

Developing the Vegetation Drought Response Index (VegDRI): *Monitoring Vegetation Stress from a Local to National Scale*

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What is VegDRI?



VegDRI is a new ‘hybrid’ drought index that integrates:

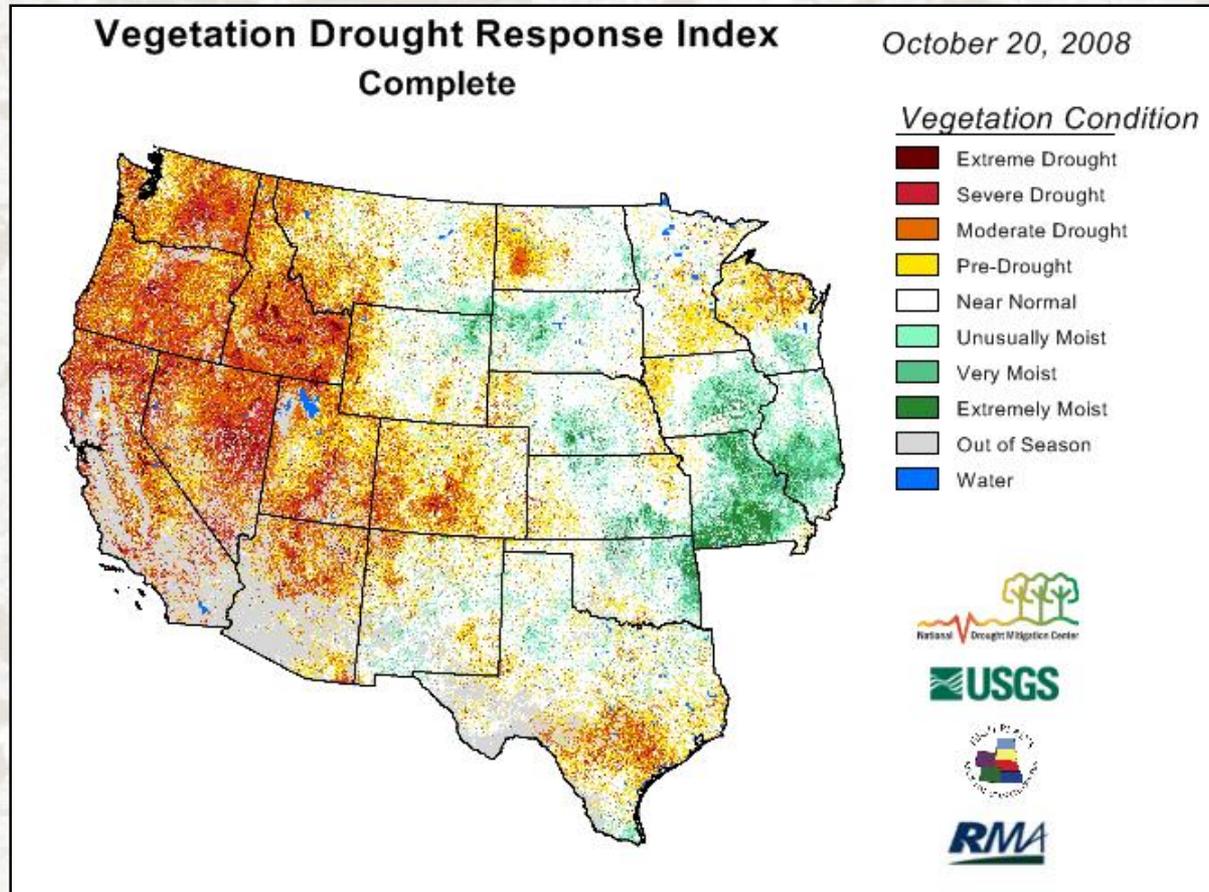
- satellite-based observations of vegetation conditions
- climate-based drought index data
- biophysical characteristics of the environment

to produce 1-km spatial resolution maps that depict

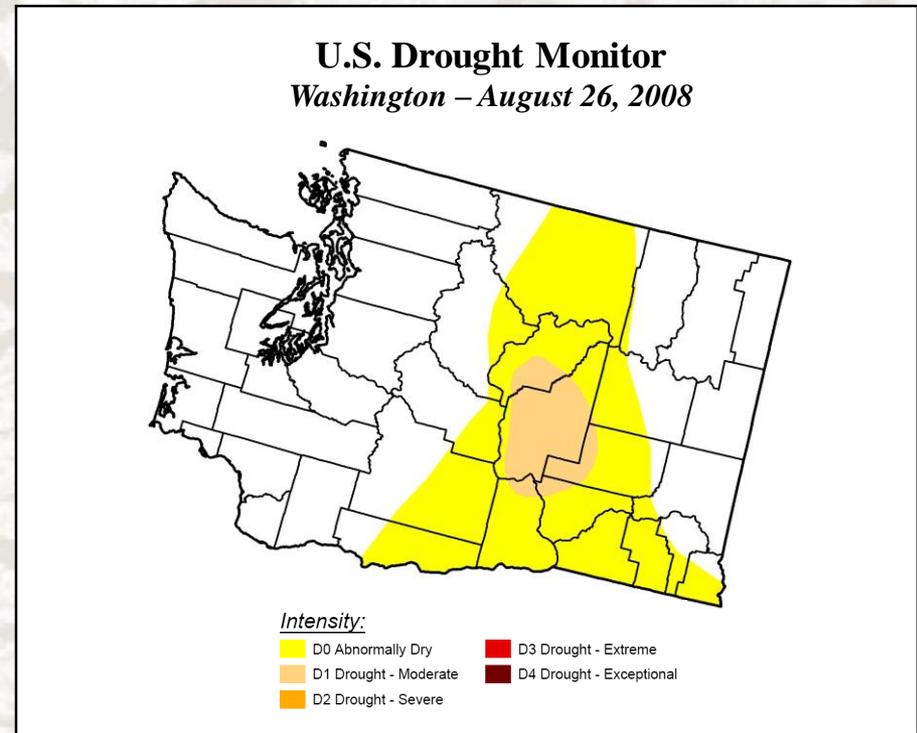
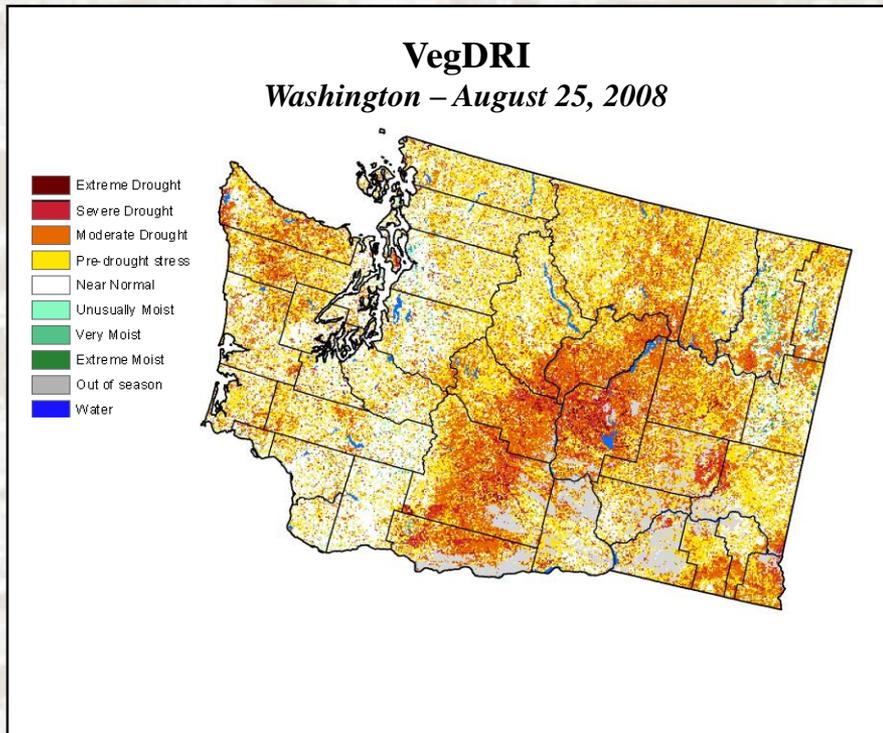
‘*drought-related vegetation stress*’ and are regularly updated (currently at 2-week interval) during the growing season.



What is VegDRI?



VegDRI vs. U.S. Drought Monitor



Goal of VegDRI Tool: *National-level monitoring capabilities with local-scale information* (i.e., county to sub-county level) regarding the level of drought stress on vegetation.

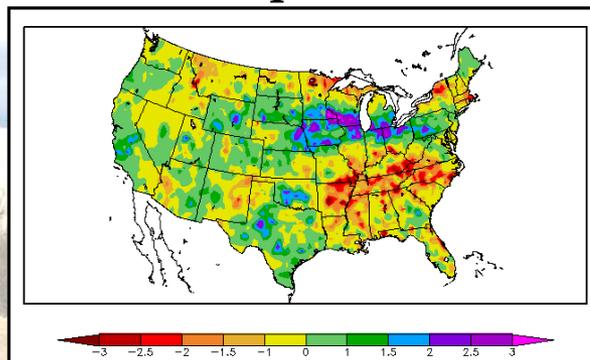
VegDRI - An Integrated Approach

*Remote Sensing
Component*



+

*Climate
Component*



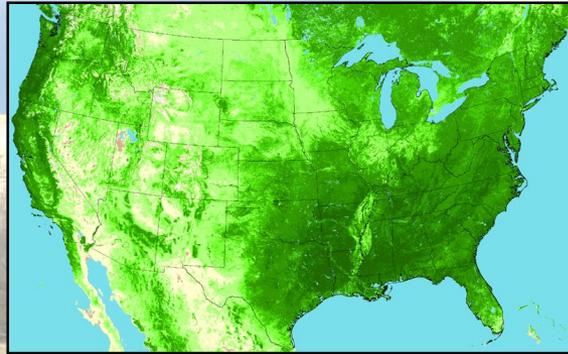
+

*Biophysical
Component*



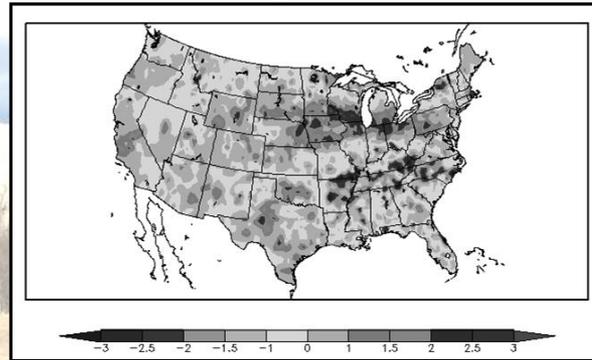
VegDRI - An Integrated Approach

Remote Sensing Component



+

Climate Component



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Biophysical Component



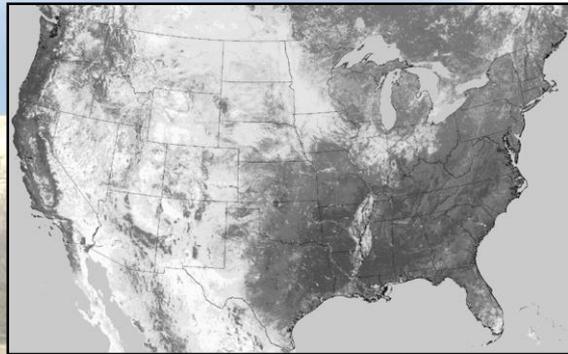
Role: Satellite-based observations provide information on the *spatial distribution and general condition of vegetation.*

(+) Spatially detailed information about vegetation across large geographic areas.

(-) Difficult to discriminate drought impacted areas from locations under other types of environment stress (flooding, fire, hail, & pests) or experiencing land use change.

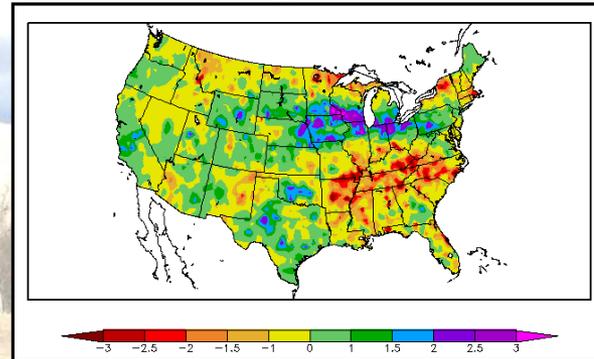
VegDRI - An Integrated Approach

Remote Sensing Component



+

Climate Component



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Biophysical Component

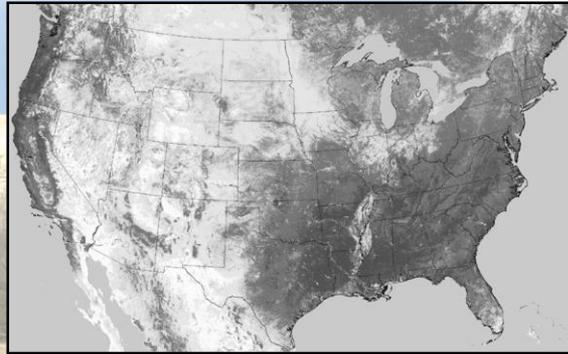


Role: Climate-based drought index maps provide a *'broad-scale' measure of dryness* that can be used for interpretation of the vegetation stress recorded in the satellite observations.

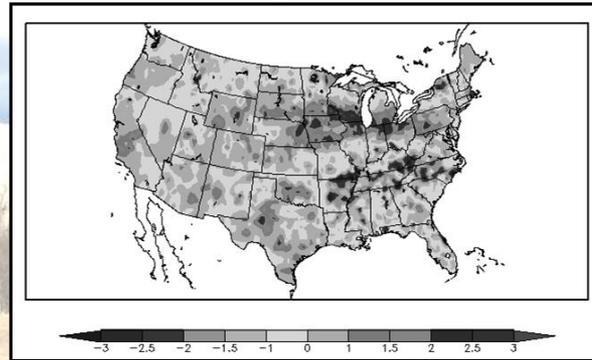
- Drought areas typified by below average vegetation conditions recorded in the satellite data and drier than normal conditions in the climate data.

VegDRI - An Integrated Approach

Remote Sensing Component



Climate Component



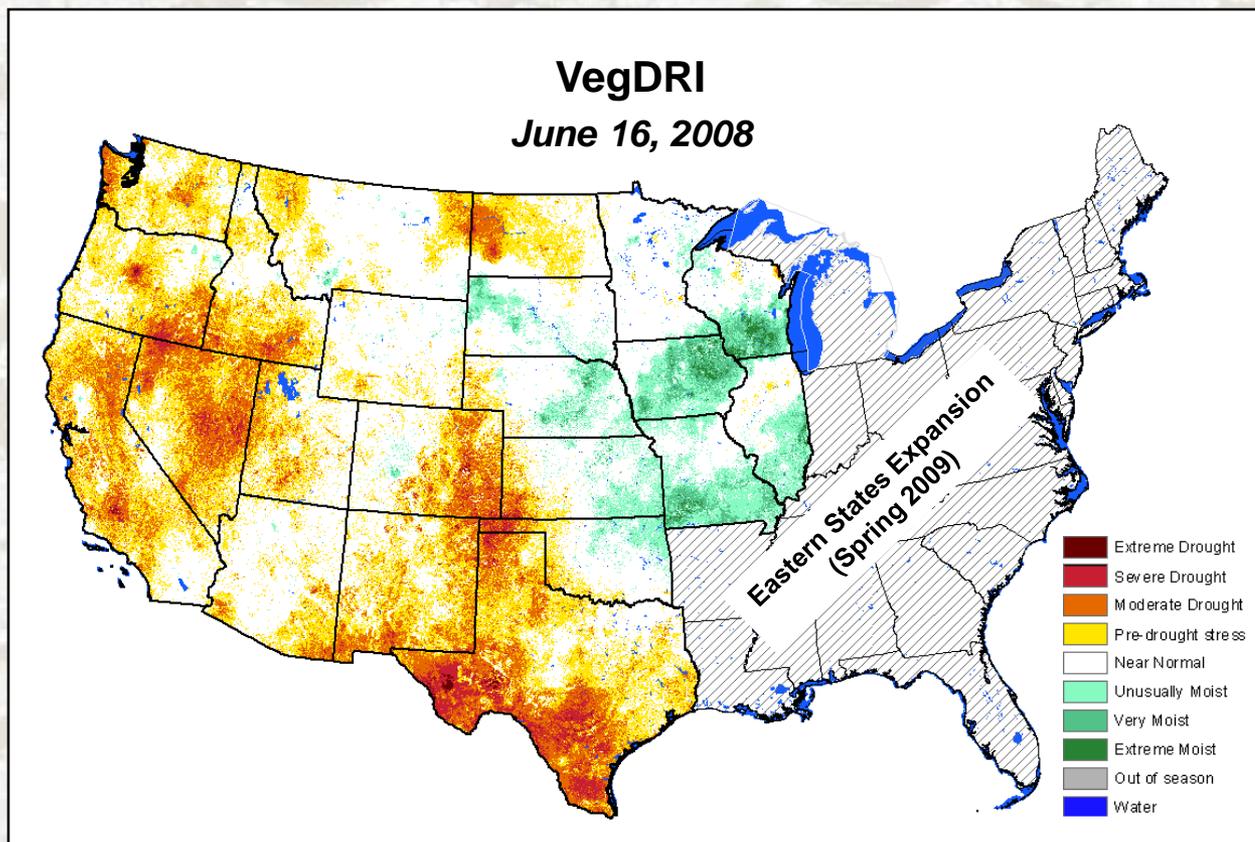
Biophysical Component



Role: Different characteristics of the environment are considered that influence climate-vegetation interactions.

- land use/land cover type
- irrigation
- soil available water capacity
- elevation
- ecological setting

VegDRI Expansion Schedule



- Information currently available for Pacific Northwest (ID, OR, & WA):
 - 2007 & 2008 growing seasons
- Production of a 20-year historical record of VegDRI maps. (1989 – 2008)
- Year-round production & weekly map updates planned in 2009.

(*) Bi-weekly maps currently available.

VegDRI Website and Products

VegDRI products are available at the VegDRI page within the Monitoring section of the NDMC website.

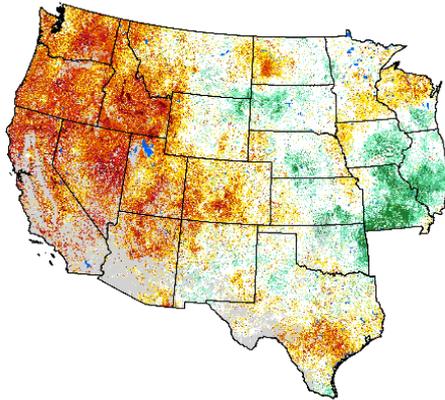
VegDRI | Change | Archive | Experimental Products | Outreach | Evaluation | FAQ | Feedback

Vegetation Drought Response Index

Select map type:

Vegetation Drought Response Index Complete

October 20, 2008



Vegetation Condition

- Extreme Drought
- Severe Drought
- Moderate Drought
- Pre-Drought
- Near Normal
- Unusually Moist
- Very Moist
- Extremely Moist
- Out of Season
- Water

[To download the image, right-click here and select "Save target as..."](#)

[To download the pdf, right-click here and select "Save target as..."](#)

What's New!

VegDRI expands coverage over the Western U.S. [more...](#)

[Evaluation](#) and [Outreach](#) sections added

VegDRI presented in Montana and Texas. [more...](#)

The 2006-2007 Archive is currently being updated. New dates will be added as they become available.

Key features and changes in the VegDRI map for October 20, 2008. For evaluators in these areas, any additional information or observations you can provide would be most helpful.

High Plains Region

Moderate to severe drought conditions have persisted over most parts of Colorado especially in the west intensified. The drought conditions over the eastern parts of Nebraska and South Dakota persisted. Over western Kansas and the panhandles Oklahoma and Texas, the drought condition has improved. Severe to extreme drought conditions have persisted over south central Texas.

Minnesota

The drought conditions over the northern-half of Minnesota have improved.

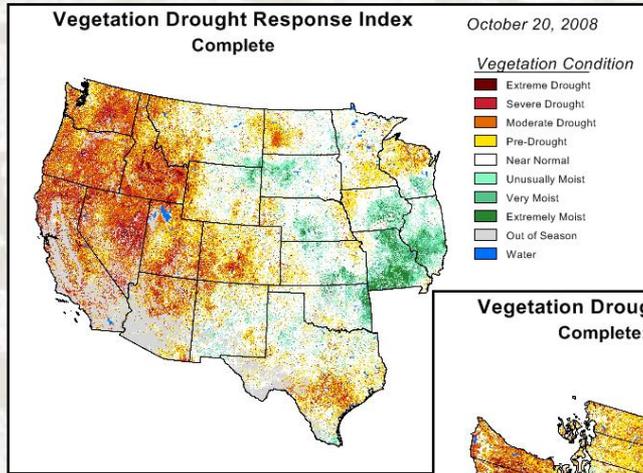
  

http://www.drought.unl.edu/vegdro/VegDRI_Main.htm

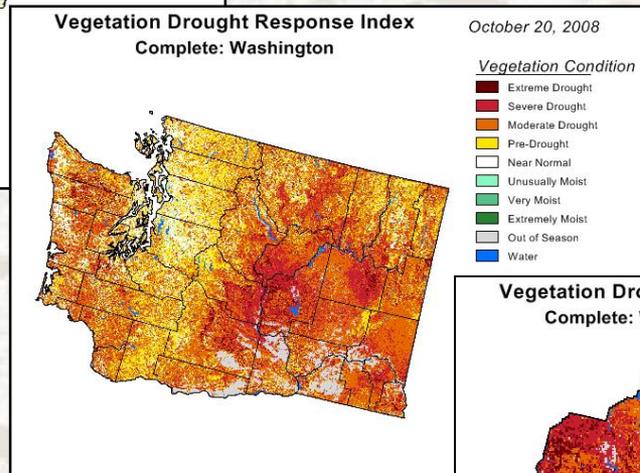


1. VegDRI Quick-View Maps

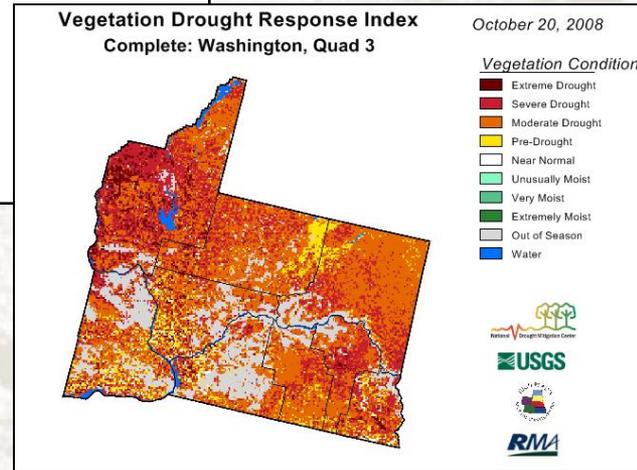
(multiple spatial scales)



Regional-level



State-level



Sub-state level

1. VegDRI Quick-View Maps (cont).

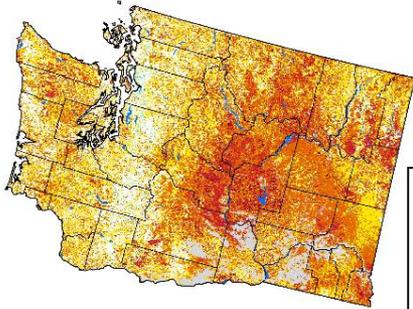
(land cover type)

Vegetation Drought Response Index
Complete: Washington

October 6, 2008

Vegetation Condition

- Extreme Drought
- Severe Drought
- Moderate Drought
- Pre-Drought
- Near Normal
- Unusually Moist
- Very Moist
- Extremely Moist
- Out of Season
- Water



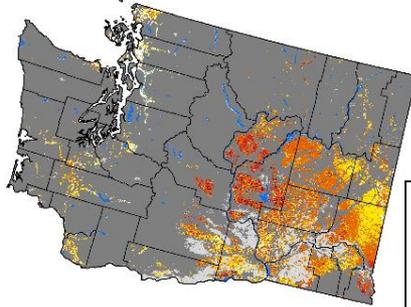
Complete view

Vegetation Drought Response Index
Croplands: Washington

October 6, 2008

Vegetation Condition

- Extreme Drought
- Severe Drought
- Moderate Drought
- Pre-Drought
- Near Normal
- Unusually Moist
- Very Moist
- Extremely Moist
- Other landcover
- Out of Season
- Water



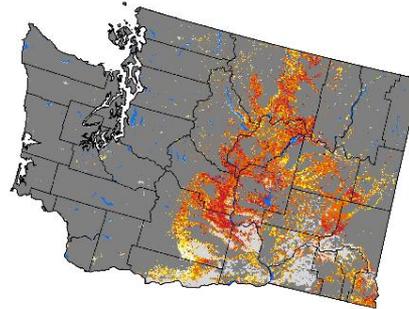
Cropland view

Vegetation Drought Response Index
Rangelands: Washington

October 6, 2008

Vegetation Condition

- Extreme Drought
- Severe Drought
- Moderate Drought
- Pre-Drought
- Near Normal
- Unusually Moist
- Very Moist
- Extremely Moist
- Other landcover
- Out of Season
- Water



Rangeland view



USGS



RMA



2. VegDRI Area Statistics (% area) (currently available at state-level only)

Complete	Extreme Drought	Severe Drought	Moderate Drought	Pre-Drought	Near Normal	Unusually Moist	Very Moist	Extremely Moist
08/10/20	3.26	19.72	38.22	21.21	10.63	0.45	0.09	0.02
08/10/06	1.13	11.07	30.59	28.49	21.12	0.65	0.22	0.11
08/09/22	2.12	16.63	33.67	24.69	15.33	0.43	0.16	0.06
08/09/08	1.45	11.05	29.17	28.21	21.94	0.52	0.33	0.05
08/08/25	0.73	5.98	22.69	29.71	31.85	1.00	0.38	0.27
08/08/11	0.72	5.21	21.82	29.75	34.18	1.10	0.34	0.26
08/07/28	0.86	5.84	22.77	32.99	30.35	1.13	0.37	0.22
08/07/14	0.83	5.75	23.07	32.84	28.35	0.92	0.45	0.09
08/06/30	1.37	6.90	23.51	32.26	30.58	0.88	0.28	0.08
08/06/16	1.22	4.34	17.72	32.90	37.02	1.07	0.45	0.31
08/06/02	1.00	3.89	15.67	31.62	36.52	0.99	0.45	0.20
08/05/19	1.01	3.83	15.48	29.98	29.29	0.72	0.26	0.21
08/05/05	0.86	3.57	12.29	23.21	22.22	0.49	0.15	0.14
07/10/08	0.48	4.93	20.17	31.21	31.85	1.01	0.23	0.13

- Summarize the % area of each VegDRI class for ‘current’ map and all prior dates in the growing season.
- Specific tables available for rangeland and cropland.
- Tables are currently available only at state level.



3. Change Maps

3 Types:

1) Prior period

ex. - Sep 4, 2007 vs. Sep 10, 2007

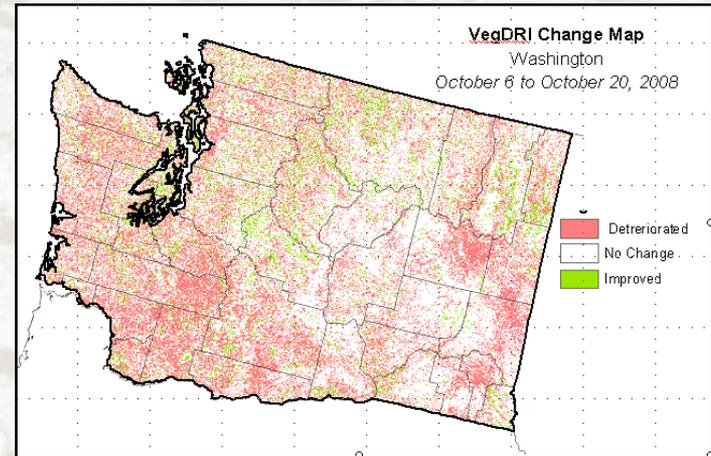
2) Same period from the prior year or a specific year in past

(* currently not available)

ex. – Sep 24, 2007 vs. Sep 24, 2006

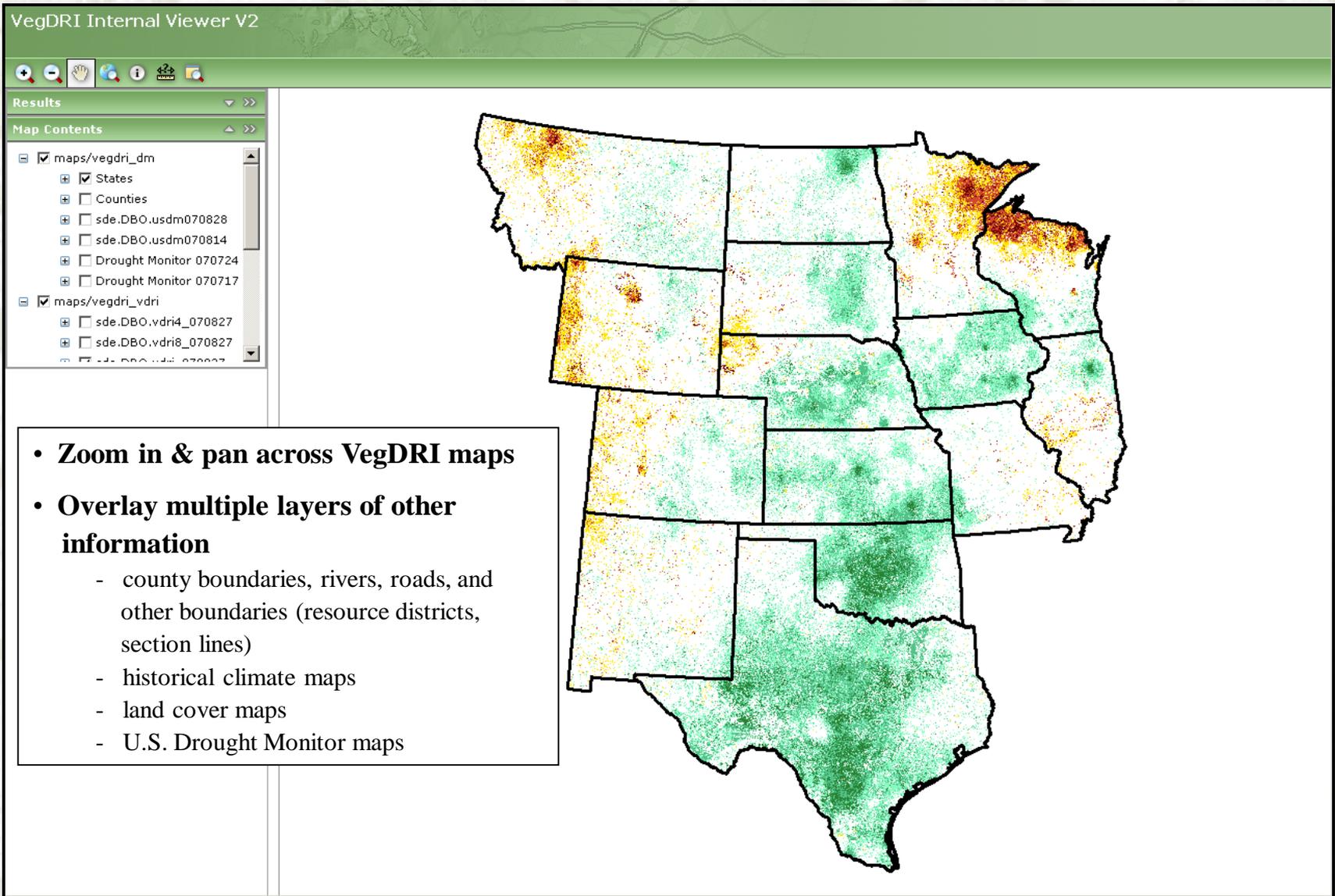
3) Historical average (* currently not available)

ex. – Sep 24, 2007 vs. average for Sep 24 (1989
through 2006)



6. Dynamic Map Viewer (in development)

VegDRI Internal Viewer V2



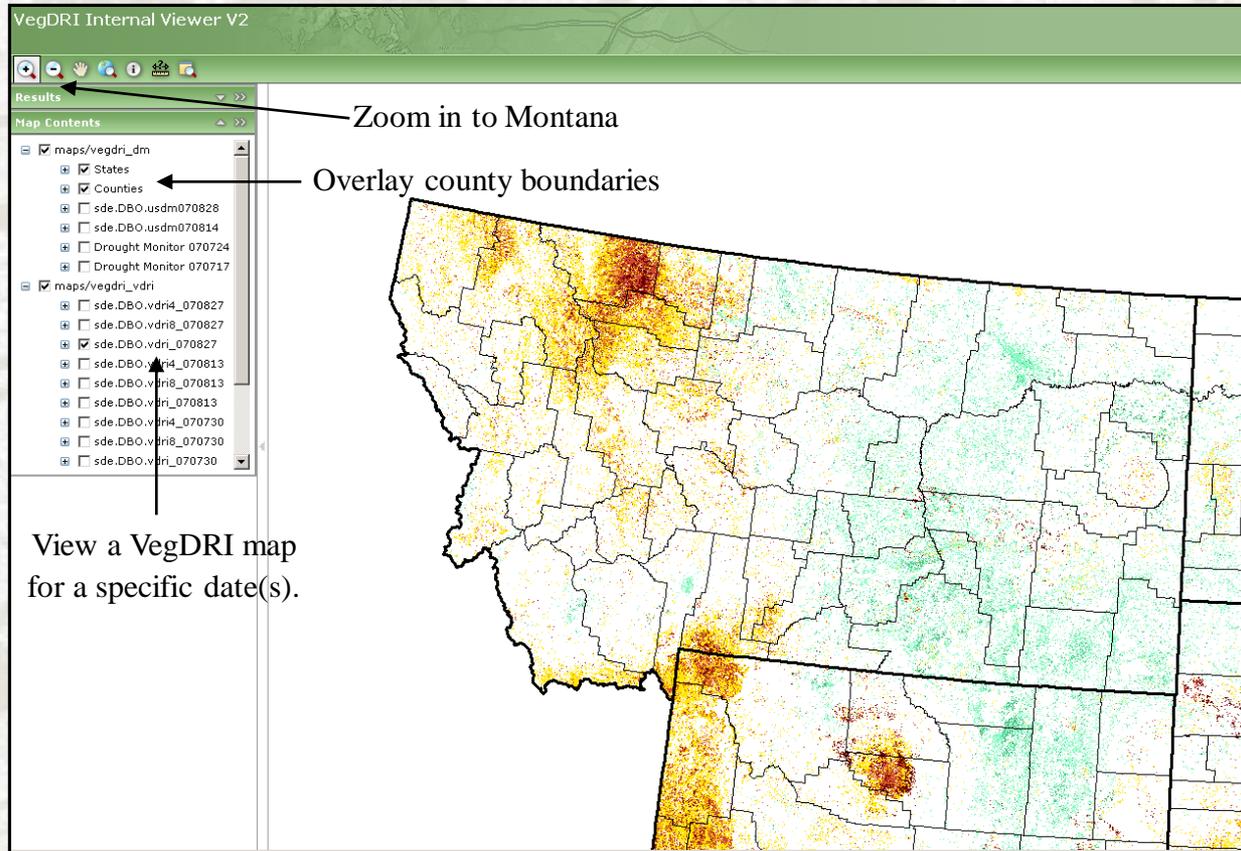
Results >>>

Map Contents <<<

- maps/vegdrv_dm
 - States
 - Counties
 - sde.DBO.usdm070828
 - sde.DBO.usdm070814
 - Drought Monitor 070724
 - Drought Monitor 070717
- maps/vegdrv_vdri
 - sde.DBO.vdri4_070827
 - sde.DBO.vdri8_070827
 - sde.DBO.vdri_070827

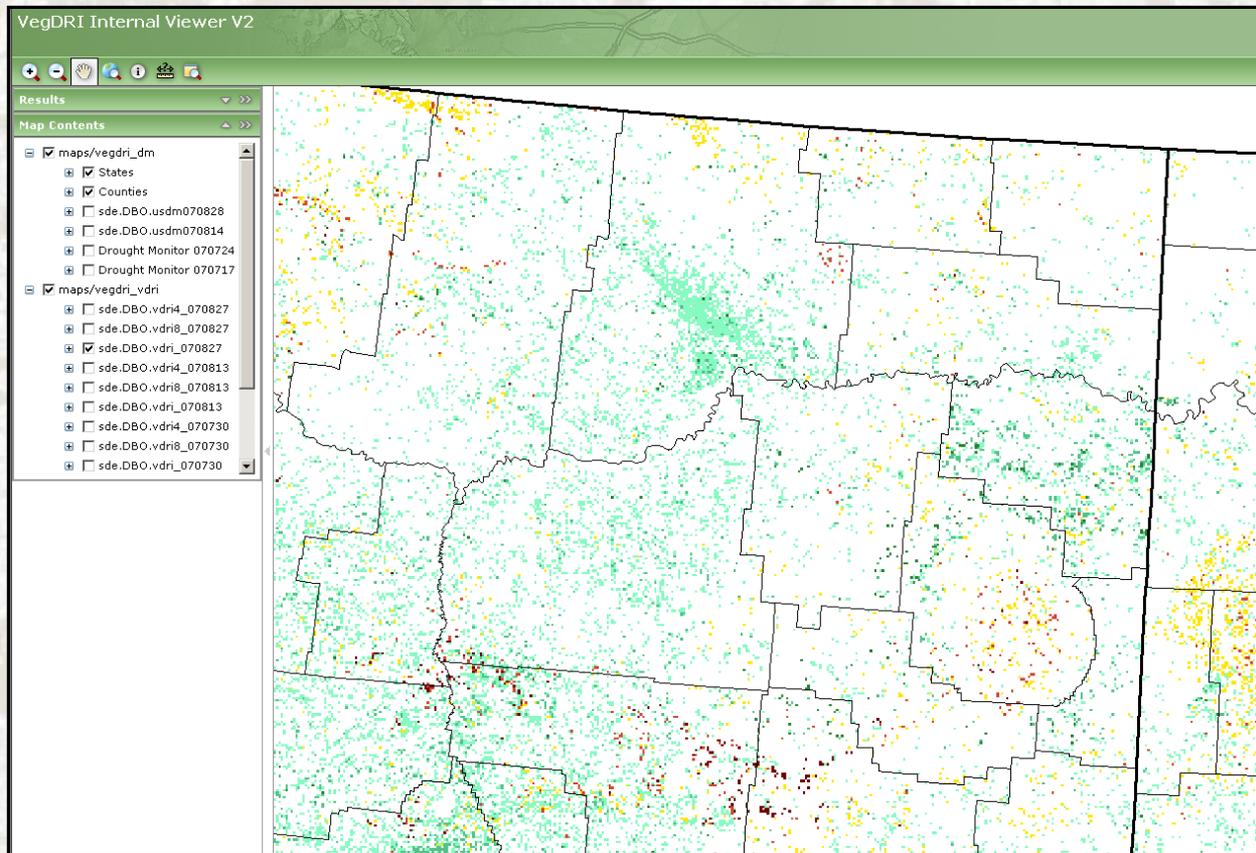
- **Zoom in & pan across VegDRI maps**
- **Overlay multiple layers of other information**
 - county boundaries, rivers, roads, and other boundaries (resource districts, section lines)
 - historical climate maps
 - land cover maps
 - U.S. Drought Monitor maps

6. Dynamic Map Viewer (in development)



The user customizes the view of the map for their specific needs and interests.

6. Dynamic Map Viewer (in development)



Capability to visualize information at the local level for a county or multiple counties.

For more information about VegDRI, please
contact:

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