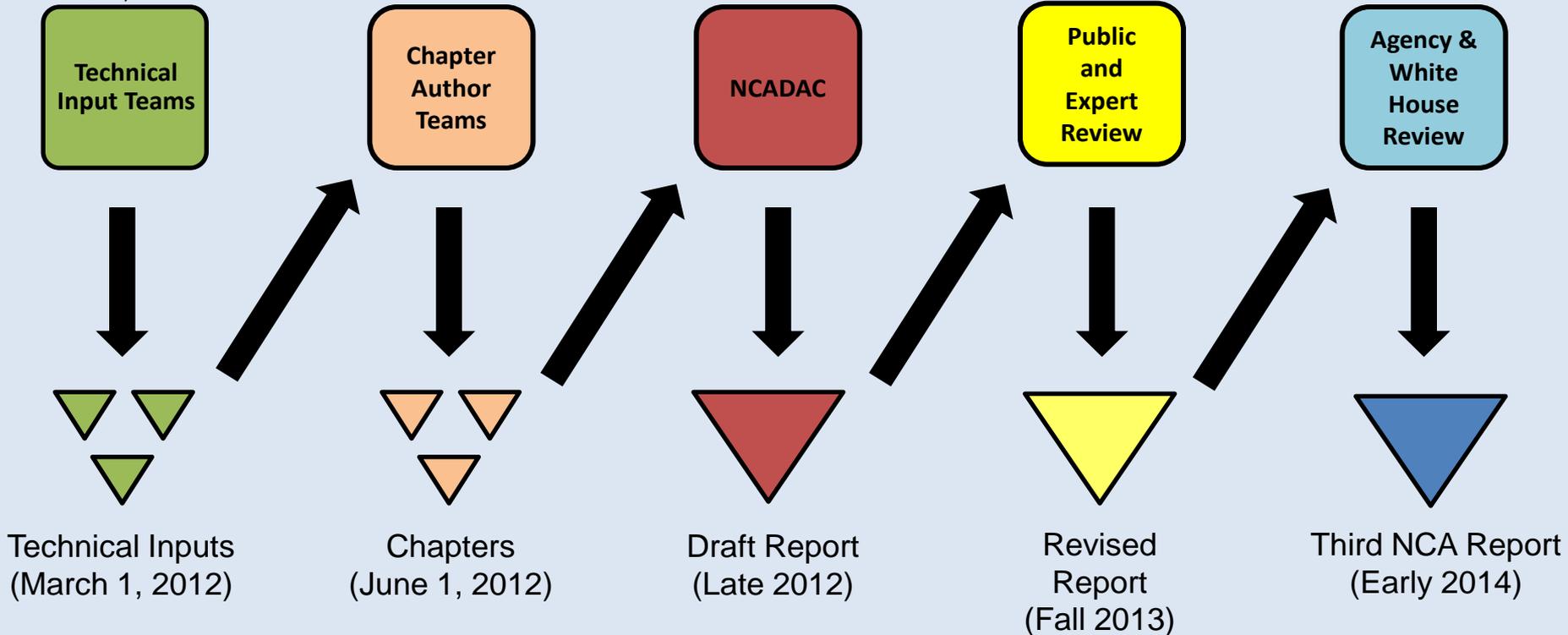
- Paul Schramm (CDC) on the Southeast Chapter
 - Jonathan Patz (Wisconsin) on the Midwest Chapter



Third NCA Report Process

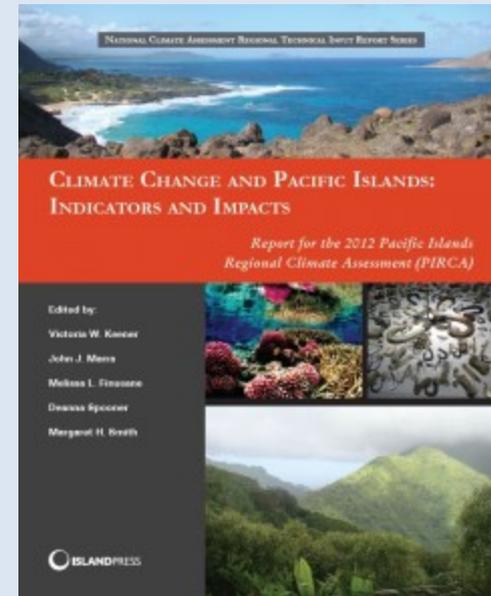
Federal agencies,
universities, NCAnet
members, and others

January 14 –
April 12, 2013



Progress to Date

- First “request for information”:
250+ technical inputs from 100+ individuals and teams, including:
 - New regional climate histories and projections for each region
 - New sea level rise scenarios
 - **In-depth foundational assessments for each region and most sectors**
- Author teams delivered their draft chapters to the NCADAC
- Draft report released January 11, Public comment period opened January 14



Island Press is publishing most of the regional technical inputs over the next few months: <http://www.cakex.org/NCAreports> (Pacific Islands and Coasts currently available, Southwest expected in February 2013);

Most of the federal agency-sponsored reports are available from <http://www.globalchange.gov/what-we-do/assessment/nca-activities/available-technical-inputs>

Outcomes of the NCA

- **Ongoing, relevant, highly credible analysis** of scientific understanding of climate change impacts, risk, and vulnerability
- Enhanced timely **access to Assessment-related data** from multiple sources useful for decision making
- **Systematic evaluation** of progress towards reducing risk, vulnerability, and impacts
- **National indicators** of change and the capacity to respond



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Components of the 2013 NCA

- Delivery of the Third NCA Report via an **e-book**, 400 pages, and a 50 page printed synthesis document
- A defensible, transparent, well-documented product
- First stage of the Global Change Information System for USGCRP – electronic access to all findings and data
- An information foundation for strong communications products and processes that are useful to a variety of audiences, including Congress, local regional and state decision-makers, etc.

Outline for 2013 NCA Report



- Introduction/Letter to the American People
- Executive Summary: Report Findings
- Introduction (approach to sustained scientific assessment, including scenarios, indicators, engagement, etc.)
- The scientific basis for climate change
- Sectors and sectoral cross-cuts
- Regions and biogeographical cross-cuts
- Decision support, mitigation and adaptation
- Agenda for climate change science
- The NCA sustained assessment process
- Appendices
 - Commonly Asked Questions
 - Expanded Climate Science Info

Regions



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Sectors

- Water resources
- Energy supply and use
- Transportation
- Agriculture
- Forestry
- Ecosystems and biodiversity
- Human health



Sectoral Cross-Cuts



- Water, energy, and land use
- Urban/infrastructure/
vulnerability
- Impacts of climate change on tribal, indigenous, and native lands and resources
- Land use and land cover change
- Rural communities and development
- Impacts on biogeochemical cycles

Biogeographical Cross-Cuts

- Oceans and marine resources
- Coastal zone, development, and ecosystems



Resources Applied for Ch.9, Human Health

- Health Sector Regional Workshops
 - Northwest & Southeast, February 2012
- Scenarios of climate change in US
- Technical Inputs
 - 65+ Technical Input documents on health
- Literature Review
 - Assessment of climate-health research Jan 2007 – July 2012
 - Over 2,500 citations compiled
 - Intended as an update to Synthesis and Assessment Product (SAP) 4.6 and the 2009 NCA Health chapter

Key Message 1

“Climate change threatens human health and well-being in many ways, including impacts from increased extreme weather events, wildfire, decreased air quality, diseases transmitted by insects, food and water, and threats to mental health. Some of these health impacts are already underway in the U.S.”

Smoke from Wildfires has Widespread Health Effects

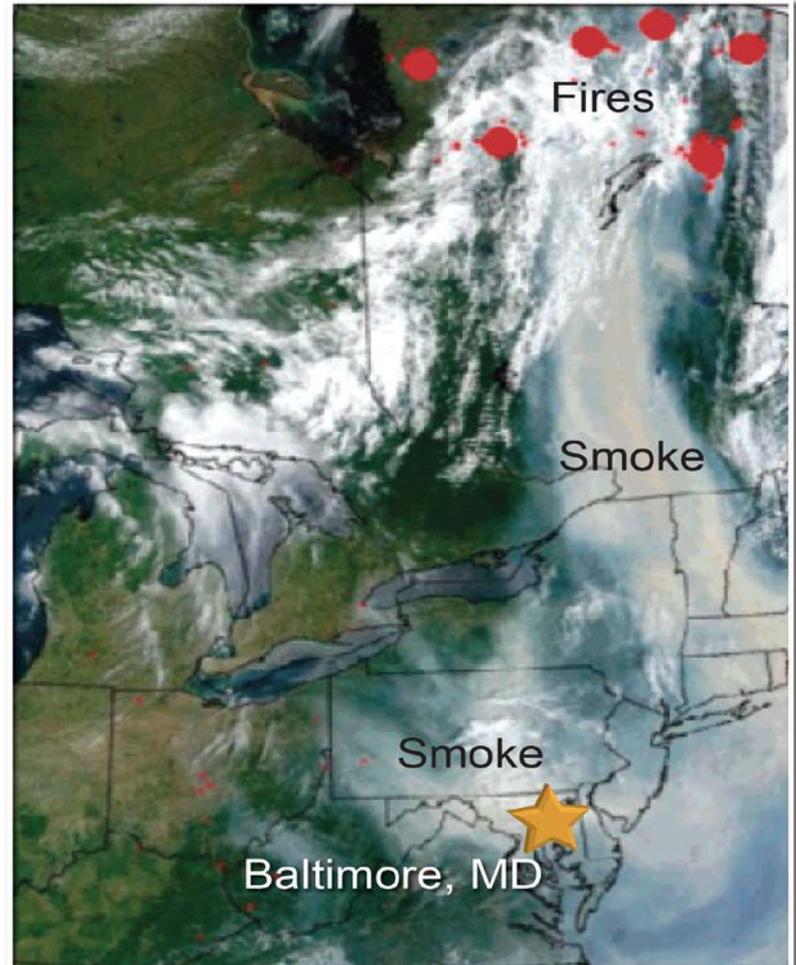
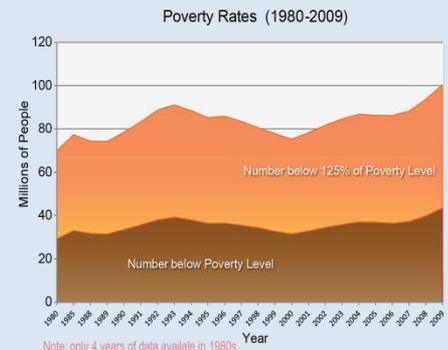
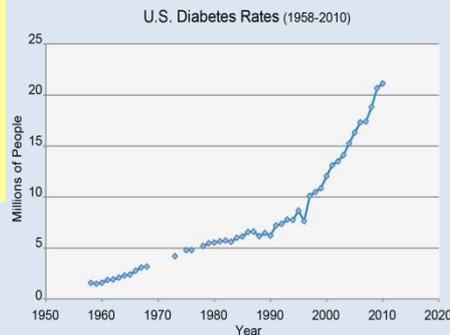
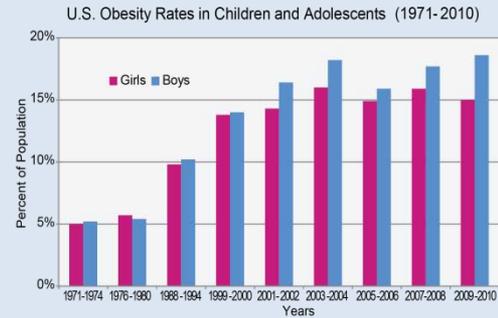
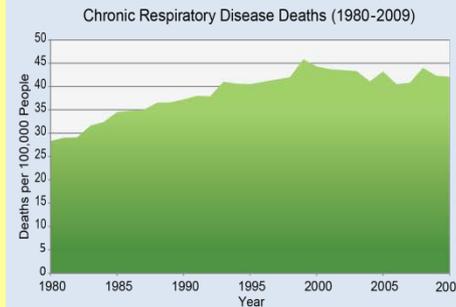
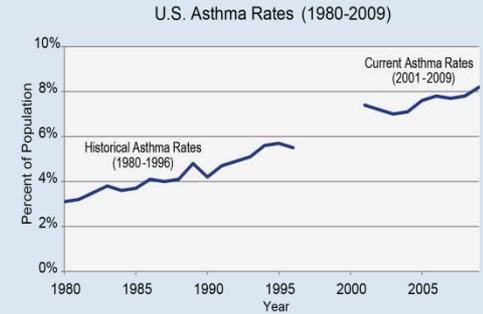
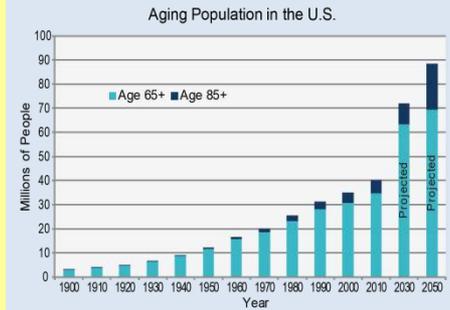


Figure 9.6 (p.341), draft report.

Key Message 2

Elements of Vulnerability to Climate Change

“Climate change will, absent other changes, amplify some of the existing health threats the nation now faces. Certain people and communities are especially vulnerable, including children, the elderly, the sick, the poor, and some communities of color.”



Key Message 3

“Public health actions, especially preparedness and prevention, can do much to protect people from some of the impacts of climate change. Early action provides the largest health benefits. As threats increase, our ability to adapt to future changes may be limited.”

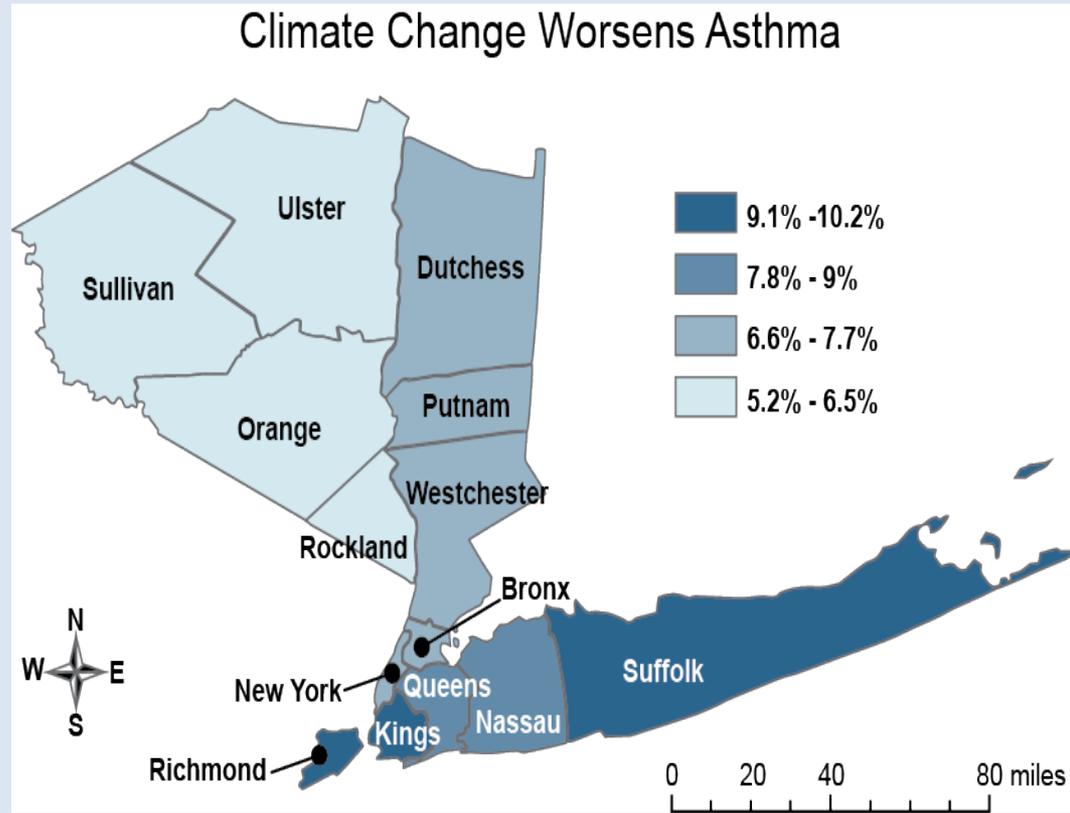
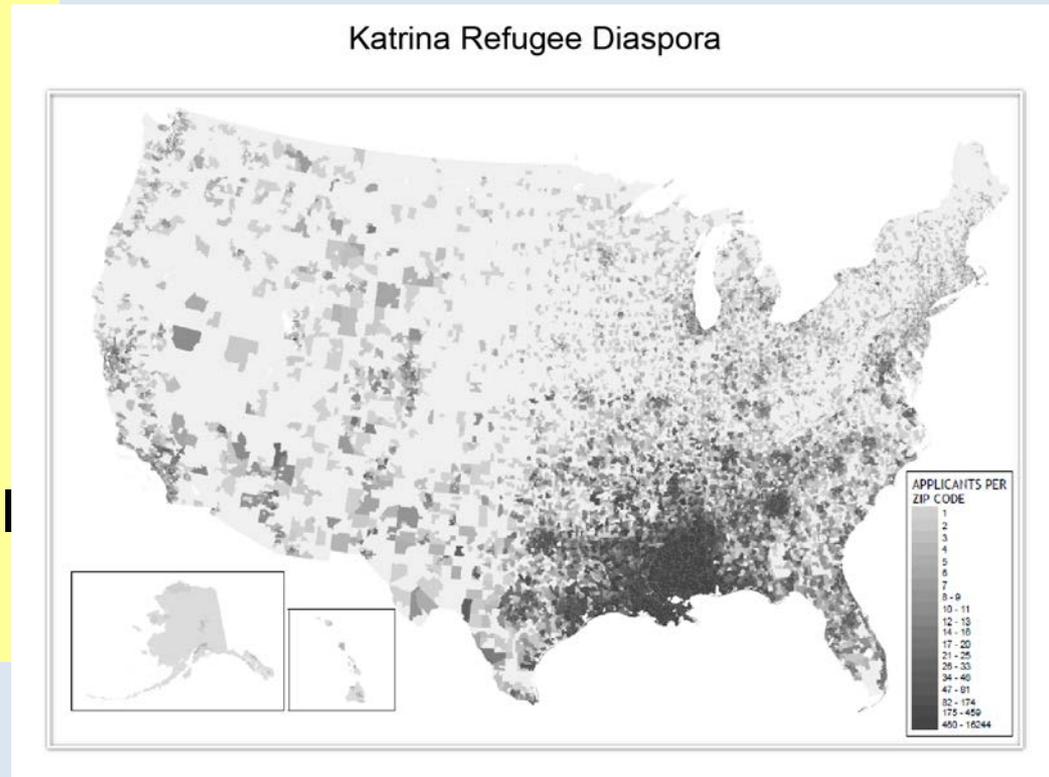


Figure 9.1 (p.335), draft report.

Key Message 4

“Responding to climate change provides opportunities to improve human health and well-being across many sectors, including energy, agriculture, and transportation. Many of these strategies offer a variety of benefits, protecting people while combating climate change and providing other societal benefits.”

Figure 9.13 (p.352), draft report.



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Key Health Threats

- ***Multiple Climate Stressors & Health***
 - Climate change impacts add to the *cumulative* stresses currently faced by vulnerable populations: children, the elderly, the poor, some communities of color, and people with chronic illnesses; in locations (cities, floodplains, and coastlines) are more vulnerable to extreme events & ongoing, persistent climate-related threats: poor air quality, heat, drought, flooding, and mental health stress. Over time, the accumulation of these stresses will be increasingly devastating to these populations.
- ***Societal System Failures During Extreme Events***
 - Multiple system failures can occur during extreme weather events (infrastructure, evacuation, response services in Hurricane Katrina; loss of electrical power during heat waves limits air conditioning access, increasing everyone's vulnerability). Can exceed response capacity & in succession, deplete our reserves from personal to national scale, esp. for vulnerable.
- ***Large-Scale Environmental Change Favors Disease Emergence***
 - Climate change is causing large-scale environmental change, increases likelihood of emergence/re-emergence of unfamiliar disease threats. Factors include shifting pest ranges, lack of immunity & preparedness, inadequate monitoring. Diseases that pose increasing US health threats include Lyme disease, dengue fever, new diseases like Chikungunya.



How to Provide Comments

- To provide ***YOUR input*** on the **Third NCA Draft Report**, please go to:

<http://www.globalchange.gov/what-we-do/assessment/draft-report-information>

or

<http://ncadac.globalchange.gov>

or

<http://assessment.globalchange.gov>



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What will happen to the comments?

- Authors and NCADAC will prepare responses; both comments and responses will be publicly available
- Although commenters must identify themselves in the online form, their identity will not be provided to the authors or review editors during the response period
- Only comments submitted via the official online comment forms will be accepted
- Review editors will assess the adequacy of the responses
- The National Academies will review the revised document and evaluate the adequacy of incorporated responses
- Revised draft report prepared, reviewed, OK'd by NCADAC
- Submitted for US Government review: will be considered for submittal to Congress as the government's response to the GCRA requirements.

Major focus on engagement and communications

NCAnet: Partners in Assessment



- A network of organizations that extend the NCA process and products
- Building long-term capacity to conduct and use assessments
- Cultivating partnerships with organizations that will participate in the sustained assessment process
- You can sign-up:
<http://ncanet.usgcrp.gov/home/sign-up>

60+ organizations so far!
<http://ncanet.usgcrp.gov>

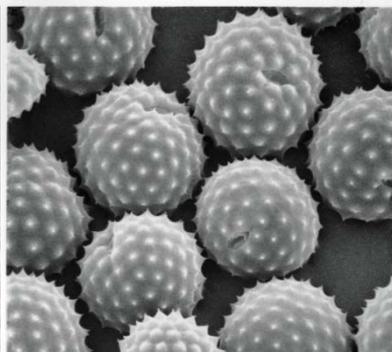
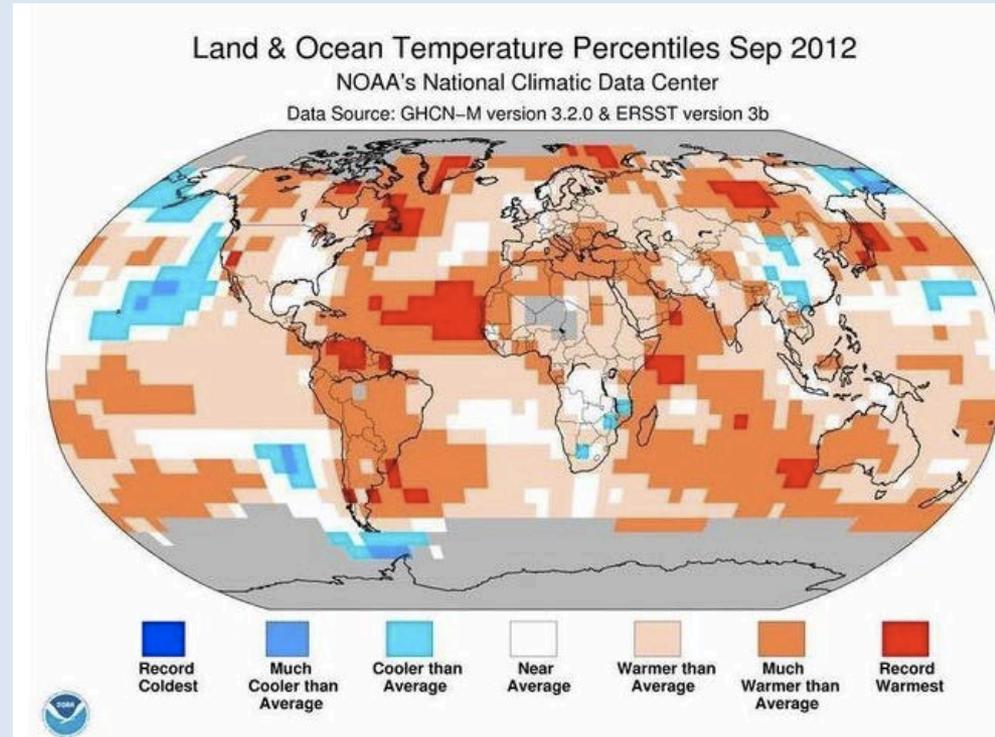


Climate change & health: connecting the dots...

climate change fuels impacts that are
happening here and now.

2012: Record-Breaking Extreme Weather

- June-Aug 2012: 10,000 daily high temperature records broken
- 2012: hottest year ever recorded in contiguous US
- Drought across 2/3 of US in July (\$77 billion cost estimate)
- Jan-Oct: 9 million+ acres burned in wildfires

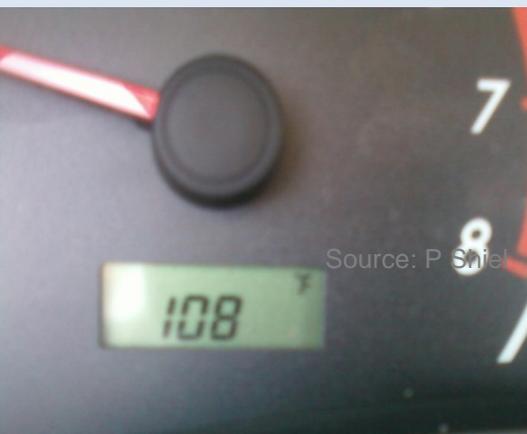


Widespread recent first-person experience of extreme weather

- Hurricane Sandy
- Heat
- Drought
- Wildfire



Source: Cristian Salazar/Gotham Gazette



Source: P. Sniel



Source: Christian Science Monitor

\$14 billion in health-related costs from just six US climate change-related events, 2002-2009

(Knowlton et al., *Health Affairs* 2011)

Six U.S. Case Studies, 2002-2009, Resulted in More Than \$14 Billion in Climate-Related Health Costs.

During the Red River and associated floods, two deaths, 263 emergency room visits, and an estimated 3,000 outpatient visits resulted in nearly \$20.4 million in health-related costs. Seasonal river flooding will increasingly affect many areas of the country, resulting in more injuries and deaths. Increased heavy downpours are projected from climate change as temperatures rise, raising levels of both evaporation and precipitation in many areas.



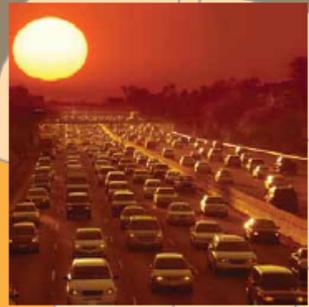
SMOG POLLUTION, NATIONWIDE, 2002

Across the U.S. in 2002, nearly 288 million Americans were exposed to ozone smog levels above the health-based standard, which was then 80 ppb. This exposure hastened death for 795 people, and caused 4,150 hospitalizations and more than 365,000 outpatient visits, at a cost of \$6.5 billion. Smog levels are anticipated to rise in the coming years, in the absence of strategies to reduce precursor emissions, because as climate change increases temperatures, ozone-forming chemical reactions also increase.

FLOODING, NORTH DAKOTA, 2009



FEMA News Photo



HEAT WAVE, CALIFORNIA, 2006

Over a two-week heat wave, 655 deaths, 1,620 hospitalizations, and more than 16,000 excess emergency room visits, resulted in nearly \$5.4 billion dollars in costs. Major heat waves such as this are expected to occur more frequently in the future.

WILDFIRES, SOUTHERN CALIFORNIA, 2003



© Dave Powell, USDA Forest Service

These fires burned more than 736,000 acres and resulted in 69 deaths, 778 hospitalizations, and more than 47,600 outpatient visits. Together, this resulted in health-related costs exceeding \$578 million. Conditions conducive to wildfires, including drought and extreme heat, are expected to worsen in many parts of the country due to climate change.



WEST NILE VIRUS, LOUISIANA, 2002

An outbreak of West Nile Virus in Louisiana in 2002 resulted in an estimated 24 premature deaths, 204 hospitalizations, and nearly 5,800 outpatient visits. Health-related costs totaled \$207 million. Mosquito-borne diseases are expected to emerge and spread into more northern climates as temperatures increase and create more habitable environments for mosquitoes.



FEMA News Photo

HURRICANES, FLORIDA, 2004

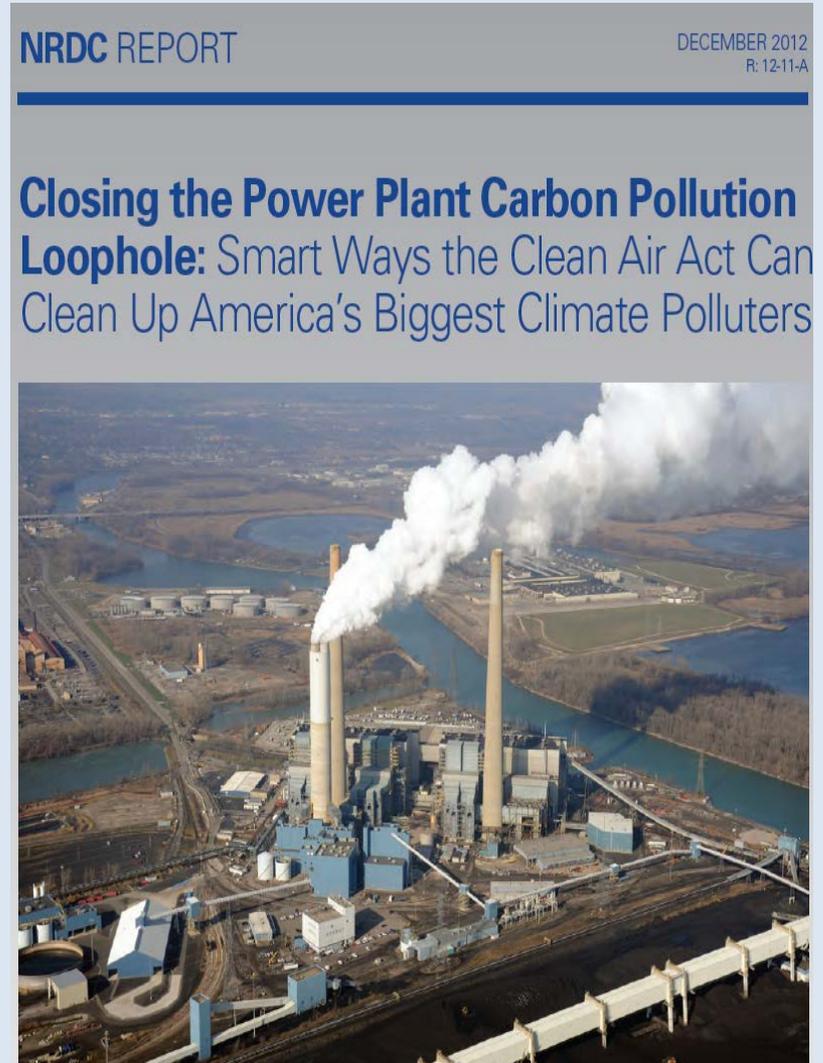
Four major hurricanes caused 144 premature deaths, nearly 2,200 hospitalizations, 2,600 emergency visits, and \$1.4 billion in health-related costs. Climate change is projected to increase the intensity of hurricanes, as sea surface temperature rise in the North Atlantic and provide more energy to drive storm systems. Some climate models project a doubling in the most intense hurricanes (Category 4 and 5) by late in this century.⁸

Prevention: reducing carbon pollution

Several groups in the NCAnet have their own policy solutions to propose about reducing climate change:

- Center for Climate and Energy Solutions
- Massachusetts Climate Action Network
- National Wildlife Federation
- NRDC
- Sierra Club
- Union of Concerned Scientists

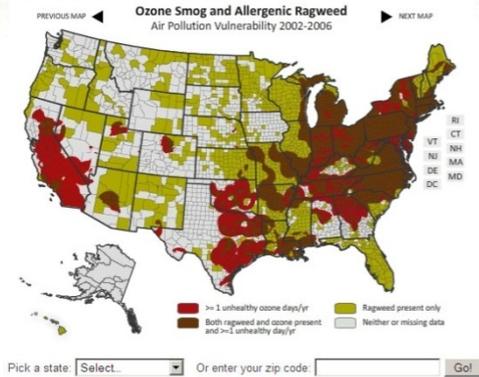
among others...



CLIMATE CHANGE THREATENS HEALTH

SERIOUS THREATS WHERE YOU LIVE AND WHAT TO DO ABOUT THEM

Climate change is one of the most serious public health threats facing the nation, but few people are aware of how it can affect them. Children, the elderly, and communities living in poverty are among the most vulnerable. Click on a state on the map for more information on climate-health threats, actions being taken to prepare communities, and what you can do.



Five Ways Climate Change Threatens Health

Air Pollution >
Rising heat worsens smog. Burning coal and oil emits carbon and particle pollution; plants produce more allergenic pollen, affecting respiratory health threats like asthma.
[Find out more >](#)

Extreme Heat >
Heat waves send thousands to emergency rooms and cost health care systems millions of dollars. Climate change brings longer, more intense heat waves.
[Find out more >](#)

Infectious Diseases >
Hotter summers can make disease-carrying insects more active, for longer seasons; illnesses like dengue, West Nile, and Lyme can spread into new areas.
[Find out more >](#)

Drought >
Hotter days and nights, and changing rainfall patterns reduce water supply quantity and quality, and diminish food security.
[Find out more >](#)

Flooding >
Climate change intensifies rainfall, heavy rains increase risk of drinking water contamination and illness; floods can force communities to relocate.
[Find out more >](#)

MORE INFORMATION

Take Action



VIDEO: Climate Change Threatens Health



[Watch the Video >](#)

Issue Papers and Reports

- [Climate and Your Health](#) (2011)
Addressing the Most Serious Health Effects of Climate Change
- [Climate Change, Water, and Risk](#) (2010)
Current Water Demands Are Not Sustainable
- [Tides of Trouble](#) (2010)
Increased Threats to Human Health and Ecosystems from Harmful Algal Blooms
- [The Worst Summer Ever?](#) (2010)
A report on record setting night-time temperatures
- [Fever Pitch](#) (2009)
Mosquito-Borne Dengue Fever Threat Spreading in the Americas
- [Boosting the Benefits](#) (2008)
Improving Air Quality and Health by Reducing Global Warming Pollution in California
- [Preparing for Global Warming](#) (2008)
A Framework for Protecting Community Health and the Environment in a Warmer World
- [Sneezing and Wheezing](#) (2007)
How Global Warming Could Increase Ragweed Allergies, Air Pollution and Asthma

Climate and Health blog posts from

SWITCHBOARD

[Dirty, Muggy Summer Air Reminds Us Why We Need Stricter Air Quality Standards that Cut Pollution](#)
posted by Kim Knowlton, 8/30/11
"Today it was 111°F in Phoenix, AZ; tomorrow a high of 107°F is predicted. More than 70 ...

[Waiting for Irene and Remembering Katrina](#)
posted by Gina Solomon, 8/25/11
Like most people on the East Coast, I'm anxiously watching the approach of Hurricane Irene, a ...

[Irene Approaches, But Climate Change Got Here First](#)
posted by Kim Knowlton, 8/25/11
NRDC's "Climate Change Threatens Health" webpages map five major climate-health ...

[Strengthening Local Level Heat-Health Measures in India](#)
posted by Anjali Jaiswal, 8/17/11
NRDC's new tool, "Climate Change Threatens Health" shows local data and maps detailing extreme ...

[More from Switchboard >>](#)

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NRDC's
Climate Change Threatens Health
website:
local climate-health threats, and adaptation actions

www.nrdc.org/climatemaps



Making Global Climate Change Local: Record-Breaking 2012 Extreme Weather In Your Backyard

Extreme Weather Map 2012

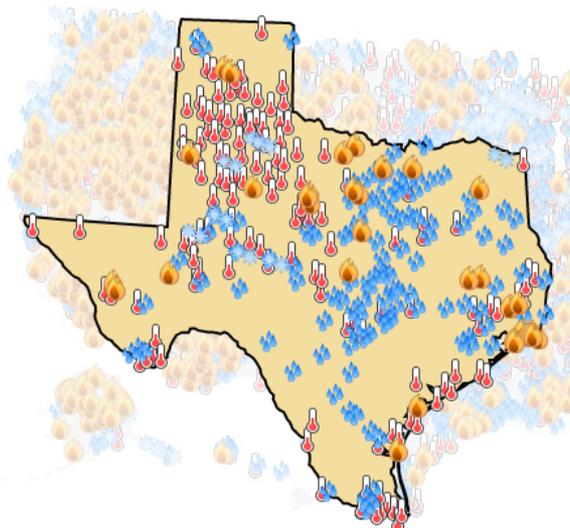
2012: Thousands More Weather Records Broken in the US, Costs Skyrocketing — Another "Year of What Climate Change Looks Like"

Climate change increases the risk of many types of record-breaking extreme weather events that threaten communities across the country. In 2012, there were 3,527 monthly weather records broken for heat, rain, and snow in the US, according to information from the National Climatic Data Center (NCDC).¹ That's even more than the 3,251 records smashed in 2011—and some of the newly-broken records had stood for 30 years or more.

Check out the interactive map below to find out what events hit your area.

MAP LEGEND

-  Record Temperature ⓘ
-  Record Rainfall
-  Record Snowfall
-  Large Wildfires ⓘ
-  FEMA-Declared Disaster or Emergency ⓘ
-  Drought



Texas experienced in 2012:

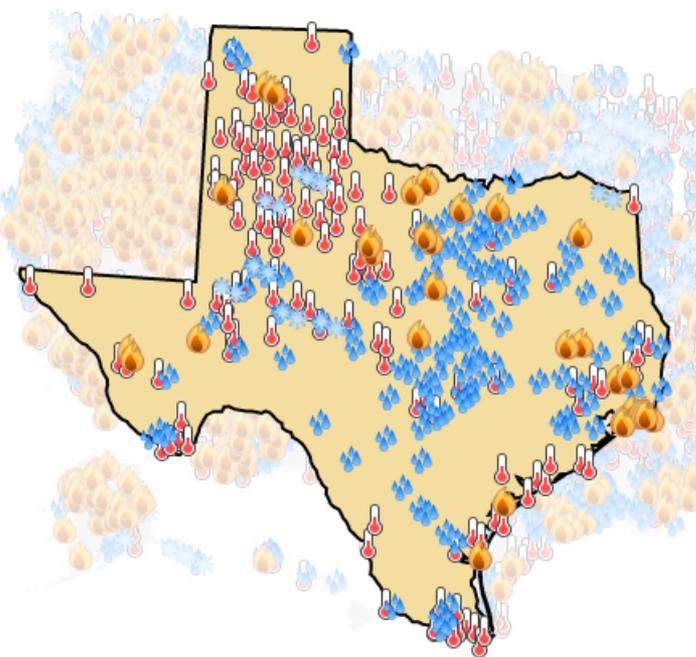
- Record-breaking heat in 89 counties and a total of 144 broken heat records
- Record-breaking snow in 7 counties and a total of 8 broken snow records
- Record-breaking precipitation in 73 counties and a total of 115 broken precipitation records
- Total of 34 large wildfires

[TAKE ACTION NOW](#)

[» View state data](#)



Making Global Climate Change Local: Record-Breaking 2012 Extreme Weather In Your Backyard



Texas experienced in 2012:

View Records Broken in 2012 By State or County

Select State: Select County:

In 2012, Brewster County experienced a total of 6 broken heat records, and 4 broken precipitation records.

[Send](#) [Tweet](#)

NEW RECORD(S) FOR MONTHLY HIGHEST MAXIMUM TEMPERATURE

county	station	record	record date	prev record	prev record date
Brewster	Panther Junction	100°	4/26/2012	99°	4/30/2011
Brewster	Alpine	99°	4/26/2012	97°	4/16/1963
Brewster	Persimmon Gap	105°	4/27/2012	104°	4/30/2002
Brewster	Castolon	91°	12/2/2012	90°	12/13/1993
Brewster	Panther Junction	83°	12/3/2012	82°	12/14/1995

NEW RECORD(S) FOR MONTHLY HIGHEST MINIMUM TEMPERATURE

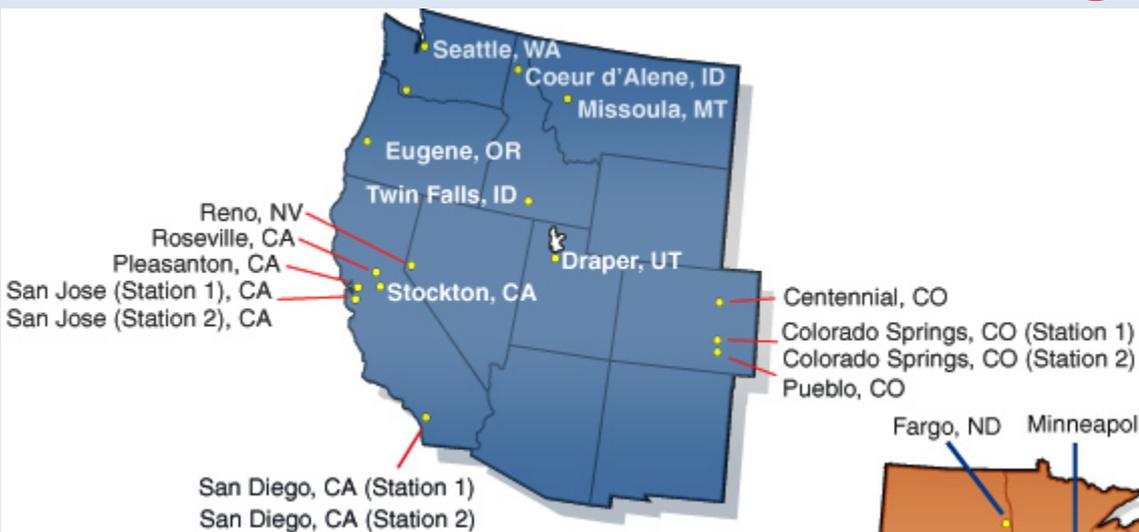
county	station	record	record date	prev record	prev record date
Brewster	Panther Junction	77°	9/3/2012	76°	9/12/2000

NEW RECORD(S) FOR PRECIPITATION

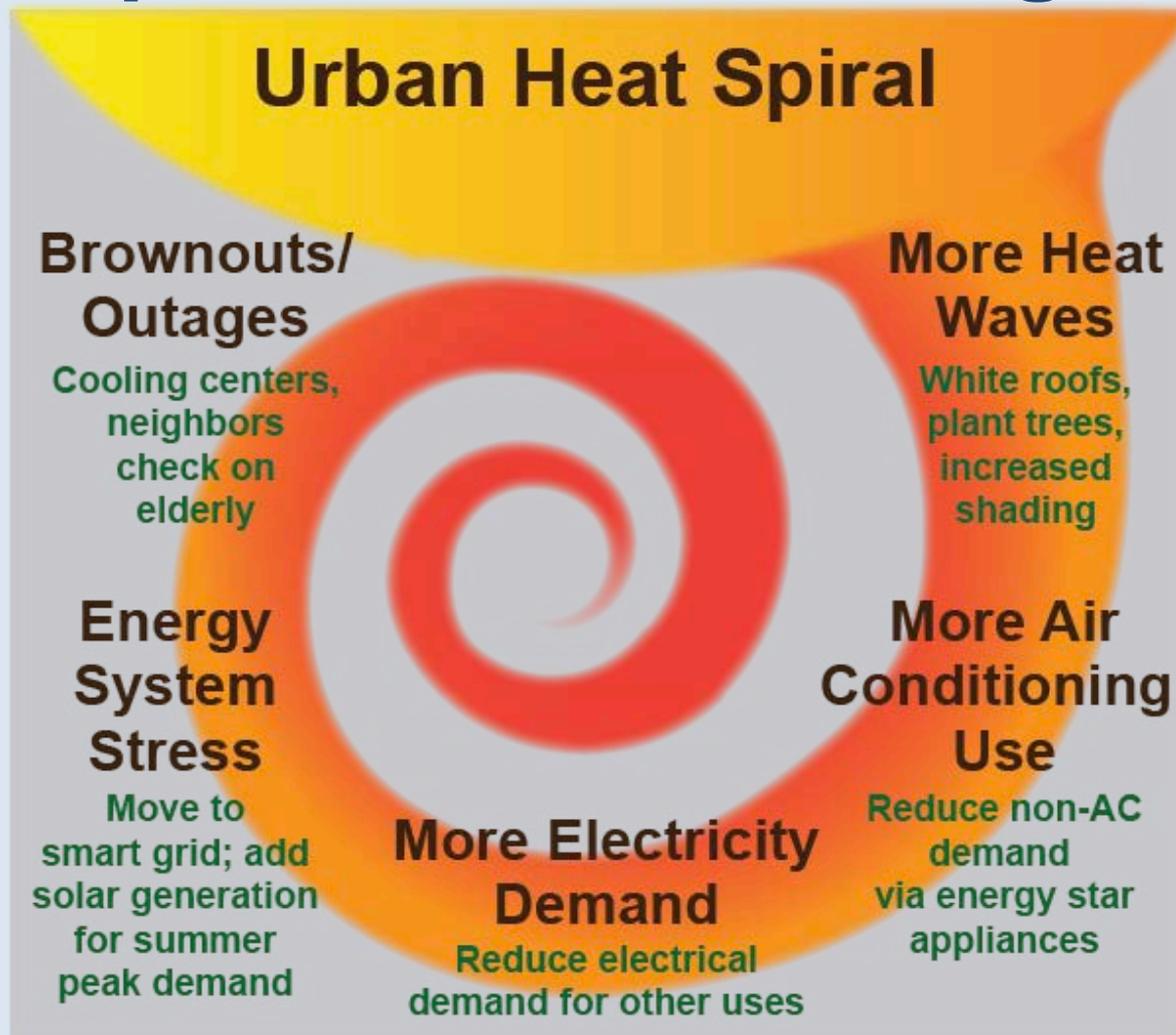
county	station	record	record date	prev record	prev record date
Brewster	Terlingua	0.15 in.	2/13/2012	0.13 in.	2/14/1951
Brewster	Terlingua	0.31 in.	2/17/2012	0.15 in.	2/13/2012
Brewster	Alpine	2.83 in.	7/28/2012	2.82 in.	7/1/1977
Brewster	Terlingua	2.2 in.	9/28/2012	1.12 in.	9/23/1950

National Allergy Bureau pollen collection network:

www.aaaai.org/nab



Adaptation to Increasing Heat



**National
Climate
Assessment**

U.S. Global Change Research Program

Heat Health Collaboration: Scientific Research to Support Policy

March 2011:

Indo-US Scientific
Workshop:

- 40 experts discuss heat-adaptation strategies
- 2010 Heat Wave Focus

March 2012:

Fact sheet and report
released and
disseminated

March 2013:

Heat Communications
Plan pilot



March 2011 Kick-Off Workshop Ahmedabad

A Climate-Prepared Future



- To limit health effects, move toward cleaner, non-polluting energy sources that won't run out & benefit health today
- Adapt to unavoidable climate change impacts with public health preparedness
- Limit carbon pollution from current sources





Questions?

Thank you for your work
“connecting the dots”

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Submit Comments

- Your review comments are an **important** part of the process of producing a credible and relevant report
- In order to ensure that your comments on the NCA Draft Report are included as a part of the official record, you **MUST** submit them via the online comment tool:

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