

# Understanding Vulnerability



# Vulnerability

- The degree to which a system is susceptible to (sensitive), and unable to cope with (adaptive capacity), adverse effects of climate change (including climate variability and extremes)
- Three core elements:
  - Exposure;
  - Sensitivity; and
  - Adaptive capacity



# Why is a Vulnerability Assessment Important?

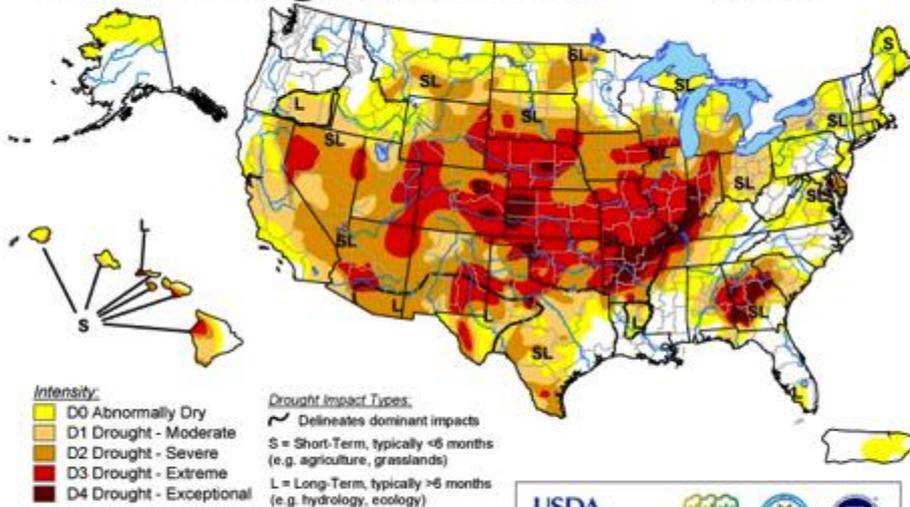
- Provides insight into the areas of your community that need attention
- Helps prioritize actions
- Provides opportunity for multi-department and multi-jurisdictional collaboration
- Structure for tracking progress



# Exposure

## U.S. Drought Monitor

July 31, 2012  
Valid 7 a.m. EDT



### Intensity:

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

### Drought Impact Types:

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

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

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



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- Exposure is a determination of whether the system as a whole or its parts will experience a specific changing climate condition.
- It is often an inventory of the “assets”—people, property, systems, and functions—that could be lost, injured, or damaged due to an impact of climate change.

National Integrated Drought  
information System

# Sensitivity



Breakingnews.com

The degree to which a built, natural, or human system is directly or indirectly affected by changes in climate conditions or specific climate change impacts. If a system is likely to be affected as a result of climate change, it should be considered sensitive to climate change

# Adaptive Capacity

The ability of a system to adjust to climate change, to moderate potential damages, to take advantage of opportunities, or to cope with consequences.



Effect of institution on adaptive capacity	Score	Aggregated scores for dimensions and adaptive capacity as a whole
Positive effect	2	1.01 to 2.00
Slightly positive effect	1	0.01 to 1.00
Neutral or no effect	0	0
Slightly negative effect	-1	-0.01 to -1.00
Negative effect	-2	-1.01 to -2.00



➤ **Questions?**

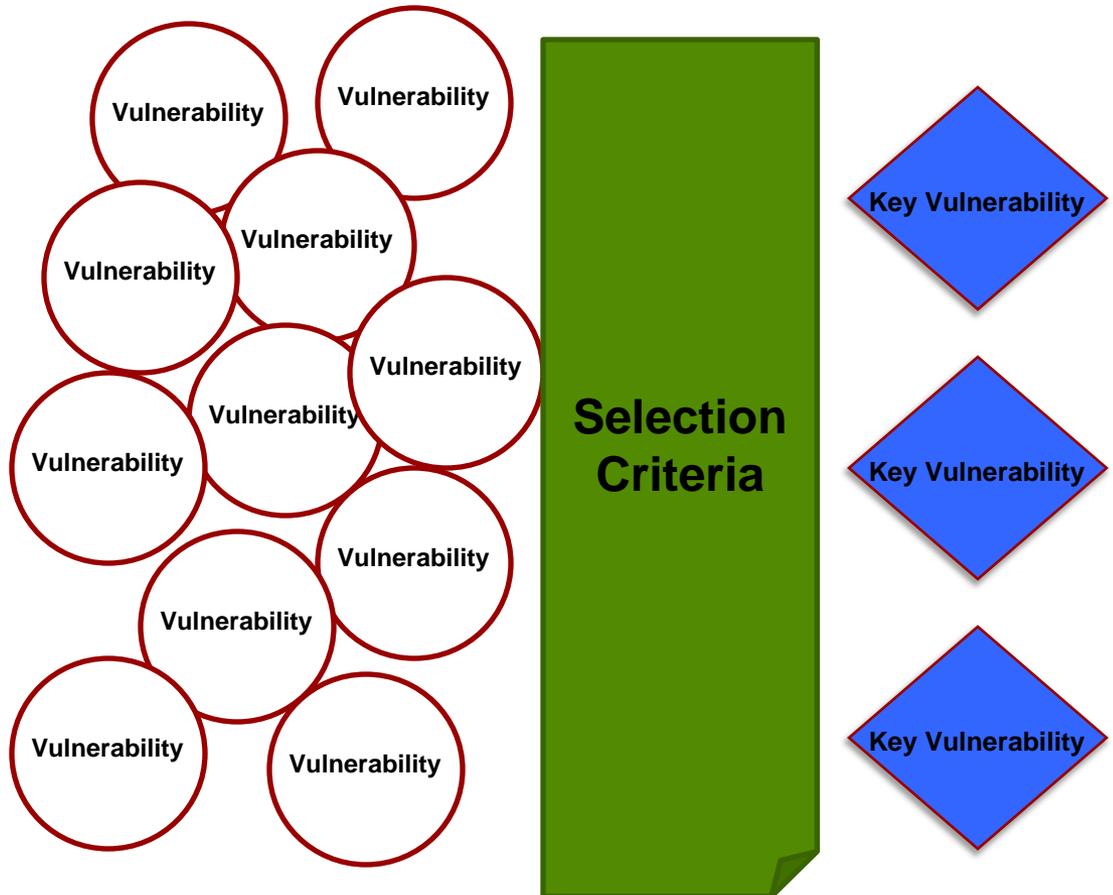
➤ **Exercise**

# Areas of Concern

- “We are most concerned about heat and its impact on vulnerable populations.”
- “Potential for more air alert days.”
- “Increased diseases due to lack of deep freeze.”
- “More infrastructure issues, such as pot holes with changing freeze-thaw cycles.”
- “Most salt usage with more freezing rain, resulting chloride in surface waters.”
- “More street flooding and stormwater issues.”
- “Increased heat events in the population and housing stock not use to them.”

# Identifying Key Vulnerabilities

- Decision criteria can help determine which vulnerabilities to initially prioritize
- Criteria derived from the Intergovernmental Panel on Climate Change
- Qualitative and Quantitative



# Key Vulnerability Selection Criteria

- Magnitude of Impact
- Timing of Impact
- Persistence and Reversibility of Impact
- Likelihood of Impact
- Potential for Adaptation Actions
- Importance of Vulnerable Populations
- Distributional Aspects of Impacts and Vulnerabilities