How Energy Sector Resilience Efforts Have Used Cal-Adapt: Some Examples

Susan Wilhelm
Energy Generation Research Office
Energy Research and Development Division

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Today's Talk

1. How is Cal-Adapt being used by energy sector stakeholders and researchers? How is Cal-Adapt being leveraged by others?
2. How will the Energy Commission support Cal-Adapt's evolution to respond to energy sector needs?

Cal-Adapt 2.0: Supporting Climate Resilience Partnership

California Investor-Owned Utilities participating in the U.S. Department of Energy's Resilience Partnership used Cal-Adapt to support vulnerability assessments:

- **PG&E**: used Cal-Adapt's extreme heat tool to explore intensity and duration of projected mid-century heat waves
- **SoCalEdison**: used Cal-Adapt in conjunction with spatial overlays of infrastructure and as a basis for exploring uncertainty.
- **SDG&E**: used Cal-Adapt to support a comprehensive GIS-based vulnerability study.

More about DOE's Resilience Partnership here: https://energy.gov/epsa/partnership-energy-sector-climate-resilience

Cal-Adapt 2.0: Supporting Resilience **Action**

Moving beyond vulnerability assessments, California Investor-Owned Utilities participating have used Cal-Adapt to support on-the-ground resilience efforts:

- **SDG&E**: Used Cal-Adapt 2.0 to support climate-resilient design of a compressor station in Blythe, California, to investigate implications of climate re: SDG&E's Design Standards, and to explore climate dimensions of system hardening projects.
- **SoCalEdison** (SCE): Data available on Cal-Adapt 2.0 improved analyses regarding projected climate (e.g., Mesa Substation Project in Monterey Park, California); plans to integrate climate projections into existing planning models.

Ultimately, General Rate Cases that incorporate climate adaptation actions are envisioned, relying on data available on Cal-Adapt.

How Is Cal-Adapt Contributing to Energy Resilience Research?

A suite of **energy sector vulnerability and resilience studies leverage Cal-Adapt** to provide science-based investigation of risks and adaptation strategies for California's energy sector.

A few examples from California's Fourth Climate Change Assessment. *Stay tuned for results in 2018!*

- Research investigating **wildfire impacts on transmission and distribution:** implications of projected wildfire risk on reliability, cost, resilience options. Localized analyses using data on Cal-Adapt enable investigation of development frontier, important transfer paths, and isolated load areas/load sources.
- Research investigating **vulnerability California's transportation fuel system** is using precipitation projections coupled with hydrological models to identify places where may be vulnerable to inland (as well as coastal) flooding events in an changing climate.
- Precipitation data showcased on Cal-Adapt is being used to generate future projected curves portraying how intensity, duration, and frequency of precipitation is projected to change, with **high spatial resolution**, to **inform infrastructure risk analysis**.

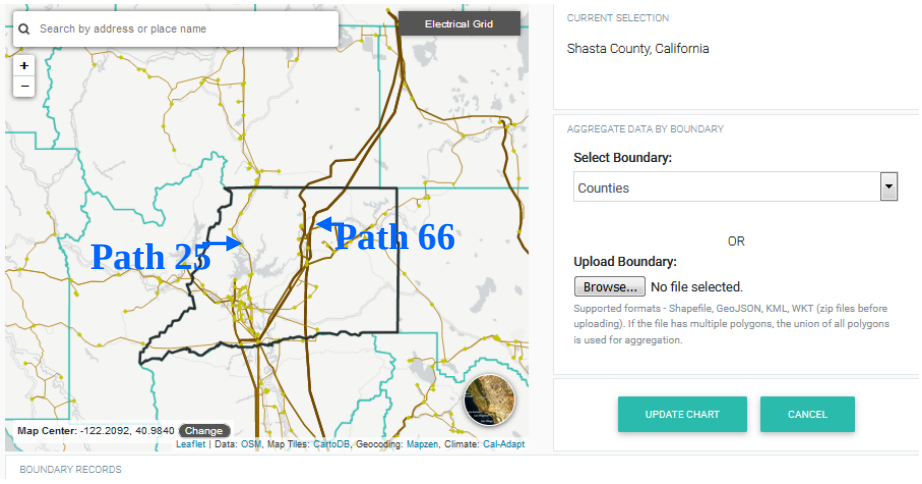

Figure: Cal-Adapt shows electricity sector infrastructure, including transmission lines. Fourth Assessment research team's preliminary historical analysis shows at least 17 fires within 0.25 miles of these transmission paths 25 and 66, 2000-2016 timeframe.

Cal-Adapt Embraced by Variety of Resilience Efforts

Cal-Adapt is publicly available and has been adopted by a variety of adaptation initiatives:

- **General Planning Guidelines** (2017 update), §65302(g)(4), **direct local governments to Cal-Adapt** as resource to support assessment of climate-related vulnerabilities and development of adaptation policies;
- The Governor's Office of Planning and Research (OPR) is interested in supporting General Planning through custom Cal-Adapt tools designed to fulfil statutory requirements related to climate change adaptation;
- Forthcoming Adaptation Guidance from the Technical Advisory Group established by **OPR directs state agencies to Cal-Adapt as a source for peer-reviewed, state-sanctioned data depicting** projected climate risks and for map overlays to facilitate planning and investment;
- In March 2017, the **State Water Resources Control Board (SWRCB)** Approved a Resolution (no. 2017-0012) on "Comprehensive Response to Climate Change" **directing staff to consult "the most current data available through Cal-Adapt"**;
- Caltrans' Transportation Adaptation Planning Grant Program, to distribute $20M to local and regional agencies for adaptation planning, points to Cal-Adapt as a tool to support applicants;

Cal-Adapt Embraced by a Variety of Efforts, *continued*

- The California Department of Public Health used climate risks portrayed by Cal-Adapt as the foundation of work to "Build Resistance Against Climate Effects" (BRACE) by preparing local and county-level public health departments for projected risks;
- The **California Government Operations Agency** (GovOps) **leveraged Cal-Adapt's publicly available Applications Programming Interface (API)** to develop an automated tool supporting incorporation of adaptation into Sustainability Roadmaps;
- The **United States Forest Service** (USFS) has already used Cal-Adapt for planning at least one **fuel treatment** (Tatham Ridge Project) **with future climate conditions in mind**;
- Cal-Adapt is named as a resource by landmark legislation (SB 379) that requires integration of climate-related risks in local hazard mitigation plans;
- *Safeguarding California* (2017 update) notes that Cal-Adapt "is at the forefront of resources for specific communities to understand how climate change will raise temperatures and exacerbate extreme heat events, drought, snowpack loss, wildfire, and coastal flooding";
- OPR's Adaptation Clearinghouse (a.k.a. **ICARP**, or Integrated Climate Adaptation and Resiliency Program), development of which was mandated by SB 246, **refers users to Cal-Adapt for exploration of local climate risks** through high resolution climate projections.

Future Plans for Cal-Adapt

Energy Commission's planned support for Cal-Adapt: evolution to reflect new research and understandings relevant to energy sector resilience**.

- Provide visualizations and data access for additional parameters of interest to energy sector, e.g., stream flows, wind, solar irradiation, relative humidity.
- Data and tools developed by energy sector research contributing to California's Fourth Climate Change Assessment.
- Development of new tools and visualizations in response to feedback, workshop findings, and Advisory Committee guidance.

** This **planned support** includes:

- GFO-16-311, Group 3, "Building on the Cal-Adapt Platform to Deliver Actionable Information in Support of Electricity Sector Resilience", http://www.energy.ca.gov/contracts/GFO-16-311/
- Proposed Natural Gas R&D Plan, Fiscal Year 2017-2018, overview presented at Staff Workshop on January 26, 2017. http://www.energy.ca.gov/research/notices/2017-01-24_workshop/presentations/

Thank you!

www.cal-adapt.org