



Extension Agronomy

eUpdate

11/21/2014

These e-Updates are a regular weekly item from K-State Extension Agronomy and Steve Watson, Agronomy e-Update Editor. All of the Research and Extension faculty in Agronomy will be involved as sources from time to time. If you have any questions or suggestions for topics you'd like to have us address in this weekly update, contact Steve Watson, 785-532-7105 swatson@ksu.edu, Jim Shroyer, Crop Production Specialist 785-532-0397 jshroyer@ksu.edu, or Curtis Thompson, Extension Agronomy State Leader and Weed Management Specialist 785-532-3444 cthompso@ksu.edu.

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1. Chloride as a topdressing nutrient for wheat

With wheat prospects looking reasonably good so far this season in many areas of the state, producers may be wondering if it would pay to add chloride to their topdressing blend. Chloride is a highly mobile nutrient in soils so split or topdress application may be beneficial, especially in regions of sufficient precipitation or with coarse texture soils that may cause leaching.

One of the main benefits from good chloride (Cl) nutrition is the improvement in overall disease resistance in wheat. Wheat response to chloride is usually expressed in improved color, suppression of fungal diseases, and increased yield. It is difficult to predict whether chloride would significantly increase wheat yields unless there has been a recent soil test analysis for this nutrient. Chloride fertilization based on soil testing is slowly becoming more common in Kansas.

As with nitrate and sulfate, chloride soil testing is recommended using a 0-24" profile sample. More field testing is needed, particularly in western Kansas, to determine the extent of the chloride-deficient areas, and to improve soil test correlations and calibrations. But based on current data, the probability of a response to Cl in dryland wheat production in central Kansas is higher than in western Kansas.

The interpretation of the Cl test and corresponding fertilizer recommendations for wheat are given in the table below. Chloride fertilizer is recommended when the soil test is below 6 ppm, or 45 pounds soil chloride in the 24-inch sample depth. Dry or liquid fertilizer sources are all plant available immediately. Potassium chloride (potash) and ammonium chloride are the most commonly available and widely used fertilizer products, though other products such as calcium, magnesium and sodium chloride can also be used.

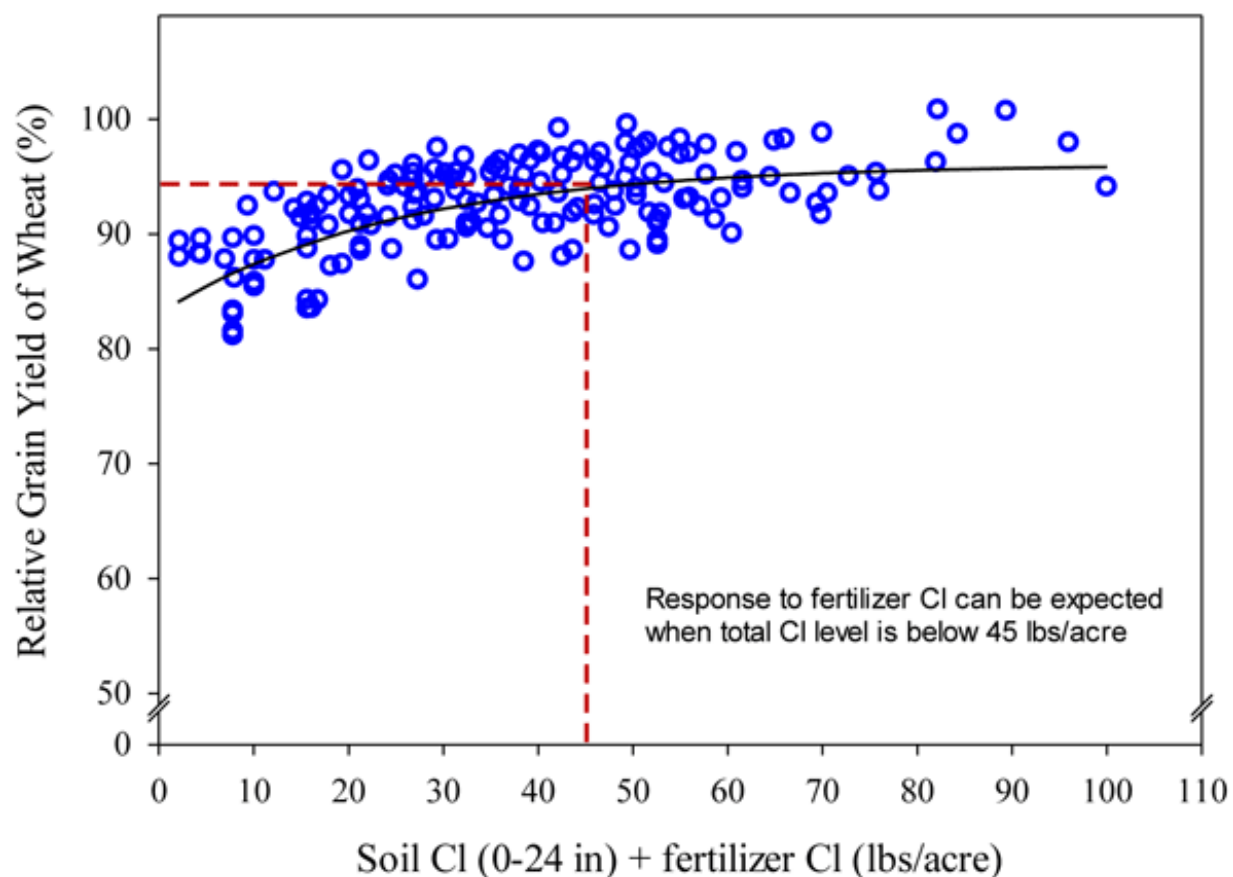


Figure 1. Relative wheat grain yield as affected by total chloride supply (soil + fertilizer) in Kansas.

Soil Test Chloride Interpretations for Wheat in Kansas			
	Soil Chloride in a 0-24 inch sample		Chloride Recommended
Category	lbs/acre	ppm	lbs Cl/acre
Low	<30	<4	20
Medium	30-45	4-6	10
High	>45	>6	0

Deficiency symptoms appear as leaf spotting and are referred to as physiological leaf spot.

K-State has done considerable research on Cl applications to wheat since the early 1980's, mostly in the eastern half of the state. Results have varied, but there have been economic yield responses in almost all cases where soil test Cl levels have been less than 30 lbs/acre. Deficiencies were most likely to be found on fields with no history of potash (KCl) applications. Early studies showed that there are variety differences in response to Cl, but no recent studies have been done on this.

For more information, see "Chloride in Kansas: Plant, Soil, and Fertilizer Considerations," MF2570:
www.ksre.ksu.edu/bookstore/pubs/MF2570.pdf

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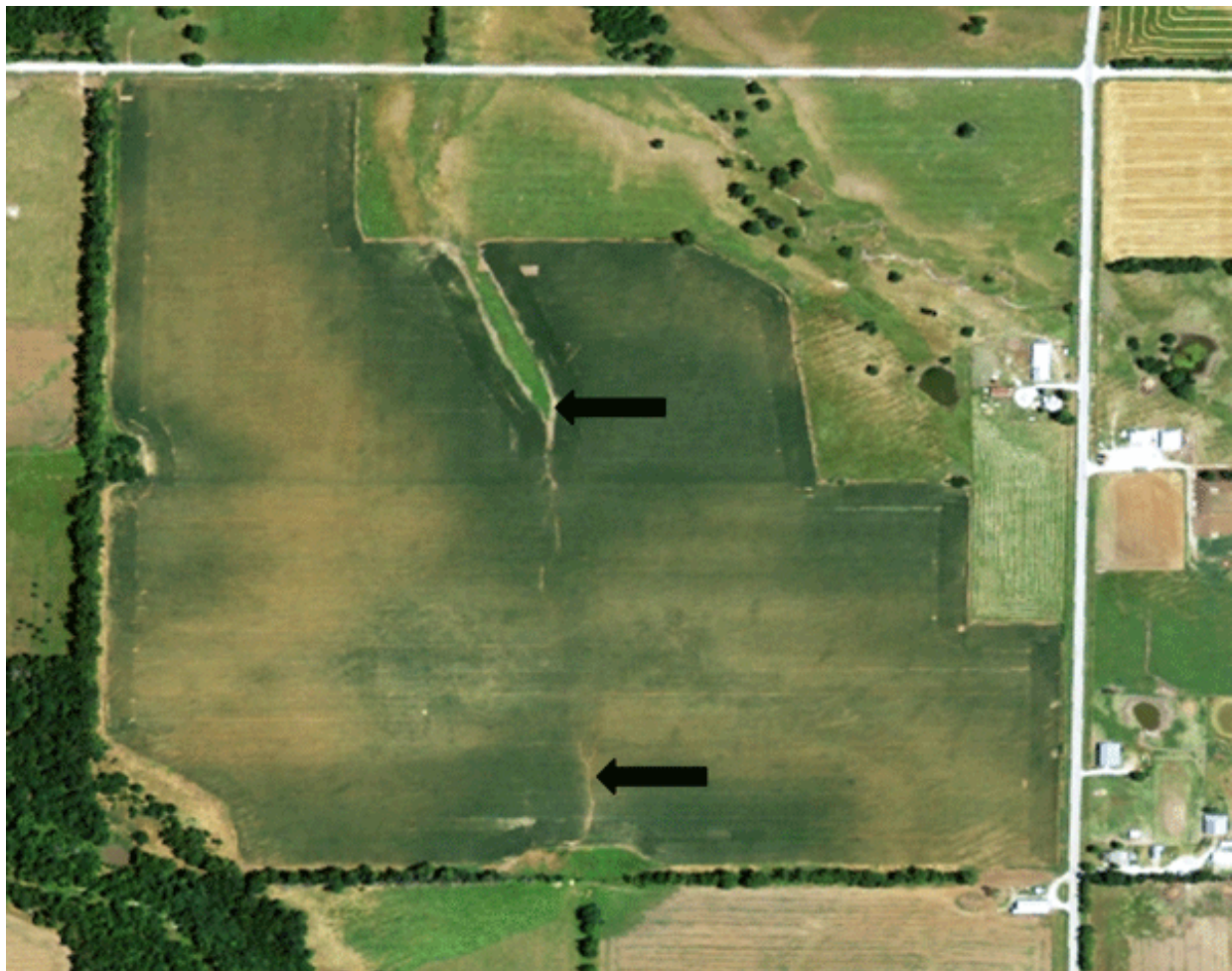
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2. High-resolution imagery and terrain maps help identify erosion-vulnerable areas of fields

Crop production in Southeast Kansas is challenging because of the shallow topsoil, underlain with a dense, unproductive clay layer. Concerns for topsoil loss have shifted production systems to reduced tillage or conservation management practices. However, nutrient and sediment loss is still a problem in the high-rainfall area.

To improve crop production and further adoption of conservation practices, identification of vulnerable areas of fields is needed. Publicly available high-resolution imagery products and terrain maps can provide information on field conditions. This research explores within-field variability of farm production fields and uses online databases to collect information on vegetation and topography.

A 110-acre production field (Wagstaff silty clay loam soil) in southeast Kansas was selected in cooperation with a producer. This field has been in a long-term corn/wheat/soybean rotation. Waterways drain the field to the south and north (Figure 1).



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Figure 1. USDA National Agricultural Imagery Program remote image from early summer 2012 of a crop production field in southeast Kansas. Arrows indicate waterways draining the field.

Yield and plant growth information were collected at harvest. High-resolution imagery was downloaded through the USDA National Agricultural Imagery Program (NAIP) and elevation data and orthoimagery were downloaded from the U.S. Geological Survey (USGS). Plant canopy coverage was analyzed using ArcGIS with Spatial Analyst (ESRI, Redlands, CA). NAIP 4-band imagery for the production field was collected from June 8 through July 24, 2012 and was used to calculate the normalized difference vegetation index (NDVI) (Figure 2). The NDVI indicates the uneven crop growth within the field, with areas of sparse (pink-orange) and dense (green) crop canopy growth (Figure 2).



Figure 2. Calculation of normalized difference vegetation index (NDVI) from USDA National Agricultural Imagery Program imagery for the crop production field.

Digital elevation maps (DEMs) were used to calculate surface curvature of the field and perform terrain analysis using ArcGIS and TauDEM (Utah State University). Although the field had only a moderate slope (1–3%), calculation of surface curvature indicated a ridge through the center of the field (Figure 3) that coincided with areas of thin vegetation identified on the NDVI map.



Figure 3. Curvature of the field surface derived from USGS digital elevation map data.

Soybean yield was reduced in areas of low vegetation (Figure 4). Analysis of the DEM allowed determination of areas of the field that held water and areas of high potential runoff where soil loss was likely (Figure 5). These areas could benefit by altered management practices to slow water runoff from the field and keep topsoil and nutrients on the field.

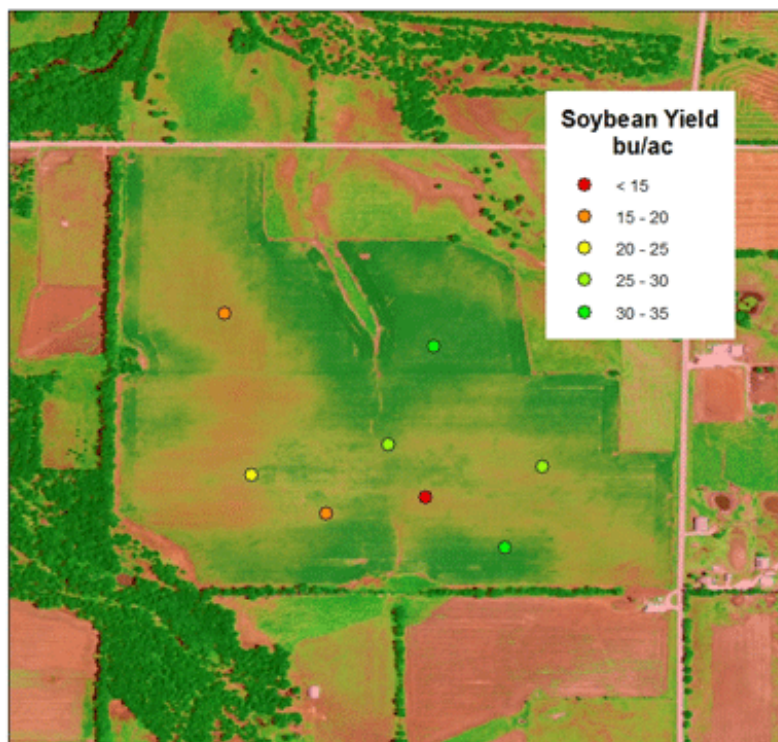


Figure 4. Soybean yield in 2013 from hand-harvested subplots within the field.



Figure 5. Terrain analysis of the crop field showing areas of high runoff potential.

Given the limited topsoil depth, high potential for erosion, and negative impact of clay content on crop yields, development of conservation practices to conserve and build topsoil are critical. Transitioning to conservation management practices such as reduced tillage and use of cover crops has been shown to improve the soil microenvironment and enhance the long-term sustainability of the agronomic production system. These conservation practices are being optimized for southeast Kansas and implemented in research and production fields.

This kind of information can be used to develop protocols for alternative management to protect vulnerable areas and reduce topsoil loss. We are also developing a simple hydrological model use the Hydrologic Simulation Program – Fortran (HSPF) and the Soil Water Assessment Tool (SWAT) to further delineate erosion and impact on crop performance.

Gretchen Sassenrath, Agronomist, Southeast Agricultural Research Center
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3. Canola Day, November 25, Alfalfa Co., Oklahoma

K-State Research and Extension will be part of a Canola Day being held on Tuesday, November 25 at 10 a.m. The location of the field day is rural address Highway 8 and Noble Road in Alfalfa County, Okla., 3 miles south of Kiowa, Kan. Inclement weather location will be the office of Williams AG, LLC, 1310 Main St. in Kiowa.

Speakers at the Canola Day:

- Mike Stamm: K-State Research and Extension
- Heath Sanders: Great Plains Canola Association
- Josh Bushong: Oklahoma State University
- Bob Schrock: Producer
- Randy Plunkett: United Suppliers Corp.
- Allen Taylor: Production/Nutrient Management, Verdesian Life Sciences, LLC
- Chad Asmus: BASF

Topics:

- Planting Dates/Row Spacing/Residue Management Practices: Josh Bushong, Bob Schrock, and Heath Sanders
- Canola Varieties: Mike Stamm
- Insecticide/Herbicide Options: Randy Plunkett and Heath Sanders
- In Row Dry Fertilizer Rates/Phosphorus Management: Allen Taylor
- Blackleg Dangers/Fungicide Decisions: Chad Asmus
- Use of Growth Regulators to Help Slow Fall Canola Growth: Heath Sanders
- Grid Sampling/Soil Analysis/Variable Rate Technology/Nutrient Replacement Options: Bob Schrock
- Tissue Sampling/Micronutrient Options: Allen Taylor and Bob Schrock

Lunch will be provided by Williams AG, LLC. Please RSVP by Nov. 21 to Williams AG, LLC at:

Cell: 620-825-6094 (Cindra)

Office: 620-825-4310

Mike Stamm, Canola Breeder
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4. K-State Soybean Production Schools scheduled for early February



A series of four K-State Soybean Production Schools will be offered in early February 2015 to provide in-depth training targeted for soybean producers and key stakeholders. The schools will be held at four locations around the state. The schools will be sponsored by Kansas Soybean Commission.

The one-day schools will cover a number of issues facing soybean growers: irrigation management; weed control strategies; crop production practices; nutrient and soil fertility management; and insect and disease management.

The dates and locations of the K-State Soybean Production Schools are:

Feb. 3 – Salina – Ambassador Hotel, 1616 W. Crawford St.
Contact Information: Tom Maxwell, Central Kansas Extension District.
tmaxwell@ksu.edu - phone 785-309-5850

Feb. 4 – Derby – Derby Welcome/Senior Center, 611 N Mulberry Rd.
Contact Information: Zach Simon, Sedgwick County Extension.
zsimon@ksu.edu - phone 316-660-0100

Feb. 5 – Independence – Civic Center, 410 North Penn Ave.
Contact Information: Jeri Sigle, Wildcat Extension District.
jlsigle@ksu.edu - phone 620-331-2690

Feb. 6 – Sabetha – North Ridge Church, 316 Lincoln St.
Contact Information: David Hallauer, Meadowlark District and Matthew Young, Brown County Extension.
David Hallauer: dhallaue@ksu.edu - phone 785-863-2212
Matthew Young: mayoung@ksu.edu - phone 785-742-7871

More information on the final program for each Soybean School will be provided in future issues of the Agronomy eUpdate.

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To see the content of last-year's 2014 K-State Soybean Schools, go to:
<http://www.agronomy.k-state.edu/extension/crop-production/soybeans/soybean-schools/2014-soybean-school/index.html>

5. Comparative Vegetation Condition Report: November 4 - 17

K-State's Ecology and Agriculture Spatial Analysis Laboratory (EASAL) produces weekly Vegetation Condition Report maps. These maps can be a valuable tool for making crop selection and marketing decisions.

Two short videos of Dr. Kevin Price explaining the development of these maps can be viewed on YouTube at:

<http://www.youtube.com/watch?v=CRP3Y5Nlggw>

<http://www.youtube.com/watch?v=tUdOK94efxc>

The objective of these reports is to provide users with a means of assessing the relative condition of crops and grassland. The maps can be used to assess current plant growth rates, as well as comparisons to the previous year and relative to the 25-year average. The report is used by individual farmers and ranchers, the commodities market, and political leaders for assessing factors such as production potential and drought impact across their state.

NOTE TO READERS: The maps below represent a subset of the maps available from the EASAL group. If you'd like digital copies of the entire map series please contact Nan An at nanan@ksu.edu and we can place you on our email list to receive the entire dataset each week as they are produced. The maps are normally first available on Wednesday of each week, unless there is a delay in the posting of the data by EROS Data Center where we obtain the raw data used to make the maps. These maps are provided for free as a service of the Department of Agronomy and K-State Research and Extension.

The maps in this issue of the newsletter show the current state of photosynthetic activity in Kansas, the Corn Belt, and the continental U.S., with comments from Mary Knapp, service climatologist:

Kansas Vegetation Condition

Period 46: 11/04/2014 - 11/17/2014

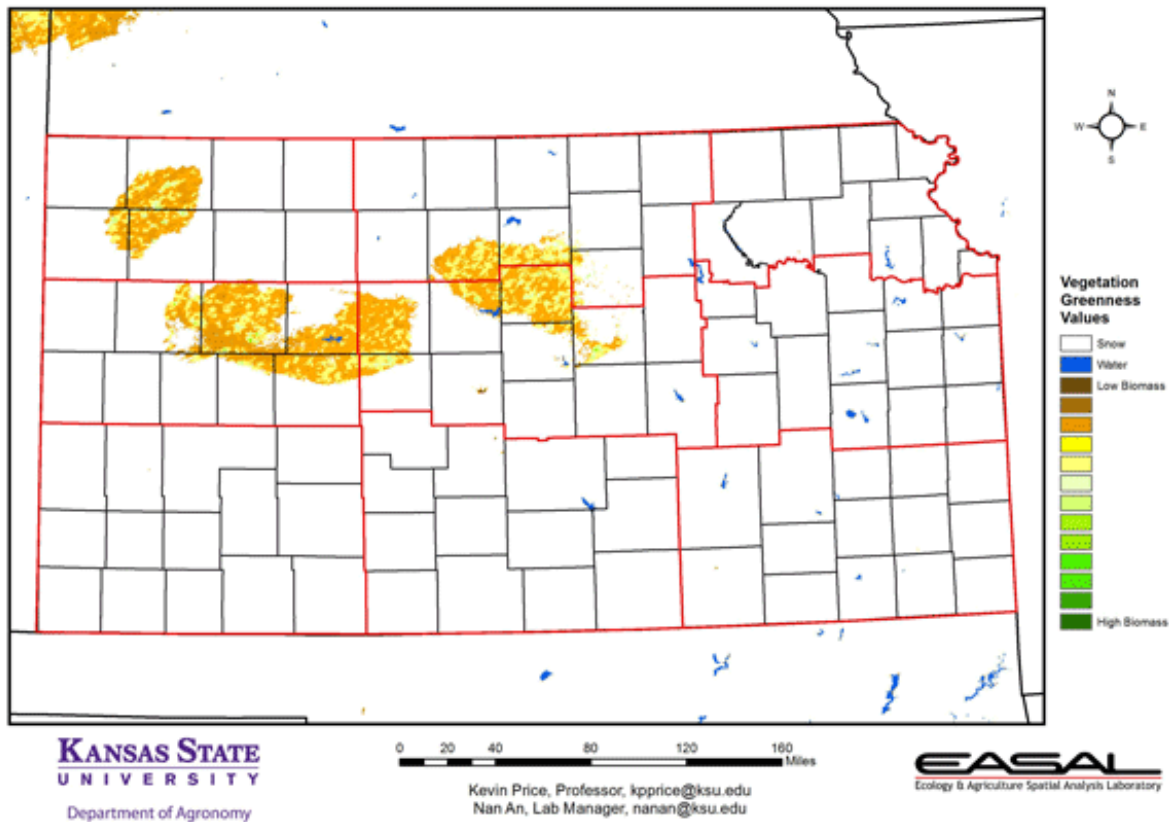


Figure 1. The Vegetation Condition Report for Kansas for November 4 – 17 from K-State’s Ecology and Agriculture Spatial Analysis Laboratory shows that snow was a factor across much of the state during this two-week period. Unfortunately, snow depths were limited. The greatest snowfall was 2-4 inches, with many locations seeing only a trace of accumulation. The moisture content was also limited, generally less than a quarter of an inch.

Kansas Vegetation Condition Comparison
Early-November 2014 compared to the Early-November 2013

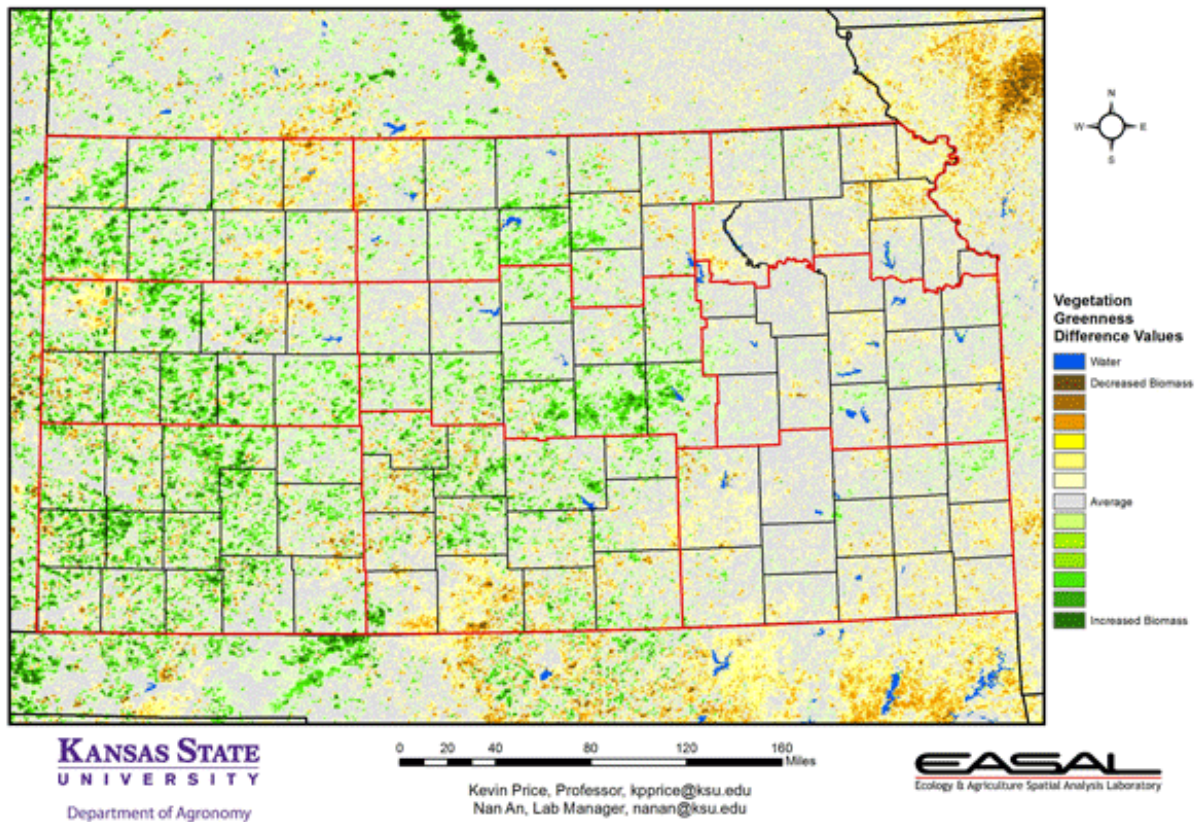


Figure 2. Compared to the previous year at this time for Kansas, the current Vegetation Condition Report for November 4 – 17 from K-State’s Ecology and Agriculture Spatial Analysis Laboratory shows that vegetative activity was higher this year. Mild temperatures with adequate moisture favored plant growth even in areas where drought persists.

Kansas Vegetation Condition Comparison

Early-November 2014 compared to the 25-Year Average for Early-November

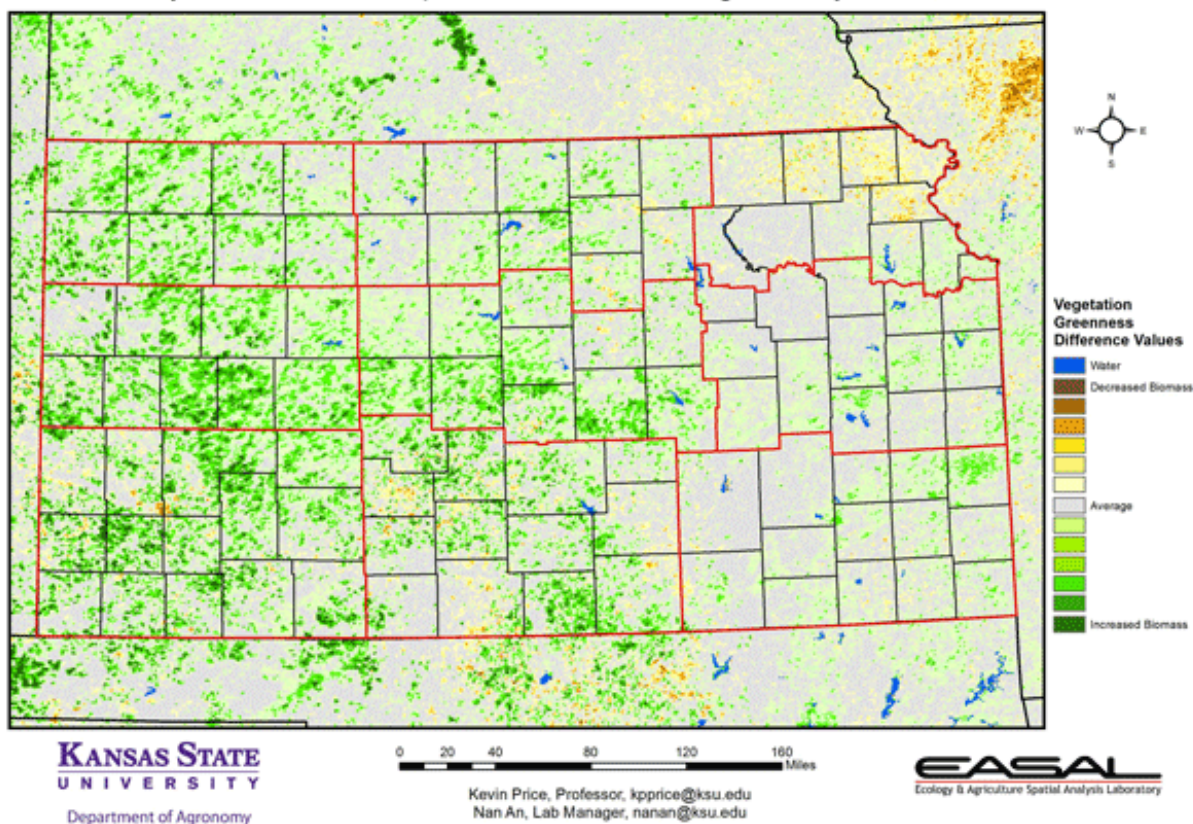


Figure 3. Compared to the 25-year average at this time for Kansas, this year's Vegetation Condition Report for November 4 – 17 from K-State's Ecology and Agriculture Spatial Analysis Laboratory shows biomass production was above average in most of the state. The greatest departures can be seen in west central and central Kansas.

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U.S. Corn Belt Vegetation Condition

Period 46: 11/04/2014 - 11/17/2014

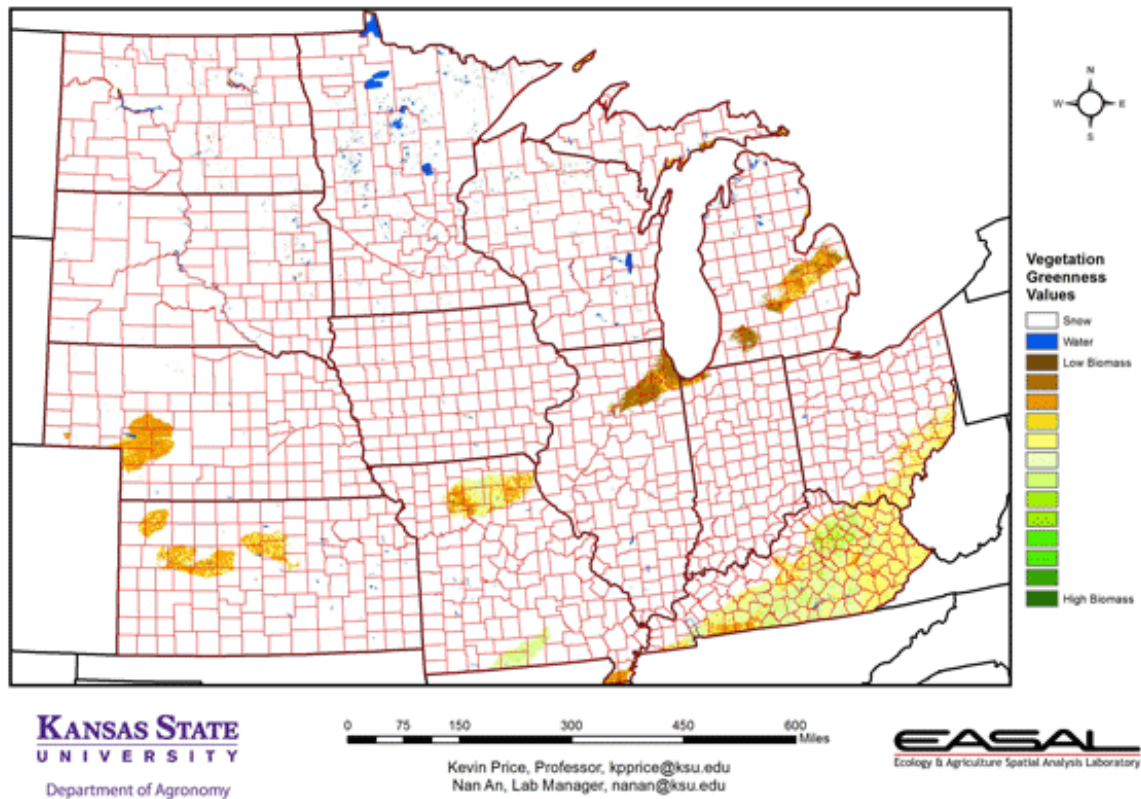


Figure 4. The Vegetation Condition Report for the Corn Belt for November 4 – 17 from K-State’s Ecology and Agriculture Spatial Analysis Laboratory shows that only a few spots missed snow during the period. The heaviest amounts were in the northern areas of the region. In the Northern Great Lakes region, which includes northern Minnesota, northern Wisconsin and the Upper Peninsula of Michigan, 92 percent of the area has snow cover, with an average depth of 5 inches and a maximum depth of 32 inches.

U.S. Corn Belt Vegetation Condition Comparison
Early-November 2014 Compared to Early-November 2013

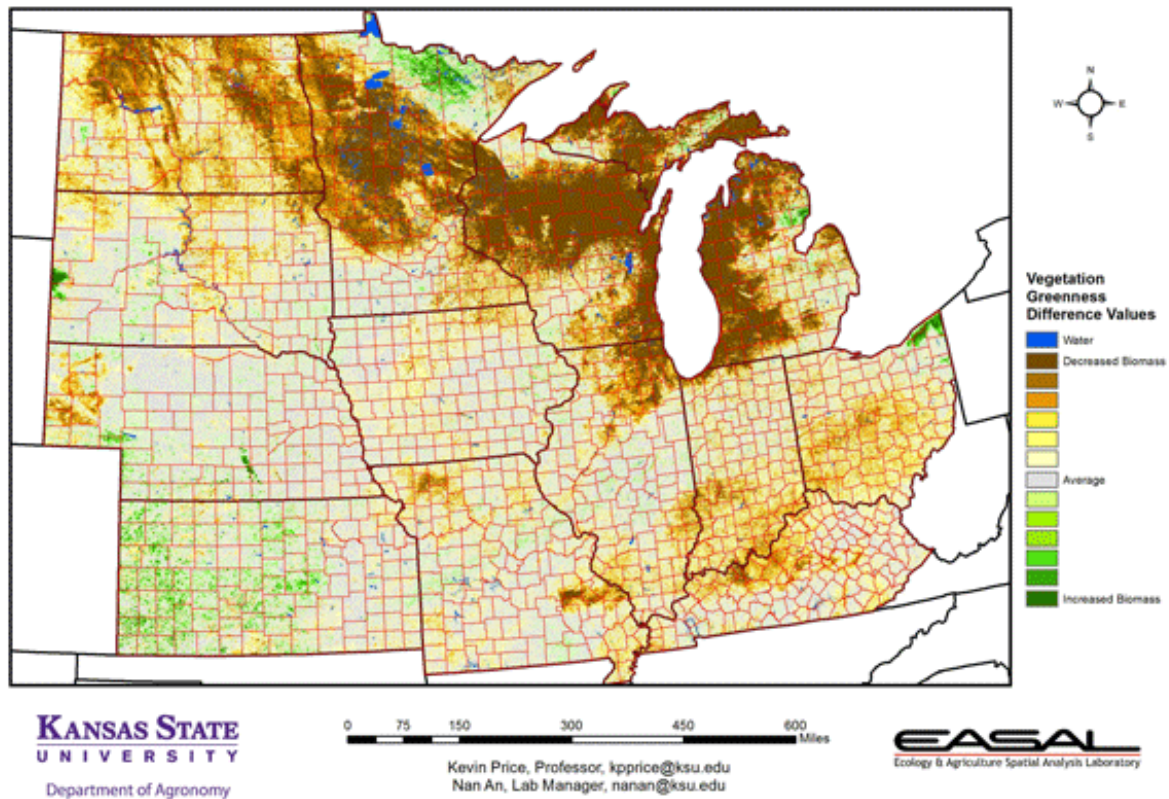


Figure 5. The comparison to last year in the Corn Belt for the period November 4 – 17 from K-State’s Ecology and Agriculture Spatial Analysis Laboratory shows that photosynthetic activity is much lower across the northern portions of the region. Much of this is due to the snow cover in the area. In the Northern Plains snow cover is at 91 percent this year; last year the coverage was just 13 percent.

U.S. Corn Belt Vegetation Condition Comparison
 Early-November 2014 Compared to the 25-Year Average for Early-November

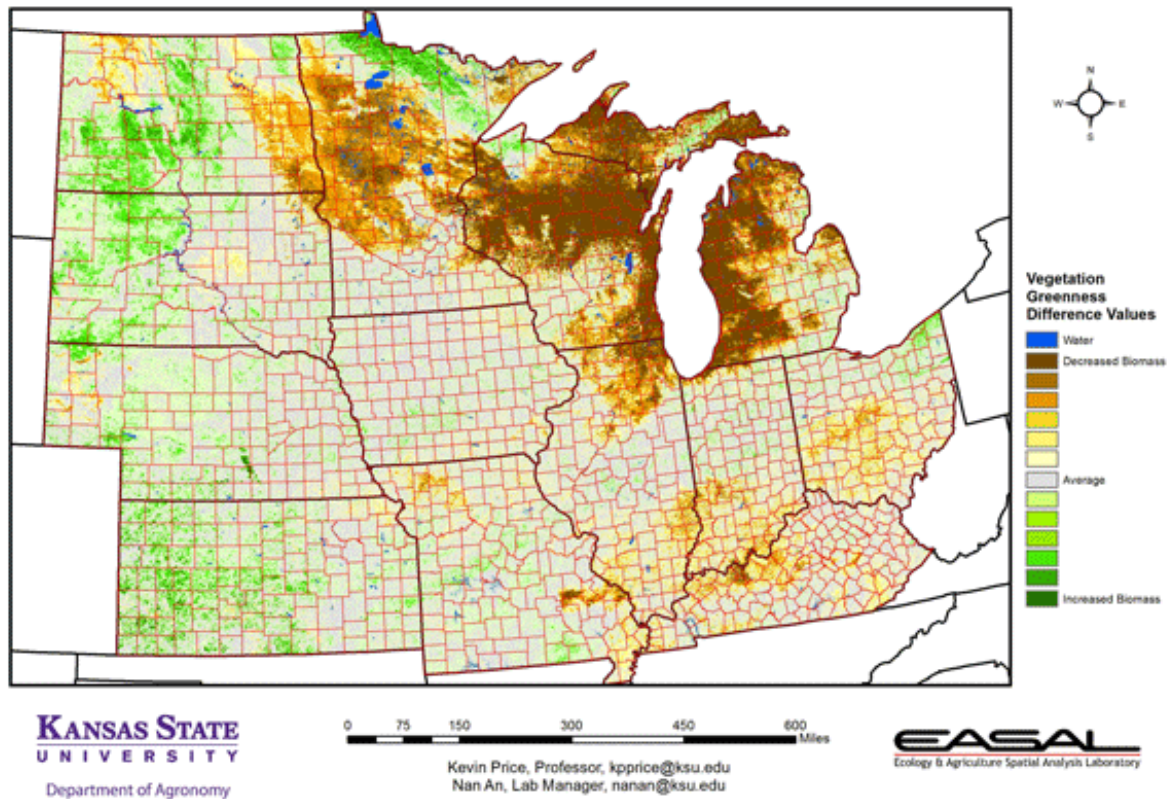


Figure 6. Compared to the 25-year average at this time for the Corn Belt, this year's Vegetation Condition Report for November 4 – 17 from K-State's Ecology and Agriculture Spatial Analysis Laboratory shows that the greatest increase in biomass production is in the western portion of the region. In the Great Lakes area of the Corn Belt, heavy snow cover has resulted in below-average photosynthetic activity.

Continental U.S. Vegetation Condition

Period 46: 11/04/2014 - 11/17/2014

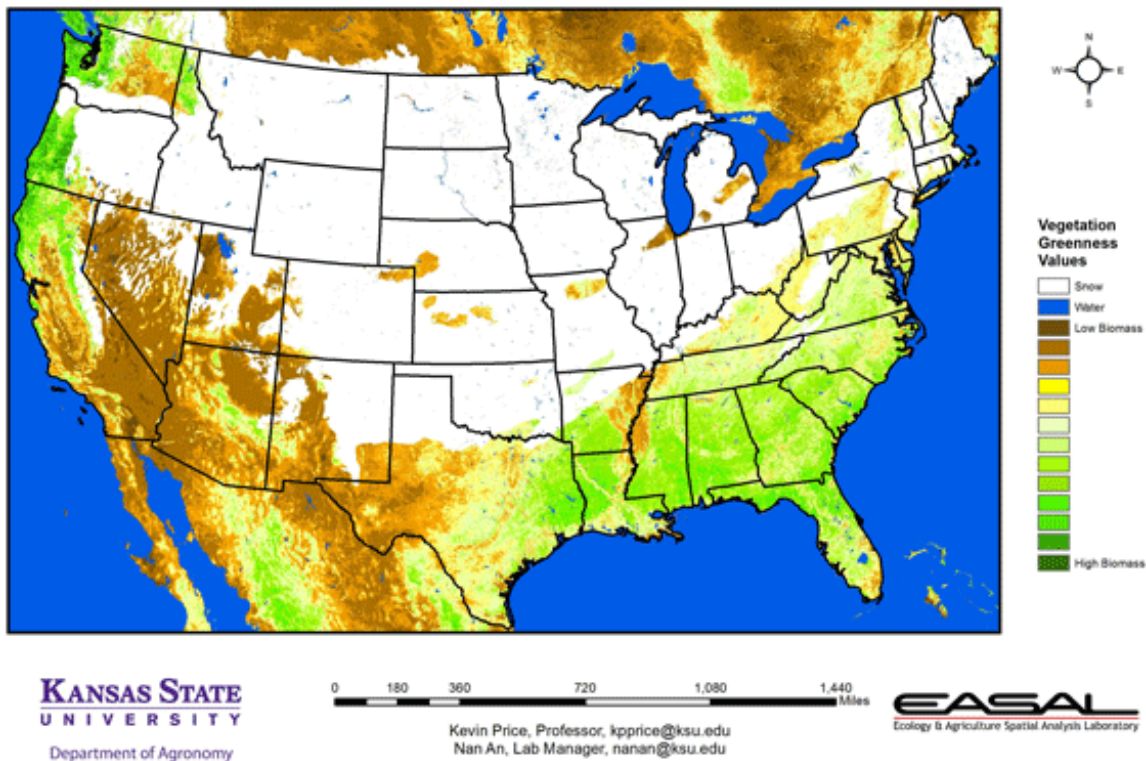


Figure 7. The Vegetation Condition Report for the U.S. for November 4 – 17 from K-State’s Ecology and Agriculture Spatial Analysis Laboratory shows that snow cover affected a good portion of the U.S. Most of the accumulation in the southern areas was light and melted quickly. It is noteworthy that parts of the West continue to have lower-than-normal snow pack for this time of year.

Continental U.S. Vegetation Condition Comparison
Early-November 2014 Compared to Early-November 2013

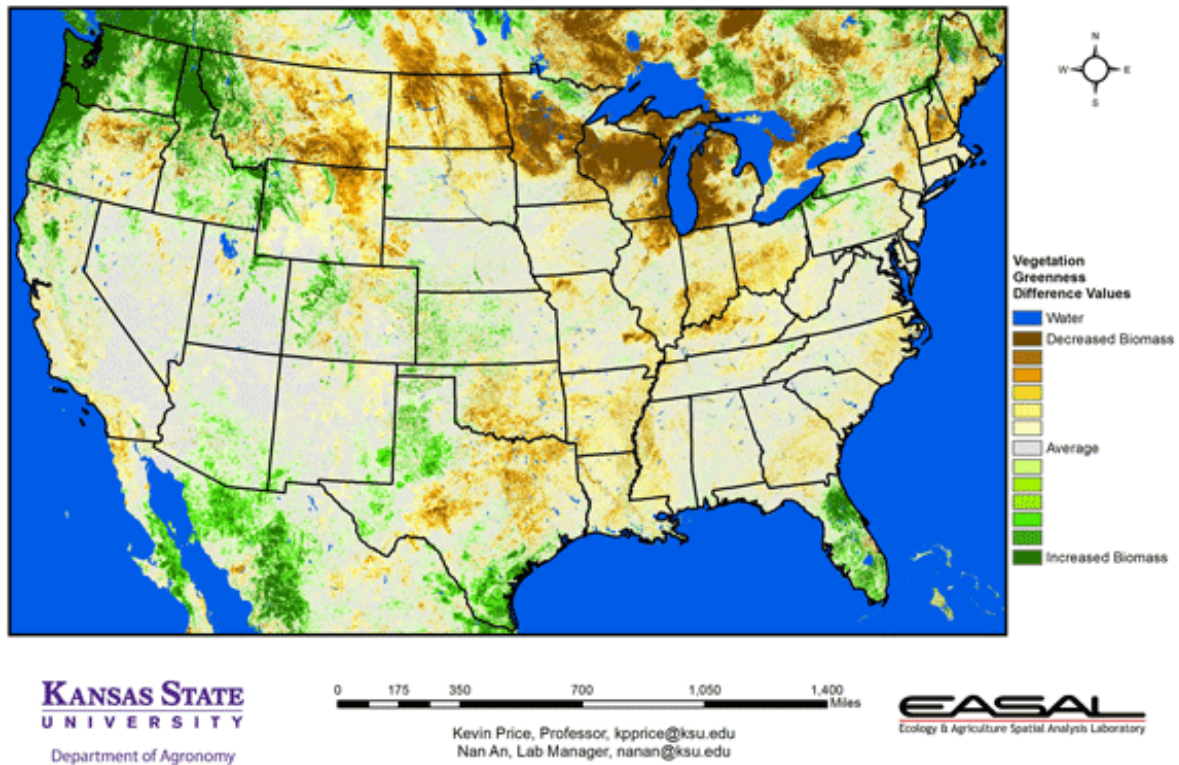


Figure 8. The U.S. comparison to last year at this time for the period November 4 – 17 from K-State’s Ecology and Agriculture Spatial Analysis Laboratory shows that the Pacific Northwest has the greatest increase in photosynthetic activity, while the upper Midwest has the greatest decrease. In the Northwest, snow cover is less than last year, and the average depth is a quarter of the average depth last year.

Continental U.S. Vegetation Condition Comparison
Early-November 2014 Compared to 25-year Average for Early-November

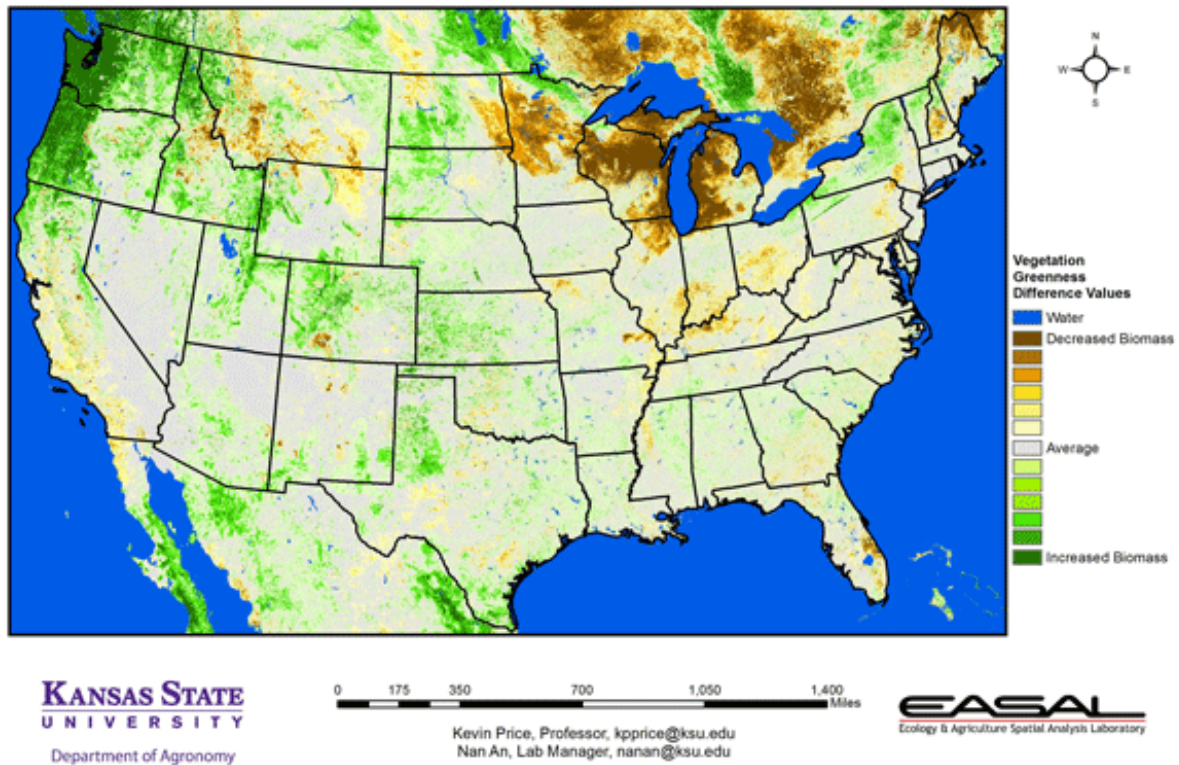


Figure 9. The U.S. comparison to the 25-year average for the period November 4 – 17 from K-State's Ecology and Agriculture Spatial Analysis Laboratory shows that the Pacific Northwest has the greatest increase in biomass production, while the Great Lakes region has the greatest decrease.

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