Climate TRACE Peer-reviewed Articles and Mentions

Last updated: November 8, 2024.

1. Articles authored or co-authored by Climate TRACE members

Agriculture: Cattle emissions (Harvard University)

- Hancock, S.E., Jacob, D., Chen, Z., Nesser, H., Davitt, A., Varon, D.J., Sulprizio, M.P., Balasus, N., Estrada, L.A., East, J.D. and Penn, E., 2024. Satellite quantification of methane emissions from South American countries: A high-resolution inversion of TROPOMI and GOSAT observations. *EGUsphere*, *2024*, pp.1-33. https://doi.org/10.5194/egusphere-2024-1763

Agriculture: Soil and fertilizer emissions (Michigan State University)

- Northrup, D.L., Basso, B., Wang, M.Q., Morgan, C.L. and Benfey, P.N., 2021. Novel technologies for emission reduction complement conservation agriculture to achieve negative emissions from row-crop production. *Proceedings of the National Academy of Sciences*, *118*(28), p.e2022666118. https://www.pnas.org/doi/10.1073/pnas.2022666118
- Saha, D., Basso, B. and Robertson, G.P., 2021. Machine learning improves predictions of agricultural nitrous oxide (N2O) emissions from intensively managed cropping systems. *Environmental Research Letters*, *16*(2), p.024004. https://iopscience.iop.org/article/10.1088/1748-9326/abd2f3/meta

Agriculture: Rice emissions (Paddy Watch)

- Fatchurrachman, Rudiyanto, Soh, N.C., Shah, R.M., Giap, S.G.E., Setiawan, B.I. and Minasny, B., 2022. High-Resolution Mapping of Paddy Rice Extent and Growth Stages across Peninsular Malaysia Using a Fusion of Sentinel-1 and 2 Time Series Data in Google Earth Engine. *Remote Sensing*, *14*(8), p.1875. https://doi.org/10.3390/rs14081875
- Rudiyanto, Minasny, B., Shah, R.M., Che Soh, N., Arif, C. and Indra Setiawan, B., 2019. Automated near-real-time mapping and monitoring of rice extent, cropping patterns, and growth stages in Southeast Asia using Sentinel-1 time series on a Google Earth Engine platform. *Remote Sensing*, *11*(14), p.1666. https://doi.org/10.3390/rs11141666.

Forestry and Land Use Change: Forestry emissions (CTrees)

- Xu, L., Saatchi, S.S., Yang, Y., Yu, Y., Pongratz, J., Bloom, A.A., Bowman, K., Worden, J., Liu, J., Yin, Y. and Domke, G., 2021. Changes in global terrestrial live biomass over the 21st century. *Science Advances*, *7*(27), p.eabe9829. https://www.science.org/doi/10.1126/sciadv.abe9829

Fossil fuel operations: Oil & gas emissions (RMI)

- Lu, X., Jacob, D. J., Wang, H., Maasakkers, J. D., Zhang, Y., Scarpelli, T. R., Shen, L., Qu, Z., Sulprizio, M. P., Nesser, H., Bloom, A. A., Ma, S., Worden, J. R., Fan, S., Parker, R. J., Boesch, H., Gautam, R., Gordon, D., Moran, M. D., Reuland, F., Villasana, C. A. O., and Andrews, A. 2022. Methane emissions in the United States, Canada, and Mexico: evaluation of national methane emission inventories and 2010–2017 sectoral trends by inverse analysis of in situ (GLOBALVIEWplus CH4 ObsPack) and satellite (GOSAT) atmospheric observations, Atmos. Chem. Phys., 22, 395–418, https://acp.copernicus.org/articles/22/395/2022/
- Scarpelli, T.R., Jacob, D.J., Grossman, S., Lu, X., Qu, Z., Sulprizio, M.P., Zhang, Y., Reuland, F., Gordon, D. and Worden, J.R., 2022. Updated Global Fuel Exploitation Inventory (GFEI) for methane emissions from the oil, gas, and coal sectors: evaluation with inversions of atmospheric methane observations. *Atmospheric Chemistry and Physics*, *22*(5), pp.3235-3249. https://doi.org/10.5194/acp-22-3235-2022.

Power: Electricity emissions (WattTime & Transition Zero)

- Couture, Heather D and O'Connor, Joseph and Mitchell, Grace and Söldner-Rembold, Isabella and D'souza, Durand and Karra, Krishna and Zhang, Keto and Rouzbeh Kargar, Ali and Kassel, Thomas and Goldman, Brian and Tyrrell, Daniel and Czerwinski, Wanda and Talekar, Alok and McCormick, Colin. "Towards Tracking the Emissions of Every Power Plant on the Planet." NeurIPS 2020 Workshop on Tackling Climate Change with Machine Learning. https://www.climatechange.ai/papers/neurips2020/11. 2020.
- Couture, H., 2020. How to track the emissions of every power plant on the planet from space. IEEE Spectrum. Available at: https://spectrum.ieee.org/how-to-track-the-emissions-of-every-power-plant-on-the-planet-from-space
- Couture, H.D., Alvara, M., Freeman, J., Davitt, A., Koenig, H., Rouzbeh Kargar, A., O'Connor, J., Söldner-Rembold, I., Ferreira, A., Jeyaratnam, J. and Lewis, J., 2024. Estimating Carbon Dioxide Emissions from Power Plant Water Vapor Plumes Using Satellite Imagery and Machine Learning. *Remote Sensing*, *16*(7), p.1290. https://doi.org/10.3390/rs16071290
- Hobbs, M., Kargar, A.R., Couture, H., Freeman, J., Söldner-Rembold, I., Ferreira, A., Jeyaratnam, J., O'Connor, J., Lewis, J., Koenig, H. and McCormick, C., 2023, July. Inferring Carbon Dioxide Emissions From Power Plants Using Satellite Imagery and Machine Learning. In *IGARSS 2023-2023 IEEE International Geoscience and Remote Sensing Symposium* (pp. 4911-4914). IEEE. Available at: https://ieeexplore.ieee.org/abstract/document/10283046

Transportation: Road Transport emissions (Johns Hopkins University Applied Physics Lab)

- Mukherjee, Ryan, Derek Rollend, Gordon Christie, Armin Hadzic, Sally Matson, Anshu Saksena, and Marisa Hughes. 2021. Towards Indirect Top-Down Road Transport Emissions Estimation. In Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition, pp. 1092-1101. https://arxiv.org/abs/2103.08829
- Rollend, D., Foster, K., Kott, T.M., Mocharla, R., Muñoz, R., Fendley, N., Ashcraft, C., Willard, F., Reilly, E.P. and Hughes, M., 2023. Machine learning for activity-based road transportation emissions estimation. *Environmental Data Science*, *2*, p.e38. https://doi.org/10.1017/eds.2023.32

Waste: Waste emissions (Global Plastics Watch):

- Kruse, Caleb, Edward Boyda, Sully Chen, Krishna Karra, Tristan Bou-Nahra, Dan Hammer, Jennifer Mathis, Taylor Maddalene, Jenna Jambeck, and Fabien Laurier. 2022. Satellite Monitoring of Terrestrial Plastic Waste. arXiv preprint arXiv:2204.01485. https://arxiv.org/abs/2204.01485.

2. Articles that reference Climate TRACE

Economics

- Kadach, I., Koo, M., Martin, X. and Zhao, M., 2024. Decipher Market Responses to Climate Trace Emission Data Release. *Available at SSRN*. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4961358
- Zhang, B., Kang, J. and Feng, T., 2024. Global disparities in CO2 emissions from mobility sectors of diverse economies: A macroscopic exploration across 188 countries/regions. *Environmental and Sustainability Indicators*, *23*, p.100455. https://doi.org/10.1016/j.indic.2024.100455

Government and Policy

- Boedijanto, F.J.O. and Delina, L.L., 2024. Potentials and challenges of artificial intelligence-supported greenwashing detection in the energy sector. *Energy Research & Social Science*, *115*, p.103638. https://doi.org/10.1016/j.erss.2024.103638

- Gordon, D. and Reuland, F., 2023. Advancing New Technology and Policy to Manage Methane in This Decisive Decade. *Environment: Science and Policy for Sustainable Development*, *65*(6), pp.5-17.
- Gore, A., 2022. Measure emissions to manage emissions. *Science*, *378*(6619), pp.455-455. https://doi.org/10.1126/science.adf5788
- Gupta A (2023) The advent of 'radical' transparency: Transforming multilateral climate politics? PLOS Clim 2(1): e0000117. https://doi.org/10.1371/journal.pclm.0000117
- Hsu, A. and Schletz, M., 2023. Digital technologies–the missing link between climate action transparency and accountability? *Climate Policy*, pp.1-18. https://doi.org/10.1080/14693062.2023.2237937
- Salas, J., Patterson, G. and de Barros Vidal, F., 2022. A Systematic Mapping of Artificial Intelligence Solutions for Sustainability Challenges in Latin America and the Caribbean. *IEEE Latin America Transactions*, *20*(11), pp.2312-2329. https://ieeexplore.ieee.org/document/9904756

Health

- Whitmee, S., Anton, B. and Haines, A., 2023. Accountability for carbon emissions and health equity. *Bulletin of the World Health Organization*, *101*(2), p.83. https://doi.org/10.2471%2FBLT.22.289452

3. Methods not developed by Climate TRACE but the coalition is implementing to estimate sector-specific emissions

Heavy Industry (used by Transition Zero)

- Liangrocapart, Sompong, Suphongsa Khetkeeree, and Bannakorn Petchthaweetham. "Thermal Anomaly Level Algorithm for Active Fire Mapping by Means of Sentinel-2 Data." In 2020 17th International Conference on Electrical Engineering/Electronics, Computer, Telecommunications and Information Technology (ECTI-CON), pp. 687-690. IEEE, 2020.
- Marchese, Francesco, Nicola Genzano, Marco Neri, Alfredo Falconieri, Giuseppe Mazzeo, and Nicola Pergola. "A multi-channel algorithm for mapping volcanic thermal anomalies by means of Sentinel-2 MSI and Landsat-8 OLI data." Remote Sensing 11, no. 23 (2019): 2876.
- Zhou, Yi, Fei Zhao, Shixin Wang, Wenliang Liu, and Litao Wang. "A method for monitoring iron and steel factory economic activity based on satellites." Sustainability 10, no. 6 (2018): 1935.

Oil & Gas (used by RMI)

- Abella, Jessica P., and Joule A. Bergerson. "Model to investigate energy and greenhouse gas emissions implications of refining petroleum: Impacts of crude quality and refinery configuration." *Environmental science & technology* 46, no. 24 (2012): 13037-13047.
- Brandt, Adam, Mohammad S. Masnadi, Jeff S. Rutherford, Hassan M. ElHoujeiri, Quinn Langfitt, Kourosh Vafi, Yulia Chen, James Duffy. 2022. "Oil Production Greenhouse Gas Emissions Estimator OPGEE v3.0b User guide & Technical documentation."
- Chen, Y., et al. 2022. Quantifying Regional Methane Emissions in the New Mexico Permian Basin with a Comprehensive Aerial Survey. *Environmental Science and Technology Letters*, 56(7). https://doi.org/10.1021/acs.est.1c06458
- Cusworth, D., et al. 2021. Multi Satellite Imaging of a Gas Well Blowout Enables Quantification of Total Methane Emissions. *Geophysical Research Letters*, *48*(2). https://doi.org/10.1029/2020gl090864
- Cusworth, D., et al. 202). Intermittency of Large Methane Emitters in the Permian Basin. *Environmental Science and Technology Letters, 8(7).* https://doi.org/10.1021/acs.estlett.1c00173https://github.com/arbrandt/OPGEE/blob/master/documentation/OPGEE_v3.0_methodology.pdf

- Lauvaux, T., Giron, C., Mazzolini, M., d'Aspremont, A., Duren, R., Cusworth, D., Shindell, D. and Ciais, P., 2022. Global assessment of oil and gas methane ultra-emitters. *Science*, *375*(6580), pp.557-561. DOI: 10.1126/science.abj4351
- Young, Ben, Troy Hottle, Troy Hawkins, Matthew Jamieson, Gregory Cooney, Kavan Motazedi, and Joule Bergerson. "Expansion of the petroleum refinery life cycle inventory model to support characterization of a full suite of commonly tracked impact potentials." *Environmental science & technology* 53, no. 4 (2019): 2238-2248.

Rice (used by Paddy Watch)

- Zhang, Geli, Xiangming Xiao, Jinwei Dong, Fengfei Xin, Yao Zhang, Yuanwei Qin, Russell B. Doughty, and Berrien Moore. "Fingerprint of rice paddies in spatial–temporal dynamics of atmospheric methane concentration in monsoon Asia." *Nature communications* 11, no. 1 (2020): 1-11.

Aviation (used by WattTime)

- International Civil Aviation Organization. 2018. "ICAO Carbon Emissions Calculator Methodology, Version 11." https://www.icao.int/environmental-protection/CarbonOffset/Documents/Methodology%20ICAO%20Carbon%20Calculator_v11-2018.pdf

Mining (used by Hypervine)

- Moon, Jihyun, and Hoonyol Lee. "Analysis of Activity in an Open-Pit Mine by Using InSAR Coherence-Based Normalized Difference Activity Index." *Remote Sensing* 13, no. 9 (2021): 1861.
- Wang, Lili, Liao Yang, Weisheng Wang, Baili Chen, and Xiaolin Sun. "Monitoring Mining Activities Using Sentinel-1A InSAR Coherence in Open-Pit Coal Mines." *Remote Sensing* 13, no. 21 (2021): 4485.