



Path of destruction: recent trends in California wildfires

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The situation

- In recent years, California has experienced multiple **large, destructive wildfires**
- Visualizing **wildfire trends over time** is important for:
 - Educating the public
 - Assisting state agencies in decision-making
- CalFire website lists all wildfires since 2013, but **lacks plotting tools**

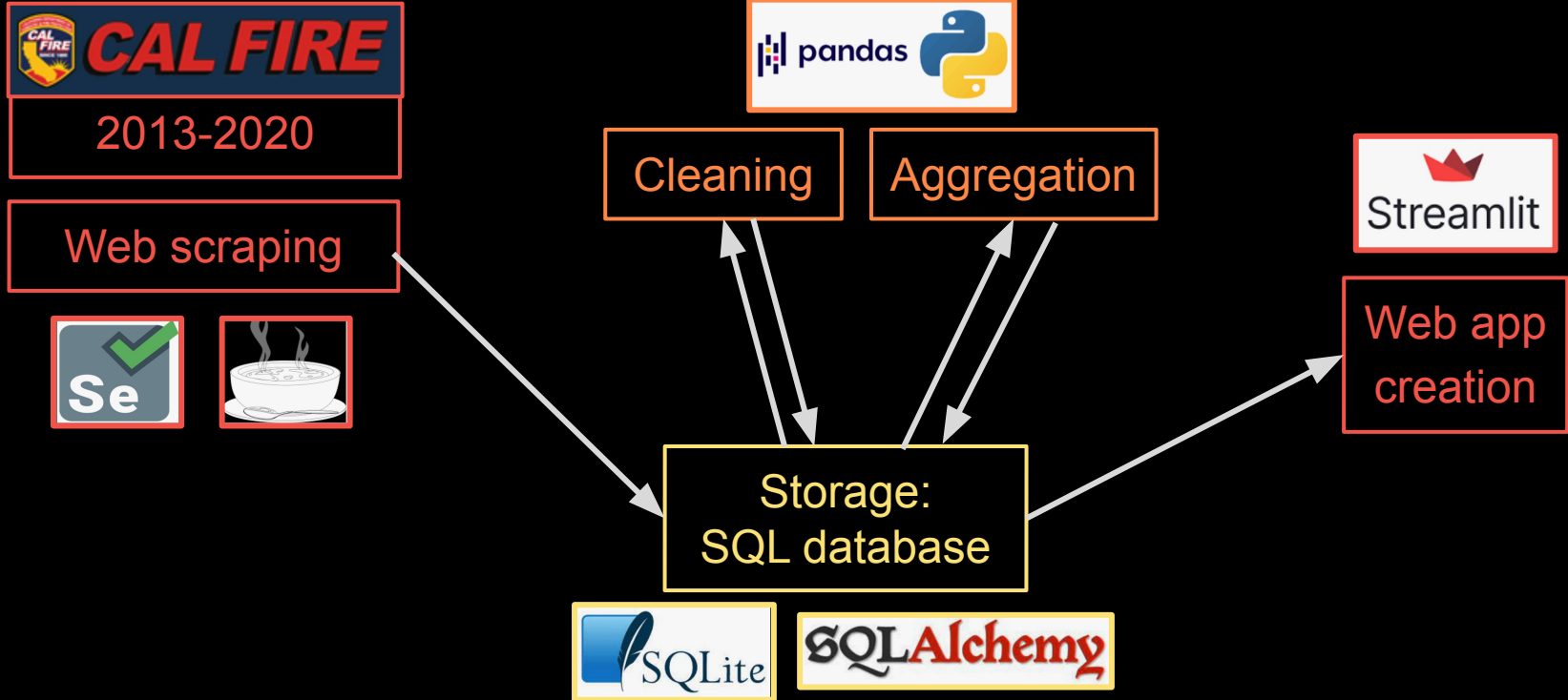




Project Aims

- Engineer a **data pipeline** using the CalFire data
- Create a user-friendly **web dashboard** of state wildfire trends

Data Pipeline

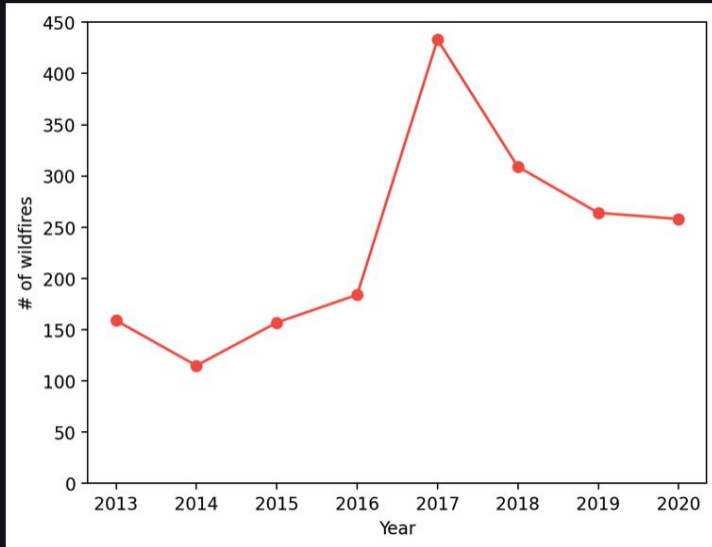


Wildfire Trends in California (2013-2020)

Major Trends

Select one:

- ☒ Number of fires per year
- ☐ Acres burned per year (in thousands)
- ☐ Structures destroyed per year
- ☐ Fatalities per year

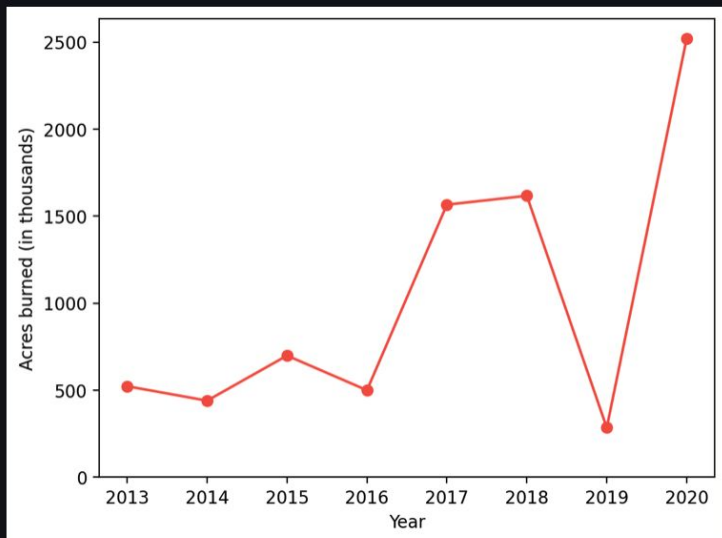


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Largest fires (in thousands of acres)

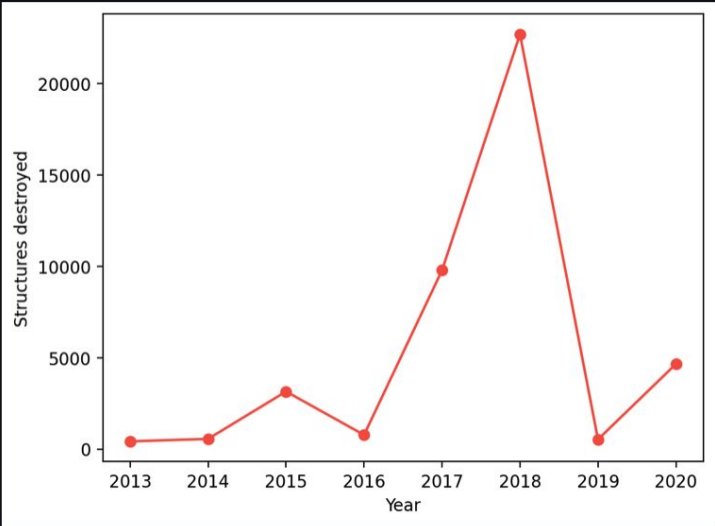
	start_date	acres	destroyed	fatalities	counties
August Complex (include...	2020-08-16	1032	0	0	Mendocino, Humboldt, Tr...
Ranch Fire (Mendocino C...	2018-07-27	410	246	0	Colusa, Glenn, Lake and ...
SCU Lightning Complex	2020-08-18	396	222	0	Santa Clara, Alameda, Co...
LNU Lightning Complex (i...	2020-08-16	363	0	0	Napa, Sonoma, Lake, Yol...
Thomas Fire	2017-12-04	281	1063	0	Santa Barbara and Ventura
Rim Fire	2013-08-17	257	0	0	Tuolumne
Carr Fire	2018-07-23	229	1614	3	Shasta and Trinity
Chetco Fire	2017-07-12	191	0	0	<NA>
Camp Fire	2018-11-07	153	18804	85	Butte
Rough Fire	2015-07-21	151	0	0	El Dorado

Wildfire Trends in California (2013-2020)

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- ☒ Structures destroyed per year
- ☐ Fatalities per year



Most destructive fires

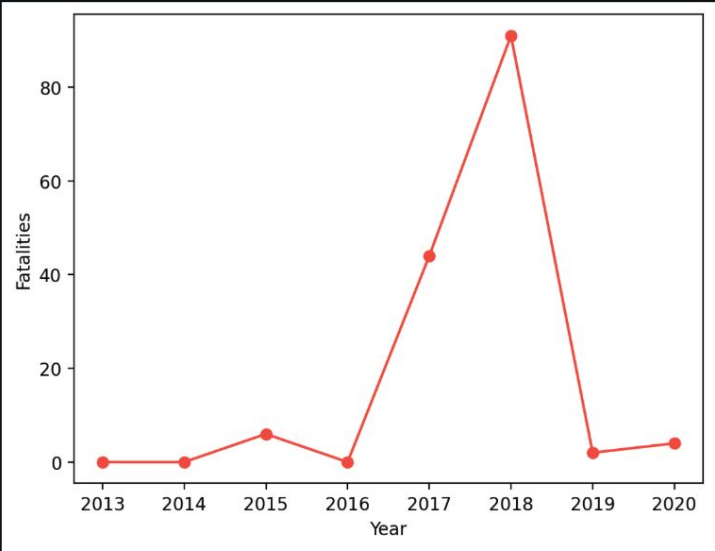
	start_date	acres	destroyed	fatalities	counties
Camp Fire	2018-11-07	153	18804	85	Butte
Tubbs Fire (Central LNU C...	2017-10-08	36	5636	22	Napa and Sonoma
Valley Fire	2015-09-12	76	1955	4	<NA>
Woolsey Fire	2018-11-08	96	1643	3	Los Angeles and Ventura
Carr Fire	2018-07-23	229	1614	3	Shasta and Trinity
Glass Fire	2020-09-26	67	1555	0	Napa and Sonoma
CZU Lightning Complex (l...	2020-08-15	86	1490	0	Santa Cruz and San Mateo
Nuns / Adobe / Norrbom/ ...	2017-10-08	56	1355	3	Napa and Sonoma
Thomas Fire	2017-12-04	281	1063	0	Santa Barbara and Ventura
Butte Fire	2015-08-08	70	877	2	Butte

Wildfire Trends in California (2013-2020)

Major Trends

Select one:

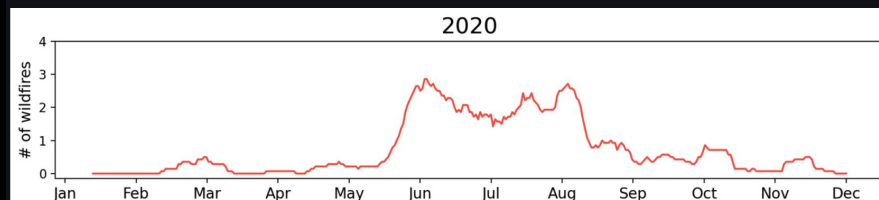
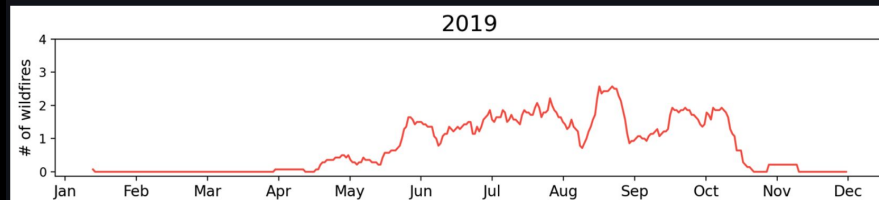
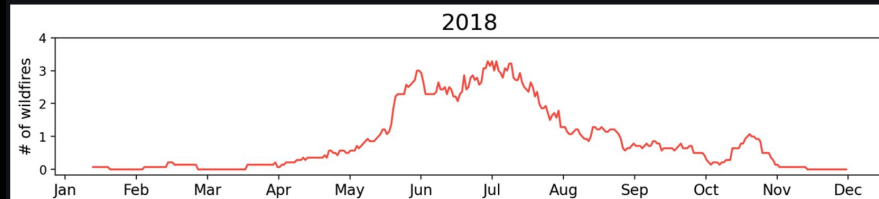
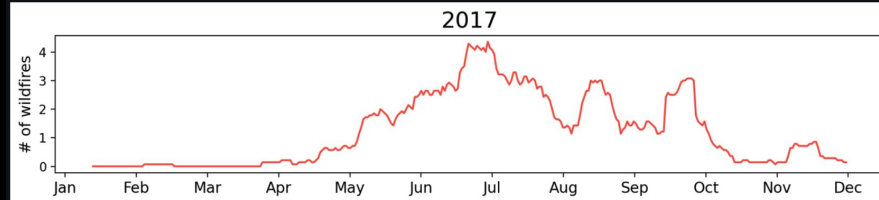
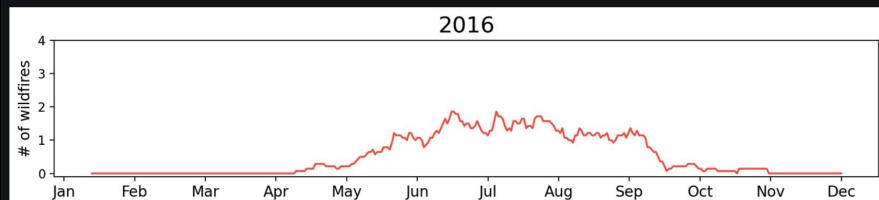
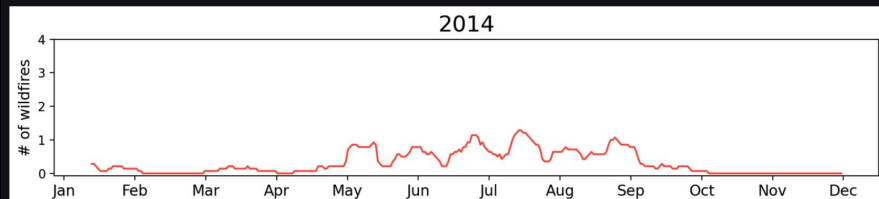
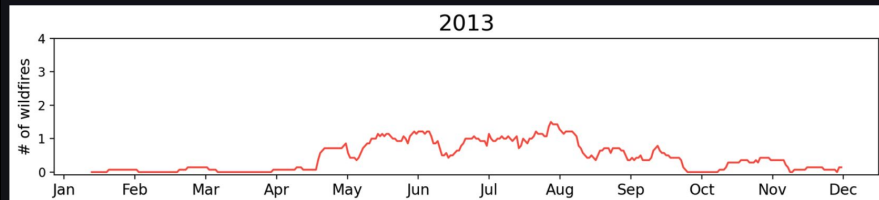
- ☐ Number of fires per year
- ☐ Acres burned per year (in thousands)
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- ☒ Fatalities per year



Deadliest fires

	start_date	acres	destroyed	fatalities	counties
Camp Fire	2018-11-07	153	18804	85	Butte
Tubbs Fire (Central LNU C...	2017-10-08	36	5636	22	Napa and Sonoma
Redwood Valley Fire (Men...	2017-10-08	36	546	9	Mendocino
Atlas Fire (Southern LNU ...	2017-10-08	51	120	6	Napa and Solano
Cascade Fire (Wind Comp...	2017-10-08	9	264	4	Yuba
Zogg Fire	2020-09-27	56	204	4	Shasta and Tehama
Valley Fire	2015-09-12	76	1955	4	<NA>
Nuns / Adobe / Norrbom/ ...	2017-10-08	56	1355	3	Napa and Sonoma
Woolsey Fire	2018-11-08	96	1643	3	Los Angeles and Ventura
Carr Fire	2018-07-23	220	1614	2	Shasta and Trinity

Number of new wildfires (14-day rolling average)





Conclusion

- Successfully engineered a **data pipeline** and created a user-friendly **web dashboard** of wildfire trends
- California's fires are increasing in size and number
- 2018 was particularly destructive and deadly because of a single fire

Future Directions

- Upgrade the pipeline to include:
 - New/active wildfires
 - Auto-update when new fires are posted
- Expand web app to include:
 - Search by county
 - Detailed maps



Thank you!

LNU Lightning Complex Napa County 2020



LNU Lightening Complex. Napa County 2020



Glass Fire, Napa County 2020

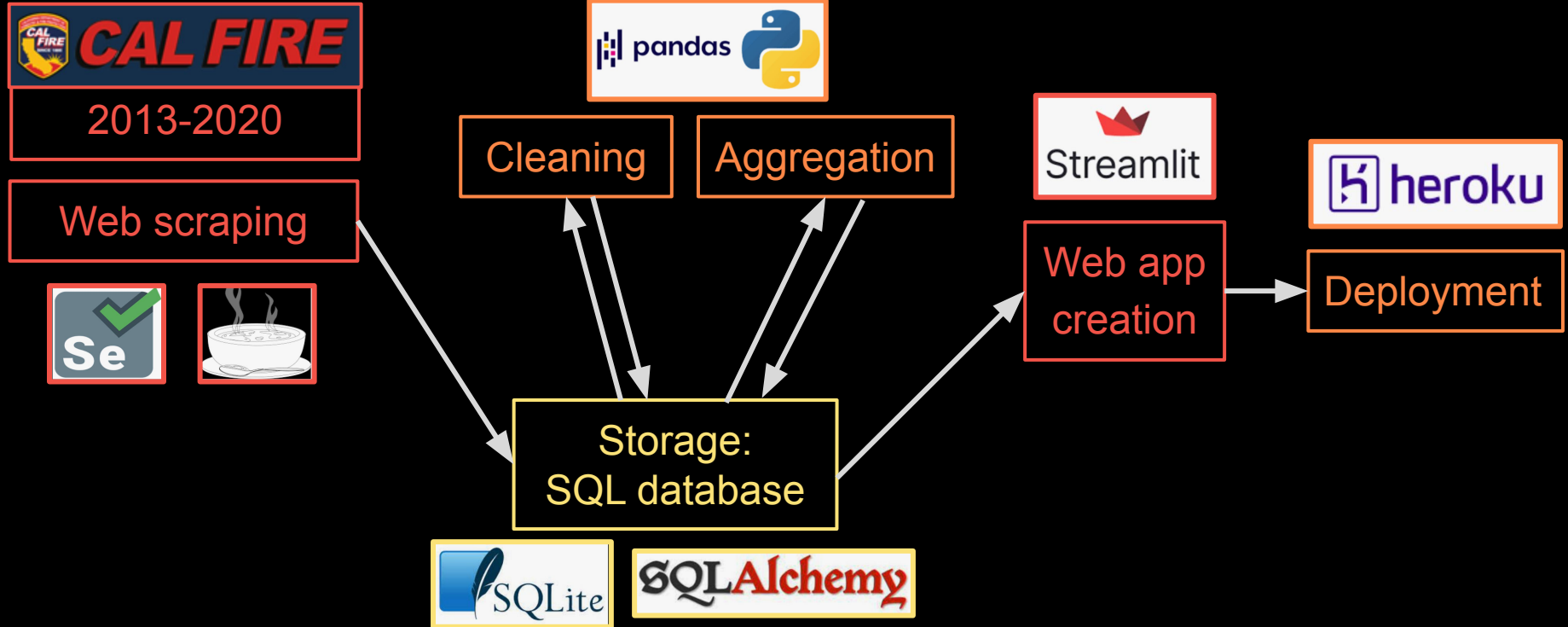


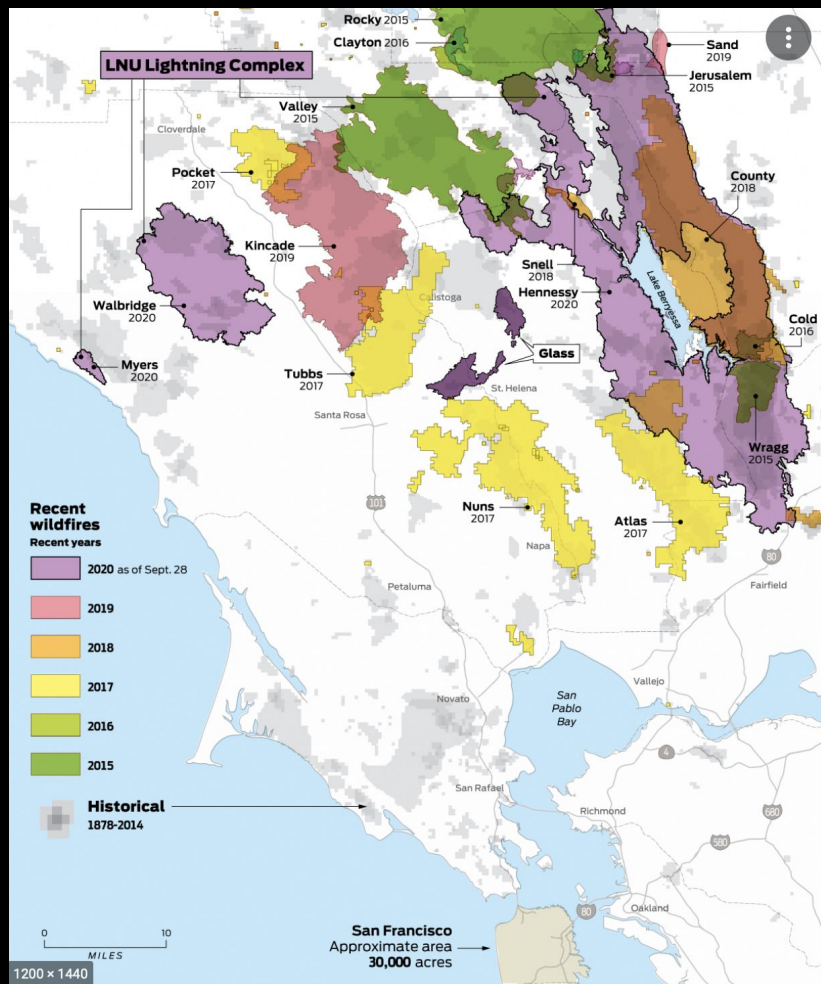



Smoke engulfs Golden Gate Bridge 2020



Data Pipeline







CAL FIRE

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Search our Incident Database

Search by Incident Name, Year, County or Keyword

Sonoma County

Search

Name	Start Date	Counties	Acres	Containment
Middle Fire	8/13/2021	Sonoma	22	100%
Lakeville Fire	6/5/2020	Sonoma	141	100%
Gulch Fire	6/6/2020	Sonoma	107	100%
Glass Fire	9/27/2020	Napa and Sonoma	67,484	100%
Pine Fire	9/21/2009	Sonoma	300	100%
McCabe Fire	11/22/2013	Sonoma	3,505	100%
Sawmill Fire	9/25/2016	Sonoma	1,547	100%
Adobe Fire (Central LNU Complex)	10/9/2017	Sonoma	1,868	100%



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2017

Search

No Incidents Were Found Matching the Search Criteria



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Search our Incident Database

Search by Incident Name, Year, County or Keyword

Sonoma County 2017

Search

Name	Start Date	Counties	Acres	Containment
Adobe Fire (Central LNU Complex)	10/9/2017	Sonoma	1,868	100%
Pocket Fire (Central LNU Complex)	10/9/2017	Sonoma	17,357	100%
Pressley Fire (Central LNU Complex)	10/9/2017	Sonoma		100%
Oakmont Fire (Central LNU Complex)	10/14/2017	Sonoma	100	100%
Tubbs Fire (Central LNU Complex)	10/8/2017	Napa and Sonoma	36,807	100%
Nuns / Adobe / Norrbom/ Pressley / Partrick Fires / Oakmont (Central LNU Complex)	10/8/2017	Napa and Sonoma	56,556	100%
Toll Fire	6/22/2017	Solano	39	100%
Independence Fire	7/31/2017	Sonoma	11	100%
Bodega Fire	8/27/2017	Sonoma	18	100%
37 Fire	10/9/2017	Sonoma	1,660	100%

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2

