

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

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Presentation Outline

- The **MANY FACES OF DROUGHT**
 - Drought as hazard, characteristics, definition
- Breaking the **HYDRO-ILLOGICAL CYCLE** 
 - Crisis management → Risk management
- Our **CHANGING CLIMATE—CHANGING VULNERABILITY**
- Building **SOCIETAL RESILIENCE --**
What are the 'pillars' for change?
 - Drought monitoring and prediction, early warning/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?

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**



It's behind me...

Isn't it..?

Drought— it sneaks up on you!

Droughts differ in terms of:

- **INTENSITY**
- **Duration**
- **Spatial Extent**

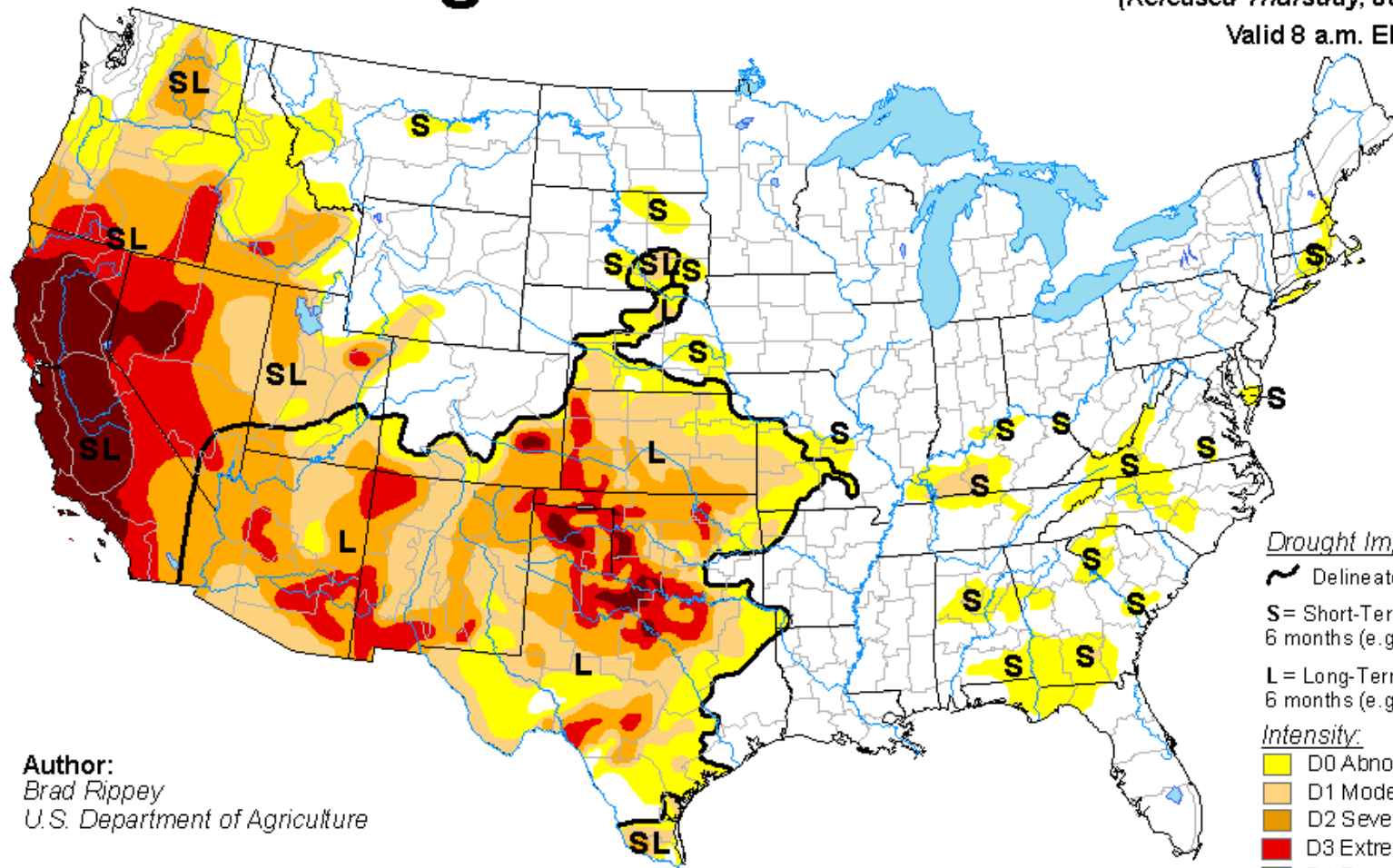
As with other natural hazards,
each drought event is unique in its characteristics.

U.S. Drought Monitor

July 29, 2014

(Released Thursday, Jul. 31, 2014)

Valid 8 a.m. EDT



Drought Impact Types:

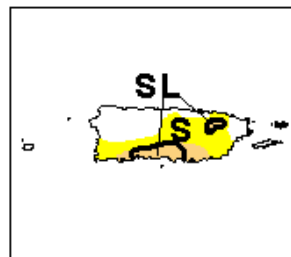
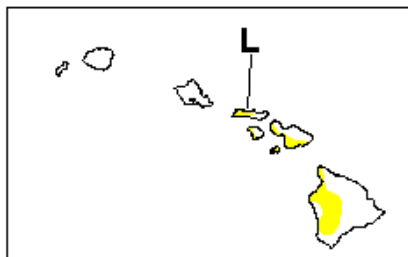
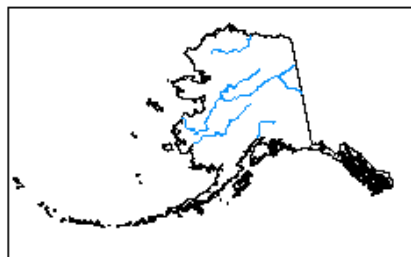
- ~ Delineates dominant impacts
- S= Short-Term, typically less than 6 months (e.g. agriculture, grasslands)
- L= Long-Term, typically greater than 6 months (e.g. hydrology, ecology)

Intensity:

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

Author:
Brad Rippey
U.S. Department of Agriculture

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



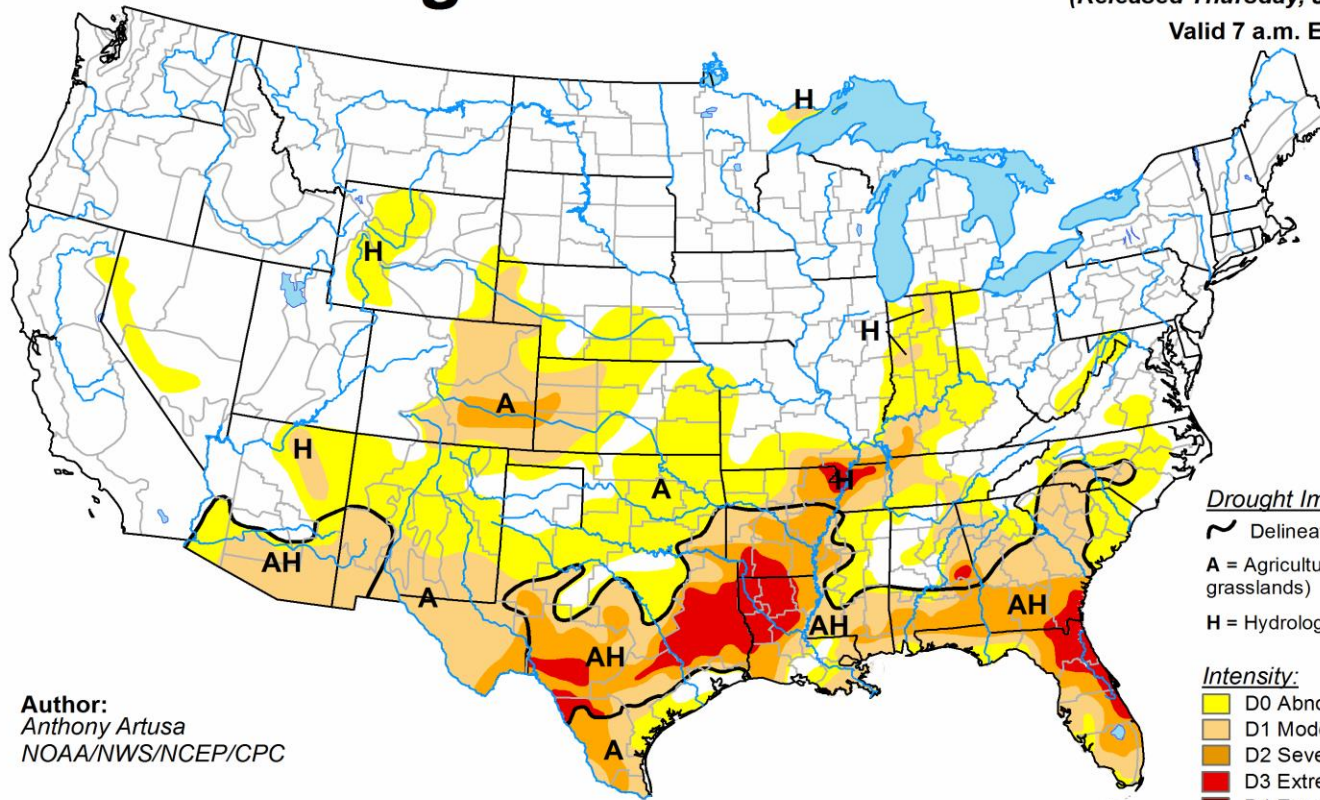
<http://droughtmonitor.unl.edu/>

USDM Animation

January 2011 to March 2014

U.S. Drought Monitor

January 4, 2011
 (Released Thursday, Jan. 6, 2011)
 Valid 7 a.m. EST



Drought Impact Types:

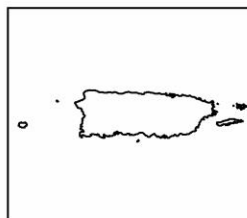
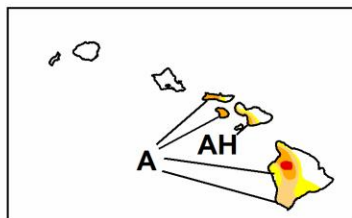
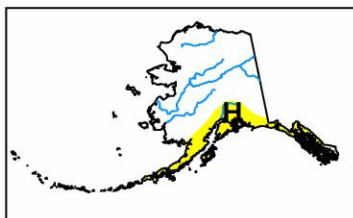
- ~ Delineates dominant impacts
- A = Agricultural (crops, pastures, grasslands)
- H = Hydrological (water)

Intensity:

- Yellow: D0 Abnormally Dry
- Light Orange: D1 Moderate Drought
- Orange: D2 Severe Drought
- Red: D3 Extreme Drought
- Dark Red: D4 Exceptional Drought

Author:
 Anthony Artusa
 NOAA/NWS/NCEP/CPC

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



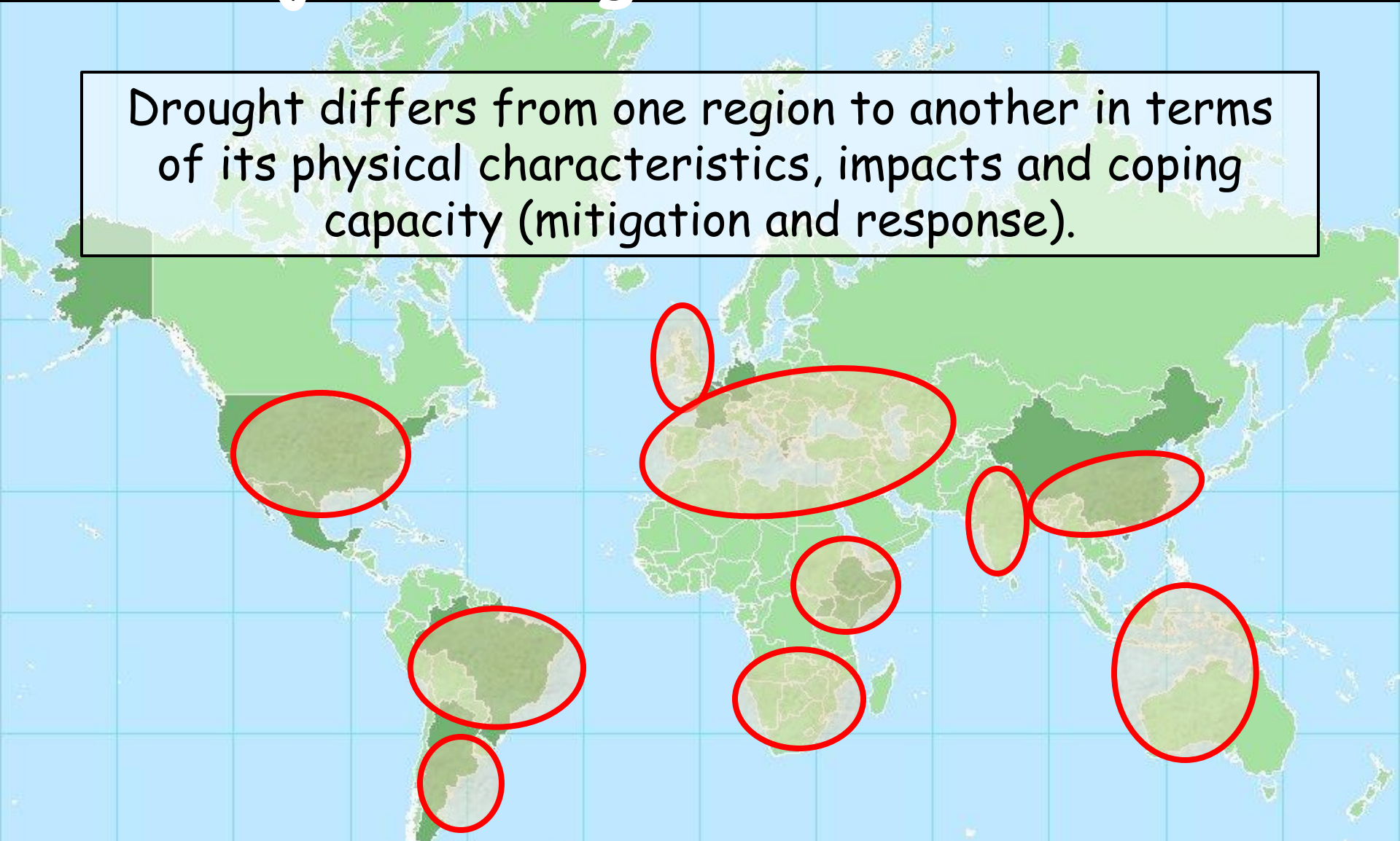
<http://droughtmonitor.unl.edu/>

The Many Faces of Drought



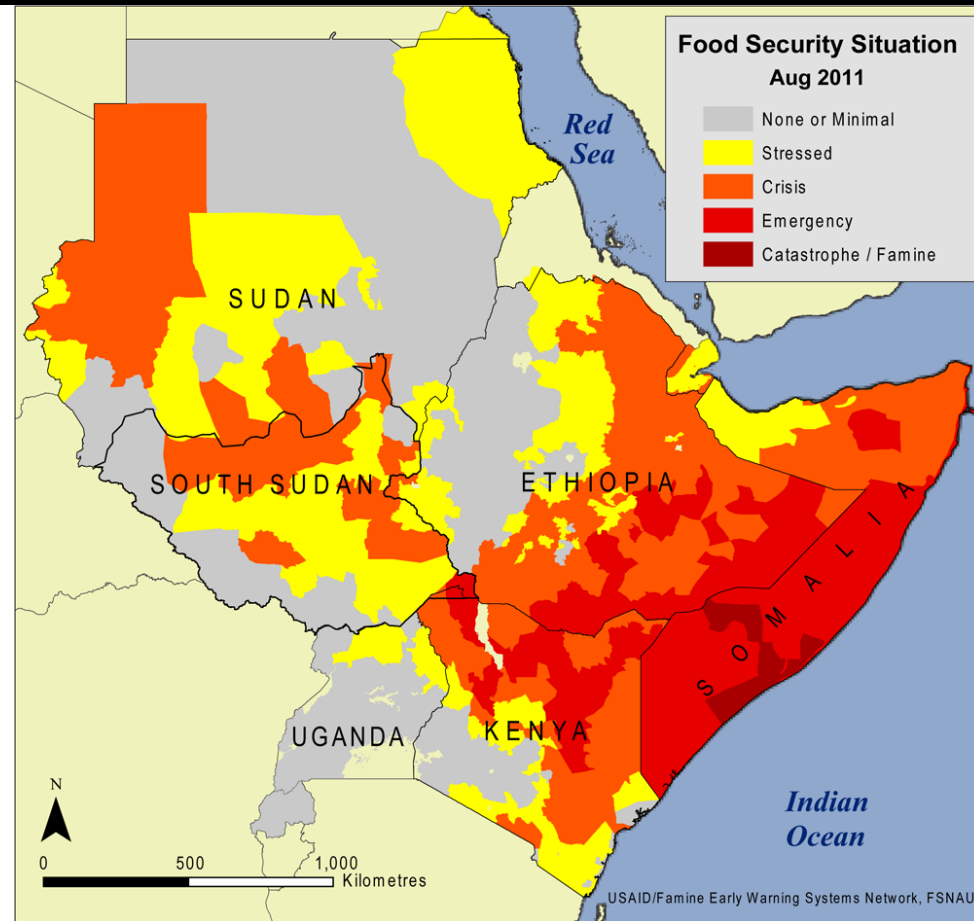
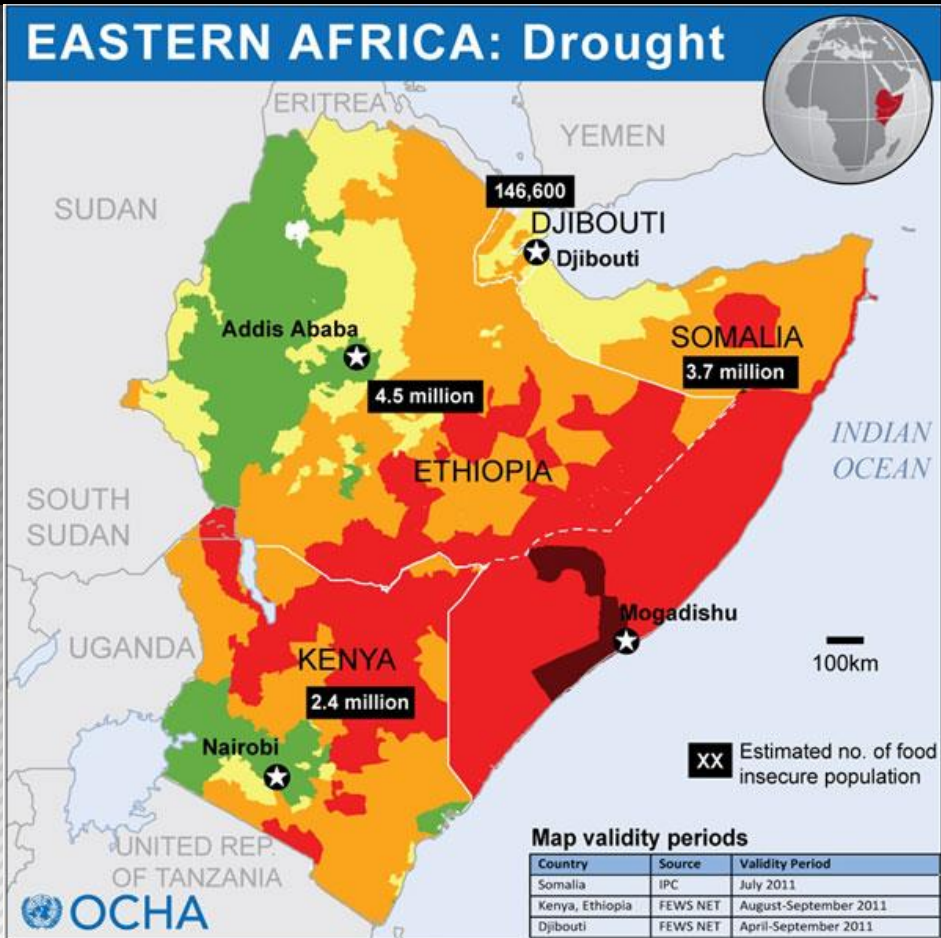
Major Drought Areas—2012

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



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

Drought and Food Security



Integrated Food Security Phase Classification (IPC)

- 1. None or Minimal
- 2. Stressed
- 3. Crisis
- 4. Emergency
- 5. Catastrophe / Famine

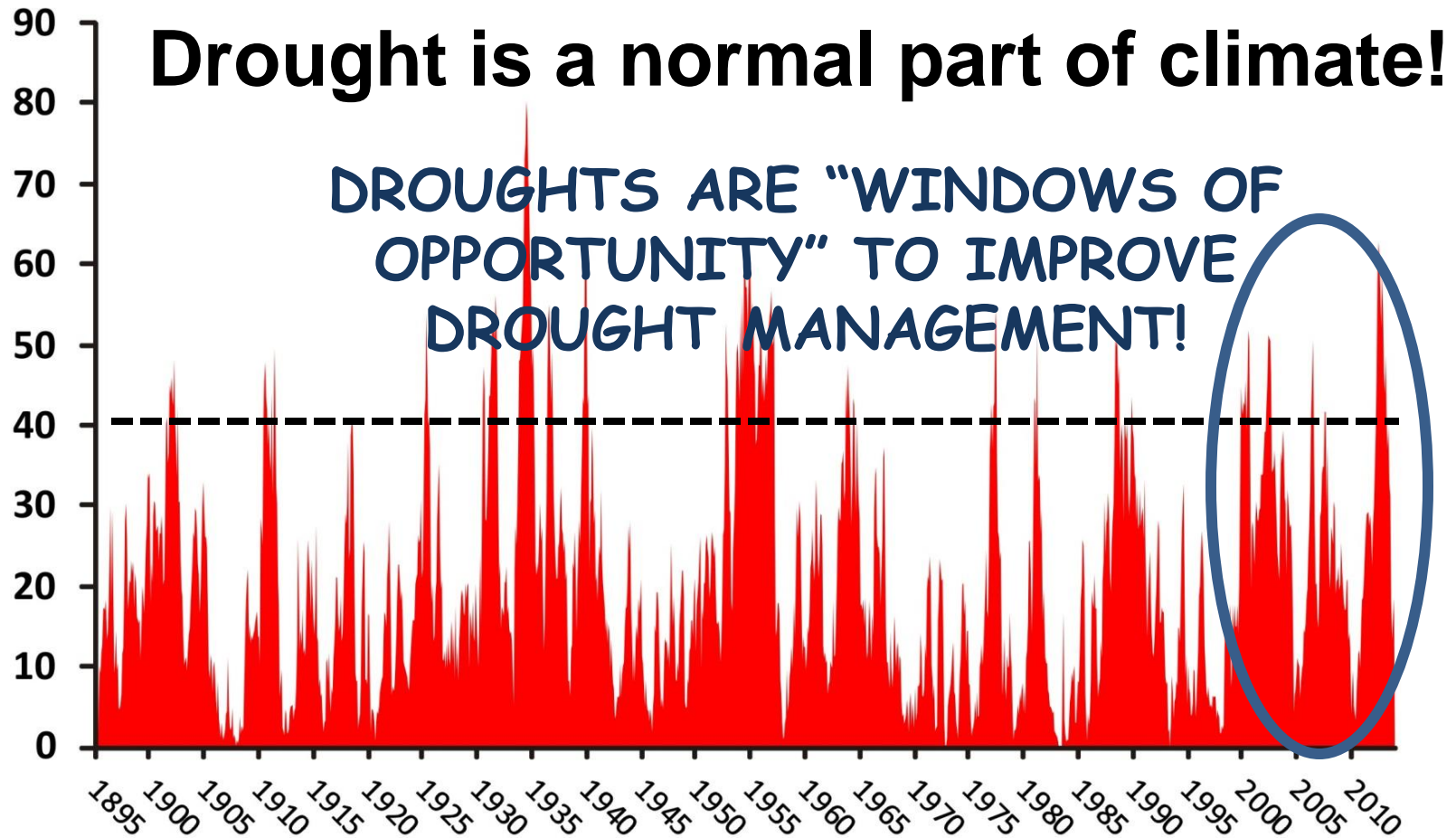
Map Sources: IPC Country Teams, UNCS, FEWS NET

The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the United Nations

Map created 21 Jul 2011.

Percent Area of the United States in Moderate to Extreme Drought

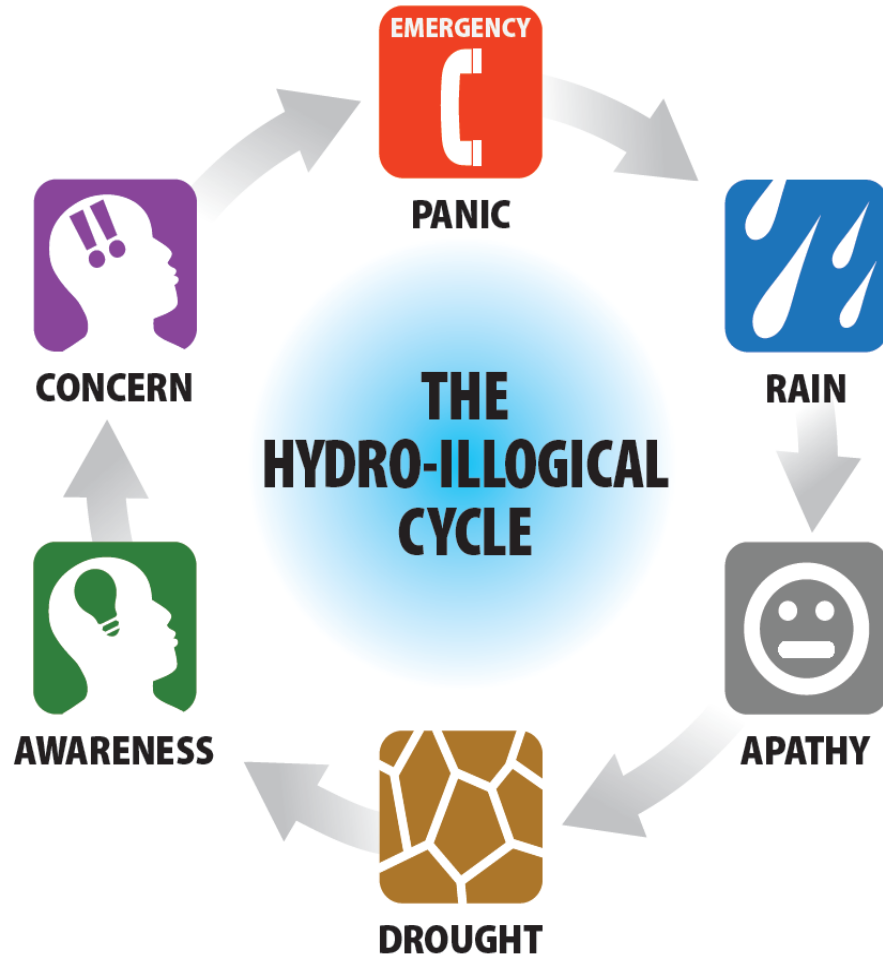
January 1895–December 2013



Based on data from the National Climatic Data Center/NOAA

Breaking the Hydro-illogical Cycle:

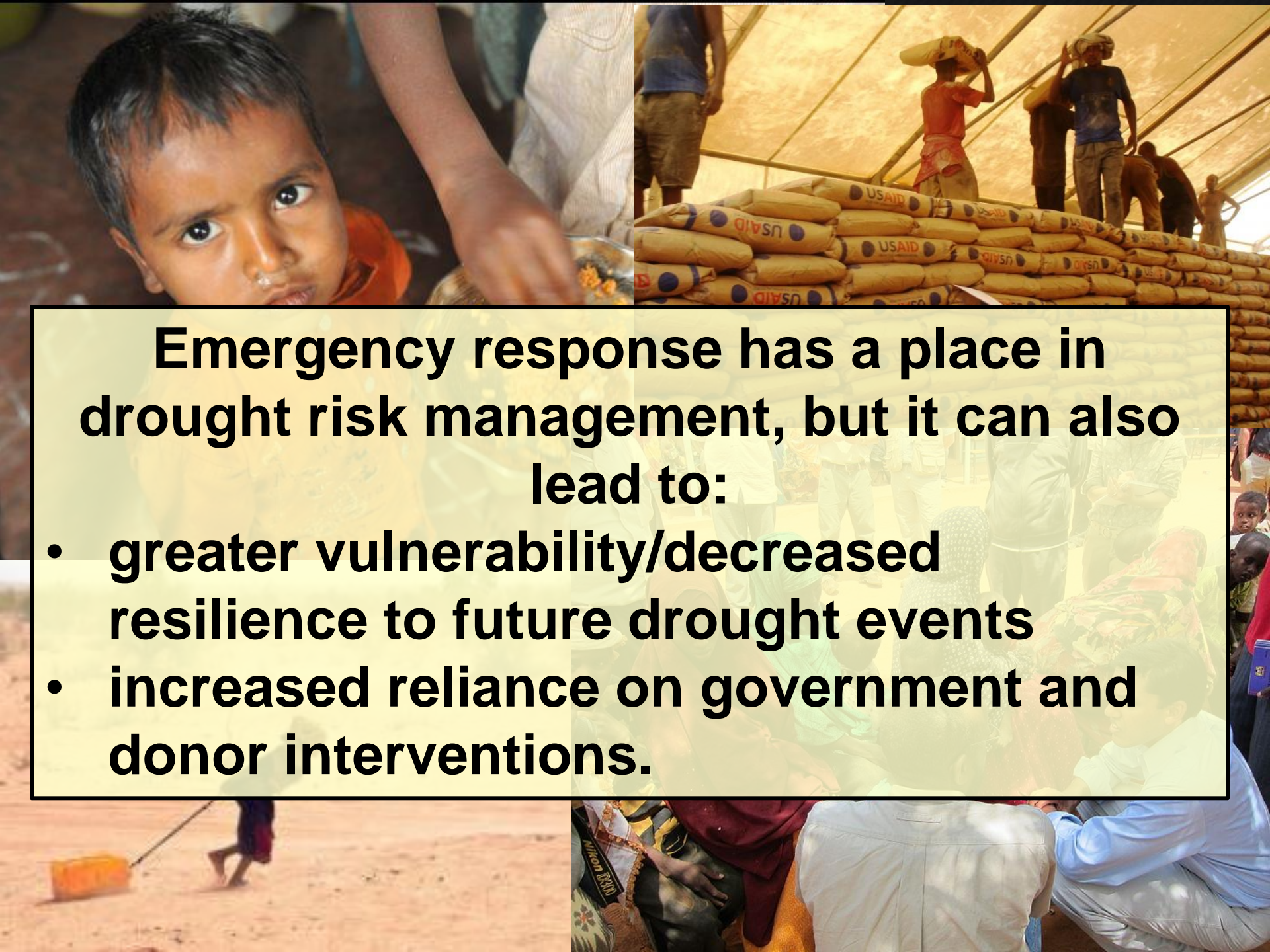
An Institutional Challenge for Drought Management



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!



Emergency response has a place in drought risk management, but it can also lead to:

- greater vulnerability/decreased resilience to future drought events**
- increased reliance on government and donor interventions.**

Crisis Management Characteristics

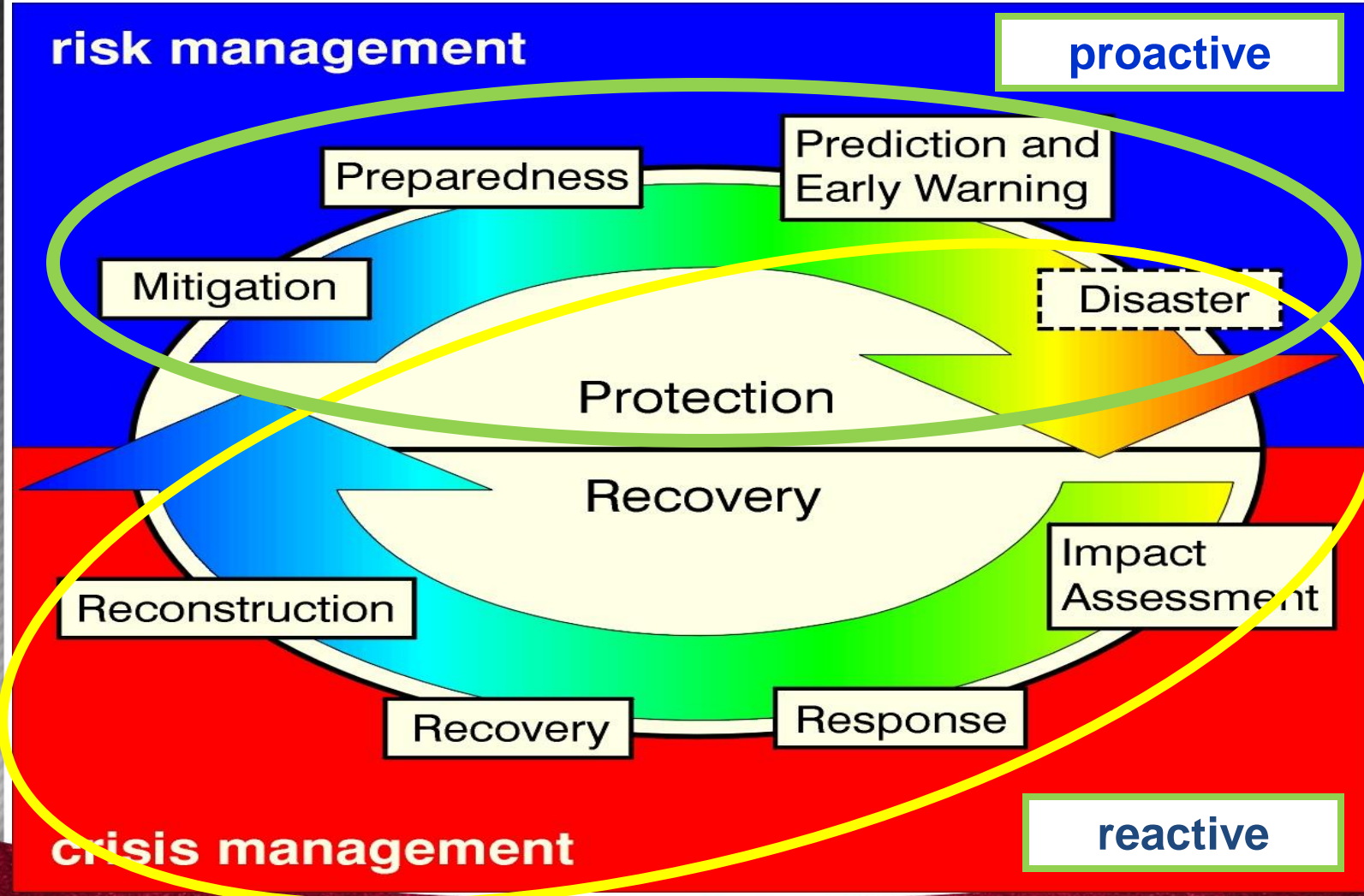
- Ineffective, treats symptoms of drought
- Untimely, response actions
- Increases reliance on government/donors
- Poorly coordinated, national to local level actions
- Expensive, large expenditures from numerous government agencies
- Reduces vulnerability?
- Increases vulnerability?

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

The Cycle of Disaster Management

Risk management increases coping capacity, builds resilience.



Crisis management treats the symptoms, not the causes.

Hazard x Vulnerability = Risk

EXPOSURE

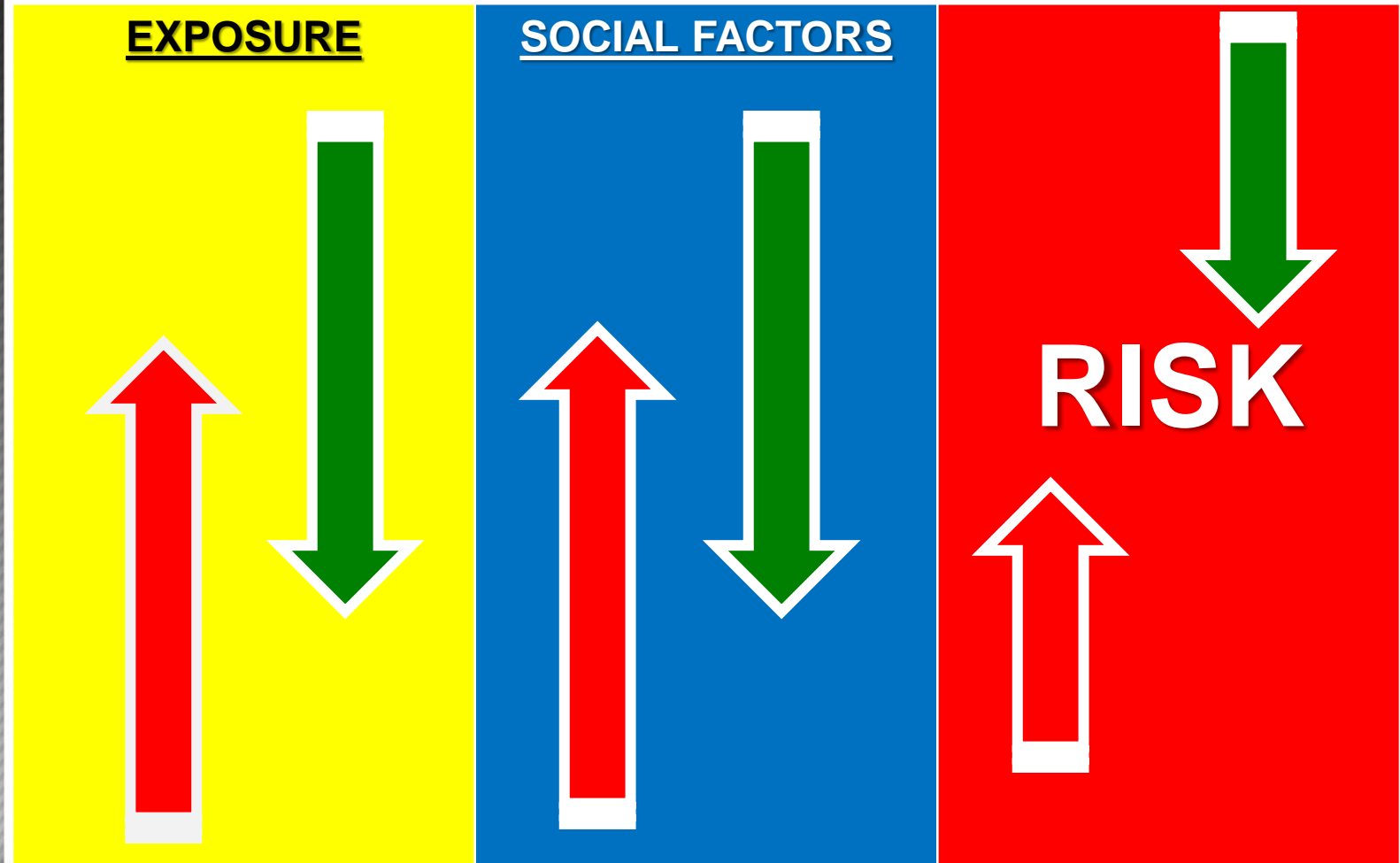
- **Severity/Magnitude**
 - Intensity/Duration
- **Frequency**
- **Spatial extent**
- **Trends**
 - Historical
 - Future
- **Impacts**
- **Early warning**

SOCIAL FACTORS

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

RISK

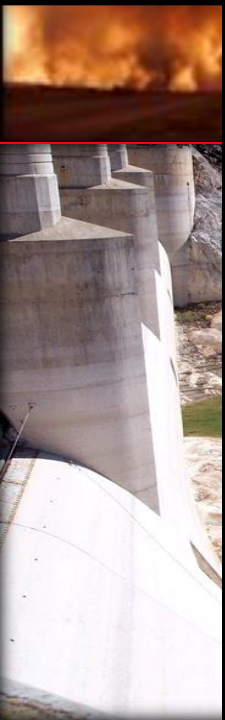
Hazard **x** Vulnerability = Risk



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



Incentives for Changing the 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?**

Natural Catastrophes Worldwide 1980-2012

Number

500

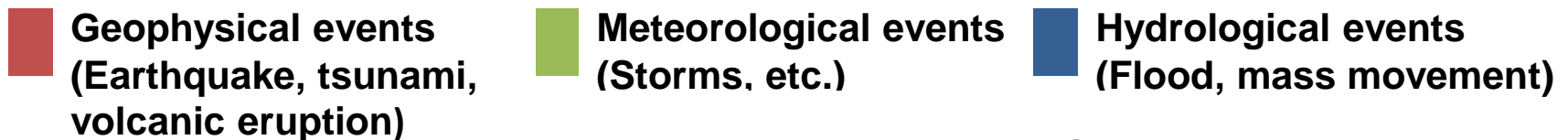
400

300

200

100

1980 1982 1984 1986 1988 1990 1992 1994 1996 1998 2000 2002 2004 2006 2008 2010 2012



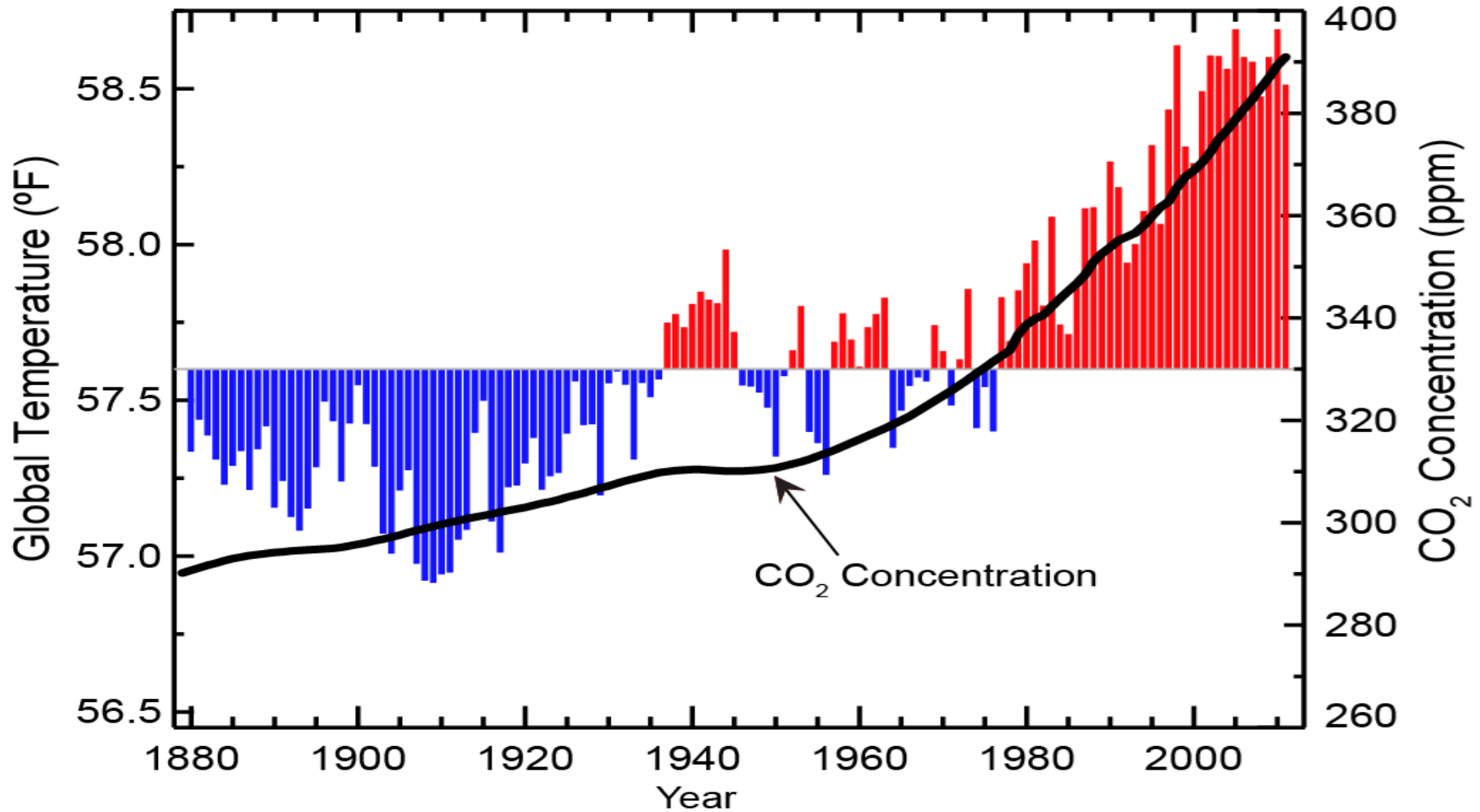
Source: Munich Re

Needed Actions for Change: Reducing Societal Vulnerability

- Improve **drought awareness**
- Develop/improve monitoring, seasonal forecasts, early warning and **information delivery** systems
- Improve **decision support** tools
- Complete **risk assessments** of vulnerable sectors, population groups, regions
- Improve understanding and quantification of **drought impacts vs. mitigation costs**
- Develop and implement **drought preparedness plans**
- Create **national drought policies** based on the principles of risk reduction

Our Changing Climate

Global Temperature and Carbon Dioxide



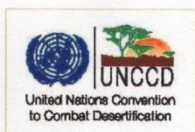
There is a close correlation between CO₂ and temperature that has been verified through many lines of research. This graph shows the relationship of temperature and CO₂ over the last 130 years.

The Climate Change Challenge for Drought Management

- Increasing mean temperature
- High temp. stress and 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**





HIGH-LEVEL MEETING ON NATIONAL DROUGHT POLICY

(HMNDP)
TOWARDS MORE DROUGHT RESILIENT SOCIETIES

11-15 March 2013
CICG, Geneva

Final Report



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
- Engaged and supportive stakeholders
- Engaged research community
- Strong outreach and media program



National Drought Policy

Preparedness Plans based
on the principles of risk
reduction

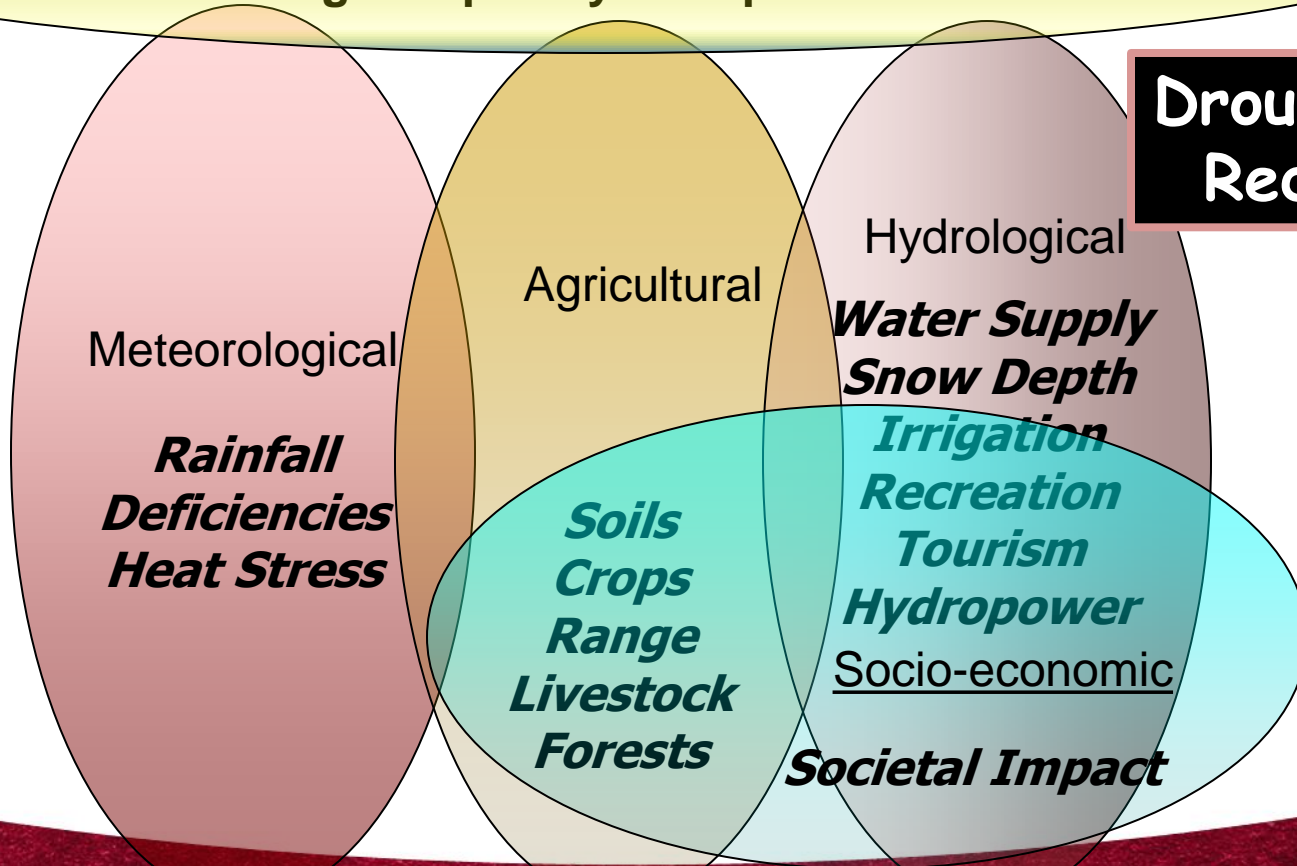
Natural and Social Dimensions of Drought

Decreasing emphasis on the natural event (precipitation deficiencies)

Increasing emphasis on water/natural resource management & policy

Increasing complexity of impacts and conflicts

Drought Risk Reduction



Time/Duration of the event

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;
 - **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.

Building an effective **national drought management policy and supporting preparedness plans** is like assembling the pieces of a puzzle.

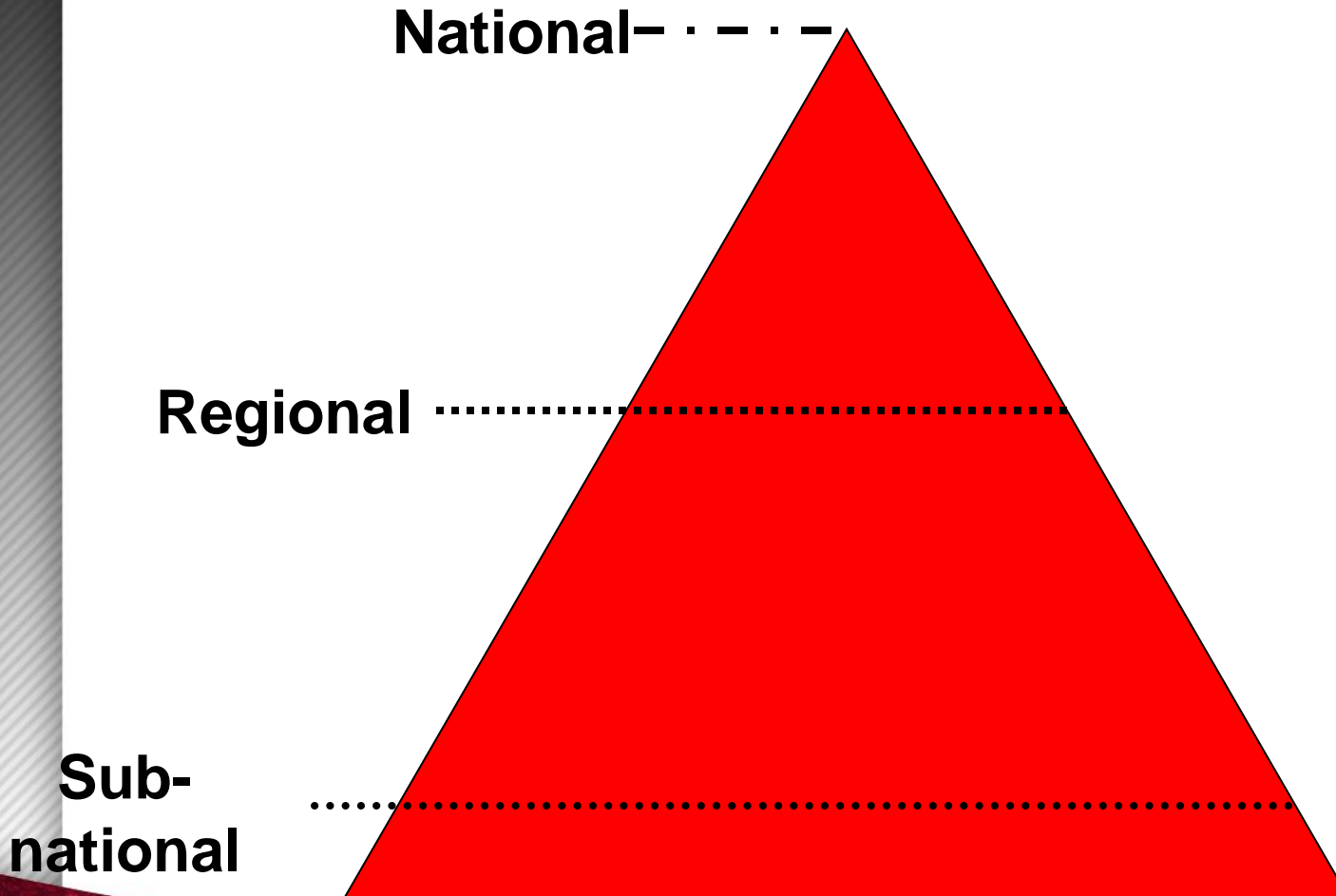
Many of the puzzle pieces may be present, but there is a lack of coordination, data sharing and a collaborative plan of action. And, the emphasis is on post-impact actions and programs.



All relevant agencies/ministries, stakeholder groups, sectors, and regions in the policy and planning process must be included. We do not see the full picture until all pieces are in place.

The process for RISK-BASED DROUGHT MANAGEMENT POLICY & PLANNING

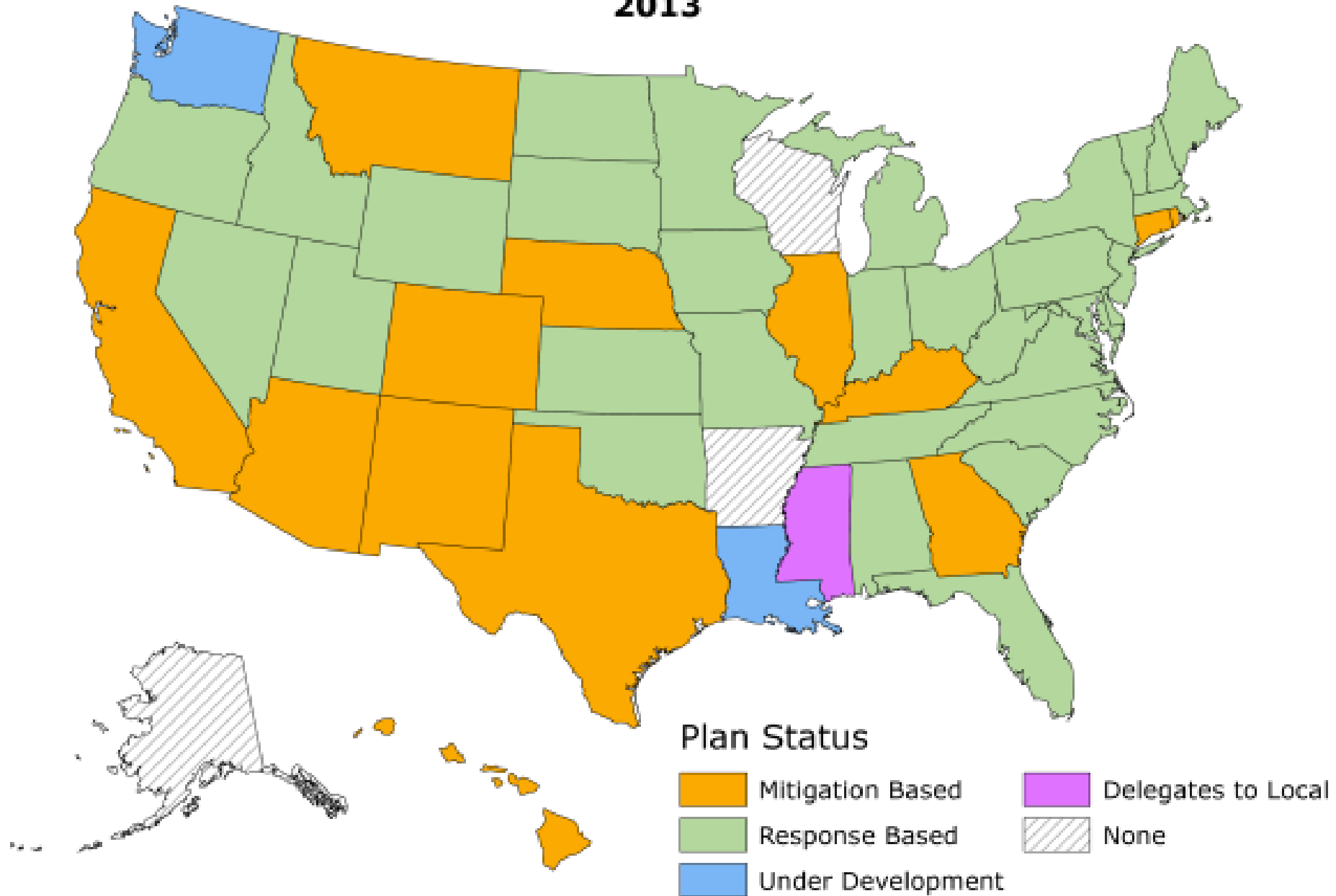
TOP DOWN



BOTTOM UP

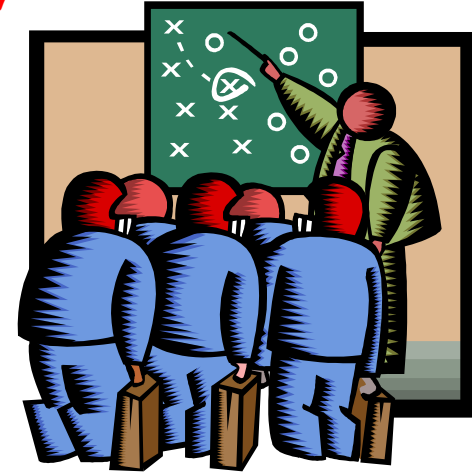
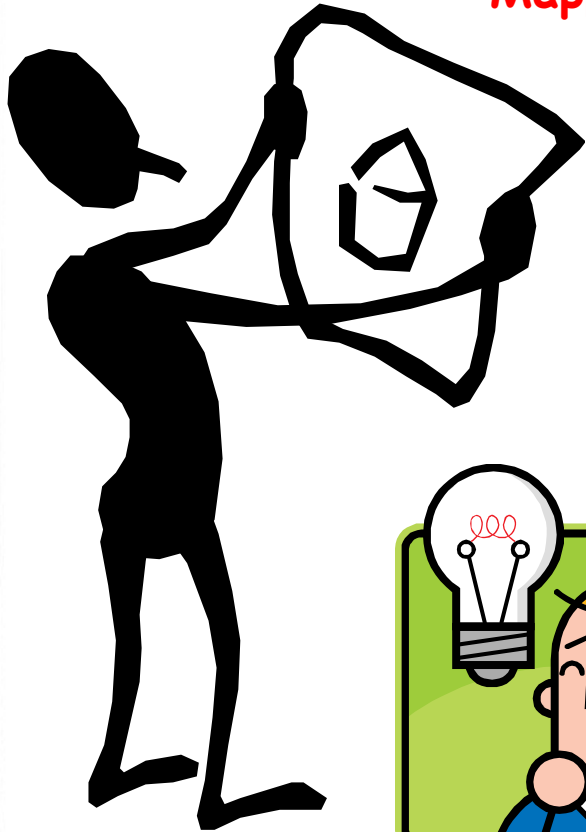
Status of State Drought Plans

2013

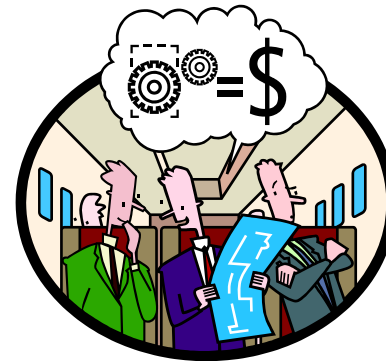


Where do we start?

Mapping out a strategy!



Leadership!



Financial Resources Required?
Cost?

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
 - Monitoring/archiving of impacts/losses
- **Mitigation and response**
 - Proactive measures to increase coping capacity
 - Response measures that support the principles of drought risk reduction

A UN-WATER INITIATIVE

UN WATER

ORGANIZED BY:



LOCAL ORGANIZER



1st Regional Workshop | Bucharest, Romania

Capacity Development to Support National **DROUGHT** Management Policies

9-11 July 2013

The Class Hotel | Bucharest, Romania

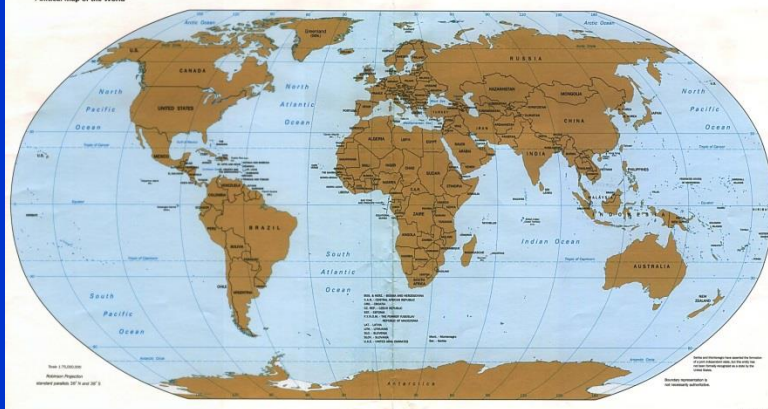
Find out more on the initiative:

www.ais.unwater.org/droughtmanagement



A series of 4-5 workshops sponsored by WMO, FAO, UNCCD, UN-Water and the Convention on Biological Diversity (Eastern Europe, Latin America, Asia and Africa)

Political Map of the World





Integrated Drought Management Programme (IDMP)



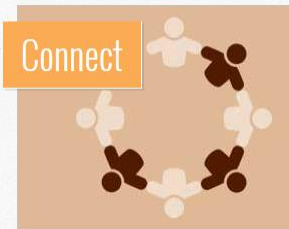
About

Find out more about the Integrated Drought Management Programme (IDMP)



Find

Find knowledge resources on integrated drought management



Connect

Learn about the activities of IDMP and connect to them

The IDMP works with a wide range of partners with the objective of supporting stakeholders at all levels by providing them with policy and management guidance through globally coordinated generation of scientific information and sharing best practices and knowledge for integrated drought management. The IDMP is a contribution to the [Global Framework for Climate Services \(GFCS\)](#) especially with regards to GFCS priority areas of disaster risk reduction, water, agriculture and food security. It especially seeks to support regions and countries to develop more proactive drought policies and better predictive mechanisms and these guidelines are a contribution to this end.

U N I



National Drought Management Policy Guidelines

A Template for Action



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

Integrated Drought Management Programme (IDMP)

National Drought Policy: A 10-Step Process

Step 1

Appoint a national drought policy commission

Step 2

State or define the goals and objectives of a risk-based national drought management policy

Step 3

Seek stakeholder participation and **define/resolve** conflicts between key water use sectors, considering transboundary implications.

Step 4

Inventory data and financial resources available and **identify** groups at risk

Step 5

Prepare/write the key tenets of a national drought management policy and preparedness plans
(monitoring, early warning and prediction; risk and impact assessment; mitigation and response)

Risk Assessment: Purpose

-
- To identify those sectors, population groups, or regions most at risk from drought, most probable impacts, and mitigation actions that will reduce impacts to future events.



Who and what is at risk and why.

Vulnerability Profile

National Drought Policy: A 10-Step Process

(continued)

Step 6

Identify research needs and **fill** institutional gaps

Step 7

Integrate science and policy aspects of drought management

Step 8

Publicize the national drought management policy and preparedness plans, **build** public awareness and consensus

Step 9

Develop education programs for all age and stakeholder groups

Step 10

Evaluate, test and **revise** drought management policy and supporting preparedness plans

Drought Task Force

Citizens
Advisory
Committee
(optional)



Drought Plan Organizational Structure

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'**!

A photograph of a cornfield at sunset. The sun is low on the horizon, creating a bright orange and yellow glow. The silhouettes of the corn plants are visible against the bright sky.

Thanks for your attention!

Contact Information:

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