Fire Science & Climate Adaptation

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Adapting to Wildfire

For SDG&E, adapting to wildfire means understanding the issues caused by wildfires, developing solutions to these issues, and mitigating the impact of PSPS

Wildfire Adaptation

3 Main Initiatives

- **Situational Awareness**
  - **Collecting data and understanding conditions across the service territory as granularly as possible**
- **Subject Matter Expertise**
  - **Having the internal capability to create, process, and operationalize data from situational awareness technologies**
- **Academic and Community Partnerships**
  - **Developing data and research where it might be lacking and sharing information with stakeholders across the region to ensure a holistic approach to adapting to climate change**

Evolution of SDG&E's Situational Awareness

Fire Safe 1.0 — 2008

Enhanced the ability to monitor events and collect data

- Hired meteorologists and firefighters to support operations
- Transitioned from handheld weather stations to deploying the largest utility weather network in the world
- Installed mountaintop cameras across the backcountry

Fire Safe 2.0 — 2012

Focus on developing tools to support system operations

- Created sophisticated weather forecast models
- Partnered with firefighting agencies and academia to create fire potential models
- Expanded mountain camera networks
- Innovated the operational use of fire behavior modeling systems for utilities

Fire Safe 3.0 — 2018

Support a culture of continuous growth and improvement through innovation and scientific advancement

- SDG&E creates the Fire Science and Innovation Lab
- Vegetation Risk Index is analyzing data from hundreds of thousands of trees
- 30-second high-speed weather data implemented
- Wildfire Safety Community Advisory Council formed
- Introduction of AI-based forecasting models

Fire Safe 4.0 — 2021

- Satellites detect hot spots and link with cameras
- Artificial Intelligence identifies smoke and pushes notifications
- NDVI cameras monitor chlorophyll in the vegetation
- The next generation of fire behavior models are being built
- Partnerships with academic leaders are being expanded

Subject Matter Expertise

Since 2009, what was one meteorologist has become an entire department (Fire Science & Climate Adaptation)

Fire Science

- Meteorologists
- Ex-Fire Service

Climate Adaptation

- Climate Adaptation Specialists
- Meteorologists
- Data Scientists

Community Engagement

- Communications Experts
- Community Resilience Advisors

ACADEMIC PARTNERSHIPS

Where skill or research gaps existed within SDG&E, the utility sought external expertise to fill those gaps and further understand the changing problem of wildfire and climate change in general

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Incorporation of Climate Data

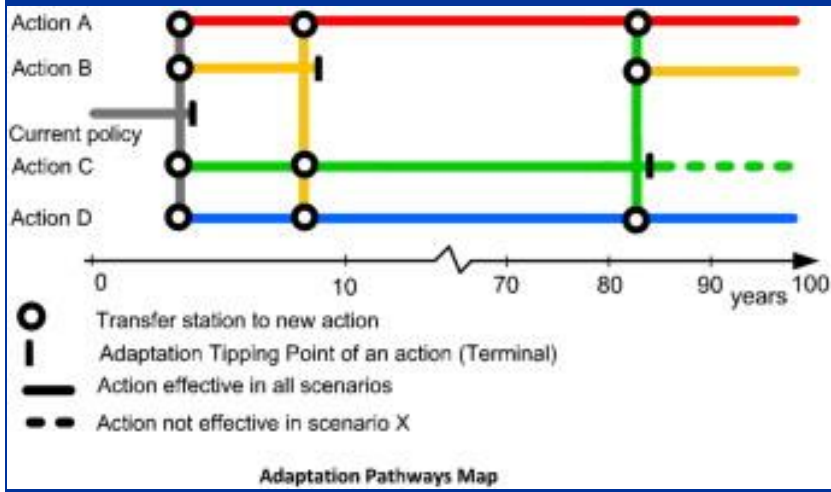
Dealing With Uncertainty

SDG&E is currently conducting a system wide vulnerability assessment for all SDG&E assets operations and services

- Addresses multiple climate hazards
- Investigates three future time horizons

Flexible Adaptation Pathways

  - Gives SDG&E the ability to engage in long-term utility planning in light of long-term climate uncertainty



Adaptation Pathways Map

Community Partnerships

- Understanding the science and engineering aspects of wildfire resilience is only half of the equation
- Community based organization, public safety partner, and customer inputs and feedback led to some of the more successful solutions of today

Generator Programs

Community Resource Centers

Wildfire Safety Fairs

DATA IS THE FUEL FOR EMERGING TECHNOLOGIES

The more data, the more value can be delivered through emerging technologies, allowing SDG&E to proactively manage our operations and reduce the risk of wildfire.

Power of Data

AlertSDG&E Camera Network

Capture video and images of service territory in high fire threat districts

Internet of Things (IoT) Sensors

Capture precise fuel moisture measurements and weather conditions through devices in the field

Power of Technology

Digital

Utilize digital technologies to support real-time, informed decision making to improve operations

Artificial Intelligence

Accelerate the analysis and prioritization of high-risk areas to drive speed to action

Emerging Tech

Synthesize understanding of risk paired with proactive action to improve customer safety

DRIVING ACTION FROM DATA AND TECHNOLOGY

Expanding the data collection capabilities across our weather and camera networks to produce insights through AI, increasing weather forecasting capabilities

Smoke Detection using AI

Expanding the number of AlertSDG&E and CAL FIRE cameras to provide greater visibility into conditions in HFTD areas

Fuel Sticks

Adding “Fuel Sticks” to weather stations allows for 10-hour fuel moisture measurement

Normalized Differential Vegetation Index (NDVI) Sensors

Monitoring for chlorophyll via NDVI cameras allows for the assessment of vegetation dryness

AI-Powered Weather Forecasting

Leveraging a decade of weather data, AI-based forecasting models are running for 220 weather stations

Weather Forecasting for PSPS Events

Utilizing AI to improve the ability to anticipate and prepare for PSPS through precise weather forecasting

Hot Spot Detection from Satellites

Detecting hot spots automatically using satellite data and syncing the data with nearby cameras

The Future – Culture of Continuous Improvement

Expand academic partnerships

- Develop necessary research and the next generation of utility scientists

Continue to listen to community input for fire and other climate hazards

- Community Engagement Plan

Apply the best practices used for wildfire to address other climate hazards

Conclusion

Climate hazards are **community hazards**; they are cross-cutting and require holistic, inclusive problem solving from the utility, academia, and community members

Thank you

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