

Supplementary Information

Assessment of Inundation Dynamics in Nebraska Using AlphaEarth Foundations Embeddings

Environmental Monitoring and Assessment

Aditya Kapoor, Nebraska Water Center, Robert B. Daugherty Water for Food Global Institute, University of Nebraska, Lincoln, NE, USA (adityain2003@gmail.com)

Accuracy of the random forest classifier

Table S1. Confusion matrices of the random forest classifier. (a) Validation, 2018. (b) Training points, 2017, scored on the points used to train the classifier. PA, producer's accuracy; UA, user's accuracy; F1, harmonic mean of PA and UA

(a) Validation, 2018

Reference \ Mapped	Inundation	Vegetation	Built-up	PA (%)	F1
Inundation	2,500	0	0	100.00	1.000
Vegetation	0	2,500	0	100.00	0.922
Built-up	0	425	2,075	83.00	0.907
UA (%)	100.00	85.47	100.00		
Overall accuracy 94.33%; kappa 0.915; n = 7,500					

(b) Training, 2017

Reference \ Mapped	Inundation	Vegetation	Built-up	PA (%)	F1
Inundation	9,995	5	0	99.95	1.000
Vegetation	0	9,994	6	99.94	0.999
Built-up	0	8	9,992	99.92	0.999
UA (%)	100.00	99.87	99.94		
Overall accuracy 99.94%; kappa 0.999; n = 30,000					

Trend and correlation statistics

Table S2. Trend and correlation statistics, 2017-2025. (a) Trends. (b) Correlations with rainfall

(a) Trends (n = 9)

Series	Unit	Sen's slope	95% interval	Kendall's τ
Total inundated area	km ² yr ⁻¹	-6.37	-20.12 to 11.01	-0.389
Mean inundated area per water body	m ² yr ⁻¹	-7,073	-22,336 to 12,218	-0.389
Median water body	m ² yr ⁻¹	-2,200	-12,363 to 10,500	-0.111
Lake McConaughy	km ² yr ⁻¹	-3.83	-5.13 to -2.41	-0.667
Total without Lake McConaughy	km ² yr ⁻¹	-2.61	-16.13 to 9.78	-0.111
Normalized area	% yr ⁻¹	-2.38	-6.94 to 0.87	-0.333
Rainfall, CHIRPS	mm yr ⁻¹	-14.80	-47.43 to 39.84	-0.222
Rainfall, NOAA	mm yr ⁻¹	-14.03	-56.05 to 49.28	-0.278

(b) Correlations with rainfall

Relationship	r	n
Change in mean inundated area against rainfall of the same year	0.73	8
Change in normalized area against rainfall of the same year	0.91	8
Mean inundated area against rainfall of the same year	0.13	9
Mean inundated area against rainfall of the previous year	0.50	8
Mean inundated area against rainfall two years before	0.72	7
Mean inundated area against that of the previous year	0.59	8