USGS Global Change Science Strategy

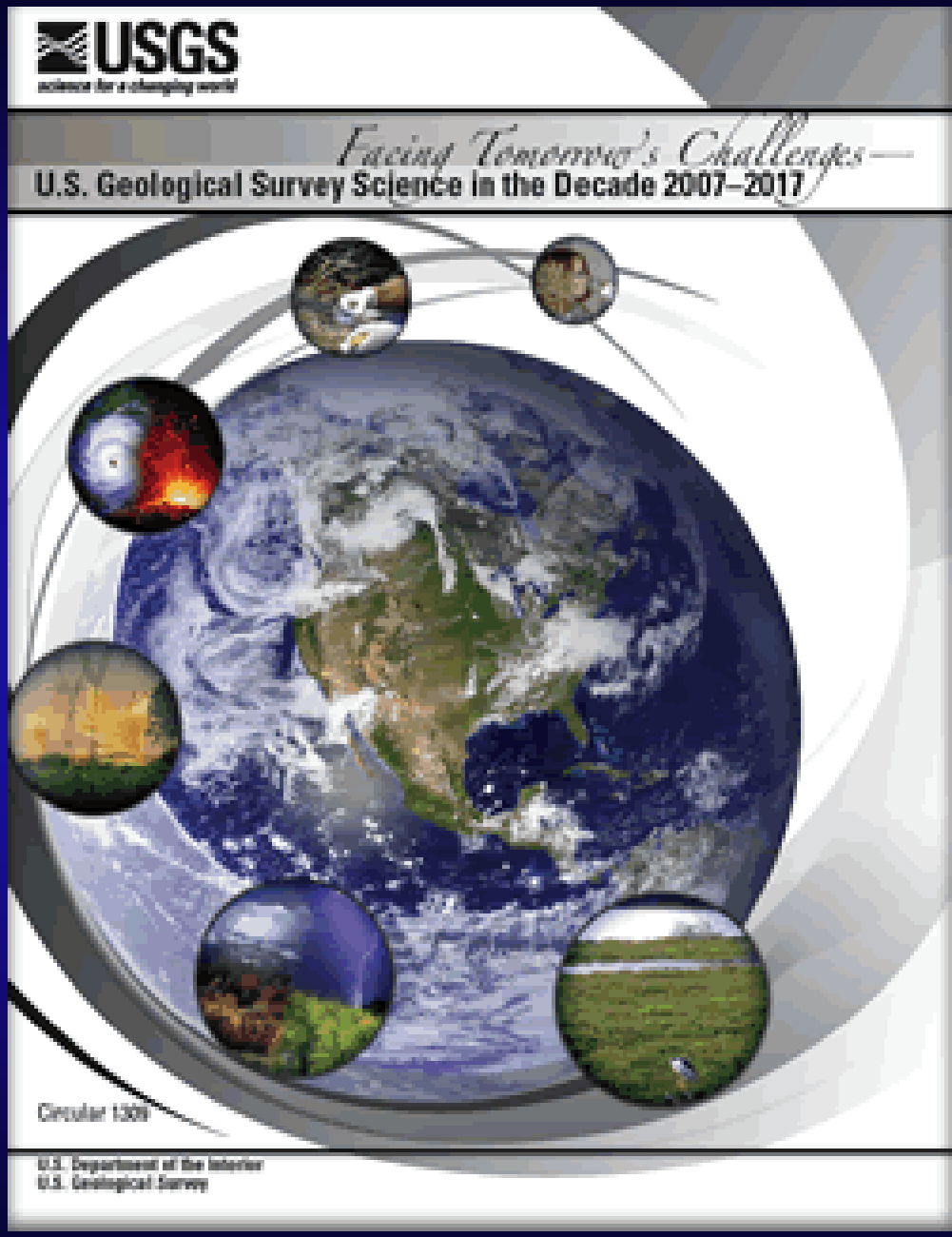
A Framework for Understanding and Responding to Climate and Land Use Change

U.S. Department of the Interior
U.S. Geological Survey

March 1, 2011

USGS Science Strategy

- Understanding Ecosystems and Predicting Ecosystem Change
- **Climate Variability and Change**
- Energy and Minerals for America's Future
- A National Hazards, Risk, and Resilience Assessment Program
- The Role of Environment and Wildlife in Human Health
- A Water Census of the United States



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U.S. Global Change Research

- Changes in the global environment that may alter the earth's capacity to sustain life to include
  - ✓ Alterations in climate
  - ✓ Land productivity
  - ✓ Oceans or other water resources
  - ✓ Atmospheric chemistry
  - ✓ Ecological systems
- USGS focus is on climate and land use change

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Characteristics of USGS Science Strategy

- Broadly informs global change policy with emphasis on natural resource managers
- Leverages core competencies of USGS in collaboration with partnerships of all types
- Highlights key research questions to focus an agenda for hypothesis-driven global change science under six goals
- Defines current state, envisions where we want to go, and describes high priority strategic actions, including outcomes, products, and partnerships to get us there

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Integrated Science for Global Change Research

Focused science capacity in fundamental and applied aspects of geology, geography, hydrology, and biology

Long-term Research and Monitoring to describe trends in land use, water, energy, minerals, species and ecosystems, and the consequences of global change

Application and translation that integrates environmental and climate change data to predict impacts on natural resources and human populations

Consistent data collection and continuous synthesis for vulnerability and impact assessments to meet the needs of decision-makers

Multi-scale Studies as a basis for integrated, international, national, and regional assessments of global change impacts on water resources and terrestrial, aquatic, and coastal environments

Synthesis, assessment, and modeling draw on USGS capacity to identify trends and predict effects of global change on natural resources and provide a scientific basis for evaluating resource management options

Comprehensive characterizations based on integrated data collection, mapping, and research, describing the earth through time, from paleo- to present

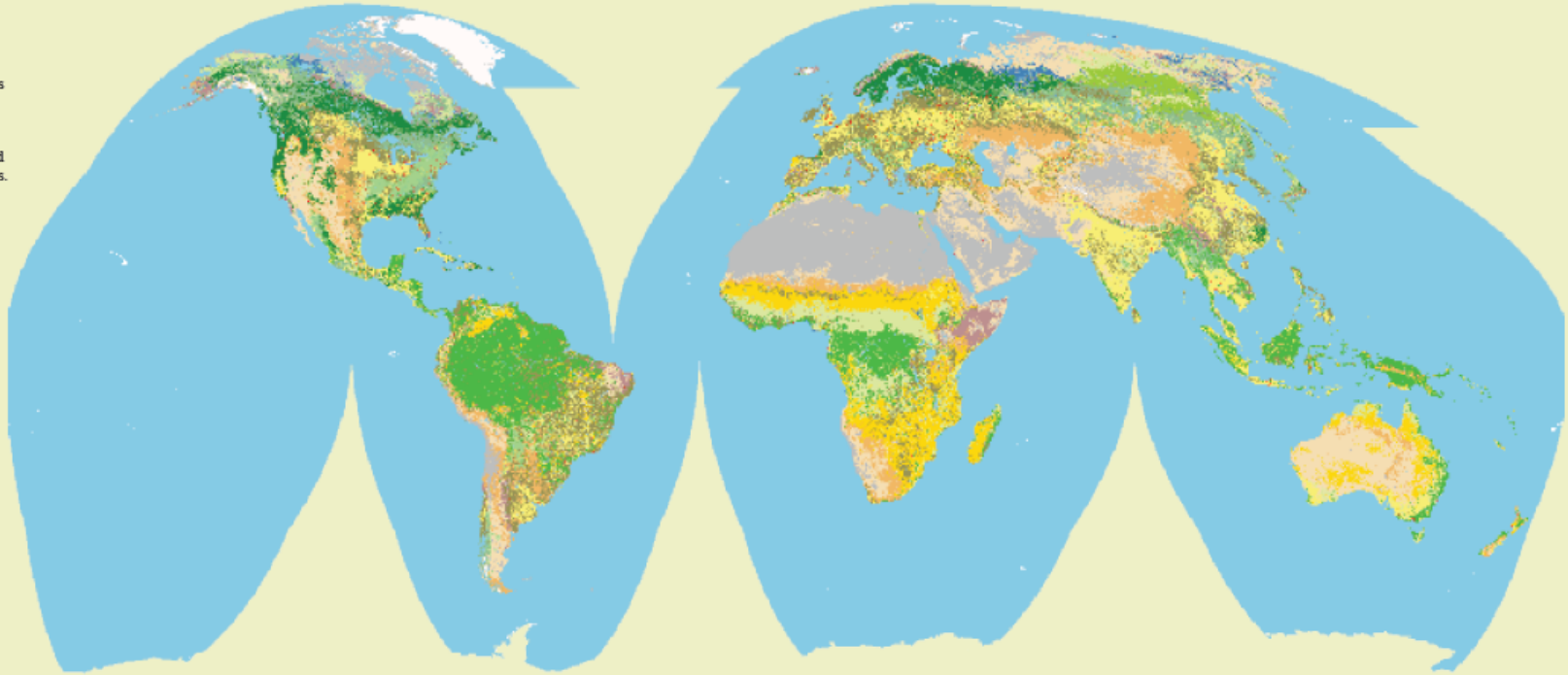
Widely distributed presence with science centers and data-collection operations in every state, offering a unique coverage across the national landscape

Fundamental process studies to interpret and understand how coupled natural and human-modified environments affect past, present, and future environments

National-scale mapping of geology, topography, land cover, water use, and ecosystems to track changes in natural systems

Regional- to global-scale earth observations documenting the expansion of human activity and changes in natural systems.

(Right) **Global Land Cover –1992** The USGS has produced several global land cover datasets over the last 15 years. This image depicts one of those datasets developed for the International Geosphere Biosphere Program (IGBP) using a classification developed and validated by the USGS for IGBP.



- Evergreen Needleleaf Forest
- Evergreen Broadleaf Forest
- Deciduous Needleleaf Forest
- Deciduous Broadleaf Forest
- Mixed Forest
- Closed Shrubland
- Open Shrubland
- Woody Savanna
- Savanna
- Grassland
- Permanent Wetland
- Cropland
- Urban and Built-up
- Cropland/Natural Vegetation Mosaic
- Snow and Ice
- Barren or SparselyVegetated
- Water

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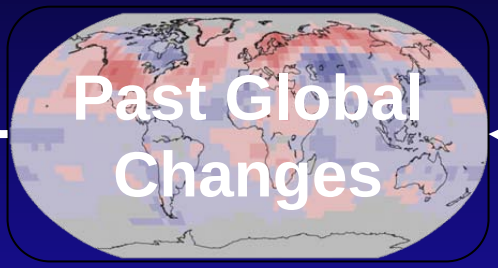
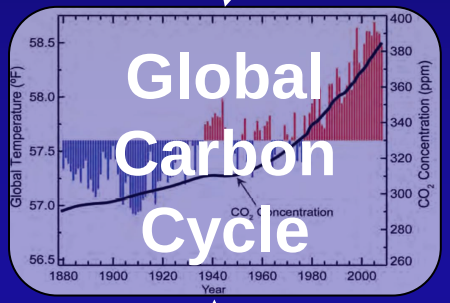
Fundamental Science Goals





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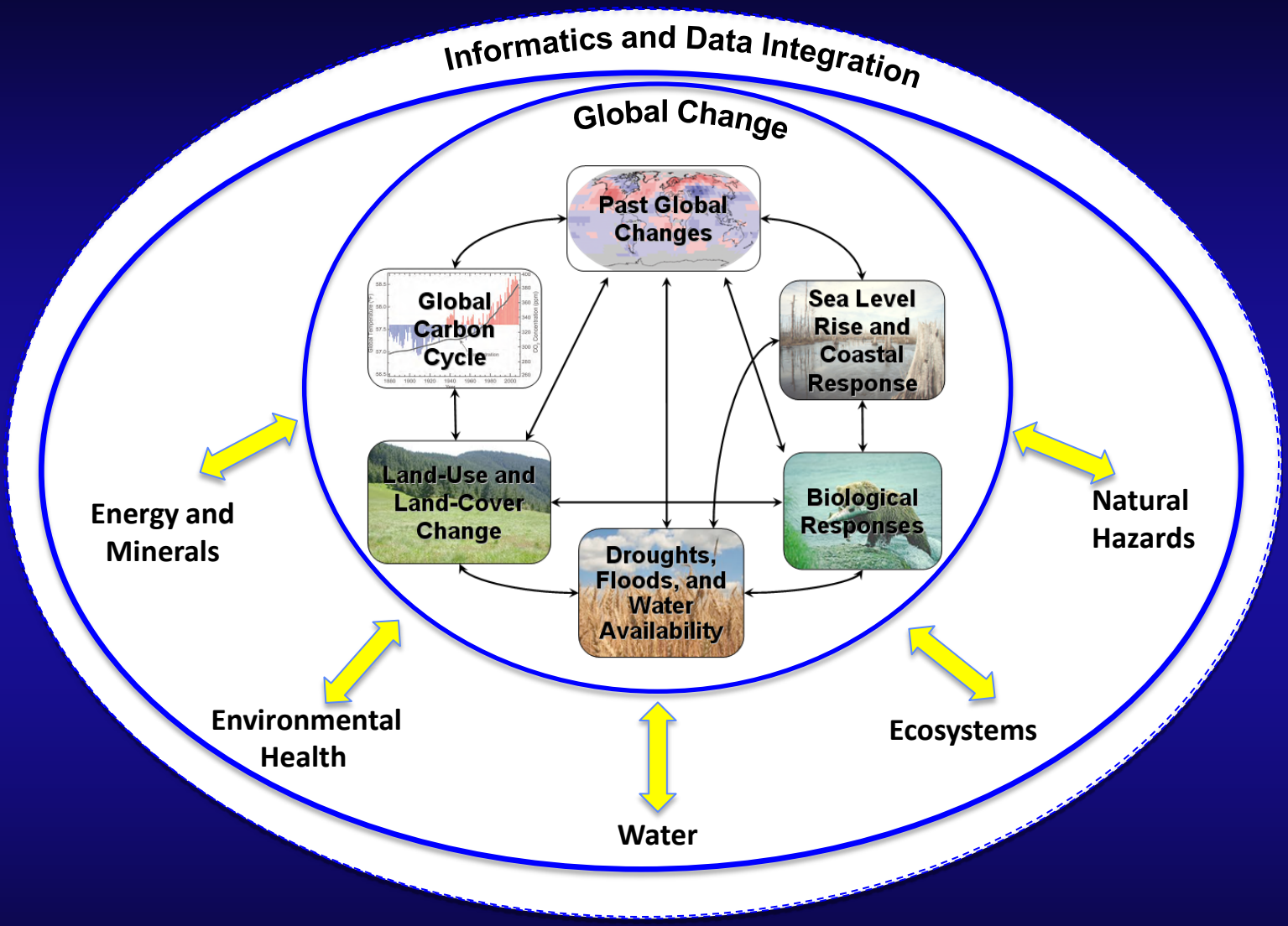
Global Change and other USGS mission areas



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Monitoring – A Critical Component

- Central role recognized in the 2007 strategy
- Examples of monitoring required by goals
  - ✓ Detecting SLR, shoreline change, subsidence
  - ✓ Timing, amounts and availability of water
  - ✓ Rates and extent of LULCC
  - ✓ C cycling
  - ✓ Abundance & distribution of plant & animals
- Multipurpose, multivariate, multiscale networks drawing on multiorganizational collaboration needed

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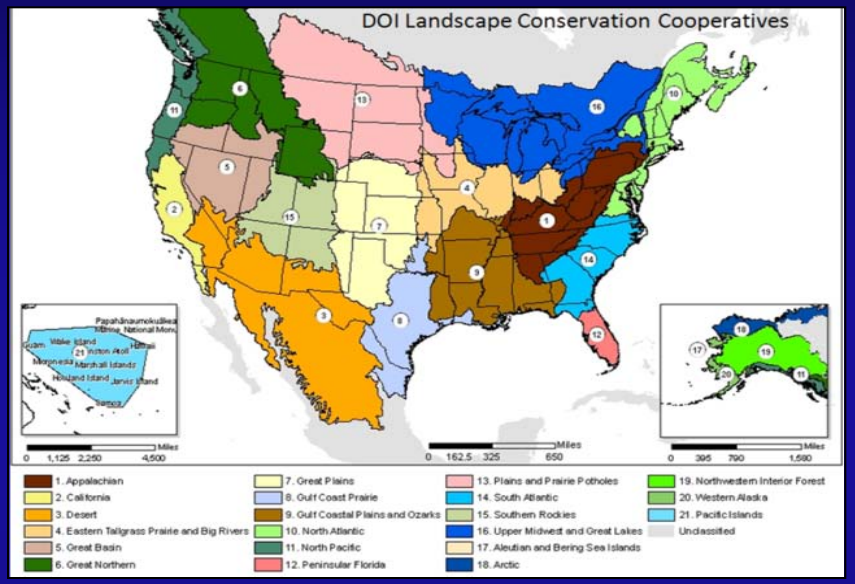
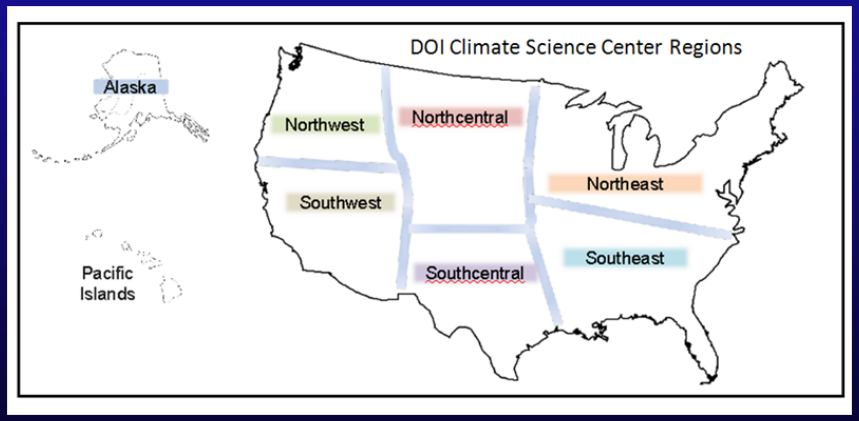
Delivering Science – Framework for Collaboration and Communication

- **8 Climate Science Centers (CSC)**
  - ✓ Science information
  - ✓ Tools and techniques
- **21 Landscape Conservation Cooperatives (LCC)**
  - ✓ Federal
  - ✓ State
  - ✓ Tribal
  - ✓ Local





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Review of Draft GC Science Strategy

Climate and Land Use Change Feedback Form - Windows Internet Explorer

Please review the USGS Global Change draft strategy and answer the questions below by April 8, 2011.

- Draft Global Change Science Strategy
- Global Change background presentation

Note: If you're a USGS employee and would like to identify yourself as such in your feedback, please access this site via a computer on the USGS network or via VPN. Otherwise, we won't know who you are.

What is your title/job function: (optional)

Question 1: Are there important climate and land-use change issues that we haven't addressed in this draft?

Question 2: Are there areas in the draft that aren't very important or that we've focused on too much?

Question 3: Do you have any other issues, questions, or ideas?

http://www.usgs.gov/start_with_science/

Help shape the future of USGS science.

The USGS Science Strategy outlines the major societal issues that USGS science is poised to address. Now we're creating specific strategies for each of those areas to expand and advance the actions we can take in the next decade, and we need your help.

Please weigh in on the drafts and questions below.

Currently Open for Comment

- Energy and Minerals
- Global Change
- Ecosystems

The Science Strategy Planning Process

Teams of USGS scientists are leading the creation of our mission area strategies. See who is on our Science Strategy Planning Teams and learn more about their responsibilities, below.

What is the Science Strategy Planning Process (click image)?

(PPT download)

- Science Strategy Planning Teams
- Science Strategy Planning Team Charter

Local intranet 100%

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