

Steven J. Davis

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CURRENT POSITION(S)

- | | |
|----------------|---|
| 2020 - present | <i>Professor, Earth System Science</i>
University of California, Irvine – Irvine, CA |
| 2023 - present | <i>Chair, Science Advisory Board</i>
Watershed – San Francisco, CA |
| 2017-present | <i>Affiliated Professor, Civil and Environmental Engineering</i>
University of California, Irvine – Irvine, CA |

RESEARCH INTERESTS

Coupled human and natural systems and sustainable systems analysis, including especially: energy technology and policy; pollution and resources embodied in international trade; “lock-in” of environmental problems; assessments of impacts and vulnerabilities; and the complex interactions of energy systems, agriculture, climate change, and global ecology

EDUCATION

- | | |
|------|--|
| 2008 | <i>PhD, Geological and Environmental Sciences</i>
Stanford University – Stanford, CA
Advisor: C. Page Chamberlain |
| 2001 | <i>JD, Virginia School of Law</i>
University of Virginia – Charlottesville, VA |
| 1998 | <i>BA, Political Science / Philosophy</i>
University of Florida – Gainesville, FL
Double major with honors, Phi Beta Kappa |

COMMUNITY SERVICE AND OUTREACH

- Journal Referee: *Nature, Science, Science Advances, Nature Climate Change, Nature Energy, Nature Geoscience, Nature Sustainability, Nature Food, Nature Communications, PNAS, PNAS Nexus, Joule, Energy & Environmental Science, Geophysical Research Letters, ES&T, Energy Policy, Ecological Economics, Environmental Research Letters, Water Resources Research*
- Chapter Lead (Ch. 32, Mitigation), [Fifth National Climate Assessment](#) (NCA5; 2021-present)
- Member, Scientific Steering Committee, [Global Carbon Project](#) (2020-present)
- Co-Founder and Co-Lead, [Carbon Monitor](#) (2020-present)
- Advisor/Board Member: [UCI Solutions that Scale](#); [Long US-China Institute](#); [Aspen Global Change Institute](#) (present)
- Mentor, [AGU Mentoring Network](#) (2019-2022)
- Contributing Author, [IPCC 6th Assessment Report](#) (AR6; 2020-2022)
- Member, Technical Council, [Science Based Targets Initiative](#) (2023-present)

RECENT AND UPCOMING TALKS AND MEETINGS

- AGU Fall Meeting, December 2023
- MIT Climate Tech Conference, October 2023
- University of Utah, Wilkes Center for Climate Science & Policy, May 2023
- University of California, Irvine, Climate Water Energy Systems Group, April 2023
- Stanford University, Doerr School of Sustainability, April 2023

STUDENT AND POSTDOCTORAL ADVISEES

Jacqueline Dowling, Postdoctoral Scholar (co-mentored with Ken Caldeira)
Jing Cheng, Postdoctoral Scholar
Candelaria Bergero, Doctoral Student
Julianne DeAngelo, Doctoral Student (now at [Watershed](#))
Can Cui, Visiting Doctoral Student (now a postdoc at ETH Zurich)
Robert Fofrich, Doctoral Student (now a postdoc at [Rutgers University](#))
Dawn Woodard, Doctoral Student (now a postdoc at [Pacific Northwest National Lab](#))
Chaopeng Hong, Postdoctoral Scholar (now an Assistant Professor at [Tsinghua University](#))
Dan Tong, Postdoctoral Scholar (now an Assistant Professor at [Tsinghua University](#))
Yue Qin, Former Postdoctoral Scholar (now an Assistant Professor at [Peking University](#))
Anna LoPresti, Masters Student (Graduated)
Christine Shearer, Postdoctoral Scholar (now at [Global Energy Monitor](#))

PAST ACADEMIC APPOINTMENTS

2016 - 2020 Associate Professor, Earth System Science
2012 - 2016 Assistant Professor, Earth System Science
University of California, Irvine – Irvine, CA

2015-2020 Visiting Faculty (summers), Department of Earth System Science
Tsinghua University – Beijing, China

2015, 2017 Young International Distinguished Professor, Institute of Applied Ecology
Chinese Academy of Sciences – Shenyang, China

2010 - 2012 Visiting Scholar, Joint Institute for the Study of Atmosphere and Ocean
University of Washington – Seattle, CA

2009 - 2010 Guest Investigator, Marine Policy Center
Woods Hole Oceanographic Institute – Woods Hole, MA

2008 - 2012 Postdoctoral Scholar, Department of Global Ecology
Carnegie Institution of Washington - Stanford, CA
Supervisor: Ken Caldeira

2004 - 2008 Research Assistant, Stable Isotope Biogeochemistry Laboratory
Stanford University – Stanford, CA

PROFESSIONAL EXPERIENCE




2022 - 2023 Head of Climate Science
Watershed – San Francisco, CA

2009 - 2017 Co-Founder and Chief Scientist
Near Zero – Seattle, WA

2006 - 2010 *Co-Founder and Executive Director*
The Climate Conservancy – Stanford, CA

2002 - 2004 *Associate Attorney, Corporate & Securities Group*
Gray, Cary, Ware & Freidenrich, LLP – Palo Alto, CA

JOURNAL PUBLICATIONS (* indicates student or postdoc author)

 Google Scholar (h-index: [71](#))
 ORCID [0000-0002-9338-0844](#)
 ResearcherID: [F-9968-2010](#) (h-index: 59)

147 publications, mean impact factor: **19.3**

in review

Dowling, JA*, TH Ruggles, ND Reich, EA Virguez, ZP Ifkovits, **SJ Davis**, AX Li, KM Kennedy, KZ Rinaldi, L Duan, K Caldeira, and NS Lewis. Technological opportunities and constraints of power-to-hydrogen-to-power systems for grid-scale energy storage.

Cheng, J*, D Tong*, H Zhao, R Xu, Y Qin, Q Zhang, K Caldeira, and **SJ Davis**. Energy security in net-zero emissions energy scenarios.

Zheng, D, D Tong*, **SJ Davis**, Y Qin*, Y Liu, R Xu, J Yang, X Yan, Q Zhang. Increases in extreme power shortage events of wind-solar supply systems worldwide.

Ruggles, T, E Virgüez, N Reich, J Dowling, H Bloomfield, E Antonini; **SJ Davis**, NS Lewis, and K Caldeira. The impact of the length of weather records for resource adequacy planning in solar- and wind-based electricity systems.

Wang, S, J Wang, C Fang, X Chen, J Liang, Y Liu, S Gao, K Hubacek, X Liu, C Zhou, Y Shan, K Feng, Z Liu, C Hong, **SJ Davis**. Decoupling consumption-based CO₂ emissions from economic growth.

Brouwer, J, C Thai, L Mastropasqua, A Hormaza Mejia, A Saeedmanesh, E Dailey, R Flores, J Reed, M MacKinnon, K Gill*, and **SJ Davis**. Cleaning up freight transportation in California.

Mittakola, RT, P Ciais, JE Schubert, D Makowski, C Zhou, H Bazzi, T Sun, Z Liu, and **SJ Davis**. Drivers of natural gas use in US buildings.

Ciais, P, **SJ Davis**, S Saatchi, Z Deng, B Poulter, F Chevallier, G Grassi, Z Liu, RL Thompson, GA McKinley, N Gruber, JP Wigneron, P Gentine, A d’Aspremont, T Lauvaux, C Albergel and D Crisp. Towards near-real-time estimates of greenhouse gas budgets.

Fofrich, R*, L Sloat, NS Diffenbaugh, F Moore, ND Mueller, and **SJ Davis**. Crop migration in response to future climate change.

Hong, C*, P Ciais, Z Liu, O Boucher, W Zhao, P Gentine, Y Wang, Z Deng, and **SJ Davis**. Near-real-time and state-level monitoring of U.S. CO₂ emissions.

in press

Zhao, W, B Zhu, **SJ Davis**, P Ciais, C Hong*, Z Liu, and P Gentile. Increased reliance on fossil energy during extreme events. Communications Earth & Environment.

2023

Davis, SJ, K Alexander, C Hong*, Juan Moreno-Cruz, M Shaner, K Caldeira, and I McKay. Food without agriculture. Nature Sustainability. doi: 10.1038/s41893-023-01241-2

147. Yang, P, Z Mi, Y-M Wei, SV Hanssen, L-C Liu, D Coffman, X Sun, H Liao, Y-F Yao, J-N Kang, P-T Wang, and **SJ Davis**. The global mismatch between equitable carbon dioxide removal liability and capacity. National Science Review.
146. Tong, D*, R Xu , **SJ Davis**, X Qin*, J Cheng*, Q Shi , Y Liu, C Chen , L Yan , X Yan , H Wang , K He , and Q Zhang. Plant-by-plant decarbonization strategies for global steel industry. Nature Climate Change. doi: 10.1038/s41558-023-01808-z
145. Brown, PT, H Hanley, A Mahesh, C Reed, SJ Strenfel, **SJ Davis**, AK Kochanski, and CC Clements. Climate-driven risk of extreme wildfire in California. Nature. doi: 10.1038/s41586-023-06444-3
144. Cheng, J*, D Tong*, Y Liu, G Geng, **SJ Davis**, K He, and Q Zhang. A synergistic approach to air pollution control and carbon neutrality in China can avoid millions of premature deaths annually by 2060. One Earth. v. 6, n. 8, p. 978-989, doi: 10.1016/j.oneear.2023.07.007
143. AghaKouchak, A, L Huning, M Sadegh, Y Qin, Y Markonis, F Vahedifard, A Mishra, A Mehran, R Obringer, A Hjelmst, S Pallickara, S Jiwa, M Hanel, Y Zhao, A Pendergrass, M Arabi, **SJ Davis**, P Ward, M Svoboda, R Pulwarty, and H Kreibich. Toward impact-based monitoring of drought and its cascading hazards. Nature Reviews Earth & Environment. doi: 10.1038/s43017-023-00457-2
142. Hegwood, M, MG Burgess, EM Costigliolo*, P Smith, B Bajželj, H Saunders, and **SJ Davis**. Rebound effects could offset more than half of avoided food waste. Nature Food. V. 4, p. 585-595, doi: 10.1038/s43016-023-00792-z
141. Arzeno-Soletero, IB, C Frieder, BT Saenz, MC Long, J DeAngelo*, **SJ Davis**, and KA Davis. Biophysical potential and uncertainties of global seaweed farming. Communications Earth & Environment. v. 4, p. 185, doi: 10.1038/s43247-023-00833-2
140. Ke, P, Z Deng, B Zhu, B Zheng, Y Wang, O Boucher, S Arous, C Zhou, R Andrew, X Dou, T Sun, X Song, Z Li, F Yan, D Cui, Y Hu, D Huo, J Pierre, R Engelen, **SJ Davis**, P Ciais, and Z Liu. Carbon Monitor Europe, near-real-time daily CO₂ emissions for 27 EU countries and the United Kingdom. Scientific Data. v. 10, p. 374, doi: 10.1038/s41597-023-02284-y

139. Wang, J*, N Ulibarri, TA Scott, and **SJ Davis**. Environmental justice, infrastructure provisioning, and environmental impact assessment: evidence from the California Environmental Quality Act. Environmental Science and Policy. v. 146, p. 66-75, doi: 10.1016/j.envsci.2023.05.003
138. Chen, X, L Chen, W Xie, N Mueller, and **SJ Davis**. Flight delays due to air pollution in China. Journal of Environmental Economics and Management. v.119, p. 102810, doi: 10.1016/j.jeem.2023.102810
137. Zhu, B, Z Deng, X Song, W Zhao, D Huo, T Sun, P Ke, D Cui, C Lu, H Zhong, C Hong, J Qiu, **SJ Davis**, P Gentine, P Ciais, and Z Liu. Carbon Monitor-Power near-real-time monitoring of global power generation on hourly to daily scales. Scientific Data. v. 10, p. 217, doi: 10.1038/s41597-023-02094-2
136. Liu, Z, Z Deng, **SJ Davis**, and P Ciais. Monitoring global carbon emissions in 2022. Nature Reviews Earth & Environment. v. 4, p. 205-206, doi: 10.1038/s43017-023-00406-z
135. Zheng, B, P Ciais, F Chevallier, H Yang, JG Canadell, Y Chen, E Chuvieco, M Deeter, C Hong, Y Kong, H Li, X Lin, **SJ Davis**, Q Zhang, and K He. Record high CO₂ emissions from boreal fires in 2021. Science. doi: 10.1126/science.ade0805
134. Zhou, C, B Zhu, **SJ Davis**, Z Liu, A Halff, S Ben Arous, H de Almeida Rodrigues, and P Ciais. Can the EU replace Russian gas? Earth System Science Data. v. 15, p. 949-961, doi: 10.5194/essd-15-949-2023
133. Huang, X, J Liu, K Ding, Z Wang, R Tang, L Xue, H Wang, Q Zhang, **SJ Davis**, MO Andreae, and A Ding. Smoke-weather interaction feeds extreme wildfires in coastal regions of different climate regimes. Science. v. 379, n. 6631, p. 457-461, doi: 10.1126/science.add9843
132. Dou, X, J Hong, P Ciais, F Chevallier, F Yan, Y Yu, Y Hu, D Huo, Y Wang, **SJ Davis**, M Crippa, G Janssens-Maenhout, D Guizzardi, E Solazzo, X Lin, X Song, B Zhu, D Cui, P Ke, H Wang, W Zhou, X Huang, Z Deng, and Z Liu. Near-real-time global gridded daily CO₂ emissions 2021. Scientific Data. v. 10, p. 69, doi: 10.1038/s41597-023-01963-0
131. Bergero, C*, G Gosnell, D Gielen, S Kang, M Bazilian, and **SJ Davis**. Pathways to net-zero emissions from aviation. Nature Sustainability. doi: 10.1038/s41893-022-01046-9
130. Wang, S, Z Hausfather, **SJ Davis**, J Lloyd, EB Olson, L Liebermann*, and J McBride. Materials demand for electricity in climate mitigation scenarios. Joule. doi: 10.1016/j.joule.2023.01.001
- 2022 129. DeAngelo, J*, BT Saenz, IB Arzeno-Soletero, C Frieder, MC Long, J Hamman, KA Davis, and **SJ Davis**. Economic and biophysical limits to seaweed-based climate solutions. Nature Plants. V. 9, p. 45-57. doi: 10.1038/s41477-022-01305-9

128. Qin, Y*, C Hong*, H Zhao, S Park, DK Munroe, **SJ Davis**, and ND Mueller. Snowmelt risk telecouplings for irrigated agriculture. Nature Climate Change. v. 12, p. 1007-1015. doi: 10.1038/s41558-022-01509-z
127. Sanders, BF, JE Schubert, D Kahl, KJ Mach, D Brady, A AghaKouchak, F Forman, RA Matthew, N Ulibarri, and **SJ Davis**. Large and inequitable flood risks in Los Angeles, California. Nature Sustainability. v. 6, p. 47-57. doi: 10.1038/s41893-022-00977-7
126. AghaKouchak, A, B Pan, O Mazdiyasn, M Sadegh, S Jiwa, W Zhang, CA Love, S Madadgar, S Papalexio, **SJ Davis**, K Hsu, and S Sorooshian. Status and prospects for drought forecasting: Opportunities in artificial intelligence and hybrid physical-statistical forecasting. Philosophical Transactions A. v. 380, n. 20210288, doi: 10.1098/rsta.2021.0288
125. Cui, C, D Guan, D Wang, V Chemutai, P Brenton, S Zhang, Q Zhang, and **SJ Davis**. Global mitigation efforts cannot neglect emerging emitters. National Science Review. doi: 10.1093/nsr/nwac223
124. Zhu, S, M Mac Kinnon, A Carlos-Carlos, **SJ Davis**, and S Samuelsen. Decarbonization will lead to more equitable air quality in California. Nature Communications. v. 13, p. 5738, doi: 10.1038/s41467-022-33295-9
123. Huo, D, X Huang, X Dou, P Ciais, Y Li, Z Deng, Y Wang, D Cui, F Benkhalifa, T Sun, B Zhu, G Roest, KR Gurney, P Ke, R Guo, C Lu, X Lin, A Lovell, K Appleby, PL DeCola, **SJ Davis**, and Z Liu. Carbon Monitor Cities near-real-time daily estimates of CO₂ emissions from 1500 cities worldwide. Scientific Data. v. 9, p. 533. doi: 10.1038/s41597-022-01657-z
122. Tang, L, X Xue, J Ruan, X Bo, Z Mi, S Wang, G Dong and **SJ Davis**. Plant-level real-time monitoring data reveal substantial abatement potential of air pollution and CO₂ in China's cement sector. One Earth. v. 5, p. 892-906. doi: 10.1016/j.oneear.2022.07.003
121. Liu, Z, Z Deng, P Ciais, J Tan, B Zhu, **SJ Davis**, RM Andrew, O Boucher, SB Arou, JG Canadell, X Dou, P Friedlingstein, R Guo, C Hong, RB Jackson, D Kammen, P Ke, C Le Quéré, C Monica, G Janssens-Maenhout, GP Peters, K Tanaka, Y Wang, B Zheng, H Zhong, T Sun, H Schellnhuber, P Gentine. Global patterns of daily CO₂ emissions reductions in the first year of COVID-19. Nature Geoscience. doi: 10.1038/s41561-022-00965-8
120. Hong, C*, H Zhao, Y Qin, Q Zhang, JA Burney, J Pongratz, K Hartung, Y Liu, FC Moore, RB Jackson, and **SJ Davis**. Land-use emissions embodied in international trade. Science. v. 376, n. 6593, p. 597-603. doi: 10.1126/science.abj1572

119. Deng, Z, P Ciais, ZA Tzompa-Sosa, M Saunois, C Qiu, C Tan, T Sun, P Ke, Y Cui, K Tanaka, X Lin, RL Thompson, H Tian, Y Yao, Y Huang, R Lauerwald, AK Jain, X Xu, A Bastos, S Sitch, PI Palmer, T Lauvaux, A d'Aspremont, C Giron, A Benoit, B Poulter, J ChangR Petrescu, **SJ Davis**, Z Liu, G Grassi, C Albergel, and F Chevallier. Comparing national greenhouse gas budgets reported in UNFCCC inventories against atmospheric inversions. Earth System Science Data. v. 14, no. 4, p. 1639-1675. doi: 10.5194/essd-14-1639-2022
118. **Davis, SJ**, Z Liu, Z Deng, B Zhu, P Ke, T Sun, R Guo, C Hong*, B Zheng, Y Wang, O Boucher, P Gentine, and P Ciais. Emissions rebound from the COVID-19 pandemic. Nature Climate Change. doi: 10.1038/s41558-022-01332-6
117. Fennell, P, J Driver, C Bataille, and **SJ Davis**. Going net zero for cement and steel. Nature. v. 603, p. 574-578. doi: 10.1038/d41586-022-00758-4
116. Liu, Z, Z Deng, **SJ Davis**, C Giron, and P Ciais. Monitoring global carbon emissions in 2021. Nature Reviews Earth & Environment. doi: 10.1038/s43017-022-00285-w
115. Jackson, RB, P Friedlingstein, C LeQuéré, S Abernethy, RM Andrew, JG Canadell, P Ciais, **SJ Davis**, Z Deng, Z Liu, GP Peters. Global CO₂ emissions rebound to pre-COVID-19 levels. Environmental Research Letters. v. 17, p. 031001, doi: 10.1088/1748-9326/ac55b6
114. Liu, Y, D Tong*, J Cheng, **SJ Davis**, S Yu, B Yarlagadda, LE Clarke, M Brauer, AJ Cohen, H Kan, T Xue, and Q Zhang. Role of climate goals on reducing future air pollution deaths in China: a modelling study. The Lancet Planetary Health. v. 6, n. 2, p. e92-e99, doi: 10.1016/S2542-5196(21)00326-0
113. Arent, DJ, C Barrows, **SJ Davis**, G Grim, J Schaidle, B Kroposki, M Ruth, B Van Zandt. Integration of energy systems. MRS Bulletin. V. 46, doi:10.1557/s43577-021-00244-8
- 2021 112. Ciais, P, F-M Bréon, S Dellaert, Y Wang, K Tanaka, L Gurriaran, Y Françoise, **SJ Davis**, C Hong*, J Penuelas, I Janssens, M Obersteiner, Z Deng, and Z Liu. Impact of lockdowns and winter temperatures on natural gas consumption in Europe. Earth's Future. doi: 10.1029/2021EF002250
111. Tong, D*, G Geng, Q Zhang, J Cheng, X Qin, C Hong*, and **SJ Davis**. Health co-benefits of climate change mitigation depend on strategic power plant retirements and pollution controls. Nature Climate Change. doi: 10.1038/s41558-021-01216-1
110. Weir, B, D Crisp, CW O'Dell, S Basu, A Chatterjee, T Oda, LE Ott, S Pawson, B Poulter, Z Zhang, P Ciais, Z Liu, and **SJ Davis**. Regional impacts of COVID-19 on carbon dioxide detected worldwide from space. Science Advances. v. 6, p. eabc3436, doi: 10.1126/sciadv.abf9415

109. Dou, X, Y Wang, P Ciais, F Chevallier, **SJ Davis**, M Crippa, G Janssens-Maenhout, D Guizzardi, E Solazzo, F Yan, D Huo, Z Bo, B Zhu, D Cui, P Ke, T Sun, H Wang, Q Zhang, P Gentine, Z Deng and Z Liu. Near-real-time global gridded daily CO₂ emissions. The Innovation. doi: 10.1016/j.xinn.2021.100182
108. Tong, D*, DJ Farnham, L Duan, Q Zhang, NS Lewis, K Caldeira, and **SJ Davis**. Geophysical constraints on the reliability of solar and wind power worldwide. Nature Communications. v. 12, p. 6141, doi: 10.1038/s41467-021-26355-z
107. DeAngelo, J*, I Azevedo, J Bistline, L Clarke, G Luderer, E Byers, and **SJ Davis**. Energy systems in scenarios at net-zero CO₂ emissions. Nature Communications. v. 12, p. 6096, doi: 10.1038/s41467-021-26356-y
106. Jackson, RB, S Abernethy, JG Canadell, M Cargnello, **SJ Davis**, S Féron, S Fuss, A Heyer, C Hong*, CD Jones, HD Matthews, FM O'Connor, M Pisciotta, HM Rhoda, R de Richter, EI Solomon, JL Wilcox, and K Zickfeld. Atmospheric methane removal: a research agenda. Philosophical Transactions of the Royal Society A. doi: 10.1098/rsta.2020.0454
105. Azevedo, I, C Bataille, J Bistline, L Clarke, and **SJ Davis**. Net-zero emissions energy systems: What we know and do not know. Energy and Climate Change. doi: 10.1016/j.egycc.2021.100049
104. Geng, G, Y Zheng, Q Zhang, T Xue, H Zhao, D Tong*, B Zheng, M Li, F Liu, C Hong*, K He and **SJ Davis**. Drivers of PM_{2.5} air pollution deaths in China 2002-2017. Nature Geoscience. doi: 10.1038/s41561-021-00792-3
103. Tian, S, H He, A Kendall, **SJ Davis**, OA Ogunseitan, JM Schoenung, S Samuelsen, and B Tarroja. Environmental trade-offs of flow battery energy storage in California. Applied Energy. doi: 10.1016/j.apenergy.2021.117354
102. Lamb, WF, T Wiedmann, J Pongratz, R Andrew, M Crippa, J Olivier, D Wiedenhofer, G Mattioli, A Al Khourdajie, J House, S Pachauri, M Figueroa, Y Saheb, R Slade, K Hubacek, L Sun, SK Ribeiro, S Khennas, S de la Rue de le Can, L Chapungu, **SJ Davis**, I Bashmakov, H Dai, S Dhakal, X Tan, Y Geng, B Gu, and J Minx. A review of trends and drivers of greenhouse gas emissions by sector from 1990 to 2018. Environmental Research Letters. v. 16, p. 073005, doi: 10.1088/1748-9326/abee4e
101. Bo, X, M Jia, X Xue, L Tang, Z Mi, S Wang, W Cui, X Chang, J Ruan, S Dong, B Zhou, and **SJ Davis**. Effect of strengthened standards on Chinese iron- and steelmaking emissions. Nature Sustainability. doi: 10.1038/s41893-021-00736-0
100. Benz, S, **SJ Davis**, J Burney. Drivers and projections of global surface temperature anomalies at sub-city scale. Environmental Research Letters. v. 16, p. 064093, doi: 10.1088/1748-9326/ac0661

99. Fennell, P, **SJ Davis**, and A Mohammed. Decarbonizing cement production. Joule. doi: 10.1016/j.joule.2021.04.011
98. Guo, R, J Wang, L Bing, D Tong*, P Ciais, **SJ Davis**, RM Andrew, F Xi, and Z Liu. Global CO₂ uptake of cement in 1930-2019. Earth System Science Data. v. 13, p. 1791-1805, doi: 10.5194/essd-2020-275
97. Cheng, J, D Tong*, Q Zhang, Y Liu, Y Lei, G Yan, L Yan, S Yu, RY Cui, L Clarke, G Geng, B Zheng, X Zhang, **SJ Davis**, K He. Pathways of China's PM_{2.5} air quality 2015-2060 in the context of carbon neutrality. National Science Review. p. nwab078, doi:10.1093/nsr/nwab078
96. Arellano-Gonzales, J, A AghaKouchak, J Burney, **SJ Davis**, MC Levy, Y Qin*, and FC Moore. The adaptive benefits of agricultural water markets in California. Environmental Research Letters. doi: 10.1088/1748-9326/abde5
95. Le Quéré, CL, GP Peters, P Friedlingstein, RM Andrew, JG Canadell, **SJ Davis**, RB Jackson, and MW Jones. Fossil CO₂ emissions in the post-COVID era. Nature Climate Change. v. 11, p. 197-199, doi: 10.1038/s41558-021-01001-0
94. Hong, C*, JA Burney, J Pongratz, JEMS Nabel, ND Mueller, RB Jackson, and **SJ Davis**. Global and regional drivers of land-use greenhouse gas emissions 1961-2017. Nature. v. 589, p. 554-561, doi: 10.1038/s41586-020-03138-y
- 2020
93. Wang, D, D Guan, S Zhu, M MacKinnon, G Geng, Q Zhang, H Zheng, T Lei, P Gong and **SJ Davis**. Economic footprint of California wildfires in 2018. Nature Sustainability. doi: 10.1038/s41893-020-00646-7
92. Zheng, B, G Geng, P Ciais, **SJ Davis**, R Martin, F Chevallier, Y Lei, K He, and Q Zhang. Satellite-based estimates of decline and rebound in China's daily CO₂ emissions during and after COVID-19 lockdown. Science Advances. V. 6, n. 49, p. eabd4998, doi: 10.1126/sciadv.abd4998
91. Chevallier, F, B Zheng, G Broquet, P Ciais, Z Liu, **SJ Davis**, Z Deng, Y Wang, F-M Bréon, and CW O'Dell. Local anomalies in the carbon dioxide column-averages across the globe during the first months of the coronavirus recession. Geophysical Research Letters. v. 47, p. e2020GL090244, doi: 10.1029/2020GL090244
90. Liu, Z, P Ciais, Z Deng, **SJ Davis**, B Zheng, Y Wang, Y Lei, D Cui, B Zhu, X Dou, P Ke, T Sun, R Guo, C Lu, R Guo, O Boucher, F-M Bréon, E Boucher, and F Chevallier. Carbon Monitor: a near-real-time daily dataset of global CO₂ emission from fossil fuel and cement production. Scientific Data. doi: 10.1038/s41597-020-00708-7
89. Ayompe,L; **SJ Davis**, and B Egoh. Trends and drivers of African fossil fuel CO₂ emissions 1990-2017. Environmental Research Letters. doi: 10.1088/1748-9326/abc64f

88. Liu, Z, Z Deng, P Ciais, R Lei, **SJ Davis**, S Feng, B Zheng, D Cui, X Dou, P He, B Zhu, C Lu, P Ke, T Sun, Y Wang, X Yue, Y Wang, Y Lei, H Zhou, Z Cai, Y Wu, R Guo, T Han, J Xue, O Boucher, F Chevallier, E Boucher, Y Wei, Q Zhang, D Guan, P Gong, DM Kammen, K He, and HJ Schellnhuber. Near-real-time monitoring of global CO₂ emissions reveals the effects of the COVID-19 pandemic. Nature Communications. v. 11, p. 5172, doi: 10.1038/s41467-020-18922-7. **Cited >300 times**
87. Zheng, Y, Q Zhang, D Tong*, **SJ Davis**, and K Caldeira. Climate effects of China's efforts to improve its air quality. Environmental Research Letters. v. 15, p. 104052, doi: 10.1088/1748-9326/ab9e21
86. Yuan, M, F Tong, L Duan, JA Dowling, **SJ Davis**, NS Lewis, and K Caldeira. Would firm generators facilitate or deter variable renewable energy in a carbon-free electricity system? Applied Energy. V. 279, p. 115789, doi: 10.1016/j.apenergy.2020.115789
85. Tong, F, M Yuan, NS Lewis, **SJ Davis**, and K Caldeira. Effects of deep reductions in storage costs on highly reliable solar and wind-based electricity system costs. iScience. v. 23, p. 101484, doi: 10.1016/j.isci.2020.101484
84. Sergi, B, I Azevedo, **SJ Davis**, and N Muller. Regional and county flows of particulate matter damage in the U.S. Environmental Research Letters. doi: 10.1088/1748-9326/abb429
83. Shearer, C, D Tong*, R Fofrich*, and **SJ Davis**. Committed emissions of the U.S. power sector, 2000-2018. AGU Advances. doi: 10.1029/2020AV000162
82. Dowling, JA, KZ Rinaldi, TH Ruggles, **SJ Davis**, M Yuan, F Tong, NS Lewis, and K Caldeira. Role of long-duration energy storage in variable renewable electricity systems. Joule. doi: 10.1016/j.joule.2020.07.007
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41. Seto, KC, **SJ Davis**, RB Mitchell, E Stokes, G Unruh, D Urge-Vorsatz. Carbon lock-In: Types, causes, and policy implications. Annual Reviews of Environment and Resources, v. 41, p. 19.1-19.28 **Cited >400 times**
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37. Smith, P, **SJ Davis**, F Creutzig, S Fuss, J Minx, B Gabrielle, E Kato, RB Jackson, A Cowie, E Kriegler, D van Vuuren, J Rogelj, P Ciais, J Milne, JP Canadell, D McCollum, V Krey, G Shrestha, P Friedlingstein, T Gasser, A Grübler, WK Heidug, M Jonas, CD Jones, F Kraxner, E Littleton, J Lowe, JR Moreira, N Nakicenovic, M Obersteiner, A Patwardhan, G Peters, M Rogner, E Rubin, A Sharifi, A Torvanger, Y Yamagata, J Edmonds and C Yongsung. Biophysical and economic limits to negative CO₂ emissions. Nature Climate Change, v. 6, p. 42-50, doi: 10.1038/nclimate2870 **Cited >900 times**
- 2015
36. Hannam, P, Z Liao, **SJ Davis**, and M Oppenheimer. Developing country finance in a post-2020 global climate agreement. Nature Climate Change, v. 5, p. 983-987
35. Liu, Z, **SJ Davis**, K Feng, K Hubacek, S Liang, and LD Anadon. Targeted opportunities to address the climate-trade dilemma in China. Nature Climate Change, v. 6, p. 201-206 **Cited >200 times**
34. Rozenberg, J, **SJ Davis**, U Narloch, S Hallegatte. Climate constraints on the carbon intensity of economic growth. Environmental Research Letters, v. 10, p. 095006
33. LoPresti*, A, A Charland, D Woodard, JT Randerson, NS Diffenbaugh, and **SJ Davis**. Rate and velocity of climate change caused by cumulative carbon emissions. Environmental Research Letters, v. 10, p. 095001
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31. Kimball, S, M Lulow, Q Sorenson, K Balazs, Y Fang, **SJ Davis**, and T Huxman. Cost-effective ecological restoration. Restoration Ecology, doi: 10.1111/rec.12261 **Cited >100 times**
30. Pongratz, J, E Hansis, and **SJ Davis**. Relevance of methodological choices for accounting of land use change carbon fluxes. Global Biogeochemical Cycles, v. 29, p. 1230-1246
29. Feng, K, **SJ Davis**, L Sun, and K Hubacek. Drivers of the US CO₂ emissions 1997-2013. Nature Communications, v. 6, p. 7714 **Cited >300 times**
28. Zhao, HY, Q Zhang, **SJ Davis**, DB Guan, Z Liu, H Huo, JT Lin, WD Liu, and KB He. Assessment of China's virtual air pollution transport embodied in trade by a consumption-based emission inventory. Atmospheric Chemistry and Physics, v. 15, p. 5443-5456. **Cited >100 times**

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 24. Shearer*, C, J Bistline, M Inman, and **SJ Davis**. The effect of natural gas supply on US renewable energy and CO₂ emissions. Environmental Research Letters, v. 9, p. 094008 (*ERL Highlight of 2014*)
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 20. Caro, D, **SJ Davis**, S Bastianoni, and K Caldeira. Global and regional trends in greenhouse gas emissions from livestock. Climatic Change, v. 126, p. 203-216. **Cited >100 times**
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 18. Lin, J, D Pan, **SJ Davis**, Y Kuang, Q Zhang, K He, C Wang, D Streets, and D Guan. China's international trade and air pollution in the United States. Proceedings of the National Academy of Sciences, v. 111, n. 5, p. 1736-1741 (*Winner of 2014 Cozzarelli Prize*) **Cited >400 times**
- 2013
17. Andrew, R, **SJ Davis**, and GP Peters. Climate policy and dependence on traded carbon. Environmental Research Letters, v. 8, no. 3, p. 034011
 16. Feng, K, **SJ Davis**, X Li, D Guan, L Sun, Z Liu, and K Hubacek. Outsourcing CO₂ within China. Proceedings of the National Academy of Sciences, v. 110, p. 11654-11659 **Cited >500 times**
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 12. Dickinson, WR, TF Lawton, M Pecha, **SJ Davis**, GE Gehrels, and RA Young. Provenance of the Paleogene Colton Formation (Uinta basin) and Cretaceous–Paleogene provenance evolution in the Utah foreland: Evidence from U-Pb ages of detrital zircons, paleocurrent trends, and sandstone petrofacies. Geosphere, v. 8, p. 854-880
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 10. Chamberlain, CP, HT Mix, A Mulch, MT Hren, ML Kent-Corson, **SJ Davis**, TW Horton, and SA Graham. The Cenozoic climatic and topographic evolution of the western North American Cordillera. American Journal of Science, v. 312, p. 213-262. **Cited >100 times**
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 8. Caldeira, K and **SJ Davis**. Accounting for carbon dioxide emissions: A matter of time. Proceedings of the National Academy of Sciences, v. 108, n. 21, p. 8533-8534
- 2010
7. **Davis, SJ**, D Matthews, and K Caldeira. Future CO₂ emissions and climate change from existing energy infrastructure. Science, v. 329, p. 1330-1335 **Cited >1000 times**
 6. **Davis, SJ**, WR Dickinson, GE Gehrels, JE Spencer, TF Lawton, and AR Carroll. The Paleogene California River: Evidence of Mojave-Uinta paleodrainage from U-Pb ages of detrital zircons. Geology, v. 38, p. 931-934, doi: 10.1130/G31250.1
 5. Burney, J, **SJ Davis**, and DB Lobell. Greenhouse gas mitigation by agricultural intensification. Proceedings of the National Academy of Sciences, v. 107, n. 26, p. 12052-12057 **Cited >1100 times**
 4. **Davis, SJ** and K Caldeira. Consumption-based accounting of CO₂ emissions. Proceedings of the National Academy of Sciences, v. 107, n. 12, p. 5687-5693 **Cited >1700 times**
- 2009
3. **Davis, SJ**, HT Mix, BA Wiegand, AR Carroll, and CP Chamberlain. Synorogenic evolution of large-scale drainage patterns: Isotope paleohydrology of sequential Laramide basins. American Journal of Science, v. 309, p. 549-602, doi: 10.2475/07.2009.02

2. **Davis, SJ**, A Mulch, AR Carroll, TW Horton, and CP Chamberlain. Paleogene Landscape Evolution of the central North American Cordillera: Developing topography and hydrology in the Laramide Foreland. GSA Bulletin, v. 121, p. 100-116, doi: 10.1130/B26308.1
1. **Davis, SJ**, BA Wiegand, AR Carroll, and CP Chamberlain. The effect of drainage reorganization on paleoaltimetry studies: An example from the Paleogene Laramide Foreland. Earth and Planetary Science Letters, v. 275, p. 258-268, doi: 10.1016/j.epsl.2008.08.009

ONLINE PUBLICATIONS

- 2016 Inman, M, DL Sanchez, MD Mastrandrea, **SJ Davis**, and K Fries. An Unprecedented Push for Low-carbon Energy Innovation. A report published by Near Zero: <http://www.nearzero.org/reports/mission-innovation>
- 2014 Shearer, C, M Inman, and **SJ Davis**. Keystone XL: The Climate Impact: An Expert Elicitation. A report published by Near Zero: <http://www.nearzero.org/reports/KXL/>
- 2012 Inman, M and **SJ Davis**. How Low Will Solar Photovoltaic Prices Go?: An Expert Discussion. A report published by Near Zero: <http://www.nearzero.org/reports/pv-learning/>
- Inman, M and **SJ Davis**. Energy High in the Sky: Expert Perspectives on Airborne Wind Energy Systems. A report published by Near Zero: <http://www.nearzero.org/reports/AirborneWind/>
- 2011 **Davis, SJ**. Department of Energy Funding Priorities: An Expert Discussion. A report published by Near Zero: <http://www.nearzero.org/reports/doe-priorities>
- 2009 **Davis, SJ**, Reducing the Carbon Footprint of Fat Tire[®] Amber Ale by Changing Agricultural Practices: Potential and Limitations. A report by The Climate Conservancy.
- 2008 **Davis, SJ**. The Carbon Footprint of Earthbound Farm[®] Mixed Baby Greens. A report by The Climate Conservancy.
- Davis, SJ**. The Carbon Footprint of Fat Tire[®] Amber Ale. A report by The Climate Conservancy: http://www.ess.uci.edu/~sjdavis/pubs/Fat_Tire_2008.pdf
- 2007 **Davis, SJ**, Toward a Product-Level Standard: Life Cycle Analysis of Greenhouse Gas Emissions. The London Accord.

PROFESSIONAL AFFILIATIONS

- State Bar of California
- American Geophysical Union (Fellow)
- American Association for the Advancement of Science (Member)
- Rancho Gordo Bean Club (Member)

TEACHING

- ESS 70A Sustainable Energy Systems
- ESS 204 Humans in the Earth System
- ESS 158 Sustainable Systems Analysis
- ESS 100 Climate Solutions (Bending the Curve)
- UPPP H30E Cities: Focal Point for Sustainability Problems and Solutions
- ESS 192 Careers in Earth System Science
- ESS 178 Solving the Carbon-Climate-Energy Problem (*retired*)
- ESS 60C Global Environmental Issues (*retired*)

AWARDS AND GRANTS

- 2023 Clarivate Analytics Highly Cited Researcher 2023
- 2022 Clarivate Analytics Highly Cited Researcher 2022
ClimateWorks Foundation, “Net-zero emissions food systems.” (PI: **SJ Davis**), \$250,000
- 2021 Clarivate Analytics Highly Cited Researcher 2021
- 2020 Clarivate Analytics Highly Cited Researcher 2020
ClimateWorks Foundation, “Assessing the global potential of macroalgae cultivation.” (PI: **SJ Davis**), \$150,000
Climate Imperative/Energy Innovation Policy and Technology LLC, “State-level Carbon Monitor.” (PI: **SJ Davis**), \$100,000
- 2019 Clarivate Analytics Highly Cited Researcher 2019
Research Support from Carnegie Institution for Science, (PI: **SJ Davis**), \$170,000
- 2018 [James B. Macelwane Medal](#) (American Geophysical Union),
Conferred AGU Fellow
- 2017 Ecological Society of America Sustainability Science Award
<http://www.esa.org/esablog/meetings/esa-2017-annual-meeting/jianguo-liu-2017-sustainability-science-award/>
- 2016 NSF/USDA Innovations at the Nexus of Food, Energy and Water Systems (INFEWS), “Monitoring and managing food, energy, and water systems under stress: The California crucible.” (PI: **SJ Davis**), \$2.88M total, \$1.88M to UC Irvine:
http://www.nsf.gov/awardsearch/showAward?AWD_ID=1639318
TomKat UC Carbon Neutrality Project, “Reaching the other side of the bridge: Challenges in eliminating natural gas as an energy source” (PI: **SJ Davis**), \$55,000: <https://www.nceas.ucsb.edu/projects/12746#>
UC Irvine award for Outstanding Contributions to Undergraduate Education
Alfred P. Sloan Foundation, Does the elicitation mode matter? Comparing different methods for eliciting expert judgment. (PI: Erin Baker, UMass Amherst), \$20,000

- 2015 Gordon & Betty Moore Foundation, Funding for Workshop: “Critical Barriers to Progress in Sustainability Science,” (PI: **SJ Davis**), \$30,000
[PNAS Cozzarelli Prize](#)
- 2014 Research Support from Near Zero, (PI: **SJ Davis**), \$100,000
 Research Support from Aspen Global Change Institute, (PI: **SJ Davis**), \$11,000
- 2013 NSF Coupled Human and Natural Systems (CHANS) Fellowship, \$1,500
- 2012 Research Support from Near Zero, (PI: **SJ Davis**), \$68,276

SELECTED MEDIA COVERAGE AND OP-EDS

- 2023 New York Times, “The Toll of Climate Disasters Is Rising. But a U.S. Report Has Good News, Too,” Raymond Zhong:
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