

# **A daily, 250 m, and real-time gross primary productivity product (2000 – present) covering the Contiguous United States**

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## **Supplementary Materials**

Table S1. SURFRAD sites used for the modeling and evaluation of PAR.

<b>Code</b>	<b>Name</b>	<b>Latitude</b>	<b>Longitude</b>	<b>For PAR modeling</b>	<b>For PAR evaluation</b>
BON	Bondville	40.0519	-88.3731	2000 – 2018	2019
TBL	Table Mountain	40.1250	-105.2368	2000 – 2018	2019
DRA	Desert Rock	36.6237	-116.0195	2000 – 2018	2019
FPK	Fort Peck	48.3078	-105.1017	2000 – 2018	2019
GWN	Goodwin Creek	34.2547	-89.8729	2000 – 2018	2019
PSU	Penn. State Univ.	40.7201	-77.9309	2000 – 2018	2019
SXF	Sioux Falls	43.7340	-96.6233	2003 – 2018	2019

Table S2. AmeriFlux sites used for the evaluation of PAR.

<b>Site</b>	<b>Land cover</b>	<b>Latitude</b>	<b>Longitude</b>	<b>For PAR evaluation</b>
US-AR1	GRA	36.4267	-99.4200	2009 – 2012
US-AR2	GRA	36.6358	-99.5975	2009 – 2012
US-ARB	GRA	35.5497	-98.0402	2005 – 2006
US-ARC	GRA	35.5465	-98.0400	2005 – 2006
US-ARM	CRO	36.6058	-97.4888	2003 – 2012
US-Blo	ENF	38.8953	-120.6328	2002 – 2007
US-GBT	ENF	41.3658	-106.2397	2002 – 2003, 2005 – 2006
US-GLE	ENF	41.3665	-106.2399	2005 – 2014
US-Ha1	DBF	42.5378	-72.1715	2002 – 2012
US-KS2	CSH	28.6086	-80.6715	2003 – 2006
US-Los	WET	46.0827	-89.9792	2002 – 2008, 2010, 2014
US-Me1	ENF	44.5794	-121.5000	2004 – 2005
US-Me2	ENF	44.4523	-121.5574	2013 – 2014
US-Me6	ENF	44.3233	-121.6078	2011 – 2014
US-MMS	DBF	39.3232	-86.4131	2002 – 2014
US-Myb	WET	38.0498	-121.7651	2011 – 2014
US-Ne1	CRO	41.1651	-96.4766	2002 – 2013
US-Ne2	CRO	41.1649	-96.4701	2002 – 2013
US-Ne3	CRO	41.1797	-96.4397	2002 – 2013
US-NR1	ENF	40.0329	-105.5464	2002 – 2014
US-PFa	MF	45.9459	-90.2723	2002 – 2014
US-SRG	GRA	31.7894	-110.8277	2008 – 2014
US-SRM	WSA	31.8214	-110.8661	2004 – 2014
US-Syv	MF	46.2420	-89.3477	2002 – 2008, 2012 – 2014
US-Ton	WSA	38.4316	-120.9660	2002 – 2014
US-Tw1	WET	38.1074	-121.6469	2012 – 2014
US-Tw2	CRO	38.1047	-121.6433	2012 – 2013
US-Tw3	CRO	38.1159	-121.6467	2013 – 2014
US-Tw4	WET	38.1030	-121.6414	2014
US-Twt	CRO	38.1087	-121.6530	2009 – 2014
US-UMB	DBF	45.5598	-84.7138	2002 – 2014
US-UMd	DBF	45.5625	-84.6975	2007 – 2014
US-Var	GRA	38.4133	-120.9507	2002 – 2014
US-WCr	DBF	45.8059	-90.0799	2002 – 2006, 2008 – 2014
US-Whs	OSH	31.7438	-110.0522	2007 – 2014
US-Wi0	ENF	46.6188	-91.0814	2002
US-Wi3	DBF	46.6347	-91.0987	2002, 2004
US-Wi4	ENF	46.7393	-91.1663	2002, 2004 – 2005
US-Wi6	OSH	46.6249	-91.2982	2002
US-Wi9	ENF	46.6188	-91.0814	2004 – 2005
US-Wkg	GRA	31.7365	-109.9419	2004 – 2014

Table S3. AmeriFlux sites used for the modeling and evaluation of PUE and GPP.

<b>Site</b>	<b>Land cover</b>	<b>Latitude</b>	<b>Longitude</b>	<b>For PUE and GPP modeling and evaluation</b>
US-AR1	GRA	36.4267	-99.4200	2009 – 2012
US-AR2	GRA	36.6358	-99.5975	2009 – 2012
US-ARB	GRA	35.5497	-98.0402	2005 – 2006
US-ARC	GRA	35.5465	-98.0400	2005 – 2006
US-ARM	CRO	36.6058	-97.4888	2003 – 2012
US-Blo	ENF	38.8953	-120.6328	2000 – 2007
US-Cop	GRA	38.0900	-109.3900	2001 – 2003, 2006 – 2007
US-GBT	ENF	41.3658	-106.2397	2002 – 2003
US-GLE	ENF	41.3665	-106.2399	2005 – 2014
US-Ha1	DBF	42.5378	-72.1715	2000 – 2012
US-KS2	CSH	28.6086	-80.6715	2003 – 2006
US-Los	WET	46.0827	-89.9792	2000 – 2008, 2010, 2014
US-Me1	ENF	44.5794	-121.5000	2004 – 2005
US-Me2	ENF	44.4523	-121.5574	2002 – 2014
US-Me6	ENF	44.3233	-121.6078	2010 – 2014
US-MMS	DBF	39.3232	-86.4131	2000 – 2014
US-Myb	WET	38.0498	-121.7651	2011 – 2014
US-Ne1	CRO	41.1651	-96.4766	2001 – 2012
US-Ne2	CRO	41.1649	-96.4701	2001 – 2012
US-Ne3	CRO	41.1797	-96.4397	2001 – 2012
US-NR1	ENF	40.0329	-105.5464	2000 – 2014
US-ORv	WET	40.0201	-83.0183	2011
US-PFa	MF	45.9459	-90.2723	2000 – 2014
US-SRG	GRA	31.7894	-110.8277	2008 – 2014
US-SRM	WSA	31.8214	-110.8661	2004 – 2014
US-Syv	MF	46.2420	-89.3477	2001 – 2007, 2012 – 2014
US-Ton	WSA	38.4316	-120.9660	2001 – 2014
US-Tw1	WET	38.1074	-121.6469	2012 – 2014
US-Tw2	CRO	38.1047	-121.6433	2012
US-Tw3	CRO	38.1159	-121.6467	2013 – 2014
US-Tw4	WET	38.1030	-121.6414	2014
US-Twt	CRO	38.1087	-121.6530	2009 – 2014
US-UMB	DBF	45.5598	-84.7138	2000 – 2014
US-UMd	DBF	45.5625	-84.6975	2007 – 2014
US-Var	GRA	38.4133	-120.9507	2001 – 2014
US-WCr	DBF	45.8059	-90.0799	2000 – 2006, 2011 – 2014
US-Whs	OSH	31.7438	-110.0522	2007 – 2014
US-Wi0	ENF	46.6188	-91.0814	2002
US-Wi3	DBF	46.6347	-91.0987	2002, 2004
US-Wi4	ENF	46.7393	-91.1663	2002, 2004 – 2005
US-Wi6	OSH	46.6249	-91.2982	2002
US-Wi9	ENF	46.6188	-91.0814	2004 – 2005
US-Wkg	GRA	31.7365	-109.9419	2004 – 2014
US-Bo1	CRO	40.0062	-88.2904	2000 – 2007
US-Ha2	ENF	42.5393	-72.1779	2004
US-Ho2	ENF	45.2091	-68.7470	2000 – 2004
US-NC2	ENF	35.8030	-76.6685	2005 – 2006
US-NR1	ENF	40.0329	-105.5464	2000 – 2007
US-Ro1	CRO	44.7143	-93.0898	2004 – 2006
US-Ro3	CRO	44.7217	-93.0893	2004 – 2006

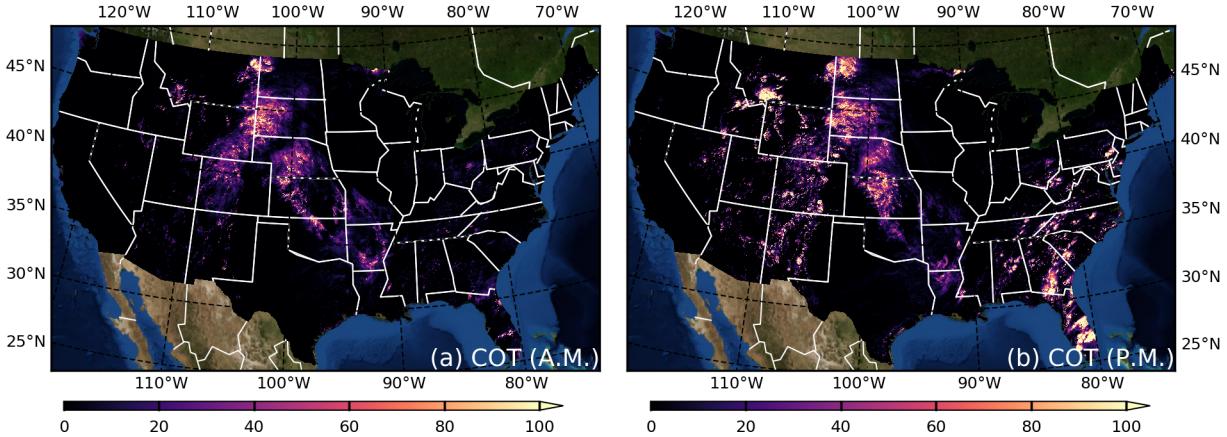


Figure S1. Spatial distribution of cloud optical thickness in (a) A.M. and (b) P.M. on Aug 1, 2019. The background image is a © NASA Blue Marble image.

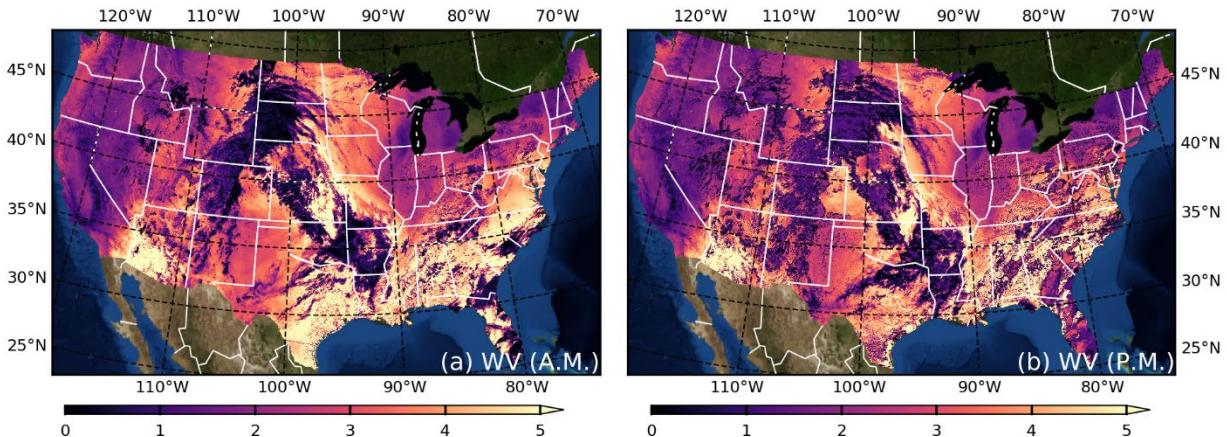


Figure S2. Spatial distribution of water vapor in (a) A.M. and (b) P.M. on Aug 1, 2019. The background image is a © NASA Blue Marble image.

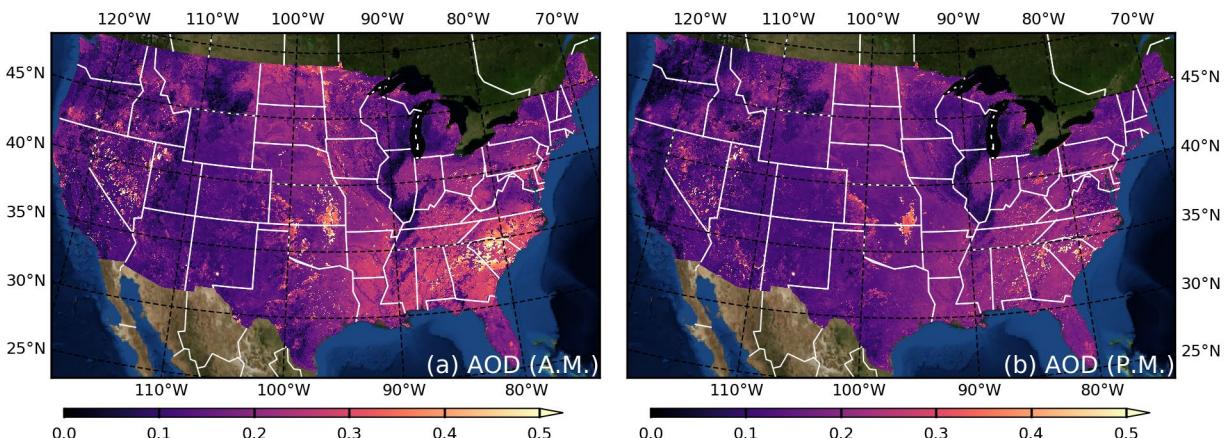


Figure S3. Spatial distribution of aerosol optical depth in (a) A.M. and (b) P.M. on Aug 1, 2019. The background image is a © NASA Blue Marble image.

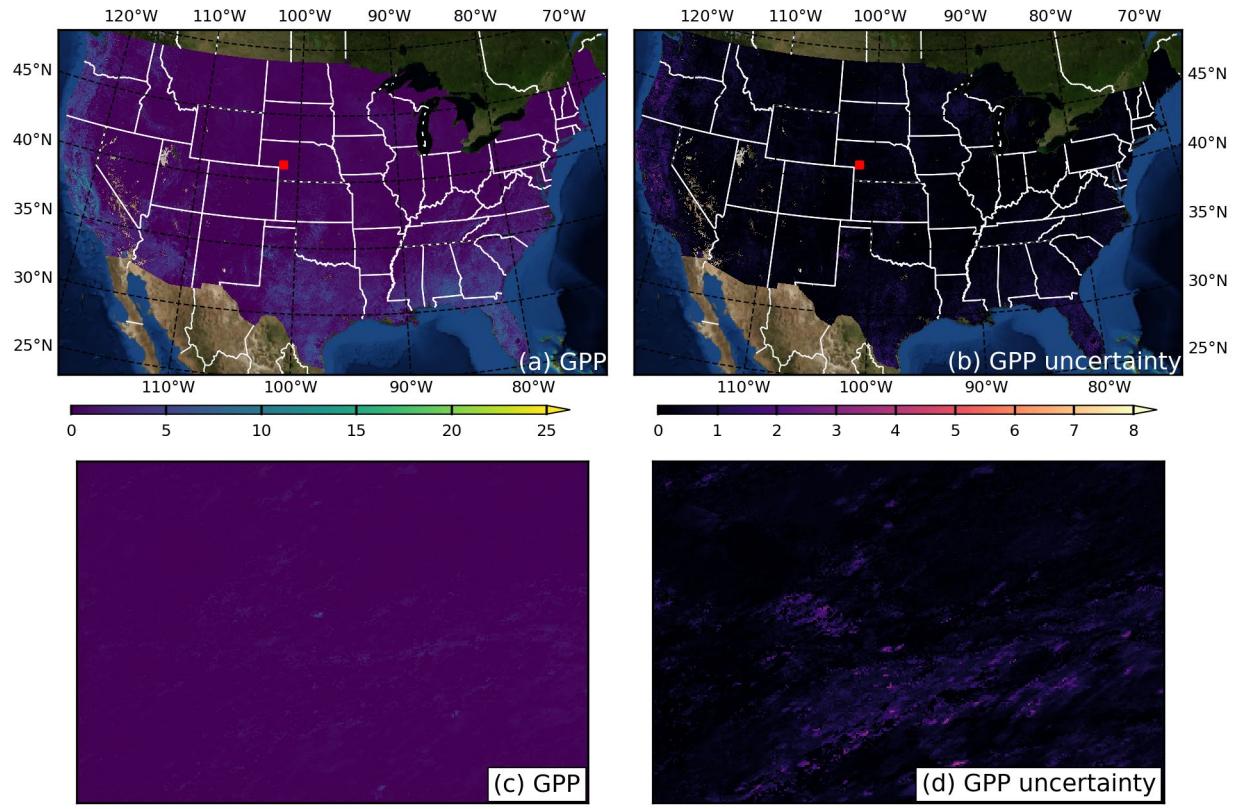


Figure S4. Spatial distribution of 250 m resolution (a and c) GPP ( $\text{gC m}^{-2} \text{ d}^{-1}$ ) and (b and d) GPP uncertainty ( $\text{gC m}^{-2} \text{ d}^{-1}$ ) on Mar 29, 2020. (c and d) show a  $50 \times 75 \text{ km}^2$  area in the Keith County, Nebraska (red marker in [a] and [b]). The background image is a © NASA Blue Marble image.