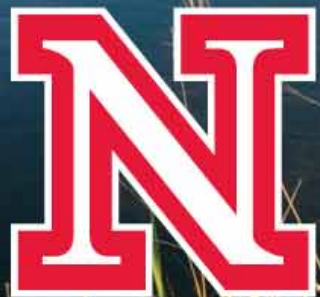




# **Integrated Drought Risk Management: *Challenges and the Way Forward***

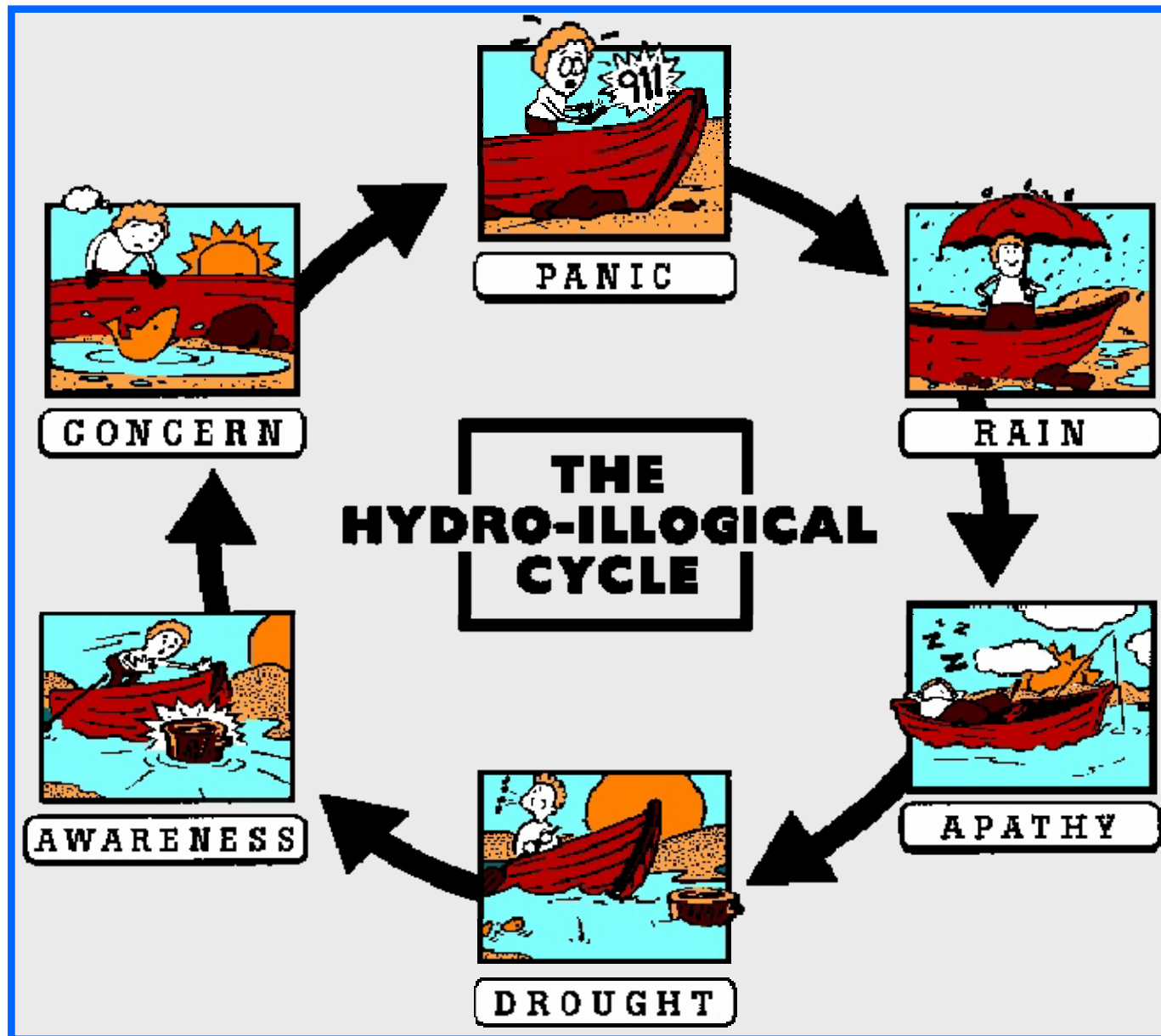
Are we making progress  
breaking the  
Hydro-illogical Cycle?

**Donald A. Wilhite,  
Director  
School of Natural  
Resources**



**UNIVERSITY OF NEBRASKA-LINCOLN**

# Breaking the Hydro-illogical Cycle: An Institutional Challenge

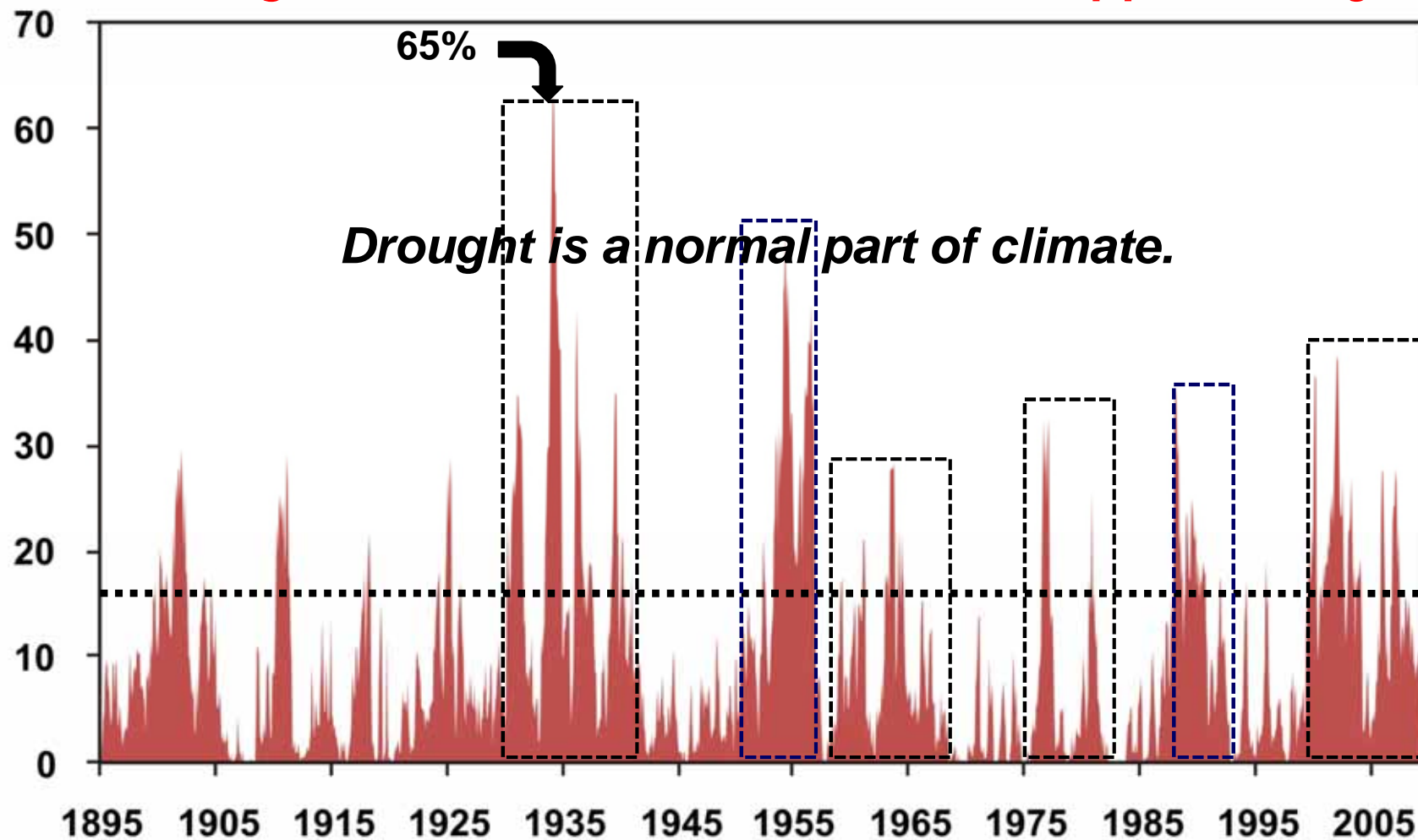


Crisis Management

# Percent Area of the United States in Severe and Extreme Drought

January 1895–May 2010

Drought events are 'windows of opportunity'.

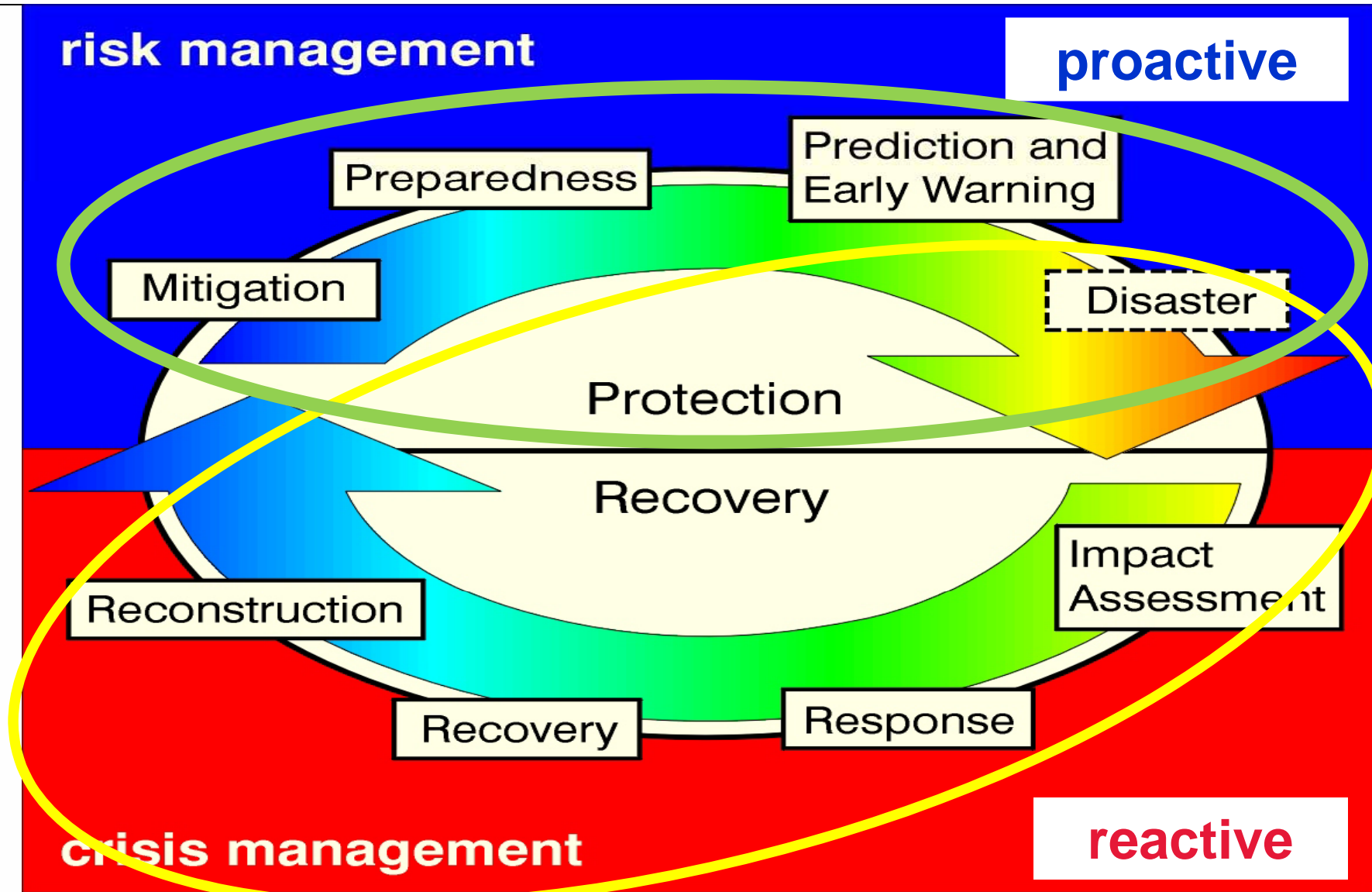


Based on data from the National Climatic Data Center/NOAA



# 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**

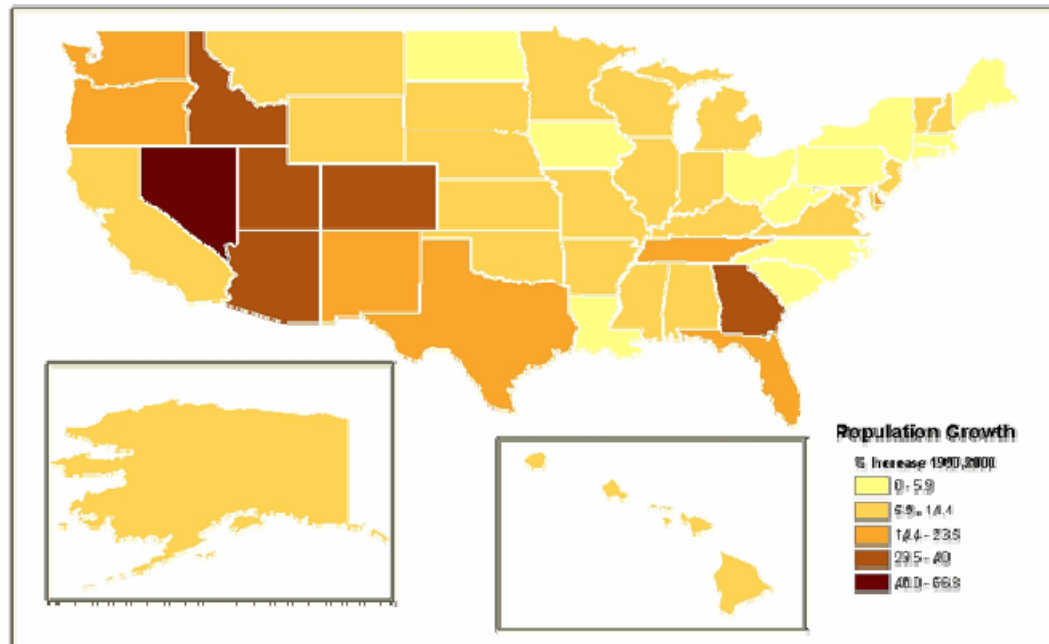
**Widely adopted as the new paradigm for drought management.**



# Key Observations—Current and Future Droughts in the U.S.

- **Multiple severe droughts** since 1996 have had severe impacts and have raised concern about **increasing vulnerability**.
- **U.S. population** is migrating rapidly to the **water-short western states and the southeast**.

Population Growth  
(% change, 1990-  
2000)



# Key Observations—Current and Future Droughts in the U.S.

---

- **Multiple severe droughts** since 1996 have had severe impacts and have raised concern about **increasing vulnerability**.
- **U.S. population** is migrating rapidly to the **water-short western states and the southeast**.
- Water demand is increasing dramatically, **conflicts** between water users are **increasing**.



# Key Observations—Current and Future Droughts in the U.S.

---

- Water supplies are **fully or over-appropriated** in many river basins.
- All levels of **government are poorly prepared** for drought—reactive, crisis management approach.
- Existing water **laws and institutions** are based on **outmoded** values and goals.



# Key Observations—Current and Future Droughts in the U.S.

---

- **Climate change** is likely to increase the **frequency, severity, and duration** of drought for some regions.
  - Increasing temperatures, increased evaporation, increased heat stress/heat waves
  - Changes in precipitation amount, intensity, distribution, and form, increased variability
  - Reduced snowpack, stream flow, ground water recharge, lower reservoir levels



# Top 10 Challenges for Progress— Drought Risk Management

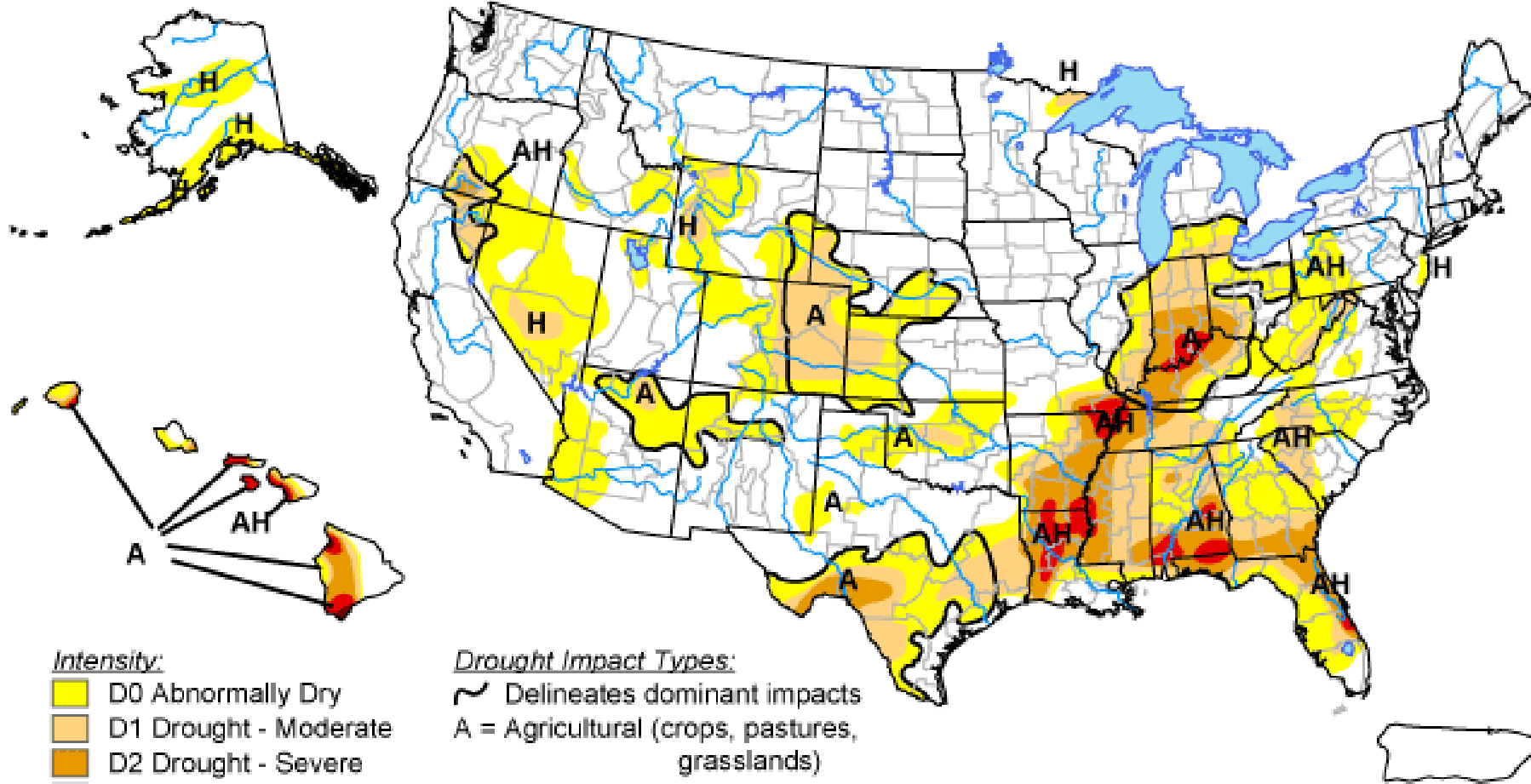
---

- Drought doesn't get the respect of most other natural hazards (loss of life/non-structural impacts).
- Drought monitoring/early warning is complex.








# U.S. Drought Monitor


November 9, 2010  
Valid 8 a.m. EST



Intensity:

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

Drought Impact Types:

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

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

<http://drought.unl.edu/dm>



Released Thursday, November 11, 2010  
Author: Mark Svoboda, National Drought Mitigation Center



# Top 10 Challenges for Progress— Drought Risk Management

---

- Drought is the '*Rodney Dangerfield*' of natural hazards, i.e., it doesn't get respect.
- Drought monitoring/early warning is complex.
- Drought predictability is low in most cases.
- Decision-support tools and delivery systems must be improved and tailored to the needs of users.
- Impacts are poorly understood and documented.



# Top 10 Challenges for Progress— Drought Risk Management

---

- Drought relief discourages risk-based management approach.
- Institutional inertia constrains change from crisis to risk management.
- Poor understanding of how societal changes affect vulnerability.
- Drought mitigation actions are less obvious.
- Political will for a national drought policy is weak, i.e., president/prime minister, congress or parliament, ministries, and provincial governors.



A scenic landscape featuring a large body of water in the foreground, a prominent rock formation in the middle ground, and a range of mountains in the background under a clear sky. The water is a deep blue, and the rock formation is a mix of brown and tan. The mountains in the background are a mix of brown and tan, with some greenery on the slopes. The sky is a clear, pale blue.

# Summary

# Guiding Principles for Drought Risk Reduction

---

- **Political commitment, strong institutions,** and appropriate governance are essential for integrating drought risk issues into a sustainable development and disaster risk reduction process.
- **A bottom-up approach with community participation,** both in decision making and implementation, is essential to move from policies to practices.
- **Capacity building and knowledge development** are often required to help build political commitment, competent institutions, and an informed constituency.



# Guiding Principles for Drought Risk Reduction

---

- **Drought policies should establish a clear set of principles or operating guidelines** to govern the management of drought and its impacts and development of a preparedness plan with a strategy to achieve objectives.
- **Drought policies and plans should emphasize mitigation and preparedness** rather than relying solely on drought relief.



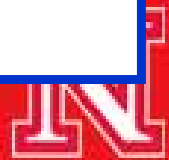
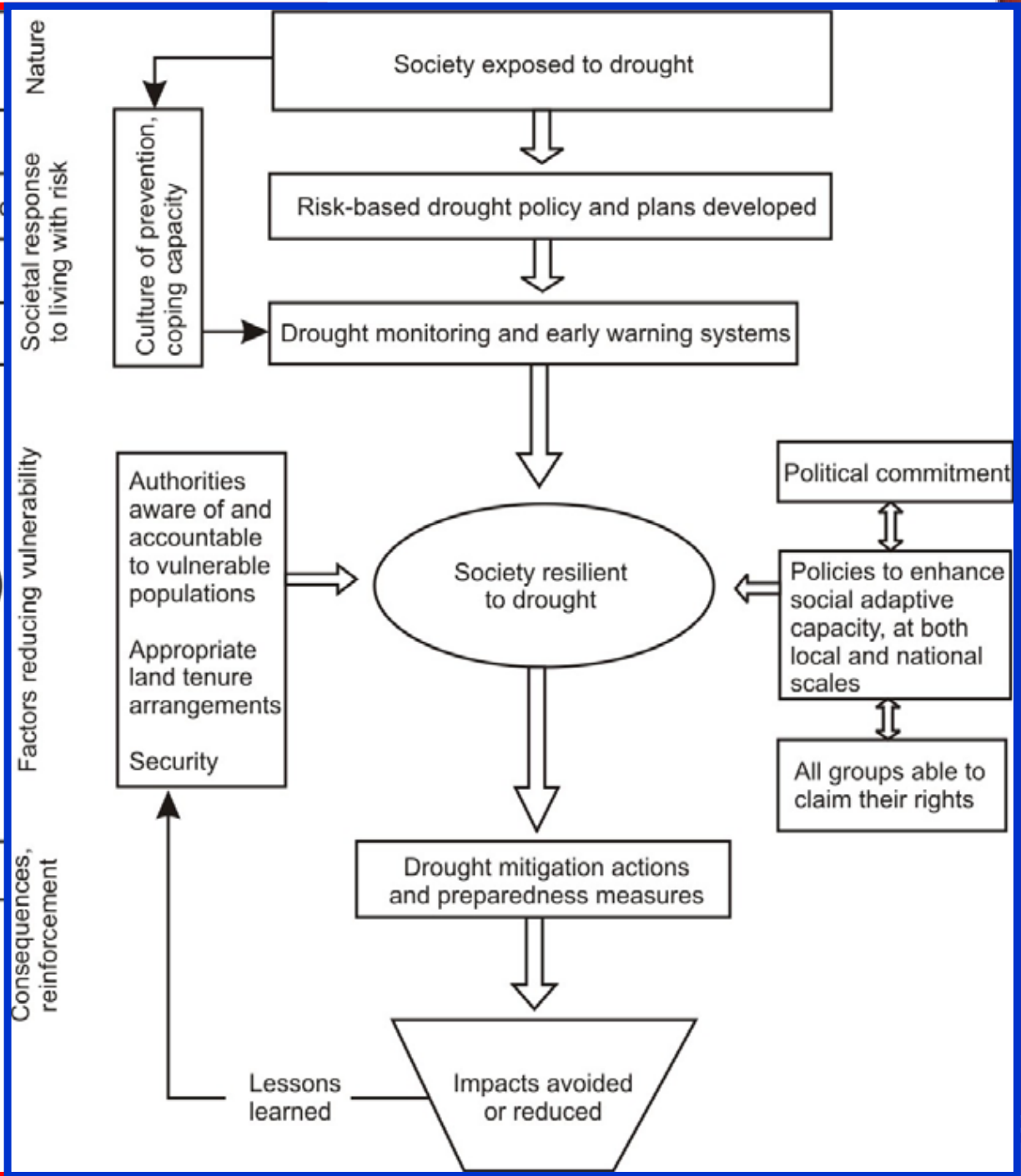
# Guiding Principles for Drought Risk Reduction

---

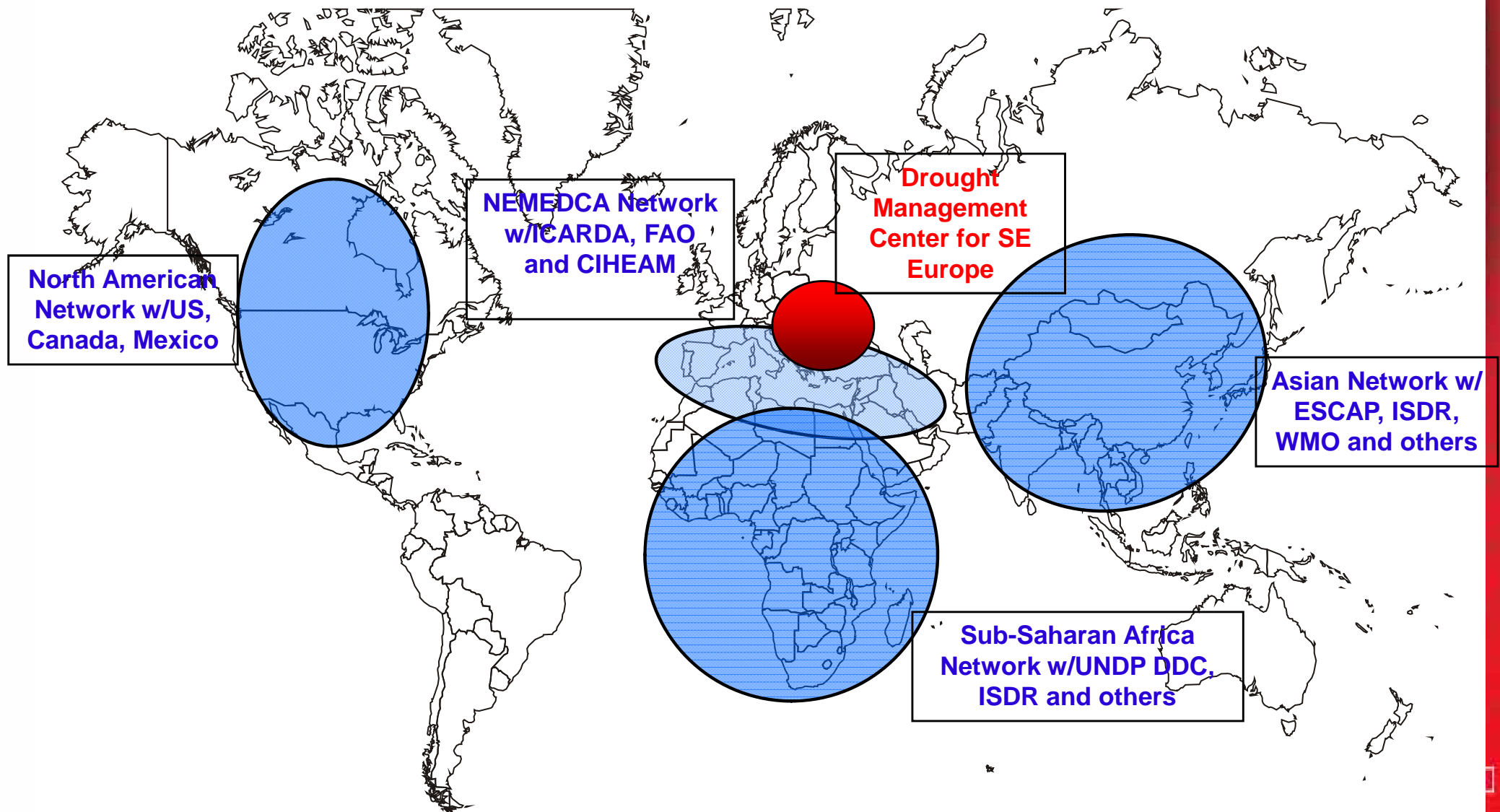
- **Drought monitoring, risk assessment, and the identification of appropriate risk reduction measures** are principle components of a drought policy and plan.
- **Policy mechanisms to ensure that drought risk reduction strategies** are carried out should be developed and enforced.
- **Sound development of long-term investment** in mitigation and preparedness measures is essential to reduce the effects of drought.



# Drought Resilient Society



# Global/Regional Drought Preparedness Network



. . . a network of regional networks!

If we don't succeed, we run the risk of failure."

---



Dan Quayle  
Former U.S. Vice  
President



*Thanks!*

[dwilhite2@unl.edu](mailto:dwilhite2@unl.edu)

*School of Natural Resources*  
*snr.unl.edu*



UNIVERSITY OF  
Nebraska  
Lincoln

# Drought Management in the U.S.: Next Steps!

---

- NIDIS is KEY—it provides an opportunity to improve our drought early warning system, linking federal, state, and local efforts. It also provides the opportunity to:
  - Build greater resilience to drought through improve planning and adaptation.
    - More emphasis on drought mitigation planning.
    - Federal government needs to provide leadership/incentives.
  - Increase emphasis on risk management to lessen the need for reactive, costly response measures.
    - Mitigation is more cost-effective than emergency response.
  - Help form a coherent national drought policy that ultimately reduces societal vulnerability.



# Drought Management in the U.S.: Next Steps!

---

- Re-engage governors/states to move the agenda forward.
  - Greatest progress made when WGA, SGA, and NGA were pushing the national drought policy debate forward.
  - NIDIS, NDMC, and others can provide the scientific expertise in support of this effort.
- Manage for climate variability and change!

