

# Identifying Your Vulnerabilities



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Michael J. Hayes

*Building Drought Early Warning Capacity in Montana*

March 17 – 18, 2015

Bozeman, MT



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Overview of NDMC's Drought Impact Reporter (DIR)

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Interactive activity using the DIR

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Outline

Example framework for drought impact assessment and resilience planning

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Discussion

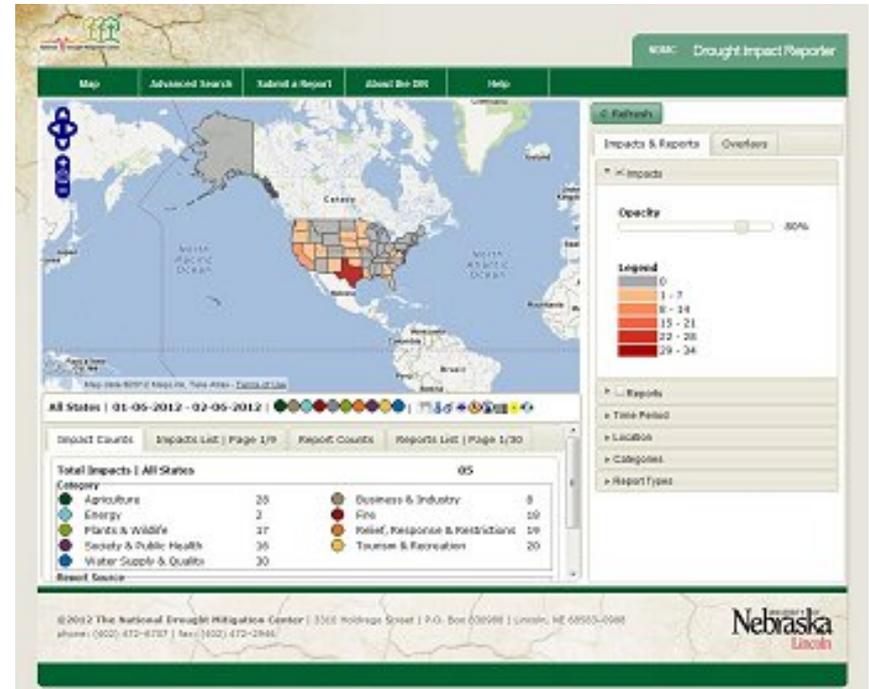
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Wrap up and report out

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# NDMC's Drought Impact Reporter (DIR)

- Launched in July 2005
- Nation's only multi-source archive of drought impacts
- Sources
  - Media
  - Government agencies and reports
  - Citizen observers



Developed with funding from NOAA & USDA's Risk Management Agency

# Citizen Observers

Report impacts through the DIR website or CoCoRaHS



Reporter: [reporter.unl.edu/submitreport/](http://reporter.unl.edu/submitreport/)

Getting Started  Free Hotmail  Suggested Sites  Web Slice Gallery

NDMC Drought Impact Reporter

Map | Advanced Search | **Submit a Report** | About

## Submit a Report

[Learn how your report becomes an impact.](#)

\* indicates required field

**Description**

Please provide a **Description** of how drought is affecting you, your livelihood, your activities, etc.

If there is a report online that helps illustrate your observation, please use the **Related Link** box to provide the link.

A **Condition Monitoring Report** allows a regular observer to describe normal conditions that are likely to change during drought, to create a basis for comparison. Please check Condition Monitoring Report if that's what you are submitting. If you aren't sure, please leave it unchecked.

Condition Monitoring Report

**Impact Description\***

**Related Link**

**Categories**

To help get a handle on drought's complex impacts, we divide them into **Categories**. Not all impacts fit neatly within a category, but many do.

Please click on the checkbox or category name to select it.

When you select a category, you have the option to enter a **Value** in dollars for losses or gains. Any information about dollar losses or gains will appear along with the other information you submit in your report.

Categories	Value (not required)
<input type="checkbox"/> Agriculture	\$
<input type="checkbox"/> Business & Industry	\$
<input type="checkbox"/> Energy	\$
<input type="checkbox"/> Fire	\$
<input type="checkbox"/> General Awareness	\$
<input type="checkbox"/> Plants & Wildlife	\$
<input type="checkbox"/> Relief, Response & Restrictions	\$
<input type="checkbox"/> Society & Public Health	\$
<input type="checkbox"/> Tourism & Recreation	\$
<input type="checkbox"/> Water Supply & Quality	\$

Link to submit a report

Reprinted from Rod... | follow the leader... | Map of Drought Im... | Computer Noteboo... | About the DIR - Dr... | Map

www.cocorahs.org/state.aspx?state=mt

Most Visited  Getting Started  Free Hotmail  Suggested Sites  Web Slice Gallery

**CoCoRaHS** COMMUNITY COLLABORATIVE RAIN, HAIL & SNOW NETWORK  
"Because every drop counts"

Home | States | View Data | Maps | My Data Entry | Login

**Montana**

**State Menu**

- Montana Home
- State Coordinators
- Maps

**Montana Reports**

- Daily Precip
- Multi-Day Precip
- Hail Reports
- Significant Weather

**View All Reports**

- Daily Precip
- Daily Comments
- Multi Day Precip
- Hail Reports
- Significant Weather
- Rainy Days
- Stations

Daily Precipitation (inches x.xx)  
Montana  
3/14/2015

0.0
0.00 - 0.01
Trace
0.01 - 0.02
0.02 - 0.03
0.03 - 0.04
0.04 - 0.05
0.05 - 0.06

[View Large Map](#)

## CoCoRaHS Montana

Observations in Big Sky Country

**Main Menu**

- Home
- About Us
- Join CoCoRaHS
- Contact Us
- Donate

**Resources**

- FAQ / Help
- Education
- Training Slide-Shows
- Videos
- Drought Impacts
- Evapotranspiration

**Volunteer Coordinators**

- Hill Pad
- Distribution/Drop-off

**Thinking about becoming a volunteer?**  
Have you heard of CoCoRaHS but are not sure how to become involved? Or are you a new observer looking for online training? To get started, visit the [FAQ/Help](#) section under the *Resources* heading for general information, frequently asked questions and volunteer training instructions. For more specific questions, contact your regional or state coordinator.

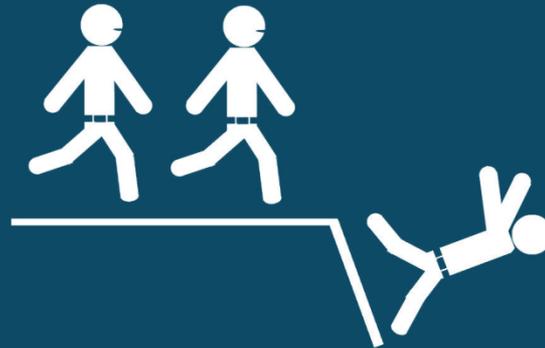
**Upcoming CoCoRaHS Training Sessions:**  
Some offices are offering to do the training online, saving you fuel costs, and time driving. You only need a computer hi-speed internet preferable and a phone that you can use to dial into a free teleconference call. See the "news" section of the website of the NWS office offering the training in order to register for the training.

Billings - <http://www.weather.gov/billings>  
Glasgow - <http://www.weather.gov/glasgow>  
Great Falls - <http://www.weather.gov/greatfalls>  
Missoula - <http://www.weather.gov/missoula>

We currently have no training sessions scheduled, but if you would like training, or have

**Go to:**

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



**FOLLOW THE  
LEADER**

# Go to: <http://droughtreporter.unl.edu>

NDMC Drought Impact Reporter

Map | Advanced Search | Submit a Report | About the DIR | Help

Refresh

Impacts & Reports | Overlays

Impacts

Opacity: 80%

Impacts Legend:

- 0
- 2 - 11
- 12 - 21
- 22 - 31
- 32 - 40
- 41 - 49

Reports

Time Period

Location

Categories

Report Types

All States | 02-14-2015 - 03-14-2015

Impact Counts | Impact List | Report Counts | Report List

**Total Impacts | All States: 81**

Category	
Agriculture	13
Energy	1
Plants & Wildlife	9
Society & Public Health	27
Water Supply & Quality	60
Business & Industry	10
Fire	1
Relief, Response & Restrictions	53
Tourism & Recreation	8

Report Source

©2015 The National Drought Mitigation Center | 3310 Holdrege Street | P.O. Box 830988 | Lincoln, NE 68583-0988  
phone: (402) 472-6707 | fax: (402) 472-2946 | [Contact Us](#)

UNIVERSITY OF Nebraska Lincoln



# NDMC Drought Impact Reporter

- Map
- Advanced Search
- Submit a Report
- About the DIR
- Help

For quick access to impacts from the last 30 days, click on the state from the DIR home page

**Skiers coming going to southern Montana for skiing**

Duration: 02-20-2015 - unknown

**Extension on deadline to replace livestock, defer tax on gains from sales**

STATE | ● ●

Duration: 09-30-2014 - 12-31-2015

**U.S. beef prices continue to rise**

STATE | ● ●

Duration: 01-01-2014 - 02-28-2015

OK



**Impacts | Montana**

02-14-2015 - 03-14-2015

Total Impacts 3

Statewide Impacts 2

**Category**

- Agriculture 2
- Relief, Response & Restrictions 1
- Society & Public Health 1
- Tourism & Recreation 1

**Report Source**

- Media 3

Impacts List

County View

Category	Count	Category	Count
● Agriculture	13	● Business & Indus	
● Energy	1	● Fire	
● Plants & Wildlife	9	● Relief, Response	
● Society & Public Health	27	● Tourism & Recreation	8
● Water Supply & Quality	60		

Clicking on IMPACTS LIST brings up a box with the lists of impacts. Clicking on an individual impact will bring up more information about that impact.

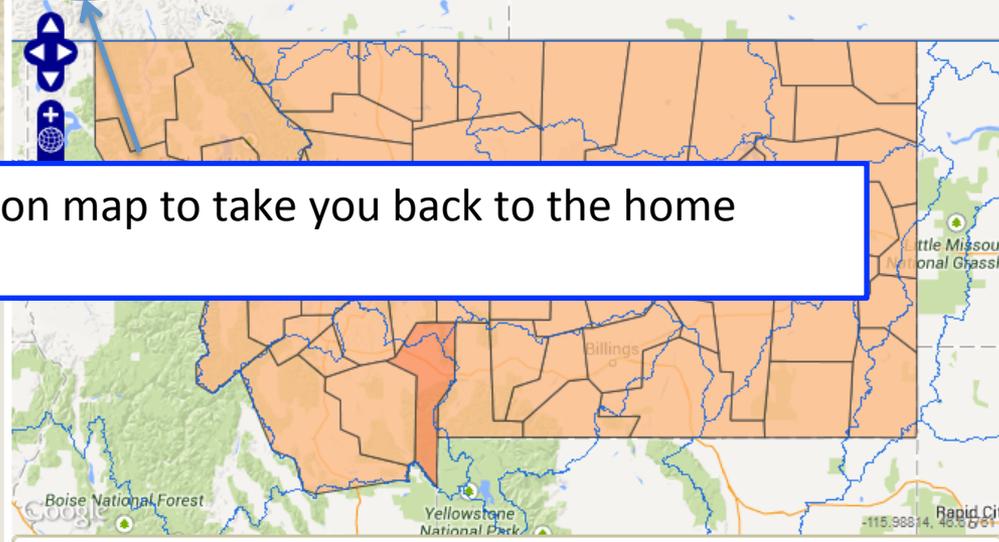




Map Advanced Search Submit a Report

Clicking on the overlays tabs give you options to view the impact map by HUCs

Clicking on map to take you back to the home screen.



Refresh

Impacts & Reports **Overlays**

- Drought Monitor
- Hydrologic Unit Codes
- Climate Divisions
- Congressional Districts
- RMA Regions

Montana | 02-14-2015 - 03-14-2015

Impact Counts Impact List Report Counts Report List

**Total Impacts | Montana** 3

Statewide Impacts 2

Category					
	Agriculture	2		Relief, Response & Restrictions	1
	Society & Public Health	1		Tourism & Recreation	1

Report Source

	Media	3
--	-------	---

**NDMC Drought Impact Reporter**

Map Advanced Search Submit a Report About the DIR Help

Refresh

Impacts & Reports Overlays

Impacts

Opacity

**Impacts**

- 0
- 2 - 11
- 12 - 21
- 22 - 31
- 32 - 40
- 41 - 49

Reports

**Query Reports By**

- Source Location
- Affected Area

Opacity 80%

**Reports**

- 1 - 25
- 26 - 50
- 51 - 75
- 76 - 100
- 101 - 124

All States | 02-14-2015 - 03-14-2015

Impact Counts Impact List Report Counts Report List

**Total Impacts | All States 81**

Category					
	Agriculture	13		Business & Industry	10
	Energy	1		Fire	1
	Plants & Wildlife	9		Relief, Response & Restrictions	53
	Society & Public Health	27		Tourism & Recreation	8
	Water Supply & Quality	60			

Report Source

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phone: (402) 472-6707 | fax: (402) 472-2946 | Contact Us

To customize your reports click here. This gives you the option to query by

- Source location
- Affected area

Click REFRESH to apply your selections.

Query Reports By

- Source Location
- Affected Area

Opacity 80%

Reports

- 1 - 25
- 26 - 50
- 51 - 75
- 76 - 100
- 101 - 124



# NDMC Drought Impact Reporter

- Map
- Advanced Search
- Submit a Report
- About the DIR
- Help



Refresh

Click REFRESH to apply your selections.

Clicking *Time Period* lets you customize the time interval for your query

Time Period

Last Month

Last Month

Last Week

Last 6 Months

Last Year

Customize

All States | 02-14-2015 - 03-14-2015 | [Color Swatches]

- Impact Counts
- Impact List
- Report Counts
- Report List

**Total Impacts | All States 81**

Category			
● Agriculture	13	● Business & Industry	10
● Energy	1	● Fire	1
● Plants & Wildlife	9	● Relief, Response & Restrictions	53
● Society & Public Health	27	● Tourism & Recreation	8
● Water Supply & Quality	60		



# NDMC Drought Impact Reporter

- Map
- Advanced Search
- Submit a Report
- About the DIR
- Help



Clicking *Location* lets you customize the state and county for your query

Refresh

Click REFRESH to apply your selections.

Location

State:

County:

All States | 02-14-2015 - 03-14-2015

- Impact Counts
- Impact List
- Report Counts
- Report List

**Total Impacts | All States 81**

Category					
	Agriculture	13		Business & Industry	10
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	Society & Public Health	27		Tourism & Recreation	8
	Water Supply & Quality	60			

Report Source



NDMC Drought Imp

Map Advanced Search Submit a Report About the DIR Help

Click REFRESH to apply your selections.

Refresh

Clicking *Categories* lets you customize the impact for your query

- Check All Uncheck All
- Agriculture
  - Business & Industry
  - Energy
  - Fire
  - General Awareness
  - Plants & Wildlife
  - Relief, Response & Restrictions
  - Society & Public Health
  - Tourism & Recreation
  - Water Supply & Quality

All States | 02-14-2015 - 03-14-2015 | [Color Swatches]

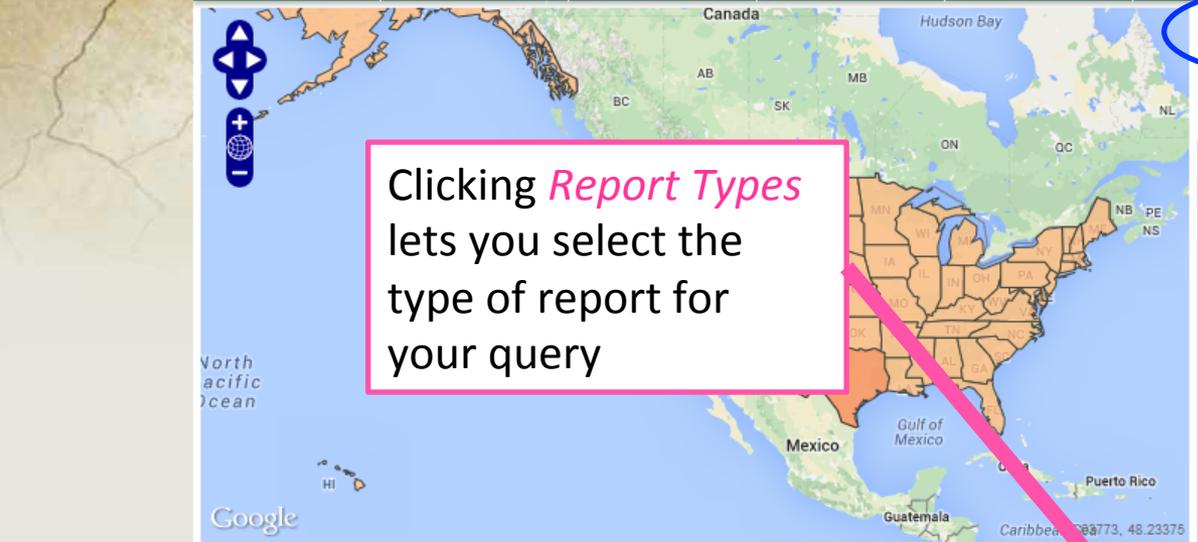
Impact Counts Impact List Report Counts Report List

**Total Impacts | All States 81**

Category			
Agriculture	13	Business & Industry	10
Energy	1	Fire	1
Plants & Wildlife	9	Relief, Response & Restrictions	53
Society & Public Health	27	Tourism & Recreation	8
Water Supply & Quality	60		

Report Source

Categories



Clicking *Report Types* lets you select the type of report for your query

Refresh

Click REFRESH to apply your selections.

- Impacts & Reports Overlays
- Check All Uncheck All
- Media
  - User
  - CoCoRaHS
  - National Weather Service
  - Burn Ban
  - Water Restriction
  - Other Agency
  - Hawaii
  - Legacy

All States | 02-14-2015 - 03-14-2015 | [Color Swatches]

Impact Counts Impact List Report Counts Report List

**Total Impacts | All States 81**

Category					
	Agriculture	13		Business & Industry	10
	Energy	1		Fire	1
	Plants & Wildlife	9		Relief, Response & Restrictions	53
	Society & Public Health	27		Tourism & Recreation	8
	Water Supply & Quality	60			

- Time Period
- Location
- Categories
- Report Types

Click IMPACT LIST on this menu to see the list of impacts using all of your choices for type, time, etc.

For the period of record there were 406 reported impacts for the state of Montana

Refresh

Impacts & Reports Overlays

Impacts 80%

225 - 233

Reports

Query Reports By  
 Source Location  
 Affected Area

Opacity 80%

Reports 0

Montana | 01-01-1995 - 03-14-2015

Impact Counts **Impact List** Report Counts Report List

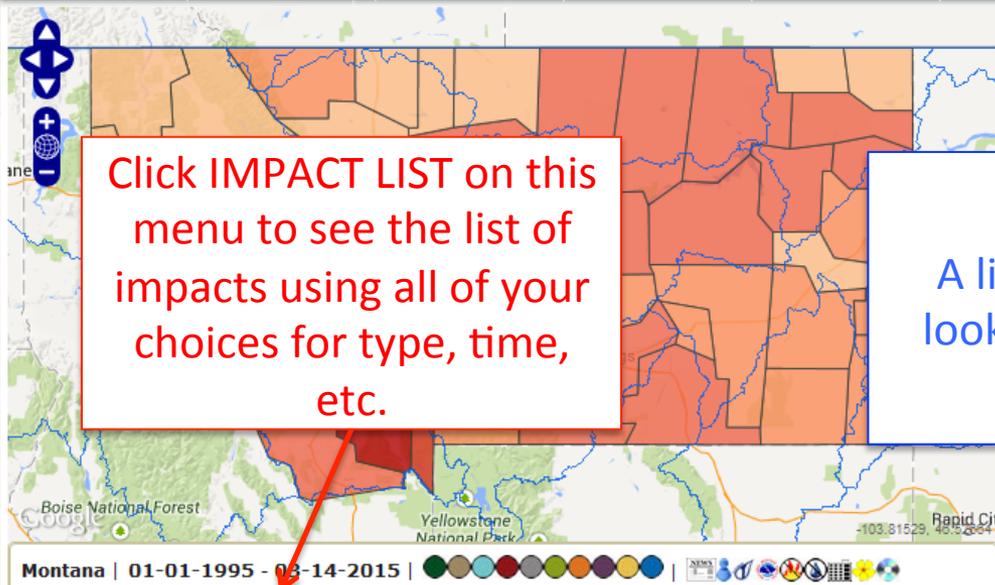
**Total Impacts | Montana**  
Statewide Impacts  
406  
185

Category	Count	Category	Count
Agriculture	183	Business & Industry	17
Energy	10	Fire	65
Plants & Wildlife	70	Relief, Response & Restrictions	90
Society & Public Health	75	Tourism & Recreation	16
Water Supply & Quality	83		



NDMC Drought Impact Reporter

- Map
- Advanced Search
- Submit a Report
- About the DIR
- Help



Refresh

Impacts & Reports Overlays

Impacts

215 - 224

225 - 233

Reports

Click IMPACT LIST on this menu to see the list of impacts using all of your choices for type, time, etc.

A list of impacts that looks like this pops up

Montana | 01-01-1995 - 03-14-2015

Impact Counts Impact List Reports

Total Impacts | Montana  
Statewide Impacts

Category

- Agriculture 18
- Energy 10
- Plants & Wildlife 70
- Society & Public Health 75
- Water Supply & Quality 83

**Extension on deadline to replace livestock, defer tax on gains from sales**

STATE | ● ●

Duration: 09-30-2014 - 12-31-2015

**U.S. beef prices continue to rise**

STATE | ● ●

Duration: 01-01-2014 - 02-28-2015

<< < 1 > >>

# Mini impact analysis

## Using Impacts to your watershed

### Identifying Your Vulnerabilities

*Building Drought Early Warning Capacity in Montana*

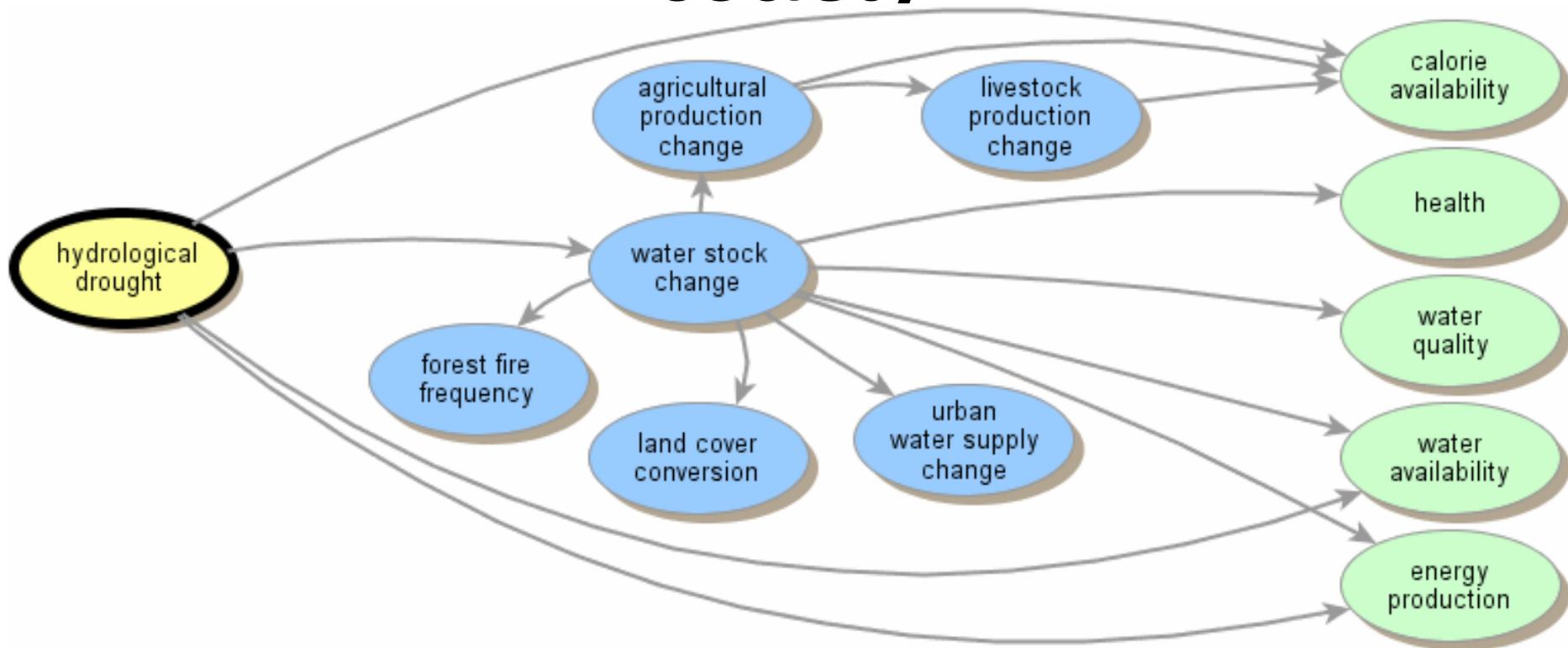
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#### BEAVERHEAD & RED ROCK (Beaverhead)

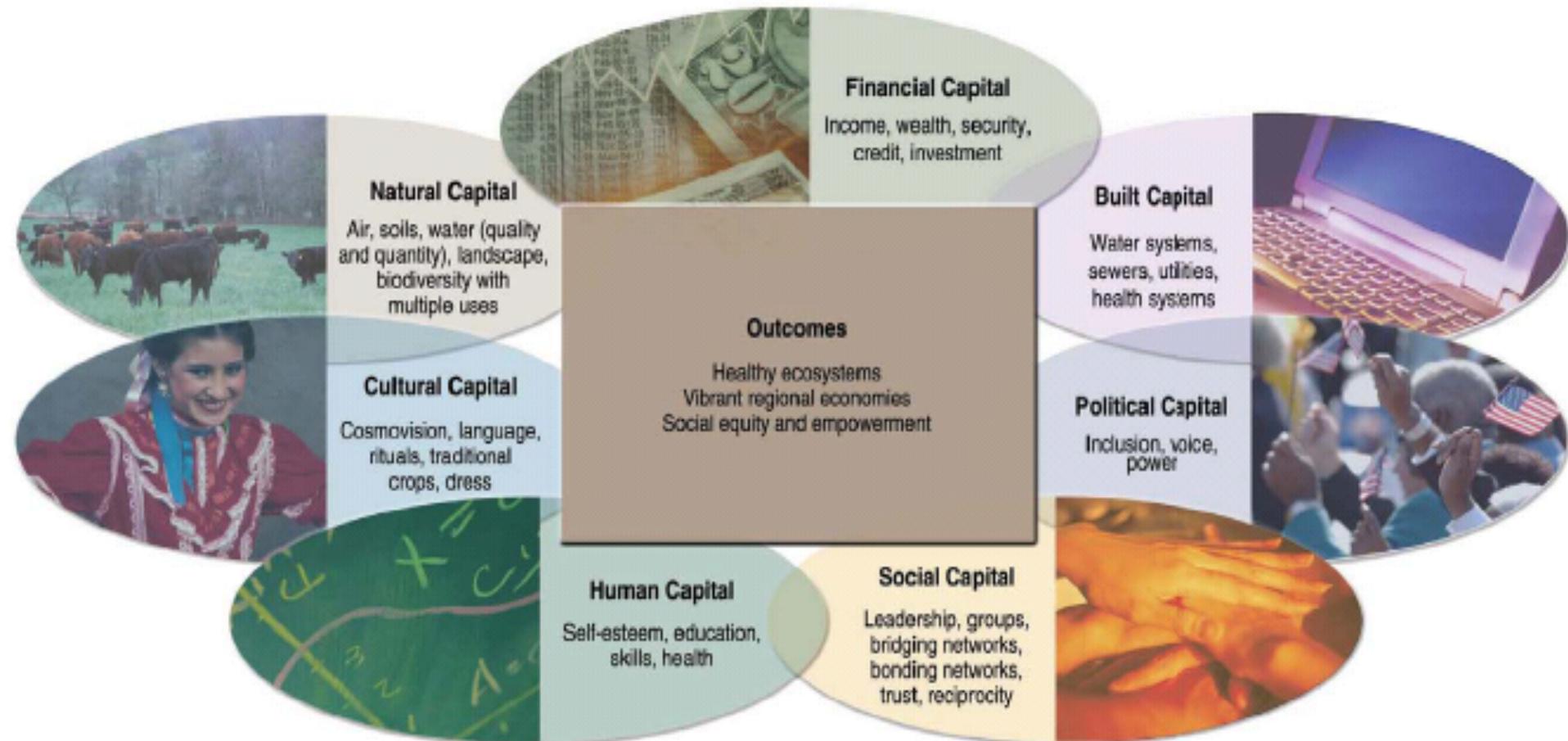
Impact	Year(s)	Capitals/Resources
River closures and fishing bans to protect trout and grayling populations due to low flows.	2013, 2007, 2006, 2005, 2004	
Hardware store closing after 29 years in business due to sustained drought conditions.	2004	
Cattle producers have been forced to reduce foundation stock and cull herds due to continued drought. In 2000, county producers managed 121,232 cattle 24 months and older. In 2003, producers managed 98,540.	2003	
Since the beginning of the drought, angler days have fallen from nearly 50,000 days to an all-time record low of 15,000 angler days. Almost half of the anglers that came to the area were from out of state; however, now only about 10 percent of the anglers are from out of state.	2005	
Because of a change in the FSA's Conservation Reserve Program (CRP), 48 of Montana's 56 counties are now eligible for emergency haying and grazing of CRP acres.	2012	
Stage 1 fire restrictions	2012	
The U.S. Secretary of Agriculture has declared counties as natural disaster areas because of continued drought. Farmers and ranchers in these counties are eligible for federal low-interest emergency loans.	2004	
The U.S. Department of Agriculture announced that livestock producers are eligible to receive powdered milk from the federal government to supplement feed supplies.	2004	
The Bureau of Land Management requested that livestock owners curb grazing on public land by 30 percent, due to drought.	2013	
The Small Business Administration has announced it is offering low-interest loans to non-farm businesses that have lost money due to continued drought.	2003	
An early season fire consumed 400 acres, including five homes and other structures. Another wildfire west of Wise River burned 33 acres.	2013	

# Drought impacts have a ripple effect that can impact many sectors of society



# Community Capitals Framework: An Example Framework for impact Assessment

- Due to the highly diverse nature of drought impacts, it follows that the CCF would naturally lend itself to drought planning and mitigation efforts.



# Discussion Questions

1) Classify the drought impacts for your watershed as to whether it is to natural, built, financial, social, human, or cultural capitals.

Identifying Your Vulnerabilities  
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 Bozeman, MT

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Session 3: Identifying your impacts and vulnerabilities  
 Building Drought Early Warning Capacity in Montana  
 March 17 – 18, 2015  
 Bozeman, MT

### Overview of the Community Capitals Framework

**Natural capital** refers to those assets that abide in a location, including resources, amenities, and natural beauty. Natural capital might include: air, soils, water quality and quantity, landscape, biodiversity and features of the landscape or of nature.

**Cultural capital** reflects the way people "know the world" and how to act within it. Cultural capital includes the dynamics of who we know and feel comfortable with, what heritages are valued, collaboration across races, ethnicities, and generations, etc. Cultural capital influences what voices are heard and listened to, which voices have influence in what areas, and how creativity, innovation, and influence emerge and are nurtured. Cultural capital might include: ethnic festivals, multi-lingual populations, a strong work ethic, or traditional crops.

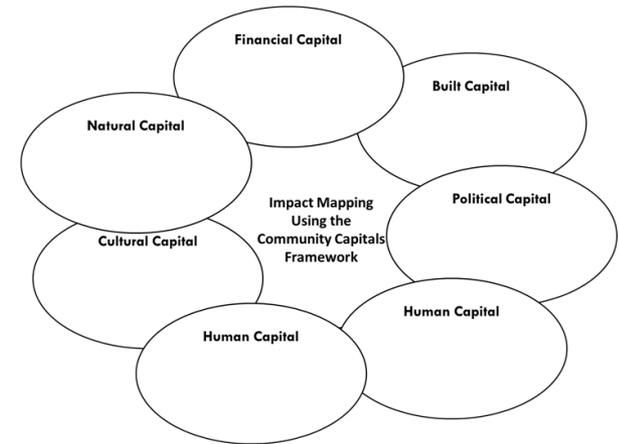
**Human capital** is understood to include the skills and abilities of people, as well as the ability to access outside resources and bodies of knowledge in order to increase their understanding and to identify promising practices. Human capital also addresses leadership's ability to "lead across differences," to focus on assets, to be inclusive and participatory, and to be proactive in shaping the future of the community or group. Human capital might include: a local leadership development program, education, skills, or health.

**Social capital** reflects the connections among people and organizations or the social glue to make things happen. Social capital might include: groups, bridging networks, trust, and reciprocity.

**Political capital** refers to the ability to influence standards, rules, regulations and their enforcement. Political capital might include: access to power and power brokers, such as access to a local office of a member of Congress, access to local, county, state, or tribal government officials, or leverage with a regional company.

**Financial capital** refers to the financial resources available to invest in community capacity building, to underwrite businesses development, to support civic and social entrepreneurship, and to accumulate wealth for future community development. Financial capital might include: income, wealth, security, credit, or investments. Many times financial capital becomes the focus of community efforts.

**Built capital** refers to the infrastructure that supports the community. Built capital might include: telecommunications, industrial parks, main streets, water and sewer systems, roads, etc. Built capital is often a focus of community development efforts. However, preliminary research indicates that when grants for water, sewers, roads and other projects are given to communities that have not invested in the other capitals, those projects tend to be less successful.



Impact List  
 Handouts pp. 1 & 2

# Discussion Questions

2) How well did the list capture the range of impact types in your watershed? What additional impacts can you ID that should be considered?

Identifying Your Vulnerabilities  
Building Drought Early Warning Capacity in Montana  
March 17 – 18, 2015  
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Session 3: Identifying your impacts and vulnerabilities  
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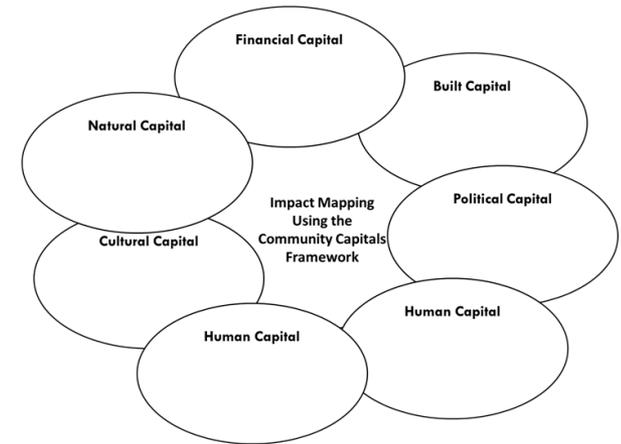
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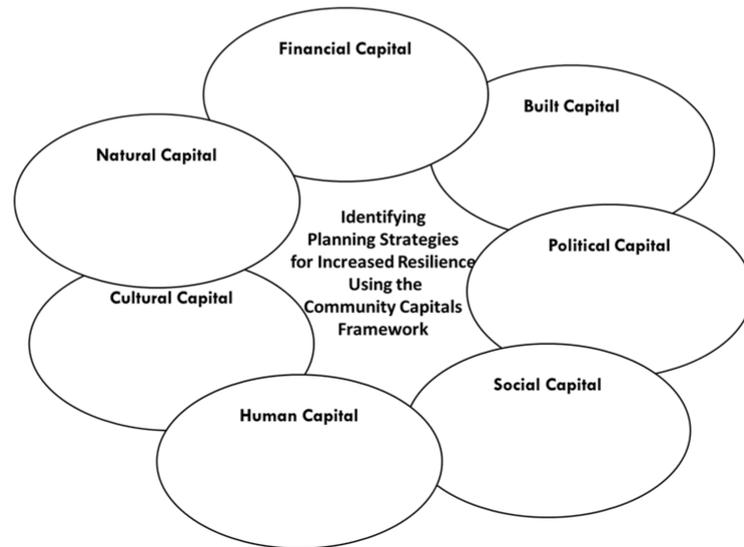
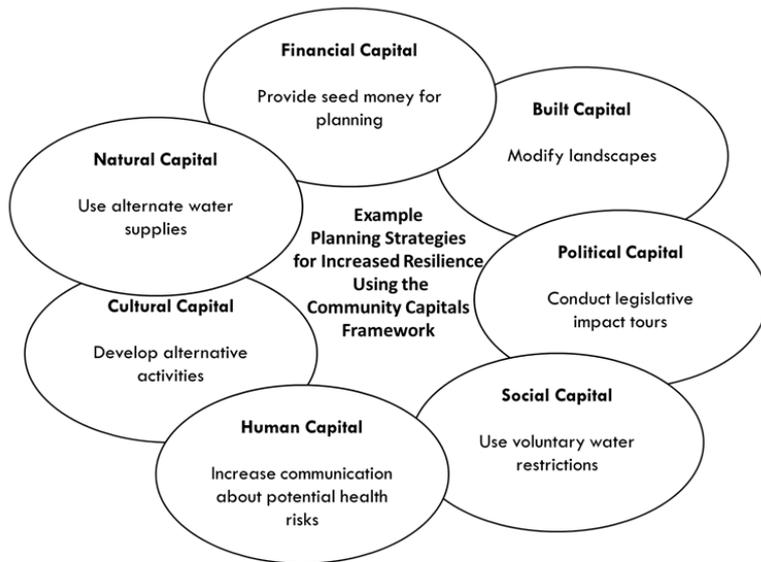


Impact List  
Handouts pp. 1 & 2



# Discussion Questions

4) How can you leverage your existing resources to reduce drought vulnerability to the capitals you've identified in questions 1 – 3?

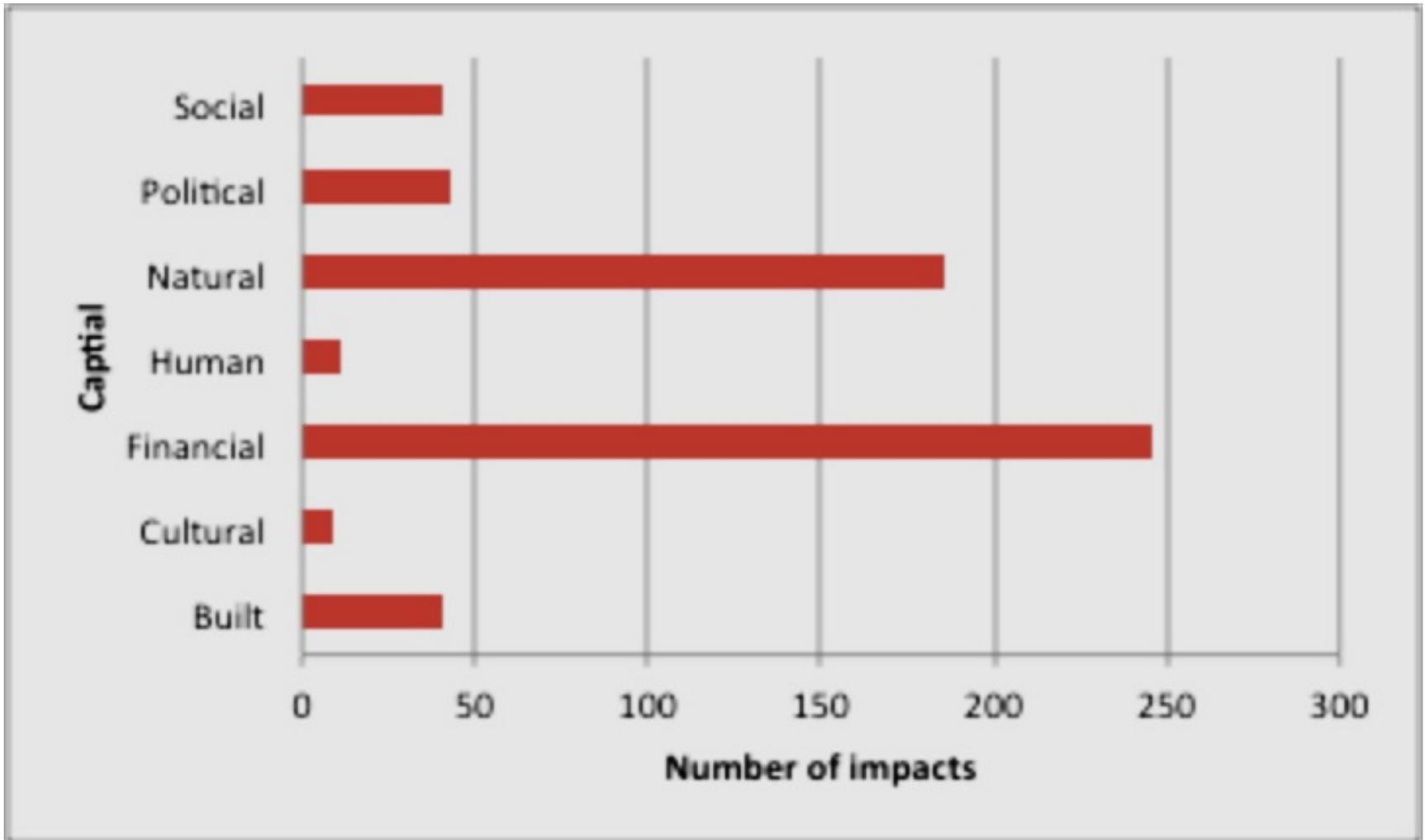


# Report Out

- Use your “Sticky Wall Parking Lot” to
  - ID any impacts that you haven’t previously considered



# Example of a CCF analysis of 2012 Great Plains



# Drought Impacts and Community Capitals Great Plains 2012

## Natural Capital

- Decline in rangeland grass production
- Trees susceptible to pests/disease
- Algae blooms in ponds
- Blowing dirt
- Grass fires
- Wildlife deaths

## Financial Capital

- Decreased crop yields
- Increased water and energy rates
- Reduced revenue from water sales
- Remove menu items (elk & buffalo)
- Closed ethanol plant
- Increased firefighting expenses

# Drought Impacts and Community Capitals Great Plains 2012

## Built Capital

- Wells shut down
- Power outages
- Shifts and cracks in foundations
- Closed roads (fire)
- Homes destroyed in wildfires

## Political Capital

- Activation of water restrictions
- State of Emergency declarations
- Improvements to USDA programs
- Opening of CRP lands for grazing
- Federal Drought Aid

# Drought Impacts and Community Capitals Great Plains 2012

## Human Capital

- Increased respiratory illness
- Increased heat-related ambulance calls
- Increased spider bites (brown recluse)
- Farmers less optimistic
- Increased anxiety in ethanol business

## Social Capital

- Voluntary water reductions
- Increased public awareness and media efforts
- Increased demands on volunteer fire and rescue
- Working extra overtime repairing water mains

## Cultural Capital

- 4<sup>th</sup> of July fireworks cancelled
- Closed swimming pools
- American Farm Bureau held national day of prayer
- Decreased hunting opportunities

The background of the slide is a close-up photograph of parched, reddish-brown soil. The soil is cracked into irregular, polygonal shapes, with some small pieces of dry straw or grass scattered across the surface. The lighting is natural, highlighting the texture and color of the dry earth.

**Questions?**

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