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# Actions to Address Wildfire Risks for Vulnerable Populations and Critical Facilities: Electricity

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*(a federally recognized tribal government)*

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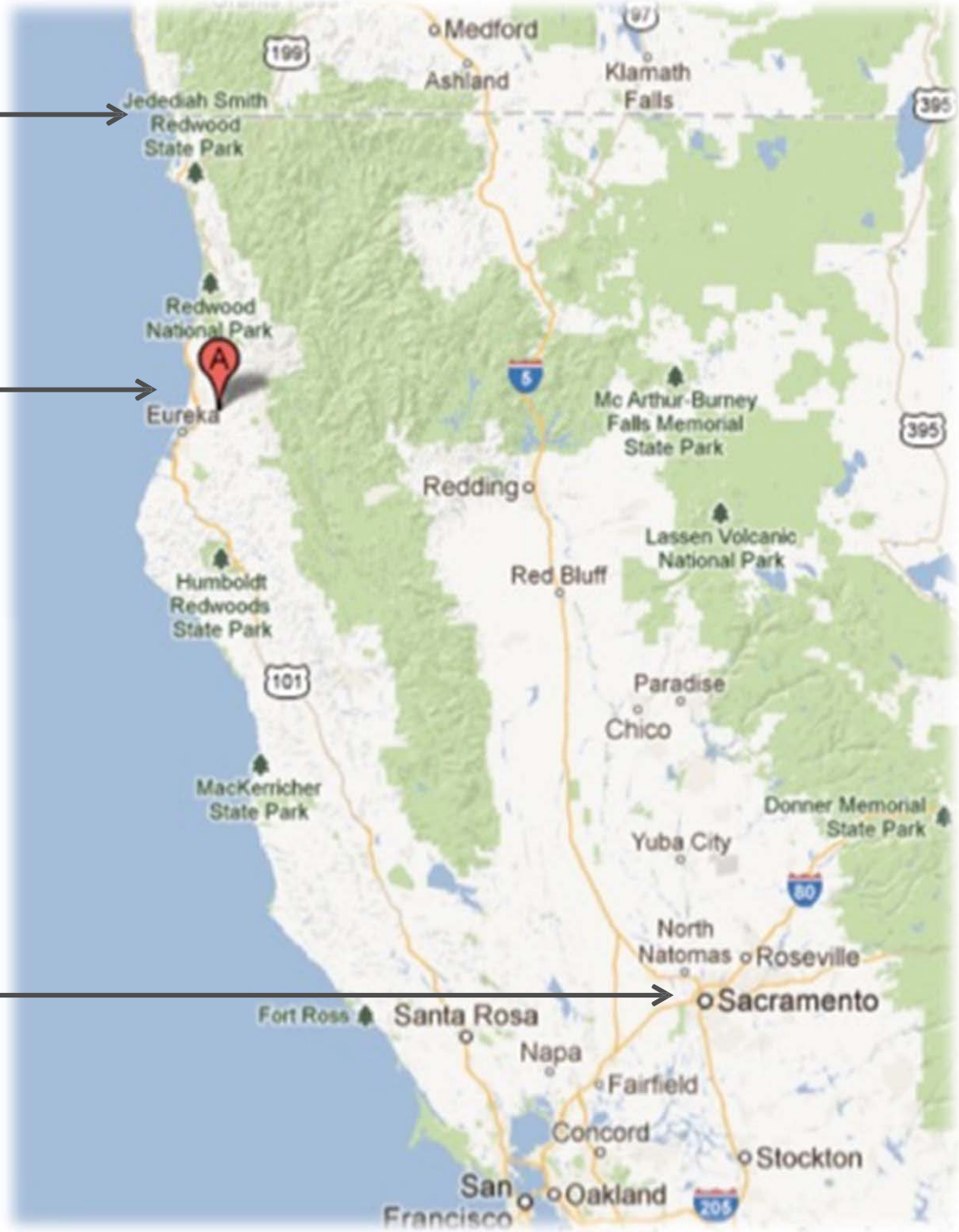
# Key Points

- **Microgrids and other Distributed Energy Resources (DERs) successfully supply electricity in wildfire and other disasters**
  - Islanded systems can support critical infrastructure, lifeline sectors, and vulnerable populations
    - Two scales of microgrids at Blue Lake Rancheria (BLR): community and facility
- **Recommendations for High Priority Actions**
  - Prioritize and continue aggressive actions to reverse climate change
  - Support rapid build-out of zero-carbon DERs with microgrids
  - Rapid transition of RPS eligibility to only proven zero carbon sources
    - Continue Solar – inexpensive, secure, free fuel, truly zero carbon as of 2018.
      - https://www.theatlantic.com/science/archive/2016/12/the-solar-industry-has-paid-off-its-carbon-debts/510308/
    - Continue Wind – inexpensive, free fuel; offshore wind high capacity factor
    - Continue Paired Wind/Solar + Battery Storage
    - Remove Biomass power from RPS – high-cost, air pollution, deeply uncertain (and complex) carbon lifecycle accounting risks progress toward RPS goals
      - https://www.scientificamerican.com/article/congress-says-biomass-is-carbon-neutral-but-scientists-disagree/
  - Consider biochar as wildfire initiative
    - Pre-suppression, remediation, and carbon sequestration strategy

Oregon / California Border

Blue Lake Rancheria

Sacramento



# Need for Resilience in Rural, Vulnerable Communities

- Climate change + other local impacts threaten health, life, ecosystems, economics, and infrastructure
- Wildfires
- Landslides
- Drought
- Extreme Storms
- Floods
- Sea Level Rise
- Earthquake / Tsunami
- Tenuous Energy Supplies
  - One 115kV transmission loop
  - In wildfire country

Photo: October 2017 wildfire
~¼ mile from Blue Lake Rancheria
Credit: CalFire

# Critical Infrastructure Electricity at BLR

- BLR has "lifeline sector" approach to building resilient critical infrastructure
  - Energy, water, food, transportation, and communication/IT
  - BLR energy resilience = solar + storage DER microgrids

Microgrid solar array at Blue Lake Rancheria. Credit: BLR

- Community-scale microgrid
  - Solar + battery storage; centralized control system
  - Operates in grid-connected and islanded modes
  - Powers 6-building campus of most critical infrastructure
    - Gov't offices; economic enterprises; water systems; American Red Cross shelter
  - CEC EPIC funding; successful; expanding solar and battery storag ع
- Facility-scale fuel station/convenience store microgrid
  - Solar + battery storage; advanced building controls
  - Replicable, low-carbon 'resilience package' for ~12,000 fuel stations in CA
  - CEC EPIC funding; in construction
- Electricity from BLR microgrids supports our other lifeline sectors:
  - Water – existing water and wastewater systems; new 'smart' drinking water grid
  - Food – onsite storage, preparation, production
  - Transportation – onsite EV charging stations; biodiesel manufacturing
  - Communications/IT – broadband, internet, VPNs, satellite, emergency radios

# Actions & Recommendations

- **Continue aggressive climate actions to reduce wildfires and other impacts**
- **Continue to develop zero-carbon DERs, microgrids, and new technologies**
  - Solar/wind, +/- storage; offshore floating wind
  - Support related DER/microgrid/new technology workforce development
    - E.g., provide electrician training programs in rural areas with <3 hour drive
- **Continue RPS transition to zero carbon**
  - Solar – least cost; industry-wide zero carbon (2018)
  - Wind – inexpensive; offshore wind = high capacity factor
  - Paired wind/solar + battery storage – baseload; new jobs
  - Biomass power – remove from RPS
    - High cost; old/unreliable; violations (ratepayer burdens)
    - Inaccurate carbon accounting likely obscures / prevents achieving RPS goals
      - Biomass energy carbon accounting is complex and inaccurate (e.g., southeast U.S. pellets/U.K.) https://e360.yale.edu/features/carbon-loophole-why-is-wood-burning-counted-as-green-energy
        - Black/brown carbon emissions, "short lived climate pollutants," largely unaccounted for
      - At a minimum, increase RPS verification of biomass GHG emissions and data. Please see: http://www.synapse-energy.com/sites/default/files/Carbon-Footprint-of-Biomass-11-056.pdf
    - Hazardous air pollution / health issues
      - Toxic "hot spots" in vulnerable communities; PM 2.5 causes ~9,000 deaths in CA each year https://www.arb.ca.gov/research/health/pm-mort/pm-report_2010.pdf
    - Not wildfire solution; plants too far from tree mort./high hazard areas
    - Biomass plants pose specific fire risk (fuel pile combustion, dust explosions) http://biomassmagazine.com/articles/15451/protecting-the-process

# Actions & Recommendations

## Biochar

- State-wide, landscape-level wildfire pre-suppression, and recovery initiative
- Convert biomass to biochar (not power), and distribute/till biochar into soil
- Newer approach to tree mortality, burned area/soils remediation, buffer zones
- U.S. Forest Service/USDA research demonstrates co-benefits of biochar
  - https://www.fs.fed.us/blogs/promise-biochar-forests-grasslands-and-farms
  - http://wastetowisdom.com/people/deborah-s-page-dumroese/
  - Improve soils (nutrients); soils hold more water; carbon sequestration
  - Prevent wildfire via in-situ management of high hazard forest fuels
- Also a carbon sequestration strategy
- Public / private partnerships
  - Public: firefighters, forestry professionals, military, civilian conservation groups funded to conduct onsite biochar conversion and soil remediation
  - Private: provide biochar production technology, operations, and conduct excess biochar sales (e.g., agricultural uses)
  - Carbon market integration: carbon sequestration regimes / carbon credits
  - Analogy: multi-state programs combat the Dust Bowl – same approach for wildfire?*

* "The government's response included deploying Civilian Conservation Corps workers to plant shelter belts; encouraging farmers to try new techniques like contour plowing to minimize erosion; establishing conservation districts; and using federal money in the Plains for everything from grasshopper control to outright purchases of failed farms. … [B]ecause nearly four million acres of land had been purchased by the government during the Dust Bowl and permanently restored as national grasslands, the soil didn't blow as much. Atleast a few lessons had been learned." http://www.pbs.org/kenburns/dustbowl/legacy/