

CY PLAN 228: Research Workshop in Metropolitan Regional Planning

Rebuilding for a Resilient Recovery: Alternative Scenarios, Impacts and Tools

Department of City and Regional Planning
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University of California at Berkeley
Fall 2020

Time: Tu/Th 2-4pm

Room: Remote ([Zoom link](#), password: resilience)

Units: 4

Course Description

Approximately one-fourth of Californians live in high-risk fire areas, with three million housing units at risk. Climate change has accelerated, causing the state's fires to grow bigger and last longer – and colliding with California's ongoing construction of single-family homes in the exurban fringe and greenhouse gas emissions reduction goals. Yet, the State's 2018 Strategic Fire Plan focuses almost exclusively on prevention via education, land use planning, and land management; just one of its eight goals targets recovery, but without mention of best practices for rebuilding. Despite Governor Newsom's April 2019 call to "deprioritize new development" in areas of extreme fire risk, the legislative focus thus far has been on retrofitting homes to become more fire-resistant. A bill that prohibits development in high fire-risk areas unless it meets certain standards (Senate Bill 182) likely faces opposition because it may allow anti-growth cities to avoid meeting their housing goals.

The failure of California to embrace more resilient recovery processes is due in no small part to the lack of rigorous analysis about the long-term environmental, social, and fiscal costs of simply rebuilding in place. In this workshop, we examine how to rebuild for fire recovery in a resilient fashion -- reducing greenhouse gas emissions, preserving agricultural land, stabilizing communities, and producing positive fiscal impact. We will study three communities hard hit by recent fires, but each with a different demographic profile and built form: the Thomas Fire in Ventura County, the Tubbs Fire in Santa Rosa, and the Camp Fire in Butte County (Paradise). For each case, we will examine a set of alternative scenarios, including business-as-usual rebuilding, on-site higher density rebuilding, and off-site urban infill rebuilding. In addition, working with The Nature Conservancy (TNC), we will examine the feasibility of establishing a wildfire risk reduction boundary around the city of Paradise.

For each case, we will examine impacts on the environment, particularly in terms of vehicle miles traveled (VMT) and loss of natural and working lands; impacts on communities, particularly displacement of low-income households (and related health and other costs); and impacts on city and state budgets (particularly infrastructure and other costs of sprawl). Working with officials in Sacramento, we will explore the institutional and regulatory structures that would provide the most appropriate carrots and sticks for a more resilient recovery, asking, for instance: How might the state structure a fire insurance program that, like FEMA, supports buy-outs in high risk areas? How can the state incentivize more infill development by taking into account the costs of fire? What is the most equitable way to collect tax revenues in order to recover some of the costs of firefighting?

In this workshop, students will conduct mixed-methods research; some students will focus primarily on quantifying the costs and benefits of smarter recovery patterns, while others will primarily conduct stakeholder and key informant interviews. Students will all learn to conduct scenario planning via Urban Footprint's proprietary software, and will have the option of learning economic impact analysis via the IMPLAN software as well. Together, the class will design potential solutions including both specific policy and planning recommendations for the case study cities and high-level recommendations for state agencies. This class is co-taught by Karen Chapple and Robert Olshansky, an emeritus professor from UIUC who is one of the world's leading experts in disaster recovery, working in close consultation with The Nature Conservancy. Funding for the workshop was provided via a grant from Next 10.

Learning Objectives

In this class, students will:

- develop an understanding of resilience;
- become familiar with secondary data analysis and mapping;
- learn how to use scenario and/or impact analysis software;
- master qualitative research methods and ethics, including how to conduct and analyze interviews;
- learn how to work in interdisciplinary teams on interdisciplinary issues;
- practice presentation techniques.

Prerequisites

The class is intended for MCP students, but others may be admitted with permission of the instructor. There are no course prerequisites; however, students will benefit from prior exposure to primary and secondary data analysis techniques, as in CP 201A and B.

Course Requirements

Task 1: Background research - Resilience and recovery from fire

Deliverables: Reading responses due Sept 1 (Aug 27 readings), Sept 3 (Week 2 readings), Sept 10 (Week 3 readings), and Sept 17 (Week 4 readings). Each week, please read all of the required readings. Then, post your reaction (1-2 paragraphs) on bCourses. (Note: you may want to format this as a formal literature review that can be incorporated easily into the final report.) Throughout the semester, you may want to review the supplemental readings provided at the end of the syllabus for additional information on particular topics.

Task 2: Case studies and research design

Deliverables:

- Complete and submit CITI training by September 24
<http://cphs.berkeley.edu/student.html>
- Preliminary presentation on the case studies scheduled for September 22 and 24
- Mid-semester presentation, including case study research design, scheduled for October 13

Task 3. Final report preparation

Deliverables:

- Interim draft reports (e.g., fieldwork findings, final report outline) due November 10
- Draft final report due December 1
- Presentation due week of December 7 (TBD)
- Revised final report due December 18

Grading Rubric

Task 1	5%
Task 2	35%
Task 3	60%

Texts and Readings

All readings are available on the class bCourses website or linked to on the syllabus.

Course Schedule

In general, we will reserve Tuesdays for full group meetings and Thursdays for group meetings.

Week of Aug 24: Introduction to the project

Objectives: Introduce the project as well as the team (Next 10 and Nature Conservancy), provide an introduction to wildfires, resilience, and climate mitigation in the California context.

Required readings

King, J. (December 8, 2019). Santa Rosa wants developers to build downtown housing. They're not so sure. *San Francisco Chronicle*. Available at:

<https://www.sfchronicle.com/bayarea/article/Santa-Rosa-wants-developers-to-build-downtown-14890073.php>

McCallum, K. (October 28, 2017). Fire-scorched Fountaingrove in Santa Rosa focal point of debate over rebuilding. *Press Democrat*. Available at:

<https://www.pressdemocrat.com/news/7572376-181/fire-scorched-fountaingrove-in-santa-rosa>

Martinez, A. (December 8, 2018). A year after Thomas Fire, recovery has far to go in Ventura. *Noozhawk*. Available at:

https://www.noozhawk.com/article/a_year_after_the_thomas_fire_theres_still_so_far_to_go_in_ventura_20181203

Westervelt, E. (May 29, 2019). After Paradise, living with fire means redefining resilience. *NPR*.

Available at: <https://www.npr.org/2019/05/29/724407043/after-paradise-living-with-fire-means-redefining-resilience>

Bliss, L. (2020) The price of saving Paradise. *Bloomberg CityLab*. Available at:

<https://www.bloomberg.com/news/articles/2020-08-25/a-california-town-s-bold-plan-to-defeat-wildfire?srnd=citylab&sref=ZDR4IZY3>

Read Executive Summaries and Conclusions

Newsom, G. (2019). *Wildfires and Climate Change: A Report from Governor Newsom's Strike Force*. Available at:

<https://www.gov.ca.gov/wp-content/uploads/2019/04/Wildfires-and-Climate-Change-California%E2%80%99s-Energy-Future.pdf>

Elkind, et al (2017). *Right Type, Right Place: Assessing the Environmental and Economic Impacts of Infill Residential Development through 2030*. UC Berkeley Center for Law, Energy and the Environment. Available at:

<https://escholarship.org/content/qt9fk087g3/qt9fk087g3.pdf>

(Review introduction, scenario modeling, and policy recommendations)

Week of Aug 31: Understanding the issues: Wildfire hazards, resilience, and the wildland urban interface in California

Objectives: Dive into the theory and practice of hazard mitigation and resilience planning with special emphasis on the wildland urban interface in California.

- Guest speakers: The Nature Conservancy Sept 3 (including Elizabeth O'Donoghue, Cara Lacey, Sara Newkirk, and David Edelson).
- Class discussion: Potential research questions, plus, reviewing the literature
- Reading responses due Sept 1 and Sept 3

Required Reading

Mockrin, M. H., Fishler, H. K., & Stewart, S. I. (2020). "After the fire: Perceptions of land use planning to reduce wildfire risk in eight communities across the United States." *International journal of disaster risk reduction* 45 (2020): 101444. Available at:
https://www.fs.fed.us/nrs/pubs/jrnl/2020/nrs_2020_mockrin_001.pdf

The Nature Conservancy (June 2020). Paradise nature-based fire resilient project: Final report & Literature review. *Conservation Biology Institute*. Available at:
<https://www.paradisepd.com/files/fcda41b0a/1.Paradise.Final.Report.2020.0715.pdf>

and

<https://www.paradisepd.com/files/154569dd9/2.Appendix.A.Paradise.Fire.Resilience.Literature.Review.pdf>

Read Executive Summaries/Skim

City of Santa Rosa (October 2016 - update ongoing):

<https://srcity.org/DocumentCenter/View/3982/Local-Hazard-Mitigation-Plan-Draft-PDF?bidId=>

Butte County (September 2019): <https://www.buttecounty.net/oem/mitigationplans>

Ventura County (September 2015):

<http://www.vcfloodinfo.com/pdf/2015%20Ventura%20County%20Multi-Hazard%20Mitigation%20Plan%20and%20Appendices.pdf>

Cash et al. 2020. *Climate Change and Displacement in the U.S.: A Review of the Literature*. Berkeley, CA: Urban Displacement Project.

https://www.urbandisplacement.org/sites/default/files/images/climate_and_displacement_-_lit_review_6.19.2020.pdf

Environmental Protection Agency. (January 2017). *Smart Growth Fixes for Climate Adaptation and Resilience*. Available at: https://www.epa.gov/sites/production/files/2017-01/documents/smart_growth_fixes_climate_adaptation_resilience.pdf *Read Introduction, Overcoming Barriers to Climate Adaptation, Overall Strategies, and Adapting to Wildfire*

Week of Sept 7: Institutions and planning for disaster recovery and resilience

Objectives: Understand the institutions and programs that shape disaster recovery outcomes - and understand who is left behind by those systems.

- Sept 8 Rob Olshansky on disaster recovery and replacement
- Sept 10 Group meetings
- Reading response due Sept 10

Required Readings

Olshansky and Johnson (2016). "United States: An Evolving National Recovery Policy Centralized at Federal and State Levels." [Chapter 7] In *After Greater Disasters: How Six Countries Managed Community Recovery*. Available at: <https://www.lincolnst.edu/publications/policy-focus-reports/after-great-disasters>

Tang, Z. (2019). "Incorporating Hazard Mitigation into the Local Comprehensive Planning Process." In *The Routledge Handbook of Urban Disaster Resilience* (pp. 337-351). Routledge.

Bodnar, P. & Grbusic, T. (June 2020). "Your disaster tax bill is growing." *New York Times*. Available at: <https://www.nytimes.com/2020/06/23/opinion/climate-change-financial-disaster.html>

Quinton, S. (January 2019). "As wildfire risk increases, home insurance is harder to find." Pew Charitable Trusts. Available at: <https://www.pewtrusts.org/en/research-and-analysis/blogs/stateline/2019/01/03/as-wildfire-risk-increases-home-insurance-is-harder-to-find>

Mendez, M. et al. (2020). "The (in)visible victims of disaster: Understanding the vulnerability of undocumented Latino/a and indigenous immigrants." *Geoforum*.

Read Executive Summaries

Town of Paradise. (June 2019). *Long-term Community Recovery Plan*. Available at: https://issuu.com/makeitparadise/docs/2350rptbook_final190624?fr=xKAE9_zU1NQ

City of Santa Rosa. (May 2019) *Coming Together in Crisis: The Santa Rosa Story - After Action Report of the City of Santa Rosa's Response to the 2017 Sonoma County Fires*. Available at: https://issuu.com/cityofsantarosa/docs/aar_-_csr

California Department of Housing and Community Development. (June 2020). *State of California Proposed Action Plan for Disaster Recovery (CDBG-DR)*. Available at: https://www.hcd.ca.gov/community-development/disaster-recovery-programs/cdbg-dr/cdbg-dr-2018/docs/DRAFT_2019_State_CDBG_Disaster_Recovery_Action_Plan_for_2018_Disasters_English.pdf

Week of Sept 14: Infill development and scenario planning

Objectives: Explore the impacts of infill development on local economies, fiscal policy, greenhouse gas emissions, and public health. Understand the role of scenario planning for local governments in mitigating wildfire risk and adapting to climate change.

- Laurie Johnson (Sept 15)
- Kelan Stoy, Urban Footprint (Sept 17)
- (Also time for group meetings on Sept 17)
- Last reading response due Sept 17

Required Readings

Johnson, L. A. (2019). "Recovery Planning with US Cities." *In The Routledge Handbook of Urban Disaster Resilience* (pp. 378-394). Routledge.

Distefano, J. (2019). "Mapping Fire Risk and Planning for Recovery in Sonoma County." *Urban Footprint*. Available at: <https://urbanfootprint.com/mapping-fire-risk-and-recovery-sonoma-county/>

Bartholomew, K. (2007). "Land use-transportation scenario planning: promise and reality." *Transportation* 34, 397–412. Available at: <https://doi.org/10.1007/s11116-006-9108-2>

Rickards, L. (2014). "The problem of fit: scenario planning and climate change adaptation in the public sector." *Environment and Planning C: Government and Policy* 32(4): 641-662. Available at: https://journals.sagepub.com/doi/pdf/10.1068/c12106?casa_token=hojyApGut_UAAAAA:CwqrNf7VPeEcz80zn4jk3FXhduXh7GPtweM7eaYLP_GY4tCCZug8MVZ0HUkZmHvviB9D7Y26FXBGKho

Jones, C., & Kammen, D. M. (2014). "Spatial distribution of US household carbon footprints reveals suburbanization undermines greenhouse gas benefits of urban population density." *Environmental science & technology*, 48(2), 895-902. Available at: https://pubs.acs.org/doi/full/10.1021/es4034364?casa_token=wjsvu09G86kAAAAA%3AO42FFRJJrMR1i76YRt1fLmY3_RwUkSnvY5rqAxwyZX88qrxiKT2aFPxih-1NmpdU4JhvnvgL9W0e6IV_cDw&

Read Executive Summaries

Salon D. (2014) *Quantifying the effect of local government actions on VMT: Final Report*. California Air Resources Board & California Environmental Protection Agency. Available at: <https://ww2.arb.ca.gov/sites/default/files/classic//research/apr/past/09-343.pdf>

Marvin, D. et al (2018). *Toward a Carbon Neutral California: Economic and Climate Benefits of Land Use Interventions*. Next 10. Available at: <https://www.next10.org/sites/default/files/2019-06/toward-carbon-neutral-california-web.pdf>

Week of Sept 21 - Understanding the cases and research approaches

- Speaker on Sept 22: Pyrogeographer Crystal Kolden, UC Merced
- Short presentations on case study communities
- Discussion: research design

Required readings

Kolden, C. A., & Henson, C. (2019). "A socio-ecological approach to mitigating wildfire vulnerability in the wildland urban interface: a case study from the 2017 Thomas fire." *Fire*, 2(1). Available at: <https://www.mdpi.com/2571-6255/2/1/9/htm>

McWethy, D.B., Kolden, C.A. (2019) Rethinking resilience to wildfire. *Nature Sustainability* 2: 797-804. Available at: <https://www.nature.com/articles/s41893-019-0353-8>

Goodspeed (2019). *Embracing Uncertainty to Make Better Decisions: Policy Brief*. Lincoln Institute of Land Policy. <https://www.lincolnst.edu/sites/default/files/pubfiles/scenario-planning-policy-brief.pdf>

Yin, R.K. . *Case Study Research and Applications: Design and Methods*. Selected chapters.

Week of Sept 28 - Starting Interviews

- Discussion: Conducting interviews
- Thursday group meetings: Begin/refine case study research

Required Readings

** Review relevant news clips on the case study areas**

Rubin, Herbert J. and Irene S. Rubin. 2005. Chapters 1, 5, 6, 8, 9. *Qualitative interviewing: The art of hearing data*. Thousand Oaks, CA: Sage.

Week of Oct 5 - Starting case study research

- Thursday group meetings: Begin/refine case study research

Recommended research/readings

- General plans, Local hazard mitigation plans, Post-disaster plans
- Public land use data

Week of Oct 12 - Mid-term presentation

- Midterm presentation, Oct 13
- Thursday group meetings

Weeks of Oct 19 through November 2 – Continued interviews and research

- Tuesday TBD, Thursday group meetings

Week of November 9 – Preparing interim draft of final report

- Interim draft final report and presentation due November 10

Weeks of Nov 16 through Nov 30 – Finalizing report and preparing final presentations

- Tuesday TBD, Thursday group meetings

Week of December 8 – Final presentations!

Suggested Readings

Vulnerability and Displacement

Richards, R. (July 2019). *Before the fire: protecting vulnerable communities from wildfire*. Center for American Progress. Center for American Progress. Available at:

<https://www.americanprogress.org/issues/green/reports/2019/07/25/472639/before-the-fire/>

Richards R. (July 2019). *After the fire: vulnerable communities respond and rebuild*. Center for American Progress. Available at:

<https://www.americanprogress.org/issues/green/reports/2019/07/25/472738/fire-vulnerable-communities-respond-rebuild/>

Esnard, A.M. & Sapat, A. (2019) “Population Displacement.” In *The Routledge Handbook of Urban Disaster Resilience* (pp. 284-299). Routledge.

Peakcock, W. et al. (2015). “Inequalities in long-term housing recovery after disasters.” *Journal of the American Planning Association*, 80(4), 356-371. Available at:

<https://www.tandfonline.com/doi/abs/10.1080/01944363.2014.980440>

Finance and Insurance

Keenan, J. (2019). *Climate Adaptation Finance and Investment in California*. Routledge.

Available at: <https://opr.ca.gov/docs/20181106->

[Keenan Climate Adaptation Finance and Investment in California 2018.pdf](#) *Read Ch. 3

‘Funding and Financing Adaptation’

Hecht, S. & Lamm, T. (December 2019). *California Climate Risk: Insurance-Based Approaches to Mitigation and Resilience*. Center for Energy, Law, & the Environment. Available at:

<https://www.law.berkeley.edu/research/cee/research/climate/california-climate-action/california-climate-risk/>

Newberry, L. (August 31, 2018). "As California fire disasters worsen, insurers are pulling out and stranding homeowners." *Los Angeles Times*. Available at: <https://www.latimes.com/local/lanow/la-me-ln-wildfire-homeowners-insurance-20180830-story.html>

Kasler, D. (January 20, 2020). "How global companies drive the home insurance crisis in California." *The Sacramento Bee*. Available at: <https://www.sacbee.com/news/business/article239259628.html>

Birkland, T. A. (2010). "Federal disaster policy: Learning, priorities, and prospects for resilience." In *Designing resilience: Preparing for extreme events*. Louise Comfort, ed: 106-128.

Governance and Policy

Olshansky, R. B., Hopkins, L. D., & Johnson, L. A. (2012). Disaster and recovery: Processes compressed in time. *Natural Hazards Review*, 13(3), 173-178. Available at: [https://ascelibrary.org/doi/full/10.1061/\(ASCE\)NH.1527-6996.0000077?casa_token=AnoaTHTw18cAAAAA:Hhi6LysFXnbz75tjKGqF5_uiO9A1AQkr1Hg9yS_WQEFoW9je6hfw7We89qMmzutuyui3krX3n720z](https://ascelibrary.org/doi/full/10.1061/(ASCE)NH.1527-6996.0000077?casa_token=AnoaTHTw18cAAAAA:Hhi6LysFXnbz75tjKGqF5_uiO9A1AQkr1Hg9yS_WQEFoW9je6hfw7We89qMmzutuyui3krX3n720z)

Haines, T. K., Renner, C. R., & Reams, M. A. (2008). A review of state and local regulation for wildfire mitigation. In *The Economics of Forest Disturbances* (pp. 273-293). Springer, Dordrecht. Available at: https://www.srs.fs.usda.gov/pubs/ja/ja_haines005.pdf

California Office of Planning and Research. *Local Adaptation and Resiliency Planning: SB 379 Survey Report*. Available at: <https://opr.ca.gov/docs/20200626-SB379-Report.pdf>

Crow, D.A. & Albright, E.A. (2019) Intergovernmental relationships after disaster: state and local government learning during flood recovery in Colorado, *Journal of Environmental Policy & Planning*, 21:3, 257-274. Available at: https://www.tandfonline.com/doi/full/10.1080/1523908X.2019.1623660?casa_token=LdNG1PJ2I34AAAAA%3AvBHJFnTBPUsuPBdtC1rij-UyTgB74NsUMQa8HQRYX7q2I5GkvRQ3OA5jjeXZRxQ5TC1IWLYfJjM

Kousky, C. (2014). Informing climate adaptation: A review of the economic costs of natural disasters. *Energy economics*, 46, 576-592. Available at: <https://tarjomefa.com/wp-content/uploads/2019/11/F1557-TarjomeFa-English.pdf>

Smith, G. (2019). "The Role of States in Disaster Recovery." In *The Routledge Handbook of Urban Disaster Resilience* (pp. 352-377). Routledge.

Patek, G. (June 2019). *Allocating Utility Wildfire Costs: Options and Issues for Consideration*. California Legislative Analyst's Office. Available at:
<https://lao.ca.gov/reports/2019/4079/allocating-wildfire-costs-062119.pdf>

Taylor, P. B. (2019). "The Good, the Bad, and the Unnecessary: Forest Fire Suppression Funding and Forest Management Provisions of the Consolidated Appropriations Act of 2018." *Public Land & Resources Law Review*, 41, 79-104. Available at:
https://heinonline.org/HOL/Page?handle=hein.journals/publan41&div=7&g_sent=1&casa_token=w2jkr27Dgx8AAAAA:dvSWgl6ubsmKtngFow7ZrQXS1vh7DW7pQwf95LHkVvNUjZAXJ0ciyPv90e2ZB85nbaikMQFLEA&collection=journals

Infill Development

Carruthers & Ulfarsson. (2008). "Does 'Smart Growth' Matter to Public Finance?" *Urban Studies* 45 (9): 1791–1823. Available at :
https://journals.sagepub.com/doi/pdf/10.1177/0042098008093379?casa_token=w2dz-6Y6riIAAAA:OjUG8zOO4q3-oF7cjc4SUwchJthXxz7NHGeTkle6htgQU3U2NuKdRjAVY3-KsPTUzVLBaftPCPenMe0

Chapple (2014). "Infill Development and Density" In *Planning Sustainable Cities and Regions: Towards More Equitable Development*. [Chapter 3] Routledge.

Chapple, K. (2016). Integrating California's Climate Change and Fiscal Goals: The Known, the Unknown, and the Possible. *California Journal of Politics and Policy*, 8(2): Available at:
<https://escholarship.org/content/qt2jg8t1v4/qt2jg8t1v4.pdf>

Chatman, et al. (March 2016) *Analyzing the Economic Benefits and Costs of Smart Growth: Final Report* [Chapters 1, 4, 5 and 6] California Air Resources Board. Available at:
<https://ww2.arb.ca.gov/sites/default/files/classic//research/apr/past/11-326.pdf>

Landis, et al. (2006). "The Future of Infill Housing in California: Opportunities, Potential, and Feasibility." *Housing Policy Debate* 17(4), 681-725. Available at:
<https://doi.org/10.1080/10511482.2006.9521587>

Mitigation and Resilience

Hino, H & Burke, M. (February 2020). Does information about climate risk affect property values? *Stanford King Center on Global Development*. *Read Introduction and Discussion* Available at: <https://kingcenter.stanford.edu/sites/default/files/publications/wp1069.pdf>

Schulte, S., & Miller, K. A. (2010). Wildfire risk and climate change: the influence on homeowner mitigation behavior in the wildland–urban interface. *Society and Natural Resources*, 23(5), 417-435. Available at:

https://www.tandfonline.com/doi/pdf/10.1080/08941920903431298?casa_token=HP7xqL1iUuMAAAAA:9jHtj1cf93Gd2N_HEO85QzyW-ma2jib8F3_ATlyssjp7zQ9czaM27vsQllyWdNuEQBiDZIKQKHj

Bone, C. et al. (2016). “Employing resilience in the United States Forest Service.” *Land Use Policy*, 52: 430-438. Available at: <https://www.sciencedirect-com.libproxy.berkeley.edu/science/article/pii/S0264837716000041>

Zurich North America. (December 2019). *California fires: building resilience from the ashes*. Zurich North American Insurance Company. Available at: <https://www.zurichna.com/-/media/project/zwp/zna/docs/kh/wildfire/california-wildfire-report.pdf?la=en&hash=AB77A5B3CFC40E2C50ADB7F728728001>

Radeloff, V. C. et al. (2018). “Rapid growth of the US wildland-urban interface raises wildfire risk.” *Proceedings of the National Academy of Sciences*, 115(13), 3314-3319. Available at: <https://www.pnas.org/content/pnas/115/13/3314.full.pdf>

Film: [Rebuilding Paradise](#) (available for streaming)