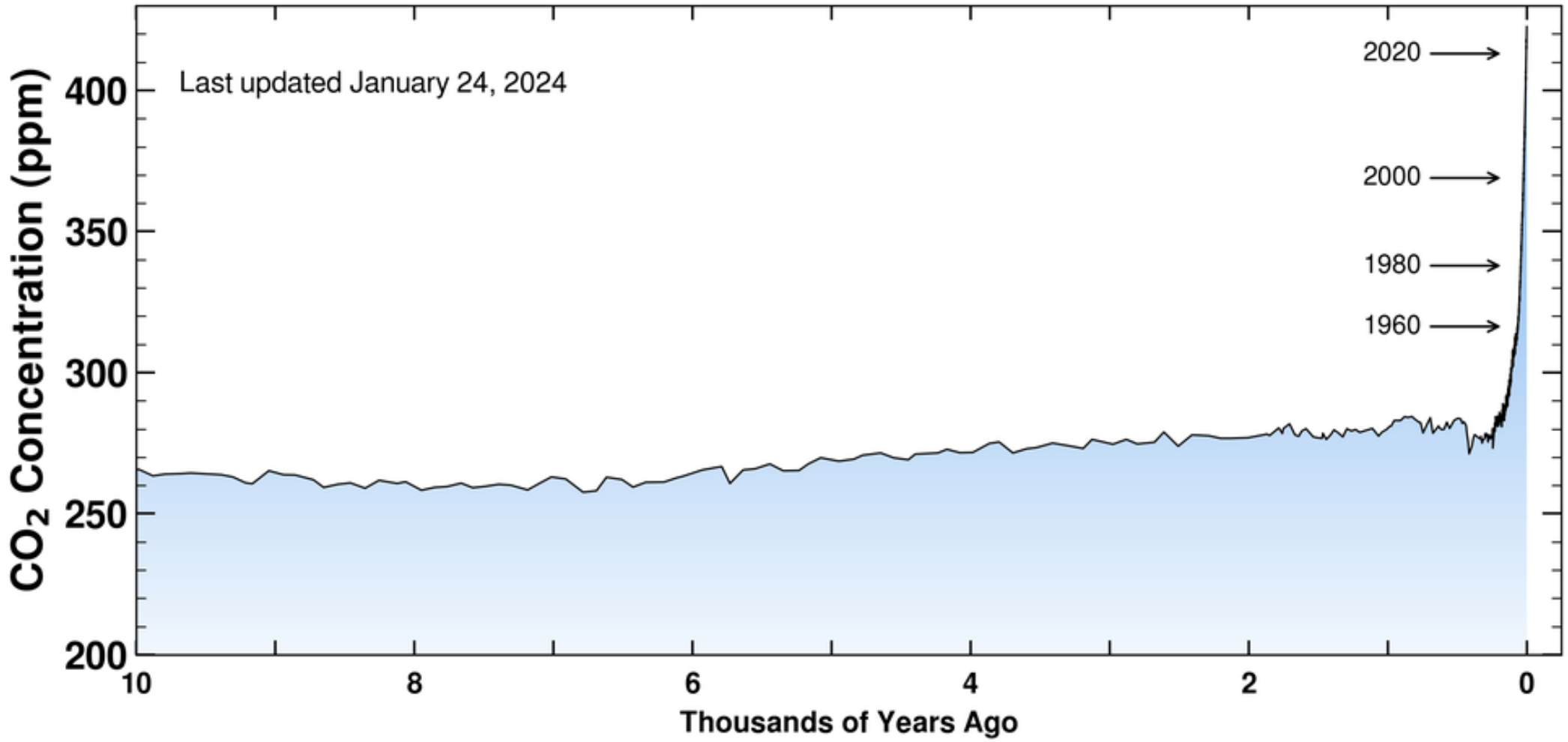
Climate Science Workshop Part 2

January 26th, 2024

Reducing Our Impact

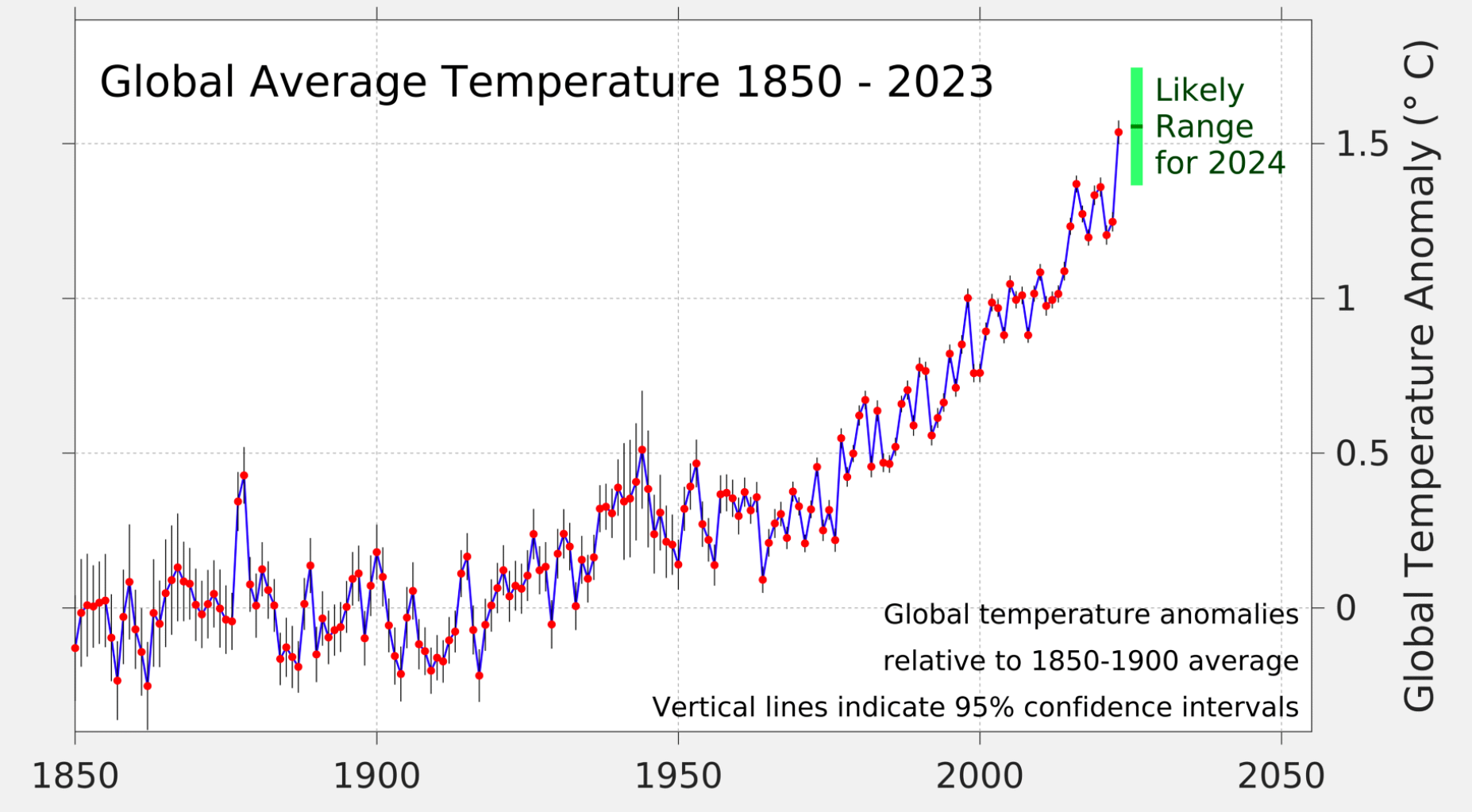
Andrew Isaacs, UC Berkeley's Haas School of Business
Brianna Beighle, Haas EWMBA '24, Patz & Hall

CO_2 concentrations have increased drastically



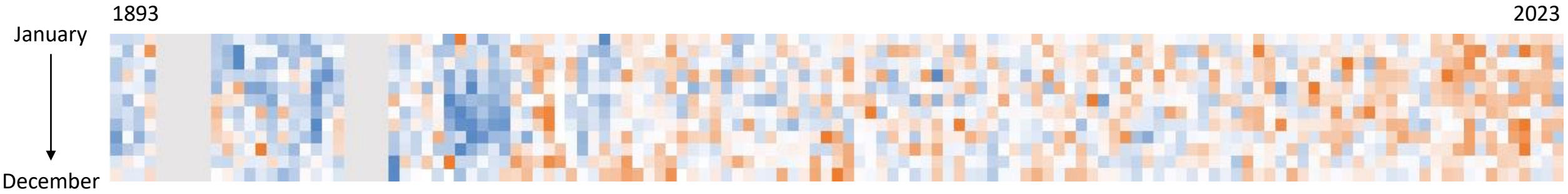
Keeling Curve, Scripps Institution for Oceanography, UC San Diego

2023 was the warmest year ever recorded



Global Temperature Report for 2023, Berkeley Earth

Napa maximum temperatures have increased



Data: Napa State Hospital, CA, US. Daily Summaries Station Details. National Centers for Environmental Information. NOAA.

Napa minimum temperatures have increased

Data: Napa State Hospital, CA, US. Daily Summaries Station Details. National Centers for Environmental Information. NOAA.

This wasn't caused by climate change, it was amplified

San Francisco Chronicle

SFChronicle.com | Tuesday, October 10, 2017 | Printed on recycled paper | $.50 *****

10	103,000	20,000	1,500	114,000	100
deaths from at least 14 major fires burning in Northern California	acres burned across eight counties	people evacuated	homes and commercial facilities destroyed	PG&E customers in Napa and Sonoma counties without power	fire victims treated at hospitals in Napa and Sonoma counties

DEVASTATION IN WINE COUNTRY

Flames consume a main building at the Signorello Estate winery in Napa, one of more than 1,500 businesses and homes destroyed by wind-driven blazes.

Homes gone: Shock in ruined neighborhoods

By Jill Tucker, Kurtis Alexander and Steve Rubenstein

Neighborhoo dafter neighborhood is gone in Santa Rosa. One of them is Coffey Park, a homey cluster of single-family homes 2 miles northwest of downtown.

Arthur and Chevette Chaney ran do five there.

"A few hours ago, we had a house," said Chevette Chaney, clutching the arm of her husband and sobbing Monday.

They stood in the middle of Random Way, which was still recognizable as a street, even if their home was not recognizable.

Neighborhoods continue to rise A10

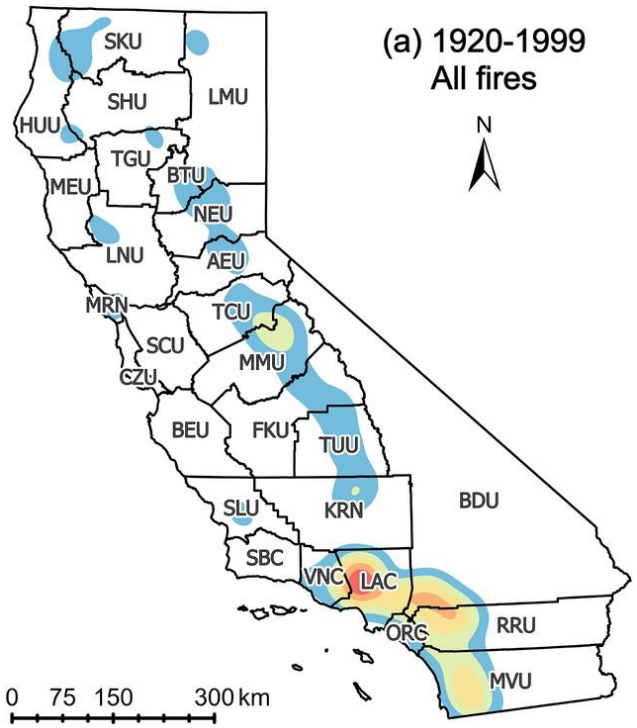
Neighbors rush with water buckets to help save a house on Baird Road in Santa Rosa, which became a virtual ghost town during the devastating North Bay fires.

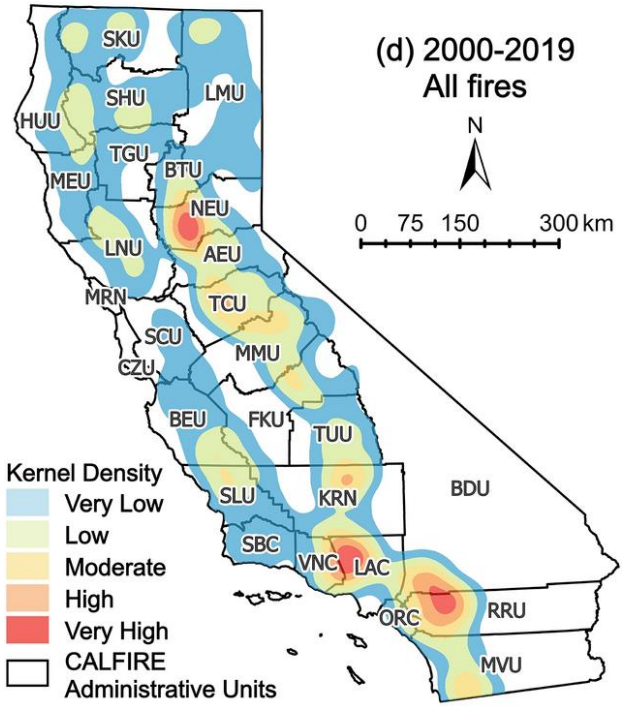
Walls of flames: At least 10 die as thousands flee, vineyards burn

By Peter Fimrite, Jill Tucker, Kurtis Alexander and Demian Bulwa

A swarm of fires supercharged by powerful winds ripped through Napa, Sonoma and Mendocino counties Monday, killing at least 10 people, injuring dozens of others, destroying more than 1,500 homes and businesses, and turning prominent wine tracts to ash.

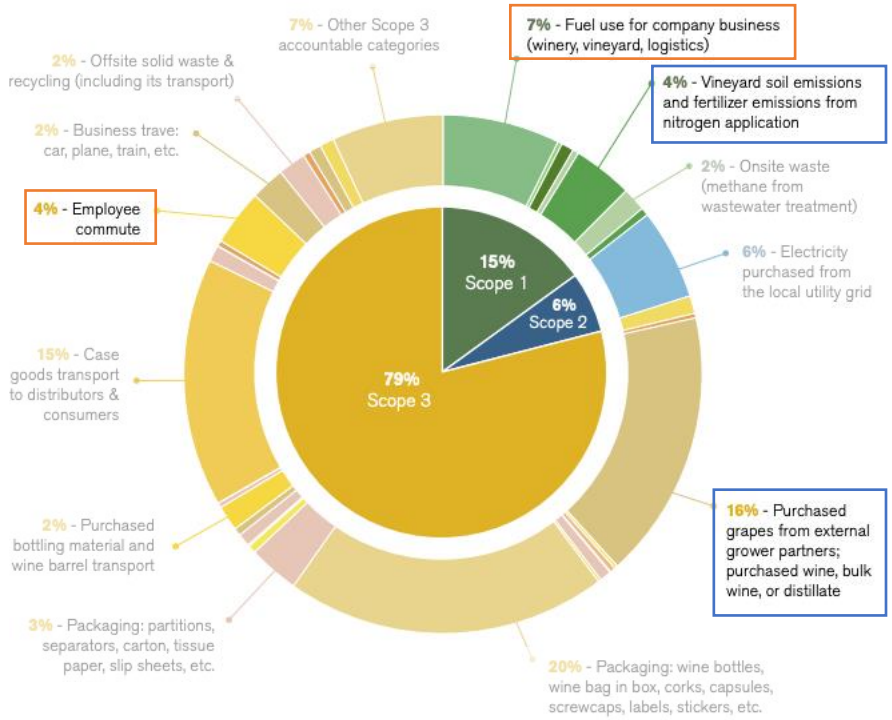
Starting in the middle of the night, the fires hopscotched across neighborhoods, raced across fields and jumped freeways. Wind gusts up to 70 mph pushed walls of flames nearly 100 feet high, throwing embers



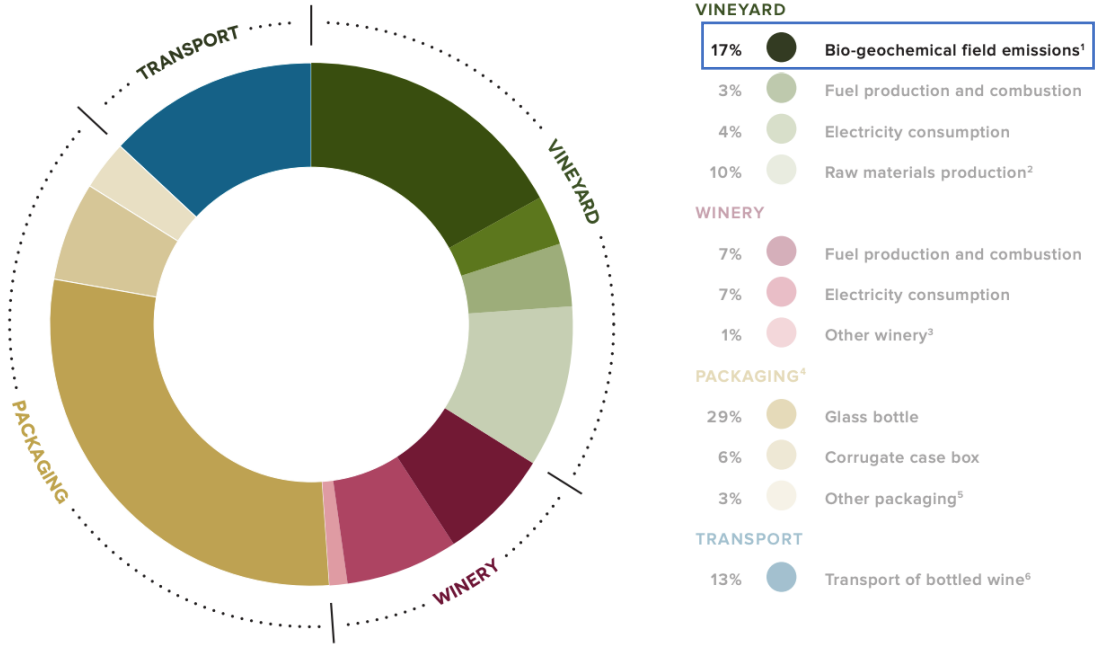


Graphics: Li, S., Banerjee, T. Spatial and temporal pattern of wildfires in California from 2000 to 2019. Sci Rep 11, 8779 (2021).

We all own climate change, in our own ways



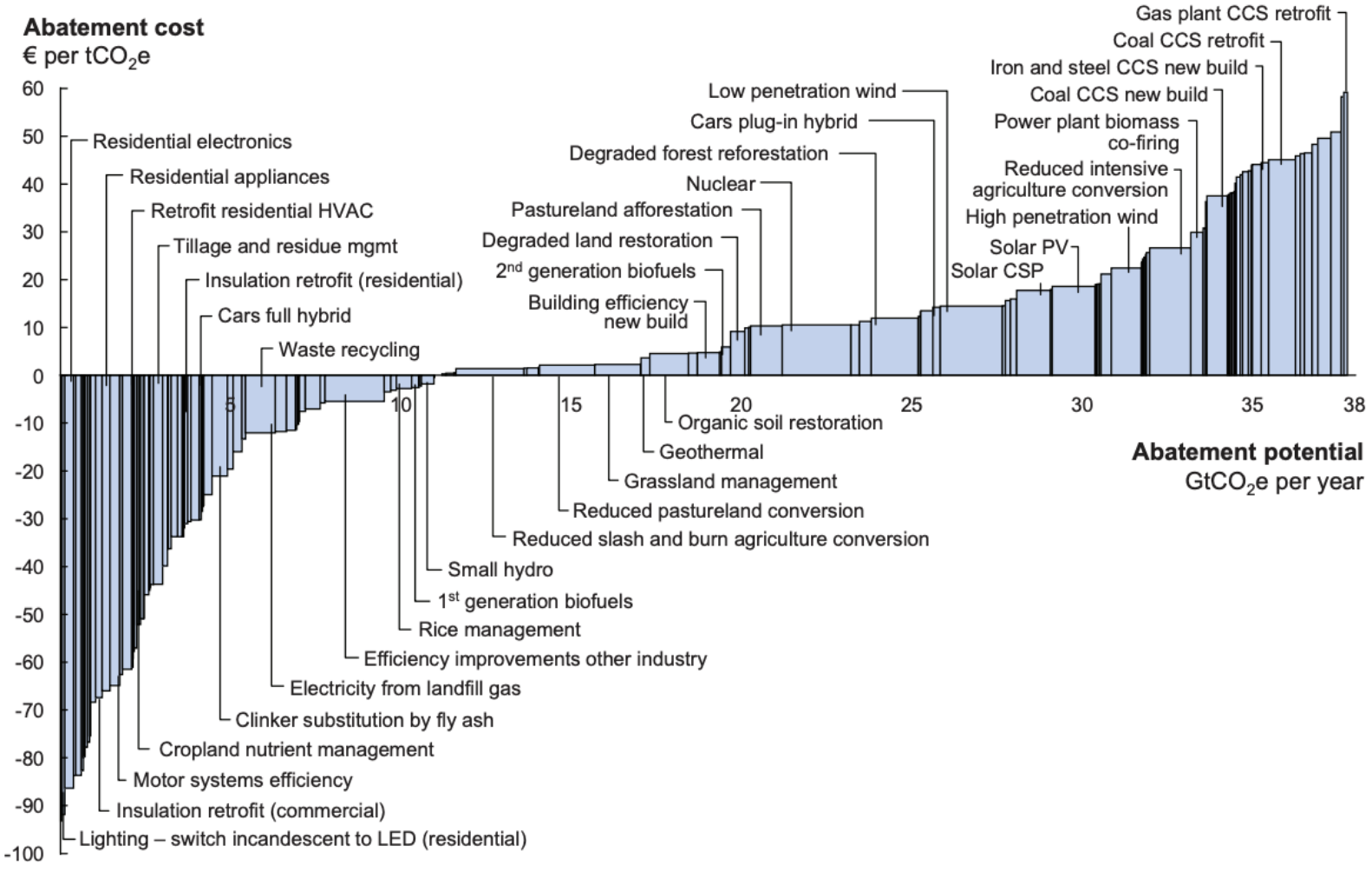
International Wineries for Climate Action
2023



California Sustainable Wine Alliance
2013

Graphics: IWCA, "Greenhouse Gas Emissions (GH) 'Hotspots'" & CSWA, "California Wine's Carbon Footprint"

There are some easy changes, many will be hard



Note: The curve presents an estimate of the maximum potential of all technical GHG abatement measures below €60 per tCO_2e if each lever was pursued aggressively. It is not a forecast of what role different abatement measures and technologies will play.

Pathways to a Low-Carbon Economy, Version 2 of the Global Greenhouse Gas Abatement Cost Curve, McKinsey & Company

Start with the “Easy Stuff”

Keep it **green** - Leave trees, no ecosystem degradation, no bare soils

Source **renewable energy** - MCE’s Deep Green

PG&E's Solar Choice, Renewable Choice

Avoid single-use plastics - AND biofuels, bioplastics

Compost - aerobic CO2 vs. anaerobic CH4

Focus on what’s **impactful** - not off-sets, look at the math

Master the easy, then tackle the culturally entrenched

Use less fossil - gasoline, diesel fuel, propane, natural gas

Electrify everything - HOW you work, how you GET to work, suppliers

Apply bare **minimum nitrogen** - organic AND conventional
remember your cover crops

Keep it **green** - no bare soils

Think outside the "four corners" of your land

Focus on what's **impactful** - do the math

Focus on what's impactful – SOIL MATH

ELSEVIER

Journal of Cleaner Production

Volume 290, 25 March 2021, 125736

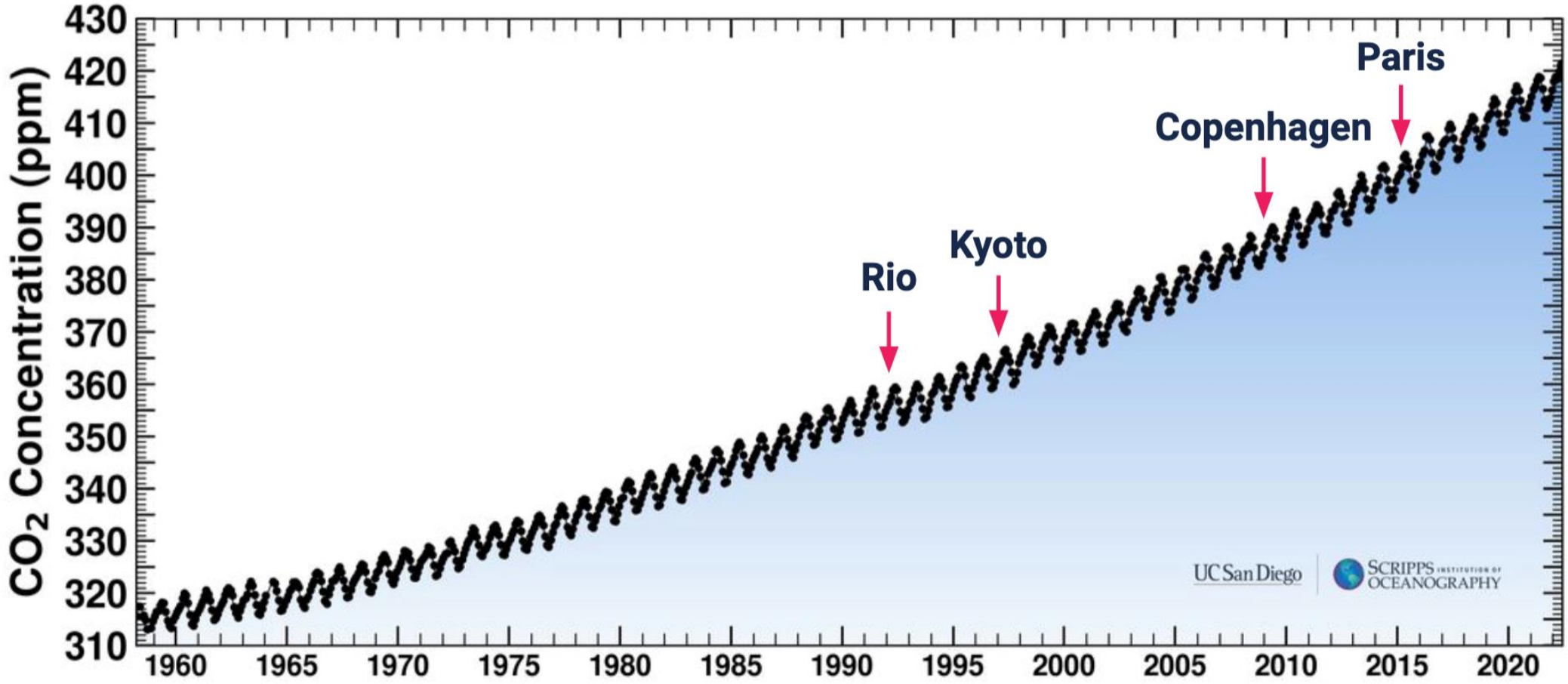
Review

Soil organic carbon sequestration rates in vineyard agroecosystems under different soil management practices: A meta-analysis

Florian Thomas Payen [a b], Alasdair Sykes [a], Matt Aitkenhead [c], Peter Alexander [b d], Dominic Moran [d], Michael MacLeod [a]

Photo: Soilscape Solutions Biochar

Enough waiting around for others to take the lead



Keeling Curve, Scripps Institution for Oceanography, UC San Diego

When solving problems…

DIG AT THE ROOTS

Reduce your climate impact – THE EXTENSIVE LIST:

1. Use less fossil energy: gasoline, diesel fuel, propane, natural gas
2. No tree removal or other ecosystem degradation
3. Let as much biomass grow on your land as you can – no bare soil
4. Go 100% solar and wind for your electricity (MCE's Deep Green or PG&E's Solar Choice or Renewable Choice)
5. Electrify absolutely everything you can…
6. …including how you and your crew do your work
7. …including how you and your crew get to job sites…
8. …same goes for pressuring your suppliers and service providers
9. Reduce nitrogen applications to the bare, bare minimum, including manure if not organic
10. If you grow nitrogen-fixing plants – legumes, clover – you are just adding to the N_2O released from your land unless you also reduce synthetic fertilizer use
11. Avoid the use of biofuels and bioplastics – they generally have a higher climate impact than conventional alternatives
12. Reduce the use of one-time-use plastics to the absolute minimum / re-use what you can
13. Nothing biodegradable should go to the landfill or be buried or piled up – you want biomass to go to CO_2, not CH_4
14. Discontinue things that are inconsequential for your climate impact - like trying to offset your emissions
15. Think outside the "four corners" of your land: it is just as consequential to reduce climate impact outside work, too.
16. There are a lot of "home remedy" distractions out there – ignore them unless you are shown the math
17. More…