Findings from the National Climate Assessment

February 20, 2013

Moderator: David Hales
President, Second Nature
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• **Why You Should Care:**
  - Rising energy demands threaten energy security, economic growth, and the environment
  - Energy efficiency provides a low-cost, diverse, stable, and environmentally sound resource base
  - Consumers often don’t embrace the need to reduce energy use and don’t know how to do it

• **What Are Your Next Steps:**
  - Tailored energy saving programs that benefit the economy, reduce supply uncertainties, and mitigate climate change
  - Marketing that touches consumers, helps transform the marketplace for energy efficient products

• **Cadmus Can Help:**
  *The Cadmus Group, Inc.:*
  - Facilitates collaborative decision-making among multiple agencies and stakeholders
  - Factors in cost-effectiveness, economic stimulus, and reduced greenhouse gas emissions
  - Conducts market research to inform program design and consumer marketing
  - Orchestrates communications campaigns to produce sustained energy efficient choices
  - Evaluates the effectiveness of program and marketing initiatives

• **Contact:**
  - Linda Dethman, Linda.Dethman@cadmusgroup.com, (503) 467-7146
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- Managing water and wastewater services for public authorities and industry
- Designing technological solutions and building and managing the facilities and systems required to deliver these services
- Construction, rehabilitation and maintenance of networks and associated infrastructure

2009 Revenue $18.1 billion
95,000 employees

- Drinking water services to 95 million people
- Wastewater services to 68 million people
- Facilities managed +5,260 water +3,220
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• address faulty thinking & common misconceptions that inhibit support for your initiative

Barbara L. Bowen, PhD, Principal & Knowledge Architect, has over 25 years of professional experience & leadership in the application of research-based cognitive technologies to enhance learning & performance.

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David Hales, President and CEO of Second Nature, is a member of the National Climate Assessment and Development Advisory Committee (NCADAC), established to oversee the development of the report. Previously, he led College of the Atlantic to become the first institution of higher education in the United States to be a “NetZero” emitter of greenhouse gases and has held numerous positions promoting sustainability nationally and internationally.
• Introduction to the Panel: David Hales
• Panel Presentations
  ➢ Kathy Jacobs, NCA Director: National Climate Assessment process and its role in policy making
  ➢ T.C. Richmond, NCADAC Vice Chair: General overview of the key findings
  ➢ Jim Buizer, NCADAC member: Introduction to the Sustained Assessment
• Panel Discussion Questions
• Audience Questions: Send your questions through the chat box
• Summary Points
• Thank you!

Please fill out the audience survey
Kathy Jacobs, Director of the National Climate Assessment and Assistant Director for Climate Assessment and Adaptation at the Office of Science and Technology Policy, is part of a team working to develop a national adaptation strategy, and serves as the liaison to the Subcommittee on Water Availability and Quality of the National Science and Technology Council.

T.C. Richmond, NCADAC Vice Chair and attorney with the law firm of Van Ness Feldman GordonDerr, LLP, has over 25 years’ experience in environmental law, land use, water law, climate change, and governance, primarily representing universities, governmental agencies and districts in the planning and management of water resources.

Jim Buizer, NCADAC member and Senior Sustainability Scientist, is the Founding Director of the Climate Adaptation and International Development Program in the Institute of the Environment at the University of Arizona, where he also holds an appointment as Professor in the School of Natural Resources and the Environment.
The National Climate Assessment

Kathy Jacobs
Assistant Director for Climate Assessments and Adaptation
Office of Science and Technology Policy

February 20, 2013
US Global Change Research Program

Global Change Research Act (1990) 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.”

13 Federal Departments & Agencies + Executive Office of the President
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

• A scientific foundation for decision support, including scenarios and other tools 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
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
- **National indicators** of change and the capacity to respond
- **Risk-based framing**
Process to Date

• Interagency Working Group (INCA, 13+ agencies) plans and manages federal components

• 60 member National Climate Assessment and Development Advisory Committee (NCADAC) responsible for development the Third NCA Report and providing advice on the sustained NCA process

• 240 authors selected by NCADAC, from academic, public, and private sectors... and 800 contributors to technical input documents

• 75+ members in NCAnet, a network of partners (mostly) outside of the federal government that connects the NCA to assessment stakeholders
Third NCA Report Process

Federal agencies, universities, NCAnet members, and others

Technical Input Teams

Chapter Author Teams

NCADAC

Public and Expert Review

Agency & White House Review

Technical Inputs (March 1, 2012)

Chapters (June 1, 2012)

Draft Report (Fall 2012)

Multiple Revisions of Draft Report (July – Oct 2013)

Third NCA Report Early 2014
Outline for Third NCA Report

• Letter to the American People
• Executive Summary: Report Findings
• Introduction
• Our Changing Climate
• Sectors & Sectoral Cross-cuts
• Regions & Biogeographical Cross-cuts
• Responses
  – Decision Support
  – Mitigation
  – Adaptation
• Agenda for Climate Change Science
• The NCA Long-term Process
• Appendices
  – Commonly Asked Questions
  – Expanded Climate Science Info
Sectors

• Water Resources
• Energy Supply and Use
• Transportation
• Agriculture
• Forestry
• Ecosystems and Biodiversity
• Human Health
Sectoral Cross-Cuts

- Water, Energy, and Land Use
- Urban Systems, Infrastructure, and Vulnerability
- Impacts of Climate Change on Tribal, Indigenous, and Native Lands and Resources
- Land Use and Land Cover Change
- Rural Communities
- Biogeochemical Cycles
Regions & Biogeographical Cross-Cuts

Oceans and Marine Resources

Coasts, Development, and Ecosystems
Format and Transparency

• E-book – the first major government publication of its type to be submitted this way

• Global Change Information System – focused on helping people get electronic access to data, tools and experts associated with NCA who can help with climate-related decisions

• Traceable accounts – the process & rationale the authors used in coming to conclusions and their confidence in those conclusions
Review of Draft Third NCA Report

Draft report information:
http://www.ncadac.globalchange.gov

Main NCA page:
http://assessment.globalchange.gov

- Public comment period: January 14 – April 12, 2013
- Town hall meetings in each of the eight geographic regions
- Review comments are an important part of the process of producing a credible and relevant report
- Comments MUST be submitted via the online comment tool
New Scenarios

- Regional climatologies and projections
- Global Sea level rise scenarios

www.scenarios.globalchange.gov
Challenges of Climate Change for Adaptation

• Non-stationarity is a new paradigm
• Trends vs abrupt change/extreme events
• Knowing “what to adapt to” especially if outside the envelope of prior experience
• Cascading effects and cross-system issues
• International context
• Institutional and regulatory issues
• Incorporating “ecosystem-based approaches” into engineered systems
National Climate Assessment
2013 Draft Report
Overview of Key Findings

Terese (T.C.) Richmond, Vice-Chair, National Climate Assessment Development Advisory Committee

Van Ness Feldman GordonDerr LLP, Seattle WA

Second Nature and the Security and Sustainability Forum
February 20, 2013
Global climate is changing, and this is apparent across the U.S. in a wide range of observations. The climate change of the past 50 years is due primarily to human activities, predominantly the burning of fossil fuels.
Global Climate is Changing

Ten Indicators of a Warming World

- Sea Ice
- Sea Surface Temperature
- Temperature Over Oceans
- Water Vapor
- Ocean Heat Content
- Air Temperature Near Surface (Troposphere)
- Temperature Over Land
- Sea Level
- Snow Cover
- Glaciers

Key Finding #1
Apparent Across the Nation

Observed U.S. Temperature Change

Key Finding #1
Due to Humans

Key Finding #1

Human Activities and the Global Carbon Budget

- CO₂ Source
- CO₂ Sink
- Fossil Fuels
- Deforestation
- Atmospheric CO₂
- Land
- Ocean

Global Temperature and Carbon Dioxide

- CO₂ Concentration


Temperature: 56.5, 57.0, 57.5, 58.0, 58.5

CO₂ Concentration: 260, 300, 340, 380, 400
Some extreme weather and climate events have increased in recent decades, and there is new and stronger evidence that many of these increases are related to human activities.
Extreme Weather Nationally

Days Over 100°F

Key Finding #2
Human-induced climate change is projected to continue and accelerate significantly if emissions of heat-trapping gases continue to increase.

- Heat-trapping gases already in the atmosphere have committed us to a hotter future.
- The magnitude of climate change beyond the next few decades depends primarily on the amount of emissions emitted now and in the future.
Future Temperatures Depends on Rates of Emissions

Average Global Temperature Projections

Key Finding #3
Continued Emissions

Largest Temperature Increases Over Continents

Low Pathway (RCP 2.6)  High Pathway (RCP 8.5)

Degrees F

1 3 5 7 9 11 13 15
Key Finding #4

Impacts related to climate change are already evident in many sectors and are expected to become increasingly challenging across the nation throughout this century and beyond.
Impacts Already Evident

Percentage Change in Very Heavy Precipitation

Key Finding #4
Impacts Already Evident

Key Finding #4

Observed Changes in Frost-Free Season

Increases in Annual Number of Days

- <5
- 5-10
- 11-15
- 16-20
- >20

Key Finding #4

U.S. Global Change Research Program
National Climate Assessment
Risk of Shoreline Change
Social Vulnerability Index

Key Finding #4
Impacts Already Evident

Billion Dollar Weather/Climate Disasters

Key Finding # 4
Key Finding #5

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.
Key Finding #6

Infrastructure across the U.S. is being adversely affected by phenomena associated with climate change, including sea level rise, storm surge, heavy downpours, and extreme heat.
Reliability of water supplies is being reduced by climate change in a variety of ways that affect ecosystems and livelihoods in many regions, particularly the Southwest, the Great Plains, the Southeast, and the islands of the Caribbean and the Pacific, including the State of Hawai`i.
Adverse impacts to crops and livestock over the next 100 years are expected. Over the next 25 years or so, the agriculture sector is projected to be relatively resilient, even though there will be increasing disruptions from extreme heat, drought and heavy downpours. U.S. food security and farm incomes will also depend on how agricultural systems adapt to climate changes in other regions of the world.
Natural ecosystems are being directly affected by climate change, including changes in biodiversity and location of species. As a result, the capacity of ecosystems to moderate the consequences of disturbances such as droughts, floods, and severe storms is being diminished.
Life in the oceans is changing as ocean waters become warmer and more acidic.

Ocean Acidification Causes Clams to Shrink

- ~250 ppm, CO₂
- ~390 ppm, CO₂
- ~750 ppm, CO₂
- ~1500 ppm, CO₂
Key Finding #11

Planning for adaptation (to address and prepare for impacts) and mitigation (to reduce emissions) activities is increasing, but progress with implementation is limited.
Thank you
The National Climate Assessment: Creating a Sustained Assessment Process

James L. Buizer
National Climate Assessment
Development & Advisory Committee
University of Arizona
February 20, 2013
Introduction to a Sustained National Climate Assessment

- Creating and sustaining the capacity to conduct and use assessments is an essential part of the NCA process.

- The National Climate Assessment and Development Advisory Committee (NCADAC) is charged with both producing a synthesis assessment report and providing advice on the sustained process.

- The sustained assessment process is already underway.
Sustained Assessment
Foundational and Special Topics

• Foundational Topics
  – Sustained assessment
  – Scenario development
    • Integration with CMIP5 outputs
    • Land cover/use cover updates
    • Guidance on use of model data
  – Indicators
  – Valuation

• Special topics Reports
  – Food security
  – International context
  – Water and drought
  – Large biophysical regions
Sustained Assessment
Why Consider Special Reports and Activities?

- Deepen understanding of climate change effects on a particular sector or region that are of national importance
- Investigate new scientific issues of concern
- Build capacity to conduct more sophisticated, useful, and credible assessments over time
- Better support decisions that reduce risk and increase opportunities
- Enable a full review for issues of national importance in an efficient and credible way
NCAnet: Partners in Assessment

Online at [http://ncanet.usgcrp.gov](http://ncanet.usgcrp.gov)

- 60+ organizations extend the NCA process and products beyond the federal government and are active partners in the sustained assessment process

- Professional societies, Academic institutions and consortia, Non-governmental organizations, Local and state government departments, Private sector

- List of partners’ NCA-related activities
- Monthly conversations among existing partners
- “Affinity groups” model for collaboration on activities
How does the reader make sense of this comprehensive publication?
Panel Discussion Questions

What is the role of the NCA in development of federal actions?
What is new in the findings and science?
Panel Discussion Questions

What is the importance of the ongoing assessment to decision-makers?
Audience Questions
• The NCA analyzes the effects of global change and projects major trends
• Climate change adversely threatens human health and well-being, infrastructure, water sources, and ecosystems
• Planning for adaptation and mitigation activities is increasing, but progress with implementation is limited
• The NCA seeks to establish a sustained process for informing an integrated research program
• The Sustained Assessment will improve understanding of regional effects, build capacity and better support decisions that reduce risk and increase opportunities
• Building a sustained assessment process relies on building a network of partners within and outside of the federal government who can help create, maintain, and champion the assessment process
How to Provide Comments

• To provide input on the Third NCA Draft Report go to:

http://ncadac.globalchange.gov
Draft Review

• Draft of NCA released for review Jan 14, 2013
• Comments can be submitted by the public, agencies and individual agency employees at
  
  http://ncadac.globalchange.gov

• All comments will be responded to, 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
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Thank you for joining us!

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UPCOMING Webinars:
Implications from the National Climate Assessment
Thursday, March 14, 2013 1:15-2:45pm EDT
Community Engagement on Climate Response Decisions - The COAST Model
Tuesday, March 19, 12:00-1:30pm EDT