

Minding the Gap: From Science to Drought Action and Policy

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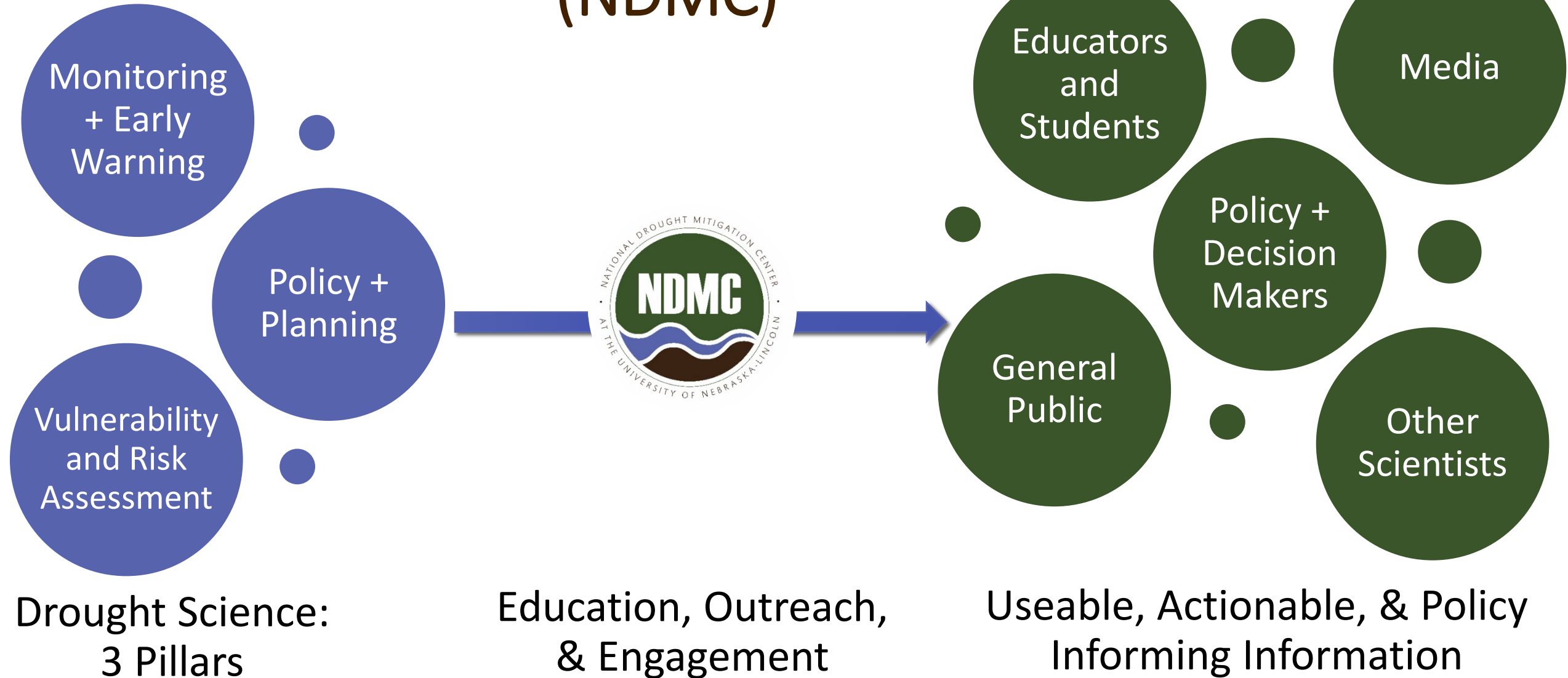


NATIONAL DROUGHT
MITIGATION CENTER
UNIVERSITY OF NEBRASKA

CEC Virtual Drought Summit

September 29 - October 1, 2020

National Drought Mitigation Center (NDMC)

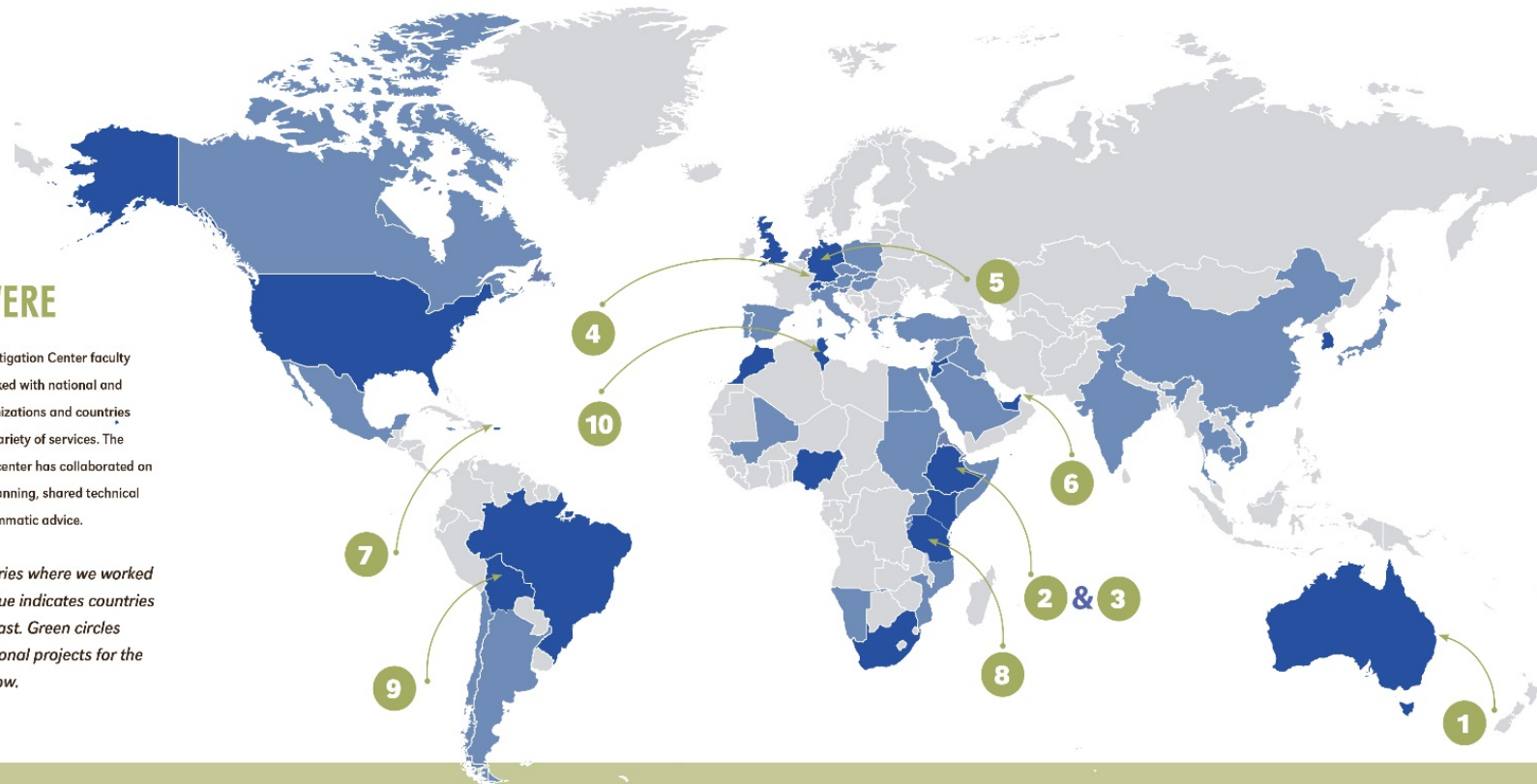


NDMC National/International Activities

WHERE WE WERE

National Drought Mitigation Center faculty and staff have worked with national and international organizations and countries around the world, providing a variety of services. The map shows where the drought center has collaborated on research, facilitated drought planning, shared technical knowledge, or provided programmatic advice.

Dark blue indicates countries where we worked in 2017, and the lighter blue indicates countries where we worked in the past. Green circles highlight our top international projects for the year; descriptions are below.



1 Tropical Ag Conference and University of South Queensland Visit

Location: Brisbane, Australia

NDMC's Mark Svoboda consulted with livestock producers at the University of South Queensland in Brisbane and spoke at the TropAg 2017 Conference.

2 Seasonal Prediction of Hydro-Climatic Extremes for the Greater Horn of Africa

Location: Addis Ababa, Ethiopia

NDMC and partners — NASA, Addis Ababa University, and Ethiopia's Meteorological

Society and National Meteorological Agency — presented a workshop on predicting and managing climate extremes.

3 International Conference on Agro-meteorology

Location: Addis Ababa, Ethiopia

NDMC's Tsegaye Tadesse, climatologist and remote-sensing expert, was the keynote speaker and a panelist at "Climate Information for Climate Resilient Agriculture: Enhancing Agro-meteorological Advisory Services to Build Climate Resilience for Smallholder Farmers in Ethiopia."

4 Integrated Drought Management Program Advisory Committee Meeting

6 Dubai Drought Vulnerability Assessments Training Workshop

of Meteorology and Hydrology to improve resilience to drought.

Svoboda gave the keynote presentation at the Latin American and Caribbean

- **NOAA/NIDIS + USDA**
- **UN organizations: FAO, ISDR, UNDP and CCD**
- **World Meteorological Organization (WMO)**
- **USAID, World Bank**
- **Global Water Partnership (Integrated Drought Management Program)**
- **Various regional and national climate centers**
- **Numerous government agencies and universities in different countries**

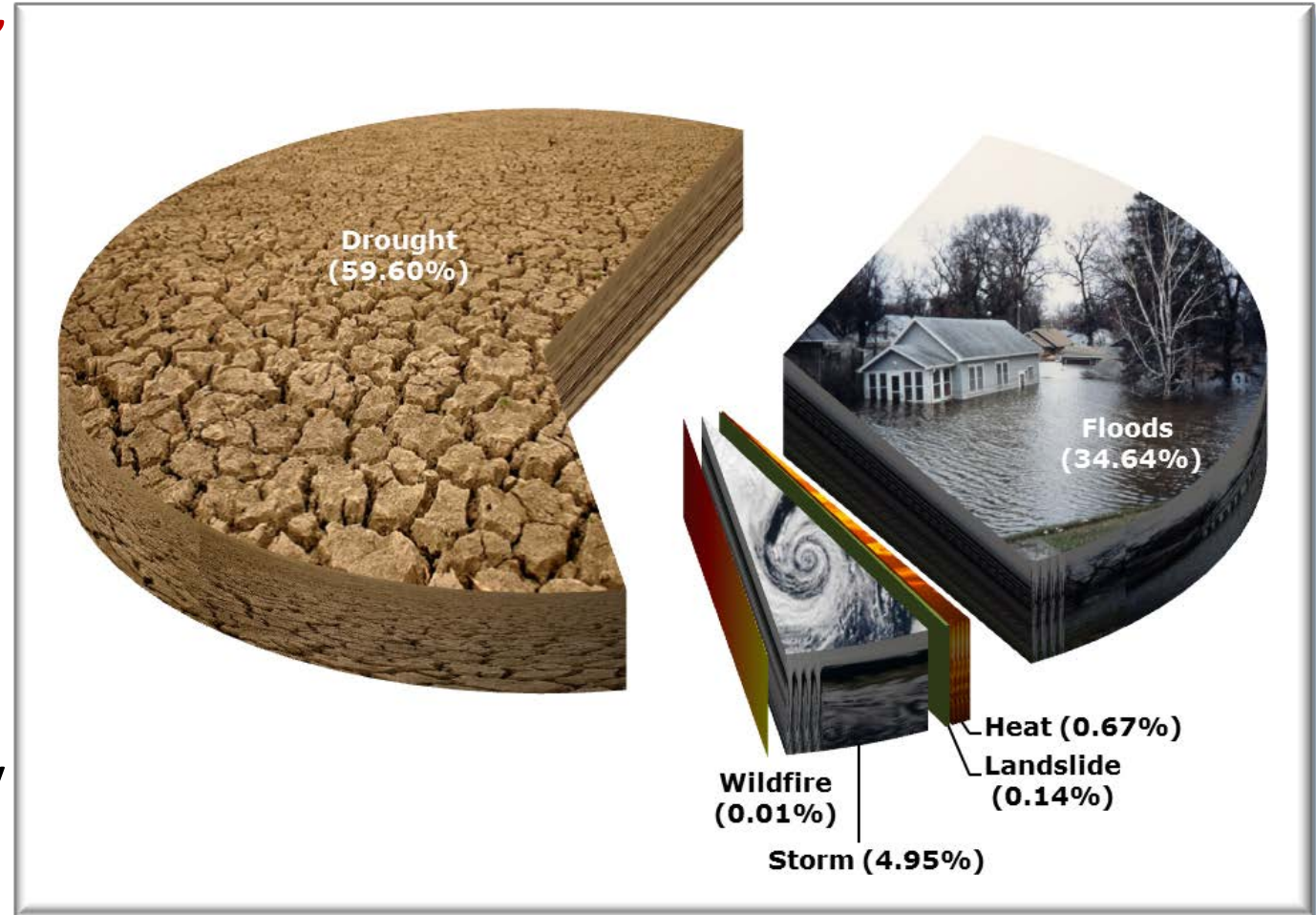


Percentage of disaster-deaths worldwide according to each category of climate-related hazard, (1900-2013)

Drought is a MAX environmental “stressor” both spatially and temporally...

Potential Issues:

Political
instability/upheaval
Civil strife
Health
Famine
Migration
Water quantity and quality
Water conflicts
(transboundary)



Source: Adapted from EM-DAT: The OFDA/CRED International Database, Belgium 2012
Keim, ME Extreme Weather Events: the role of public health (as presented by Dr. Jesse Bell, UNMC)

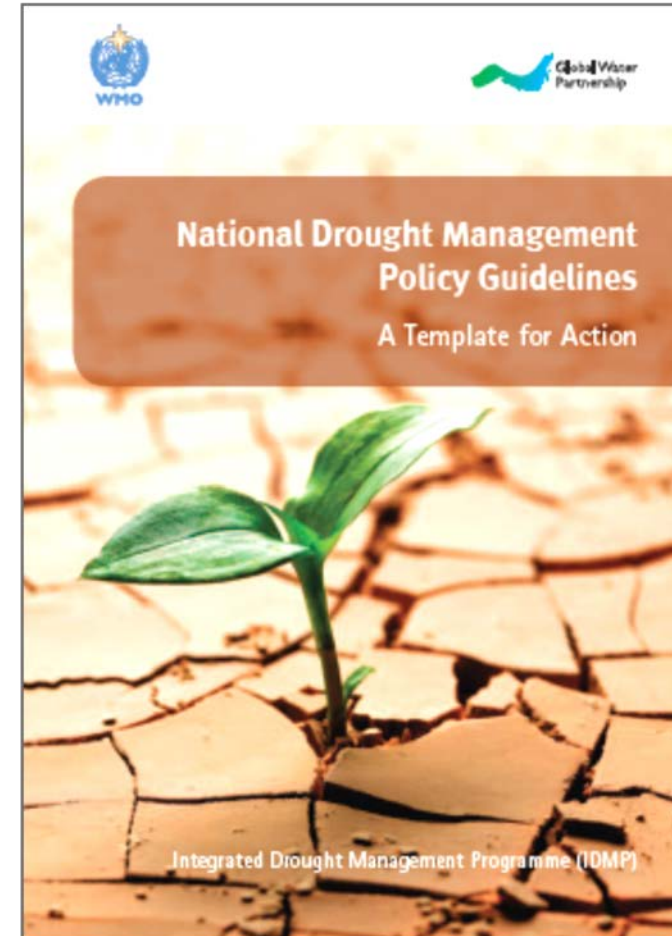
IDMP Outcome: National Drought Management Policy Guidelines

3 Pillars approach

Response to need articulated at the High Level Meeting on National Drought Policy (2013)

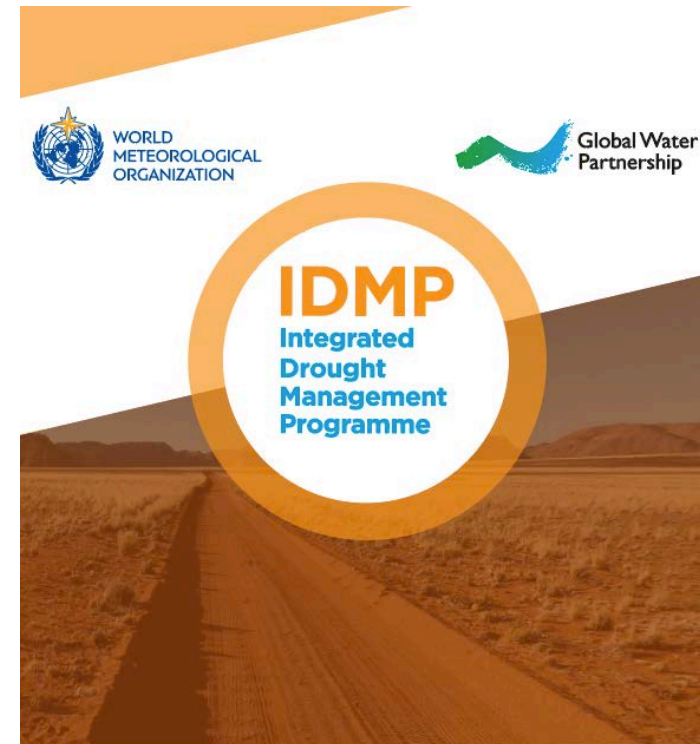
Template that ***can be adapted to national realities and needs***

Building on existing risk management capacities (***10-Step Process, Wilhite, NDMC***)



Drought Risk Management: The Three Pillars

- Overall purpose: preparedness planning based on these ***pillars of risk reduction*** leads to successful drought policy

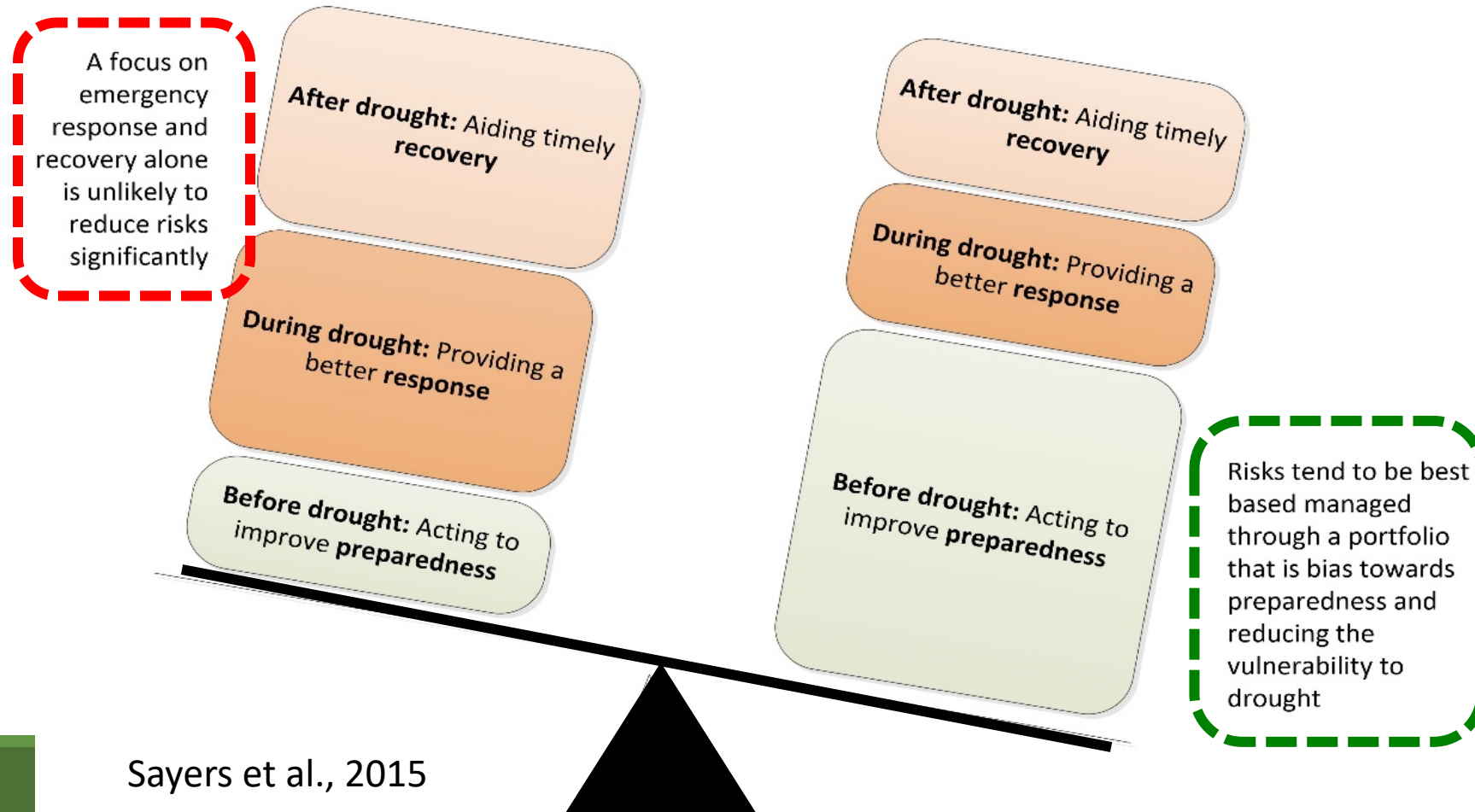


<http://www.droughtmanagement.info>



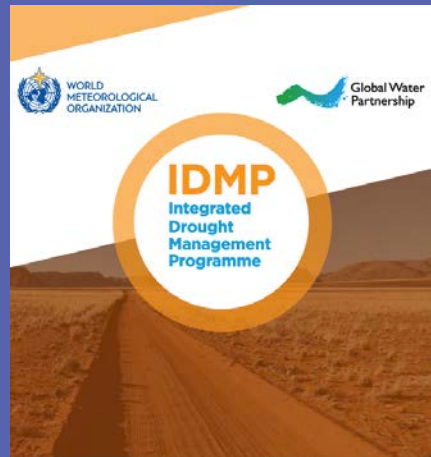
Strategic Risk-based Approach for Building Drought Resilience

Determining the right ***balance*** of measures:
A portfolio approach



Sayers et al., 2015

Drought Risk Management: The Three Pillars



Successful Drought Policy

Monitoring &
Early Warning

(I)

Vulnerability &
Impact
Assessment

(II)

Mitigation &
Response

(III)

Overall purpose: preparedness planning based on these pillars of risk reduction.

NDMC International DRMS Activities

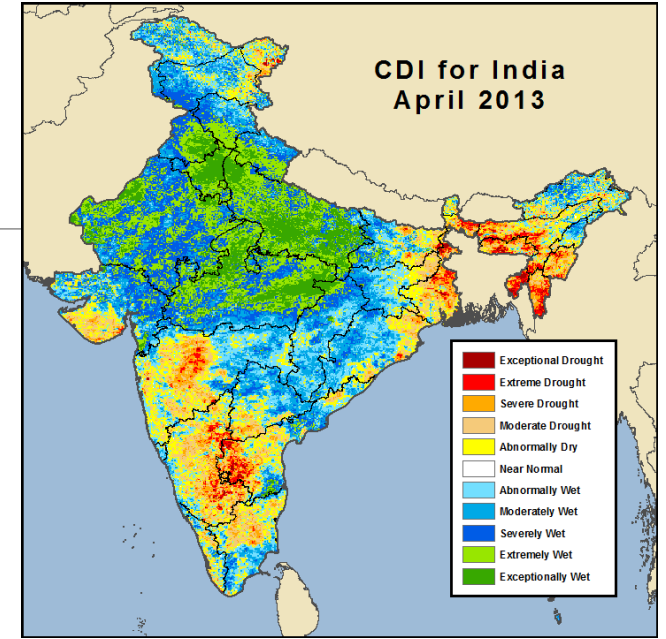
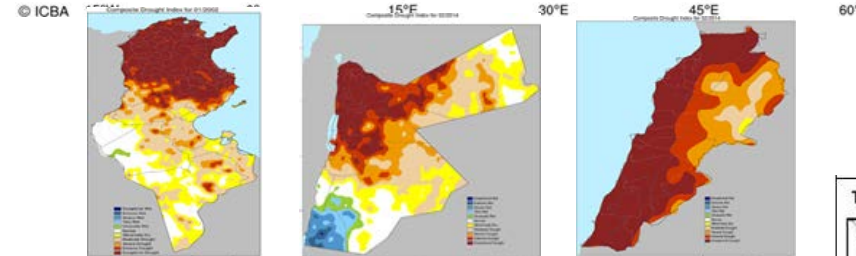
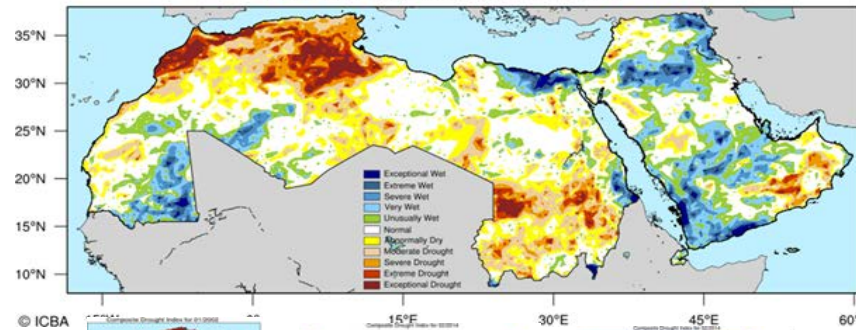


Caribbean (I, II, III)



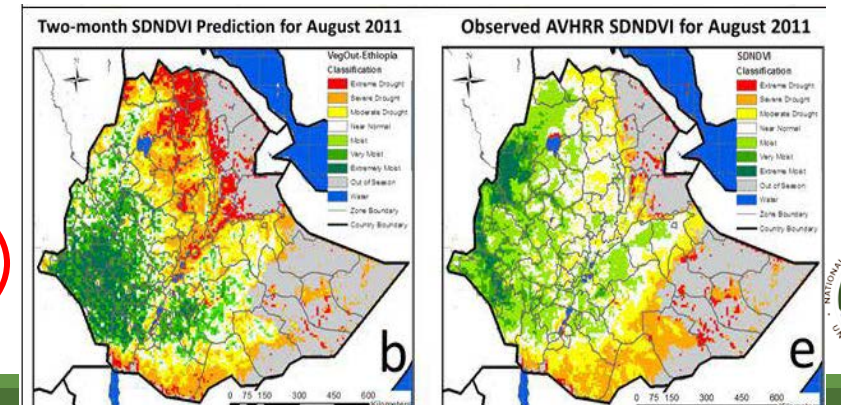
MENA (I, II, III)

Composite Drought Index for January 2016

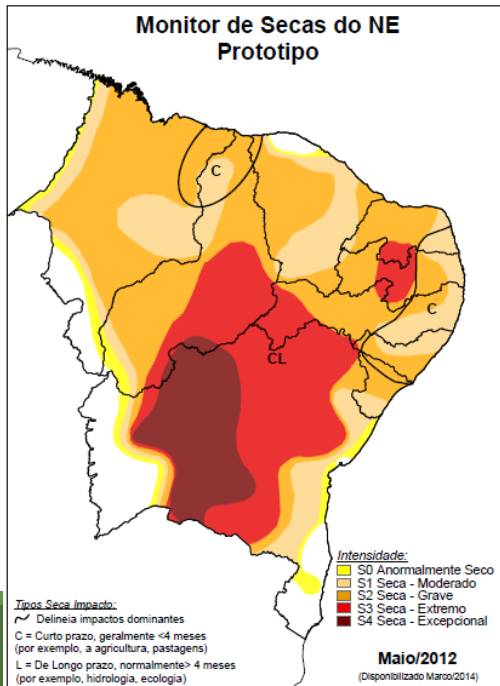


India (I)

Greater Horn of Africa (I)



Brazil (I)

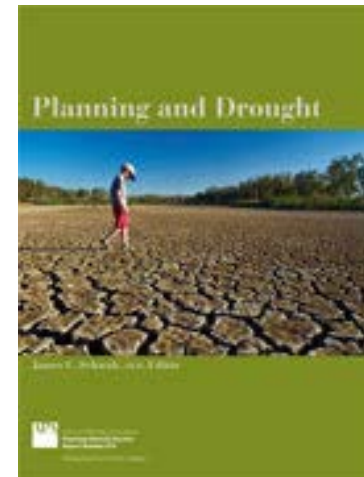


Lesson

- Drought Preparedness Plans can either be:
 - ***Stand alone***, or
 - ***Integrated*** into a variety of other existing plans, which may be ***more efficient and avoid duplication of effort*** between all hazards.
 - ***Not a prescriptive process***, must do what works best for your situation. ***Context matters!***

Some examples of these are:

- Comprehensive/Master
- Water/Conservation
- Multi-hazard
- Climate Change/Adaptation



Drought Planning Progress

Federal level

- National Integrated Drought Information System (NIDIS)

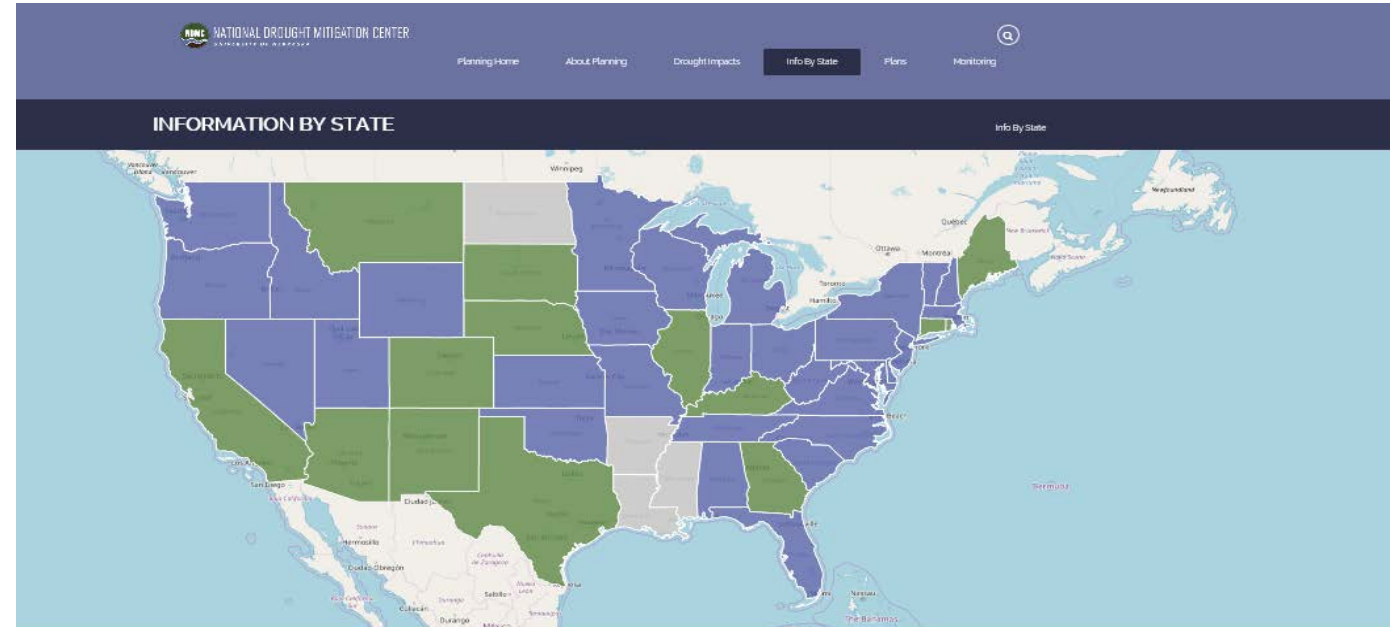
Native American Tribes

State level

Local level

- Municipalities
- River Basins
- Counties
- Utilities
- NE; Natural Resource Districts
- Water and Conservation Districts
- Ranchers/Producers

Status of State Drought Plans



Display: Drought Plans

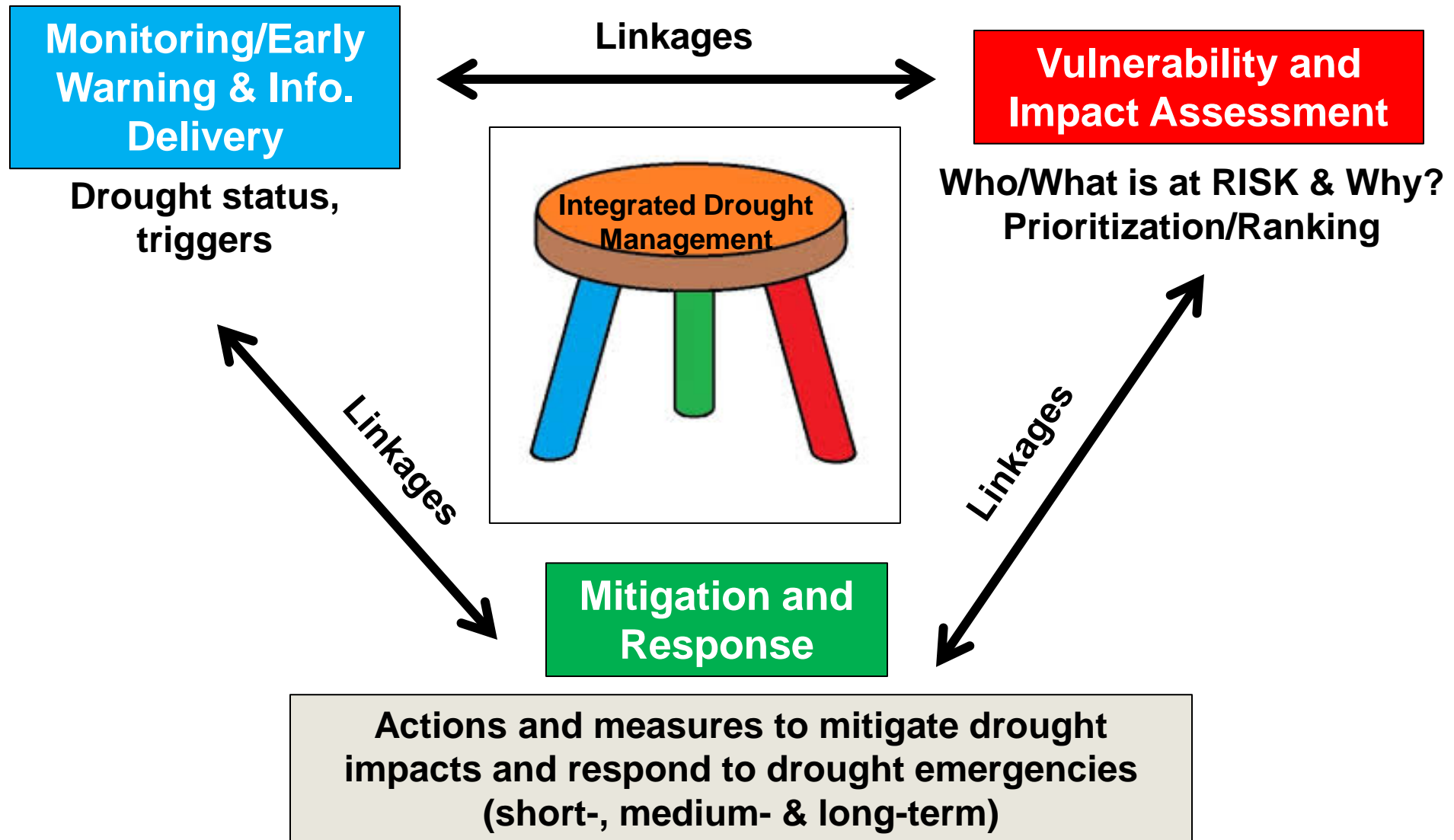
Drought Plan Type:

- Mitigation
- Response
- No Drought Plan on File

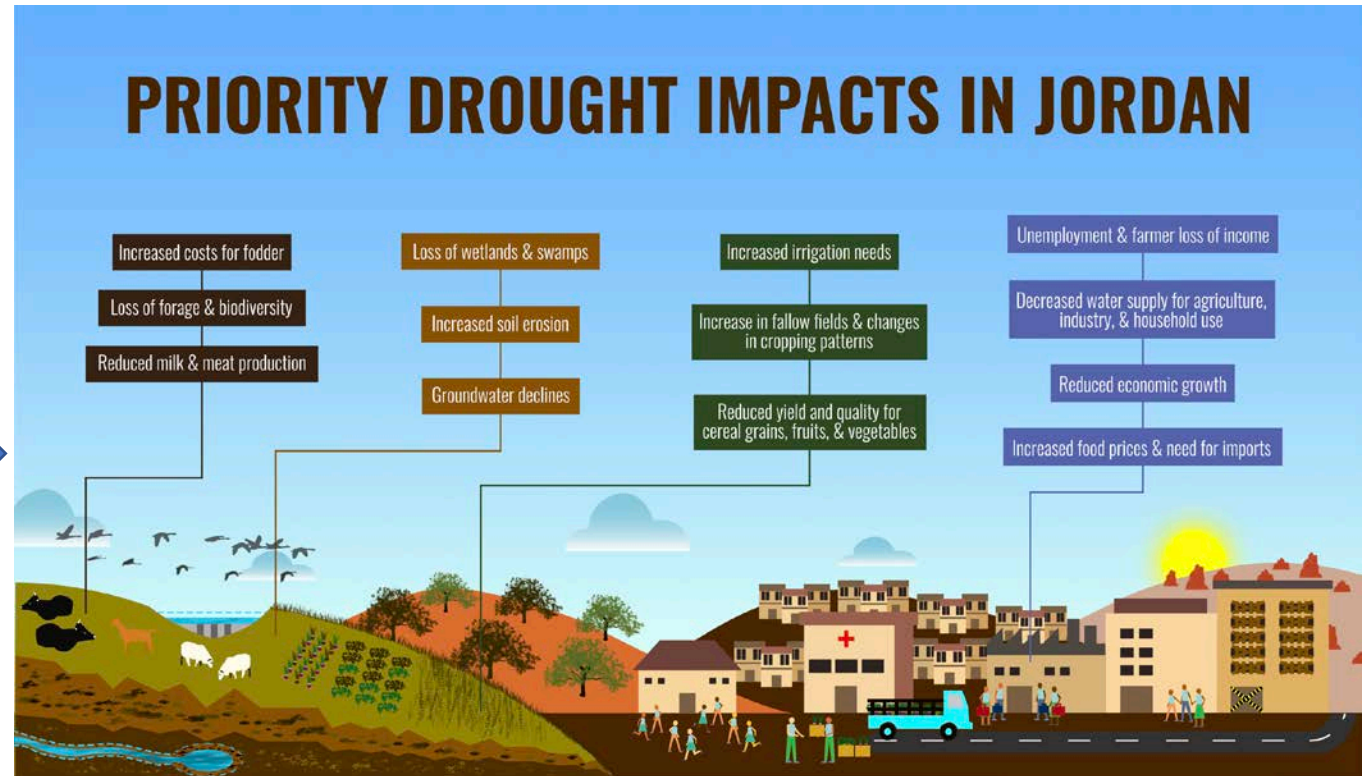
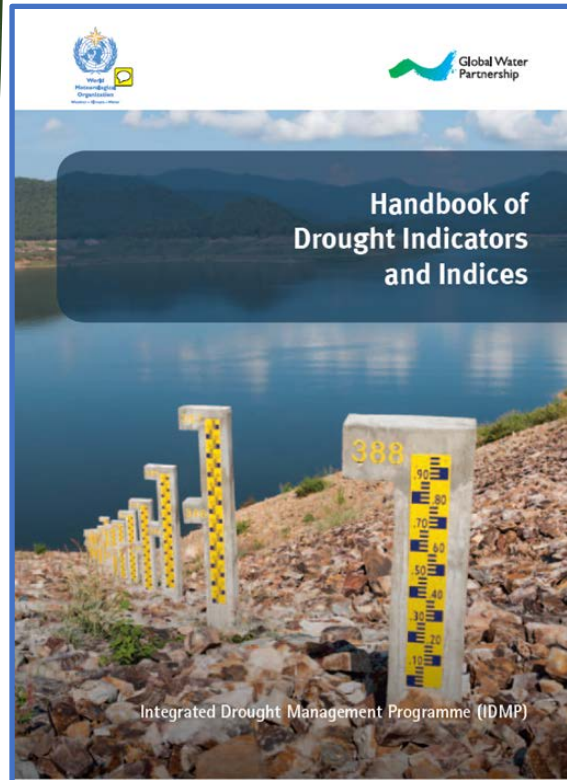
OTHER STATE RESOURCES



Drought Plan Components



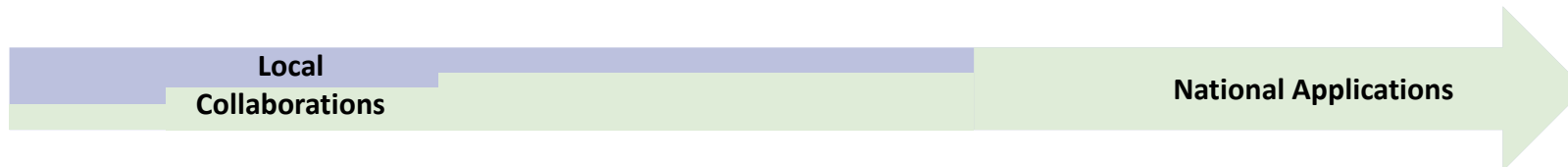
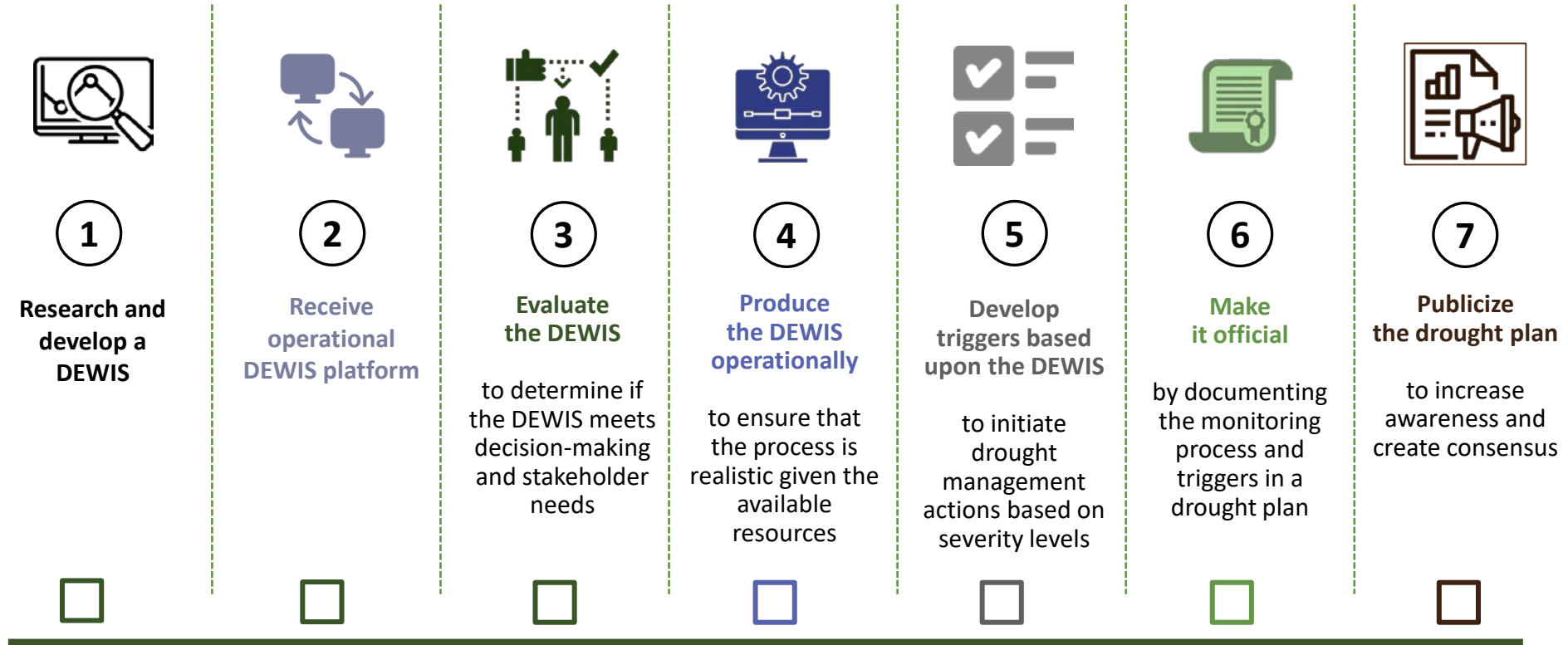
Linking impacts with indicators



Drought Early Warning Information System (DEWIS)



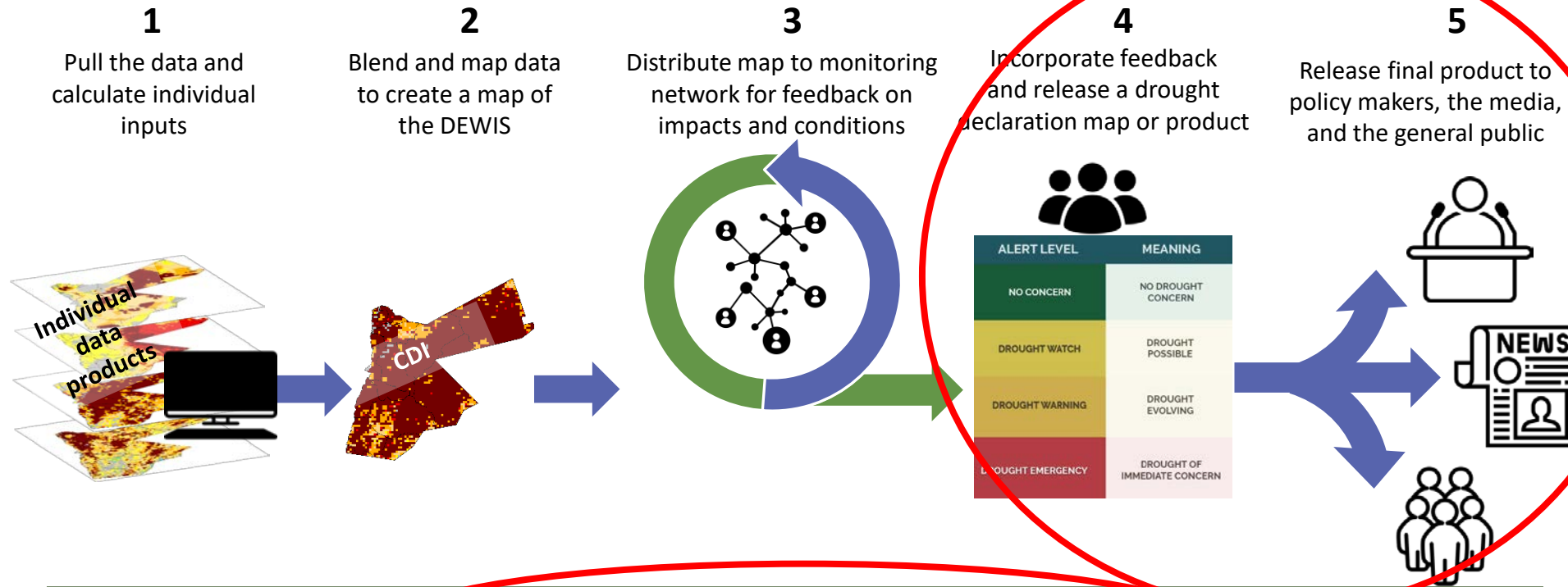
From science to action: integrating DEWIS into policy



Drought Early Warning Information System (DEWIS)



Operational Production: Using the DEWIS to monitor current conditions



Establishing a feedback system for the DEWIS



- Government officials?
- University researchers?
- Agricultural producers?
- Private sector?



- Vegetation conditions?
- Recent weather conditions & trends?
- Crop yield/range production?
- Soil moisture?



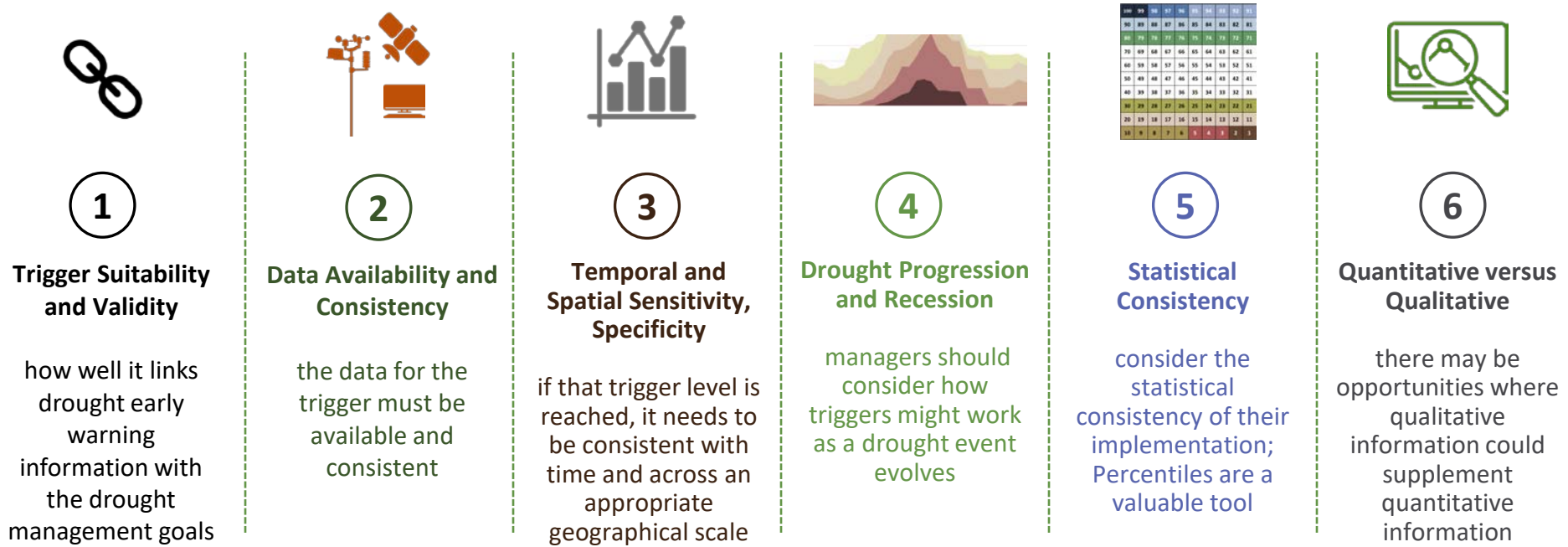
- Phone calls?
- Email?
- Survey?



- Revised map?
- Drought alert?

Trigger: specific indicator values or thresholds that initiate (and/or terminate) drought management responses, which are often associated with severity levels in a drought plan. Drought triggers often specify the indicator value, the time period, the spatial scale, the drought level, and whether conditions are intensifying or receding.

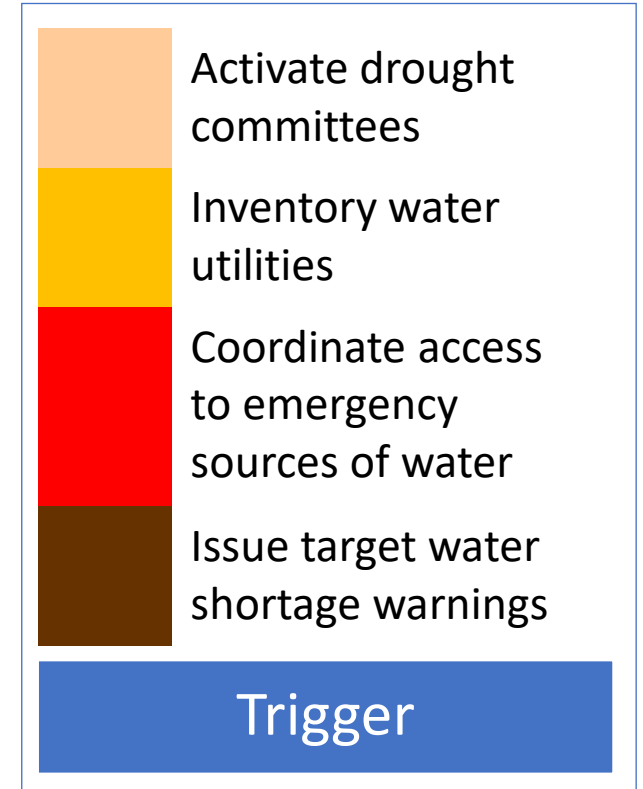
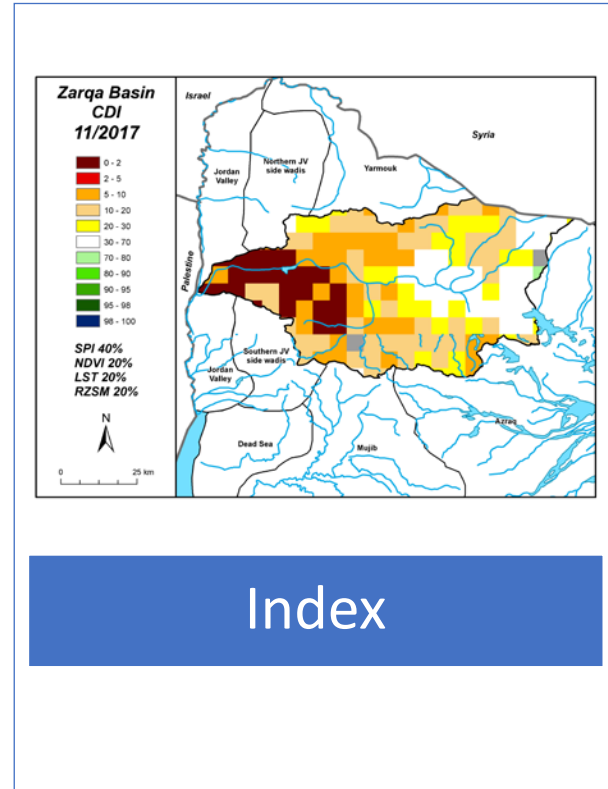
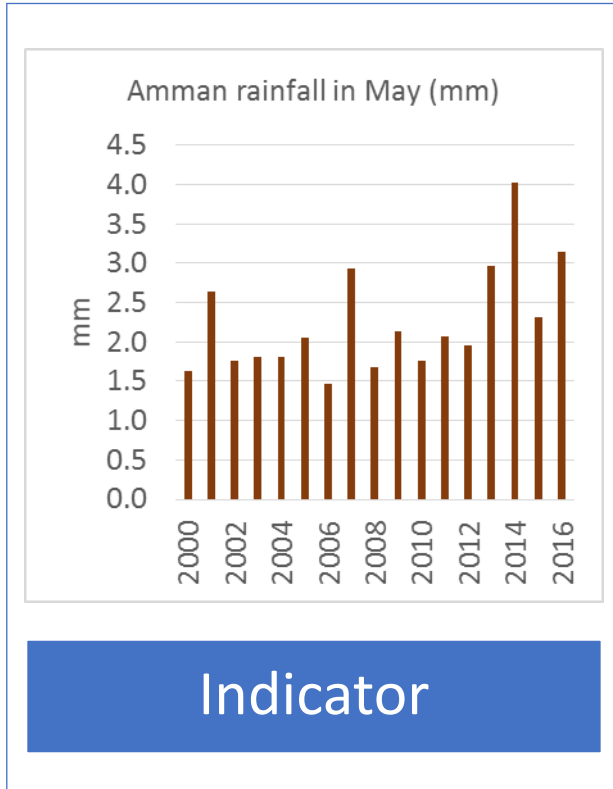
Key Considerations for Drought Triggers:



Why use drought triggers?

- Drought triggers are an important component in an effective drought early warning system.
- **Triggers identify the timing and level of drought management response leading into, during, or following a drought event.**
- Triggers also link historical drought severity with drought response actions taken, so that improvements in response management strategies can be made.
- **Examples of actions triggers might initiate include drought declarations (at national, regional, or local levels), emergency drought relief programs, or the implementation of various water supply and/or water demand restrictions.**

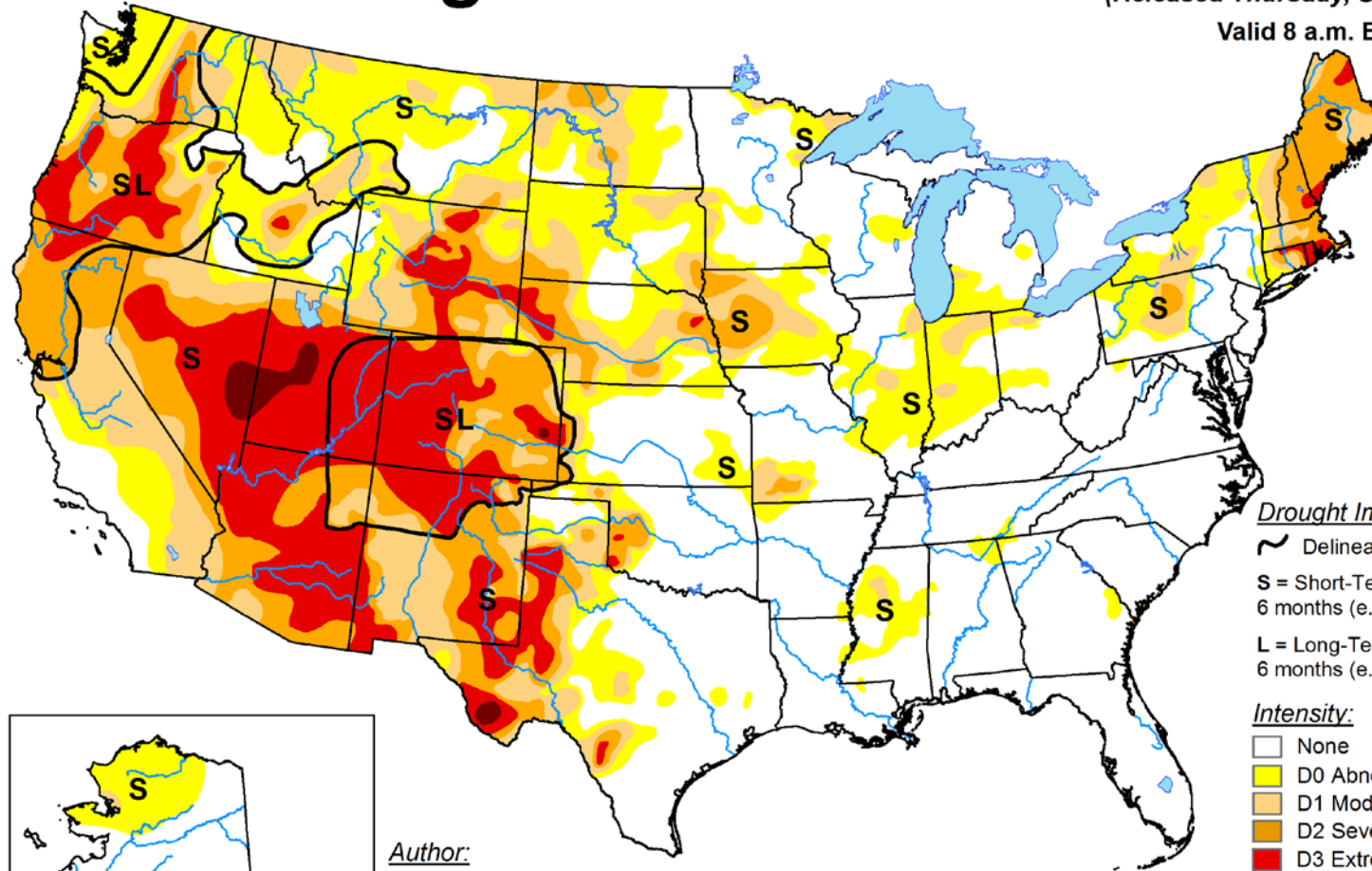
Triggers make data actionable



U.S. Drought Monitor

September 22, 2020
(Released Thursday, Sep. 24, 2020)

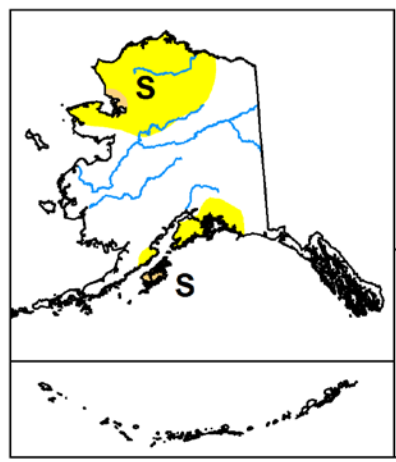
Valid 8 a.m. EDT



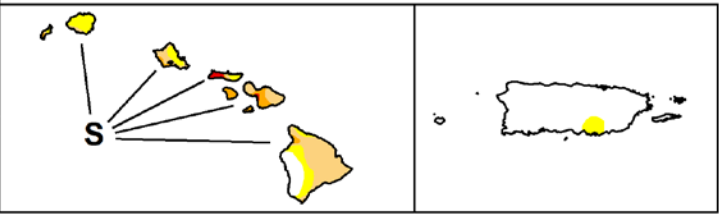
Drought Impact Types:
 ~ Delineates dominant impacts
 S = Short-Term, typically less than 6 months (e.g. agriculture, grasslands)
 L = Long-Term, typically greater than 6 months (e.g. hydrology, ecology)

Intensity:
 None
 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. For more information on the Drought Monitor, go to <https://droughtmonitor.unl.edu/About.aspx>



Author:
 Brad Rippey
 U.S. Department of Agriculture



droughtmonitor.unl.edu

Some Examples of Decision Making and Policy Using the USDM

(Science before Policy)

Policy:

- **2008/2014 Farm Bill**
 - USDA Farm Service Agency, Natural Resources Conservation Service, Risk Management Agency
 - **~\$6.5 billion in payments** disbursed (through 2015) via the **Livestock Forage Disaster Program (LFP)** between 2011-2015
- **Internal Revenue Service**
 - Livestock tax deferral program
- **U.S. Department of Agriculture**
 - Secretarial *“Fast Track”* Drought Designations (USDM trigger since 2012)
- **NOAA National Weather Service**
 - Drought Information Statements
- **Environmental Protection Agency**
 - Water quality monitoring
- **Centers for Disease Control and Prevention**
 - Public health
- **Bureau of Land Management**
- **Several States use the USDM in their monitoring/early warning and in drought plans**



Drought Management Exercises



A GUIDE TO DROUGHT MANAGEMENT EXERCISES



UNIVERSITY OF
Nebraska
Lincoln

May 2018



International Journal of River Basin Management



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Serious Gaming for Participatory Planning of Multi-Hazard Mitigation

Andrea Carson, Mary Windsor, Harvey Hill, Tonya Haigh, Nicole Wall, Jason Smith, Rolf Olsen, Deborah Bathke, Ibrahim Demir & Marian Muste

To cite this article: Andrea Carson, Mary Windsor, Harvey Hill, Tonya Haigh, Nicole Wall, Jason Smith, Rolf Olsen, Deborah Bathke, Ibrahim Demir & Marian Muste (2018): Serious Gaming for Participatory Planning of Multi-Hazard Mitigation, International Journal of River Basin Management, DOI: [10.1080/15715124.2018.1481079](https://doi.org/10.1080/15715124.2018.1481079)

To link to this article: <https://doi.org/10.1080/15715124.2018.1481079>



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Lessons Learned...

Early Warning and Risk Management Relationship: *A cycle forms...*

- As **monitoring and early warning systems improve**, **the need** for better drought risk management strategies (planning and mitigation) increases
- As **planning and mitigation strategies are implemented**, **the need** for improved drought monitoring and early warning increases
- **Information (value added)** and a need for triggers drives this cycle

Current/Future Drought Management Concerns

Past drought management efforts have been **reactive** (costly, untimely, ineffective & poorly coordinated).

Impacts are increasing and becoming **increasingly complex** across sectors, demonstrating increasing vulnerabilities...yet, impact assessments are lacking and/or no consistent methodology is present, therefore the **costs/losses of drought are not well documented**.

How do we tie together (e.g., **“triggers”**) the 3 pillars of Drought Risk Management elements?

Climate change and anthropogenic reactions/contributions to drought is and will continue to alter the frequency, severity and duration of droughts for many regions—**increasing costs** and **reducing recovery** times.

Given increased drought incidence and upward spiraling impacts, **how can we convince policy makers that drought preparedness and the application of the principles of risk management are worthy of upfront investments?**

Some Takeaway Messages

Integrated drought management* requires a **collaborative approach within and between levels of government and with the private sector and various stakeholders (**no silos!**).

*Truly a **wicked problem**: Complex and interdisciplinary nature of drought....**no one can go it alone!** Must leverage expertise, resources, program with credit/attribution for all who participate

*To be successful, we must develop methodologies and produce case studies that address the **benefits of action vs. costs of inaction!**

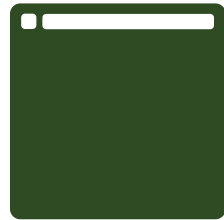
*Build political will for a **paradigm shift** to risk management.....drought needs to be very much a part of any water, food and national security conversation



Thank You!
Questions?

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ON THE WEB



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