



SDG&E Meteorology Overview
Chris Arends

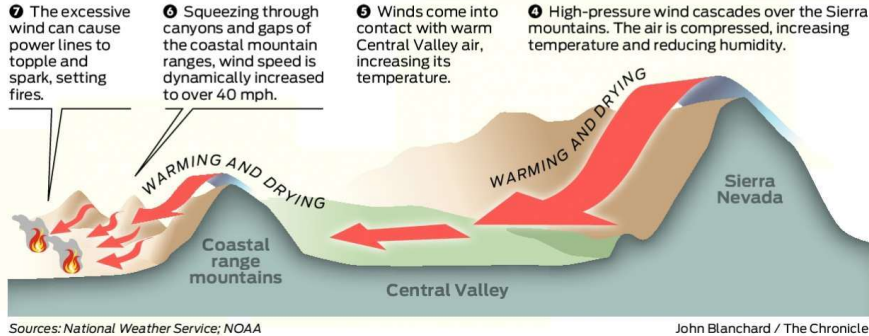
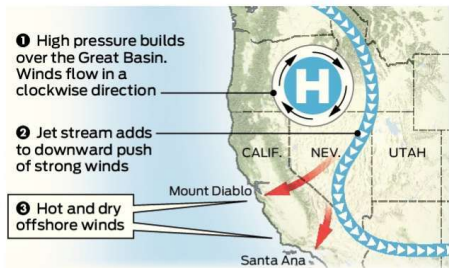
January 10, 2024

Predicting Impact of Extreme Winds

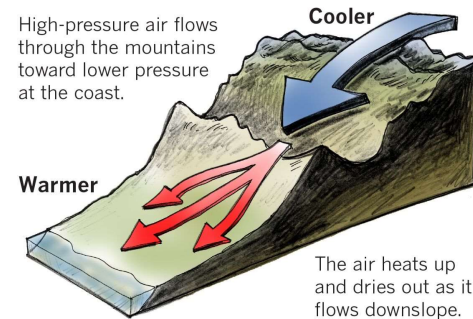
Diablo Winds

What creates dangerous winds

The Diablo winds that were forecast for Northern California usually come in the fall, but their behavior is hard to predict because mountains, valleys and even cloud formations can alter their speed and direction.



Santa Ana Winds



Los Angeles Times
2019

High pressure located inland drives offshore winds.

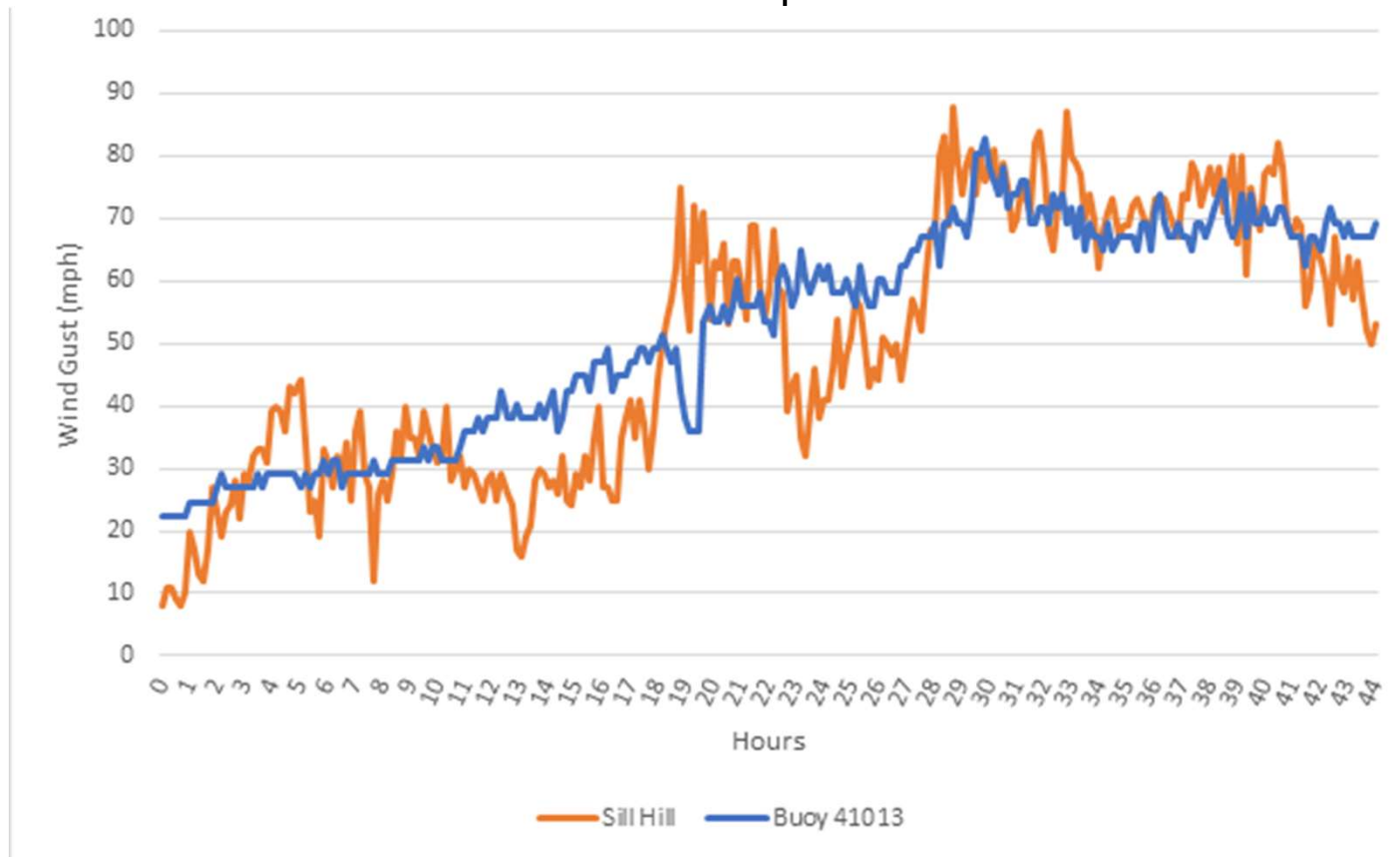
Local mountain ranges and passes result in areas of strong gusty winds as flow drains towards the coast.

As air descends the mountains on the path to the coast, the air heats up and results in lowering humidity levels.

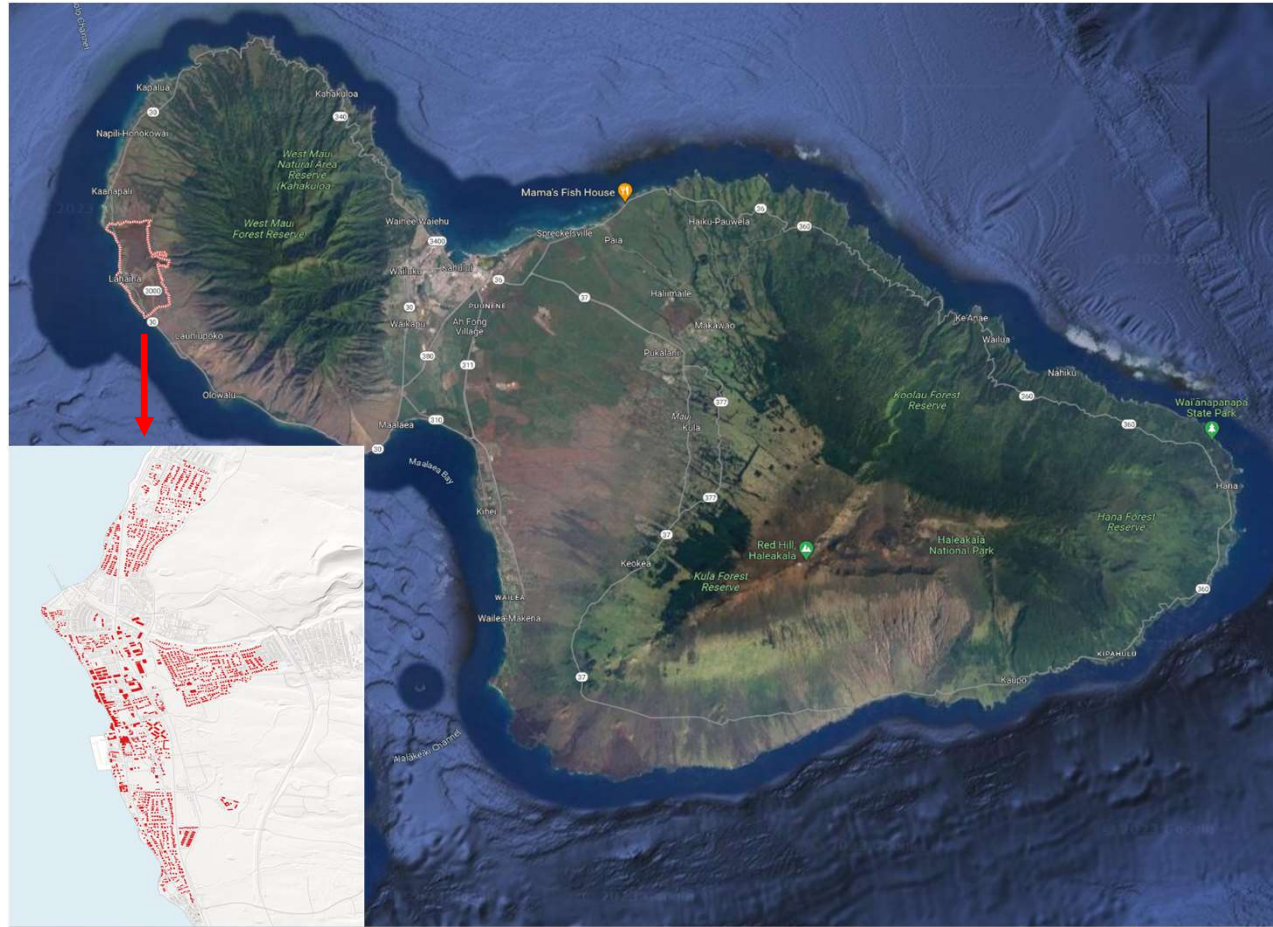
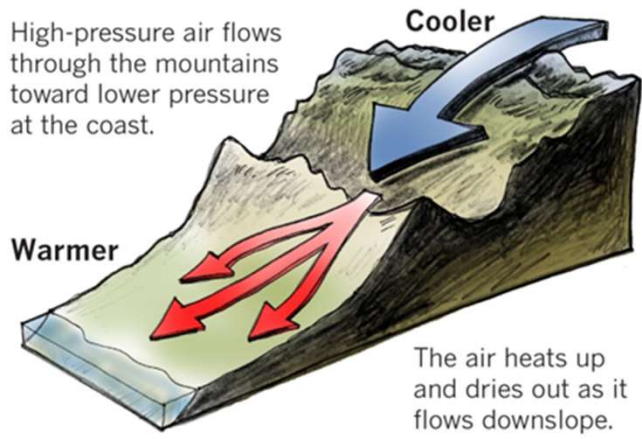
Gusty winds and low humidity elevates fire weather conditions.

Santa Ana Winds at Sill Hill versus a Hurricane

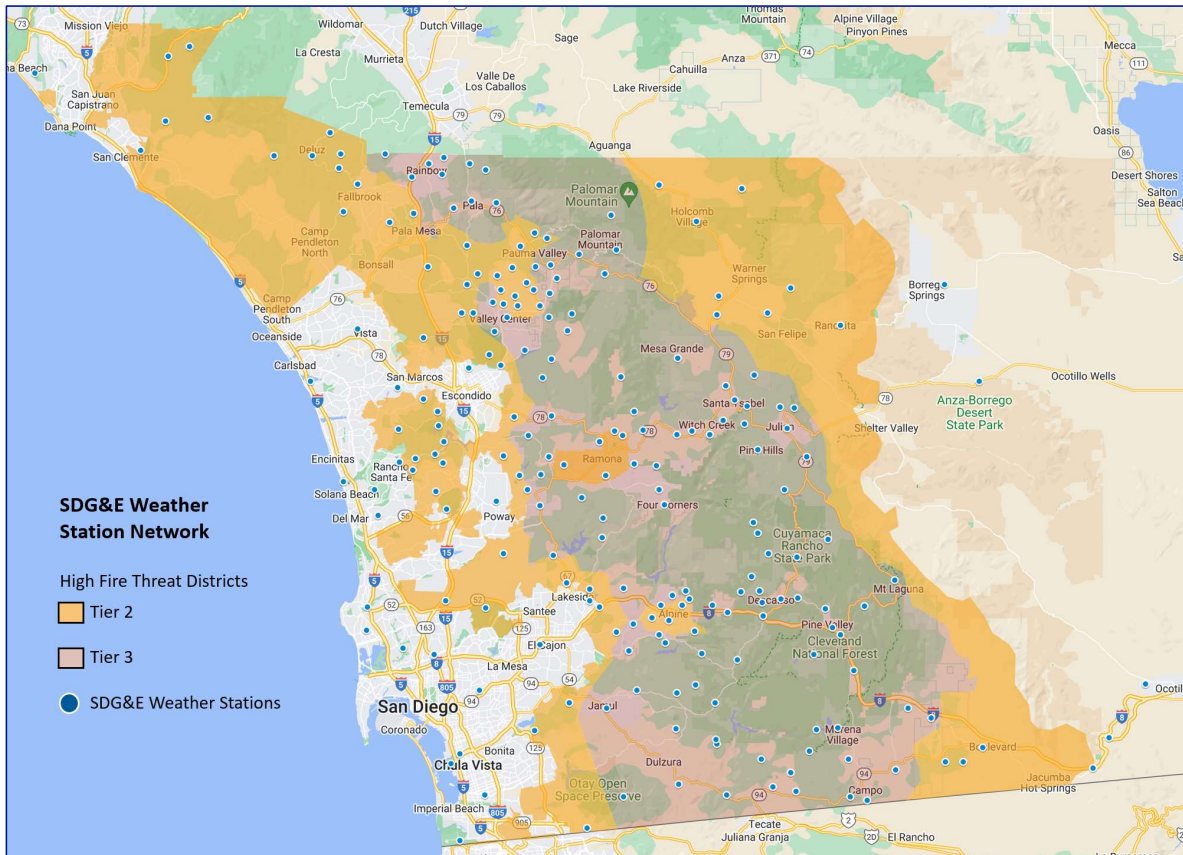
Dec 2017 Santa Ana vs Sept 2018 Hurricane Florence



Maui Wildfire



SDG&E Weather Network: 222 Weather Stations



SDG&E owns and operates the densest utility weather network in the nation

New SDGEWeather.com

SDGE Weather Awareness System
Friday, September 8

Safety Message
FPI Exceptions: None An Excessive Heat Warning is in effect for SD County Deserts from 10am Saturday to 8pm Sunday.

HARRISON PARK RANCHITA CRESTWOOD BOULEVARD WEST LAKE CUYAMACA

Current Temperatures

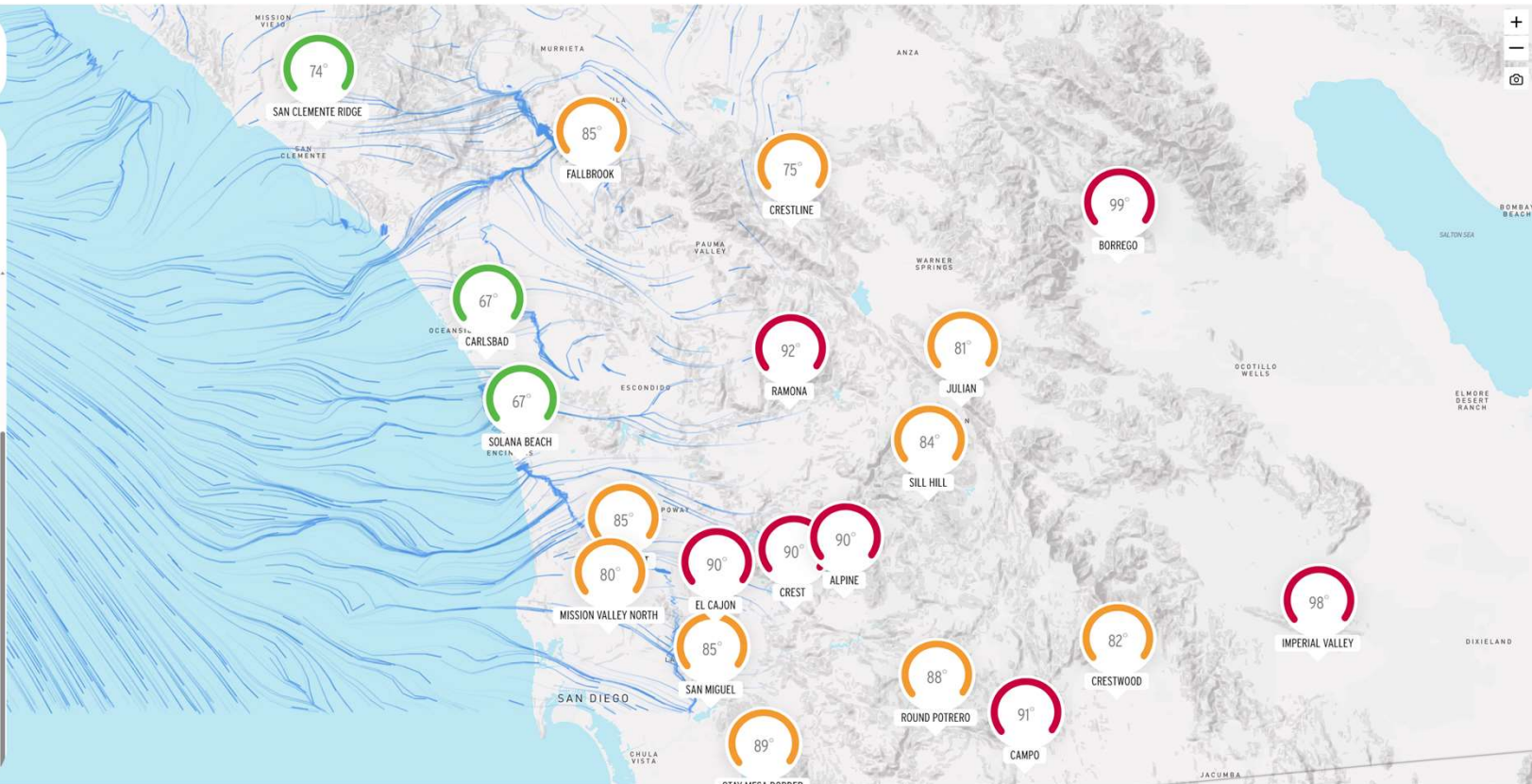
67°	80°	90°	92°	81°	99°
BEACHES	MESAS	INLAND VALLEYS	FOOTHILLS	MOUNTAINS	DESERTS

Current Relative Humidity

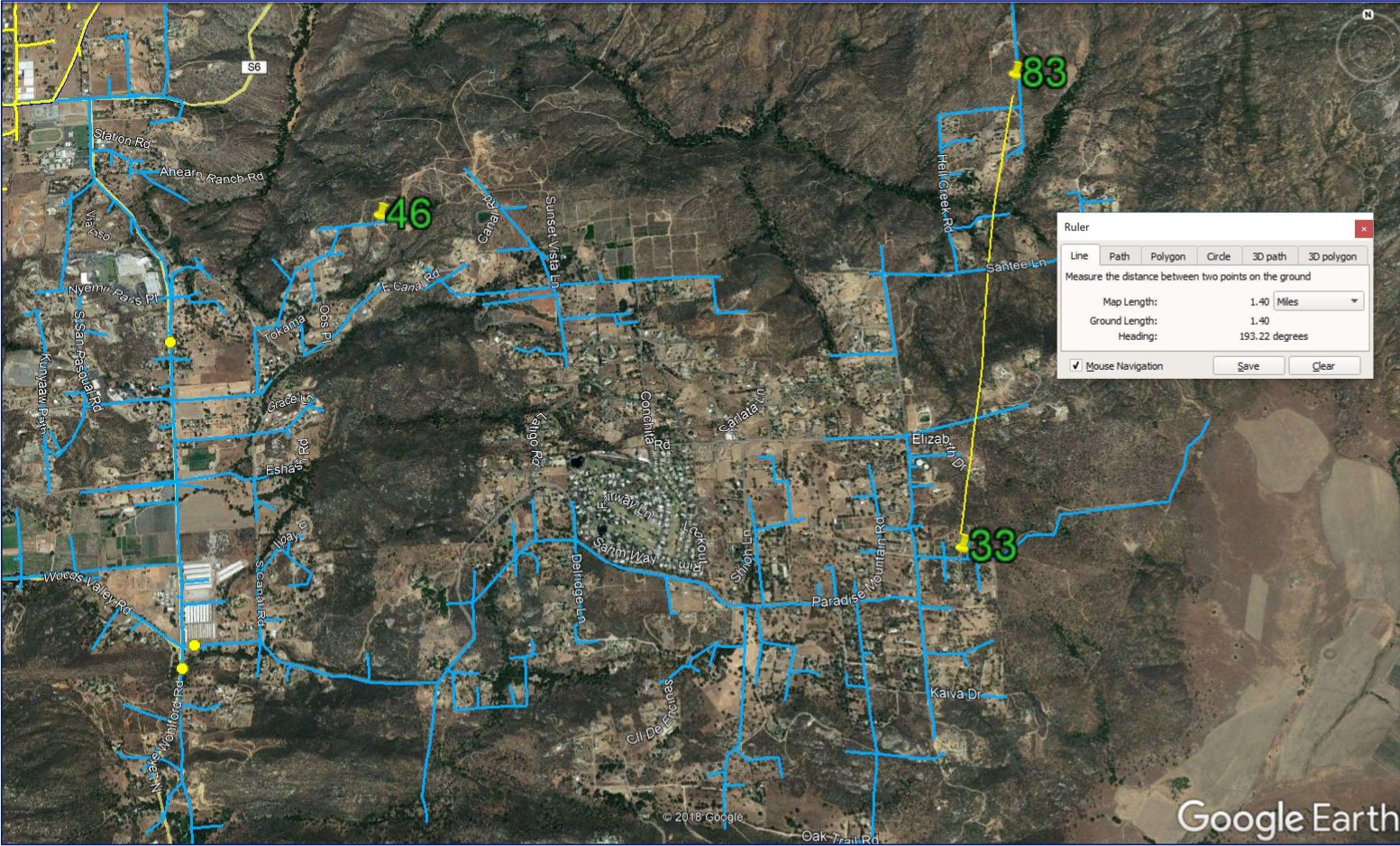
97%	65%	32%	19%	34%	21%
BEACHES	MESAS	INLAND VALLEYS	FOOTHILLS	MOUNTAINS	DESERTS

Project Activity Level (PAL)

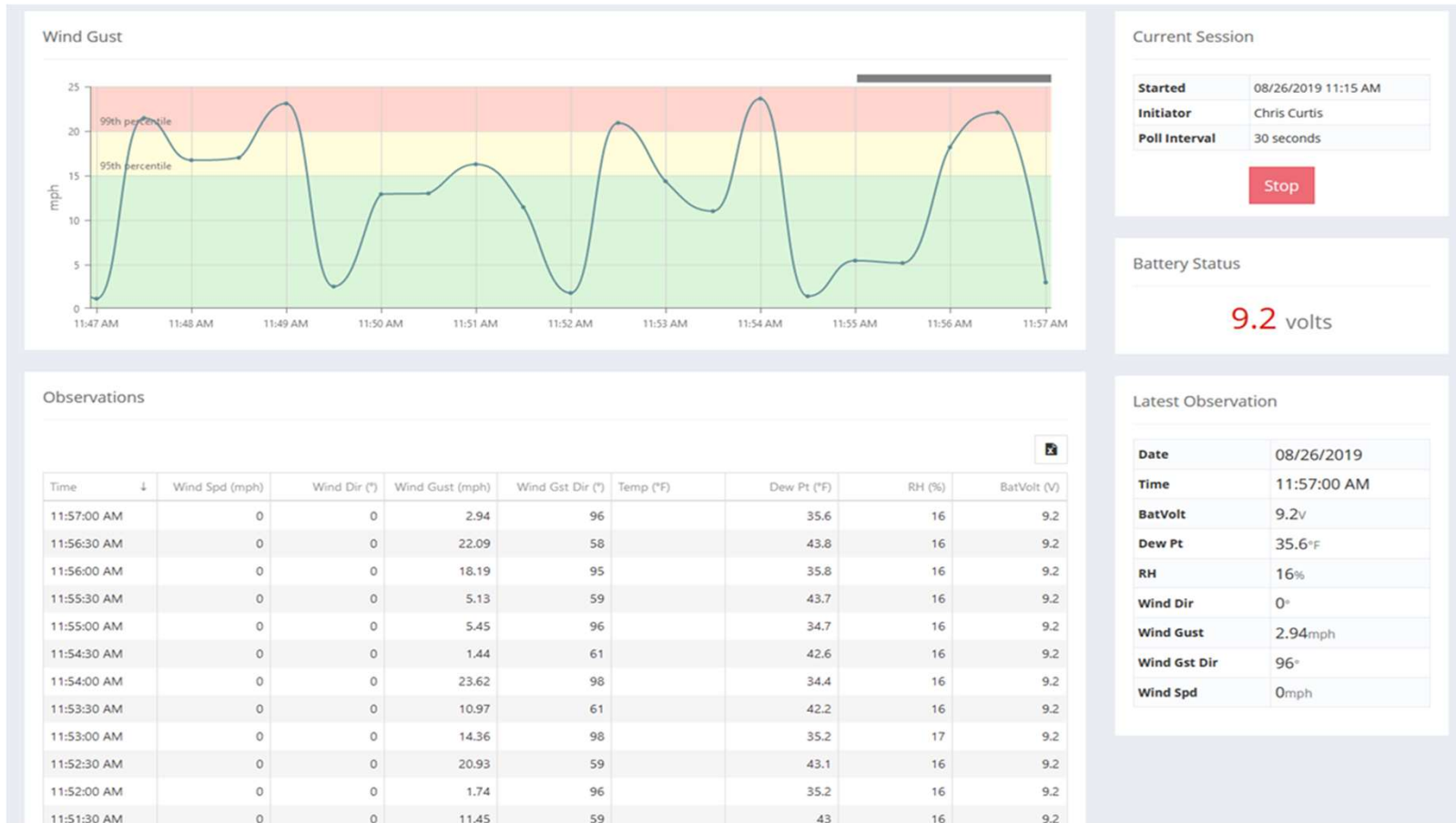
C	C
MOUNTAIN	INLAND



SDG&E Weather Network: 222 Weather Stations



High Speed Weather Data



Current Session

Started	08/26/2019 11:15 AM
Initiator	Chris Curtis
Poll Interval	30 seconds

Stop

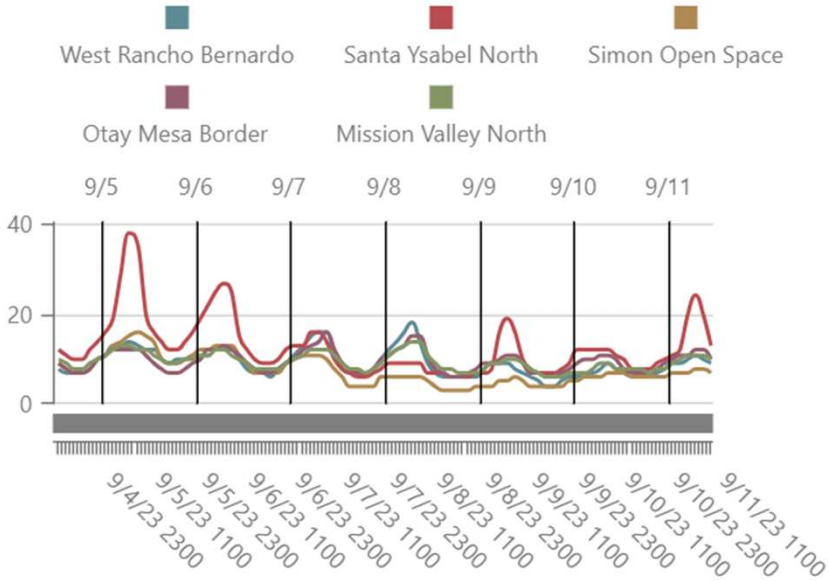
Battery Status

9.2 volts

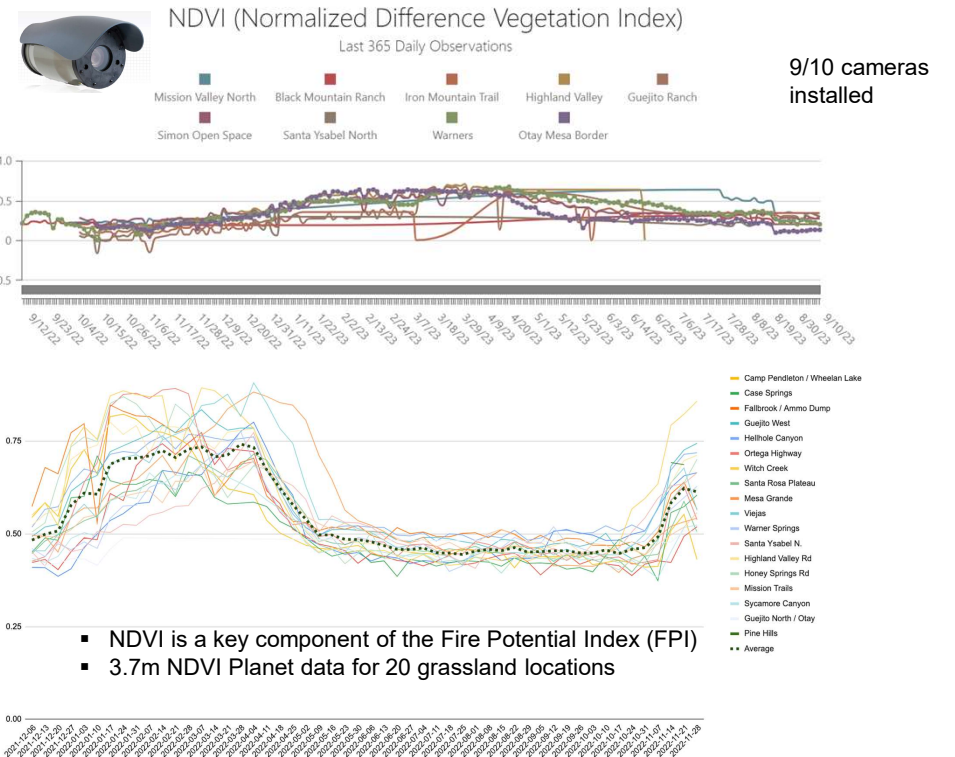
Latest Observation

Date	08/26/2019
Time	11:57:00 AM
BatVolt	9.2v
Dew Pt	35.6°F
RH	16%
Wind Dir	0°
Wind Gust	2.94mph
Wind Gst Dir	96°
Wind Spd	0mph

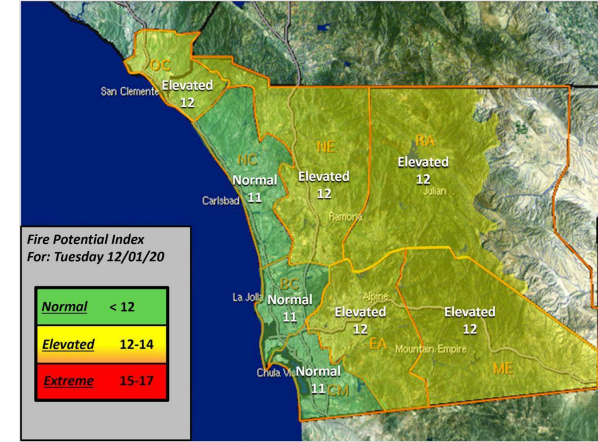
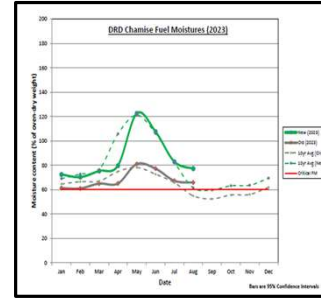
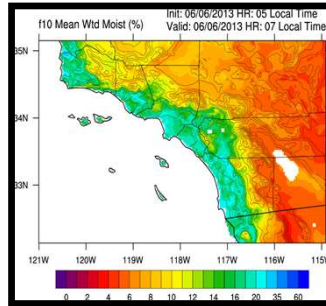
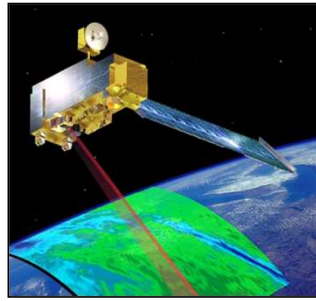
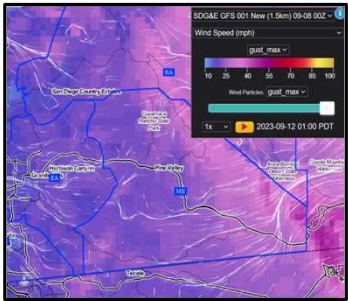
Enhanced Fuel Moisture Sampling



- 10 Hour fuel moisture / temp sensor
- 5/8 installed to date



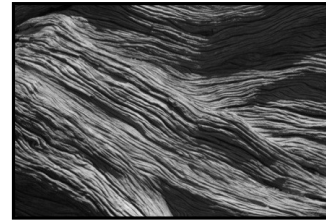
Fire Potential Index (FPI)



Weather
(wind speed & humidity)



Grasses



Dead Fuels

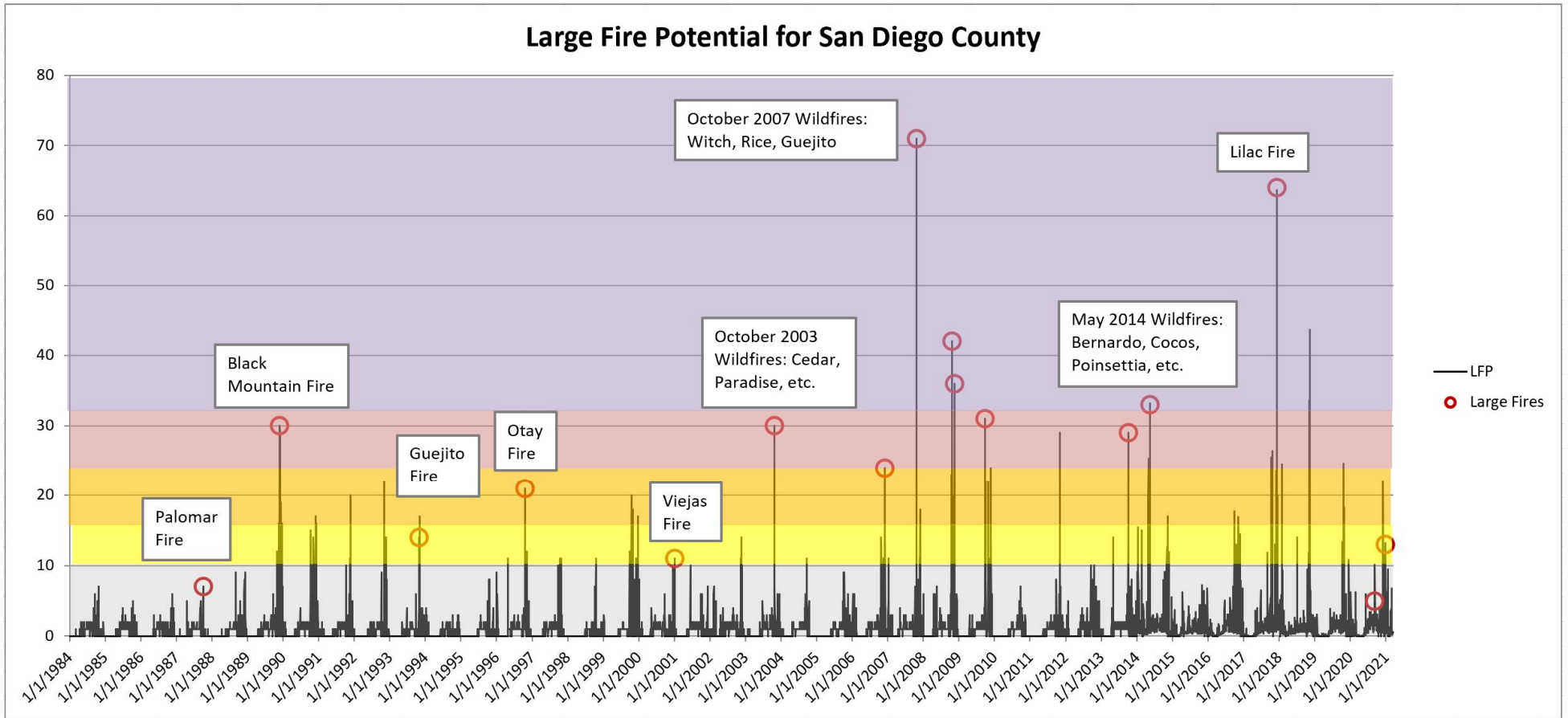


Live Fuels

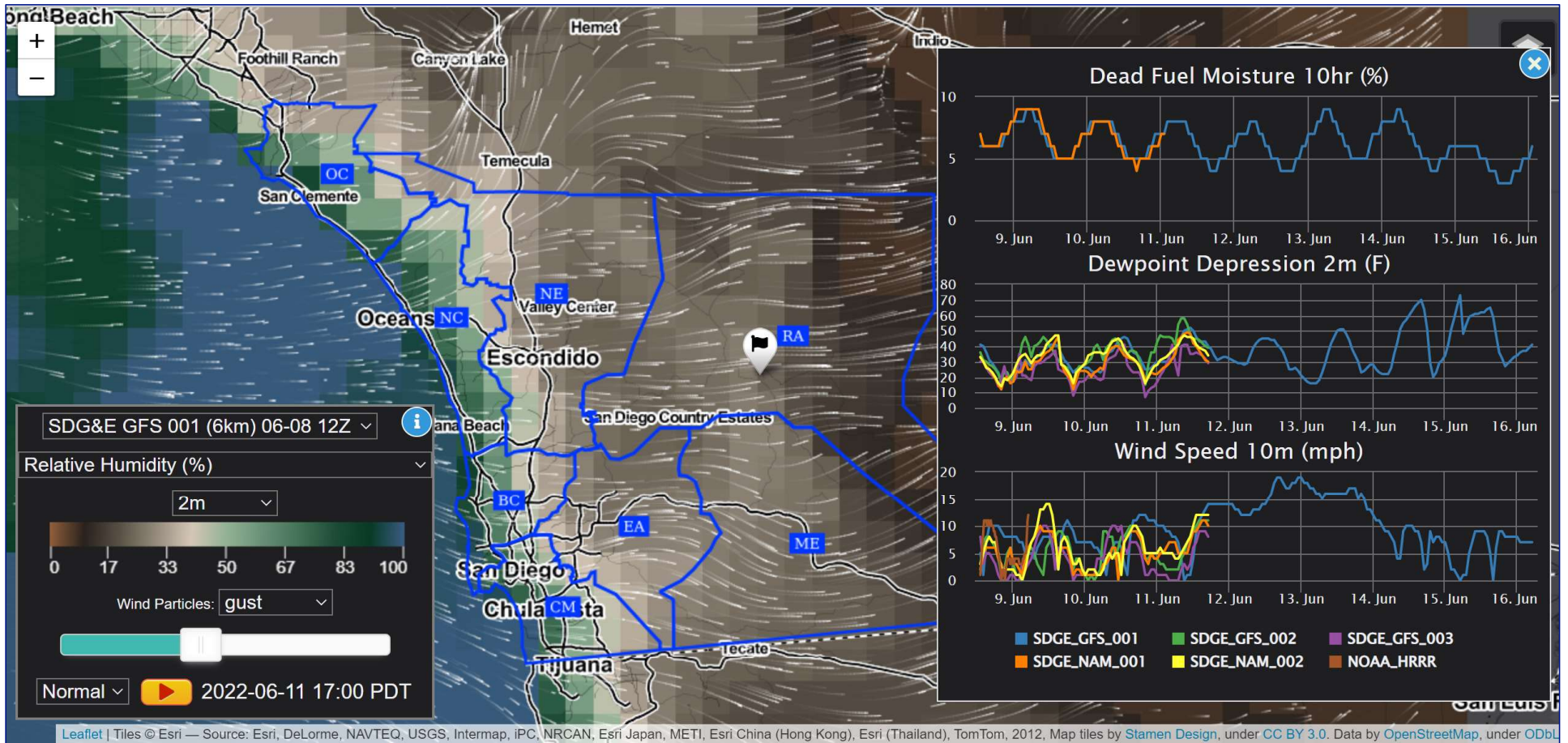
Fuel Moisture

	Mon 11/30	Tue 12/01	Wed 12/02	Thu 12/03	Fri 12/04	Sat 12/05	Sun 12/06	Mon 12/07
ME	Elevated 12	Elevated 12	Elevated 14	Extreme 15	Extreme 15	Elevated 14	Elevated 14	Elevated 14
RA	Elevated 12	Elevated 12	Elevated 14	Extreme 15	Extreme 15	Elevated 14	Elevated 14	Elevated 14
EA	Elevated 12	Elevated 12	Elevated 14	Extreme 15	Extreme 15	Elevated 14	Elevated 14	Elevated 14
NE	Elevated 12	Elevated 12	Elevated 14	Extreme 15	Extreme 15	Elevated 14	Elevated 14	Elevated 14
OC	Elevated 12	Elevated 12	Elevated 13	Elevated 14	Elevated 14	Elevated 13	Elevated 13	Elevated 13
NC	Normal 11	Normal 11	Elevated 12	Elevated 14	Elevated 14	Elevated 13	Elevated 13	Elevated 13
BC	Normal 11	Normal 11	Elevated 12	Elevated 12	Elevated 12	Elevated 12	Elevated 12	Elevated 12
CM	Normal 11	Normal 11	Elevated 12	Elevated 12	Elevated 12	Elevated 12	Elevated 12	Elevated 12

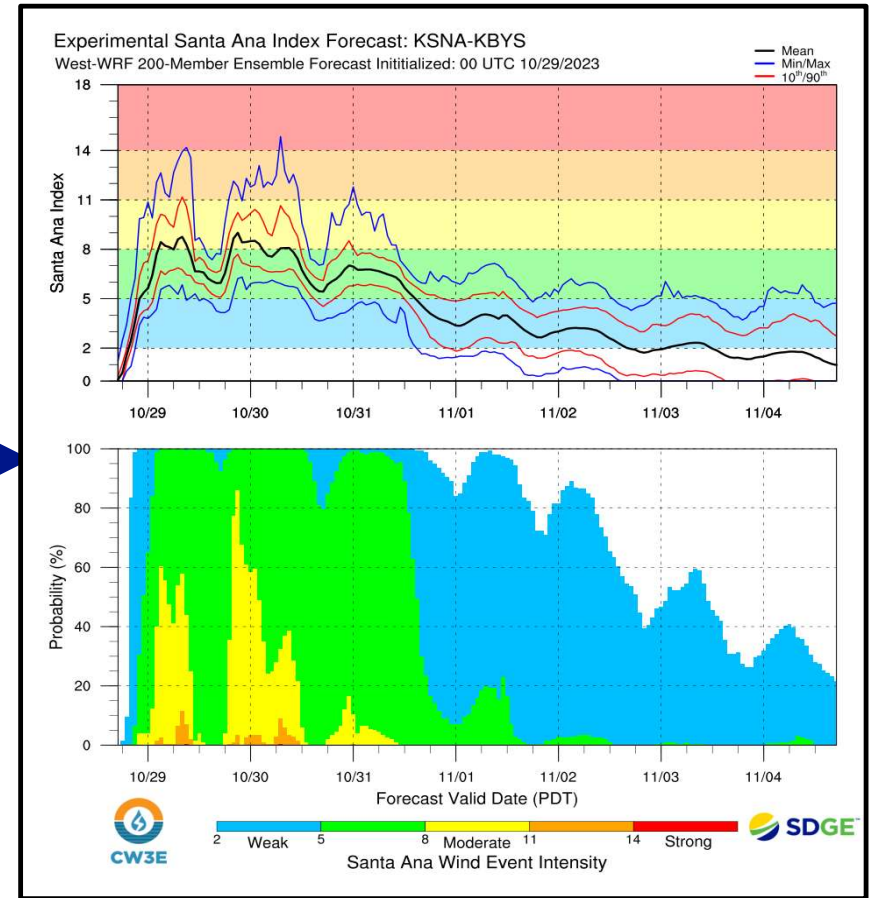
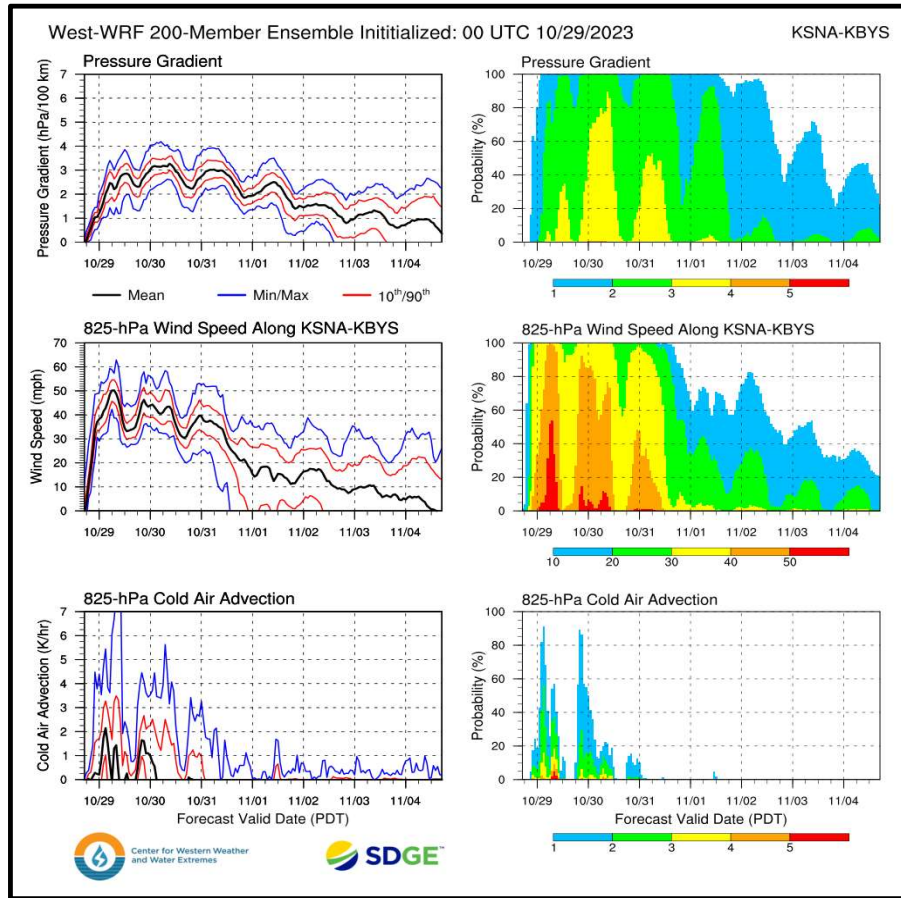
Santa Ana Wildfire Threat Index



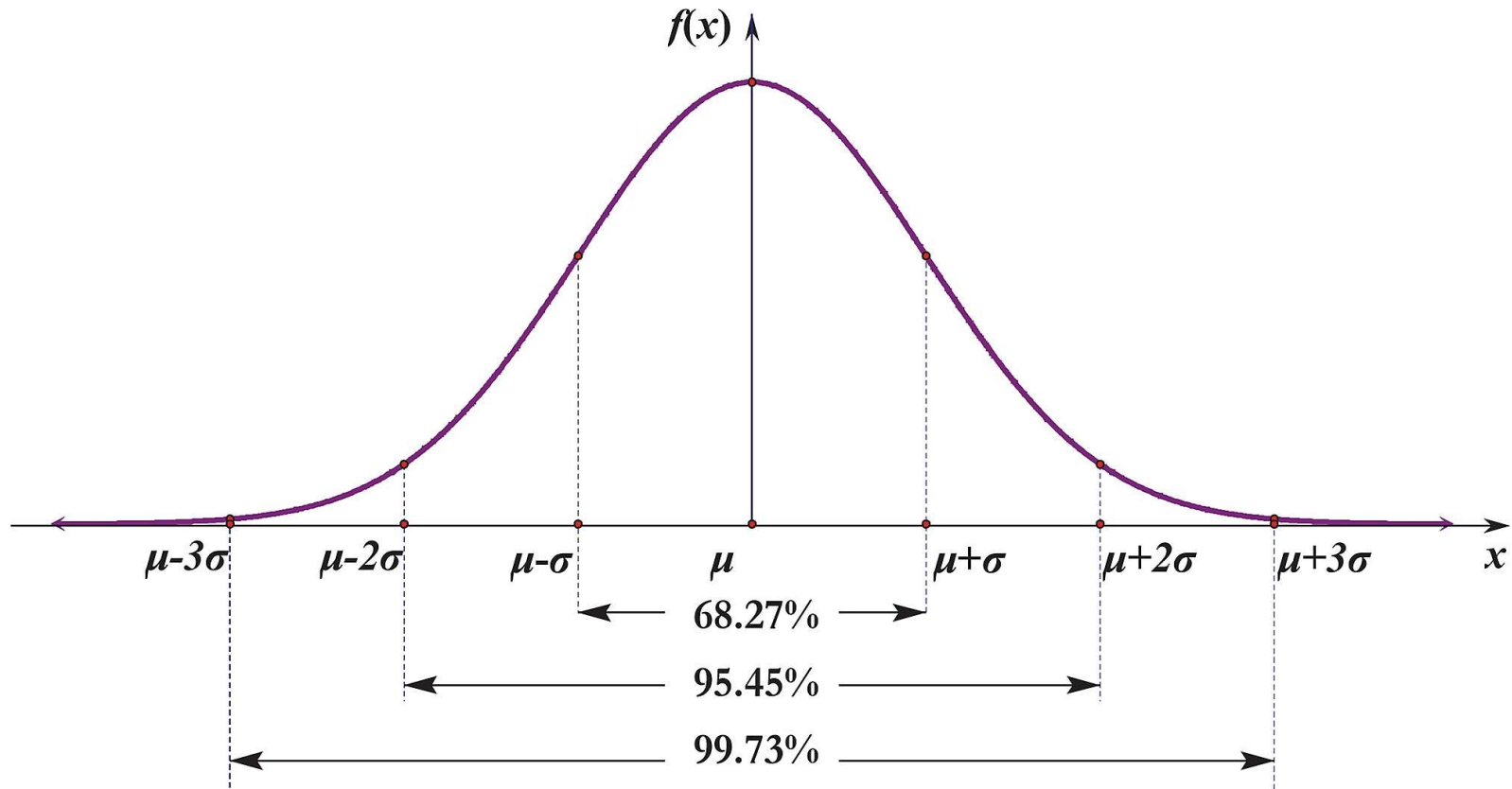
Weather Forecast Modeling: <https://wxmap.sdsc.edu/>



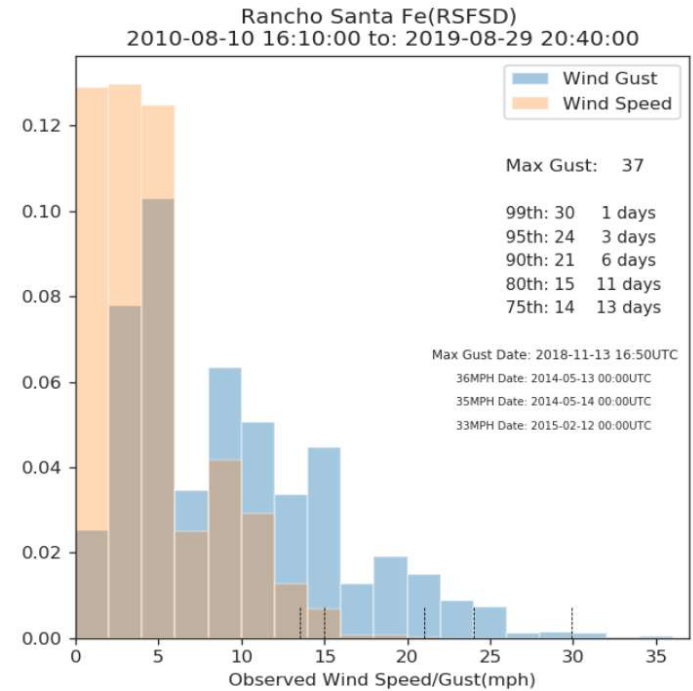
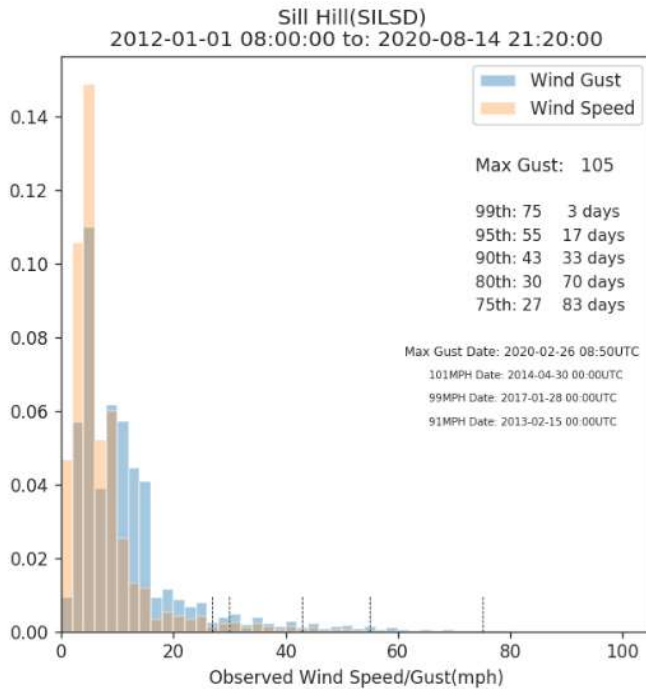
Santa Ana Index: cw3e.ucsd.edu/sdge/



Normal Distribution



Weather Station Statistics



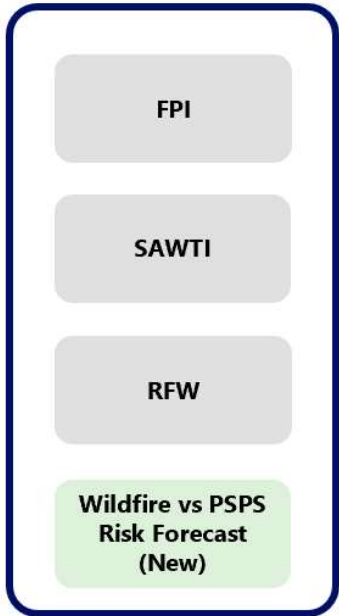
Automated Circuit Forecast

	A	B	C	D	E	F	G	H	I	J
1	SILSD	Sill Hill	66	23:00	84	23:00	79	0:00	35	23:00
2	CWSD	Crestwood	40	23:00	64	23:00	63	0:00	30	23:00
3	EWSD	East Willows Rd	46	23:00	63	10:00	50	0:00	26	21:00
4	NDCSD	North Descanso	44	23:00	63	9:00	48	1:00	23	23:00
5	BMSSD	Buckman Springs	36	21:00	62	10:00	58	1:00	23	23:00
6	LPTSD	La Posta	34	23:00	62	22:00	55	0:00	28	23:00
7	SRHSD	Sunrise Hwy	35	22:00	61	10:00	49	0:00	17	22:00
8	BOCSD	Boulder Creek	48	23:00	61	23:00	59	0:00	23	23:00
9	LFRSD	Lucky Five Ranch	36	23:00	61	10:00	62	1:00	23	23:00
10	HOSSD	Hoskings Ranch	30	23:00	58	10:00	49	0:00	21	20:00
11	VGSD	Viejas Grade	45	23:00	57	11:00	45	0:00	23	23:00
12	CMNSD	Cameron	34	23:00	57	12:00	47	0:00	23	23:00
13	POTSD	Potrero	30	10:00	57	10:00	46	5:00	25	23:00
14	SHCSD	School House Canyon	36	22:00	57	10:00	58	1:00	27	22:00
15	AVYSD	Anderson Valley	31	23:00	56	10:00	44	0:00	23	22:00
16	SHVSD	Sherilton Valley	45	23:00	56	13:00	56	0:00	27	23:00
17	DYESD	Dye Mountain	36	22:00	56	10:00	47	5:00	23	21:00
18	RHSSD	Rancho Heights	42	21:00	55	11:00	42	0:00	14	21:00
19	CHHSD	Chihuahua Valley	27	22:00	55	12:00	19	8:00	23	23:00

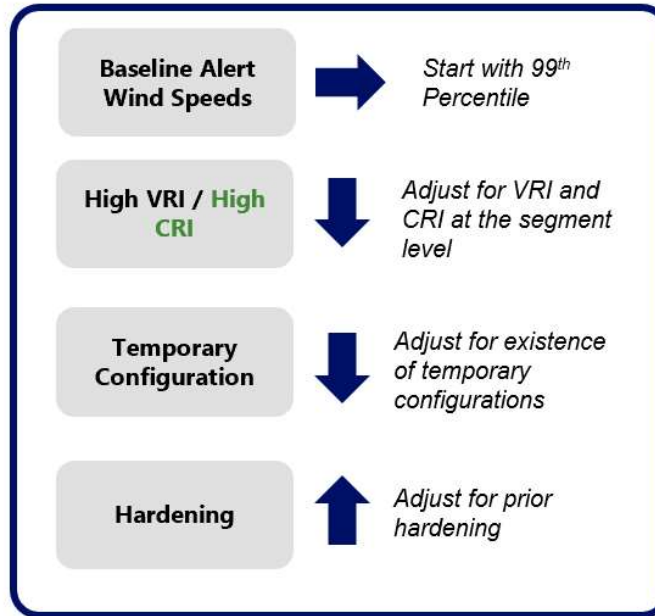
station_level_daily_gusts_20221

PSPS Decision-Making Framework

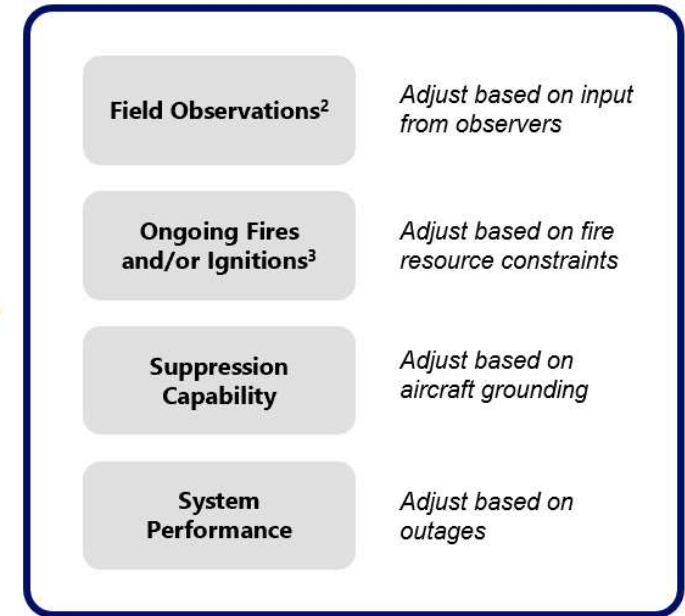
Monitor Fire Condition Forecasts



Establish Circuit List & alert wind speeds based on historical wind patterns¹

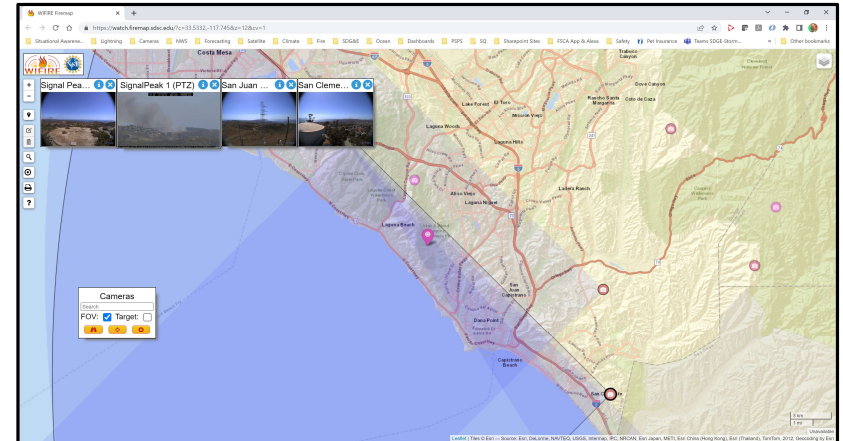


Use Field Information & Real Time Updates to Inform De-energization



- 1) If fire potential is not extreme, it can also inform adjustments to alert wind speeds
- 2) Field observations do not change alert speeds
- 3) Ongoing fires do not adjust alert speeds but rather adjust our PSPS decision-making when reaching alert speed

Academic Partnerships: Univ. Wisconsin



University of Wisconsin-Madison Space Science and Engineering Center (SSEC)

SSEC is a world-class archive of satellite data, receiving, archiving, and redistributing most geostationary weather satellite data produced globally. SSEC and SDG&E have partnered to increase situational awareness of wildfire ignitions in the service territory.

Satellite Wildfire Alerts Coastal Fire 5-11-2022

- GOES-16/18 carry the Advanced Baseline Imager (ABI), a next-generation fire detection and characterization at 2 km spatial and 1-5 minute temporal resolutions.
- The Wildfire Automated Biomass Burning Algorithm (WFABBA) flags pixels that have a potential fire.
- Six categories of fire detection based on confidence and environmental factors.
- The WFABBA took < 5 minutes from ignition to first detection of the Coastal Fire.


New Alert California Camera Network: alertca.live

The screenshot displays the alertca.live web interface. On the left is a map of California with blue camera location markers. The main area is a grid of live camera feeds. The top navigation bar includes 'UC San Diego', 'Search cameras', 'All Cameras', 'Active Cameras', 'Menu', 'Tutorial Video', and 'login'. The camera feeds are arranged in a 3x3 grid. The top row shows 'San Juan Hills North', 'Foreman 2', and 'Clay Min 2'. The middle row shows 'Bailey Peak 1', 'Quail Canyon 1', and 'Clay Min 2'. The bottom row shows 'Lycara Peak 2', 'Buffalo Bump South', 'Buffalo Bump North', 'Labac Oaks 1', 'Gorman 1', and 'Labac Oaks 2'. Each feed includes a title, coordinates, and a 'Last Moved' timestamp. The 'Labac Oaks 1' and 'Gorman 1' feeds have an 'IMAGE POLE' overlay.

Artificial Intelligence Smoke Detection

Wildfire Alert System sdge Monitor Logout

Smoke Detection



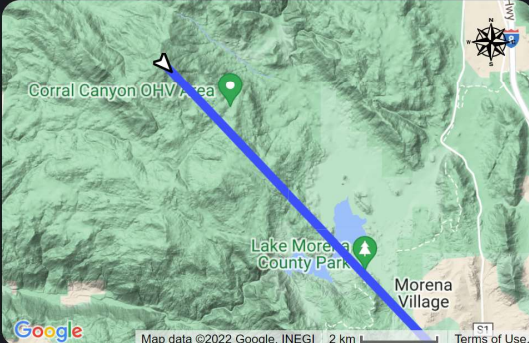
axis-lospinossouth elev:4803' X:+137.28 Y:-1.70 Z:25.0 CalFireMVU.nsoto.05-02T09:57 © UCSD/HPWREN 2022/05/02 09:57:56.84 ALERTwildfire.or

LosPinosSouth

[2022-05-02 09:58:35] LosPinosSouth Go to Share

[2022-05-02 09:58:35] LosPinosSouth

Fire Direction



137° SE Direction may differ in the range of $\pm 5^\circ$.

Recent

History

Date: 2022-04-28 ~ 2022-05-05

2022-05-02 1

[2022-05-02 09:58:35] LosPinosSouth

Wildfire Analyst (WFA)

The screenshot displays the Wildfire Analyst (WFA) software interface. The left sidebar contains navigation icons for home, map, layers, and settings. The main window is divided into two panes: 'Inputs' and 'Results'.

Inputs:

- Test - 06162020 122653
- 06/09/2020 12:00 - 06/09/2020 20:00
- Created by: Chris Arends

Results:

Impact Analysis

Size	IAA	Buildings
4177.44 ac	4-Very High	1
Population Impacted	Poles	Z-Poles
0	0	0

[Open Impact Analysis Table](#)

IAA | Fire Behavior | Weather

4 - Very High

Size (1hr) | **Avg. Slope**

0 ac | 44%

Fire Behavior Index

(2) - Moderate: Fire spreads rapidly presenting moderate resistance to control but can be countered with direct attack by firefighters.

Flame Length | **ROS**

6.42 ft | 11.2 ch/h

Growth Potential Index

GPI	Perimeter (1hr)	Area (a2/a1)
4 - High	0.7 mi	310 %

Simulation Animation

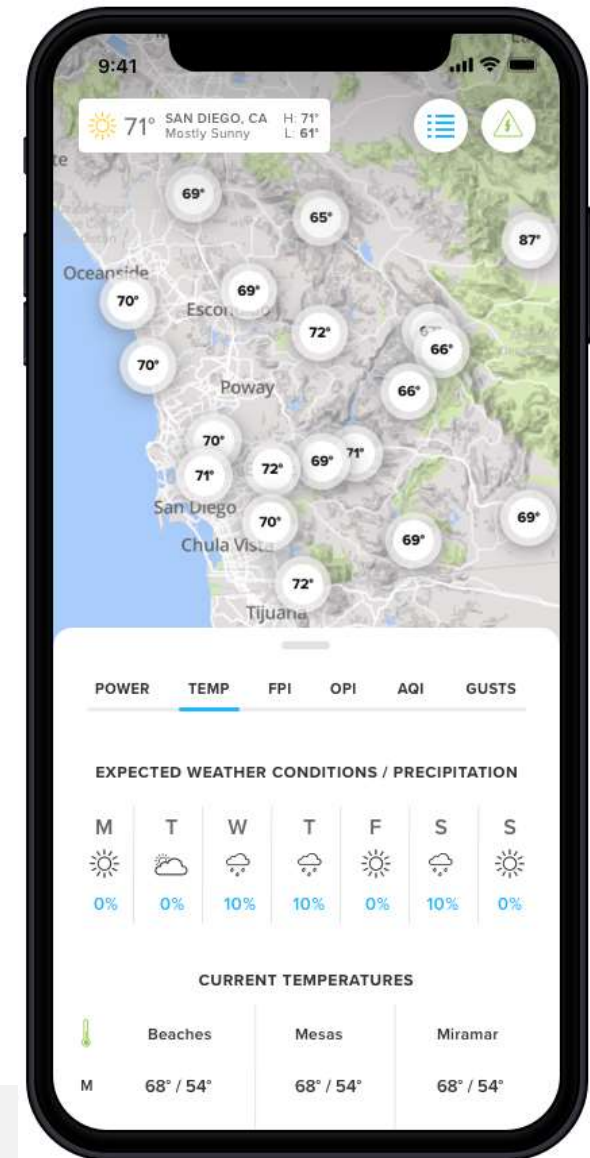
The right pane shows a 3D terrain map with a simulated wildfire spread area overlaid in red and orange. A timeline at the bottom indicates the simulation period from Tuesday, 06/09/2020 to Wednesday, 06/10/2020. The text 'Powered by Esri' is visible in the bottom right corner of the map area.

New SDG&E Weather App



New situational awareness app release 2.0 with updated geo-location features and map-based visualizations:

- “Follow-Me” weather observation and forecast
- Map based and tabular display of:
 - Potential Index (FPI),
 - Air Quality Index (AQI),
 - Outage Potential Index (OPI)
 - Wind Gusts
 - Temperatures
 - Outages
- Map based integration of all AlertCA Cameras
- Push Notifications for hazardous weather warnings
 - Red Flag Warnings (RFW)
 - Winter Storm Warnings
 - Thunderstorms, etc.



Thank You

