Curriculum Vitae for David B. Lobell

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A. Academic History Degrees:			
2000		Sc.B.	Brown University Department of Applied Mathematics, Magna Cum Laude
2005		Ph.D.	Stanford University, Department of Geological and Environmental Sciences Dissertation: "A remote sensing approach to understand controls on cropland productivity"
Post-doct 2005-200	toral training: 08		Lawrence Fellow, Lawrence Livermore National Laboratory
R Employment History.			
D. P	resent	Professo Gloria an Envir William Senior F and S	r, Earth System Science Department (ESS), Stanford University nd Richard Kushel Director, Center on Food Security and the ronment (FSE), as of Sep 2018 Wrigley Senior Fellow, Woods Institute for the Environment fellow, Freeman Spogli Institute for International Studies (FSI) tranford Institute for Economic Policy and Research (SIEPR).
2013 - 20	017	Associat	e Professor (ESS) and Senior Fellow (Woods/FSI), Stanford
2009 - 20	013	Assistan	t Professor (ESS) and Center Fellow (Woods/FSI), Stanford
2008 - 20	009	Senior R	lesearch Scholar, FSE, Stanford
2005 - 20	007	Lawrenc	e Postdoctoral Fellow, Lawrence Livermore National Laboratory
 C. Public and Professional Service Advisor, Global Commission on Adaptation. 2018-2022 Lead Author, Intergovernmental Panel on Climate Change (IPCC) Fifth Assessment Report, Chapter 7 of the Working Group II, "Food Production Systems and Food Security", 2010-2014. Also member of core writing team for "Summary for Policy Makers" and contributing author for Ch. 18 on "Detection and Attribution of Observed Impacts" Member of National Academy of Sciences Committee on Stabilization Targets for Atmospheric Greenhouse Gas Concentrations (August 2009-May 2010) and Assessing the Impact of Climate Change on Political and Social Stresses (Sep 2011-Sep 2012) Member of Technical Advisory and Review Panel for World Bank Group activities related to climate change adaptation, 2012 Editori, Global Change Biology, 2011-2018 Editorial Advisory Board Member, Global Food Security, 2012-2019 Editorial Board Member, Environmental Research Letters, 2009-2013 Associate Editor, Journal of Environmental Quality, 2008 – 2010 Co-organized and Led Meeting of 20 International Scientists on "Adapting Agriculture to Climate Change: The Role of Crop Wild Relatives" in Bellagio, Italy in September, 2010 Organized and Led Meeting of 17 International Scientists on "Climate extremes and crop adaptation" at Stanford in June, 2009 Edited special issue of J Environmental Quality on "Remote Sensing of Soil Degradation" National Academy of Sciences Panel on Climate, Energy, and Security (May-June 2008) National Academy of Sciences Workshop on Remote Sensing for Human Welfare (January 2006) NASA Land Cover Land Use Change Grant Review Panel, September 2005 			

Frequent reviewer for over 25 scientific journals, including Science, Nature and PNAS.

Occasional editor at PNAS (on request of board member).

Numerous invited talks at corporations and business conferences on climate change adaptation Numerous public lectures throughout the Bay Area on climate change and food

D. Post-Degree Honors and Awards:

Awards:

T.W. Schultz Memorial Lecture & Award, Agricultural & Applied Economics Association, 2025 Elected Member, National Academy of Sciences, 2023 National Academy of Sciences Food and Agriculture Prize, 2022 Honorary Doctorate, Brown University, 2021 Macarthur Fellow, 2014-2018 Sir Frederick McMaster Fellowship, CSIRO, Australia, 2014 Terman Fellow, Stanford University, 2011-2014 Google Science Communication Fellow, 2011 James B. Macelwane Medal, American Geophysical Union, 2010 Fellow, American Geophysical Union, 2010 NASA New Investigator Program Award, 2008-2010 Lawrence Fellowship, Lawrence Livermore National Laboratory, 2005-2008

Selected invited talks (in past 3 years):

- November 2024, National Academy of Sciences Blavatnik Forum (Washington D.C.), "Climate adaptation in croplands: Lessons from the past 50 years"
- September 2024, University of British Columbia, "Evaluating climate adaptation progress and needs in agriculture"
- April 2024, National Academy of Sciences Symposium (Washington D.C.), "Innovation, climate, and the agricultural productivity challenge"
- April 2024, Corteva Agrisciences Seminar, "Climate smart agriculture in the United States"
- March 2024, Sunway University (Malaysia) "Navigating to a climate-smart food system"
- October 2023, United States Department of Agriculture Research and Development Division, "What works in climate smart agriculture?"
- May 2023, Federal Reserve Bank of Kansas City, 2023 Agricultural Symposium: The Changing Geography of Agricultural Production "Ongoing climate change and adaptation in U.S. agriculture"
- April 2023, Carnegie Institution of Washington. "Climate smart agriculture: separating the wheat from the chaff"
- March 2023, University of Illinois Center for Digital Agriculture "Using satellites to advance climate-smart agriculture" (keynote)
- October 2022, Annual Cornell Institute for Digital Agriculture symposium "Using satellites to advance climate-smart agriculture" (keynote)
- September 2022, Foundation for Food and Agriculture Research "Using crop analytics to improve agriculture and the environment"
- December 2021, Asia Development Bank Institute Annual Meeting "Best bets for a carbonneutral global food system"
- November 2021, UC Santa Barbara and UC Davis, "Crop analytics: can data take agriculture to the next level?"
- November 2021 Geo for Good Summit, "Science Powering Supply Chain Analysis Using Google Earth Engine to Improve Agricultural Data"
- September 2021, National University of Singapore, "Food security and climate change in Southeast Asia"
- August 2021, Google, "Tracking agricultural outcomes at field scales: methods and applications"
- August 2021, International Association of Agricultural Economists Annual Meeting "Twice Is Nice: The Benefits of Two Ground Measures for Evaluating Satellite-Based Yield Estimates"

E. Scholarly Publications

Peer Reviewed Publications (*indicates first author was a student or post-doc):

- *Deines JM, Archontoulis SV, Huber I, Lobell DB. Observational evidence for groundwater influence on crop yields in the United States. Proceedings of the National Academy of Sciences. 2024 Sep 3;121(36):e2400085121.
- Yang Y, Tilman D, Jin Z, Smith P, Barrett CB, Zhu YG, Burney J, ..., Lobell DB. Climate change exacerbates the environmental impacts of agriculture. *Science*. 2024 Sep 6;385(6713):eadn3747. https://doi.org/10.1126/science.adn3747e
- Burke M, Zahid M, Martins MC, Callahan CW, Lee R, Avirmed T, Heft-Neal S, Kiang M, Hsiang SM, Lobell D. Are We Adapting to Climate Change?. National Bureau of Economic Research; 2024 Sep 23.
- Fuglie KO, Hertel TW, Lobell DB, Villoria NB. Agricultural Productivity and Climate Mitigation. Annual Review of Resource Economics. 2024 Oct 7;16(1):21-40. https://doi.org/10.1146/annurev-resource-101323-094349
- Zhou J, Zhu P, Kluger DM, Lobell DB, Jin Z. Changes in the Yield Effect of the Preceding Crop in the US Corn Belt Under a Warming Climate. Global change biology. 2024 Nov;30(11):e17556.
- * von Bloh M, Lobell D, Asseng S. Knowledge informed hybrid machine learning in agricultural yield prediction. Computers and Electronics in Agriculture. 2024 Dec 1;227:109606.
- * Ma Y, Liang SZ, Myers DB, Swatantran A, Lobell DB. Subfield-level crop yield mapping without ground truth data: A scale transfer framework. Remote Sensing of Environment. 2024 Dec 15;315:114427.
- *Zheng Z, Zhong Y, Zhang L, Burke M, Lobell DB, Ermon S. Towards transferable building damage assessment via unsupervised single-temporal change adaptation. Remote Sensing of Environment. 2024 Dec 15;315:114416.
- Di Tommaso, S., Wang, S., Strey, R. and Lobell, D.B., 2024. Mapping sugarcane globally at 10 m resolution using GEDI and Sentinel-2. Earth System Science Data Discussions, 2024, pp.1-26.
- *Manvi, R., Khanna, S., Burke, M., Lobell, D. and Ermon, S., 2024. Large language models are geographically biased. arXiv preprint arXiv:2402.02680.
- *Cambron, T.W., Deines, J.M., Lopez, B., Patel, R., Liang, S.Z. and Lobell, D.B., 2024. Further adoption of conservation tillage can increase maize yields in the western US Corn Belt. Environmental Research Letters, 19(5), p.054040.
- *Moore, K.A. and Lobell, D.B., 2024. Opportunities and Barriers for Agrivoltaics on Tribal Lands. Sustainability, 16(13), p.5414.
- Burke, M., Tanutama, V., Heft-Neal, S., Hino, M. and Lobell, D., 2023. Game, sweat, match: Temperature and elite worker productivity. *Nature Communications*, in revision
- *Khanna, S., Irgau, M., Lobell, D.B. and Ermon, S., 2024. ExPLoRA: Parameter-Efficient Extended Pre-Training to Adapt Vision Transformers under Domain Shifts. arXiv preprint arXiv:2406.10973.
- *Ma Y, Chen S, Ermon S, Lobell DB. 2024. Transfer learning in environmental remote sensing. Remote Sensing of Environment. 301:113924. https://doi.org/10.1016/j.rse.2023.113924
- *Stigler, M. and Lobell, D., 2024. Optimal index insurance and basis risk decomposition: an application to Kenya. *American Journal of Agricultural Economics, 106 (1), 306-329*
- *Manvi, R., Khanna, S., Mai, G., Burke, M., Lobell, D. and Ermon, S., 2024. GeoLLM: Extracting Geospatial Knowledge from Large Language Models. Twelfth International Conference on Learning Representations (*ICLR*)
- * Xu, J., Elmustafa, A., Weldegebriel, L., Negash, E., Lee, R., Meng, C., Ermon, S. and Lobell, D., 2024. HarvestNet: A Dataset for Detecting Smallholder Farming Activity Using Harvest Piles and Remote Sensing. *Thirty-Eighth AAAI Conference on Artificial Intelligence (AAAI-24)*
- *He, L., Rosa, L., Lobell, D.B., Wang, Y., Yin, Y., Doughty, R., Yao, Y., Berry, J.A. and Frankenberg, C., 2023. The weekly cycle of photosynthesis in Europe reveals the negative impact of particulate pollution on ecosystem productivity. *Proceedings of the National Academy of Sciences*, 120(49), p.e2306507120.
- *Khanna, S., Liu, P., Zhou, L., Meng, C., Rombach, R., Burke, M., Lobell, D.B. and Ermon, S., 2023, December. Diffusionsat: A generative foundation model for satellite imagery. In The Twelfth International Conference on Learning Representations.
- *Wong, C.A., Lobell, D.B. and Mauter, M.S., 2023. Multicriteria Suitability Index for Prioritizing Early-Stage Deployments of Wastewater-Derived Fertilizers in Sub-Saharan Africa. *Environmental Science & Technology*, 57, 45, 17588–17597.
- *Tsao, A., Nzewi, I., Jayeoba, A., Ayogu, U. and Lobell, D.B., 2023. Canopy Height Mapping for Plantations in Nigeria Using GEDI, Landsat, and Sentinel-2. *Remote Sensing*, 15(21), p.5162.
- *Kluger, D.M., Lobell, D.B. and Owen, A.B., 2023. Biases in estimates of air pollution impacts: the role of omitted variables and measurement errors. *arXiv preprint arXiv:2310.08831*.

- Yang, Y., Jin, Z., Mueller, N.D., Driscoll, A.W., Hernandez, R.R., Grodsky, S.M., Sloat, L.L., Chester, M.V., Zhu, Y.G. and Lobell, D.B., 2023. Sustainable irrigation and climate feedbacks. *Nature Food*, 4 (8), 654-663. https://doi.org/10.1038/s43016-023-00821-x
- Bhattarai, N., Lobell, D.B., Balwinder-Singh, Fishman, R., Kustas, W.P., Pokhrel, Y. and Jain, M., 2023. Warming temperatures exacerbate groundwater depletion rates in India. *Science Advances*, 9(35), p.eadi1401.
- * Morton, C.M., Pullabhotla, H., Bevis, L. and Lobell, D.B., 2023. Soil micronutrients linked to human health in India. *Scientific Reports*, 13(1), p.13591.
- *Weldegebriel, L., Negash, E., Nyssen, J. and Lobell, D., 2023. Eyes in the sky on Tigray-Monitoring the impact of armed conflict on cultivated land using satellite imagery in Ethiopia. *Science of Remote Sensing*, 100133.
- *Liu, E., Meng, C., Kolodner, M., Sung, E.J., Chen, S., Burke, M., Lobell, D. and Ermon, S., 2023. Building Coverage Estimation with Low-resolution Remote Sensing Imagery. *Remote Sensing, in review*.
- * Di Tommaso, S., Wang, S., Vajipey, V., Gorelick, N., Strey, R. and Lobell, D.B., 2023. Annual fieldscale maps of tall and short crops at the global scale using gedi and sentinel-2. *Remote Sensing*, 15(17), p.4123.
- Tamim, A., Harou, A.P., Burke, M., Lobell, D., Madajewicz, M., Magomba, C., Michelson, H., Palm, C. and Xue, J., 2022. Relaxing Credit and Information Constraints: Five-Year Experimental Evidence from Tanzanian Agriculture. *Journal of Development Economics, in review*.
- Lobell, D.B., Villoria, N.B. Reduced benefits of climate-smart agricultural policies from land-use spillovers. *Nat Sustain* (2023). https://doi.org/10.1038/s41893-023-01112-w
- *Cong, Y., Khanna, S., Meng, C., Liu, P., Rozi, E., He, Y., Burke, M., Lobell, D. and Ermon, S., 2022. Satmae: Pre-training transformers for temporal and multi-spectral satellite imagery. *Advances in Neural Information Processing Systems*, 35, pp.197-211.
- *Deines, J. M., Swatantran, A., Ye, D., Myers, B., Archontoulis, S., & Lobell, D. B. (2023). Field-scale dynamics of planting dates in the US Corn Belt from 2000 to 2020. *Remote Sensing of Environment*, 291, 113551. https://doi.org/https://doi.org/10.1016/j.rse.2023.113551
- Lobell, D.B., Di Tommaso, S. and Burney, J.A., 2022. Globally ubiquitous negative effects of nitrogen dioxide on crop growth. *Science Advances*, 8(22), https://doi.org/10.1126/sciadv.abm9909
- Lin, C., Zhong, L., Song, X.P., Dong, J., Lobell, D.B. and Jin, Z., 2022. Early-and in-season crop type mapping without current-year ground truth: Generating labels from historical information via a topology-based approach. *Remote Sensing of Environment*, 274, p.112994.
- *Elmustafa, Rozi, He, Mai, Ermon, Burke, and Lobell. 2022. Understanding economic development in rural Africa using satellite imagery, building footprints and deep models. In Proceedings of the 30th International Conference on Advances in Geographic Information Systems (SIGSPATIAL '22). Association for Computing Machinery, New York, NY, USA, Article 89, 1–4. <u>https://doi.org/10.1145/3557915.3561025</u>
- * Kluger, D.M., Owen, A.B. and Lobell, D.B., 2022. Combining randomized field experiments with observational satellite data to assess the benefits of crop rotations on yields. *Environmental Research Letters*, 17(4), p.044066.
- *Deines, J., Guan, K., Lopez, B., Wang, S., White, C., Zhou, Q., and D.B. Lobell 2022. Recent cover crop adoption is associated with small maize and soybean yield losses in the United States. *Global Change Biology*, 00, 1–14. https://doi.org/10.1111/gcb.16489.
- *Wang, S., Waldner, F. and Lobell, D.B., 2022. Unlocking large-scale crop field delineation in smallholder farming systems with transfer learning and weak supervision. *Remote Sensing* 14(22), 5738; https://doi.org/10.3390/rs14225738.
- * Meng, C., Liu, E., Neiswanger, W., Song, J., Burke, M., Lobell, D. and Ermon, S., 2022. Is-count: Largescale object counting from satellite images with covariate-based importance sampling. In *Proceedings of the AAAI Conference on Artificial Intelligence* (Vol. 36, No. 11, pp. 12034-12042).
- *Behrer, A. and Lobell, D.B. Higher levels of no-till agriculture associated with lower PM2.5 in the Corn Belt. 2022. *Environmental Research Letters*, 17(9):094012.
- Ishtiaque, A., Singh, S., Lobell, D., Fishman, R. and Jain, M., 2022. Prior crop season management constrains farmer adaptation to warming temperatures: Evidence from the Indo-Gangetic Plains. Science of The Total Environment, 807, p.151671.
- *Lee, J.Y., Wang, S., Figueroa, A.J., Strey, R., Lobell, D.B., Naylor, R.L. and Gorelick, S.M., 2022. Mapping Sugarcane in Central India with Smartphone Crowdsourcing. *Remote Sensing*, 14(3), p.703.

- *Campolo, J., Ortiz-Monasterio, I., Guerena, D. and Lobell, D.B., 2022. Evaluating maize yield response to fertilizer and soil in Mexico using ground and satellite approaches. *Field Crops Research*, 276, p.108393.
- *Yeh, C., Meng, C., Wang, S., Driscoll, A., Rozi, E., Liu, P., Lee, J., Burke, M., Lobell, D.B. and Ermon, S., 2021, August. SustainBench: Benchmarks for Monitoring the Sustainable Development Goals with Machine Learning. In *Thirty-fifth Conference on Neural Information Processing Systems*.
- Di Tommaso, S., Wang, S. and Lobell, D.B., 2021. Combining GEDI and Sentinel-2 for wall-to-wall mapping of tall and short crops. *Environmental Research Letters*. https://doi.org/10.1088/1748-9326/ac358c
- *Kluger, D.M., Wang, S. and Lobell, D.B., 2021. Two shifts for crop mapping: Leveraging aggregate crop statistics to improve satellite-based maps in new regions. *Remote Sensing of Environment*, 262, p.112488
- Bhattarai, N., Pollack, A., Lobell, D.B., Fishman, R., Singh, B., Dar, A. and Jain, M., 2021. The impact of groundwater depletion on agricultural production in India. *Environmental Research Letters*, 16(8), p.085003.
- Lobell, D.B. and Burney, J.A., 2021. Cleaner air has contributed one-fifth of US maize and soybean yield gains since 1999. *Environmental Research Letters*, *16*(7), p.074049.
- Lobell, D.B., Di Tommaso, S., Burke, M. and Kilic, T., 2021. Twice Is Nice: The Benefits of Two Ground Measures for Evaluating the Accuracy of Satellite-Based Sustainability Estimates. *Remote Sensing*, 13(16), p.3160.
- *Lee, J., Grosz, D., Uzkent, B., Zeng, S., Burke, M., Lobell, D. and Ermon, S., 2021, May. Predicting Livelihood Indicators from Community-Generated Street-Level Imagery. In *Proceedings of the AAAI Conference on Artificial Intelligence* (Vol. 35, No. 1, pp. 268-276).
- *Lee, J., Brooks, N.R., Tajwar, F., Burke, M., Ermon, S., Lobell, D.B., Biswas, D. and Luby, S.P., 2021. Scalable deep learning to identify brick kilns and aid regulatory capacity. *Proceedings of the National Academy of Sciences*, *118*(17).
- Ishtiaque, A., Singh, S., Lobell, D., Singh, B., Fishman, R. and Jain, M., 2021. Prior crop season management constrains farmer adaptation to warming temperatures: Evidence from the Indo-Gangetic Plains. Science of The Total Environment, p.151671.
- Rao, P., Zhou, W., Bhattarai, N., Srivastava, A.K., Singh, B., Poonia, S., Lobell, D.B. and Jain, M., 2021. Using Sentinel-1, Sentinel-2, and Planet Imagery to Map Crop Type of Smallholder Farms. *Remote Sensing*, 13(10), p.1870.
- Ortiz-Bobea, A., Ault, T.R., Carrillo, C.M., Chambers, R.G. and Lobell, D.B., 2021. Anthropogenic climate change has slowed global agricultural productivity growth. *Nature Climate Change*, 11(4), pp.306-312.
- *Ayush, K., Uzkent, B., Meng, C., Tanmay, K., Burke, M., Lobell, D. and Ermon, S., 2021. Geographyaware self-supervised learning. In *Proceedings of the IEEE/CVF International Conference on Computer Vision* (pp. 10181-10190).
- Burke, M., Driscoll, A., Lobell, D.B. and Ermon, S., 2021. Using satellite imagery to understand and promote sustainable development. *Science*, *371*(6535).
- *Deines, J.M., Patel, R., Liang, S.Z., Dado, W. and Lobell, D.B., 2021. A million kernels of truth: insights into scalable satellite maize yield mapping and yield gap analysis from an extensive ground dataset in the US Corn Belt. *Remote Sensing of Environment*, 253, p.112174.
- *Campolo, J., Güereña, D., Maharjan, S. and Lobell, D.B., 2021. Evaluation of soil-dependent crop yield outcomes in Nepal using ground and satellite-based approaches. *Field Crops Research*, 260, p.107987.
- Benami, E., Jin, Z., Carter, M.R., Ghosh, A., Hijmans, R.J., Hobbs, A., Kenduiywo, B. and Lobell, D.B., 2021. Uniting remote sensing, crop modelling and economics for agricultural risk management. *Nature Reviews Earth & Environment*, pp.1-20.
- *Yeh, C., Perez, A., Driscoll, A., Azzari, G., Tang, Z., Lobell, D., Ermon, S. and Burke, M., 2020. Using publicly available satellite imagery and deep learning to understand economic well-being in Africa. *Nature communications*, *11*(1), pp.1-11.
- Newport, D., Lobell, D.B., Srivastava, A.K., Rao, P., Umashaanker, M., Malik, R.K., McDonald, A. and Jain, M., 2020. Factors Constraining Timely Sowing of Wheat as an Adaptation to Climate Change in Eastern India. *Weather, Climate, and Society*, 12(3), pp.515-528.
- *Wang, S., Di Tommaso, S., Deines, J.M. and Lobell, D.B., 2020. Mapping twenty years of corn and soybean across the US Midwest using the Landsat archive. *Scientific Data*, 7(1), pp.1-14.
- Diffenbaugh, N.S., et al., 2020. The COVID-19 lockdowns: a window into the Earth System. *Nature Reviews Earth & Environment*, 1(9), pp.470-481.

- *Wang, S., Di Tommaso, S., Faulkner, J., Friedel, T., Kennepohl, A., Strey, R. and Lobell, D.B., 2020. Mapping crop types in southeast india with smartphone crowdsourcing and deep learning. *Remote Sensing*, 12(18), p.2957.
- *Lin Aung, H., Uzkent, B., Burke, M., Lobell, D. and Ermon, S., 2020. Farm Parcel Delineation Using Spatio-Temporal Convolutional Networks. In *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition Workshops* (pp. 76-77).
- *Dado, W.T., Deines, J.M., Patel, R., Liang, S.Z. and Lobell, D.B., 2020. High-Resolution Soybean Yield Mapping Across the US Midwest Using Subfield Harvester Data. *Remote Sensing*, 12(21), p.3471.
- Wolski, P., Lobell, D., Stone, D., Pinto, I., Crespo, O. and Johnston, P., 2020. On the role of anthropogenic climate change in the emerging food crisis in southern Africa in the 2019–2020 growing season. *Global Change Biology*, 26(5), pp.2729-2730.
- Lobell, D.B., Deines, J.M. and Di Tommaso, S., 2020. Changes in the drought sensitivity of US maize yields. *Nature Food*, pp.1-7.
- Lobell, D.B., 2020. Principles and priorities for one CGIAR. Food Policy, p.101825.
- Lobell, D.B., Di Tommaso, S., You, C., Yacoubou Djima, I., Burke, M. and Kilic, T., 2020. Sight for Sorghums: Comparisons of Satellite-and Ground-Based Sorghum Yield Estimates in Mali. *Remote Sensing*, 12(1), p.100.
- *Wang, S., Chen, W., Xie, S.M., Azzari, G. and Lobell, D.B., 2020. Weakly Supervised Deep Learning for Segmentation of Remote Sensing Imagery. *Remote Sensing*, 12(2), p.207.
- Edreira, J.I.R., Mourtzinis, S., Azzari, G., Andrade, J.F., Conley, S.P., Lobell, D., Specht, J.E. and Grassini, P., 2020. From sunlight to seed: Assessing limits to solar radiation capture and conversion in agroecosystems. *Agricultural and Forest Meteorology*, 280, p.107775.
- *Ayush, K., Uzkent, B., Burke, M., Lobell, D. and Ermon, S., 2020. Generating Interpretable Poverty Maps using Object Detection in Satellite Images. *arXiv preprint arXiv:2002.01612*.
- *Deines, J.M., Wang, S. and Lobell, D.B., 2019. Satellites reveal a small positive yield effect from conservation tillage across the US Corn Belt. *Environmental Research Letters*, 14(12), p.124038.
- *Jain, M., Rao, P., Srivastava, A.K., Poonia, S., Blesh, J., Azzari, G., McDonald, A.J. and Lobell, D.B., 2019. The impact of agricultural interventions can be doubled by using satellite data. *Nature Sustainability*, 2(10), pp.931-934.
- Lobell, D.B., Azzari, G., Burke, M., Gourlay, S., Jin, Z., Kilic, T. and Murray, S., 2019. Eyes in the Sky, Boots on the Ground: Assessing Satellite-and Ground-Based Approaches to Crop Yield Measurement and Analysis. *American Journal of Agricultural Economics*.
- *Zaveri, E. and Lobell, D.B., 2019. The role of irrigation in changing wheat yields and heat sensitivity in India. *Nature communications*, 10(1), pp.1-7.
- Gourlay, S., Kilic, T. and Lobell, D.B., 2019. A new spin on an old debate: Errors in farmer-reported production and their implications for inverse scale-Productivity relationship in Uganda. *Journal of Development Economics*, p.102376.
- *Beal Cohen, A.A., Seifert, C.A., Azzari, G. and Lobell, D.B., 2019. Rotation Effects on Corn and Soybean Yield Inferred from Satellite and Field-level Data. Agronomy Journal.
- Leakey, A.D., Ferguson, J.N., Pignon, C.P., Wu, A., Jin, Z., Hammer, G.L. and Lobell, D.B., 2019. Water use efficiency as a constraint and target for improving the resilience and productivity of C3 and C4 crops. *Annual review of plant biology*, 70, pp.781-808.
- *Jin, Z., Azzari, G., You, C., Di Tommaso, S., Aston, S., Burke, M. and Lobell, D.B., 2019. Smallholder maize area and yield mapping at national scales with Google Earth Engine. *Remote Sensing of Environment*, 228, pp.115-128.
- *Jin, Z., Archontoulis, S.V. and Lobell, D.B., 2019. How much will precision nitrogen management pay off? An evaluation based on simulating thousands of corn fields over the US Corn-Belt. Field Crops Research, 240, pp.12-22.
- *Azzari, G., Grassini, P., Edreira, J.I.R., Conley, S., Mourtzinis, S. and Lobell, D.B., 2019. Satellite mapping of tillage practices in the North Central US region from 2005 to 2016. *Remote sensing of environment*, 221, pp.417-429.
- Cai, Y., Guan, K., Lobell, D., Potgieter, A.B., Wang, S., Peng, J., Xu, T., Asseng, S., Zhang, Y., You, L. and Peng, B., 2019. Integrating satellite and climate data to predict wheat yield in Australia using machine learning approaches. *Agricultural and Forest Meteorology*, 274, pp.144-159.
- *Wang, S., Azzari, G. and Lobell, D.B., 2019. Crop type mapping without field-level labels: Random forest transfer and unsupervised clustering techniques. Remote Sensing of Environment, 222, pp.303-317.
- *Perez A, Ganguli S, Ermon S, Azzari G, Burke M, Lobell D. 2019. Semi-supervised multitask learning on multispectral satellite images using wasserstein generative adversarial networks (gans) for predicting poverty. arXiv preprint arXiv:1902.11110. 2019 Feb 13.

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- Duffy, P.B., Field, C.B., Diffenbaugh, N.S., Doney, S.C., Dutton, Z., Goodman, S., Heinzerling, L., Hsiang, S., Lobell, D.B., Mickley, L.J. and Myers, S., 2019. Strengthened scientific support for the Endangerment Finding for atmospheric greenhouse gases. *Science*, 363(6427), p.eaat5982.
- * Uzkent, B., Sheehan, E., Meng, C., Tang, Z., Burke, M., Lobell, D. and Ermon, S., 2019. Learning to Interpret Satellite Images in Global Scale Using Wikipedia. arXiv preprint arXiv:1905.02506.
- *Wang, A.X., Tran, C., Desai, N., Lobell, D. and Ermon, S., 2018, June. Deep transfer learning for crop yield prediction with remote sensing data. In Proceedings of the 1st ACM SIGCAS Conference on Computing and Sustainable Societies (p. 50). ACM.
- *Zhong, H., Li, X., Lobell, D., Ermon, S. and Brandeau, M.L., 2018. Hierarchical modeling of seed variety yields and decision making for future planting plans. Environment Systems and Decisions, 38(4), pp.458-470.
- Oshri, B., Hu, A., Adelson, P., Chen, X., Dupas, P., Weinstein, J., Burke, M., Lobell, D. and Ermon, S., 2018, July. Infrastructure quality assessment in africa using satellite imagery and deep learning. In Proceedings of the 24th ACM SIGKDD International Conference on Knowledge Discovery & Data Mining (pp. 616-625). ACM.
- Zhu P, Jin Z, Zhuang Q, Ciais P, Bernacchi C, Wang X, Makowski D, Lobell D. 2018 The important but weakening maize yield benefit of grain filling prolongation in the US Midwest. Global change biology. Oct;24(10):4718-30.
- Jean N, Wang S, Azzari G, Lobell D, Ermon S. 2018. Tile2Vec: Unsupervised representation learning for remote sensing data. arXiv preprint arXiv:1805.02855. 2018 May 8.
- Ciscar JC, Fisher-Vanden K, Lobell DB. Synthesis and Review: an inter-method comparison of climate change impacts on agriculture. Environmental Research Letters. 2018 Jun 26;13(7):070401.
- *Seifert, C.A., Azzari, G. and Lobell, D.B., 2018. Satellite detection of cover crops and their effects on crop yield in the Midwestern United States. Environmental Research Letters, 13(6), p.064033.
- *Weyant, C., Brandeau, M.L., Burke, M., Lobell, D.B., Bendavid, E. and Basu, S., 2018. Anticipated burden and mitigation of carbon-dioxide-induced nutritional deficiencies and related diseases: A simulation modeling study. PLoS medicine, 15(7), p.e1002586.
- *Turner, P.A., Field, C.B., Lobell, D.B., Sanchez, D.L. and Mach, K.J., 2018. Unprecedented rates of landuse transformation in modelled climate change mitigation pathways. Nature Sustainability, 1(5), p.240.
- *Jin, Z., Ainsworth, E. A., Leakey, A. D. B., & Lobell, D. B. (2018). Increasing drought and diminishing benefits of elevated carbon dioxide for soybean yields across the US Midwest. Global Change Biology, 24(2). https://doi.org/10.1111/gcb.13946
- *Turner, P. A., Mach, K. J., Lobell, D. B., Benson, S. M., Baik, E., Sanchez, D. L., & Field, C. B. (2018). The global overlap of bioenergy and carbon sequestration potential. Climatic Change. 148(1-2), pp.1-10.<u>https://doi.org/10.1007/s10584-018-2189-z</u>
- Tebaldi, C., & Lobell, D. (2018). Estimated impacts of emission reductions on wheat and maize crops. Climatic Change, 146(3-4), 533-545.
- *Jin, Z., Azzari, G., & Lobell, D. B. (2017). Improving the accuracy of satellite-based high-resolution yield estimation: A test of multiple scalable approaches. Agricultural and Forest Meteorology, 247. https://doi.org/10.1016/j.agrformet.2017.08.001
- *Jin, Z., Azzari, G., Burke, M., Aston, S., & Lobell, D. B. (2017). Mapping smallholder yield heterogeneity at multiple scales in eastern Africa. Remote Sensing, 9(9). https://doi.org/10.3390/rs9090931
- Zhao, C., Liu, B., Piao, S., Wang, X., Lobell, D. B., Huang, Y., ... Asseng, S. (2017). Temperature increase reduces global yields of major crops in four independent estimates. Proceedings of the National Academy of Sciences of the United States of America, 114(35). https://doi.org/10.1073/pnas.1701762114
- *Guan, K., Wu, J., Kimball, J. S., Anderson, M. C., Frolking, S., Li, B., ... Lobell, D. B. (2017). The shared and unique values of optical, fluorescence, thermal and microwave satellite data for estimating large-scale crop yields. Remote Sensing of Environment, 199. https://doi.org/10.1016/j.rse.2017.06.043
- *Pryzant, R., Ermon, S., & Lobell, D. (2017). Monitoring Ethiopian Wheat Fungus with Satellite Imagery and Deep Feature Learning. In IEEE Computer Society Conference on Computer Vision and Pattern Recognition Workshops (Vol. 2017–July). https://doi.org/10.1109/CVPRW.2017.196
- Roberts, M. J., Braun, N. O., Sinclair, T. R., Lobell, D. B., & Schlenker, W. (2017). Comparing and combining process-based crop models and statistical models with some implications for climate change. Environmental Research Letters, 12(9). https://doi.org/10.1088/1748-9326/aa7f33
- *Jain, M., Singh, B., Srivastava, A. A. K., Malik, R. K., McDonald, A. J., & Lobell, D. B. (2017). Using satellite data to identify the causes of and potential solutions for yield gaps in India's Wheat Belt. Environmental Research Letters, 12(9). https://doi.org/10.1088/1748-9326/aa8228

- *Azzari, G., & Lobell, D. B. (2017). Landsat-based classification in the cloud: An opportunity for a paradigm shift in land cover monitoring. Remote Sensing of Environment, 202. https://doi.org/10.1016/j.rse.2017.05.025
- Lobell, D. B., & Asseng, S. (2017). Comparing estimates of climate change impacts from process-based and statistical crop models. Environmental Research Letters, 12(1). https://doi.org/10.1088/1748-9326/aa518a
- *Azzari, G., Jain, M., & Lobell, D. B. (2017). Towards fine resolution global maps of crop yields: Testing multiple methods and satellites in three countries. Remote Sensing of Environment, 202. <u>https://doi.org/10.1016/j.rse.2017.04.014</u>
- *Seifert, C. A., Roberts, M. J., & Lobell, D. B. (2017). Continuous corn and soybean yield penalties across hundreds of thousands of fields. Agronomy Journal, 109(2). https://doi.org/10.2134/agronj2016.03.0134
- Burke, M. and Lobell, D.B., 2017. Satellite-based assessment of yield variation and its determinants in smallholder African systems. Proceedings of the National Academy of Sciences, 114(9), pp.2189-2194. https://doi.org/10.1073/pnas.1616919114
- Lobell, D.B. and Azzari, G., 2017. Satellite detection of rising maize yield heterogeneity in the US Midwest. Environmental Research Letters, 12(1), p.014014. <u>https://doi.org/10.1088/1748-9326/aa5371</u>
- Lobell, D.B. and Asseng, S., 2017. Comparing estimates of climate change impacts from process-based and statistical crop models. Environmental Research Letters, 12(1), p.015001.
- *Urban, D. W., Sheffield, J., & Lobell, D. B. (2017). Historical effects of CO₂ and climate trends on global crop water demand. Nature Climate Change, 7(12), 901.
- * Heft-Neal, S., Lobell, D.B. and Burke, M., 2017. Using remotely sensed temperature to estimate climate response functions. Environmental Research Letters, 12(1), p.014013. https://doi.org/10.1088/1748-9326/aa5463
- *Zhao, Y. and D.B. Lobell, 2017. Assessing the heterogeneity and persistence of farmers' maize yield performance across the North China Plain, *Field Crops Research*, 205: 55-66.
- *Seifert, C., Roberts, M., and Lobell, D.B. 2017. Continuous Corn and Soybean Yield Penalties Across Hundreds of Thousands of Fields, *Agronomy Journal*, 109(2): 541-548.
- *You, J., X. Li, M. Low, D. Lobell and S. Ermon (2017) Deep Gaussian Process for Crop Yield Prediction Based on Remote Sensing Data, *AAAI Conference on Artificial Intelligence (AAAI-17)*, 4559-4566.
- *Guan, K., Sultan, B., Biasutti, M., Baron, C., & Lobell, D. B. (2017). Assessing climate adaptation options and uncertainties for cereal systems in West Africa. *Agricultural and Forest Meteorology*, 232, 291–305. doi:10.1016/j.agrformet.2016.07.021
- Asseng, S., Cammarano, D., Basso, B., Chung, U., Alderman, P. D., Sonder, K., ... & Lobell, D. B. (2017). Hot spots of wheat yield decline with rising temperatures. Global change biology, 23(6), 2464-2472.
- *Jain, M., Srivastava, A.K., Joon, R.K., McDonald, A., Royal, K., Lisaius, M.C. and Lobell, D.B., 2016. Mapping Smallholder Wheat Yields and Sowing Dates Using Micro-Satellite Data. *Remote Sensing*, 8(10), p.860. doi:10.3390/rs8100860
- Liu, Asseng, Muller, Ewert, Elliott, Lobell et al. (2016) Similar negative impacts of temperature on global wheat yield estimated by three independent methods, *Nature Climate Change*. doi:10.1038/nclimate3115
- *Jean, N., Burke, M., Xie, M., Davis, W. M., Lobell, D. B., & Ermon, S. (2016). Combining satellite imagery and machine learning to predict poverty. *Science*, 353(6301), 790–794. https://doi.org/10.1126/science.aaf7894
- Potgieter, A. B., Lobell, D. B., Hammer, G. L., Jordan, D. R., Davis, P., & Brider, J. (2016). Yield trends under varying environmental conditions for sorghum and wheat across Australia. Agricultural and Forest Meteorology, 228, 276–285.
- *Zhao, Y., Chen, X., & Lobell, D. B. (2016). An approach to understanding persistent yield variation—A case study in North China Plain. *European Journal of Agronomy*, 77, 10-19.
- Farmaha, B. S., Lobell, D. B., Boone, K. E., Cassman, K. G., Yang, H. S., & Grassini, P. (2016). Contribution of persistent factors to yield gaps in high-yield irrigated maize. *Field Crops Research*, 186, 124-132.
- *Meng, Q., Chen, X., Lobell, D. B., Cui, Z., Zhang, Y., Yang, H., & Zhang, F. (2016). Growing sensitivity of maize to water scarcity under climate change. *Scientific reports*, 6.
- *Ravi, S., Macknick, J., Lobell, D., & Field, C. (2016). Colocation opportunities for large solar infrastructures and agriculture in drylands. *Applied Energy*. 165, 383-392
- *Xie, M., Jean, N., Burke, M., Lobell, D., & Ermon, S. (2015). Transfer Learning from Deep Features for Remote Sensing and Poverty Mapping. AAAI Conference on Artificial Intelligence (AAAI-15) http://arxiv.org/abs/1510.00098

- *Guan, K., Berry, J. A., Zhang, Y., Joiner, J., Guanter, L., Badgley, G., & Lobell, D. B. (2015). Improving the monitoring of crop productivity using spaceborne solar-induced fluorescence. *Global change biology*.doi: 10.1111/gcb.13136, 22 716-726
- Tebaldi, C., & Lobell, D. (2015). Estimated impacts of emission reductions on wheat and maize crops. *Climatic Change*. 1-13. http://link.springer.com/article/10.1007/s10584-015-1537-5
- Burke, M., Dykema, J., Lobell, D., Miguel, E., Satyanath, S. (2015). Incorporating climate uncertainty into estimates of climate change impacts. *Review of Economics and Statistics* 97.2: 461-471.
- *Guan K, Sultan B, Biasutti M, Baron C, Lobell DB (2015) What aspects of future rainfall changes matter for crop yields in West Africa? *Geophysical Research Letters*. 42.19: 8001-8010.
- *Zhao Y, Chen X, Cui Z, Lobell DB (2015) Using satellite remote sensing to understand maize yield gaps in the North China Plain. *Field Crops Research*, 183, 31–42.
- Lobell DB, Hammer GL, Chenu K, Zheng B, McLean G, Chapman SC (2015) The shifting influence of drought and heat stress for crops in northeast Australia. *Global change biology*. doi: 10.1111/gcb.13022
- Lobell DB, Thau D, Seifert C, Engle E, Little B (2015) A scalable satellite-based crop yield mapper. *Remote Sensing of Environment.* 164: 324-333. https://doi.org/10.1016/j.rse.2015.04.021
- *Urban D, Sheffield J, Lobell D. 2015. The impacts of future climate and carbon dioxide changes on the average and variability of US maize yields under two emission scenarios. *Environmental Research Letters*. 10 045003
- *Seifert CA, Lobell DB. 2015. Response of double cropping suitability to climate change in the United States. *Environmental Research Letters*, 10, 024002.
- *Moore, F.C., Lobell, D.B., 2015. The fingerprint of climate trends on European crop yields. Proc. Natl. Acad. Sci. U. S. A. 112, 2670–2675. doi:10.1073/pnas.1409606112
- *Urban, D.W., Roberts, M.J., Schlenker, W., Lobell, D.B., 2015. The effects of extremely wet planting conditions on maize and soybean yields. *Clim. Change* 1–14.
- *Gourdji, S., Läderach, P., Valle, A.M., Martinez, C.Z., Lobell, D.B., 2015. Historical climate trends, deforestation, and maize and bean yields in Nicaragua. *Agric. For. Meteorol.* 200, 270–281.
- Verón, S.R., de Abelleyra, D., Lobell, D.B., 2015. Impacts of precipitation and temperature on crop yields in the Pampas. *Clim. Change* 1–11.
- Asseng, S., Ewert, F., Martre, P., Rötter, R.P., Lobell, D.B., et al., 2015. Rising temperatures reduce global wheat production. *Nat. Clim. Chang.* 5, 143–147, doi:10.1038/nclimate2470
- Porter, J.R., Xie, L., Challinor, A.J., Cochrane, K., Howden, S.M., Iqbal, M.M., Lobell, D.B., Travasso, M.I., 2014. Chapter 7: Food Security and Food Production Systems. IPCC Working Group 2 Report.
- Sultan, B., *Guan, K., Kouressy, M., Biasutti, M., Piani, C., Hammer, G.L., McLean, G., Lobell, D.B., 2014. Robust features of future climate change impacts on sorghum yields in West Africa. *Environ. Res. Lett.* 9, 104006.
- Lobell, D.B., 2014. Climate change adaptation in crop production: Beware of illusions. *Global Food* Security. 3: 72-76
- Lobell, D.B. and Tebaldi, C., 2014. Getting caught with our plants down: the risks of a global crop yield slowdown from climate trends in the next two decades. *Environmental Research Letters*, 9(7): 074003.
- *Moore, F.C. and Lobell, D.B., 2014. Adaptation potential of European agriculture in response to climate change. *Nature Climate Change*. 4(7) 610-614
- Lobell, D.B., Roberts, M.J., Schlenker, W., Braun, N., Little, B.B., Rejesus, R.M. and Hammer, G.L., 2014. Greater Sensitivity to Drought Accompanies Maize Yield Increase in the U.S. Midwest. *Science*, 344(6183): 516-519. https://doi.org/10.1126/science.1251423
- *Ravi, S., Lobell, D.B. and Field, C.B., 2014. Tradeoffs and Synergies between Biofuel Production and Large Solar Infrastructure in Deserts. *Environmental science & technology*, 48(5): 3021-3030.
- Hertel TW, Lobell DB. 2014. Agricultural adaptation to climate change in rich and poor countries: Current modeling practice and potential for empirical contributions. *Energy Economics*.
- Challinor, A.J., Watson, J., Lobell, D.B., Howden, S.M., Smith, D.R. and Chhetri, N., 2014. A metaanalysis of crop yield under climate change and adaptation. *Nature Clim. Change*, 4(4): 287-291.
- * Sibley, A., P. Grassini, N. Thomas. K. Cassman, and D.B. Lobell. 2014. Testing remote sensing approaches for assessing yield variability among maize fields, *Agronomy Journal*, 106: 24-32
- *Meng Q, Hou P, Lobell D.B, Wang H, Cui Z, Zhang F, Chen X. 2013. The benefits of recent warming for maize production in high latitude China. Climatic Change. Doi: 10.1007/s10584-013-1009-8
- Stone, D., Auffhammer, M., Carey, M., Hansen, G., Huggel, C., Cramer, W., Lobell, D., Molau, U., Solow, A., Tibig, L. and Yohe, G., 2013. The challenge to detect and attribute effects of climate change on human and natural systems. Climatic Change: 1-15.

- Saba, A., Biasutti, M., Gerrard, M. B., & Lobell, D. B. 2013. Getting Ahead of the Curve: Supporting Adaptation to Long-term Climate Change and Short-term Climate Variability Alike. Carbon and Climate Law Review, 7(1), 3–23.
- Campbell, J.E., Lobell, D.B., Genova, R.C., Zumkehr, A. and Field, C.B., 2013. Seasonal energy storage using bioenergy production from abandoned croplands. *Environmental Research Letters*, 8(3): 035012.
- *Gourdji, S.M., Sibley, A.M. and Lobell, D.B., 2013. Global crop exposure to critical high temperatures in the reproductive period: historical trends and future projections. *Environmental Research Letters*, 8(2): 024041.
- *McGrath, J.M. and Lobell, D.B., 2013. Regional disparities in the CO2 fertilization effect and implications for crop yields. *Environmental Research Letters*, 8(1): 014054.
- Schlenker, W., Roberts, M.J. and Lobell, D.B., 2013. US maize adaptability. *Nature Climate Change*, 3(8): 690-691.
- Lobell, D.B., G.L. Hammer, G. McLean, C. Messina, M.J. Roberts, and W. Schlenker. 2013. The critical role of extreme heat for maize production in the United States, *Nature Climate Change*, DOI: 10.1038/NCLIMATE1832.
- * Georgescu, M., Lobell, D.B., Field, C.B., & Mahalov, A. (2013). Simulated hydroclimatic impacts of projected Brazilian sugarcane expansion. *Geophysical Research Letters*, 40, 1–6.
- Lobell, D.B., U. Baldos, and T.W. Hertel. 2013. Climate adaptation as mitigation: the case of agricultural investments, *Environmental Research Letters*, 8 015012 doi:10.1088/1748-9326/8/1/015012
- * Gourdji, S.M., K. Matthews, M. Reynolds, J. Cross, and D.B. Lobell. 2013. An assessment of wheat yield sensitivity and breeding gains in hot environments, *Proceedings of the Royal Society B: Biological Sciences*, 280: 1752.
- Lobell, D.B., 2013. The use of satellite data for crop yield gap analysis. Field Crops Research, 143, 56-64
- Lobell, D.B., Ortiz-Monasterio, J.I., Sibley, A.M., & Sohu, V.S. 2013. Satellite detection of earlier wheat sowing in India and implications for yield trends. Agricultural Systems, 115, 137-143
- Lobell, D.B. 2013. Errors in climate datasets and their effects on statistical crop models. Agricultural and Forest Meteorology, 170, 58-66
- Lobell, D.B., and Gourdji, S.M., 2012. The influence of climate change on global crop productivity, *Plant Physiology*, 160: 1686-1697.
- * McGrath, J.M., & Lobell, D.B. 2012. Reduction of transpiration and altered nutrient allocation contribute to nutrient decline of crops grown in elevated CO2 concentrations. Plant, Cell & Environment, in press.
- * Urban, D., Roberts, M., Schlenker, W. and Lobell, D., 2012. Projected temperature changes indicate significant increase in interannual variability of U.S. maize yields. Climatic Change, 112(2): 525-533.
- Lobell, D.B., Sibley, A. and Ivan Ortiz-Monasterio, J., 2012. Extreme heat effects on wheat senescence in India. Nature Clim. Change, advance online publication. DOI: 10.1038/NCLIMATE1356
- *Pongratz, J., Lobell, D.B., Cao, L. and Caldeira, K., 2012. Crop yields in a geoengineered climate. Nature Clim. Change, 2(2): 101-105.
- *Maltais-Landry, G. and Lobell, D.B., 2012. Evaluating the Contribution of Weather to Maize and Wheat Yield Trends in 12 US Counties. Agronomy journal, 104(2): 301.
- Lobell, D. and Field, C., 2012. California perennial crops in a changing climate. Climatic Change, 109: 317-333.
- Lobell, D., Torney, A. and Field, C., 2012. Climate extremes in California agriculture. Climatic Change, 109: 355-363.
- Lobell, D.B., W.S. Schlenker, and J. Costa-Roberts. 2011. Climate trends and global crop production since 1980. Science, doi:10.1126/science.1204531.
- Lobell, D.B., Banziger, M., Magorokosho, C. and Vivek, B., 2011. Nonlinear heat effects on African maize as evidenced by historical yield trials. *Nature Clim. Change*, 1(1): 42-45.
- * Loarie, S.R., Lobell, D.B., Asner, G.P., Mu, Q. and Field, C.B., 2011. Direct impacts on local climate of sugar-cane expansion in Brazil. Nature Clim. Change, 1(2): 105-109.
- *Nicholas, K.A., Matthews, M.A., Lobell, D.B., Willits, N.H. and Field, C.B., 2011. Effect of vineyardscale climate variability on Pinot noir phenolic composition. *Agricultural and Forest Meteorology*, 151(12): 1556-1567.
- Ahmed, S.A. et al., 2011. Climate volatility and poverty vulnerability in Tanzania. *Global Environmental Change*, 21(1): 46-55.
- Rowhani, P., Lobell, D. B., Linderman, M. & Ramankutty, N. 2011. Climate variability and crop production in Tanzania. *Agricultural and Forest Meteorology* 10.1016/j.agrformet.2010.12.002.

- *McGrath, J.M., and D.B. Lobell. 2011. An independent method for deriving the carbon fertilization effect using historical yield data from wet and dry years. *Global Change Biology*, doi: 10.1111/j.1365-2486.2011.02406.x.
- * Georgescu, M., Lobell, D.B. and Field, C.B., 2011. Direct climate effects of perennial bioenergy crops in the United States. *Proceedings of the National Academy of Sciences*, 108(11): 4307-4312.
- * Seifert, C., Ortiz-Monasterio, J.I. and Lobell, D.B., 2011. Satellite-Based Detection of Salinity and Sodicity Impacts on Wheat Production in the Mexicali Valley. *Soil Science Society of America Journal*, 75(2): 699.
- * Loarie, S.R., Lobell, D.B., Asner, G.P. and Field, C.B., 2011. Land-Cover and Surface Water Change Drive Large Albedo Increases in South America. *Earth Interactions*, 15(7): 1-16.
- Ebi, K.L., D.B. Lobell, and C.B. Field. 2010. Climate change impacts on food security and nutrition, *United Nations' SCN News*, 38: 11-17.
- *Burney, J.A., Davis, S.J. and Lobell, D.B., 2010. Greenhouse gas mitigation by agricultural intensification. *Proceedings of the National Academy of Sciences*, 107(26): 12052.
- Lobell, D.B., Ortiz-Monasterio, J.I. and Lee, A.S., 2010. Satellite evidence for yield growth opportunities in Northwest India. *Field Crops Research*, 118: 13-20.
- Hertel, T., M.B. Burke and D.B. Lobell, 2010. The poverty implications of climate-induced crop yield changes by 2030. *Global Environmental Change*, 20(4): 577-585.
- Lobell, D.B. and M.B. Burke. 2010. On the use of statistical models to predict crop yield responses to climate change. *Agricultural and Forest Meteorology*, 150 (11): 1443-1452.
- Schlenker W and Lobell DB. 2010. Robust negative impacts of climate change on African agriculture. Environmental Research Letters: 014010 (8pp)
- *Ahrens, T.D., D.B. Lobell, J.I. Ortiz-Monasterio, Y. Li, P.A. Matson. 2010. Narrowing the agronomic yield gap with improved nitrogen use efficiency: a modeling approach. *Ecological Applications*. 20(1): 91-100.
- *Georgescu, M., D. B. Lobell, and C. B. Field. 2009, Potential impact of U.S. biofuels on regional climate, *Geophys. Res. Lett.*, 36, L21806, doi: 10.1029/2009GL040477.
- Lobell, D.B. 2009. Remote Sensing of Soil Degradation: Introduction. J. Environ. Qual. 39:1-4.
- Lobell, D.B., S.M. Lesch, D.L. Corwin, M.G. Ulmer, K.A. Anderson, D.J. Potts, J.A. Doolittle, M.R. Matos, and M.J. Baltes. 2009. Regional-scale Assessment of Soil Salinity in the Red River Valley Using Multi-year MODIS EVI and NDVI. J. Environ. Qual. 39:35-41.
- Burke, M.B., E. Miguel, S. Satyanath, J.A. Dykema, and D.B. Lobell. 2009. Warming increases the risk of civil war in Africa. *Proceedings of the National Academy of Sciences* 106:20670.
- Burke MB, Lobell DB and Guarino L 2009 Shifts in African crop climates by 2050, and the implications for crop improvement and genetic resources conservation *Global Environmental Change*: 19, 317-325.
- Lobell D.B., K.G. Cassman, and C.B.Field. 2009. Crop Yield Gaps: Their Importance, Magnitudes, and Causes. *Annual Review of Environment and Resources*, 34:4.1-4.26.
- Campbell, J. E., D.B. Lobell, Field, C. B. 2009. Greater transportation energy and GHG offsets from bioelectricity than ethanol. *Science* 10.1126/science.1168885
- Lobell, D.B., G. Bala, A. Mirin, T. Phillips, R. Maxwell, D. Rotman. 2009, Regional differences in the influence of irrigation on climate, *J Climate*. 22:2248-2255.
- Lobell, D.B., and M.B. Burke. 2008. Why are agricultural impacts of climate change so uncertain? The importance of temperature relative to precipitation. *Environmental Research Letters* 3:034007.
- Campbell, J. E., Lobell, D. B., Genova, R. C., Field, C. B. 2008. The global potential of bioenergy on abandoned agriculture lands, *Environmental Science and Technology*. 10.1021/es800052w
- Lobell, D.B., M.B. Burke, C. Tebaldi, M.M. Mastrandrea, W.P. Falcon, and R.L. Naylor. 2008. Prioritizing climate change adaptation needs for food security in 2030. *Science*, 319:607-610. DOI: 10.1126/science.1152339
- Lobell, D.B., and J.I. Ortiz-Monasterio. 2008. Satellite Monitoring of Yield Responses to Irrigation Practices across Thousands of Fields. *Agron. J.* 100:1005-101
- Lobell, D. B., C. J. Bonfils, L. M. Kueppers, and M. A. Snyder. 2008, Irrigation cooling effect on temperature and heat index extremes, *Geophys. Res. Lett.*, 35, L09705, doi:10.1029/2008GL034145.
- Tebaldi, C., and D. B. Lobell 2008, Towards probabilistic projections of climate change impacts on global crop yields, *Geophys. Res. Lett.*, 35, L08705, doi:10.1029/2008GL033423.
- Bonfils, C., P. Duffy, B. Santer, T. Wigley, D. Lobell, T. Phillips, and C. Doutriaux. 2008. Identification of external influences on temperatures in California. *Clim. Change*:10.1007/s10584-007-9374-9.
- Field, C.B., J.E. Campbell and D.B. Lobell. 2008. Biomass energy: The scale of the potential resource. *Trends in Ecology & Evolution*,. doi:10.1016/j.tree.2007.12.001

- Lobell, D.B., C. Bonfils, and J.M. Faures. 2008. The role of irrigation expansion in past and future temperature trends. *Earth Interactions*, 12:1-11.
- Lobell, D.B., and C. Bonfils. 2008. The Effect of Irrigation on Regional Temperatures: A Spatial and Temporal Analysis of Trends in California, 1934–2002. *J. Clim.* 21:2063-2071.
- Lobell, D.B. and C.B. Field. 2008. Estimation of the CO₂ fertilization effect using growth rate anomalies in CO₂ and crop yields since 1961. *Global Change Biology*, 14, 39-45.
- Duffy, P.B., C. Bonfils, and D.B. Lobell. 2007. Interpreting Recent Temperature Trends in California. EOS Transcations, 88 (41): 409-410.
- Field, C.B., D.B. Lobell, H.A. Peters, and N.R. Chiariello. 2007. Feedbacks of Terrestrial Ecosystems to Climate Change. *Annual Review of Environment and Resources*, 32: 7.1-7.29.
- Bonfils, C. and D.B. Lobell. 2007. Evidence for a recent slowdown in irrigation-induced cooling, Proceedings of the National Academy of Sciences, doi: 10.1073/pnas.0700144104
- Lobell, D.B. 2007. Changes in diurnal temperature range and national cereal yields. *Agricultural and Forest Meteorology*, 145, 229-238.
- Lobell, D.B. and C.B. Field. 2007. Global scale climate-crop yield relationships and the impacts of recent warming. *Environmental Research Letters*, 2, 004000 (7pp)
- Lobell, D. B., C. Bonfils, and P. B. Duffy. 2007. Climate change uncertainty for daily minimum and maximum temperatures: a model inter-comparison. *Geophysical Research Letters*, 34: L05715, doi:10.1029/2006GL028726.
- Bala, G., K. Caldeira, M. Wickett, T. J. Phillips, D. B. Lobell, C. Delire, and A. Mirin. 2007, Combined climate and carbon-cycle effects of large-scale deforestation, *Proceedings of the National Academy of Sciences*, 0608998104.
- Bonfils, C., P. Duffy, and D. Lobell, 2007, Comments on "Methodology and Results of Calculating Central California Surface Temperature Trends: Evidence of Human-Induced Climate Change?" J. Climate, 20, 4486-4489.
- Lobell, D. B., J. I. Ortiz-Monasterio, F. C. Gurrola, and L. Valenzuela. 2007. Identification of Saline Soils with Multiyear Remote Sensing of Crop Yields, *Soil Science Society of America Journal*, 71, 777-783.
- Lobell, D.B., and J.I. Ortiz-Monasterio. 2007. Impacts of day vs. night temperatures on spring wheat yields: a comparison of empirical and CERES model predictions in three locations. *Agronomy Journal*, 99:469-477.
- Ortiz-Monasterio, J.I., and D.B. Lobell. 2007. Remote sensing assessment of regional yield losses due to sub-optimal planting dates and fallow period weed management. *Field Crops Research*. 101:80-87.
- Lobell, D.B. 2007. The cost of uncertainty for nitrogen fertilizer management: A sensitivity analysis. *Field Crops Research*. 100:210-217.
- Lobell, D.B., K.N. Cahill, and C. Field. 2007. Historical effects of temperature and precipitation on California crop yields. *Climatic Change*, 81: 187-203.
- Lobell, D.B., J.I. Ortiz-Monasterio, and W.P. Falcon. 2007. Yield Uncertainty at Field Scales Evaluated with Multi-Year Satellite Data. *Agricultural Systems*, 92:76-90.
- Lobell, D.B., C.B. Field, K.N. Cahill, and C. Bonfils. 2006. Impacts of future climate change on California perennial crop yields: model projections with climate and crop uncertainties. *Agricultural and Forest Meteorology*, 141(2-3):208-218.
- Lobell, D. B., G. Bala, C. Bonfils, and P. B. Duffy. 2006. Potential bias of model projected greenhouse warming in irrigated regions, Geophys. Res. Lett., 33, L13709, doi:10.1029/2006GL026770.
- Lobell, D.B., G. Bala, and P.B. Duffy, 2006. Biogeophysical impacts of cropland management changes on climate. *Geophysical Research Letters*, 33, L06708, doi:10.1029/2005GL025492.
- Lobell, D.B., K.N. Cahill, and C.B. Field, 2006. Weather-based forecasts of California crop yields. *California Agriculture*, 60: 211-215.
- Lobell, D.B., and J.I. Ortiz-Monasterio, 2006. Evaluating Strategies for Improved Water Use in Spring Wheat with CERES. Agricultural Water Management, 84: 249-258.
- Lobell, D.B., and J.I. Ortiz-Monasterio. 2006. Regional importance of crop yield constraints: Linking simulation models and geostatistics to interpret spatial patterns. *Ecological Modelling* 196:173-182.
- Lobell, D.B., J.I. Ortiz-Monasterio, G.P. Asner, R. Naylor, W. Falcon, and P. Matson, 2005. Analysis of wheat yield and climatic trends in Mexico. *Field Crops Research*, 94 (2-3): 250-256.
- Lobell, D.B., J.I. Ortiz-Monasterio, G.P. Asner, R. Naylor, and W. Falcon, 2005. Combining field surveys, remote sensing, and regression trees to understand yield variations in an irrigated wheat landscape. *Agronomy Journal*, 97 (1): 241-249.
- Hicke, J.A., and D.B. Lobell, 2004. Spatiotemporal patterns of cropland area and net primary production in the central United States. *Geophysical Research Letters*, 31, L20502, doi:10.1029/2004GL020927.

- Lobell, D.B., and G.P. Asner, 2004. Cropland Distributions from Temporal Unmixing of MODIS Data. *Remote Sensing of Environment*, 93(3): 412-422.
- Hicke, J.A., D.B. Lobell, and G.P. Asner, 2004. Cropland area and net primary production computed from 30 years of USDA agricultural harvest data. *Earth Interactions*, 8(10): 1-20.
- Lobell, D.B., J.I. Ortiz-Monasterio, and G.P. Asner, 2004. Relative Importance of Soil and Climate Variability for Nitrogen Management in Irrigated Wheat. *Field Crops Research*, 87, 155-165.
- Luers, A.L., D.B. Lobell, L.S. Sklar, C.L. Addams, and P.A. Matson, 2003. A method for quantifying vulnerability, applied to the agricultural system of the Yaqui Valley, Mexico. *Global Environmental Change - Human and Policy Dimensions*, 13(4): 255-267.
- Lobell, D.B. and G.P. Asner, 2003. Comparison of Earth Observing-1 ALI and Landsat ETM+ for crop identification and yield prediction in Mexico. *IEEE Transactions On Geoscience and Remote Sensing*, 41(6): 1277-1282.
- Lobell, D.B. and G.P. Asner, 2003. Climate and management contributions to recent trends in U.S. agricultural yields. *Science*, 299: 1032.
- Lobell, D.B., G.P. Asner, J.I. Ortiz-Monasterio, and T.L. Benning, 2003. Remote sensing of regional crop production in the Yaqui Valley, Mexico: estimates and uncertainties. *Agriculture, Ecosystems, and Environment*, 94: 205-220.
- Lobell, D.B., J.I. Ortiz-Monasterio, C.L. Addams, and G.P. Asner, 2002. Soil, climate, and management impacts on regional agricultural productivity from remote sensing. *Agricultural and Forest Meteorology*, 114: 31-43.
- Lobell, D.B., J.A. Hicke, G.P. Asner, C.B. Field, and S.O. Los, 2002, Satellite estimates of productivity and light use efficiency in United States agriculture, 1982-1998. *Global Change Biology*, 8: 722-735.
- Lobell, D.B., and G.P. Asner, 2002. Moisture effects on soil reflectance. *Soil Science Society of America Journal*, 66: 722-727.
- Lobell, D.B., G.P. Asner, R. Treuhaft, and B. Law, 2002, View Angle Effects on Canopy Reflectance and Spectral Mixture Analysis of Temperate Forests Using AVIRIS. *International Journal of Remote* Sensing, 23: 2247-2262.
- Lobell, D.B., G.P. Asner, R. Treuhaft, and B. Law, 2001, Sub-pixel Canopy Cover Estimation of Coniferous Forests in Oregon Using SWIR Imaging Spectrometry. *Journal of Geophysical Research*, 106: 5151-5160.
- Elmore, A.J., J.F. Mustard, S.J. Manning, and D.B. Lobell, 2000, Quantifying Vegetation Change in Semi-Arid Environments: Precision and Accuracy of Spectral Mixture Analysis and the Normalized Difference Vegetation Index. *Remote Sensing of Environment*, 73(1): 87-102.
- Asner, G.P., and D.B. Lobell, 2000, A Biogeophysical Approach for Automated SWIR Unmixing of Soils and Vegetation. *Remote Sensing of Environment*, 74(1): 99-112.

Commentaries and Perspectives:

- Gustafson D, Hayes M, Janssen E, Lobell DB, Long S, Nelson GC, Pakrasi HB, Raven P, Robertson GP, Robertson R, Wuebbles D. (2016). Pharaoh's Dream Revisited: An Integrated US Midwest Field Research Network for Climate Adaptation. BioScience, 66(1), 80-85.
- Lobell, D.B., 2012. The case of the missing wheat. Environmental Research Letters, 7(2), p.021002.
- Guarino, L. and Lobell, D.B., 2011. A walk on the wild side. Nature Clim. Change, 1(8): 374-375.
- Fedoroff, N.V., D.S. Battisti, R.N. Beachy, P.J.M. Cooper, D.A. Fischhoff, C.N. Hodges, V.C. Knauf, D. Lobell, B.J. Mazur, D. Molden, M.P. Reynolds, P.C. Ronald, M.W. Rosegrant, P.A. Sanchez, A. Vonshak, and J.K. Zhu. 2010. Radically Rethinking Agriculture for the 21st Century. *Science* 327:833-834.

Books:

Lobell, D.B. and Burke, M.B. (eds.) 2010. Climate Change and Food Security. Springer. http://www.springerlink.com/content/978-90-481-2952-2

Book Chapters:

- Lobell, D.B., Naylor, R.L., Field, C.B., 2014. Food, Energy, and Climate Connections in a Global Economy. In the Evolving Sphere of Food Security (Naylor, ed.)
- Lobell, D.B. 2010. African Agriculture in 2050: Climate Change Impacts and Adaptation Options. In Rosenzweig and Hillel (ed.) 2010. Handbook on Climate Change and Agroecosystems, ASA.
- Lobell, D.B. and Burke, M.B. 2010. Economic Impacts of Climate Change on Agriculture to 2030. In Reynolds, M. (ed.) 2010. Climate Change and Crop Production. CABI.
- Lobell, D.B. and Burke, M.B. 2010. Chapter 1: Introduction. In Lobell, D.B. and Burke, M.B. (eds.) 2010. Climate Change and Food Security. Springer.

- Burke, M.B. and Lobell, D.B. 2010. Chapter 2: Food Security and Climate: An Overview. In Lobell, D.B. and Burke, M.B. (eds.) 2010. Climate Change and Food Security. Springer.
- Lobell, D.B. 2010. Chapter 5: Crop Responses to Climate: Time Series Models. In Lobell, D.B. and Burke, M.B. (eds.) 2010. Climate Change and Food Security. Springer.
- Burke, M.B. and Lobell, D.B. 2010. Chapter 8: Adaptation What Do We Know? In Lobell, D.B. and Burke, M.B. (eds.) 2010. Climate Change and Food Security. Springer.
- Lobell, D.B. and Burke, M.B. 2010. Chapter 10: Regional and Global Assessments. In Lobell, D.B. and Burke, M.B. (eds.) 2010. Climate Change and Food Security. Springer.
- Lobell, D.B. and Burke, M.B. 2010. Chapter 11: Where Do We Go From Here? In Lobell, D.B. and Burke, M.B. (eds.) 2010. Climate Change and Food Security. Springer.
- Lobell, D.B. 2010. Impacts of climate change on global crop production and food security. In Climate Change Science and Policy, edited by S. Schneider et al., in press
- Corwin, D. L., S.M. Lesch, and D.B. Lobell. 2009. Chapter 10 Laboratory and field measurements of salinity. <u>In</u>: Tanji, K.K. (ed.) Agricultural Salinity Assessment and Management, 2nd edition.
- Asner, G.P., J.A. Hicke, and D.B. Lobell. 2003. Per-pixel analysis of forest structure: Vegetation indices, spectral mixture analysis and canopy reflectance modeling. In M. Wulder and S.E. Franklin (eds.), Methods and Applications for Remote Sensing of Forests: Concepts and Case Studies. Kluwer Academic Publishers, New York.
- Lobell, D.B. and G.P. Asner. Hyperion studies of crop stress in Mexico. In Proceedings of the AVIRIS Workshop, NASA Jet Propulsion Laboratory, Pasadena, CA, 2003.