Natural and Working Lands Climate Smart Strategy

Appendix D: Endnotes

April 22, 2022

¹ Seddon, N., S. Sengupta, M. García-Espinosa, I. Hauler, D. Herr, and A.R. Rizvi. Naturebased Solutions in Nationally Determined Contributions: Synthesis and

recommendations for enhancing climate ambition and action by 2020, (Gland, Switzerland and Oxford, UK: IUCN and University of Oxford, 2019).

https://portals.iucn.org/library/sites/library/files/documents/2019-030-En.pdf.

² LANDFIRE: LANDFIRE Existing Vegetation Type layer. (2013 - 2021). U.S. Department of Interior, Geological Survey. [Online]. Available:

https://landfire.gov/version_download.php [Accessed: February 3, 2021]. LANDFIRE: LANDFIRE Biophysical Setting layer. (2013 - 2021). U.S. Department of Interior, Geological

Survey [Online]. Available: <u>https://landfire.gov/version_download.php</u> [Accessed: February 3, 2021]; Bell, T, K. Cavanaugh, D. Siegel. 2020. SBC LTER: Time series of quarterly NetCDF files of kelp biomass in the canopy from Landsat 5, 7 and 8, since 1984 (ongoing) ver 13. Environmental Data Initiative.

https://doi.org/10.6073/pasta/5d3fb6fd293bd403a0714d870a4dd7d8. Accessed 2021-04-08. (Data extraction performed by T. Bell April 8, 2021); Eelgrass Survey GIS Data version 2.0 (2017, updated 2020), National Marine Fisheries Service West Coast Region. Available: https://www.sfei.org/data/eelgrass-survey-gis-

data#sthash.u94SjLu7.afUwqGJA.dpbs [Accessed: April 6, 2021].

³ State of California, California Air Resources Board. California's 2017 Climate Change Scoping Plan (2017).

https://ww2.arb.ca.gov/sites/default/files/classic//cc/scopingplan/scoping_plan_2017. pdf.

⁴ "The UN Environment Programme and Nature-Based Solutions." United Nations Environment Programme, 2020. <u>https://www.unep.org/unga/our-position/unep-and-nature-based-solutions</u>.

⁵ State of California, California Air Resources Board. California's 2017 Climate Change Scoping Plan (2017).

https://ww2.arb.ca.gov/sites/default/files/classic//cc/scopingplan/scoping_plan_2017. pdf.

⁶ "A Student's Guide to Global Climate Change." U.S. Environmental Protection Agency. U.S. Environmental Protection Agency, May 10, 2017.

https://archive.epa.gov/climatechange/kids/index.html.

⁷ State of California, California Air Resources Board. An Inventory of Ecosystem Carbon in California's Natural & Working Lands: 2018 Edition (2018).

https://ww3.arb.ca.gov/cc/inventory/pubs/nwl_inventory.pdf.

⁸ State of California, California Department of Forestry and Fire Protection. AB 1504. <u>https://bof.fire.ca.gov/projects-and-programs/ab-1504/.</u>

⁹ An IPCC Special Report on Climate Change, Desertification, Land Degradation, Sustainable Land Management, Food Security, and Greenhouse Gas Fluxes in Terrestrial Ecosystems. Intergovernmental Panel on Climate Change (IPCC), 2019. https://www.ipcc.ch/srccl/download/.

¹⁰ State of California, California Air Resources Board, California's 2017 Climate Change Scoping Plan (2017).

https://ww2.arb.ca.gov/sites/default/files/classic//cc/scopingplan/scoping_plan_2017. pdf.

¹¹ State of California, California Drought Action. Current Drought Conditions. <u>https://drought.ca.gov/current-drought-conditions/.</u>

¹² State of California, Governor's Budget Summary 2022-23.

https://www.ebudget.ca.gov/2022-23/pdf/BudgetSummary/EmergencyResponse.pdf. ¹³ Bateman, John. "2021 Was World's 6th-Warmest Year on Record." National Oceanic and Atmospheric Administration News & Features. January 13, 2013.

https://www.noaa.gov/news/2021-was-worlds-6th-warmest-year-on-

record#:~:text=According%20to%20an%20analysis%20by,record%2C%20dating%20back %20to%201880.&text=Earth's%20average%20land%20and%20ocean,above%20the %2020th%2Dcentury%20average.

¹⁴ Newberry, Laura. "Death Valley Hits 130 Degrees, Thought to Be Highest Temperature on Earth in Nearly a Century." Los Angeles Times, August 16, 2020.

https://www.latimes.com/california/story/2020-08-16/death-valley-hits-130-degreesthought-to-be-earths-highest-temperature-in-more-a-century.

¹⁵ "Climate Change Indicators: Heat-Related Deaths." U.S. Environmental Protection Agency, April 2021. <u>https://www.epa.gov/climate-indicators/climate-change-indicators-heat-related-deaths.</u>

¹⁶ Bedsworth, L., D. Cayan, G. Franco, L. Fisher, S. Ziaja. (California Governor's Office of Planning and Research, Scripps Institution of Oceanography, California Energy Commission, California Public Utilities Commission). 2018. Statewide Summary Report, California's Fourth Climate Change Assessment. Publication number: SUMCCCA4-2018-013. <u>https://www.energy.ca.gov/sites/default/files/2019-11/Statewide_Reports-SUM-CCCA4-2018-013_Statewide_Summary_Report_ADA.pdf</u>.

¹⁷ Ibid.

18 Ibid.

¹⁹ State of California, Governor's Forest Management Task Force. California's Wildfire and Forest Resilience Action Plan (2021).

https://www.fire.ca.gov/media/ps4p2vck/californiawildfireandforestresilienceactionpla n.pdf.

²⁰ Bedsworth, L., D. Cayan, G. Franco, L. Fisher, S. Ziaja. (California Governor's Office of Planning and Research, Scripps Institution of Oceanography, California Energy Commission, California Public Utilities Commission). 2018. Statewide Summary Report, California's Fourth Climate Change Assessment. Publication number: SUMCCCA4-2018-013. <u>https://www.energy.ca.gov/sites/default/files/2019-11/Statewide Reports-SUM-CCCA4-2018-013_Statewide_Summary_Report_ADA.pdf</u>

²¹ IPCC, 2021: Summary for Policymakers. In: Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [Masson-Delmotte, V., P. Zhai, A. Pirani,

S.L. Connors, C. Péan, S. Berger, N. Caud, Y. Chen, L. Goldfarb, M.I. Gomis, M. Huang, K. Leitzell, E. Lonnoy, J.B.R. Matthews, T.K. Maycock, T. Waterfield, O. Yelekçi, R. Yu, and B. Zhou (eds.)]. In Press

²² Sweet, W.V., B.D. Hamlington, R.E. Kopp, C.P. Weaver, P.L. Barnard, D. Bekaert, W. Brooks, M. Craghan, G. Dusek, T. Frederikse, G. Garner, A.S. Genz, J.P. Krasting, E. Larour, D. Marcy, J.J. Marra, J. Obeysekera, M. Osler, M. Pendleton, D. Roman, L. Schmied, W. Veatch, K.D. White, and C. Zuzak, 2022: Global and Regional Sea Level Rise Scenarios for the United States: Updated Mean Projections and Extreme Water Level Probabilities Along U.S. Coastlines. NOAA Technical Report NOS 01. National Oceanic and Atmospheric Administration, National Ocean Service, Silver Spring, MD, 111 pp. https://oceanservice.noaa.gov/hazards/sealevelrise/noaa-nostechrpt01-globalregional-SLR-scenarios-US.pdf ²³ Sievanen, L., J. Phillips, C. Colgan, G. Griggs, J. Finzi Hart, E. Hartge, T. Hill, R. Kudela, N. Mantua, K. Nielsen, L. Whiteman. 2018. California's Coast and Ocean Summary Report, California's Fourth Climate Change Assessment. Publication number: SUMCCC4A-2018-011. <u>https://www.energy.ca.gov/sites/default/files/2019-11/Statewide_Reports-SUM-CCCA4-2018-011_OceanCoastSummary_ADA.pdf</u>.

²⁴ Bedsworth, L., D. Cayan, G. Franco, L. Fisher, S. Ziaja. (California Governor's Office of Planning and Research, Scripps Institution of Oceanography, California Energy Commission, California Public Utilities Commission). 2018. Statewide Summary Report, California's Fourth Climate Change Assessment. Publication number: SUMCCCA4-2018-013. <u>https://www.energy.ca.gov/sites/default/files/2019-11/Statewide_Reports-SUM-CCCA4-2018-013_Statewide_Summary_Report_ADA.pdf</u>.

²⁵ Maco, S.E., E.G. McPherson, J.R. Simpson, P.J. Peper, Q. Xiao. (U.S. Department of Agriculture, Forest Service, Center for Urban Forest Research, Pacific Southwest Research Station) City of San Francisco, California Street Tree Resource Analysis (2003). <u>https://www.fs.fed.us/psw/topics/urban_forestry/products/2/psw_cufr732_SanFrancisco</u>

<u>MBCA web.pdf</u>; "Planting Tree Equity and Career Pathways for Underserved Communities." Career Pathways Initiative. American Forests, May 18, 2021.

https://www.americanforests.org/our-work/urban-forestry/workforce-development/; State of California, California Natural Resources Agency. Urban Greening Program Final Guidelines (2020). https://resources.ca.gov/-/media/CNRA-

Website/Files/grants/GGRF_UG/Urban-Greening-Program-Guidelines--Round-

<u>Four_2021.pdf</u>; State of California, California Air Resources Board. Quantification Methodology: California Natural Resources Agency Urban Greening Grant Program (2020).

https://ww2.arb.ca.gov/sites/default/files/classic/cc/capandtrade/auctionproceeds/c nra_ug_finalqm.pdf.

²⁶ U.S. Environmental Protection Agency, Office of Water. Economic Benefits of Wetlands (2006).

https://nepis.epa.gov/Exe/ZyPDF.cgi/2000D2PF.PDF?Dockey=2000D2PF.PDF; Alexander, S., and R. McInnes. The Benefits of Wetland Restoration. Ramsar Convention on

Wetlands, May 2012. <u>https://www.ramsar.org/sites/default/files/documents/library/bn4-en.pdf;</u> "Riparian Restoration." Compost and Mulch Use Toolbox. California Department of Resources Recycling and Recovery, October 9, 2019.

https://www.calrecycle.ca.gov/organics/compostmulch/toolbox/riparianrestor; Norris, Elizabeth. *Riparian Restoration*. Virginia Institute of Marine Science, 2001.

http://ccrm.vims.edu/publications/wetlands_technical_reports/01-6-Riparian-Restoration.pdf.

²⁷ State of California, California Department of Food and Agriculture. CDFA Healthy Soils Program (2021). <u>https://www.cdfa.ca.gov/oefi/healthysoils/docs/HSP_flyer_2021.pdf;</u> U.S. Department of Agriculture, Northeast Climate Hub. Managing Grazing to Improve Climate Resilience (2019).

https://www.climatehubs.usda.gov/sites/default/files/GrazingFactsheet_Feb2019_web5 08.pdf; Gosnell, H., S. Chamley, and P. Stanley. "Climate Change Mitigation as a Co-Benefit of Regenerative Ranching: Insights from Australia and the United States." Interface Focus 10 (2020). https://doi.org/20200027; "Grazing." Fire in California. University of California Cooperative Extension, n.d.

https://ucanr.edu/sites/fire/Prepare/Treatment/Grazing.

²⁸ Taylor, Mac (Legislative Analyst's Office). Improving California's Forest and Watershed Management (2018). <u>https://lao.ca.gov/reports/2018/3798/forest-watershed-</u>

<u>management-040418.pdf</u>; SB 859 Wood Products Working Group. Recommendations to Expand Wood Products Markets in California: Investing in communities and California's climate resilient future (2017). <u>https://resources.ca.gov/CNRALegacyFiles/wp-</u>

<u>content/uploads/2014/07/Wood-Products-Recommendations.pdf</u>; U.S. Department of Agriculture, Forest Service. Nature's Benefits from Your National Forests (2020). <u>https://www.fs.fed.us/emc/economics/documents/at-a-glance/benefits-to-people/pacificsw/BTP-Sierra.pdf</u>.

²⁹ "Regional Workshops - Spring 2021." Expanding nature-based solutions to achieve California's climate change and biodiversity goals. California Natural Resources Agency, May 2021. <u>https://www.californianature.ca.gov/pages/get-involved#regional</u>.
 ³⁰ State of California, Governor's Office of Planning and Research, Integrated Climate Adaptation and Resiliency Program (ICARP). Defining Vulnerable Communities in the Context of Climate Adaptation (2018). https://opr.ca.gov/docs/20200720-

<u>Vulnerable_Communities.pdf</u>; Rothstein, Richard. The Color of Law: A Forgotten History of How Our Government Segregated America. New York, New York: Liveright Publishing Corporation, a division of W.W. Norton & Company, 2018; State of California, California Environmental Protection Agency, Pollution and Prejudice: Redlining and Environmental Injustice in California (2021).

https://storymaps.arcgis.com/stories/f167b251809c43778a2f9f040f43d2f5.

³¹ State of California, Strategic Growth Council. California Strategic Growth Council's Racial Equity Resolution (2020). <u>https://sgc.ca.gov/news/2020/docs/20200826-</u> <u>Racial Equity_Resolution.pdf</u>.

³² Rodriguez, G., S. Celedon, B.R. Middleton Manning, A.S. Sanchez, C. Schell, and M. Walker. Using Nature-Based Solutions to Advance Equity: Advisory Panel Summary Document, June 8, 2021. <u>https://www.californianature.ca.gov/pages/get-involved#topical</u>.

³³ State of California, Strategic Growth Council. California Strategic Growth Council's Racial Equity Resolution (2020). <u>https://sgc.ca.gov/news/2020/docs/20200826-</u> <u>Racial Equity Resolution.pdf</u>.

³⁴ State of California, California Natural Resources Agency. Climate Justice Chapter, Safeguarding California Plan: 2018 Update (2018).

https://files.resources.ca.gov/docs/climate/safeguarding/update2018/safeguardingcalifornia-plan-2018-update.pdf.

³⁵Rodriguez, G., S. Celedon, B.R. Middleton Manning, A.S. Sanchez, C. Schell, and M. Walker. Using Nature-Based Solutions to Advance Equity: Advisory Panel Summary Document, June 8, 2021. <u>https://www.californianature.ca.gov/pages/get-involved#topical</u>.

³⁶ Goode, R., S. Gaughen, M. Fierro, D. Hankins, K. Johnson-Reyes, B.R. Middleton, T. Red Owl, R. Yonemura. 2018. Summary Report from Tribal and Indigenous Communities within California, California's Fourth Climate Change Assessment. Publication number: SUMCCCA4-2018-010. <u>https://www.energy.ca.gov/sites/default/files/2019-</u>

<u>11/Statewide_Reports-SUM-CCCA4-2018-010_TribalCommunitySummary_ADA.pdf.</u> ³⁷ State of California, Executive Department. Executive Order N-15-19 (2019). <u>https://www.gov.ca.gov/wp-content/uploads/2019/06/6.18.19-Executive-Order.pdf;</u> State of California, Office of the Governor. Statement of Administration Policy: Native American Ancestral Lands (2020). <u>https://www.gov.ca.gov/wp-</u> content/uploads/2020/09/9.25.20-Native-Ancestral-Lands-Policy.pdf.

³⁸ Goode, R., S. Gaughen, M. Fierro, D. Hankins, K. Johnson-Reyes, B.R. Middleton, T. Red Owl, R. Yonemura. 2018. Summary Report from Tribal and Indigenous Communities within California, California's Fourth Climate Change Assessment. Publication number: SUMCCCA4-2018-010. <u>https://www.energy.ca.gov/sites/default/files/2019-</u> 11/Statewide_Reports-SUM-CCCA4-2018-010_TribalCommunitySummary_ADA.pdf.

³⁹ Plumer, Brad, and Nadja Popovich. "How Decades of Racist Housing Policy Left Neighborhoods Sweltering." *The New York Times*. August 24, 2020.

https://www.nytimes.com/interactive/2020/08/24/climate/racism-redlining-cities-globalwarming.html; Hoffman, Jeremy S., Vivek Shandas, and Nicholas Pendleton. "The Effects of Historical Housing Policies on Resident Exposure to Intra-Urban Heat: A Study of 108 US Urban Areas." *Climate* 8, no. 1 (January 13, 2020). https://doi.org/10.3390/cli8010012. ⁴⁰ Rodriguez, G., S. Celedon, B.R. Middleton Manning, A.S. Sanchez, C. Schell, and M. Walker. Using Nature-Based Solutions to Advance Equity: Advisory Panel Summary Document, June 8, 2021. https://www.californianature.ca.gov/pages/getinvolved#topical.

⁴¹ Rodriguez, G., S. Celedon, B.R. Middleton Manning, A.S. Sanchez, C. Schell, and M. Walker. Using Nature-Based Solutions to Advance Equity: Advisory Panel Summary Document, June 8, 2021. <u>https://www.californianature.ca.gov/pages/get-</u>

involved#topical; State of California, California Natural Resources Agency. Climate Justice Chapter, Safeguarding California Plan: 2018 Update (2018).

https://files.resources.ca.gov/docs/climate/safeguarding/update2018/safeguardingcalifornia-plan-2018-update.pdf.

⁴² "Park Access Tool." Parks for All Californians. State of California, California Department of Parks and Recreation, n.d.

https://www.parksforcalifornia.org/parkaccess/?overlays1=parks%2Cnoparkaccess%2C parkaccess%2Cnopopulation&overlays2=parks%2Cparksper1000.

⁴³ The Trust for Public Land, "Parks and an Equitable Recovery," (2021), tpl.org/parks-and-an-equitable-recovery-parkscore-report.

⁴⁴ Rodriguez, G., S. Celedon, B.R. Middleton Manning, A.S. Sanchez, C. Schell, and M. Walker. Using Nature-Based Solutions to Advance Equity: Advisory Panel Summary Document, June 8, 2021. <u>https://www.californianature.ca.gov/pages/get-involved#topical</u>.

⁴⁵ Cal. Government Code § 7290 et seq.

⁴⁶ Cal. Government Code §6219.

⁴⁷ State of California, California Natural Resources Agency. Climate Justice Chapter, Safeguarding California Plan: 2018 Update (2018).

https://files.resources.ca.gov/docs/climate/safeguarding/update2018/safeguardingcalifornia-plan-2018-update.pdf.

⁴⁸ "Explore the Biodiversity Hotspots." Critical Ecosystem Partnership Fund. Critical Ecosystem Partnership Fund, n.d. <u>https://www.cepf.net/our-work/biodiversity-hotspots;</u> "Why Are Biodiversity Hotspots Important?" Biodiversity Hotspots. Conservation

International, n.d. <u>https://www.conservation.org/priorities/biodiversity-hotspots</u>. ⁴⁹ State of California, Natural Resources Agency. Draft Pathways to 30x30 California: Accelerating Conservation of California's Nature (2021).

https://www.californianature.ca.gov/pages/30x30.

⁵⁰ IPCC, 2022: Summary for Policymakers [H.-O. Pörtner, D.C. Roberts, E.S. Poloczanska, K. Mintenbeck, M. Tignor, A. Alegría, M. Craig, S. Langsdorf, S. Löschke, V. Möller, A. Okem (eds.)]. In: Climate Change 2022: Impacts, Adaptation, and Vulnerability. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [H.-O. Pörtner, D.C. Roberts, M. Tignor, E.S.

Poloczanska, K. Mintenbeck, A. Alegría, M. Craig, S. Langsdorf, S. Löschke, V. Möller, A. Okem, B. Rama (eds.)]. Cambridge University Press. In Press

⁵¹ Digital Coast Program Gets "Blue Carbon" Added to U.S. Emissions Inventory. National Oceanic and Atmospheric Administration, Office for Coastal Management, n.d. https://coast.noaa.gov/states/stories/digital-coast-program-gets-blue-carbon.html.

⁵² LANDFIRE: LANDFIRE Existing Vegetation Type layer. (2013 - 2021). U.S. Department of Interior, Geological Survey. [Online]. Available:

https://landfire.gov/version_download.php [Accessed: February 3, 2021]. LANDFIRE: LANDFIRE Biophysical Setting layer. (2013 - 2021). U.S. Department of Interior, Geological Survey [Online]. Available: https://landfire.gov/version_download.php [Accessed: February 3, 2021]. California Multi-Source Land Ownership (ownership18_2), October 15, 2018. CAL FIRE-FRAP. https://frap.fire.ca.gov/mapping/gis-data/ [Accessed: August 17, 2021].

⁵³ North, Malcolm, Peter Stine, Kevin O'Hara, William Zielinski, and Scott Stephens. "An ecosystem management strategy for Sierran mixed-conifer forests." Gen. Tech. Rep. PSW-GTR-220 (Second printing, with addendum). Albany, CA: US Department of Agriculture, Forest Service, Pacific Southwest Research Station. 49 p 220 (2009). https://www.fs.fed.us/psw/publications/documents/psw_gtr220/psw_gtr220.pdf.

 ⁵⁴ Anderson, M. Kat. Native American Knowledge and the Management of California's Natural Resources. University of California Press, 2005.

https://doi.org/10.1525/9780520933101; Marks-Block, Tony, and William Tripp.

"Facilitating Prescribed Fire in Northern California through Indigenous Governance and Interagency Partnerships." Fire 4, no. 3 (July 16, 2021): 37.

https://doi.org/10.3390/fire4030037.

⁵⁵ Kane, Van R., et al. "First-Entry Wildfires Can Create Opening and Tree Clump Patterns Characteristic of Resilient Forests." *Forest Ecology and Management* 454 (2019): 117659. <u>https://doi.org/10.1016/j.foreco.2019.117659</u>.

⁵⁶ Stephens, et al. "Drought, Tree Mortality, and Wildfire in Forests Adapted to Frequent Fire." *BioScience* 68, no. 2 (2018): 77–88. <u>https://doi.org/10.1093/biosci/bix146</u>; Gray, A. N., H. S. J. Zald, R. A. Kern, and M. North. 2005. "Stand conditions associated with tree regeneration in Sierran mixed-conifer forests." *Forest Science* 51:198–210.

DOI:10.1093/FORESTSCIENCE/51.3.198; Cocking, Matthew I., J. Morgan Varner, and Rosemary L. Sherriff. "California Black Oak Responses to Fire Severity and Native Conifer Encroachment in the Klamath Mountains." *Forest Ecology and Management* 270 (2012): 25–34. https://doi.org/10.1016/j.foreco.2011.12.039.

⁵⁷ Gonzalez, Patrick, John J. Battles, Brandon M. Collins, Timothy Robards, and David S. Saah. "Aboveground Live Carbon Stock Changes of California Wildland Ecosystems, 2001–2010." Forest Ecology and Management 348 (March 20, 2015): 68–77. https://doi.org/10.1016/j.foreco.2015.03.040.

⁵⁸ North, M P, et al. "Pyrosilviculture Needed for Landscape Resilience of Dry Western United States Forests." *Journal of Forestry*, May 21, 2021. https://doi.org/10.1093/jofore/fvab026. ⁵⁹ Long, Jonathan W., Lenya Quinn-Davidson, and Carl N. Skinner. "Science synthesis to support socioecological resilience in the Sierra Nevada and southern Cascade Range." Gen. Tech. Rep. PSW-GTR-247. Albany, CA: US Department of Agriculture, Forest Service, Pacific Southwest Research Station. 723 p 247 (2014).

⁶⁰ Moore, J., M. Woods, and D. Greenberg. (U.S. Department of Agriculture, Forest Service, Pacific Southwest Region, Forest Health Monitoring Program), 2019 Aerial Survey Results: California (2020). Report no. R5-PR-034

https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd700809.pdf.

⁶¹ State of California, California Air Resources Board, Public Comment Draft: Greenhouse Gas Emissions of Contemporary Wildfire, Prescribed Fire, and Forest Management Activities (December 2020).

https://ww3.arb.ca.gov/cc/inventory/pubs/ca_ghg_wildfire_forestmanagement.pdf.

⁶² Krofcheck, Daniel J., Matthew D. Hurteau, Robert M. Scheller, and E. Louise Loudermilk. "Prioritizing Forest Fuels Treatments Based on the Probability of High-Severity Fire Restores Adaptive Capacity in Sierran Forests." *Global Change Biology* 24, no. 2 (2017): 729–37. <u>https://doi.org/10.1111/gcb.13913</u>; Stephens, et al. "Drought, Tree Mortality, and Wildfire in Forests Adapted to Frequent Fire." *BioScience* 68, no. 2 (2018): 77–88. <u>https://doi.org/10.1093/biosci/bix146</u>.

⁶³ Wiechmann, M. L., Hurteau, M. D., North, M. P., Koch, G. W., & Jerabkova, L. (2015b). The carbon balance of reducing wildfire risk and restoring process: an analysis of 10year post-treatment carbon dynamics in a mixed-conifer forest. *Climatic Change*, 132(4), 709-719.

⁶⁴State of California, California's Forest Carbon Plan (2018).

https://resources.ca.gov/CNRALegacyFiles/wp-content/uploads/2018/05/California-Forest-Carbon-Plan-Final-Draft-for-Public-Release-May-2018.pdf.

⁶⁵ Battles, John, David Bell, Robert Kennedy, David Saah, Brandon Collins, Robert York, John Sanders. (University of California, Berkeley). 2018. Innovations in Measuring and Managing Forest Carbon Stocks in California. California's Fourth Climate Change Assessment, California Natural Resources Agency. Publication number: CCCA4-CNRA2018-014. <u>https://www.energy.ca.gov/sites/default/files/2019-12/Forests_CCCA4-CNRA-2018-014_ada.pdf</u>.

⁶⁶ Wiechmann, Morgan L., et al. "The Carbon Balance of Reducing Wildfire Risk and Restoring Process: an Analysis of 10-Year Post-Treatment Carbon Dynamics in a Mixed-Conifer Forest." *Climatic Change* 132, no. 4 (2015): 709–19.

https://doi.org/10.1007/s10584-015-1450-y.

⁶⁷ Krofcheck, D.J., C.C. Remy, A. R. Keyser, and M.D. Hurteau. "Optimizing Forest Management Stabilizes Carbon Under Projected Climate and Wildfires." *Journal of Geophysical Research: Biogeosciences* 124, no. 10 (October 2019): 3075–87. <u>https://doi.org/10.1029/2019jg005206</u>.

⁶⁸ Stephenson, N. L., et al. "Rate of Tree Carbon Accumulation Increases Continuously with Tree Size." *Nature* 507, no. 7490 (2014): 90–93. <u>https://doi.org/10.1038/nature12914</u>.
⁶⁹ Coppoletta, Michelle, Kyle E. Merriam, and Brandon M. Collins. "Post-Fire Vegetation and Fuel Development Influences Fire Severity Patterns in Reburns." *Ecological Applications* 26, no. 3 (2016): 686–99. <u>https://doi.org/10.1890/15-0225</u>.

⁷⁰ Kueppers, L., J.K. Gilless, P. Gonzalez, T.M. Hill, E. Margulies, and T.B. Pathak. Expanding Climate Action Through Nature-Based Solutions: Advisory Panel Summary Document, June 2, 2021. <u>https://www.californianature.ca.gov/pages/get-involved#topical</u>.

⁷¹ Wondzell, Steven M., Mousa Diabat, and Roy Haggerty. "What Matters Most: Are Future Stream Temperatures More Sensitive to Changing Air Temperatures, Discharge, or Riparian Vegetation?" JAWRA Journal of the American Water Resources Association 55, no. 1 (February 2019): 116–32. <u>https://doi.org/10.1111/1752-1688.12707</u>.

⁷² Restaino, Christina, et al. "Forest Structure and Climate Mediate Drought-Induced Tree Mortality in Forests of the Sierra Nevada, USA." *Ecological Applications* 29, no. 4 (June 2019). <u>https://doi.org/10.1002/eap.1902</u>.

⁷³ SB 859 Wood Products Working Group. Recommendations to Expand Wood Products Markets in California: Investing in communities and California's climate resilient future (2017). <u>https://resources.ca.gov/CNRALegacyFiles/wp-</u>

content/uploads/2014/07/Wood-Products-Recommendations.pdf.

⁷⁴ Welch, Kevin R., Hugh D. Safford, and Truman P. Young. "Predicting Conifer Establishment Post Wildfire in Mixed Conifer Forests of the North American Mediterranean-Climate Zone." *Ecosphere* 7, no. 12 (December 20, 2016). https://doi.org/10.1002/ecs2.1609.

⁷⁵ LANDFIRE: LANDFIRE Existing Vegetation Type layer. (2013 - 2021). U.S. Department of Interior, Geological Survey. [Online]. Available:

https://landfire.gov/version_download.php [Accessed: February 3, 2021]. LANDFIRE: LANDFIRE Biophysical Setting layer. (2013 - 2021). U.S. Department of Interior, Geological Survey [Online]. Available: https://landfire.gov/version_download.php [Accessed:

February 3, 2021]. California Multi-Source Land Ownership (ownership18_2), October 15, 2018. CAL FIRE-FRAP. https://frap.fire.ca.gov/mapping/gis-data/ [Accessed: August 17, 2021].

⁷⁶ Schrader-Patton, Charlie C., and Emma C. Underwood. "New Biomass Estimates for Chaparral-Dominated Southern California Landscapes." *Remote Sensing* 13, no. 8 (April 19, 2021): 1581. <u>https://doi.org/10.3390/rs13081581</u>.

⁷⁷ U.S. Department of Agriculture, Forest Service, Pacific Southwest Region, Remote Sensing Lab, FRID metadata (2020).

https://www.fs.fed.us/r5/rsl/projects/gis/data/FRID/FRID_Metadata.html.

⁷⁸ Gabrielle N. Bohlman, Emma C. Underwood, and Hugh D. Safford. "Estimating Biomass in California's Chaparral and Coastal Sage Scrub Shrublands." *Madroño* 65, no. 1 (January 1, 2018): 28–46. <u>https://doi.org/10.3120/0024-9637-65.1.28</u>.

⁷⁹ LANDFIRE: LANDFIRE Existing Vegetation Type layer. (2013 - 2021). U.S. Department of Interior, Geological Survey. [Online]. Available:

https://landfire.gov/version_download.php [Accessed: February 3, 2021]. LANDFIRE: LANDFIRE Biophysical Setting layer. (2013 - 2021). U.S. Department of Interior, Geological Survey [Online]. Available: https://landfire.gov/version_download.php [Accessed:

February 3, 2021]. California Multi-Source Land Ownership (ownership18_2), October 15, 2018. CAL FIRE-FRAP. https://frap.fire.ca.gov/mapping/gis-data/ [Accessed: August 17, 2021].

⁸⁰ State of California, California Department of Food and Agriculture, California Agricultural Statistics Review, 2019-2020 (2020).

https://www.cdfa.ca.gov/Statistics/PDFs/2020_Ag_Stats_Review.pdf.

⁸¹ Flint, L., Flint, A., Stern, M., Mayer, A., Vergara, S., Silver, W., Casey, F., Franco, F., Byrd, K., Sleeter, B., Alvarez, P., Creque, J., Estrada, T., Cameron, D. (U.S. Geological Survey). 2018. Increasing Soil Organic Carbon to Mitigate Greenhouse Gases and Increase Climate Resiliency for California. California's Fourth Climate Change Assessment, California Natural Resources Agency. Publication number: CCCA4-CNRA-2018-006.

https://www.energy.ca.gov/sites/default/files/2019-11/Agriculture CCCA4-CNRA-2018-006 ADA.pdf.

⁸² Lal, R. "Sequestering Carbon and Increasing Productivity by Conservation Agriculture." Journal of Soil and Water Conservation 70, no. 3 (May 2015). <u>https://doi.org/10.2489/jswc.70.3.55a</u>; Paustian, K., Lehmann, J., Ogle, S. et al. "Climate-

smart soils." Nature 532, 49–57 (2016). <u>https://doi.org/10.1038/nature17174</u>.

⁸³ Smith, Christopher W. (U.S. Department of Agriculture, Natural Resources Conservation Service, National Soil Survey Center), "Effects of Implementation of Soil Health Management Practices on Infiltration, Hydraulic Conductivity (Ksat), and Runoff" (2017); Horwath, W.R., J.P. Mitchell, and J.W. Six. Publication. *Tillage and Crop Management Effects on Air, Water, and Soil Quality in California*. University of California, Division of Agriculture and Natural Resources, Publication No. 8331, September 2008. <u>https://anrcatalog.ucanr.edu/pdf/8331.pdf</u>; Tiemann, L. K., A. S. Grandy, E. E. Atkinson, E. Marin-Spiotta, and M. D. McDaniel. "Crop Rotational Diversity Enhances Belowground Communities and Functions in an Agroecosystem." *Ecology Letters* 18, no. 8 (August 2015); 761–71. https://doi.org/10.1111/ele.12453.

⁸⁴ LANDFIRE: LANDFIRE Existing Vegetation Type layer. (2013 - 2021). U.S. Department of Interior, Geological Survey. [Online]. Available:

https://landfire.gov/version_download.php [Accessed: February 3, 2021]. LANDFIRE: LANDFIRE Biophysical Setting layer. (2013 - 2021). U.S. Department of Interior, Geological Survey [Online]. Available: https://landfire.gov/version_download.php [Accessed: February 3, 2021]. California Multi-Source Land Ownership (ownership18_2), October 15, 2018. CAL FIRE-FRAP. https://frap.fire.ca.gov/mapping/gis-data/ [Accessed: August 17, 2021].

⁸⁵ Kirwan, M., Megonigal, J. Tidal wetland stability in the face of human impacts and sea-level rise. *Nature* 504, 53–60 (2013). <u>https://doi.org/10.1038/nature12856;</u> Granek, Elise F., et al. "Ecosystem Services as a Common Language for Coastal Ecosystem-Based Management." *Conservation Biology* 24, no. 1 (February 2010): 207–16. <u>https://doi.org/10.1111/j.1523-1739.2009.01355.x</u>.

⁸⁶ Dahl, T.E. (U.S. Department of the Interior, Fish and Wildlife Service). Wetland losses in the United States, 1780s to 1980s (1990).

https://www.fws.gov/wetlands/documents/Wetlands-Losses-in-the-United-States-1780sto-1980s.pdf.

⁸⁷ Chmura, Gail L., Shimon C. Anisfeld, Donald R. Cahoon, and James C. Lynch. "Global Carbon Sequestration in Tidal, Saline Wetland Soils." *Global Biogeochemical Cycles* 17, no. 4 (December 2003). <u>https://doi.org/10.1029/2002gb001917</u>.

⁸⁸ Deverel, Steven J., Sabina Dore, and Curtis Schmutte. "Solutions for Subsidence in the California Delta, USA, an Extreme Example of Organic-Soil Drainage Gone Awry." *Proceedings of the International Association of Hydrological Sciences* 382 (April 23, 2020): 837–42. <u>https://doi.org/10.5194/piahs-382-837-2020</u>.

⁸⁹ Thorne, Karen, et al. "U.S. Pacific Coastal Wetland Resilience and Vulnerability to Sea-Level Rise." *Science Advances* 4, no. 2 (February 21, 2018).

https://doi.org/10.1126/sciadv.aao3270.

⁹⁰ Moomaw, W.R., Chmura, G.L., Davies, G.T. et al. Wetlands in a Changing Climate: Science, Policy and Management. *Wetlands* 38, 183–205 (2018). https://doi.org/10.1007/s13157-018-1023-8. ⁹¹ U.S. Environmental Protection Agency, Office of Water. Economic Benefits of Wetlands (2006).

https://nepis.epa.gov/Exe/ZyPDF.cgi/2000D2PF.PDF?Dockey=2000D2PF.PDF.

⁹² Drew, W. M., et al. Sierra Meadows Strategy. Sierra Meadows Partnership Paper 1: PP 40, (2016),

https://meadows.ucdavis.edu/files/Sierra_Meadow_Strategy_full_report_SHAREABLE_mi d.pdf.

⁹³ U.S. Environmental Protection Agency, Office of Water. Economic Benefits of Wetlands (2006).

https://nepis.epa.gov/Exe/ZyPDF.cgi/2000D2PF.PDF?Dockey=2000D2PF.PDF.

⁹⁴ Eelgrass Survey GIS Data version 2.0 (2017, updated 2020), National Marine Fisheries Service West Coast Region. Available: <u>https://www.sfei.org/data/eelgrass-survey-gis-</u> data#sthash.u94SjLu7.afUwqGJA.dpbs [Accessed: April 6, 2021); Bell, T, K. Cavanaugh,

D. Siegel. 2020. SBC LTER: Time series of quarterly NetCDF files of kelp biomass in the canopy from Landsat 5, 7 and 8, since 1984 (ongoing) ver 13. Environmental Data Initiative. <u>https://doi.org/10.6073/pasta/5d3fb6fd293bd403a0714d870a4dd7d8.</u> Accessed 2021-04-08. (Data extraction performed by T. Bell April 8, 2021).

⁹⁵ Ward, M. A., Hill, T. M., Souza, C., Filipczyk, T., Ricart, A. M., Merolla, S., Capece, L. R., O'Donnell, B. C., Elsmore, K., Oechel, W. C., and Beheshti, K. M. "Blue Carbon Stocks and Exchanges Along the Pacific West Coast." *Biogeosciences* Discuss. [preprint], in review, February 17, 2021. <u>https://doi.org/10.5194/bg-2021-27</u>; Prentice, Carolyn, Margot Hessing-Lewis, Rhea Sanders-Smith, and Anne K. Salomon. "Reduced Water Motion Enhances Organic Carbon Stocks in Temperate Eelgrass Meadows." *Limnology and Oceanography* 64, no. 6 (2019): 2389–2404. <u>https://doi.org/10.1002/lno.11191</u>;

Kauffman, J. Boone, Leila Giovanonni, James Kelly, Nicholas Dunstan, Amy Borde, Heida Diefenderfer, Craig Cornu, Christopher Janousek, Jude Apple, and Laura Brophy. "Total Ecosystem Carbon Stocks at the Marine-Terrestrial Interface: Blue Carbon of the Pacific Northwest Coast, United States." Global Change Biology 26, no. 10 (August 11, 2020): 5679–92. <u>https://doi.org/10.1111/gcb.15248</u>.

⁹⁶ Orth, Robert J., et al. "A Global Crisis for Seagrass Ecosystems." *BioScience* 56, no. 12 (December 2006): 987–96. <u>https://doi.org/10.1641/0006-</u>

<u>3568(2006)56[987:agcfse]2.0.co;2</u>; Smith, Shannen M., Hamish A. Malcolm, Ezequiel M. Marzinelli, Arthur L. Schultz, Peter D. Steinberg, and Adriana Vergés. "Tropicalization and Kelp Loss Shift Trophic Composition and Lead to More Winners than Losers in Fish Communities." *Global Change Biology* 27, no. 11 (2021): 2537–48.

https://doi.org/10.1111/gcb.15592.

⁹⁷ Rogers-Bennett, L., Catton, C.A. "Marine heat wave and multiple stressors tip bull kelp forest to sea urchin barrens." *Sci Rep* 9, 15050 (2019). <u>https://doi.org/10.1038/s41598-019-51114-y</u>.

⁹⁸ Orth, Robert J., et al. "Restoration of Seagrass Habitat Leads to Rapid Recovery of Coastal Ecosystem Services." Science Advances 6, no. 41 (October 7, 2020). https://doi.org/10.1126/sciadv.abc6434; Duarte, Carlos M., Jiaping Wu, Xi Xiao, Annette Bruhn, and Dorte Krause-Jensen. "Can Seaweed Farming Play a Role in Climate Change Mitigation and Adaptation?" Frontiers in Marine Science 4 (April 12, 2017). https://doi.org/10.3389/fmars.2017.00100; Hirsh, Heidi K., et al. "Drivers of Biogeochemical Variability in a Central California Kelp Forest: Implications for Local Amelioration of Ocean Acidification." Journal of Geophysical Research: Oceans 125, no. 11 (October 22, 2020). https://doi.org/10.1029/2020jc016320; Ricart, Aurora M., et al. "Coast-Wide Evidence of Low PH Amelioration by Seagrass Ecosystems." Global Change Biology 27, no. 11 (March 31, 2021): 2580–91.

https://doi.org/10.1111/gcb.15594.

⁹⁹ Macreadie, P.I., Anton, A., Raven, J.A. et al. "The future of Blue Carbon science." Nat Commun 10, 3998 (2019). <u>https://doi.org/10.1038/s41467-019-11693-w</u>.

¹⁰⁰ Ward, M. A., Hill, T. M., Souza, C., Filipczyk, T., Ricart, A. M., Merolla, S., Capece, L. R., O'Donnell, B. C., Elsmore, K., Oechel, W. C., and Beheshti, K. M. "Blue Carbon Stocks and Exchanges Along the Pacific West Coast." *Biogeosciences* Discuss. [preprint], in review, February 17, 2021. <u>https://doi.org/10.5194/bg-2021-27</u>.

¹⁰¹ Krause-Jensen, D., Duarte, C. "Substantial role of macroalgae in marine carbon sequestration." *Nature Geosci* 9, 737–742 (2016). <u>https://doi.org/10.1038/ngeo2790</u>.
¹⁰² Orth, Robert J., et al. "A Global Crisis for Seagrass Ecosystems." *BioScience* 56, no. 12 (December 2006): 987–96. <u>https://doi.org/10.1641/0006-</u>

<u>3568(2006)56[987:agcfse]2.0.co;2</u>.

¹⁰³ Duarte, Carlos M., Jiaping Wu, Xi Xiao, Annette Bruhn, and Dorte Krause-Jensen. "Can Seaweed Farming Play a Role in Climate Change Mitigation and Adaptation?" *Frontiers in Marine Science* 4 (April 12, 2017). <u>https://doi.org/10.3389/fmars.2017.00100</u>; Hirsh, Heidi K., et al. "Drivers of Biogeochemical Variability in a Central California Kelp Forest: Implications for Local Amelioration of Ocean Acidification." *Journal of Geophysical Research: Oceans* 125, no. 11 (October 22, 2020).

https://doi.org/10.1029/2020jc016320; Ricart, Aurora M., et al. "Coast-Wide Evidence of Low PH Amelioration by Seagrass Ecosystems." *Global Change Biology* 27, no. 11 (March 31, 2021): 2580–91. https://doi.org/10.1111/gcb.15594.

¹⁰⁴ Orth, Robert J., et al. "Restoration of Seagrass Habitat Leads to Rapid Recovery of Coastal Ecosystem Services." *Science Advances* 6, no. 41 (October 7, 2020). <u>https://doi.org/10.1126/sciadv.abc6434</u>.

¹⁰⁵ Duarte, Carlos M., Jiaping Wu, Xi Xiao, Annette Bruhn, and Dorte Krause-Jensen.
 "Can Seaweed Farming Play a Role in Climate Change Mitigation and Adaptation?"
 Frontiers in Marine Science 4 (April 12, 2017). <u>https://doi.org/10.3389/fmars.2017.00100</u>.
 ¹⁰⁶ Beheshti, K. and Ward, M. 2021. Eelgrass Restoration on the U.S. West Coast: A
 Comprehensive Assessment of Restoration Techniques and Their Outcomes. Prepared for the Pacific Marine and Estuarine Fish Habitat Partnership.

¹⁰⁷ LANDFIRE: LANDFIRE Existing Vegetation Type layer. (2013 - 2021). U.S. Department of Interior, Geological Survey. [Online]. Available:

https://landfire.gov/version_download.php [Accessed: February 3, 2021]. LANDFIRE: LANDFIRE Biophysical Setting layer. (2013 - 2021). U.S. Department of Interior, Geological Survey [Online]. Available: https://landfire.gov/version_download.php [Accessed: February 3, 2021]. California Multi-Source Land Ownership (ownership18_2), October 15, 2018. CAL FIRE-FRAP. https://frap.fire.ca.gov/mapping/gis-data/ [Accessed: August 17, 2021].

¹⁰⁸ Cal. Public Resources Code § 4799.09(e).

¹⁰⁹ Nowak, David J., Eric J. Greenfield, Robert E. Hoehn, and Elizabeth Lapoint. "Carbon Storage and Sequestration by Trees in Urban and Community Areas of the United States." *Environmental Pollution* 178 (March 2013): 229–36.

https://doi.org/10.1016/j.envpol.2013.03.019; Yesilonis, Ian D., and Richard V. Pouyat. "Carbon Stocks in Urban Forest Remnants: Atlanta and Baltimore as Case Studies." Carbon Sequestration in Urban Ecosystems, (2011), 103–20. <u>https://doi.org/10.1007/978-</u> 94-007-2366-5_5. ¹¹⁰ Rodriguez, G., S. Celedon, B.R. Middleton Manning, A.S. Sanchez, C. Schell, and M. Walker. Using Nature-Based Solutions to Advance Equity: Advisory Panel Summary Document, June 8, 2021. <u>https://www.californianature.ca.gov/pages/get-involved#topical.</u>

¹¹¹ Nowak, David J., Eric J. Greenfield, Robert E. Hoehn, and Elizabeth Lapoint. "Carbon Storage and Sequestration by Trees in Urban and Community Areas of the United States." *Environmental Pollution* 178 (March 2013): 229–36.

https://doi.org/10.1016/j.envpol.2013.03.019; Bjorkman, J., et al. "Biomass, carbon sequestration and avoided emission: assessing the role of urban trees in California." Information Center for the Environment, University of California, Davis, (March, 2015) https://escholarship.org/content/qt8r83z5wb/qt8r83z5wb_noSplash_fef1e0f77a080c405 bad0b09f30b8659.pdf.

¹¹² Maco, S.E., E.G. McPherson, J.R. Simpson, P.J. Peper, Q. Xiao. (U.S. Department of Agriculture, Forest Service, Center for Urban Forest Research, Pacific Southwest Research Station) City of San Francisco, California Street Tree Resource Analysis (2003). <u>https://www.fs.fed.us/psw/topics/urban_forestry/products/2/psw_cufr732_SanFrancisco_MBCA_web.pdf</u>.

¹¹³ Rodriguez, G., S. Celedon, B.R. Middleton Manning, A.S. Sanchez, C. Schell, and M. Walker. Using Nature-Based Solutions to Advance Equity: Advisory Panel Summary Document, June 8, 2021. <u>https://www.californianature.ca.gov/pages/get-involved#topical.</u>

¹¹⁴ "Park Access Tool." Parks for All Californians. State of California, California Department of Parks and Recreation,

n.d. <u>https://www.parksforcalifornia.org/parkaccess/?overlays1=parks%2Cnoparkaccess</u>%2Cparkaccess%2Cnopopulation&overlays2=parks%2Cparksper1000.

¹¹⁵ Maco, S.E., E.G. McPherson, J.R. Simpson, P.J. Peper, Q. Xiao. (U.S. Department of Agriculture, Forest Service, Center for Urban Forest Research, Pacific Southwest Research Station) City of San Francisco, California Street Tree Resource Analysis (2003). <u>https://www.fs.fed.us/psw/topics/urban_forestry/products/2/psw_cufr732_SanFrancisco</u>

<u>MBCA_web.pdf</u>; "Planting Tree Equity and Career Pathways for Underserved Communities." Career Pathways Initiative. American Forests, May 18, 2021.

https://www.americanforests.org/our-work/urban-forestry/workforce-development/.

¹¹⁶ LANDFIRE: LANDFIRE Existing Vegetation Type layer. (2013 - 2021). U.S. Department of Interior, Geological Survey. [Online]. Available:

https://landfire.gov/version_download.php [Accessed: February 3, 2021]. LANDFIRE: LANDFIRE Biophysical Setting layer. (2013 - 2021). U.S. Department of Interior, Geological Survey [Online]. Available: https://landfire.gov/version_download.php [Accessed:

February 3, 2021]. California Multi-Source Land Ownership (ownership18_2), October 15, 2018. CAL FIRE-FRAP. https://frap.fire.ca.gov/mapping/gis-data/ [Accessed: August 17, 2021].

¹¹⁷ Silver, Whendee L., Rebecca Ryals, and Valerie Eviner. "Soil Carbon Pools in California's Annual Grassland Ecosystems." *Rangeland Ecology & Management* 63, no.
1 (January 2010): 128–36. https://doi.org/10.2111/rem-d-09-00106.1.

¹¹⁸ Vogel, Anja, Michael Scherer-Lorenzen, and Alexandra Weigelt. "Grassland Resistance and Resilience after Drought Depends on Management Intensity and Species Richness." *PLoS ONE* 7, no. 5 (May 16, 2012).

https://doi.org/10.1371/journal.pone.0036992.

¹¹⁹ Koteen, Laura E, Dennis D Baldocchi, and John Harte. "Invasion of Non-Native Grasses Causes a Drop in Soil Carbon Storage in California Grasslands." *Environmental Research Letters* 6, no. 4 (October 1, 2011): 044001. <u>https://doi.org/10.1088/1748-9326/6/4/044001</u>.

¹²⁰ "Grassland." University of California, Santa Barbara: Cheadle Center for Biodiversity and Ecological Restoration. University of California, Santa Barbara: Cheadle Center for Biodiversity and Ecological Restoration, 2011.

https://www.ccber.ucsb.edu/ecosystem/native-plant-habitats/grassland.

¹²¹ Silver, Whendee, Sintana Vergara, Allegra Mayer. (University of California, Berkeley). 2018. Carbon Sequestration and Greenhouse Gas Mitigation Potential of Composting and Soil Amendments on California's Rangelands. California's Fourth Climate Change Assessment, California Natural Resources Agency. Publication number: CCCA4-CNRA2018-002. https://www.energy.ca.gov/sites/default/files/2019-

<u>11/Agriculture_CCCA4-CNRA-2018-002_ADA.pdf;</u> Sohi, S. P. "Carbon Storage with Benefits." *Science* 338, no. 6110 (November 22, 2012): 1034–35.

https://doi.org/10.1126/science.1225987; Gong, Xiaomin, et al. "Nanoscale Zerovalent Iron, Carbon Nanotubes and Biochar Facilitated the Phytoremediation of Cadmium Contaminated Sediments by Changing Cadmium Fractions, Sediments Properties and Bacterial Community Structure." *Ecotoxicology and Environmental Safety* 208 (January 15, 2021): 111510. https://doi.org/10.1016/j.ecoenv.2020.111510; Matzek, Virginia, David Lewis, Anthony O'Geen, Michael Lennox, Sean D. Hogan, Shane T. Feirer, Valerie Eviner, and Kenneth W. Tate. "Increases in Soil and Woody Biomass Carbon Stocks as a Result of Rangeland Riparian Restoration." *Carbon Balance and Management* 15, no. 1 (July 31, 2020). https://doi.org/10.1186/s13021-020-00150-7.

¹²² Dass, Pawlok, Benjamin Z Houlton, Yingping Wang, and David Warlind. "Grasslands May Be More Reliable Carbon Sinks than Forests in California." *Environmental Research Letters* 13, no. 7 (July 10, 2018): 074027. <u>https://doi.org/10.1088/1748-9326/aacb39</u>. Silver, Whendee L., Rebecca Ryals, and Valerie Eviner. "Soil Carbon Pools in California's Annual Grassland Ecosystems." *Rangeland Ecology & Management* 63, no. 1 (January 2010): 128–36. <u>https://doi.org/10.2111/rem-d-09-00106.1</u>.

¹²³ Vogel, Anja, Michael Scherer-Lorenzen, and Alexandra Weigelt. "Grassland Resistance and Resilience after Drought Depends on Management Intensity and Species Richness." *PLoS ONE* 7, no. 5 (May 16, 2012).

https://doi.org/10.1371/journal.pone.003699; Koteen, Laura E, Dennis D Baldocchi, and John Harte. "Invasion of Non-Native Grasses Causes a Drop in Soil Carbon Storage in California Grasslands." Environmental Research Letters 6, no. 4 (October 1, 2011): 044001. https://doi.org/10.1088/1748-9326/6/4/044001.

¹²⁴ Byrd, Kristin B, Pelayo Alvarez, Benjamin Sleeter, Lorraine Flint, Alan Flint, D. Richard Cameron, and Jeffrey Creque. "Scenarios of Climate Adaptation Potential on Protected Working Lands from Management of Soils." *Environmental Research Letters*, September 30, 2019. https://doi.org/10.1088/1748-9326/ab3ca4.

¹²⁵ U.S. Department of Agriculture, Northeast Climate Hub. Managing Grazing to Improve Climate Resilience (2019).

https://www.climatehubs.usda.gov/sites/default/files/GrazingFactsheet_Feb2019_web5 08.pdf; Gosnell, H., S. Chamley, and P. Stanley. "Climate Change Mitigation as a Co-

Benefit of Regenerative Ranching: Insights from Australia and the United States." Interface Focus 10 (2020). <u>https://doi.org/20200027</u>; "Grazing." Fire in California. University of California Cooperative Extension, n.d.

https://ucanr.edu/sites/fire/Prepare/Treatment/Grazing.

¹²⁶ LANDFIRE: LANDFIRE Existing Vegetation Type layer. (2013 - 2021). U.S. Department of Interior, Geological Survey. [Online]. Available:

https://landfire.gov/version_download.php [Accessed: February 3, 2021]. LANDFIRE: LANDFIRE Biophysical Setting layer. (2013 - 2021). U.S. Department of Interior, Geological Survey [Online]. Available: <u>https://landfire.gov/version_download.php</u> [Accessed: February 3, 2021]. California Multi-Source Land Ownership (ownership18_2), October 15,

2018. CAL FIRE-FRAP. https://frap.fire.ca.gov/mapping/gis-data/ [Accessed: August 17, 2021].

¹²⁷ Schlesinger, William H., Jayne Belnap, and Giles Marion. "On Carbon Sequestration in Desert Ecosystems." *Global Change Biology* 15, no. 6 (May 4, 2009): 1488–90.

https://doi.org/10.1111/j.1365-2486.2008.01763.x; Soper, Fiona M., Carmody K. McCalley, Kimberlee Sparks, and Jed P. Sparks. "Soil Carbon Dioxide Emissions from the Mojave Desert: Isotopic Evidence for a Carbonate Source." Geophysical Research Letters 44, no. 1 (January 16, 2017): 245–51. https://doi.org/10.1002/2016gl071198; Li, Yan, Yu-Gang Wang, R. A. Houghton, and Li-Song Tang. "Hidden Carbon Sink beneath Desert." Geophysical Research Letters 42, no. 14 (July 28, 2015): 5880–87.

https://doi.org/10.1002/2015gl064222.

¹²⁸ Lovich, J. E., and D. Bainbridge. "Anthropogenic Degradation of the Southern California Desert Ecosystem and Prospects for Natural Recovery and Restoration." *Environmental Management* 24, no. 3 (October 1999): 309–26. https://doi.org/10.1007/s002679900235.

 ¹²⁹ Guo, Qinfeng. "Slow Recovery in Desert Perennial Vegetation Following Prolonged Human Disturbance." Journal of Vegetation Science 15, no. 6 (December 2004): 757–

62. https://doi.org/10.1111/j.1654-1103.2004.tb02318.x.

¹³⁰ Sigren, Jacob M., Jens Figlus, and Anna R. Armitage. "Coastal sand dunes and dune vegetation: restoration, erosion, and storm protection." *Shore & Beach* 82.4 (2014): 5-12.
 ¹³¹ State of California, Water Resilience Portfolio (2020).

https://waterresilience.ca.gov/wp-content/uploads/2020/07/Final_California-Water-Resilience-Portfolio-2020_ADA3_v2_ay11-opt.pdf.

¹³² State of California, Natural Resources Agency, Monitoring and Evaluation of California Natural Resources Agency Investments: Proposed Steps Toward a Consolidated Project Management and Fiscal Accountability System (2020), <u>https://resources.ca.gov/-/media/CNRA-Website/Files/Initiatives/MSU/White-Paper-and-</u> Letter-Final.pdf.

¹³³ Kueppers, L., J.K. Gilless, P. Gonzalez, T.M. Hill, E. Margulies, and T.B. Pathak. Expanding Climate Action Through Nature-Based Solutions: Advisory Panel Summary Document, June 2, 2021. <u>https://www.californianature.ca.gov/pages/get-</u> involved#topical.

¹³⁴ Population projections are summaries of the California Department of Finance's publicly released E-4 projections. Counties that are split between regions have used the proportion of the population within each region by county applied to the county totals. The 2020 estimates are split based on the estimated populations at a block group level from the American Community Survey 5-year estimates based on 2014-2018 data, which was the most recent available at a Block Group as of 4/23/2021.

¹³⁵ Land areas are calculated and based on a 1:24k scale county dataset released by the California Department of Forestry & Fire Protection FRAP program. The dataset has

been intersected with a 4th Climate Assessment Regions dataset obtained from Cal-Adapt.org. Calculations are conducted in California Albers NAD83.

¹³⁶ Graphic 1: LANDFIRE: LANDFIRE Existing Vegetation Type layer. (2013 - 2021). U.S. Department of Interior, Geological Survey. [Online]. Available:

https://landfire.gov/version_download.php [Accessed: February 3, 2021].

LANDFIRE: LANDFIRE Biophysical Setting layer. (2013 - 2021). U.S. Department of Interior, Geological Survey. [Online]. Available: https://landfire.gov/version_download.php [Accessed: February 3, 2021]; Bell, T, K. Cavanaugh, D. Siegel. 2020. SBC LTER: Time series of quarterly NetCDF files of kelp biomass in the canopy from Landsat 5, 7 and 8, since 1984 (ongoing) ver 13. Environmental Data Initiative.

https://doi.org/10.6073/pasta/5d3fb6fd293bd403a0714d870a4dd7d8. Accessed 2021-04-08. (Data extraction performed by T. Bell April 8, 2021); Eelgrass Survey GIS Data version 2.0 (2017, updated 2020), National Marine Fisheries Service West Coast Region. Available: https://www.sfei.org/data/eelgrass-survey-gis-

data#sthash.u94SjLu7.afUwqGJA.dpbs [Accessed: April 6, 2021]. Graphic 2: California Multi-Source Land Ownership (ownership18_2), October 15, 2018. CAL FIRE-FRAP. https://frap.fire.ca.gov/mapping/gis-data/ [Accessed: August 17, 2021].

¹³⁷ Data from U.S. Department of Commerce, Bureau of Economic Analysis (BEA). "CAGDP2: GDP in Current Dollars by County and MSA." Updated December 8, 2021.

Accessed March 8, 2022 from: <u>https://apps.bea.gov/regional/downloadzip.cfm</u>. Additional information about BEA data on GDP by County is available at:

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(https://www.bls.gov/iag/tgs/iag_index_naics.htm).

¹³⁸ Grantham, Theodore (University of California, Berkeley). 2018. North Coast Summary Report, California's Fourth Climate Change Assessment. Publication number: SUM-CCC4A-2018-001. <u>https://www.energy.ca.gov/sites/default/files/2019-11/Reg_Report-</u> <u>SUM-CCCA4-2018-001_NorthCoast_ADA.pdf</u>.

¹³⁹ Graphic 1: LANDFIRE: LANDFIRE Existing Vegetation Type layer. (2013 - 2021). U.S. Department of Interior, Geological Survey. [Online]. Available:

https://landfire.gov/version_download.php [Accessed: February 3, 2021].

LANDFIRE: LANDFIRE Biophysical Setting layer. (2013 - 2021). U.S. Department of Interior, Geological Survey. [Online]. Available: https://landfire.gov/version_download.php [Accessed: February 3, 2021]; Bell, T, K. Cavanaugh, D. Siegel. 2020. SBC LTER: Time series of quarterly NetCDF files of kelp biomass in the canopy from Landsat 5, 7 and 8, since 1984 (ongoing) ver 13. Environmental Data Initiative.

https://doi.org/10.6073/pasta/5d3fb6fd293bd403a0714d870a4dd7d8. Accessed 2021-04-08. (Data extraction performed by T. Bell April 8, 2021); Eelgrass Survey GIS Data version 2.0 (2017, updated 2020), National Marine Fisheries Service West Coast Region. Available: https://www.sfei.org/data/eelgrass-survey-gis-

data#sthash.u94SjLu7.afUwqGJA.dpbs [Accessed: April 6, 2021]. Graphic 2: California Multi-Source Land Ownership (ownership18_2), October 15, 2018. CAL FIRE-FRAP. https://frap.fire.ca.gov/mapping/gis-data/ [Accessed: August 17, 2021].

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¹⁴² Data from U.S. Department of Commerce, Bureau of Economic Analysis (BEA).
"CAGDP2: GDP in Current Dollars by County and MSA." Updated December 8, 2021.
Accessed March 8, 2022 from: <u>https://apps.bea.gov/regional/downloadzip.cfm</u>.

Additional information about BEA data on GDP by County is available at: <u>https://www.bea.gov/data/gdp/gdp-county-metro-and-other-areas.</u> BEA Industry detail is based on the 2012 North American Industry Classification System (NAICS). A

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(https://www.bls.gov/iag/tgs/iag_index_naics.htm).

¹⁴³ Ackerly, D., A. Jones, M. Stacey, B. Riordan. (University of California, Berkeley). 2018.
 San Francisco Bay Area Summary Report, California's Fourth Climate Change
 Assessment. Publication number: CCCA4-SUM-2018-005.

https://www.energy.ca.gov/sites/default/files/2019-11/Reg_Report-SUM-CCCA4-2018-005_SanFranciscoBayArea_ADA.pdf.

¹⁴⁴ Population projections are summaries of the California Department of Finance's publicly released E-4 projections. Counties that are split between regions have used the proportion of the population within each region by county applied to the county totals. The 2020 estimates are split based on the estimated populations at a block group level from the American Community Survey 5-year estimates based on 2014-2018 data, which was the most recent available at a Block Group as of 4/23/2021.

¹⁴⁵ Graphic 1: LANDFIRE: LANDFIRE Existing Vegetation Type layer. (2013 - 2021). U.S. Department of Interior, Geological Survey. [Online]. Available:

https://landfire.gov/version_download.php [Accessed: February 3, 2021].

LANDFIRE: LANDFIRE Biophysical Setting layer. (2013 - 2021). U.S. Department of Interior, Geological Survey. [Online]. Available: https://landfire.gov/version_download.php [Accessed: February 3, 2021]; Bell, T, K. Cavanaugh, D. Siegel. 2020. SBC LTER: Time series of quarterly NetCDF files of kelp biomass in the canopy from Landsat 5, 7 and 8, since 1984 (ongoing) ver 13. Environmental Data Initiative.

https://doi.org/10.6073/pasta/5d3fb6fd293bd403a0714d870a4dd7d8. Accessed 2021-04-08. (Data extraction performed by T. Bell April 8, 2021); Eelgrass Survey GIS Data version 2.0 (2017, updated 2020), National Marine Fisheries Service West Coast Region. Available: https://www.sfei.org/data/eelgrass-survey-gis-

data#sthash.u94SjLu7.afUwqGJA.dpbs [Accessed: April 6, 2021]. Graphic 2: California Multi-Source Land Ownership (ownership18_2), October 15, 2018. CAL FIRE-FRAP. https://frap.fire.ca.gov/mapping/gis-data/ [Accessed: August 17, 2021].

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Additional information about BEA data on GDP by County is available at:

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(https://www.bls.gov/iag/tgs/iag_index_naics.htm).

¹⁴⁸ Langridge, Ruth. (University of California, Santa Cruz). 2018. Central Coast Summary Report, California's Fourth Climate Change Assessment. Publication number: SUM-CCCA4-2018-006. <u>https://www.energy.ca.gov/sites/default/files/2019-11/Reg_Report-</u> <u>SUM-CCCA4-2018-006_CentralCoast_ADA.pdf</u>.

¹⁴⁹ Graphic 1: LANDFIRE: LANDFIRE Existing Vegetation Type layer. (2013 - 2021). U.S. Department of Interior, Geological Survey. [Online]. Available:

https://landfire.gov/version_download.php [Accessed: February 3, 2021].

LANDFIRE: LANDFIRE Biophysical Setting layer. (2013 - 2021). U.S. Department of Interior, Geological Survey. [Online]. Available: https://landfire.gov/version_download.php [Accessed: February 3, 2021]; Bell, T, K. Cavanaugh, D. Siegel. 2020. SBC LTER: Time series of quarterly NetCDF files of kelp biomass in the canopy from Landsat 5, 7 and 8, since 1984 (ongoing) ver 13. Environmental Data Initiative.

https://doi.org/10.6073/pasta/5d3fb6fd293bd403a0714d870a4dd7d8. Accessed 2021-04-08. (Data extraction performed by T. Bell April 8, 2021); Eelgrass Survey GIS Data version 2.0 (2017, updated 2020), National Marine Fisheries Service West Coast Region. Available: https://www.sfei.org/data/eelgrass-survey-gis-

data#sthash.u94SjLu7.afUwqGJA.dpbs [Accessed: April 6, 2021]. Graphic 2: California Multi-Source Land Ownership (ownership18_2), October 15, 2018. CAL FIRE-FRAP. https://frap.fire.ca.gov/mapping/gis-data/ [Accessed: August 17, 2021].

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¹⁵² Data from U.S. Department of Commerce, Bureau of Economic Analysis (BEA). "CAGDP2: GDP in Current Dollars by County and MSA." Updated December 8, 2021. Accessed March 8, 2022 from: <u>https://apps.bea.gov/regional/downloadzip.cfm</u>.

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available from the U.S. Bureau of Labor Statistics

(https://www.bls.gov/iag/tgs/iag_index_naics.htm).

¹⁵³ Hall, A., N. Berg, K. Reich. (University of California, Los Angeles). 2018. Los Angeles Summary Report, California's Fourth Climate Change Assessment. Publication number: SUM-CCCA4-2018-007. <u>https://www.energy.ca.gov/sites/default/files/2019-</u>

11/Reg%20Report-%20SUM-CCCA4-2018-007%20LosAngeles_ADA.pdf.

¹⁵⁴ Graphic 1: LANDFIRE: LANDFIRE Existing Vegetation Type layer. (2013 - 2021). U.S. Department of Interior, Geological Survey. [Online]. Available:

https://landfire.gov/version_download.php [Accessed: February 3, 2021].

LANDFIRE: LANDFIRE Biophysical Setting layer. (2013 - 2021). U.S. Department of Interior, Geological Survey. [Online]. Available: https://landfire.gov/version_download.php [Accessed: February 3, 2021]; Bell, T, K. Cavanaugh, D. Siegel. 2020. SBC LTER: Time series of quarterly NetCDF files of kelp biomass in the canopy from Landsat 5, 7 and 8, since 1984 (ongoing) ver 13. Environmental Data Initiative.

https://doi.org/10.6073/pasta/5d3fb6fd293bd403a0714d870a4dd7d8. Accessed 2021-04-08. (Data extraction performed by T. Bell April 8, 2021); Eelgrass Survey GIS Data version 2.0 (2017, updated 2020), National Marine Fisheries Service West Coast Region. Available: https://www.sfei.org/data/eelgrass-survey-gis-

data#sthash.u94SjLu7.afUwqGJA.dpbs [Accessed: April 6, 2021]. Graphic 2: California Multi-Source Land Ownership (ownership18_2), October 15, 2018. CAL FIRE-FRAP. https://frap.fire.ca.gov/mapping/gis-data/ [Accessed: August 17, 2021].

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¹⁵⁷ Data from U.S. Department of Commerce, Bureau of Economic Analysis (BEA). "CAGDP2: GDP in Current Dollars by County and MSA." Updated December 8, 2021. Accessed March 8, 2022 from: <u>https://apps.bea.gov/regional/downloadzip.cfm</u>.

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(https://www.bls.gov/iag/tgs/iag_index_naics.htm).

¹⁵⁸ Kalansky, J., D. Cayan, K. Barba, L. Walsh, K. Brouwer, D. Boudreau. (University of California, San Diego). 2018. San Diego Summary Report, California's Fourth Climate Change Assessment. Publication number: SUM-CCCA4-2018-009.

https://www.energy.ca.gov/sites/default/files/2019-11/Reg_Report-SUM-CCCA4-2018-009_SanDiego_ADA.pdf.

¹⁵⁹ Graphic 1: LANDFIRE: LANDFIRE Existing Vegetation Type layer. (2013 - 2021). U.S. Department of Interior, Geological Survey. [Online]. Available:

https://landfire.gov/version_download.php [Accessed: February 3, 2021]. LANDFIRE: LANDFIRE Biophysical Setting layer. (2013 - 2021). U.S. Department of Interior, Geological Survey. [Online]. Available: https://landfire.gov/version_download.php [Accessed: February 3, 2021]; Bell, T, K. Cavanaugh, D. Siegel. 2020. SBC LTER: Time series of quarterly NetCDF files of kelp biomass in the canopy from Landsat 5, 7 and 8, since 1984 (ongoing) ver 13. Environmental Data Initiative.

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¹⁶² Data from U.S. Department of Commerce, Bureau of Economic Analysis (BEA).

"CAGDP2: GDP in Current Dollars by County and MSA." Updated December 8, 2021. Accessed March 8, 2022 from: <u>https://apps.bea.gov/regional/downloadzip.cfm</u>.

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(https://www.bls.gov/iag/tgs/iag_index_naics.htm).

¹⁶³ Houlton, B., J. Lund. (University of California, Davis). 2018. Sacramento Summary Report, California's Fourth Climate Change Assessment. Publication number: SUM-CCCA4-2018-002 <u>https://www.energy.ca.gov/sites/default/files/2019-11/Reg_Report-</u> <u>SUM-CCCA4-2018-002_SacramentoValley_ADA.pdf</u>.

¹⁶⁴ Population projections are summaries of the California Department of Finance's publicly released E-4 projections. Counties that are split between regions have used the proportion of the population within each region by county applied to the county totals. The 2020 estimates are split based on the estimated populations at a block group level from the American Community Survey 5-year estimates based on 2014-2018 data, which was the most recent available at a Block Group as of 4/23/2021.

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https://landfire.gov/version_download.php [Accessed: February 3, 2021].

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[Accessed: February 3, 2021]; Bell, T, K. Cavanaugh, D. Siegel. 2020. SBC LTER: Time series of quarterly NetCDF files of kelp biomass in the canopy from Landsat 5, 7 and 8, since 1984 (ongoing) ver 13. Environmental Data Initiative.

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¹⁶⁷ Data from U.S. Department of Commerce, Bureau of Economic Analysis (BEA). "CAGDP2: GDP in Current Dollars by County and MSA." Updated December 8, 2021. Accessed March 8, 2022 from: <u>https://apps.bea.gov/regional/downloadzip.cfm</u>.

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(https://www.bls.gov/iag/tgs/iag_index_naics.htm).

¹⁶⁸ Westerling, L., J. Medellin-Azuara, J. Viers. (University of California, Merced). 2021. San Joaquin Valley Summary Report, California's Fourth Climate Change Assessment. Publication number: SUMCCCA4-2018-003. *Link forthcoming*.

¹⁶⁹ Graphic 1: LANDFIRE: LANDFIRE Existing Vegetation Type layer. (2013 - 2021). U.S. Department of Interior, Geological Survey. [Online]. Available:

https://landfire.gov/version_download.php [Accessed: February 3, 2021].

LANDFIRE: LANDFIRE Biophysical Setting layer. (2013 - 2021). U.S. Department of Interior, Geological Survey. [Online]. Available: https://landfire.gov/version_download.php [Accessed: February 3, 2021]; Bell, T, K. Cavanaugh, D. Siegel. 2020. SBC LTER: Time series of quarterly NetCDF files of kelp biomass in the canopy from Landsat 5, 7 and 8, since 1984 (ongoing) ver 13. Environmental Data Initiative.

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data#sthash.u94SjLu7.afUwqGJA.dpbs [Accessed: April 6, 2021]. Graphic 2: California Multi-Source Land Ownership (ownership18_2), October 15, 2018. CAL FIRE-FRAP. https://frap.fire.ca.gov/mapping/gis-data/ [Accessed: August 17, 2021].

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¹⁷² Data from U.S. Department of Commerce, Bureau of Economic Analysis (BEA). "CAGDP2: GDP in Current Dollars by County and MSA." Updated December 8, 2021. Accessed March 8, 2022 from: <u>https://apps.bea.gov/regional/downloadzip.cfm.</u>

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(https://www.bls.gov/iag/tgs/iag_index_naics.htm).

¹⁷³ Hopkins, Francesca. (University of California, Riverside). 2018. Inland Deserts Summary Report, California's Fourth Climate Change Assessment. Publication number: SUM-CCCA4-2018-008. <u>https://www.energy.ca.gov/sites/default/files/2019-11/Reg_Report-</u> <u>SUM-CCCA4-2018-008_InlandDeserts_ADA.pdf</u>.

¹⁷⁴ Land areas are calculated and based on a 1:24k scale county dataset released by the California Department of Forestry & Fire Protection FRAP program. The dataset has been intersected with a 4th Climate Assessment Regions dataset obtained from Cal-Adapt.org. Calculations are conducted in California Albers NAD83.

¹⁷⁵ Graphic 1: LANDFIRE: LANDFIRE Existing Vegetation Type layer. (2013 - 2021). U.S. Department of Interior, Geological Survey. [Online]. Available:

https://landfire.gov/version_download.php [Accessed: February 3, 2021].

LANDFIRE: LANDFIRE Biophysical Setting layer. (2013 - 2021). U.S. Department of Interior, Geological Survey. [Online]. Available: https://landfire.gov/version_download.php [Accessed: February 3, 2021]; Bell, T, K. Cavanaugh, D. Siegel. 2020. SBC LTER: Time series of quarterly NetCDF files of kelp biomass in the canopy from Landsat 5, 7 and 8, since 1984 (ongoing) ver 13. Environmental Data Initiative.

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data#sthash.u94SjLu7.afUwqGJA.dpbs [Accessed: April 6, 2021]. Graphic 2: California Multi-Source Land Ownership (ownership18_2), October 15, 2018. CAL FIRE-FRAP. https://frap.fire.ca.gov/mapping/gis-data/ [Accessed: August 17, 2021].

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¹⁷⁷ Data from U.S. Department of Commerce, Bureau of Economic Analysis (BEA). "CAGDP2: GDP in Current Dollars by County and MSA." Updated December 8, 2021. Accessed March 8, 2022 from: <u>https://apps.bea.gov/regional/downloadzip.cfm</u>. Additional information about BEA data on GDP by County is available at: <u>https://www.bea.gov/data/gdp/gdp-county-metro-and-other-areas</u>. BEA Industry detail is based on the 2012 North American Industry Classification System (NAICS). A glossary of industry definitions for BEA's Regional Economic Accounts data is available at: <u>https://apps.bea.gov/regional/definitions/</u>. More information about NAICS codes is available from the U.S. Bureau of Labor Statistics

(https://www.bls.gov/iag/tgs/iag_index_naics.htm).

¹⁷⁸ Dettinger, M., H. Alpert, J. Battles, J. Kusel, H. Safford, D. Fougeres, C. Knight, L. Miller, S. Sawyer. 2018. Sierra Nevada Summary Report, California's Fourth Climate Change Assessment. Publication number: SUM-CCCA4-2018-004.

https://www.energy.ca.gov/sites/default/files/2019-11/Reg_Report-SUM-CCCA4-2018-004_SierraNevada_ADA.pdf