

# Flooding in Mississippi, June 2021

U.S. Department of Agriculture, National Agricultural Statistics Service

## Topsoil Moisture

NASA Remotely Sensed Surface Soil (topsoil) is defined as the top 2 inches (approximately 5 centimeters). The NASA SMAP 1km soil moisture measurements are volumetric soil moisture (i.e. volumetric water content in the soil). It is simply the ratio of water volume to soil volume.

Topsoil moisture above 0.4 cm<sup>3</sup>/cm<sup>3</sup> (40% water content) could be considered very wet.

Figure 1

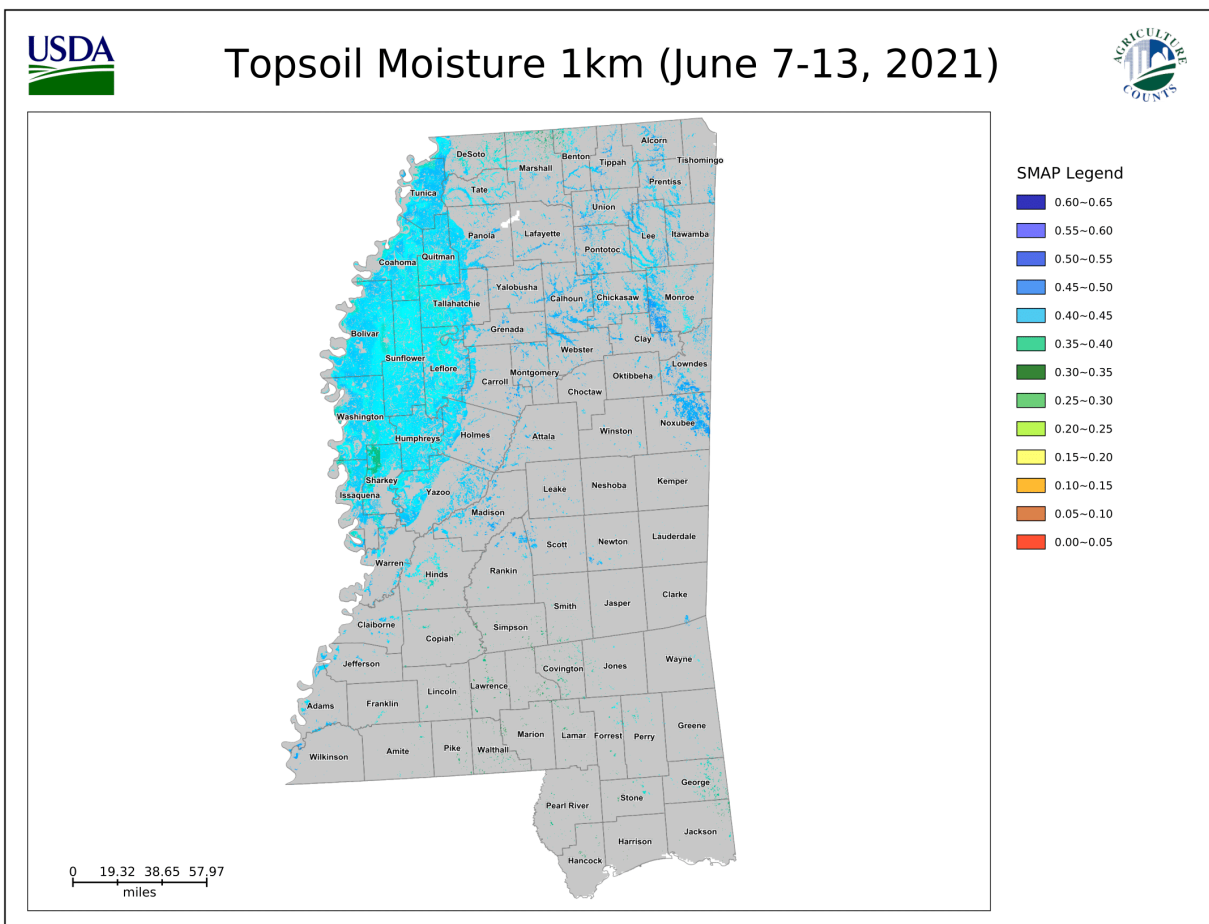


Table 1 identifies the specific crops (2020 Cropland Data Layer) that are planted in soils with greater than 40% topsoil moisture

Table 1

MS County	Corn		Cotton		Rice		Soybeans	
	Total Acreage (2020 Planted Acres)	Percentage of crop type > 0.4 Volumetric Soil Moisture	Total Acreage (2017 Census Harvested Acres)	Percentage of crop type > 0.4 Volumetric Soil Moisture	Total Acreage (2020 Planted Acres)	Percentage of crop type > 0.4 Volumetric Soil Moisture	Total Acreage (2020 Planted Acres)	Percentage of crop type > 0.4 Volumetric Soil Moisture
Bolivar	14,000	80.92%	13,680	79.56%	43,300	93.50%	301,500	89.88%
Carroll	8,200	100.00%	21,892	100.00%	N/A	N/A	8,400	100.00%
Clay	2,200	94.12%	N/A	N/A	N/A	N/A	10,500	86.70%
Coahoma	26,500	62.42%	91,135	60.61%	8500	82.09%	100,500	77.99%
Grenada	1,800	99.87%	N/A	N/A	N/A	N/A	N/A	N/A
Holmes	27,100	100.00%	43,979	100.00%	N/A	N/A	26,900	100.00%
Humphreys	21,900	98.93%	21,427	96.56%	8100	99.98%	84,900	99.28%
Lafayette	2,000	93.86%	3,143	98.73%	N/A	N/A	N/A	N/A
Leflore	49,800	56.08%	43,857	63.08%	12,200	95.03%	121,500	79.95%
Lowndes	10,900	99.69%	13,325	98.99%	N/A	N/A	13,000	97.13%
Noxubee	30,200	99.77%	23095	99.15%	N/A	N/A	9,600	100.00%
Panola	N/A	N/A	28,861	99.97%	9500	99.99%	38,600	100.00%
Pontotoc	2,600	98.60%	645	98.56%	N/A	N/A	25,300	99.46%
Quitman	6,500	26.85%	25,186	28.95%	14100	92.54%	90,000	82.64%
Sunflower	35,800	87.35%	20705	97.53%	18100	84.12%	248,000	86.31%
Tallahatchie	27,400	40.53%	44,082	51.04%	9700	96.68%	105,500	75.69%
Tippah	2,900	99.68%	3,395	99.65%	N/A	N/A	11,400	99.35%
Tunica	6,400	70.74%	33,434	86.86%	27600	99.63%	103,500	93.88%
Union	1,900	99.83%	N/A	N/A	N/A	N/A	22,800	99.52%
Washington	49,100	56.98%	22,758	83.83%	10200	99.64%	229,000	87.57%
Yalobusha	N/A	N/A	5,334	100.00%	N/A	N/A	4,500	100.00%

\*\*Total Acreage by state determined by official 2020 NASS estimates of planted acres for corn, rice, and soybeans and 2017 Census of Agriculture harvested acres for cotton. Crop type percentages determined by 2020 Cropland Data Layer.

## Topsoil Moisture Anomaly

The soil moisture anomaly (SMA) in CropCASMA is a measure of deviation of the current soil moisture value from the "normal" soil moisture level, which is represented by a historical average soil moisture value (from 2015 to current). The SMA of a given location is defined by the following formula:

$$SMA = \frac{SM - SM_m}{SM_m} \times 100\%$$

where SM and SM<sub>m</sub> denote current soil moisture value and the historical average soil moisture value of a given location.

Soil moisture anomaly above 30% could be considered very abnormal, which means there is 30% more soil moisture than normal conditions.

Figure 2

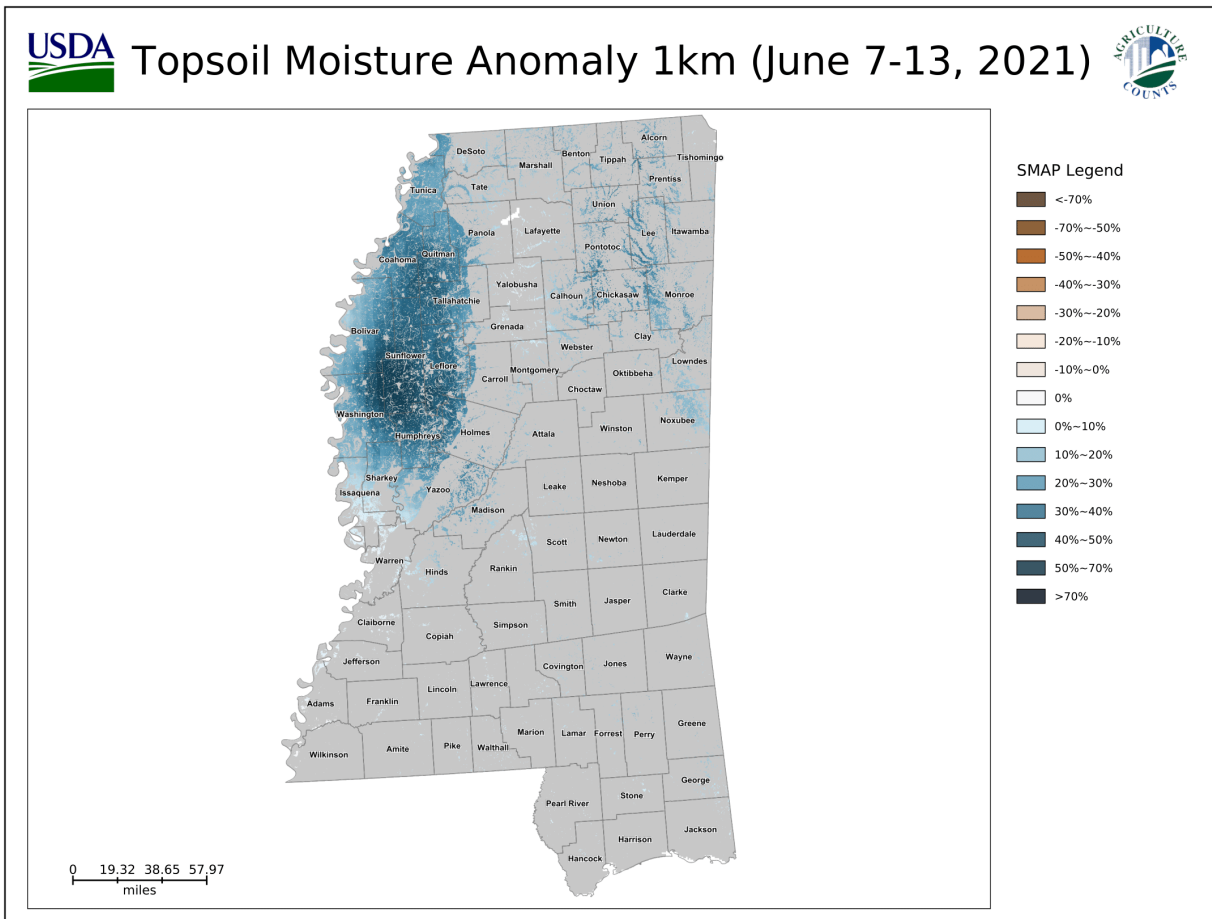


Table 2 identifies the specific crops (2020 Cropland Data Layer) in soils with greater than 30% greater soil moisture than normal conditions during the period from June 7 – 13, 2021.

Table 2

MS County	Corn		Cotton		Rice		Soybeans	
	Total Acreage (2020 Planted Acres)	Percentage of crop type > 30% Soil Moisture Anomaly	Total Acreage (2017 Census Harvested Acres)	Percentage of crop type > 30% Soil Moisture Anomaly	Total Acreage (2020 Planted Acres)	Percentage of crop type > 30% Soil Moisture Anomaly	Total Acreage (2020 Planted Acres)	Percentage of crop type > 30% Soil Moisture Anomaly
Bolivar	14,000	64.99%	13,680	24.66%	43,300	71.38%	301,500	54.48%
Carroll	8,200	59.25%	21,892	41.25%	N/A	N/A	8,400	51.41%
Clay	2,200	2.36%	N/A	N/A	N/A	N/A	10,500	7.46%
Coahoma	26,500	99.31%	91,135	96.53%	8500	96.20%	100,500	92.61%
Grenada	1,800	0.00%	N/A	N/A	N/A	N/A	N/A	N/A
Holmes	27,100	93.34%	43,979	91.32%	N/A	N/A	26,900	81.98%
Humphreys	21,900	99.17%	21427	98.13%	8100	99.97%	84,900	96.87%
Lafayette	2,000	0.01%	3,143	0.00%	N/A	N/A	N/A	N/A
Leflore	49,800	99.87%	43,857	99.92%	12,200	99.95%	121,500	98.85%
Lowndes	10,900	0.04%	13,325	0.04%	N/A	N/A	13,000	0.08%
Noxubee	30,200	0.00%	23095	0.00%	N/A	N/A	9,600	0.00%
Panola	N/A	N/A	28,861	58.63%	9500	86.54%	38,600	53.97%
Pontotoc	2,600	82.07%	645	52.51%	N/A	N/A	25,300	72.95%
Quitman	6,500	91.90%	25,186	99.32%	14100	80.45%	90,000	86.44%
Sunflower	35,800	100.00%	20705	100.00%	18100	100.00%	248,000	100.00%
Tallahatchie	27,400	91.27%	44,082	81.60%	9700	94.22%	105,500	88.45%
Tippah	2,900	33.88%	3,395	14.77%	N/A	20.22%	11,400	27.03%
Tunica	6,400	29.02%	33,434	12.74%	27600	2.29%	103,500	6.86%
Union	1,900	57.42%	N/A	N/A	N/A	N/A	22,800	43.07%
Washington	49,100	63.51%	22,758	55.75%	10200	65.92%	229,000	61.83%
Yalobusha	N/A	N/A	5,334	0.00%	N/A	N/A	4,500	0.00%

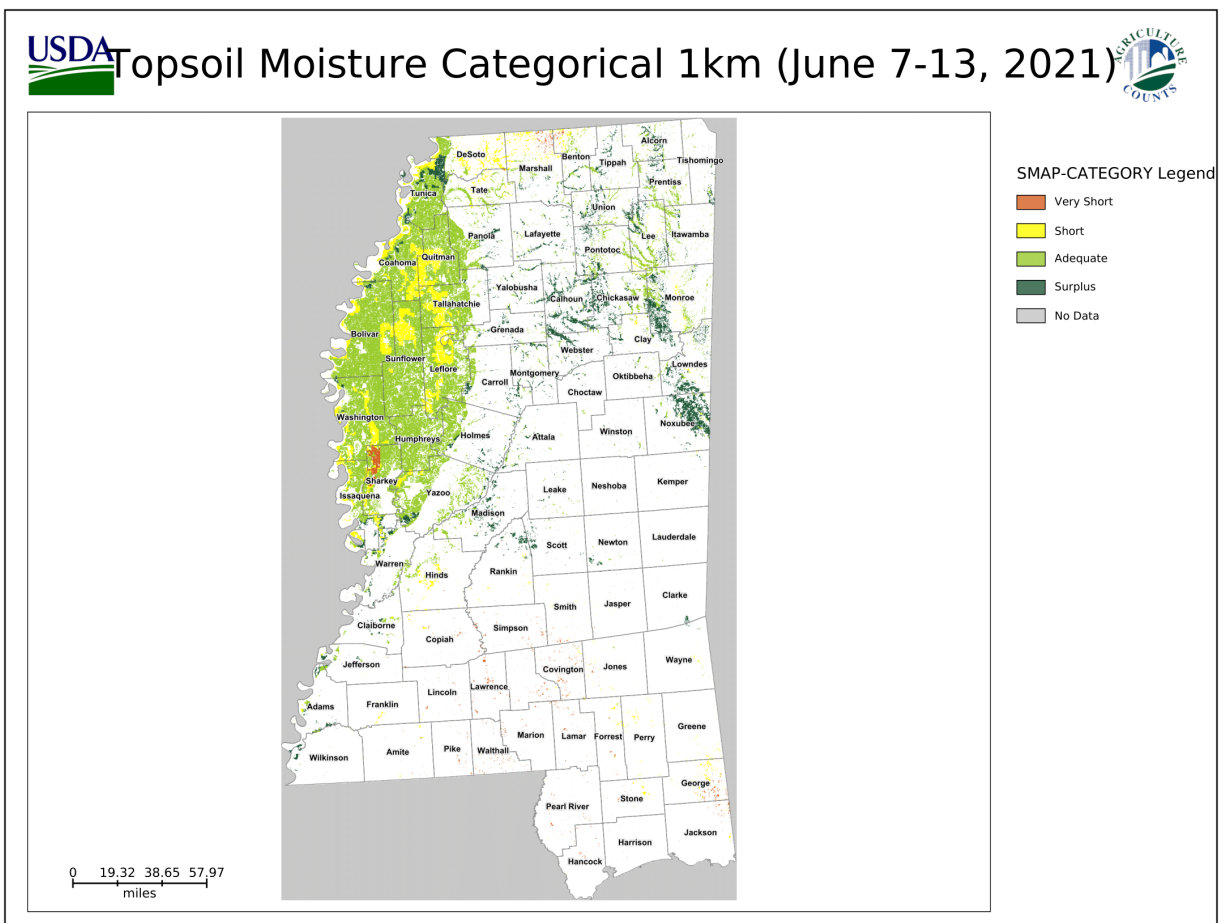
\*\*Total Acreage by state determined by official 2020 NASS estimates of planted acres for corn, rice, and soybeans and 2017 Census of Agriculture harvested acres for cotton. Crop type percentages determined by 2020 Cropland Data Layer.

## Topsoil Moisture Categorical

SMAP values are categorized into NASS categories which include:

- Very Short - Soil moisture supplies are significantly less than what is required for normal plant development. Growth has been stopped or nearly so and plants are showing visible signs of moisture stress. Under these conditions, plants will quickly suffer irreparable damage.
- Short - Soil dry. Seed germination and/or normal crop growth and development would be curtailed.
- Adequate - Soil moist. Seed germination and/or crop growth and development would be normal or unhindered.
- Surplus - Soil wet. Fields may be muddy and will generally be unable to absorb additional moisture. Young developing crops may be yellowing from excess moisture.

Figure 3



Produced by VegScape - <http://nassgeodata.gmu.edu/VegScape>

Table 3 identifies crops (2020 Cropland Data Layer) in soils with surplus soil moisture during the period from June 7 – 13, 2021.

Table 3

MS County	Topsoil Moisture Categorical (1km, June 7-13, 2021)							
	Corn		Cotton		Rice		Soybeans	
	Total Acreage (2020 Planted Acres)	Percentage of crop type with Surplus Soil Moisture	Total Acreage (2017 Census Harvested Acres)	Percentage of crop type with Surplus Soil Moisture	Total Acreage (2020 Planted Acres)	Percentage of crop type with Surplus Soil Moisture	Total Acreage (2020 Planted Acres)	Percentage of crop type with Surplus Soil Moisture
Bolivar	14,000	0.07%	13,680	0.23%	43,300	0.02%	301,500	0.82%
Carroll	8,200	26.69%	21,892	36.33%	N/A	N/A	8,400	21.95%
Clay	2,200	86.70%	N/A	N/A	N/A	N/A	10,500	55.36%
Coahoma	26,500	1.91%	91,135	1.55%	8500	4.45%	100,500	3.10%
Grenada	1,800	39.09%	N/A	N/A	N/A	N/A	N/A	N/A
Holmes	27,100	9.18%	43,979	10.14%	N/A	N/A	26,900	20.31%
Humphreys	21,900	0.00%	21427	0.00%	8100	0.00%	84,900	0.00%
Lafayette	2,000	39.56%	3,143	56.75%	N/A	N/A	N/A	N/A
Leflore	49,800	0.06%	43,857	0.04%	12,200	0.00%	121,500	0.14%
Lowndes	10,900	86.67%	13,325	77.46%	N/A	N/A	13,000	72.40%
Noxubee	30,200	93.07%	23095	92.84%	N/A	N/A	9,600	85.67%
Panola	N/A	N/A	28,861	9.28%	9500	0.13%	38,600	15.13%
Pontotoc	2,600	45.38%	645	51.11%	N/A	N/A	25,300	43.10%
Quitman	6,500	0.00%	25,186	0.00%	14100	0.00%	90,000	0.00%
Sunflower	35,800	0.00%	20705	0.00%	18100	0.00%	248,000	0.00%
Tallahatchie	27,400	0.45%	44,082	0.19%	9700	0.07%	105,500	0.68%
Tippah	2,900	44.53%	3,395	41.30%	N/A	N/A	11,400	58.32%
Tunica	6,400	10.68%	33,434	6.38%	27600	28.33%	103,500	21.35%
Union	1,900	40.06%	N/A	N/A	N/A	N/A	22,800	60.64%
Washington	49,100	0.22%	22,758	0.04%	10200	0.60%	229,000	0.88%
Yalobusha	N/A	N/A	5,334	61.81%	N/A	N/A	4,500	63.27%

\*\*Total Acreage by state determined by official 2020 NASS estimates of planted acres for corn, rice, and soybeans and 2017 Census of Agriculture harvested acres for cotton. Crop type percentages determined by 2020 Cropland Data Layer.