Managing Drought Risk in a Changing Climate:
The Role of National Drought Policy

Dr. Donald A. Wilhite
School of Natural Resources
University of Nebraska-Lincoln

Drought Risk in the Context of Change
22 September 2014
Oxford, UK

Presentation Outline

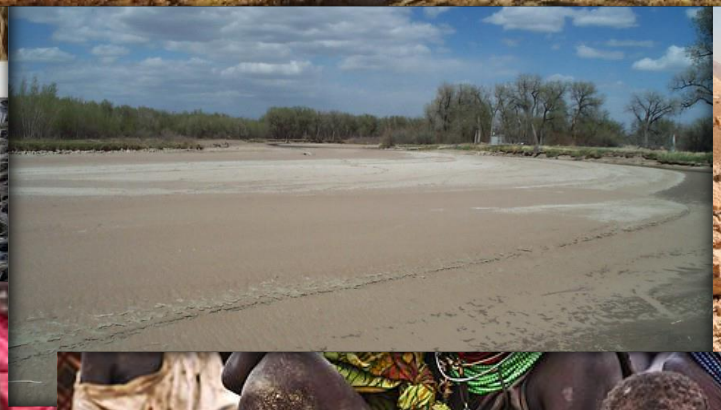
- The MANY FACES OF DROUGHT
  - **Drought as hazard, definitions, characteristics**
- Breaking the HYDRO-ILL  GICAL CYCLE
  - **Crisis management → Risk management**
- Our CHANGING VULNERABILITY—CHANGING CLIMATE
- Building SOCIETAL RESILIENCE—

  What are the 'pillars' for change?
  - **Drought monitoring and prediction, early warning and information systems**
  - **Vulnerability/risk and impact assessment**
  - **Mitigation AND response measures**
- Moving towards a POLICY FRAMEWORK that enhances preparedness and risk reduction

Two Phrases to Remember

- If you do what you've always done, you'll get what you've always got!
- Who and what is at risk and why?

The Many Faces of Drought



Defining Drought

Hundreds of definitions—application and region specific

Drought is a deficiency of **precipitation** (**intensity**) from expected or "normal" that extends over a season or longer period of time (**duration**) . . . . .

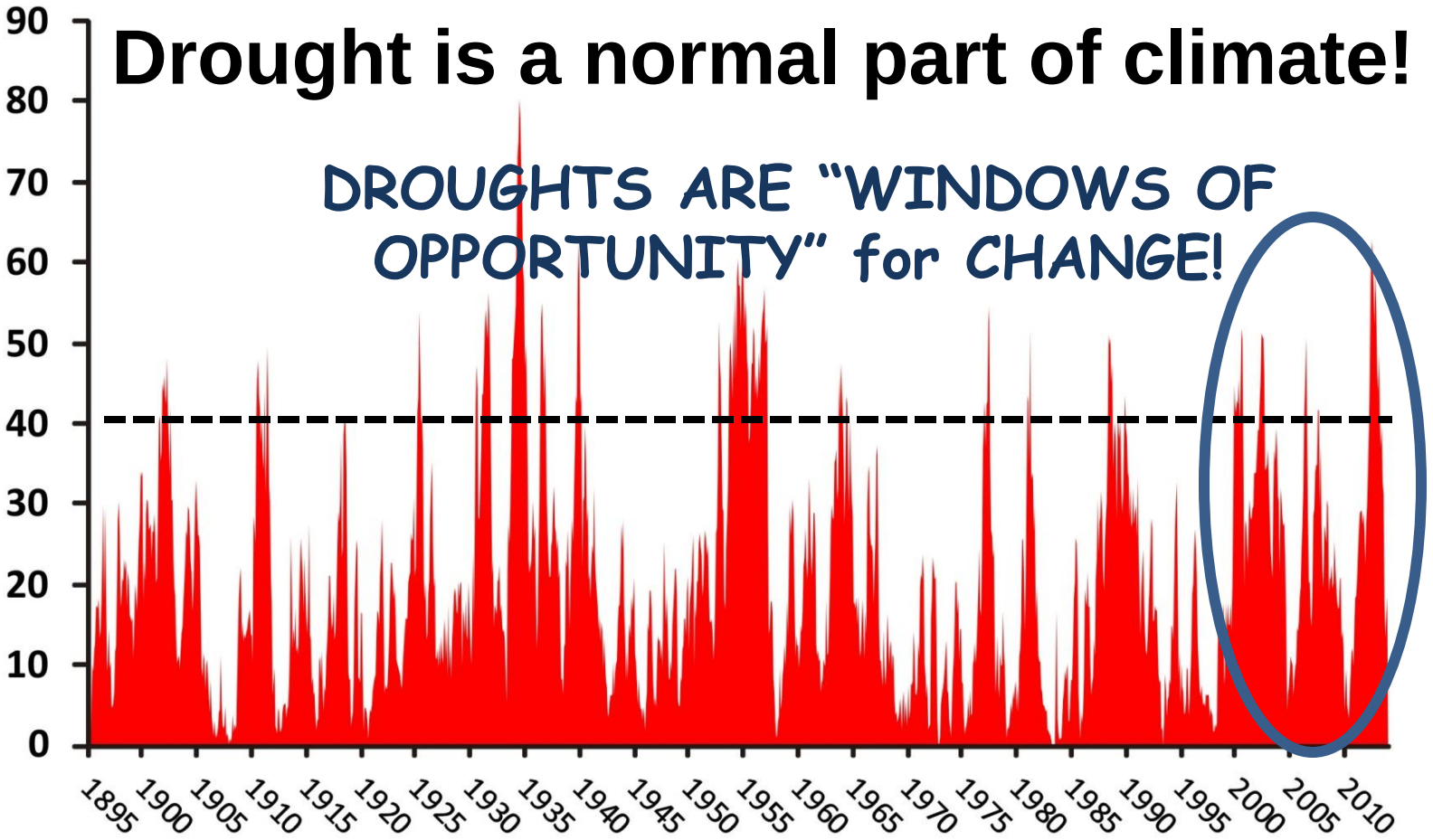
Meteorological Drought

and is insufficient to meet the demands of human activities and the environment (**impacts**).

Agricultural, Hydrological and Socio-economic Drought

Percent Area of the United States in Moderate to Extreme Drought

January 1895–December 2013



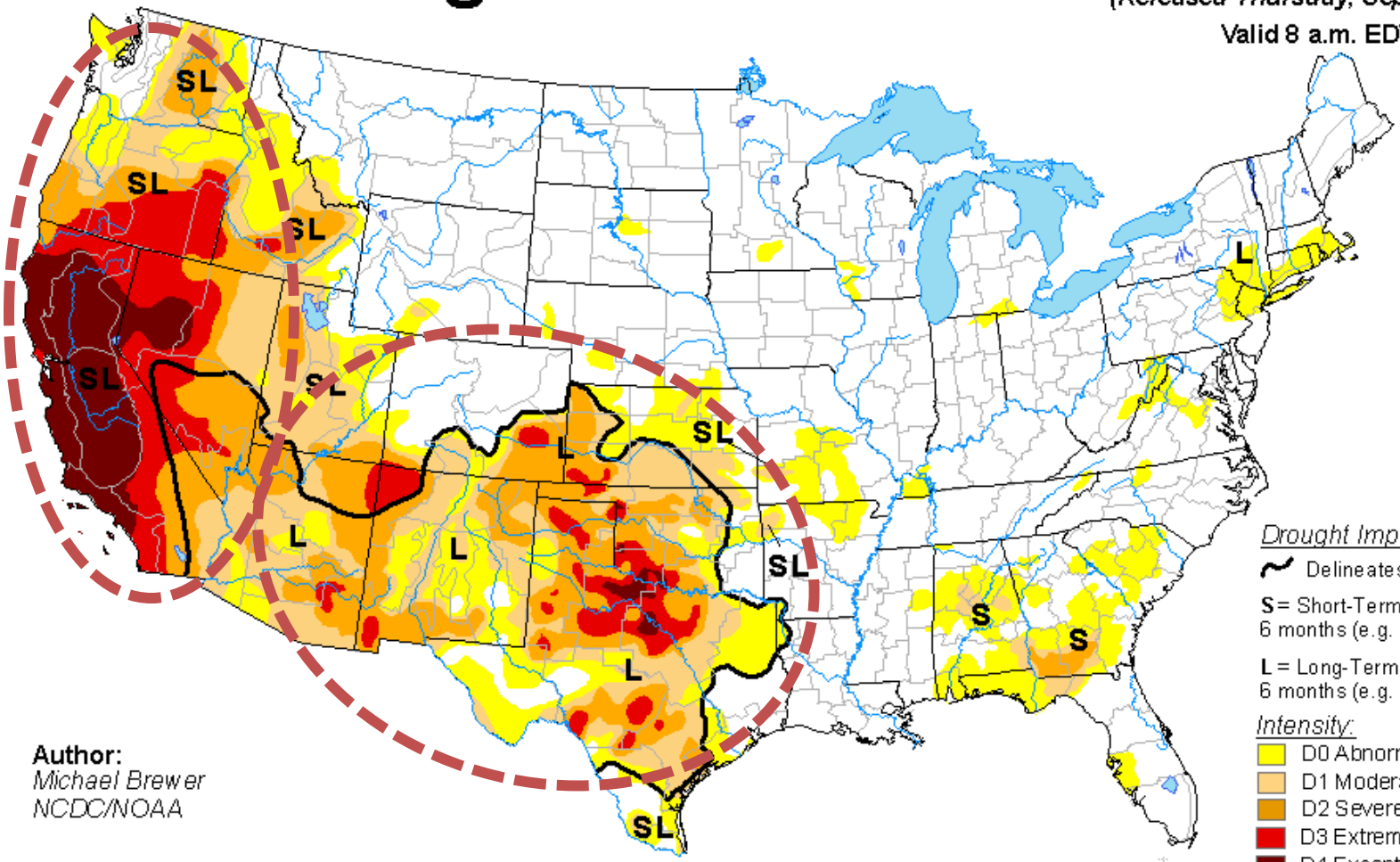
Based on data from the National Climatic Data Center/NOAA

U.S. Drought Monitor

September 16, 2014

(Released Thursday, Sep. 18, 2014)

Valid 8 a.m. EDT



Author:
Michael Brewer
NCDC/NOAA

Drought Impact Types:

Delineates dominant impacts

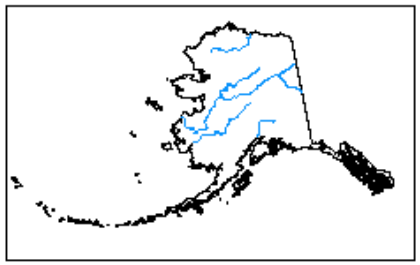
S = Short-Term, typically less than 6 months (e.g. agriculture, grasslands)

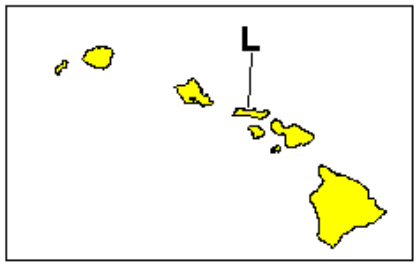
L = Long-Term, typically greater than 6 months (e.g. hydrology, ecology)

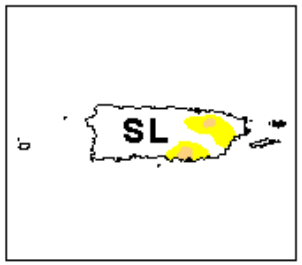
Intensity:

- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.



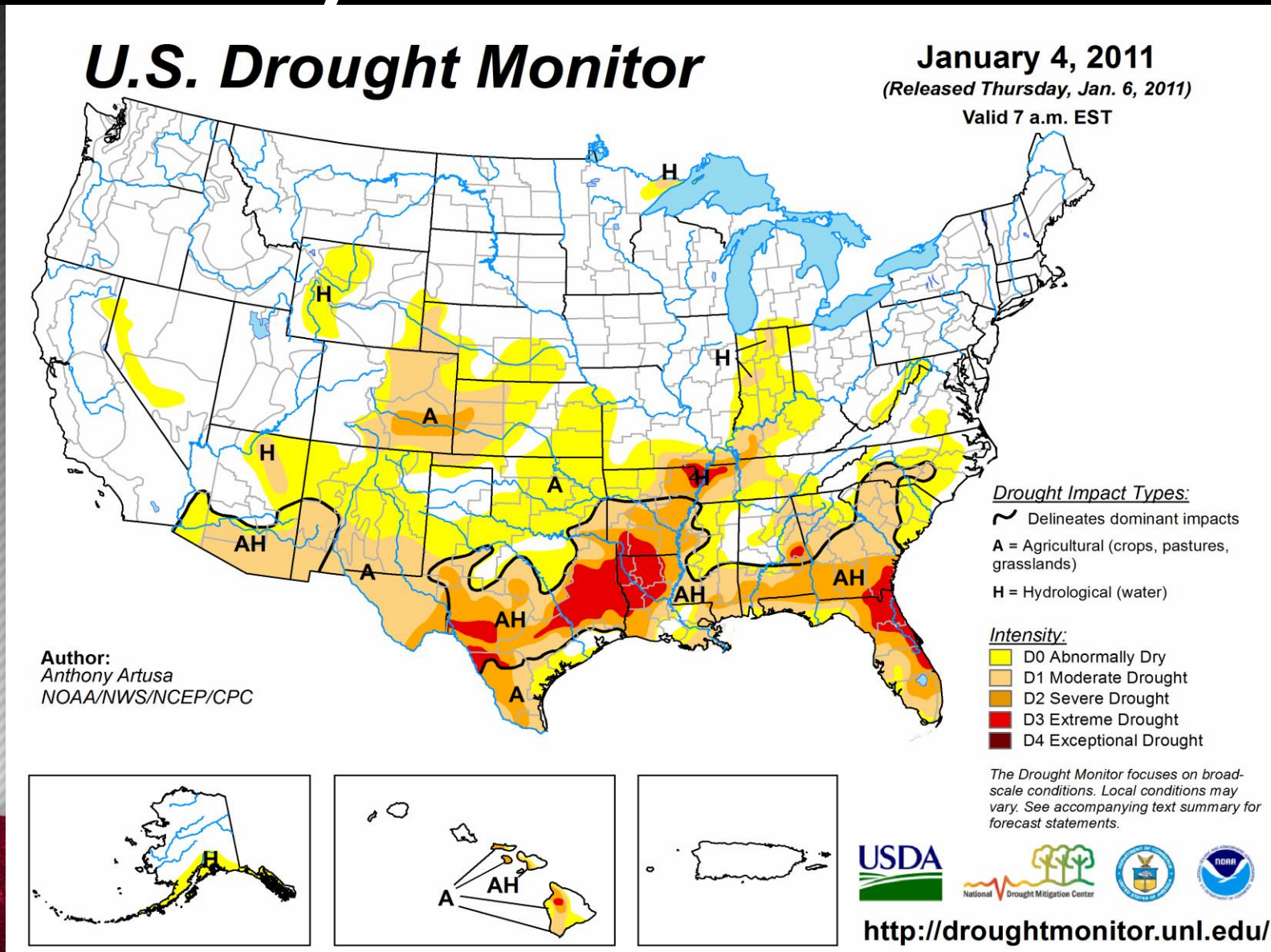




USDA National Drought Mitigation Center

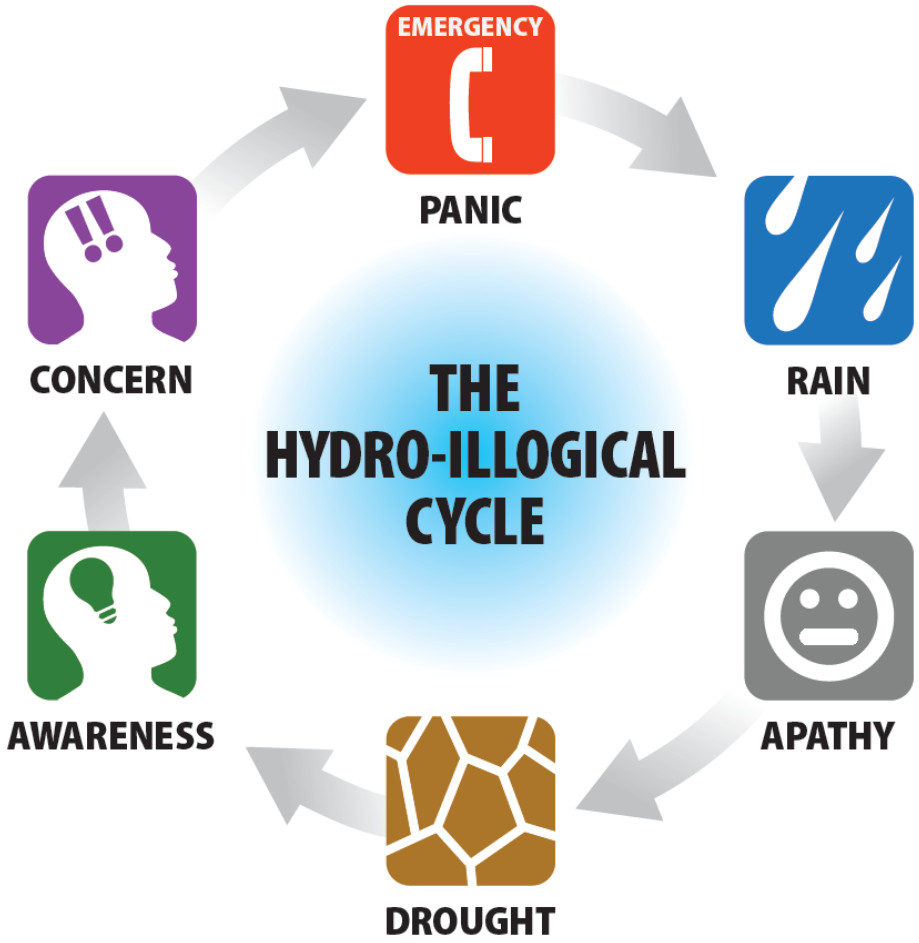
http://droughtmonitor.unl.edu/

USDM Animation
January 2011 to March 2014



Breaking the Hydro-illogical Cycle:

An Institutional Challenge for Drought Management



Crisis Management

If you do what you've always done, you'll get what you've always got.

We MUST adopt a new paradigm for drought management!

Types of Policy Responses

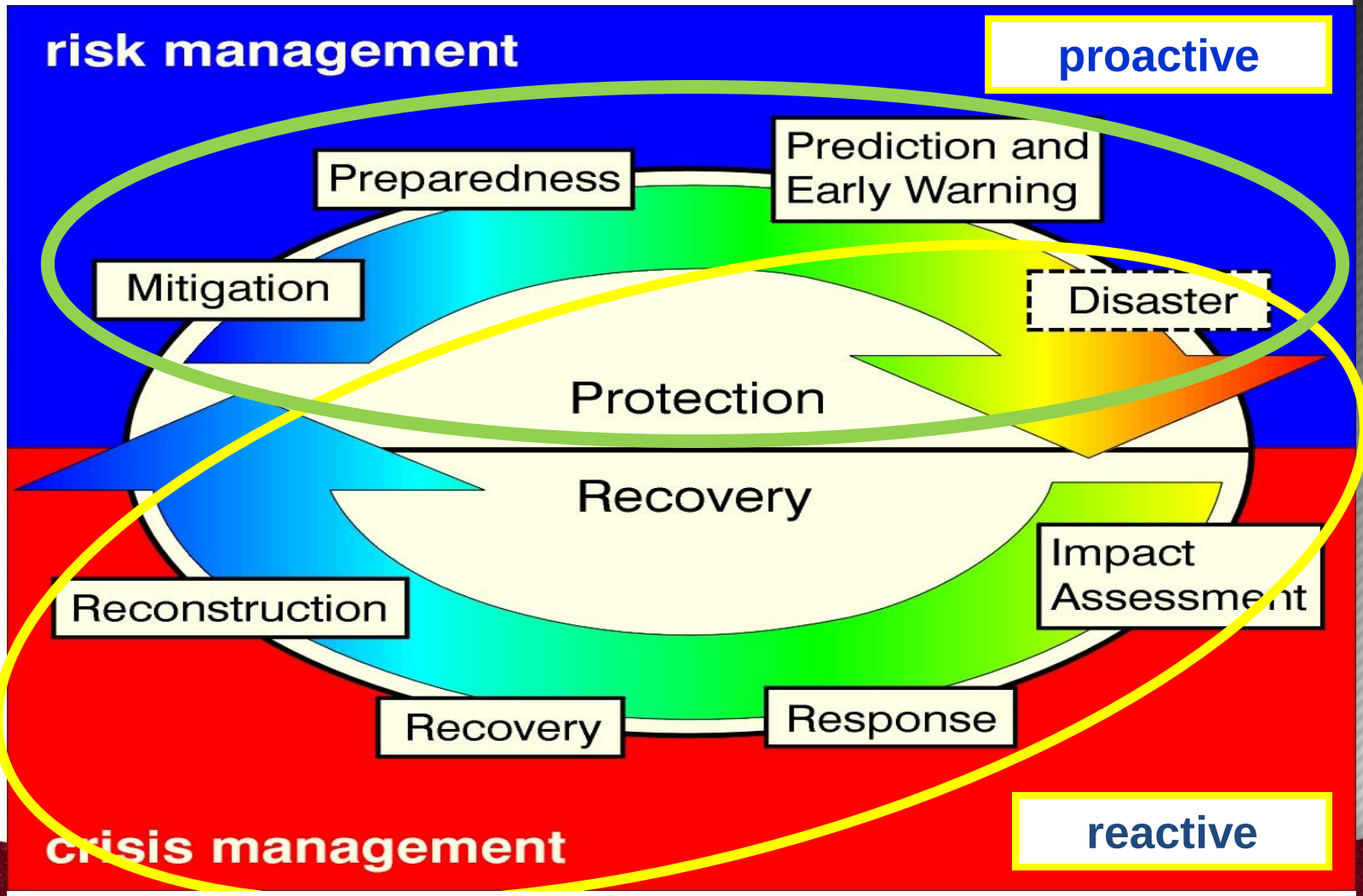
- Post-impact government interventions—relief measures (i.e., **crisis management**)
- Pre-impact government programs—mitigation measures to reduce vulnerability and impacts, including insurance programs
- Risk-based drought policies and preparedness plans, organizational frameworks and operational arrangements

Crisis Management Characteristics

- Ineffective, treats symptoms of drought
- Untimely, response actions
- Increases reliance on government/donors
- Poorly coordinated, within and between levels of government—national to local
- Expensive, large expenditures from numerous government agencies
- Does drought relief/assistance **reduce** or **increase** vulnerability?

The Cycle of Disaster Management

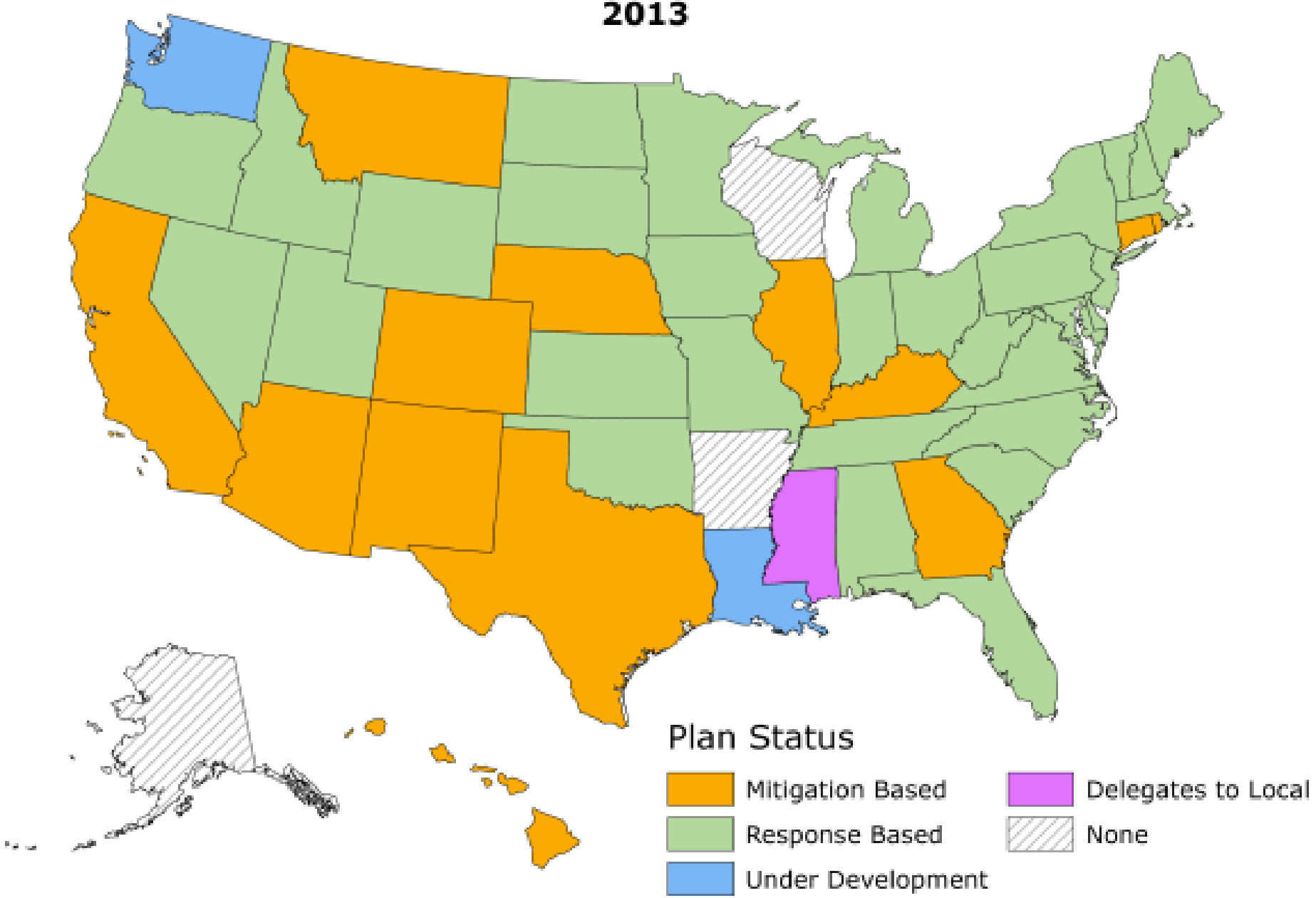
Risk management increases coping capacity, builds resilience.



Crisis management treats the symptoms, not the causes.

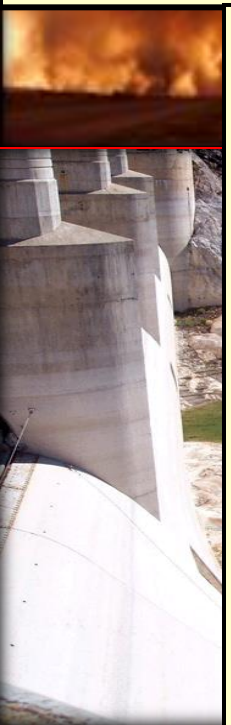
Status of State Drought Plans

2013



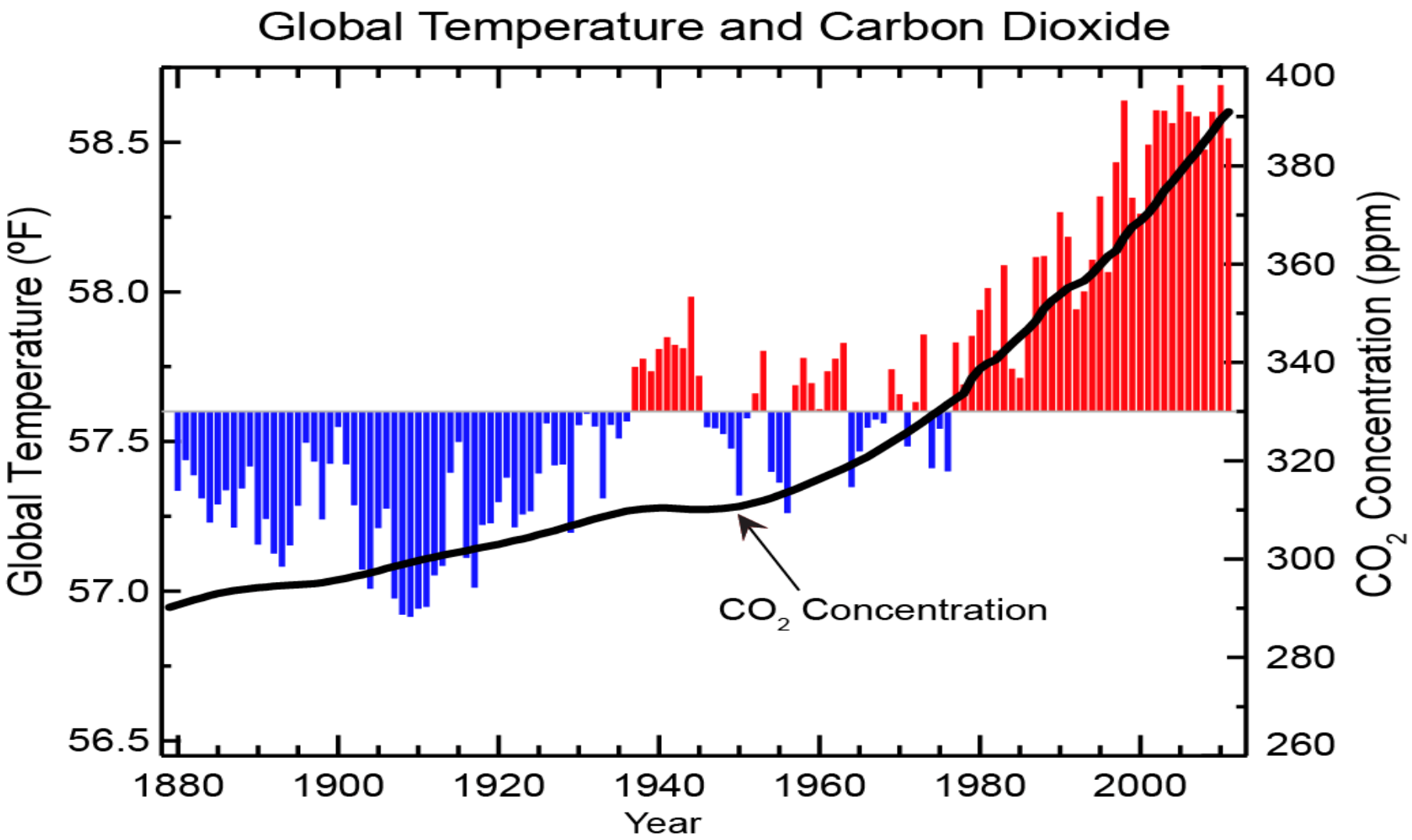
Changes in Societal Vulnerability

Drought impacts are more complex today as more economic sectors are affected, creating more conflicts between water users, i.e., *societal vulnerability is dramatically different and changing*.



- Agricultural production
- Food security
- Energy
- Transportation
- Tourism/Recreation
- Forest/rangeland fires
- Municipal water
- Water quality/quantity
- Environment
- Ecosystem services
- Health

Our Changing Climate



There is a close correlation between CO_2 and temperature that has been verified through many lines of research . This graph shows the relationship of temperature and CO_2 over the last 130 years.

The Climate Change Challenge for Drought Management

- Increasing mean temperature
- High temp. stress and increased heat waves/longer growing seasons
- Increased evapotranspiration
- Changes in precipitation amount, distribution and intensity
- Reduced soil moisture
- Changes in groundwater recharge
- Reduced runoff/stream flow resulting from reduced snowpack/sublimation

Building Societal Resilience through National Drought Policies and Preparedness Plans: The Way Forward

Hazard x Vulnerability = Risk

EXPOSURE

- Severity/Magnitude
  - Intensity/Duration
- Frequency
- Spatial extent
- Trends
  - Historical
  - Future
- Impacts
- Early warning

SOCIAL FACTORS

- Population growth
- Population shifts
- Urbanization
- Technology
- Land use changes
- Environmental degradation
- Water use trends
- Government policies
- Environmental awareness

RISK

Incentives for Changing the Drought Management Paradigm

- Addresses spiraling impacts → multiple sectors
- Reduces conflicts between water users
- Promotes wise stewardship of natural resources—sustainable development
- Reduces need for governmental assistance—allows for resources to be invested more wisely
- More frequent and severe droughts (increased duration?) in association with climate change.
- What is the **cost of inaction?**

WMO

UNCCD
United Nations Convention to Combat Desertification

FAO
FIAT PANIS

HIGH-LEVEL MEETING ON NATIONAL DROUGHT POLICY

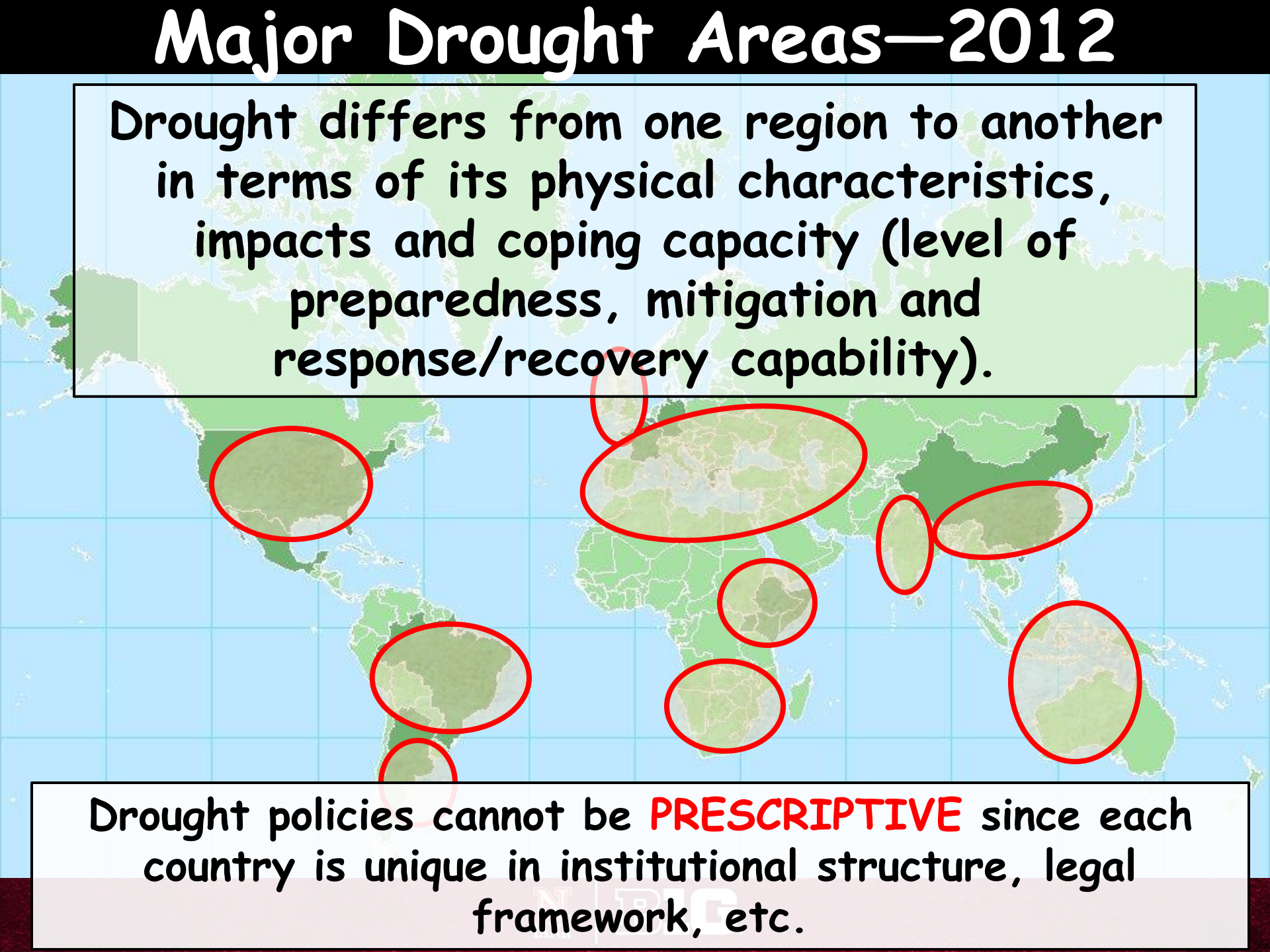
(HMNDP)
TOWARDS MORE DROUGHT RESILIENT SOCIETIES

11-15 March 2013
CICG, Geneva

Final Report

Major Drought Areas—2012

Drought differs from one region to another in terms of its physical characteristics, impacts and coping capacity (level of preparedness, mitigation and response/recovery capability).



Drought policies cannot be **PRESCRIPTIVE** since each country is unique in institutional structure, legal framework, etc.

A UN-WATER INITIATIVE

UN WATER

ORGANIZED BY:

WMO

UNCCD
United Nations Convention to Combat Desertification

FAO

LOCAL ORGANIZER

METEO ROMÂNIA

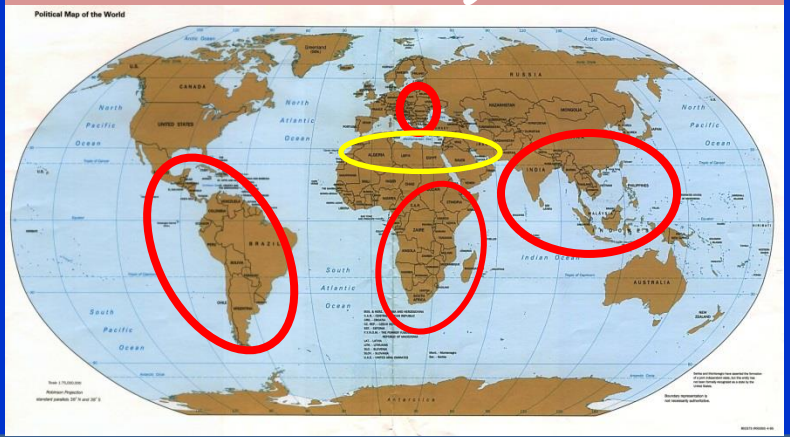
1st Regional Workshop | Bucharest, Romania

Capacity Development to Support National DROUGHT Management Policies

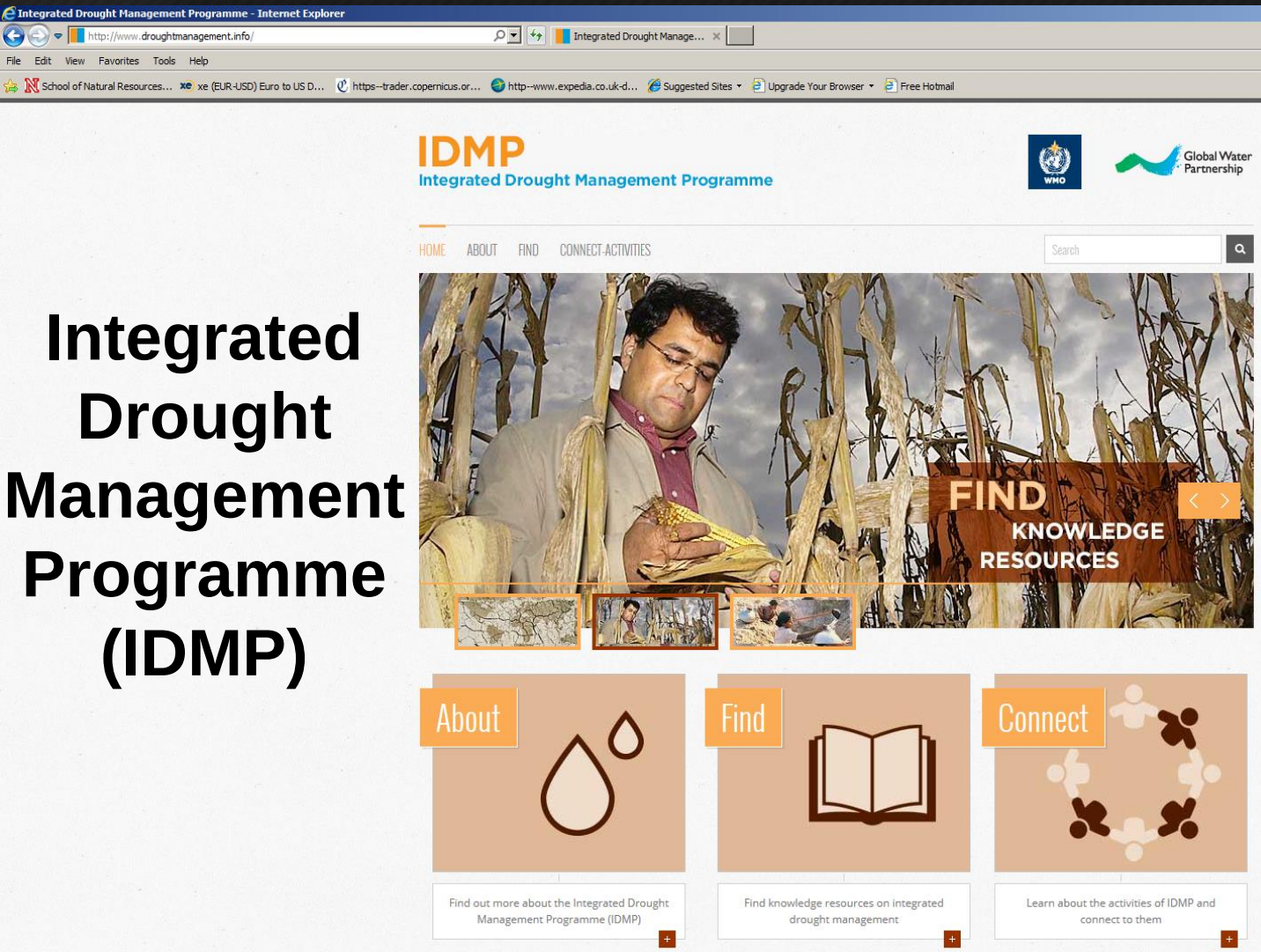
9-11 July 2013
The Class Hotel | Bucharest, Romania

Find out more on the initiative:
www.ais.unwater.org/droughtmanagement

A series of regional workshops sponsored by WMO, FAO, UNCCD, UN-Water and the Convention on Biological Diversity (Eastern Europe, Latin America, Asia Africa & Near East)



Integrated Drought Management Programme (IDMP)



http://www.droughtmanagement.info

http://www.droughtmanagement.info/about-idmp/guidelines/

Necessary Ingredients for National Drought Policy Development

- **Political will and leadership!**
- **Initial investment in building greater institutional capacity**
- **Collaborative environment that supports and encourages coordination within and between levels of government/private sector — an integrated approach**
- **Engaged and supportive stakeholders**
- **Engaged research community**
- **Strong outreach and media program**


National Drought Policy
Preparedness Plans based on the principles of risk reduction

A drought policy should be broadly stated and . . .

- **Establish a clear set of risk-based principles or guidelines to govern drought management.**
- **Policy could be part of a disaster risk reduction or climate change adaptation framework**
- **Consistent and equitable for all regions, population groups, and economic/social sectors.**
- **Consistent with the goals of sustainable development.**
- **Reflect regional differences in drought characteristics, vulnerability and impacts.**

A drought policy should (continued)

- Promote the principles of risk management by encouraging development of
  - **Early warning and delivery systems**;
    - Reliable seasonal forecasts;
  - ***Preparedness plans*** at all levels of government, within river basins, and the private sector;
  - **Risk/Vulnerability assessments** —

    Who and what is at risk and why?
  - **Mitigation actions** that reduce drought impacts and the need for government intervention;
  - **Coordinated emergency response** that ensures targeted and timely relief, consistent with drought policy goals, during drought emergencies.

Key Elements/Pillars of a Drought Preparedness Plan

- **Monitoring/early warning, prediction and information delivery systems**
  - Integrated monitoring of key indicators
    - Precipitation, temperature, soil moisture, streamflow, snowpack, groundwater, etc.
  - Use of appropriate indices
  - Reliable seasonal forecasts
  - Development/delivery of information and decision-support tools

Key Elements/Pillars of a Drought Preparedness Plan

- **Risk and impact assessment**
  - Conduct of risk/vulnerability assessments
  - **Who and What is at Risk and Why?**
  - Monitoring/archiving of impacts/losses
- **Mitigation and response**
  - Proactive measures to increase coping capacity
  - Response measures that support the principles of drought risk reduction

Takeaway Messages

- Climate is changing—climate state/variability.
- Extreme climate events are increasing in frequency globally and locally, **managing impacts is critically important—we must increase our resilience to drought**.
- Past drought management has been reactive—ineffective, poorly coordinated & poorly targeted.
- Time is ***NOW*** to change the **paradigm** from crisis to **drought risk management**.
- Time is ***NOW*** for all drought-prone nations to adopt **appropriate** drought policies to reduce the impacts of future drought episodes through risk-based management.
- The '***cost of inaction***'!

Thanks for your attention!

Contact Information:

School of Natural Resources

University of Nebraska-Lincoln

dwilhite2@unl.edu