

This file contains presentations from the National Partners Dialogue, convened in Washington, DC on November 30 and December 1, 2011.

Three presentations are included. They are separated by pages indicating the presenter.

The "O'Malley" presentation was developed to respond to discussions arising in the meeting, and thus does not constitute a single integrated presentation as the others do.

# DOI Climate Science Centers & National Climate Change and Wildlife Science Center

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**Doug Beard, Director  
National Climate Change & Wildlife  
Science Center**

**National Partners Meeting  
Washington, DC  
November 30, 2011**



# Importance of Landscape Scale Conservation and Adaptive Approach

- We're facing challenges that are immense in scale and cross political boundaries.
- Cross agency coordination is critical to assuring the most –efficient use of limited resources to address issues that cross agency missions.
- Learning by doing or adaptive approaches provides the best chance to addressing large issues effectively.

# Secretarial Order 3289

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Addressing the Impacts of Climate Change on America's Water, Land, and Other Natural and Cultural Resources (9/14/09)

... the United States Geological Survey (USGS) has been developing regional science centers ... currently known as "regional hubs" of the National Climate Change and Wildlife Science Center...

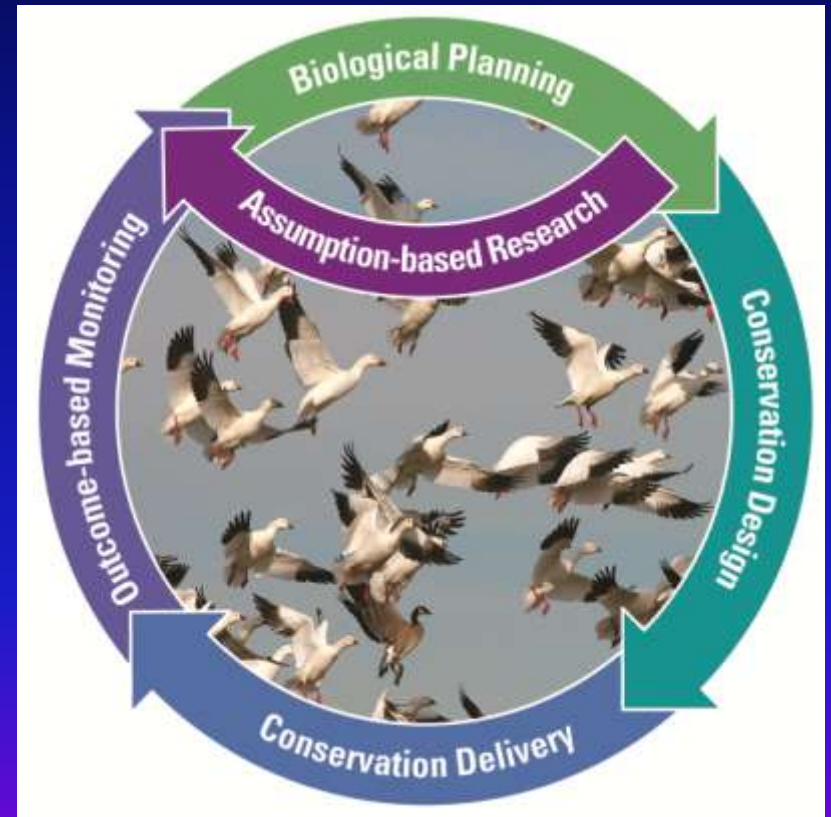
The **Climate Change & Energy Response Council** will work with USGS and other Department bureaus to rename these regional science centers as **Regional Climate Science Centers** and broaden their mandate ...



# The role of Science - Adaptive Resource Management

LCC's are grounded in an adaptive, landscape-scale conservation approach .

CSC's provide the scientific foundation that helps drive planning.



# Climate Change Adaptation Conceptual Model

Agencies, tribes, NGOs,  
& private landowners

Planning, analysis,  
and decision-making

Adaptation needs met:  
changes in policy,  
management, etc.

Development of  
analytic and decision-  
making tools

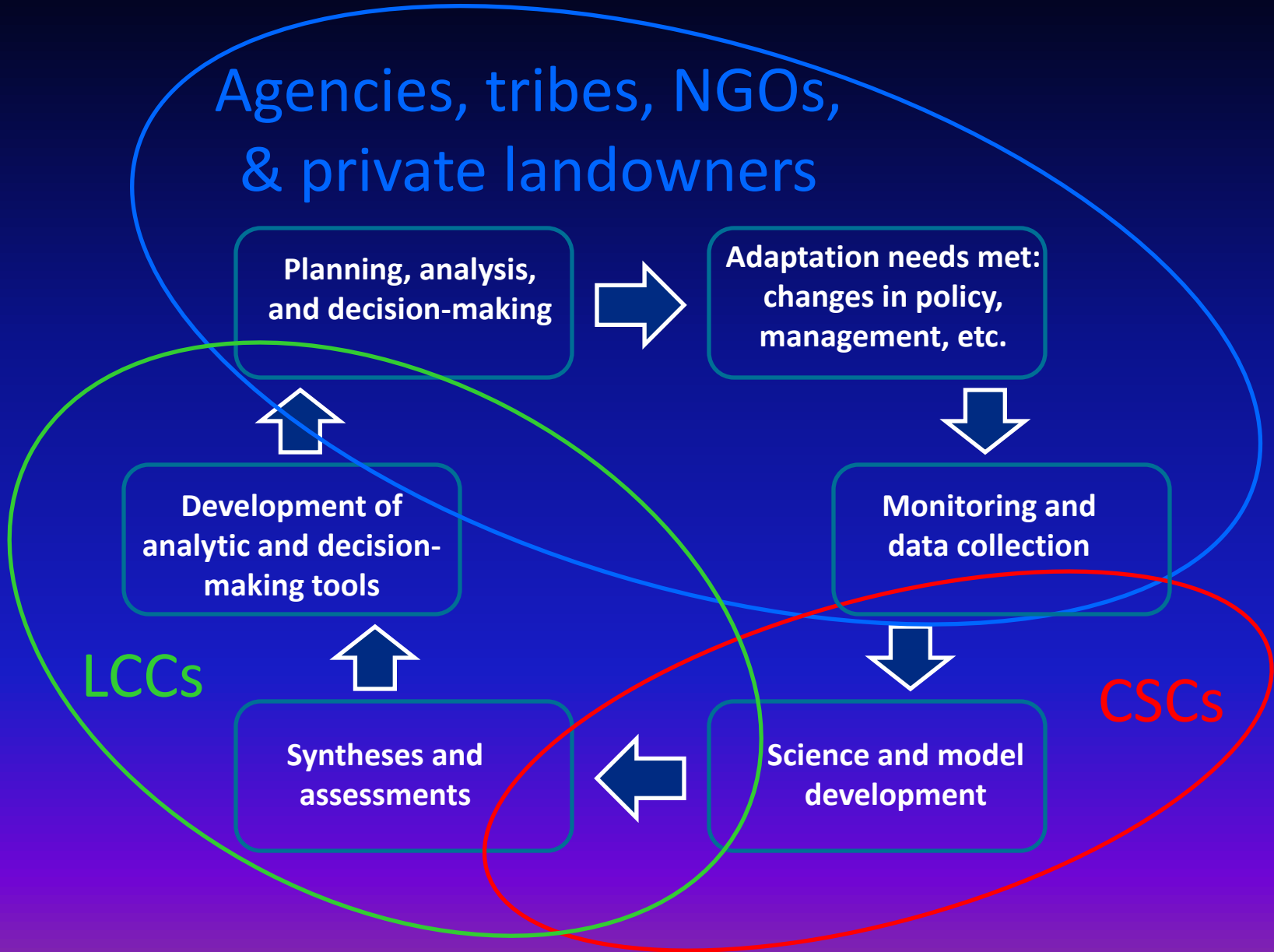
Monitoring and  
data collection

LCCs

Syntheses and  
assessments

Science and model  
development

CSCs



# Why do we care about climate change?

## Potential Impacts on Recreational Trout Fishing in Idaho

1. Fishing in Idaho is big business - 350,000 anglers spend \$282 million, annually
2. Trout was the number 1 species group sought with 258,000 trout anglers in Idaho\*
3. May-September 2004 - Henry's Fork and South Fork of the Snake River supported nearly 1,200 jobs and income of \$41 million. \*\*

\* 2006 National Survey of Fishing, Hunting, and Wildlife Associated Recreation)

\*\* 2005 Loomis, J, Trout Unlimited Report

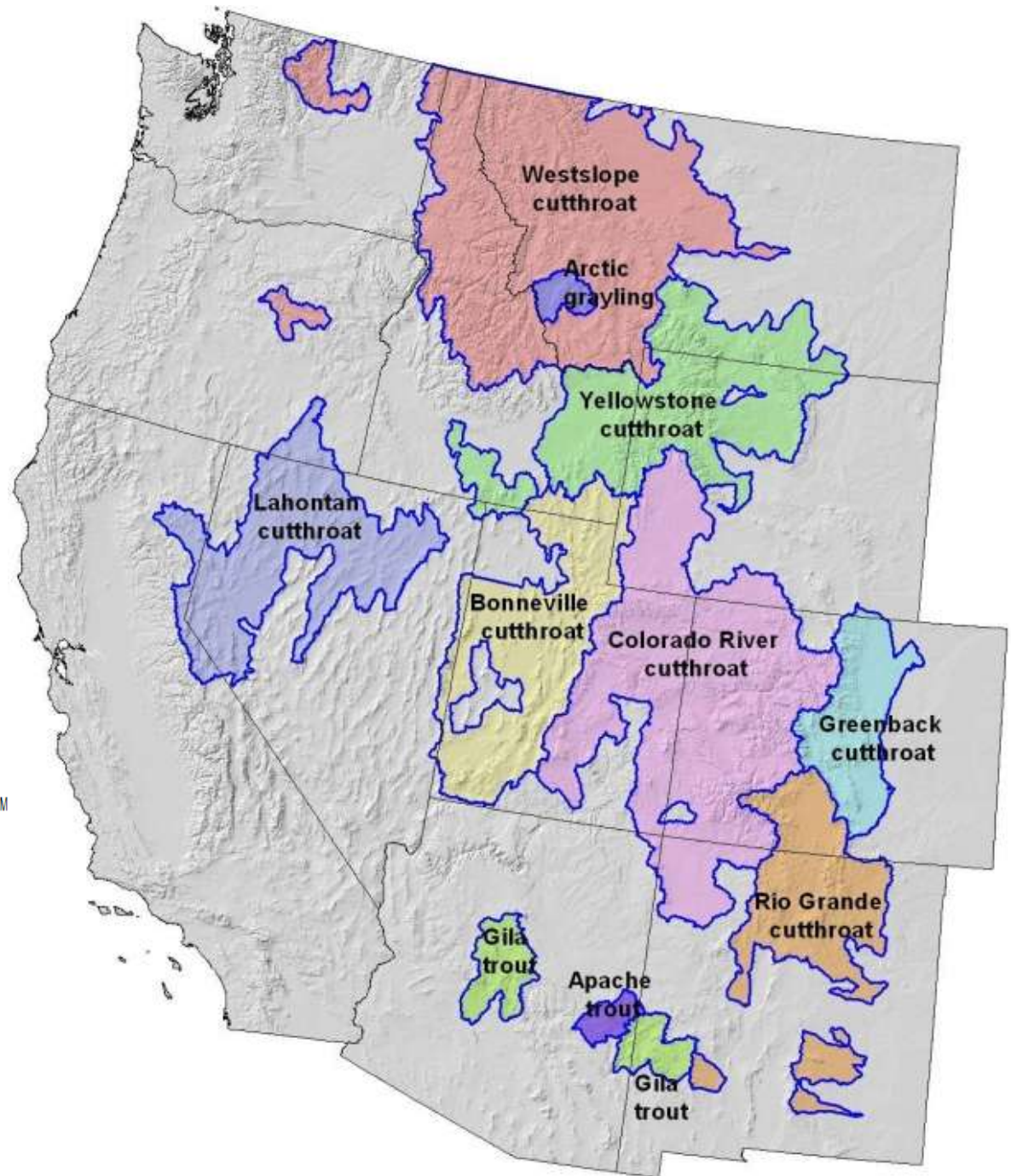


Secondary Identification and/or Statement of Cooperation

## The Potential Influence of Changing Climate on the Persistence of Western Trout and Grayling

By A. L. Haak, J. E. Williams, D. Isaak, A. Todd, C. Muhlfeld, J. L. Kershner, R. Gresswell, S. Hostetler and H. M.

Neville





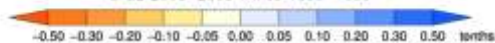
# July conditions

## 2060-2069 minus 1990-1999

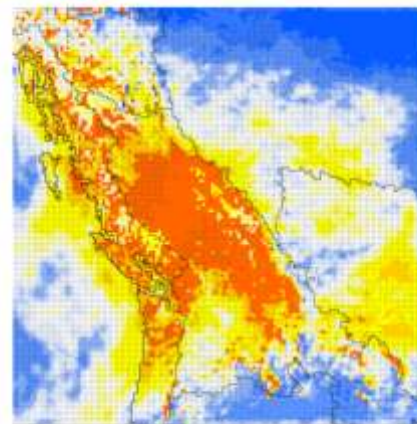
*cloud cover*



July Total Cloud (t-test  $\alpha = 0.10$ )  
GFDL 2060-2069 minus 1990-1999



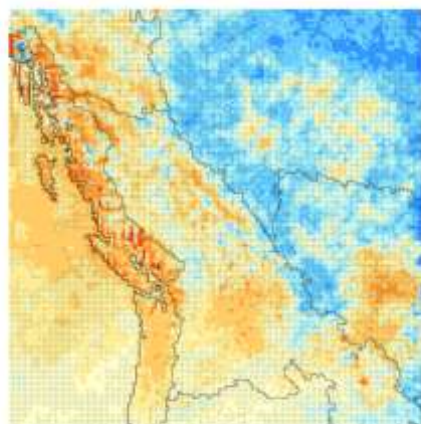
*solar radiation*



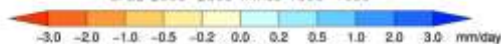
July Net Solar (t-test  $\alpha = 0.10$ )  
GFDL 2060-2069 minus 1990-1999



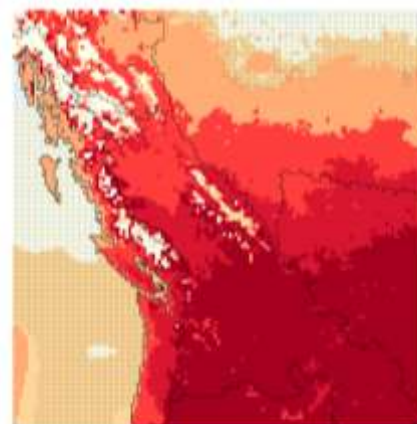
*precipitation*



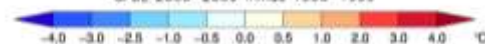
July Total Precipitation (t-test  $\alpha = 0.10$ )  
GFDL 2060-2069 minus 1990-1999



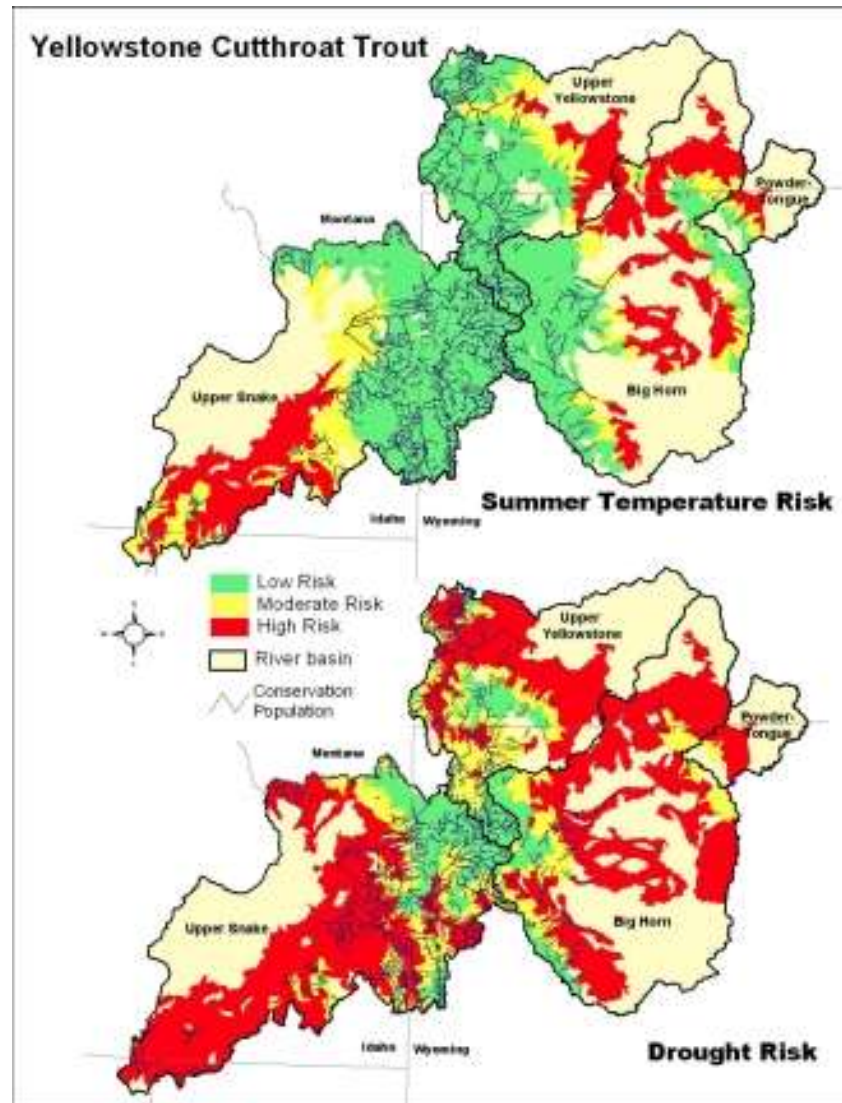
*ground temperature*



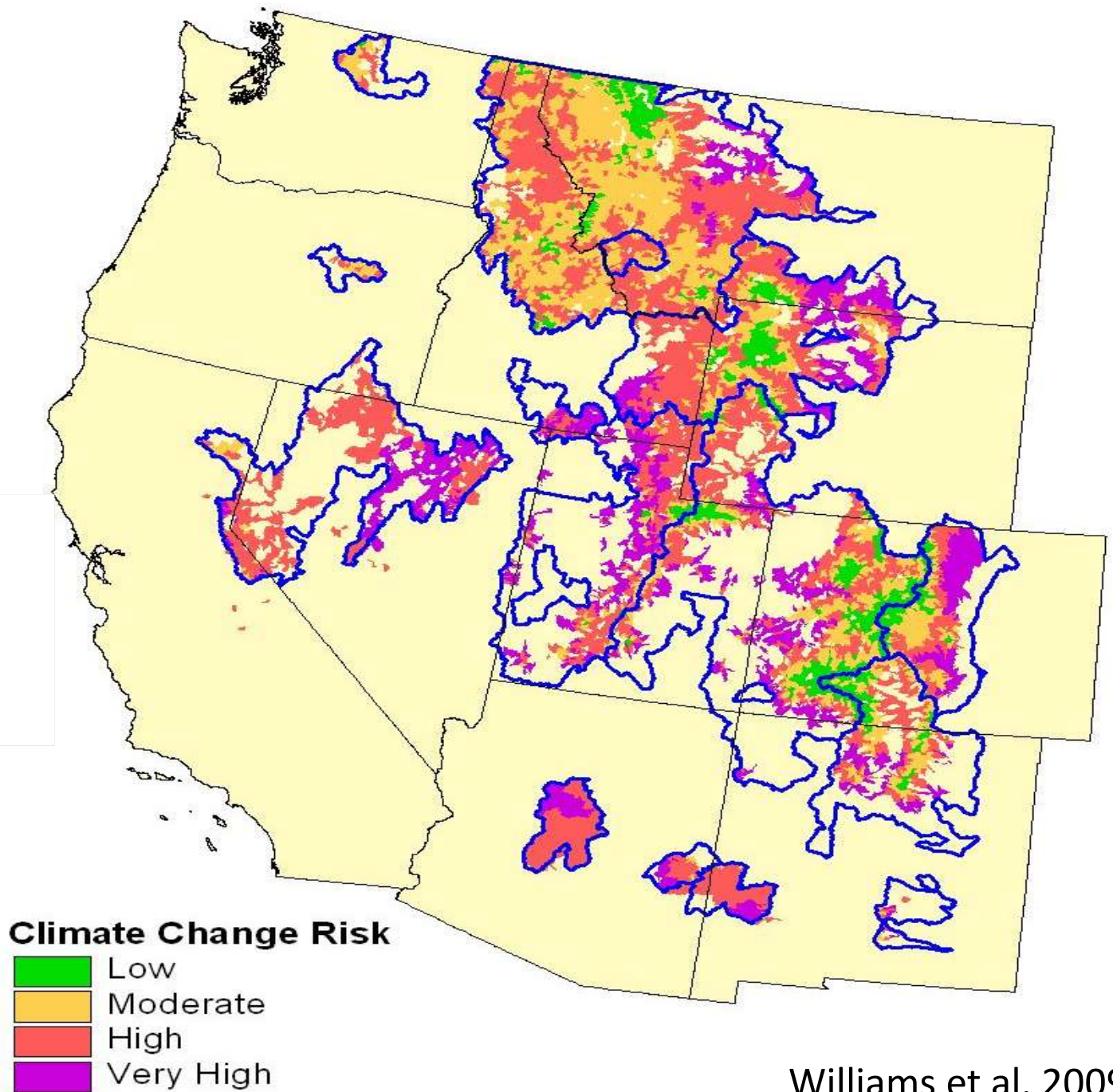
July Ground Temperature (t-test  $\alpha = 0.10$ )  
GFDL 2060-2069 minus 1990-1999



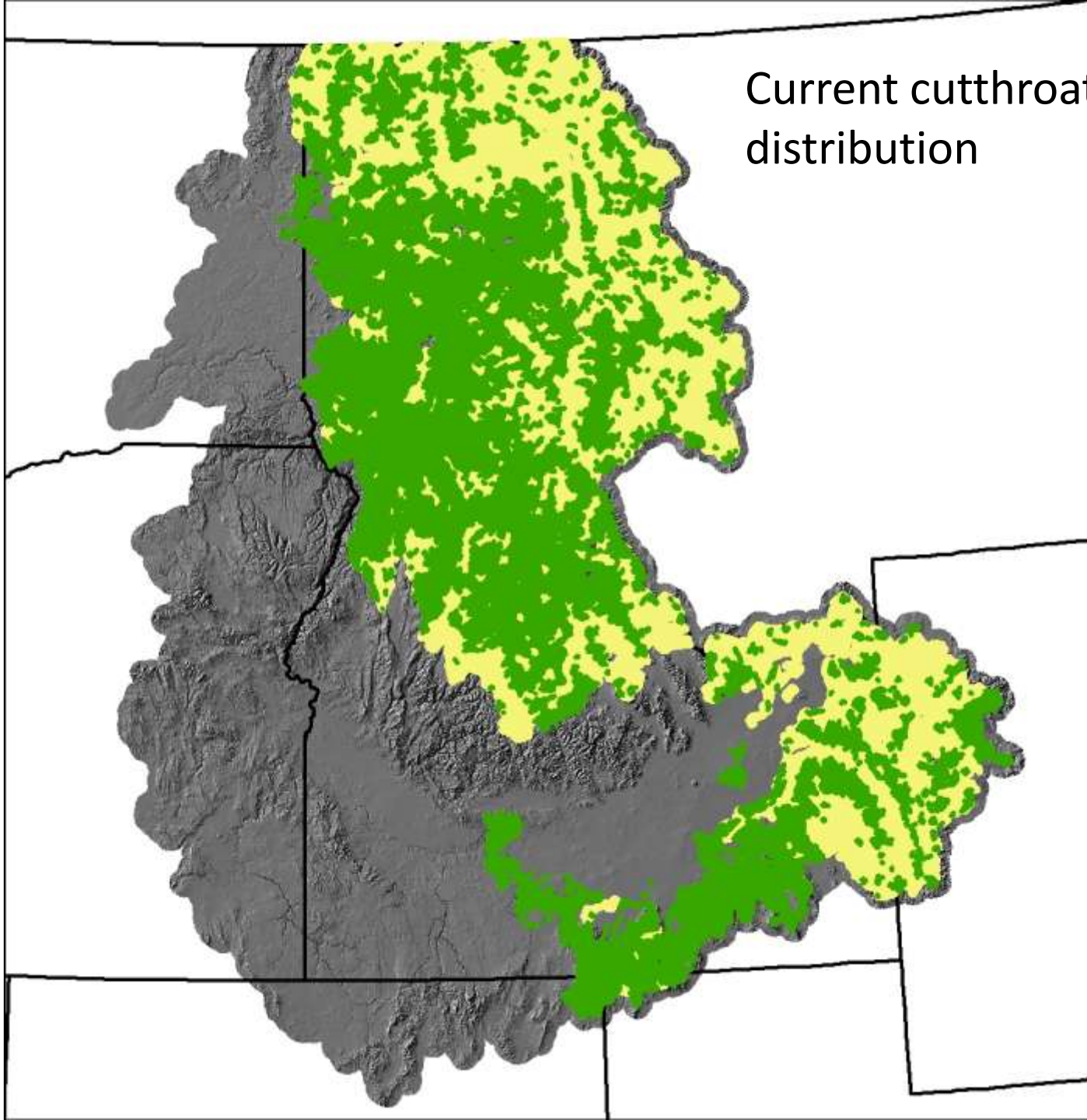
# Drought and Summer Temperature Risk



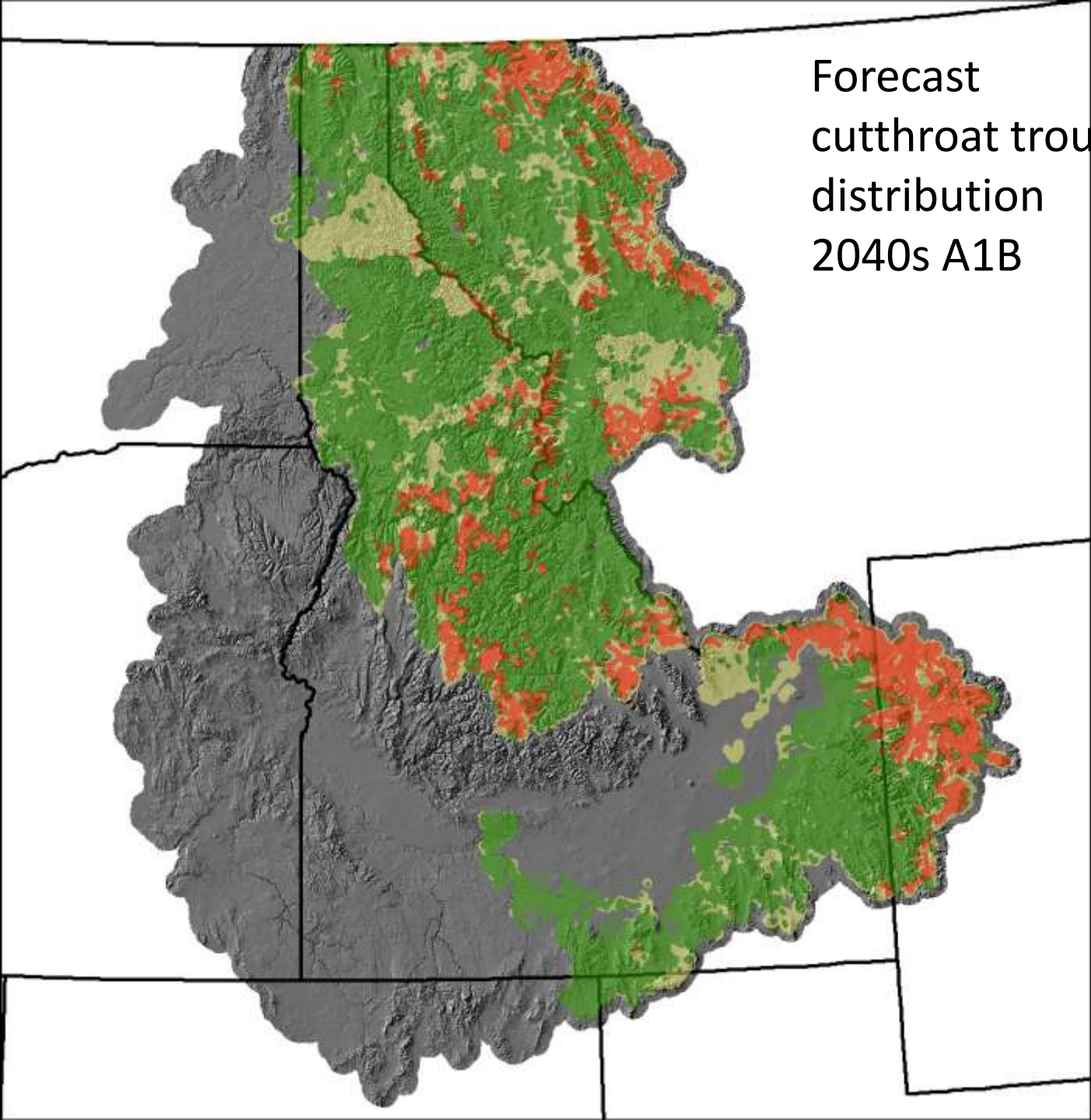
# Composite Climate Change Risk



Current cutthroat trout  
distribution

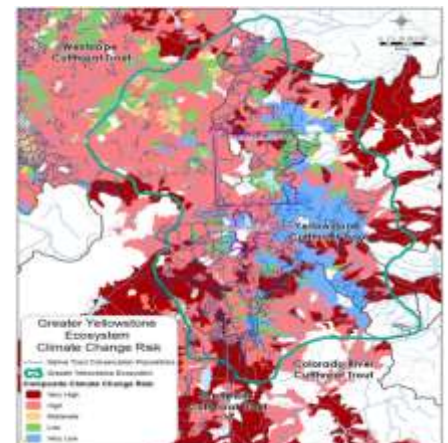


Forecast  
cutthroat trout  
distribution  
2040s A1B



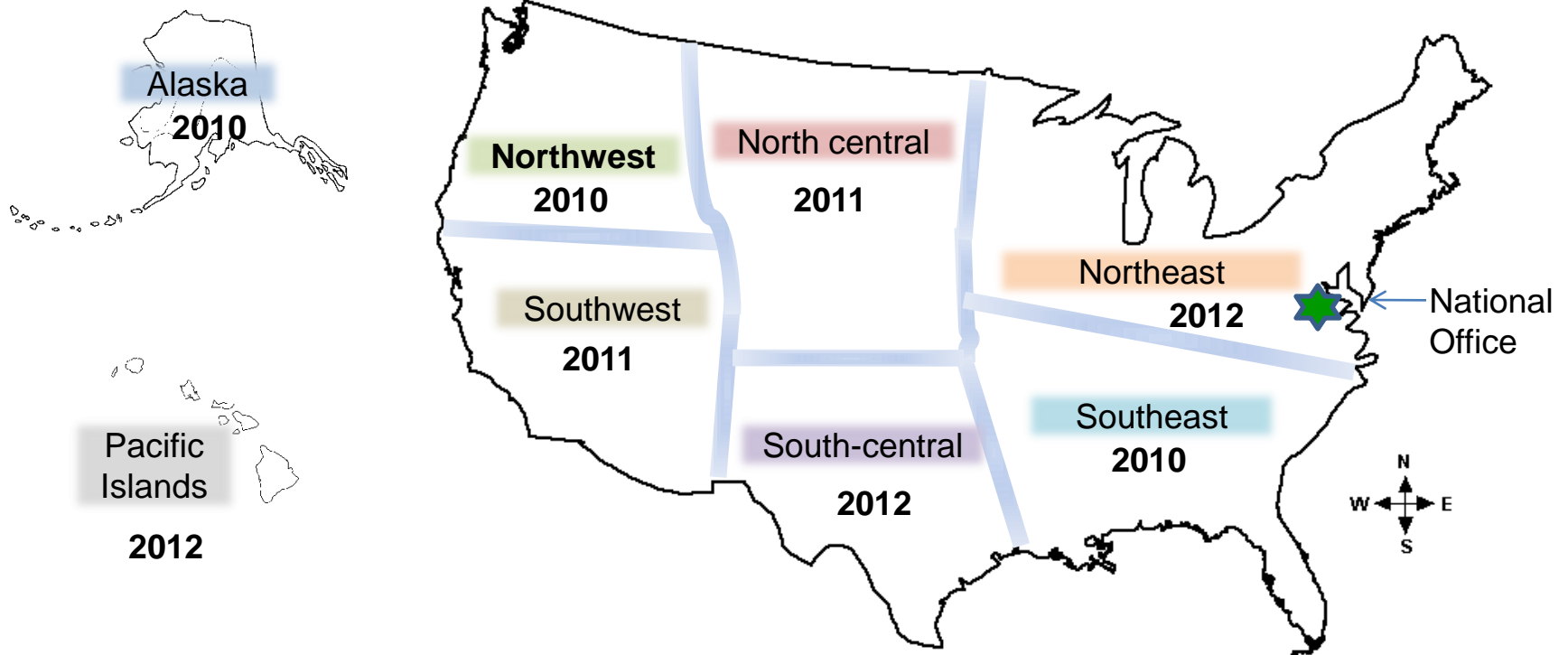
# Potential Next Steps in LCC/CSC Coordination on Coldwater Streams

- Develop adaptation plans and workshops
- Develop Monitoring Strategies
- Develop a Strategic Decision-making framework
- Build capacity among managers and scientists to utilize information.



# NCCWSC National & DOI Regional CSC's

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“Fuzzy Boundaries”

# 2010 DOI CSCs

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## **Alaska CSC – Located at Univ. of Alaska - Fairbanks in Anchorage**

- Permanent Director (August 1): Dr. Stephen Gray, former WY State Climatologist and professor, U of WY
- University of Alaska- Fairbanks PI –Scott Rupp
- Draft Science Plan Completed and available January 1, 2011
- Stakeholder Advisory Committee – Alaska Climate Change Executive Roundtable
- Approximately \$1.5 million in science funding executed in FY11



# 2010 DOI CSCs

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## South East CSC – Established at North Carolina State University

- Permanent Director: Gerald McMahon, from the USGS NC Water Science Center
- North Carolina State PI – Damian Shea
- Draft Science Plan Received July 1, 2011
- Approximately \$500,000 in science funding executed in FY11

# 2010 DOI CSCs

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## Northwest CSC - Consortium of Univ. of Washington, Oregon State Univ. and Univ. of Idaho

- Administrative Home – Oregon State University
- Oregon State PI – Phil Mote (also PI for NOAA RISA)
- University of Washington PI – Lisa Graumlich
- University of Idaho PI – Steve Daley-Laursen
- USGS Leader – Gustavo Bisbal
- Draft Science Plan Received July 1, 2011
- Approximately \$500,000 in science funding executed in FY11

# 2011 DOI CSCs

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**North Central CSC** – Located at Colorado State University in consortium with Univ. of Colorado, Colorado School of Mines, Iowa State, Univ. of Montana, Univ. of Nebraska-Lincoln, Kansas State, Montana State, and Univ. of Wyoming.

- Colorado State PI – Dennis Ojima
- USGS Director – Jeff Morisette
- Approximately \$200K of science projects started in FY'11

# 2011 DOI CSCs

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South West CSC – Located at the Univ. of Arizona in consortium with the Univ. of California – Davis, UCLA, Univ. of Colorado, Desert Research Institute (Nevada) & Scripps Institution

- University of Arizona PI – Jonathan Overpeck
- Interim USGS Coordinator – ??
- Re-Recruitment of permanent director to begin January 1<sup>st</sup>, 2012.

# Establishing 2012 DOI CSCs

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## 2012 CSC's – North East, South Central and Pacific Islands

Northeast CSC – located at University of Massachusetts-Amherst, with College of Menominee Nation, Columbia University, Marine Biological Laboratory, University of Minnesota, University of Missouri at Columbia. University of Wisconsin at Madison

- University of MA PI : Rick Palmer
- USGS Interim Coordinator–Rachel Muir

Pacific Islands CSC : Located at University of Hawaii-Manoa with University of Hawaii-Hilo, and University of Guam

- University of HA- Manoa PI : Chip Fletcher
- USGS Interim Coordinator – Dr. Loyal Mehrhoff (USFWS)

South Central CSC Host: University of Oklahoma, with Texas Tech, Louisiana State University, The Chickasaw Nation, The Choctaw Nation of Oklahoma, Oklahoma State University, and NOAA's Geophysical Fluid Dynamics Laboratory

- University of OK PI – Berrian Moore
- USGS Interim Coordinator: Allison Shipp



# National Climate Change & Wildlife Science Center

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- **Mission**

Provide **natural resource managers** with the **tools and information** they need **to develop and execute management strategies** that address the impacts of climate change on **fish, wildlife, and their habitats**

- **Focus on climate change adaption & impacts**

“Adjustment in natural or human systems in response to actual or expected climatic change effects, to moderate harm or exploit beneficial opportunities”



# NCCWSC Science Priorities

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- Assessments of current climate change information
- Understand climate from natural effects on plants/animals
- Synthesize forecasting of adaptation to climate change
- Quantify species and habitat vulnerability
- Develop clearinghouse & network capacity for data
- Develop management tools

# NCCWSC 2009 Research

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- **SE Regional Pilot (\$1.7 Million)**

- **Research Emphases (\$5.2 Million)**

- Fisheries & Fish Habitat - \$1.8 Million
- Arctic & Arctic Species - \$0.8 Million
- Estuaries & Coasts - \$0.7 Million
- Avian Conservation - \$0.5 Million
- Wildlife & Terrestrial Species - \$1.4 Million



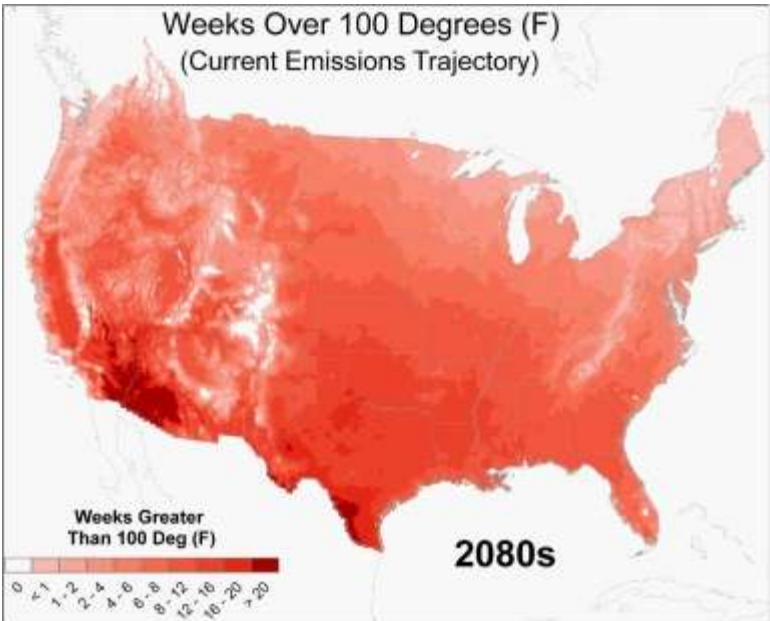
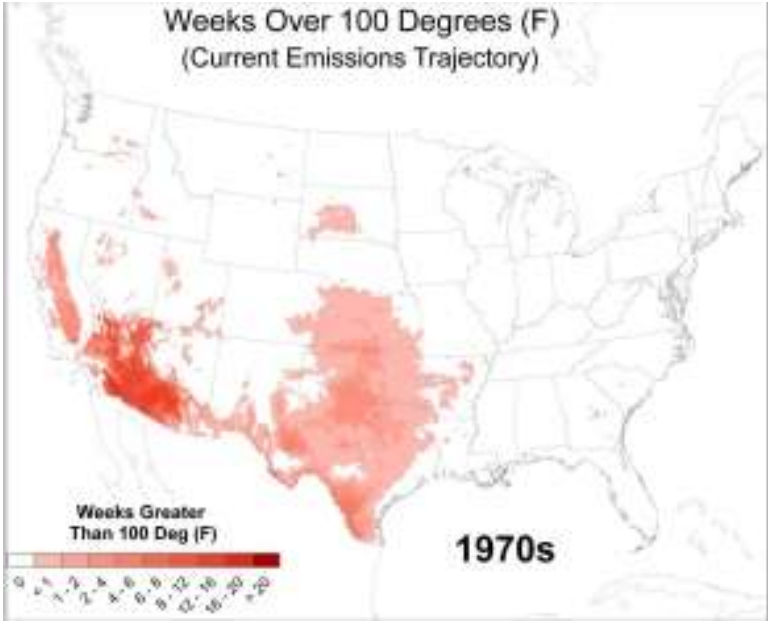
- **Partnerships (\$1.4 Million)**

- Climate Monitoring (NASA, FWS, NSF, Smithsonian, NPS)
- Landscape Conservation Cooperatives



# SE Regional Assessment – An Integrated Approach

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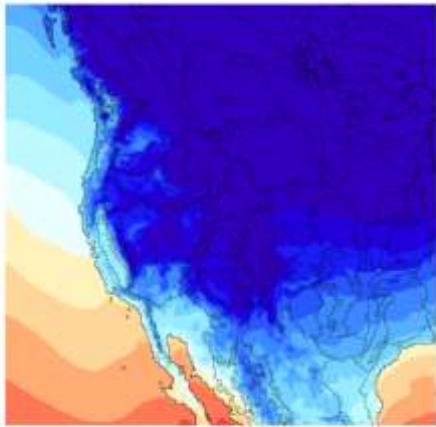
Using Global Downscaled Temperature and Precipitation

# Managing the Nation's fish habitat at multiple spatial scales in a rapidly changing climate



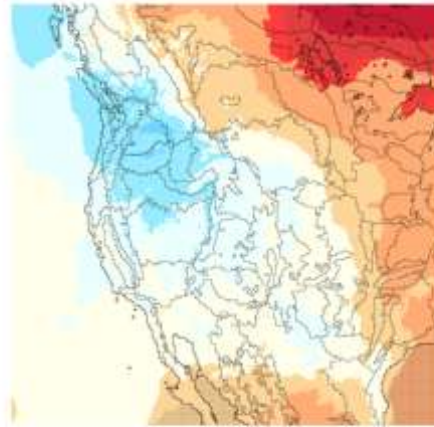
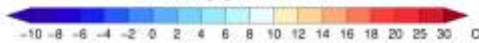
Craig Paukert, Joanne Whittier, Julian Olden, Steve Hostetler, Jeff Kershner, Don Pereira, Lucinda Johnson, Pete Jacobson, Dana Infante, Lizhu Wang, Gary Whelan, Tyler Wagner and Paola Ferreira

# Air Temperature



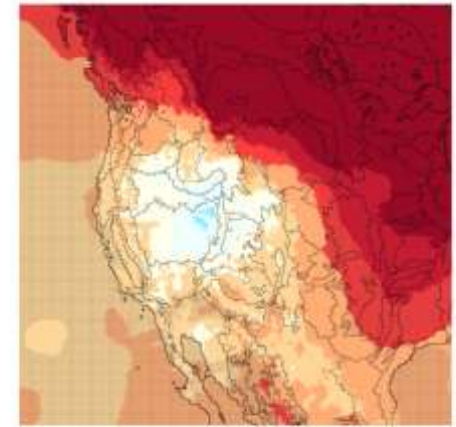
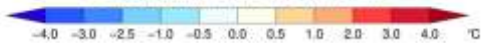
January Air Temperature

GFDL Averaging Period 1989-1999



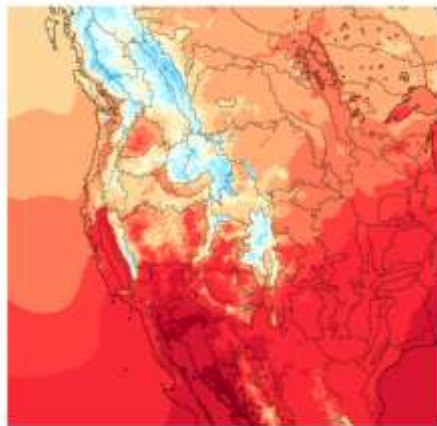
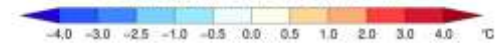
January Air Temperature

GFDL 2040-2050 minus 1989-1999 (t-test  $\alpha = 0.10$ )



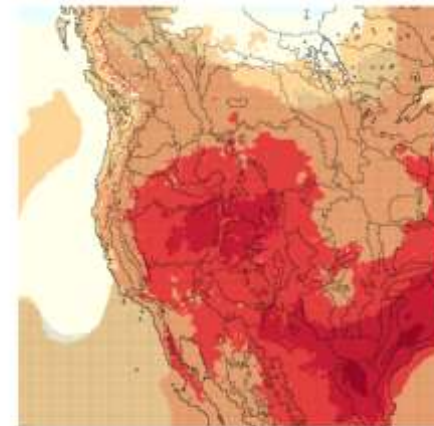
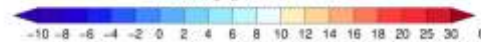
January Air Temperature

GFDL 2060-2067 minus 1989-1999 (t-test  $\alpha = 0.10$ )



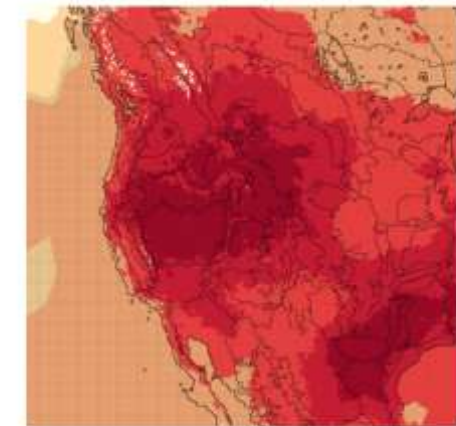
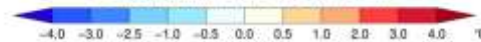
July Air Temperature

GFDL Averaging Period 1989-1999



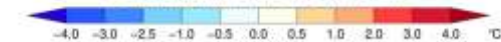
July Air Temperature

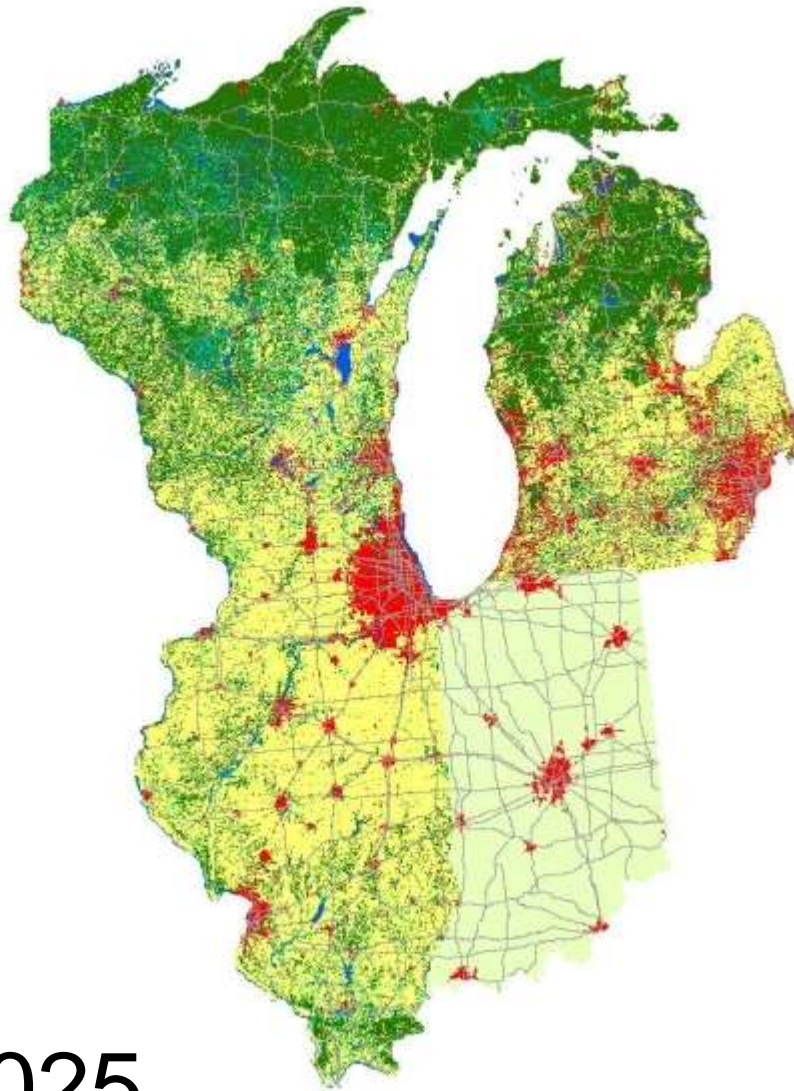
GFDL 2040-2050 minus 1989-1999 (t-test  $\alpha = 0.10$ )



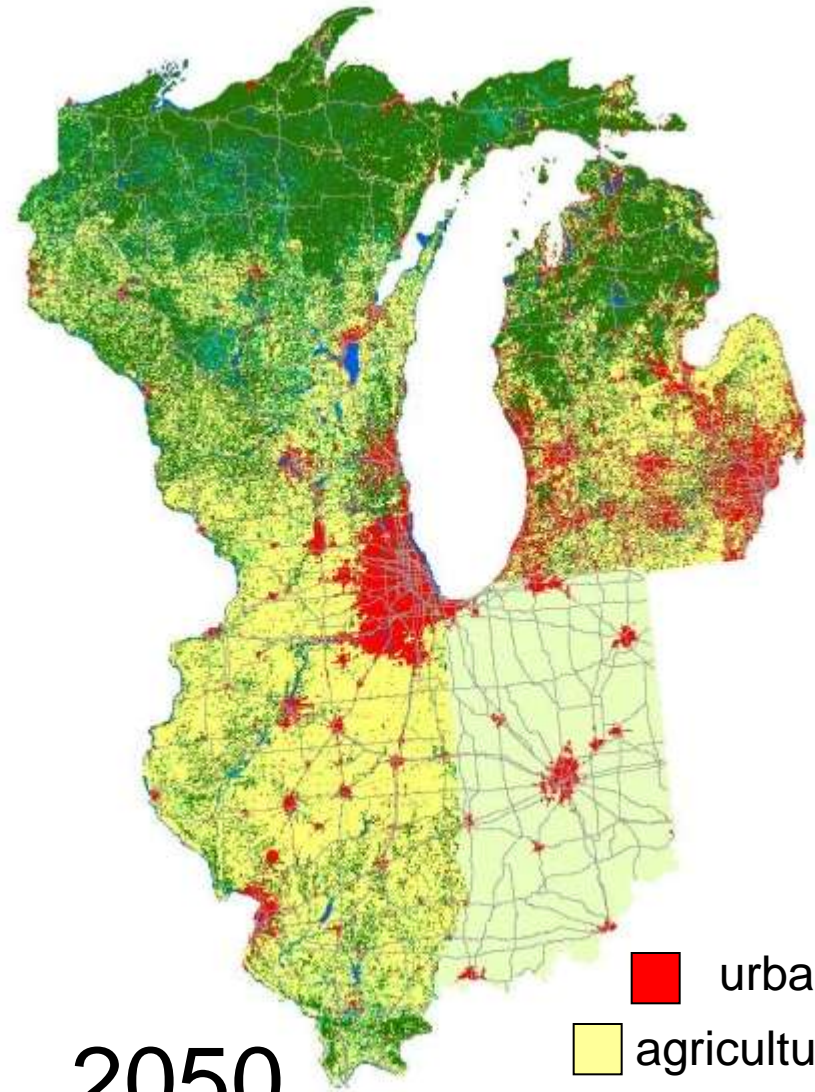
July Air Temperature

GFDL 2060-2067 minus 1989-1999 (t-test  $\alpha = 0.10$ )





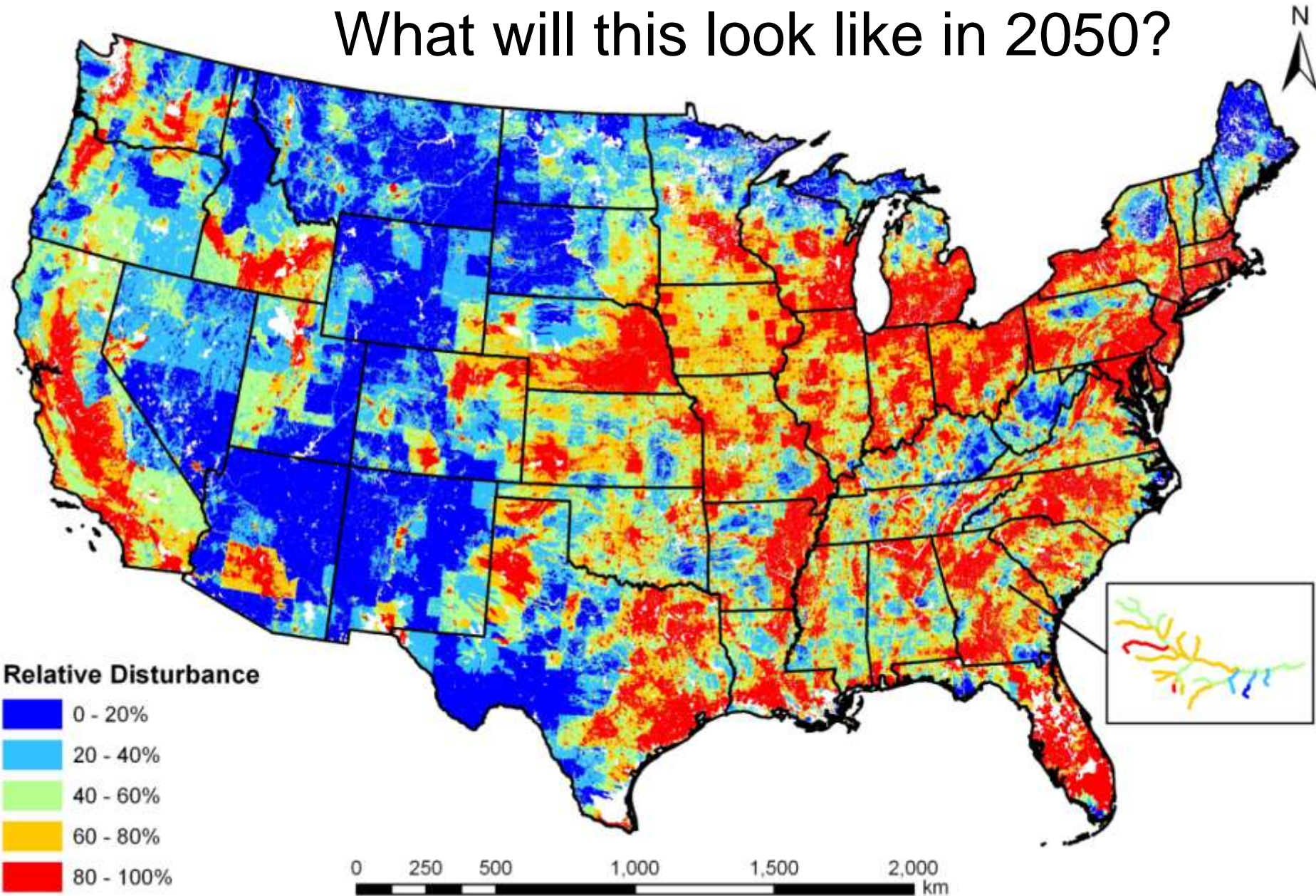
2025



2050



# What will this look like in 2050?



# DOI Climate Science Centers

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## A New Paradigm

- Linking Physical, Biological, and Social Science
- Scenario/Forecasts of Future Possibilities
- Link Research, Modeling, Synthesis, and Monitoring in a Landscape/System Perspective
- Science Collaboration/Resource Management Collaboration
- Stakeholders set priorities/Provide Review & Feedback
- Share Data and Information

Presentation by Shawn Carter – Science Coordinator, NCCWSC

# A Preliminary Outline for the NCCWSC\* Science Plan

Points for Discussion and  
Consideration

11/30/2011

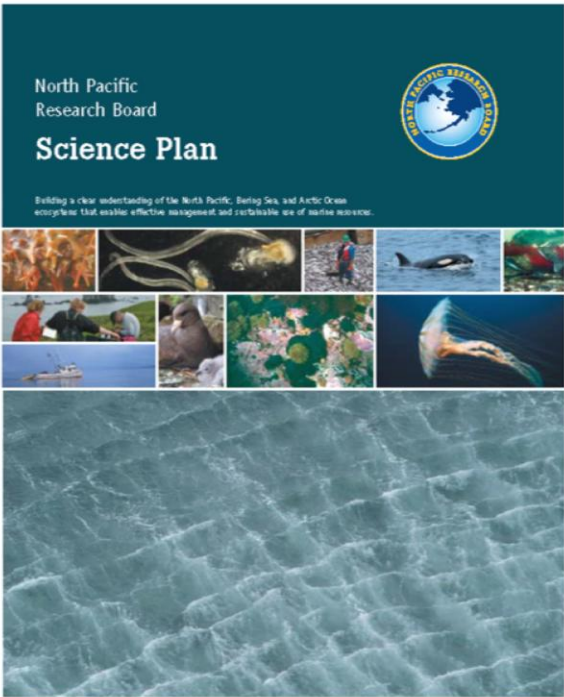
\* ( ' n i k - w i s k )



The purpose for the NCCWSC Science Plan is to provide a context and framework for sponsored research on climate impacts – while recognizing DOI and Congressional mandates.

*“The mission of the NCCWSC is to provide natural resource managers with the tools and information they need to develop and execute management strategies that address the impacts of climate and other ongoing global changes on fish and wildlife and their habitats.”*

Note: NCCWSC maintains this mission, while at the same time implementing CSCs, which may address a broader range of topics.



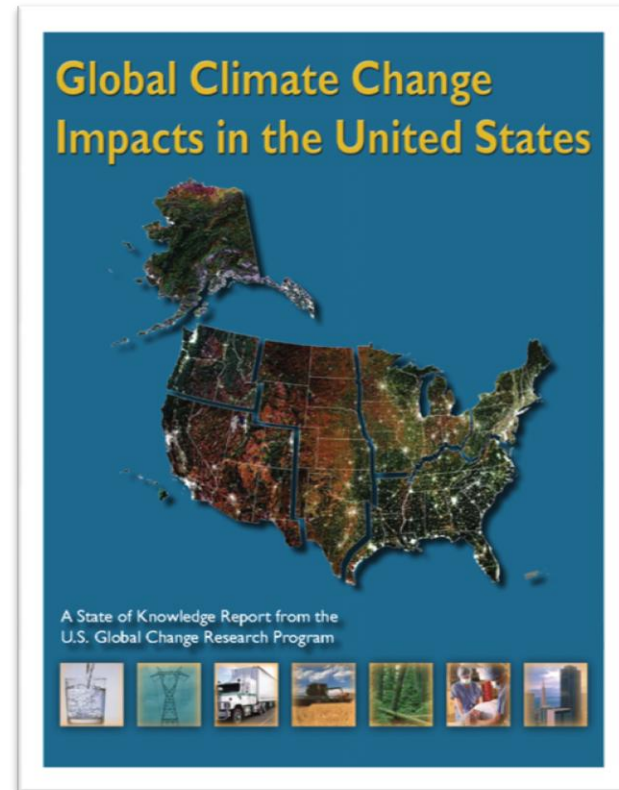
# Striking a Balance

The CSC Regional Science Agendas should address landscape-level issues (e.g. LCC and LCC+)

Regional “branding” of climate impacts and adaptation strategies is expected

Where is the NCCWSC “sweet spot”?

How do we foster a body of work that is collectively rigorous, useful, and relevant?



# Our Guiding Principles for Scientific Research

- Be inspired by and responsive to the needs of the land management community
- Place priority on evaluation, translation, and synthesis of climate impact research findings
- Promote rigorous, objective, and integrated research that advances **fundamental understanding** of climate impacts to natural resources
- Disseminate results broadly and foster professional scrutiny, critique, and learning
- Seek out and promote institutional efficiencies and leveraging opportunities in climate impact research

# The Network Concept as a Means to Advance Fundamental Understanding

- Each CSC not only generates research products, but also advances the state of knowledge.
- The measure of success for CSCs (and NCCWSC) will *not* only be the delivery of tangible benefits to resource managers. We must also provide the opportunity and means to advance the intangible body of knowledge in climate impact science.
- A national, DOI-wide, network provides an opportunity for shared learning via understanding successes *and* failures.

***Goal 1: Assess and synthesize our state of knowledge about climate change impacts to DOI lands and waters***

- Determine priority gaps in scientific understanding of climate change impacts.
- Predict fish and wildlife population changes in response to climate change.
- Assess the vulnerability of species and habitats to climate change.

*Goal 2: Work with resource managers to **develop adaptation methods** that minimize climate change impacts to the Nation's fish, wildlife, and habitats.*

- Generate predictive modeling and decision-support capability to address climate impacts to land, water, biological, and ecosystem resources.
- Develop or refine landscape-level protocols that link existing monitoring efforts to models of climate and ecological and biological response.
- Develop data management policies and practices to ensure that NCCWSC-generated data and research results are shared and interoperable with other climate initiatives.

*Goal 3: Foster research that investigates the **interactions** between climate and the physical, biological, and chemical forces that **influence ecosystem structure & function and the goods and services** they provide.*

- Link physical climate models with biological and ecological responses at management-relevant temporal-spatial scales and ecological endpoints.
- Refine, apply, and interpret watershed and ecosystem process models that directly inform climate change adaptation strategies.
- Coordinate the intercomparison ecosystem and ecosystem service modeling platforms

# The overall NCCWSC science portfolio seeks to:

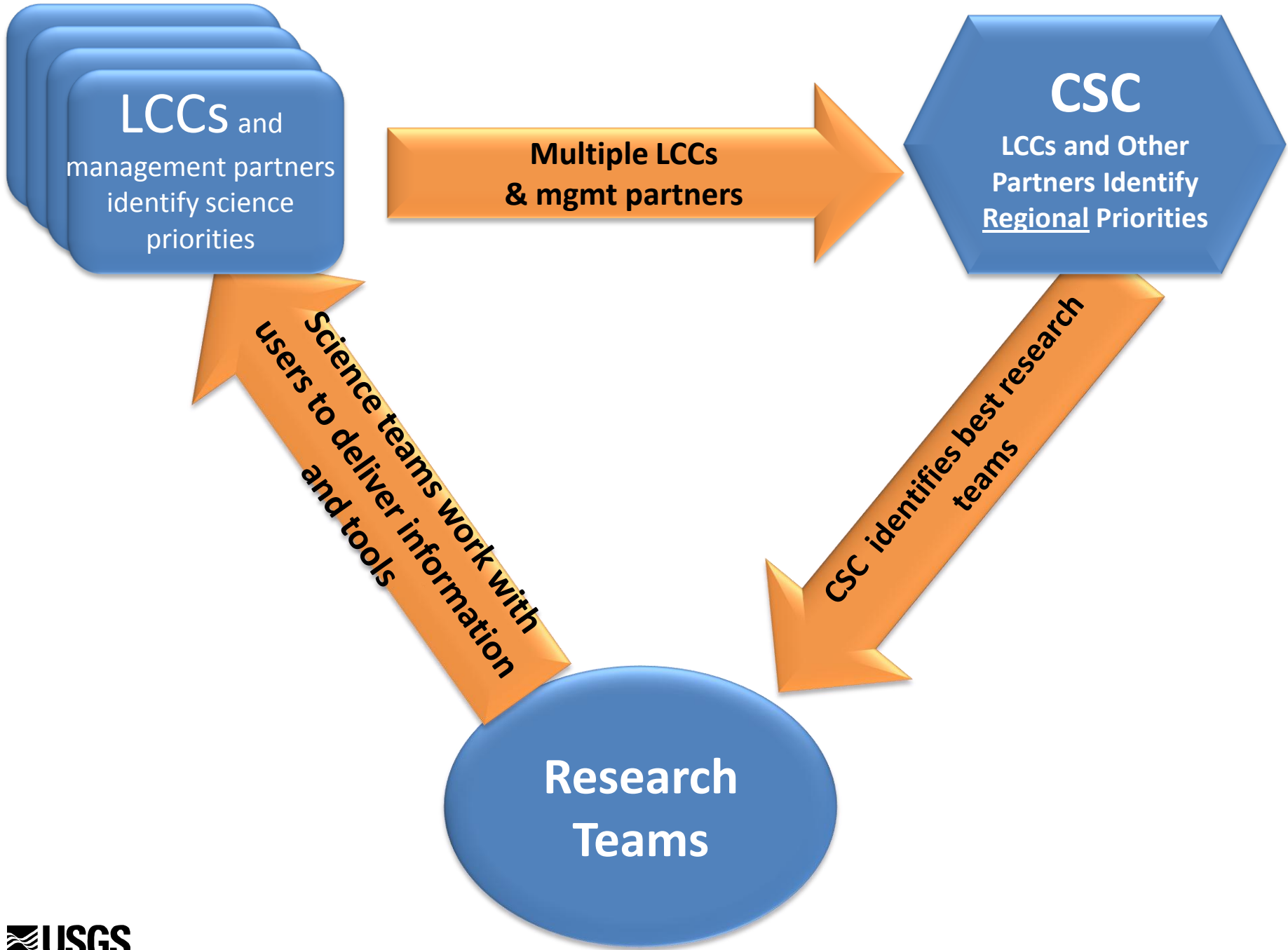
- Balance risk
  - some projects include well-established methodologies and techniques while other projects explore newer, cutting-edge, methods and technologies that are less established but potentially useful.
- Sponsor both short- and long-term projects
  - this recognizes the need to generate results quickly while allowing for larger, multi-year efforts.
- Encourage both regional and local application
  - activities at large spatial domains (e.g., downscaling a particular GCM for a CSC region) are complemented by local activities.
- Encourage interdisciplinary, multi-sector projects
  - socio-economics, physical climate modeling and ecosystem modeling, etc.
- Efficiently use DOI investments (planned leveraging)
  - catalogue and specifically target expertise in climate science within DOI bureaus, when appropriate.
- Be flexible and opportunistic (unplanned leveraging)
  - retain some funding that can be used to broaden the utility of work that is already planned or being conducted by other researchers.

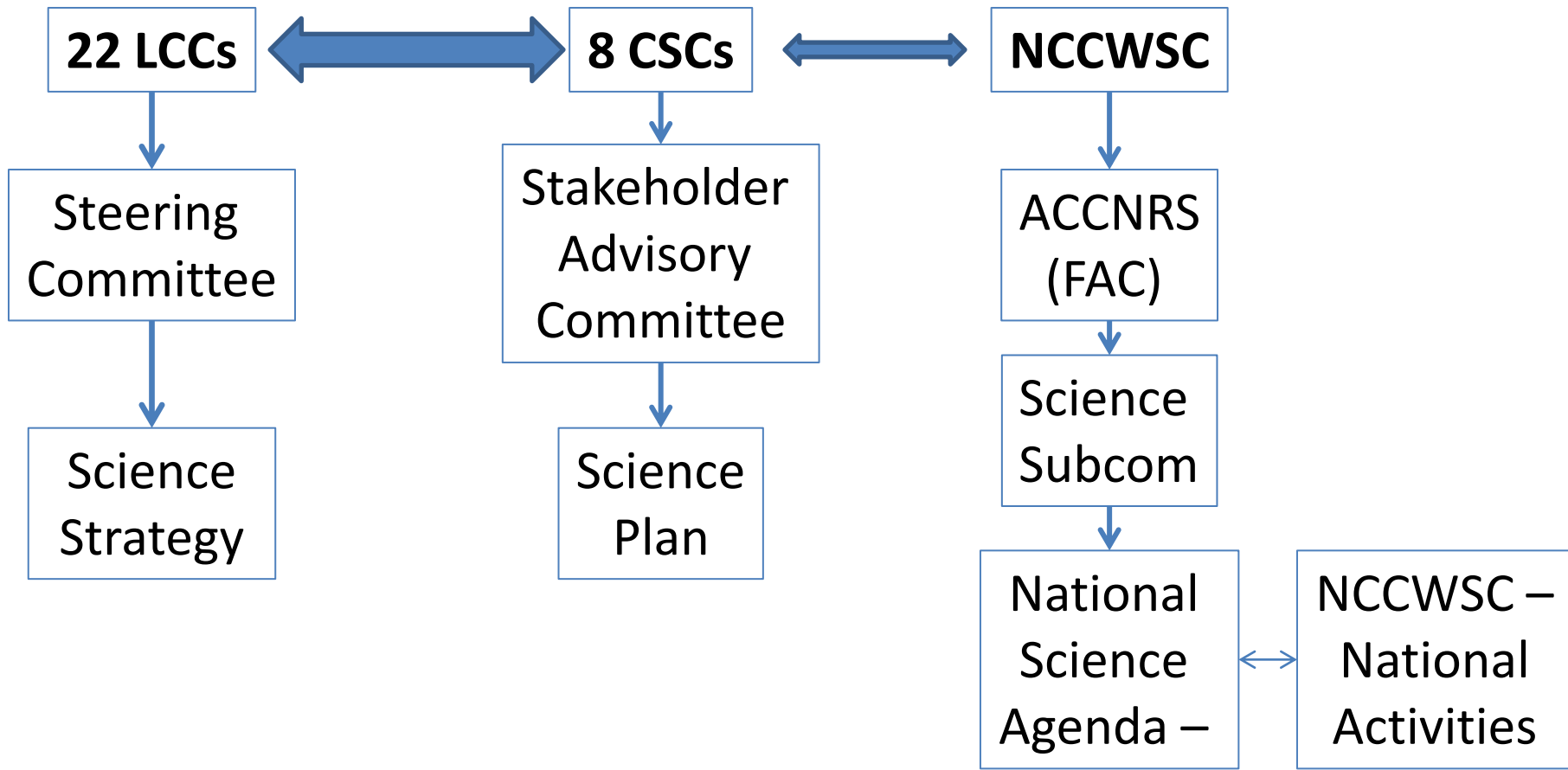


## *General Research Themes*

- National Synthesis of Climate Impacts to Fish, Wildlife, and Associated Ecosystems
- Development of Best Practices for Regional Analysis
- Forecasting and Scenario Development
- Vulnerability Assessment, Risk Assessment, Uncertainty Analysis
- Downscaled Derivative Products
- Ecosystem Processes, Services, and Resilience
- Integrated Monitoring Design and Protocols
- “Adaptation Research”, Evaluation of Adaptation Strategies

Presentation by Robin O'Malley, Policy and Partnership Coordinator, NCCWSC





FACA-Compliant  
(not federal/  
advisory)

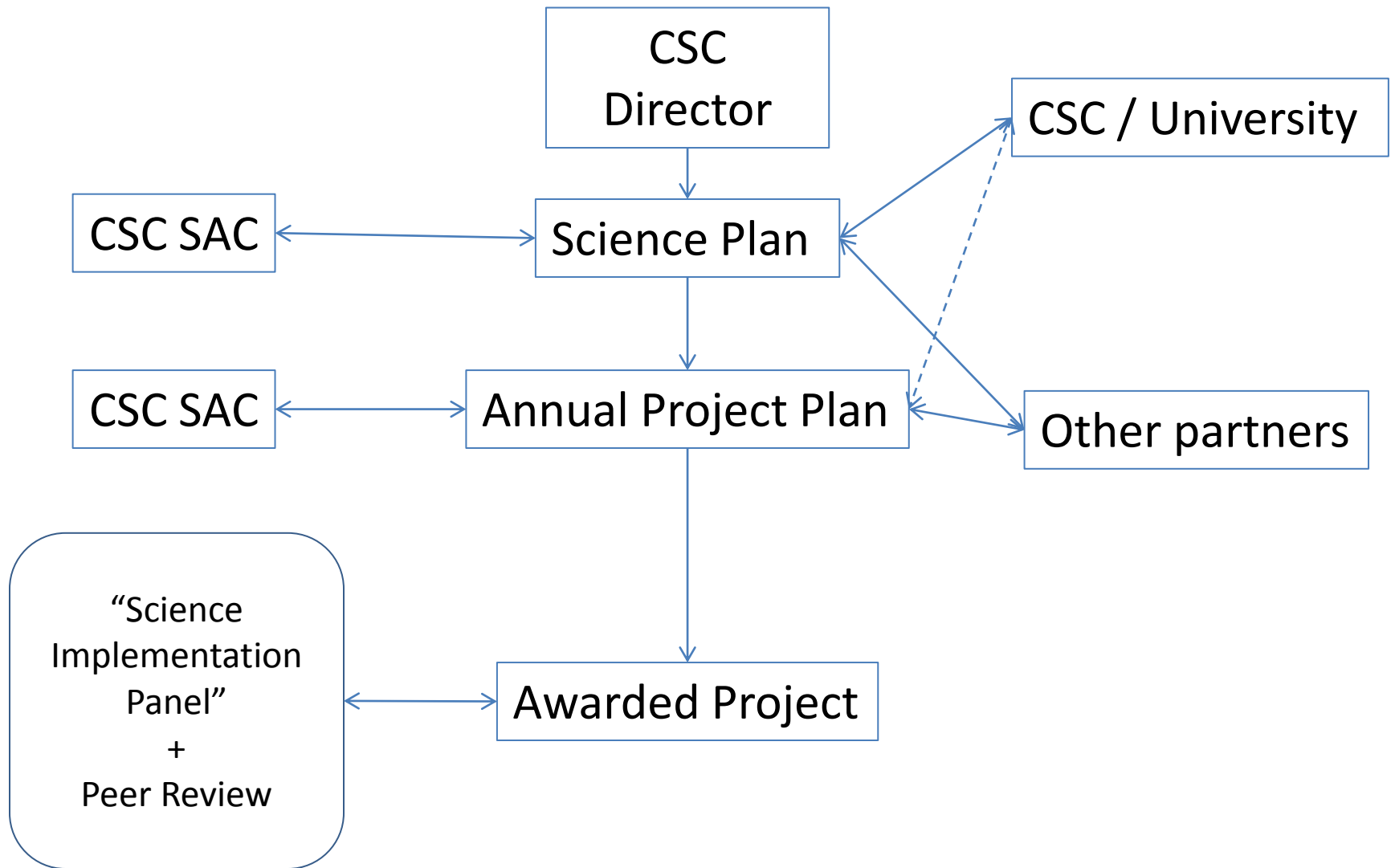
(DOI  
Guidance Sec  
III.B.2)

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(federal/  
advisory)

(DOI  
Guidance  
Sec IV.B.1)

FAC

(Shawn's  
Presentation)



# Governance – Stakeholder Advisory Committees

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- ❖ DOI, other feds, states, tribes, local governments.
- ❖ NGOs, private landowners, etc. cannot be formal members
- ❖ Roles:
  - Agree on a regional science plan (~5-10 years), based on management-derived needs, with ordered priorities.
  - Agree on annual project selection
- ❖ Chaired by USGS REX
- ❖ Meets at least annually; identify forward priorities, review past products
- ❖ Science plan must address
  - ❖ Science/research priorities
  - ❖ Monitoring priorities
  - ❖ Information management—strategies, systems, sources
  - ❖ Scientific resources and skills (gap analysis)

## Executive Stakeholder Advisory Committee NW CSC

Co-Chair-- US Geological Survey

Co-Chair—Affiliated Tribes of Northwest Indians (ATNI);

Swinomich Indian Tribal Community;

Columbia River Intertribal Fish Commission

Environmental Protection Agency

US Bureau of Reclamation

US Forest Service – National Forest System, R&D

State of Montana

State of Oregon

State of Washington

National Park Service

Natural Resource Conservation Service

Bureau of Land Management

US Forest Service

US Army Corps of Engineers – Witt Anderson / Rebecca Weiss

Bonneville Power Administration

National Oceanic and Atmospheric Administration

Fish and Wildlife Service

Federal Highway Administration

Great Basin Landscape Conservation Cooperative

North Pacific Landscape Conservation Cooperative

Great Northern Landscape Conservation Cooperative

# Advisory Committee on Climate Change and Natural Resources Science (ACCNRS) (draft draft draft draft draft)

## Membership categories

- Federal
- State
- Tribal
- State and local (inc. e.g. AFWA, WGA)
- NGO (scientific, advocacy, private/producer)
- Individual landowners / business interests
- Scientific experts (subcommittee)
- CSC university partners

## Advise on:

- National science strategy
- Nature and extent of regional/CSC engagement
- Priority setting mechanisms
- Maintaining scientific excellence



# CSCs and Tribes – Engagement To Date

- Commitment to include tribal members on CSC Stakeholder Advisory Committees
  - NW CSC – co-chaired by ATNI / Swinomish Chairman
- Commitment to government to government consultation
  - NCAI advising on who and how
- College of Menominee Nation – formal partner in NE CSC
- Chickasaw Nation and Choctaw Nation of Oklahoma – formal members of SC CSC
  - USGS supporting full-time tribal sustainability officer
- Seeking tribal members for Federal Advisory Committee
- Tribal members invited to National Partners Dialogue