



**A Sustainable Future? Or A Future to  
Survive?:  
Stories from the Frontlines of Climate  
Change and Plans For Brewing Under Duress**



**UNITED WE BREW™**

# What is brewing under duress?



# Key Areas of Interest within a Vast Topic

## **Environmental Health + Safety**

- Preparedness plans, incl. drills and communication systems
- Novel vs. known risks
- EHS staffing

## **Operational Issues**

- Maintaining operations during/after a major climate event
- Support networks for staff
- Brewery as community resource
- Indirect impacts to operations (e.g. supply chain)

## **Engineering Controls + Infrastructure/Risk Mitigation**

- Technologies and infrastructure to manage extreme weather
- Auxiliary power
- Rebuilding after a natural disaster

## **Personal Stories and Anecdotes**





# Stability Amidst Global Uncertainty

**Making The Brewery a Safe Haven**

**Ryan Dunnivant  
Canarchy Craft Brewery Collective**



**UNITED WE BREW™**

# Entropy

“The increase of disorder or entropy is what distinguishes the past from the future, giving a direction to time.”

– Steven Hawking, A Brief History of Time

Why does this seem relevant?



# You Never Know...



Photo: Jessy Ellenberger, AP



Photo: Montinique Monro, Getty Images / austin.culturemap.com

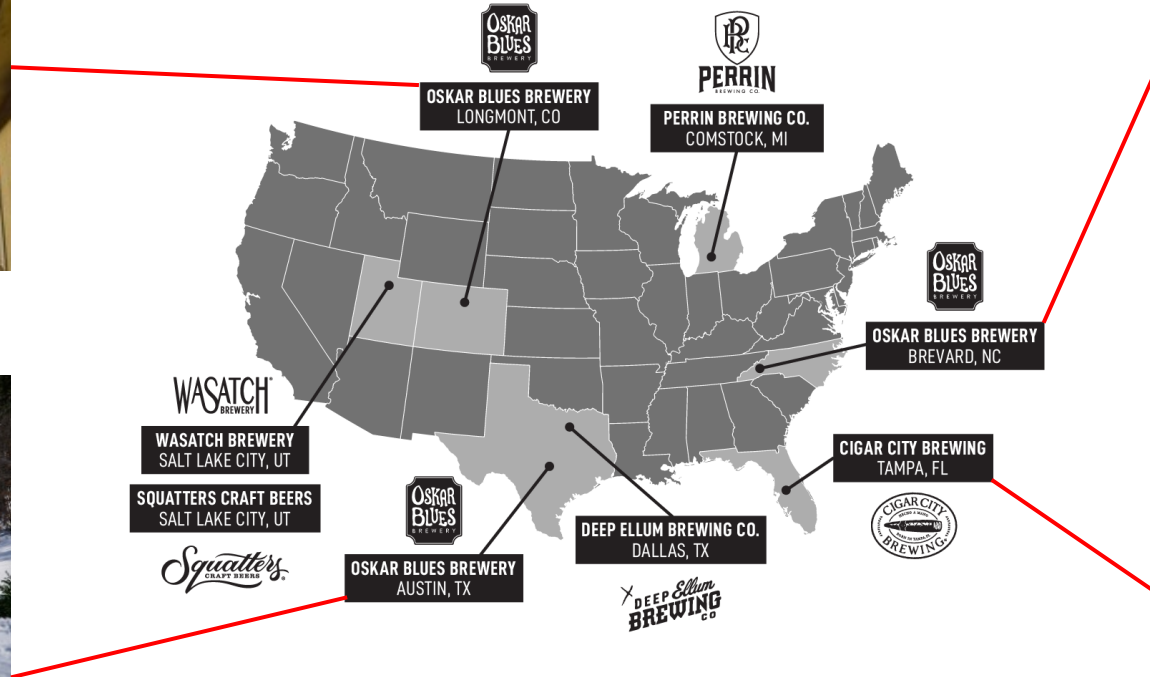


Photo: @Brevard\_Tennis



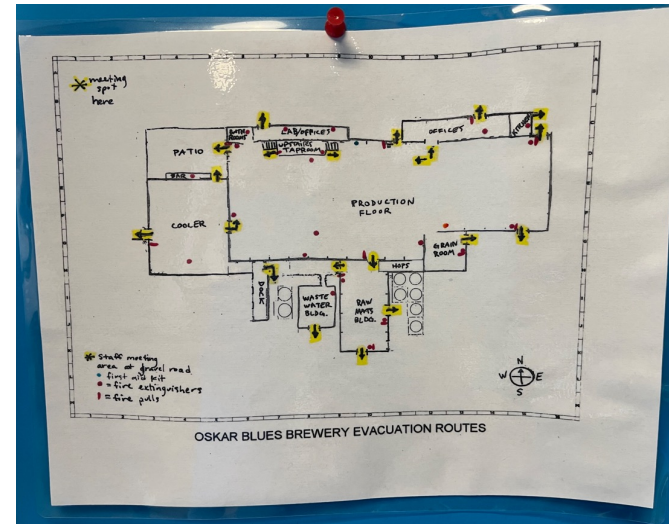
Photo: Luis Santana, Tampa Bay Times



How can we provide our employees with support and an element of certainty?

# Culture of Safety First

- Emergency Action Plans
  - Prepare for any potential emergencies
    - Clear responsibilities and checklists
      - Rapid equipment shutdowns
      - Evacuation oversight
      - Emergency services notifications
    - Education and training
    - Accessible documentation
  - Repeat, ANY potential emergencies...
    - Natural disaster (fire, hurricane, earthquake, etc.)
    - Active shooter(s), robbery, rioting
    - Medical (heat stroke, heavy bleeding, overdose, etc.)
    - Catastrophic equipment failure



SIGNS OF HEAT EXHAUSTION	SIGNS OF HEAT STROKE
Mild headache, lightheadedness	Throbbing headache, confusion, seizure, irritability, or altered/loss of consciousness
Cool, pale skin (heavy sweating)	Oral body temperature of 104°F and above; dry mouth
Nausea, vomiting	Hot skin
Muscle cramps, fatigue, weakness	Nausea, vomiting

Many signs of heat exhaustion can overlap with signs of heat stroke. When in doubt, call 9-1-1.

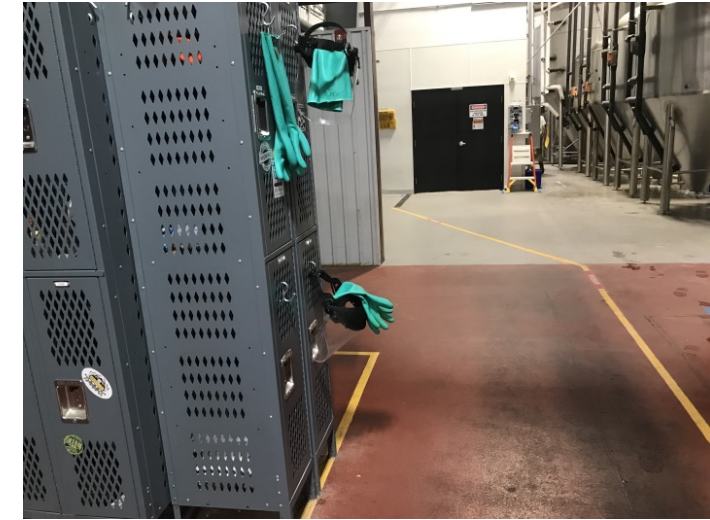
**WHAT TO DO**  
MOVE to a cooler place  
COOL with ice/cold water and lay down  
DRINK cool water or sports drinks  
CALL 9-1-1 if symptoms last longer than 1 hour

**WHAT TO DO**  
CALL 9-1-1 IMMEDIATELY  
MOVE the affected person to the shade or cooler place  
COOL the affected person with immersion in cool water or by placing ice packs on the neck and groin areas



# Culture of Safety First

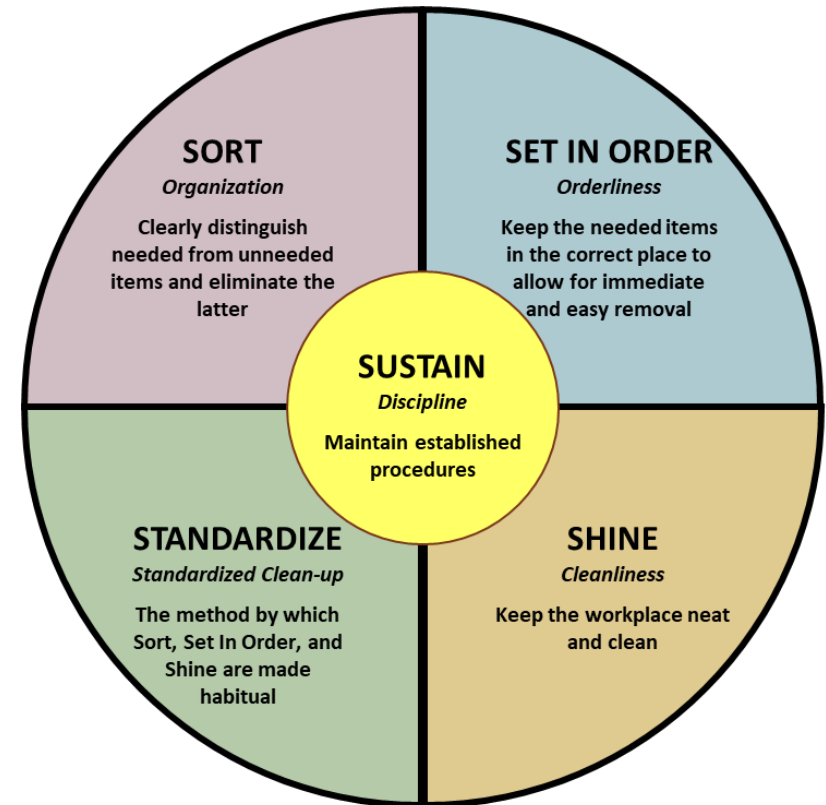
- Create Predictability
  - PPE
    - Clear, unquestionable protocols
    - Maintain supplies
    - Make it routine
  - Air Quality
    - CO2, particulate, etc.
  - Labeling and documentation
    - Confined space, hazardous chemicals, etc.
  - Organization...





# 5S

- The 5 Pillars of the Visual Workplace
  - Seiri = Sort
  - Seiton = Set in Order
  - Seiso = Shine
  - Seiketsu = Standardize
  - Shitsuke = Sustain
- 5S & Lean Manufacturing
  - Foundation of most Lean improvement tools
  - Process for DAILY cleaning, organization, and maintenance across the facility



# 5S

- WHY

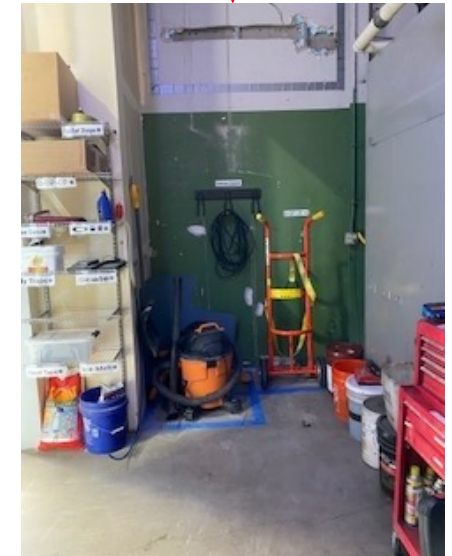
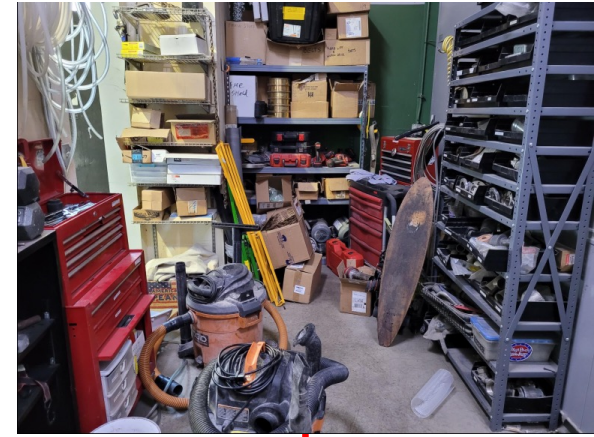
- Improve the quality of working conditions

- Safety
- Efficiency
- Equipment reliability
- Product quality
- Protect IP and confidentiality

- Reduce

- Accidents and injuries
- Equipment breakdowns
- Unacceptable and/or unsafe facility conditions
- Waste of materials and resources
- Time lost on non-value activities
- Employee dissatisfaction and frustration

BEFORE



AFTER

# Logistics

- Changes are inevitable

- Factors

- Shifting consumer preferences
- Proliferation of brands and products
- Inflation\*
- Supply Chain\*
- Staffing shortages\*

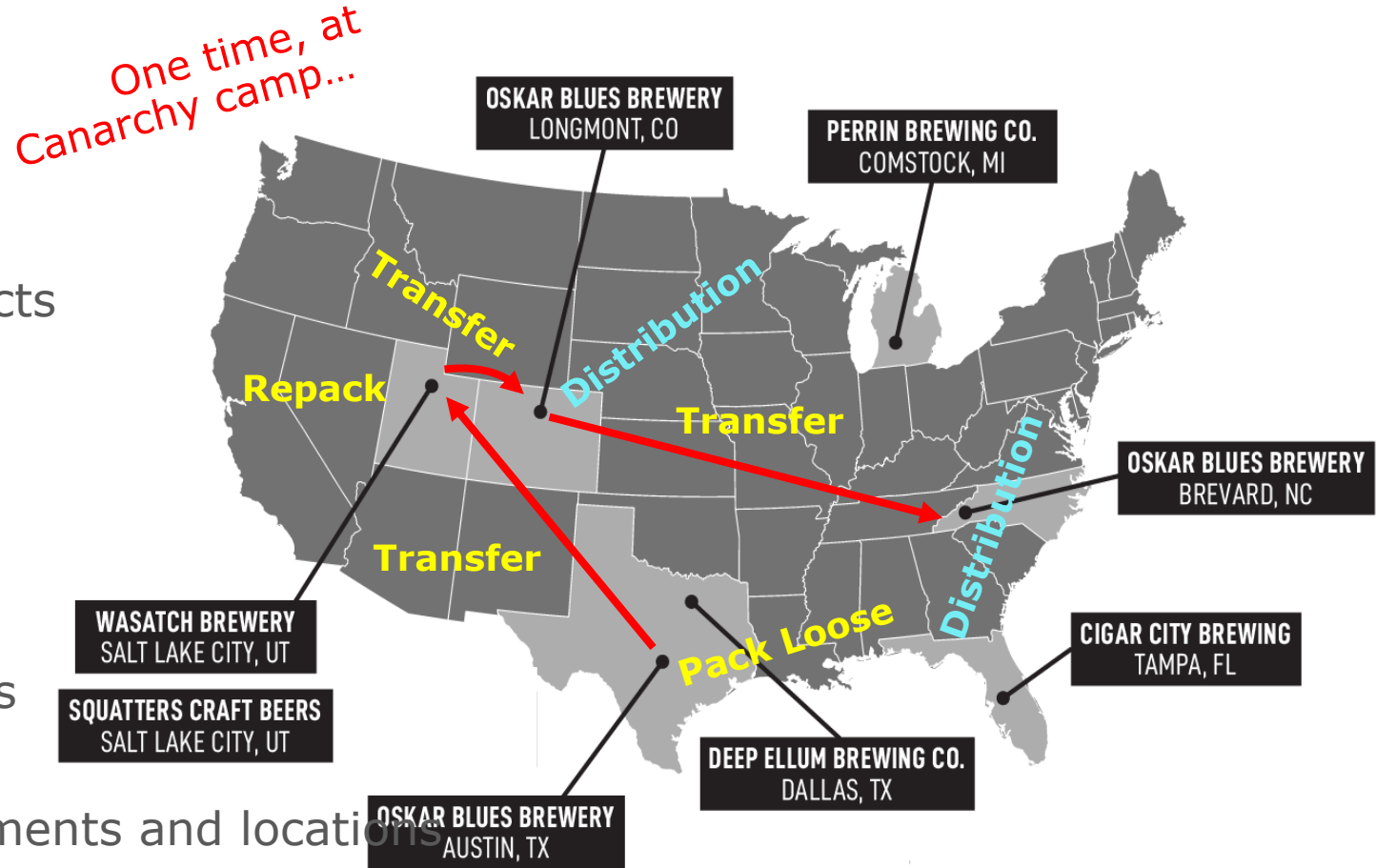
*\*More on these later...*

- Consequences

- Order changes
- Inefficient demand:capacity ratios

- COMMUNICATION

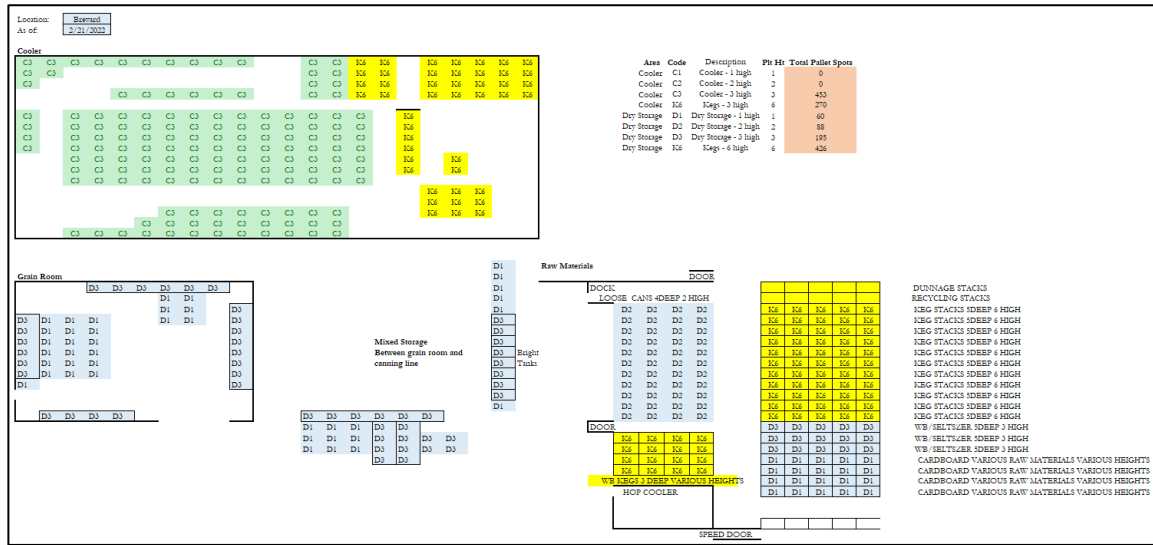
- Must be facilitated across departments and locations



# Logistics - Communication Tools

- Warehouse Analyses
  - Maps
  - Inventory assumptions
  - Conditional calculations

- Warehouse Capacity
  - Inventory reports
  - MRP imports
  - Capacity calculations



**Brevard**

	Dry Storage	Keg Dry	Cooler Storag	Keg Cool
Total	343.00	426	453.00	270
Current Need	399.20	119.10	468.61	245.88
Available	-56.20	306.90	-15.61	24.13

Inventory Date 5/17/2022

Item Group	Units in Inventory	Bottles	800 ml	750 ml	1L	12 oz - Standard	2 oz - Steel	16 oz	19.2 oz	20L	30L	15.5	5.2	
FG Beer: Bottled	-	-	-	-	11.85	-	-	-	-	-	-	-	-	Cooler
FG: NA Beverages	1,043	-	-	-	-	-	-	-	-	-	-	-	-	Cooler
FG Beer: Canned	45,816	-	-	-	-	392.25	-	4.40	24.14	-	-	-	-	Cooler
FG Beer: Kegged	2,933	-	-	-	-	-	-	-	-	-	-	165.38	80.50	Cooler
FG FMB: Canned	5,048	-	-	-	-	19.88	24.96	-	-	-	-	-	-	Dry Storage
FG FMB: Kegged	51	-	-	-	-	-	-	-	-	-	-	3.88	1.00	Dry Storage
PG: Packaging	2,116,621	-	-	-	-	68.27	-	3.66	6.84	-	-	-	-	Dry Storage
PG: Microstic Keg	2,013	-	-	-	-	-	-	-	-	-	-	30.75	88.35	Dry Storage

Item Group	Units in Inventory	Lids	Pak-Tech	Tray	Keg Cap	Keg Collar	Other Units	
PG: Packaging	2,116,621	2.07	0.05	31.00	1.32	NA	NA	<Other - Glue, Hand Wrap, Machine Wrap, Ink/Makeup
Paperboard	307,406	4-12's	6-12's	6-12's Sleek	12-12's	12-12's Sleek	15-12's	Dry Storage
Paperboard	307,406	0.00	14.57	14.57	32.18	0	4.00	Dry Storage

Item Group	Units in Inventory			
Sugar	1,950	0.98	Dry Storage	Assumes 2000 lbs/pallet
R.M. Barrels	-	NA	Dry Storage	Not competing for dry storage space
R.M. Chemicals	590,290	NA	Dry Storage	Chemstation and in house equipment
R.M. Flavonings	473	NA	Dry Storage	Flavours sizes vary and are unknown
R.M. Gases	114,331	NA	Dry Storage	
R.M. Hops	39,562	35.97	Cooler	Hop 3 high pallets are 1100 lbs - 44 boxes @ 25lbs/box
R.M. Malt	140,051	63.66	Dry Storage	Malt 1 high Pallets 2000-2200 lbs, bags & totes, usually, some pallets of bags were 2750 (50/55#), most 40/50#, 39/50#
R.M. Other	-	NA	Dry Storage	
R.M. Process Aids	63,958	NA	Dry Storage	
R.M. Yeast	33,741	NA	Dry Storage	Yeast is consumed quickly - no pallet spots

Silos need to become their own warehouse  
I'm not accounting for any Malts on pallets (bags)  
Does not account for partial pallets of each gain



# Logistics - Communication Tools

- Warehouse Capacity Reports

- Current

- “As-Is” report
- Dependent on Inventory in Warehouse data
- Are we utilizing space to its full potential?

- Future

- Dependent on MRP data
- Utilize for planning

- Visibility and Flexibility

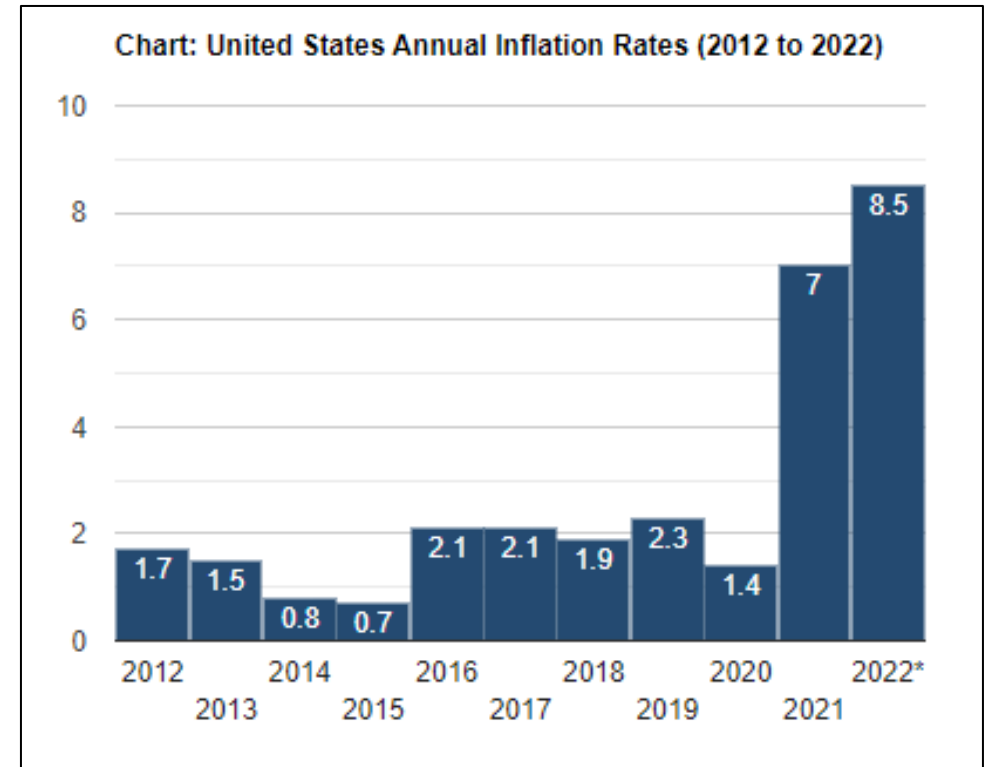
- Control what you can control
- *As for what you can't...*

	Inventory Date: 5/17/2022									
	AU	BV	Ecusta	DL	Madison	GR	LM	SL	TP	CANarchy
<b>Dry Storage</b>										
Available Pallet Spots	600.00	769.00	1,917.00	65.00	390.00	259.00	1,840.00	294.00	597.00	6,731.00
DG Pallets	256.57	399.20	1140.53	75.82	206.26	158.03	590.93	219.88	156.19	3203.41
Empty Kegs	144.08	119.10	NA	179.60	NA	70.00	252.40	283.33	220.18	1268.68
FG Seltzer	21.37	49.72	28.00	1.20	3.40	4.92	240.79	36.17	0.26	385.82
% Capacity	42.8%	67.4%	59.5%	116.6%	52.9%	61.0%	45.2%	74.8%	63.0%	66.4%
<b>Cooler Storage</b>										
Available Pallet Spots	194.00	723.00	966.00	59.00	493.00	393.00	737.00	556.00	360.00	4,481.00
FG Pallets	56.77	468.61	198.51	30.32	64.04	90.01	530.71	225.40	88.67	1753.03
Kegs Palletized	50.58	245.88	NA	36.13	66.90	171.75	145.95	218.00	88.98	1024.16
% Capacity	55.3%	98.8%	20.5%	112.6%	26.6%	66.6%	91.8%	79.7%	49.3%	62.0%



# Inflation & Supply Chain

- More than meets the eye...
  - COVID lockdowns
  - Reduced manufacturing
  - Exponential ramp in demand
  - Just as importantly...CLIMATE CHANGE!

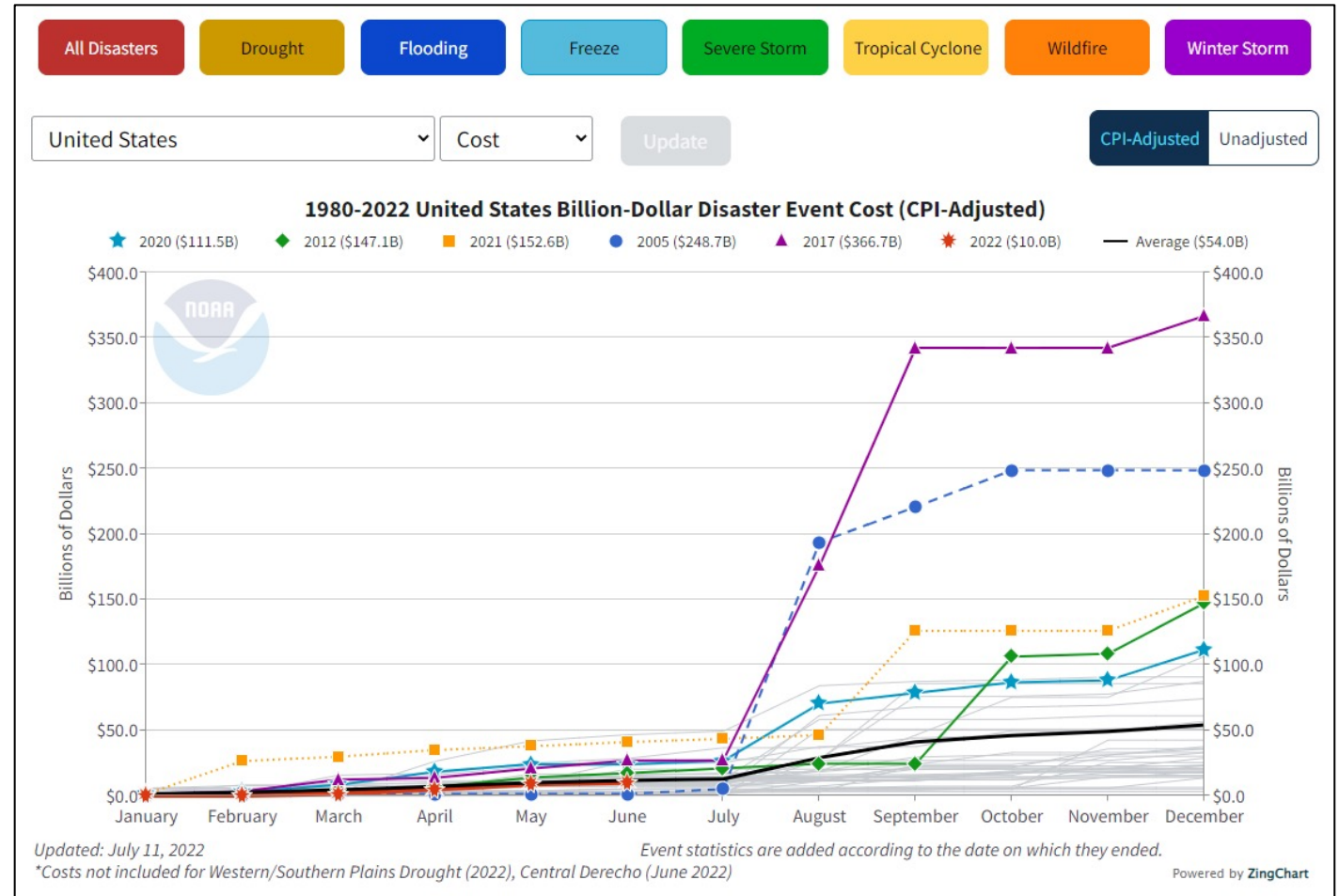


[Current US Inflation Rates: 2000-2022 | US Inflation Calculator](#)



# Inflation & Supply Chain

- Climate Disasters
  - More and more frequent
  - Examples of captured costs
    - Physical damage, asset loss
    - Time element loss
    - Damaged infrastructure
  - Examples of uncaptured costs
    - Environmental degradation
    - Healthcare
    - Disrupted supply chains
    - *Contingent business interruption*



[Billion-Dollar Weather and Climate Disasters | National Centers for Environmental Information \(NCEI\) \(noaa.gov\)](https://www.noaa.gov/education/outreach-and-engagement/education-products/lesson-plans/billion-dollar-weather-and-climate-disasters)



# Inflation & Supply Chain

- Transportation
  - Catastrophic weather disasters
  - Deteriorating roads and infrastructure
  - Rising fuel prices
  - Aging fleets
  - Driver shortages
- Product & Material Availability
  - Material shortages, cost increases
  - Extended lead times
  - Volatile markets
  - Limited expertise

**GLOBAL SUPPLY CHAINS  
ARE INTERDEPENDENT!**



You can't catch me, I'm the Powerflex Man!

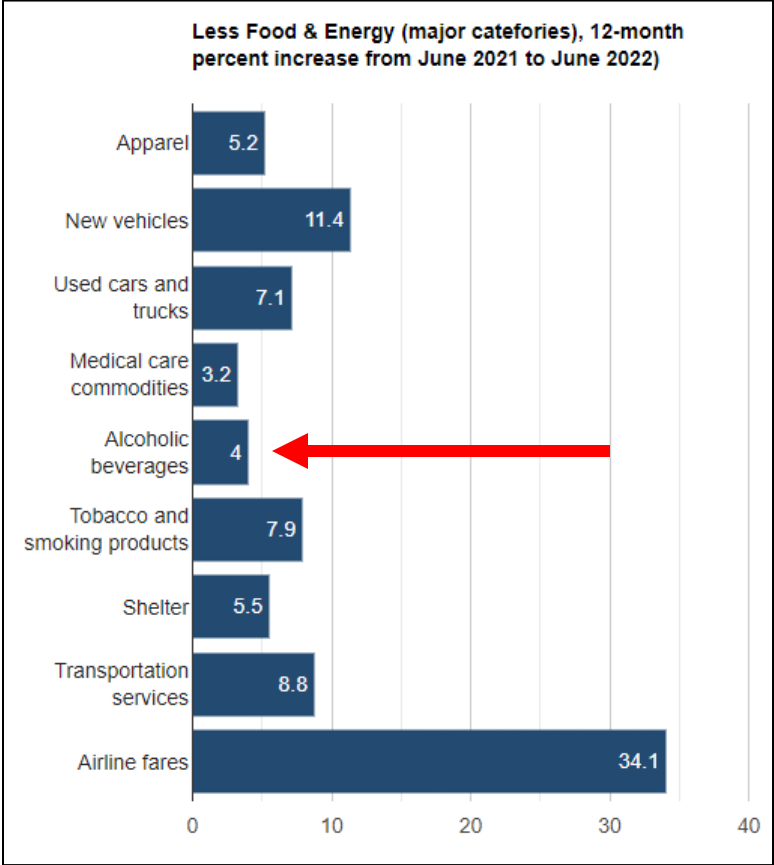
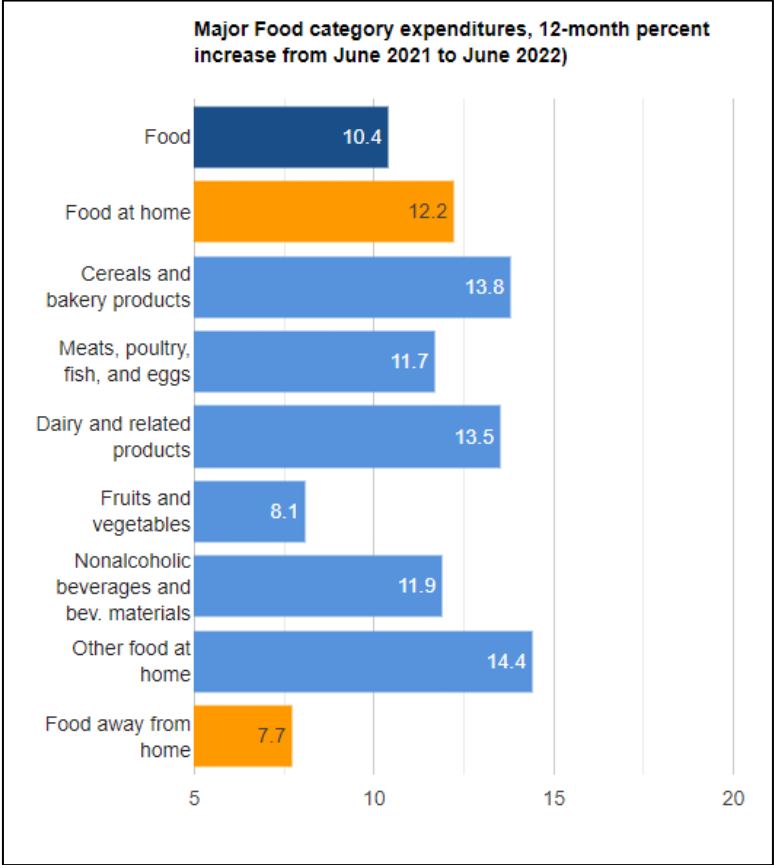
If only CO2 were this readily available...





# Inflation & Supply Chain

- Alcohol is a luxury...

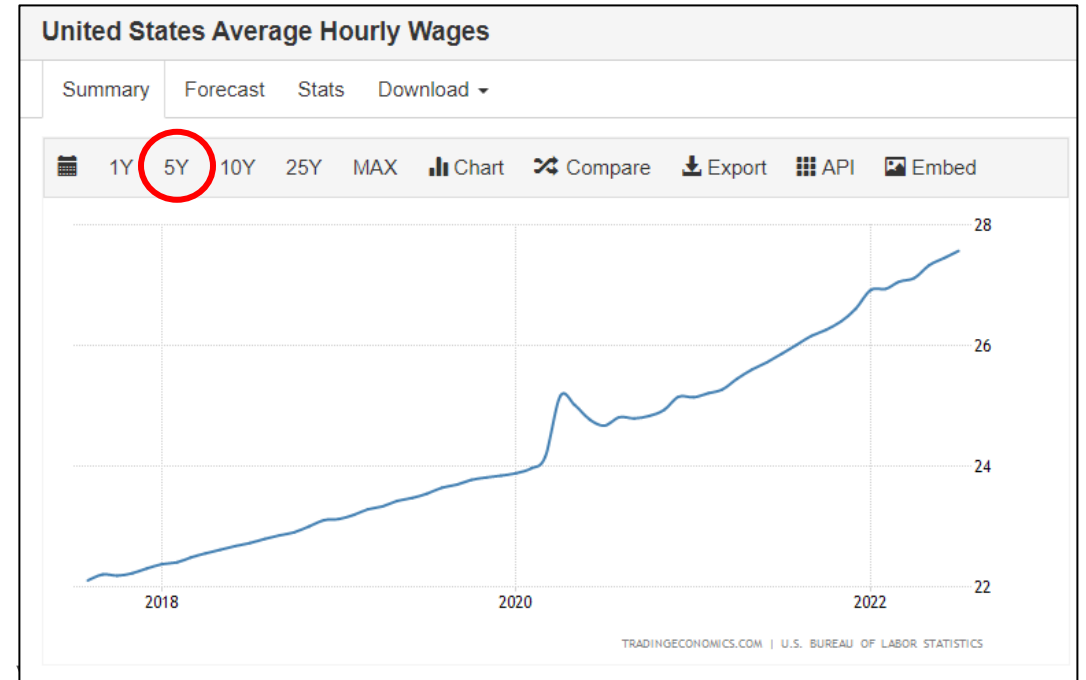
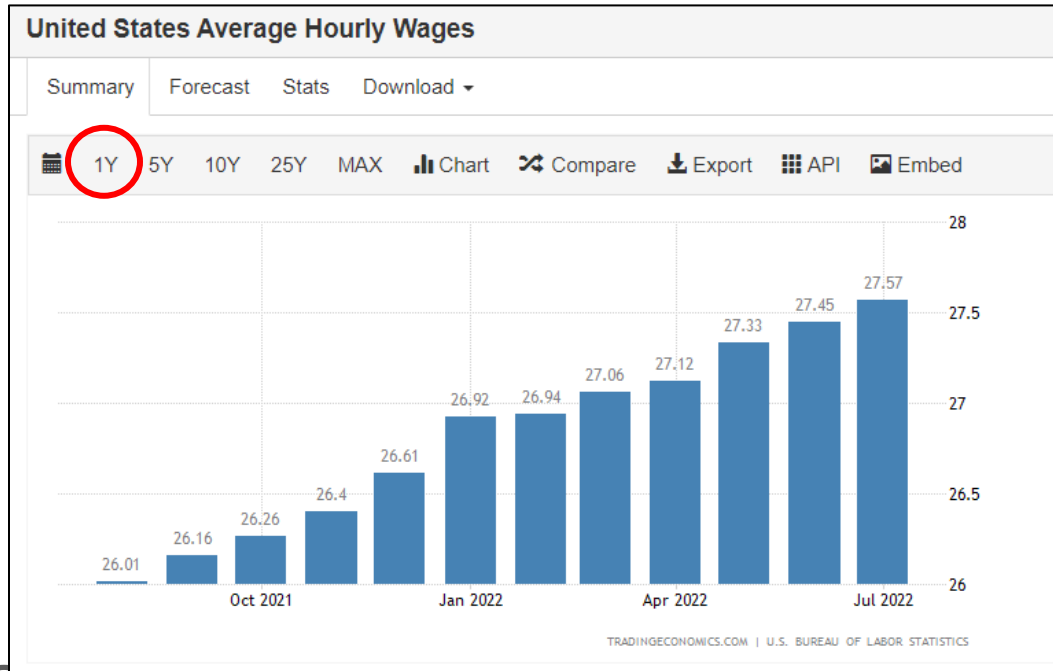


[U.S. Inflation Near 41-Year High as CPI Hits 9.1% in June | US Inflation Calculator](#)



# Workforce

- Competition is fierce



- Pay matters, but are you challenging your employees lives?

[United States Average Hourly Wages - July 2022 Data - 1964-2021 Historical \(tradingeconomics.com\)](https://tradingeconomics.com)



# Employee Support

- Incivility promotes:
  - Harassment
  - Intimidation, bullying, fear
  - Discrimination, judgment
  - Inaccessibility, isolation
  - Disengagement, mindlessness
  - Violence
- Civility promotes:
  - Assistance, facilitation
  - Group think, confidence
  - Open-mindedness, compassion
  - Friendliness, connection
  - Engagement, awareness
  - Creativity



# Employee Support

## OSKAR BLUES BREWERY

<b>P</b> PASSION	<p>Constant Learning, Improvement, and Knowledge Sharing Ownership, Confidence, and Dedication Have Fun! Energy is Contagious!</p>
<b>R</b> RESPECT	<p>Mutual Respect and Appreciation Teamwork, Interdependence, and Collaboration Trust, Transparency, and Safe Space</p>
<b>I</b> INTEGRITY	<p>Highest Quality Products, Practices, and Materials Dignity, Accountability, Dependability Stewardship of Our People, Products, Culture, and the Environment</p>
<b>D</b> DISCIPLINE	<p>Safety and Adherence to 5S Cleanliness and Organization Focus, Preparation, and Adaptability</p>
<b>E</b> EMPOWER	<p>Effective Communication Active and Engaged Leadership Proactive Training and Maintenance</p>








<b>P</b> PASION	<p>Constantemente aprender, Improvisar, compartir el conocimiento Coinfidencia y dedicacion Estar alegres! La energia es contagiosa!</p>
<b>R</b> RESPETA	<p>Respeto mutuo y aprecio Trabajo en equipo, interdependencia y colaboracion Crear, transparencia y lugares seguros</p>
<b>I</b> INTEGRIDAD	<p>Productos de alta calidad, practicas y materiales Dignidad, responsabilidad y confiabilidad Administracion de nuestra gente, productos, cultura y medio ambiente</p>
<b>D</b> DISCIPLINA	<p>Seguridad y cumplimiento al 5S Limpieza y organization Enfoque, preparacion y adaptabilidad</p>
<b>E</b> EMPODERAMIENTO	<p>Comunicacion efectiva Liderazgo activo y comprometido capacitacion y mantenimiento proactivos</p>



# Community Engagement

- Your platform
  - Be a positive force
  - Sustainability
  - Participation
  - JEDI
- Climate POLICY
  - Solutions require policy
  - Support the vote
  - Embody positive change



 **Oskar Blues Brewery (Austin Taproom)** ...  
Feb 19, 2021 · 🌐

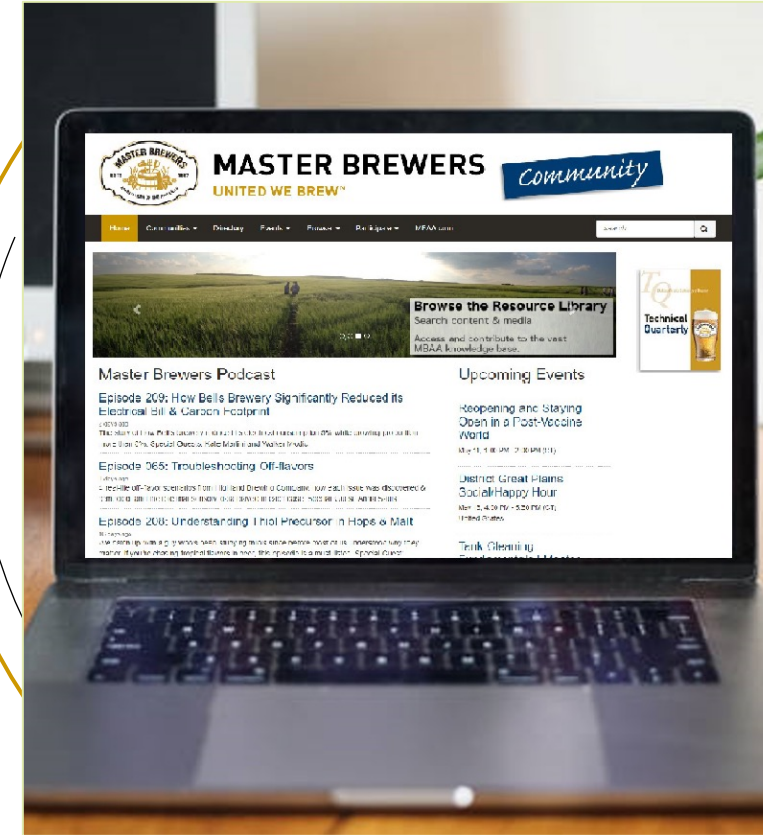
**!!** We've got clean fresh water at Oskar Blues Brewery in Austin. If you or anyone you know needs water in North Austin, please send them to us this Saturday and Sunday, 12-5pm. **!!**

- Masks required at all times.
- Bring clean containers to fill with fresh water – please take only what you need and help others by delivering to them.
- Please only bring containers you can carry yourself.
- Head to the North side of the building, toward the grain silos. Our brewers will help fill your containers near our loading dock.
- No charge, no registration. If you need water, we'll help you get clean delicious water.



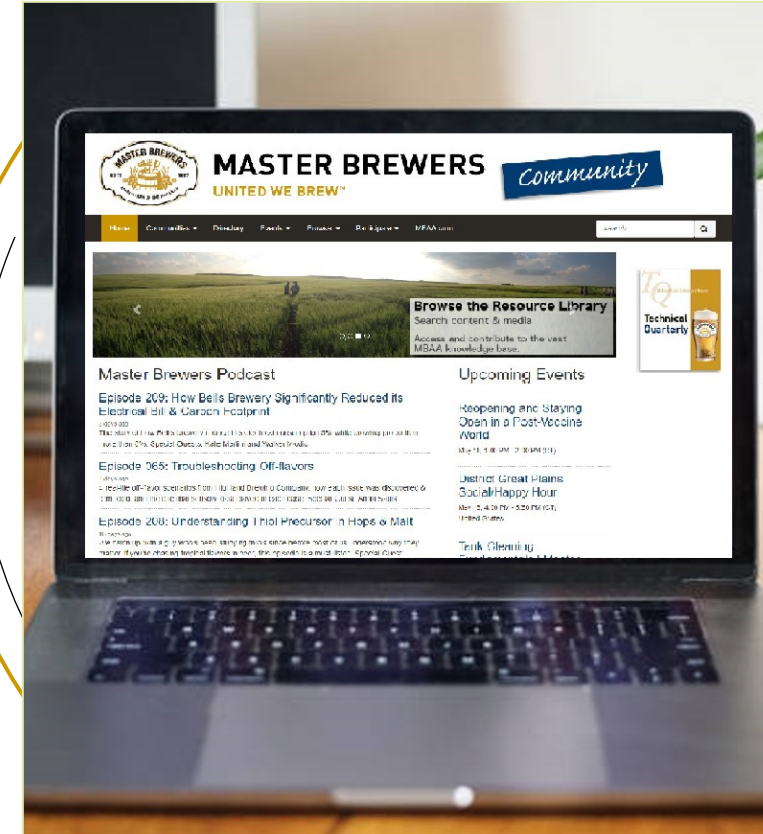
# Resources & Sources

- National Centers for Environmental Information
  - <https://www.ncei.noaa.gov/access/billions/>
- U.S. Inflation Calculator
  - <https://www.usinflationcalculator.com/inflation/current-inflation-rates/>
- Trading Economics, U.S. Bureau of Labor Statistics
  - <https://tradingeconomics.com/>
- U.S. Bureau of Labor Statistics
  - <https://www.bls.gov/>
- Can'd Aid
  - <https://candaid.org/>



# Acknowledgements

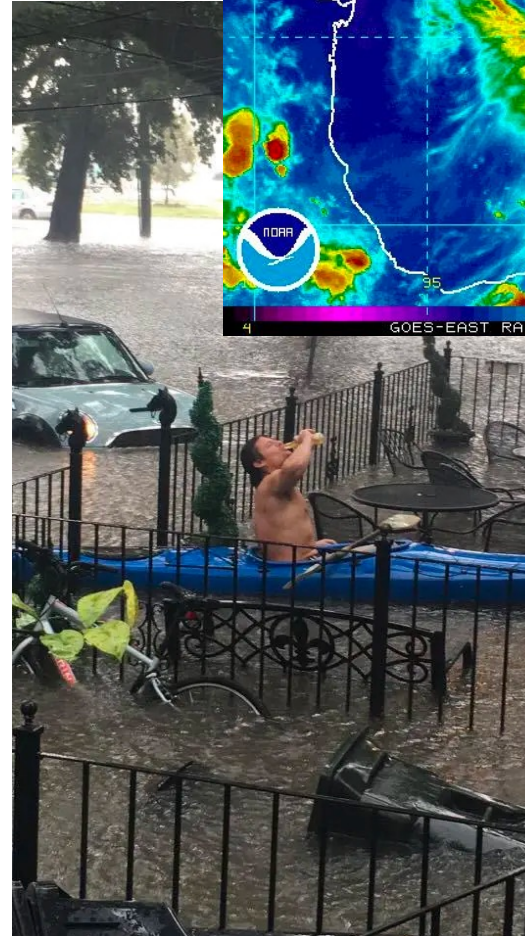
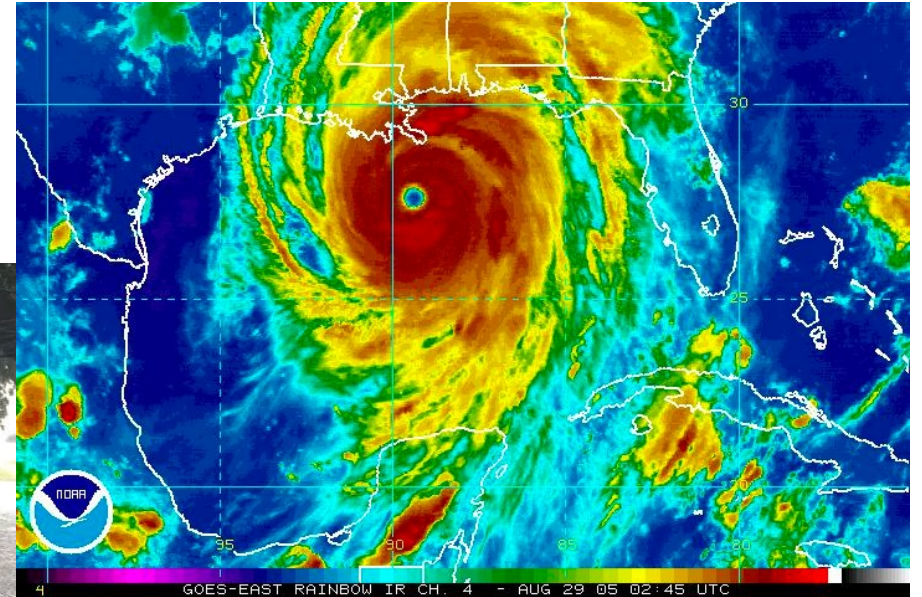
- Jon Lee, Canarchy VP Brewing Operations – West
  - Rachel Bell, Canarchy Safety Specialist
  - Keith Moszczenski, FS180 Consulting
  - Canarchy Production, Analytics, and Quality teams
- 
- MBAA
  - ASBC
  - You!



# Brewing On The Gulf Coast

**Operating a brewery at the mouth of the Mississippi River amongst hurricanes and flooding**

**Eric Jensen  
Owner/Head Brewer  
Parleaux Beer Lab  
New Orleans, LA**





# Recent Hurricanes Impacting SE Louisiana

## Category 1

- July 5, 2005: **Cindy**
- Sept. 13, 2007: **Humberto**
- Sept. 13, 2008: **Ike**
- Aug. 28-29, 2012: **Isaac**
- Oct. 8, 2017: **Nate**
- July 13, 2019: **Barry**



## Category 2

- Sept. 1, 2008: **Gustav**
- Oct. 9, 2021: **Delta**

## Category 3

- Aug. 29, 2005: **Katrina**
- Sept. 24, 2005: **Rita**
- Oct. 28, 2020: **Zeta**

## Category 4

- Aug. 27, 2020: **Laura**
- Aug. 29, 2021: **Ida**



# SUMMER FLOODING

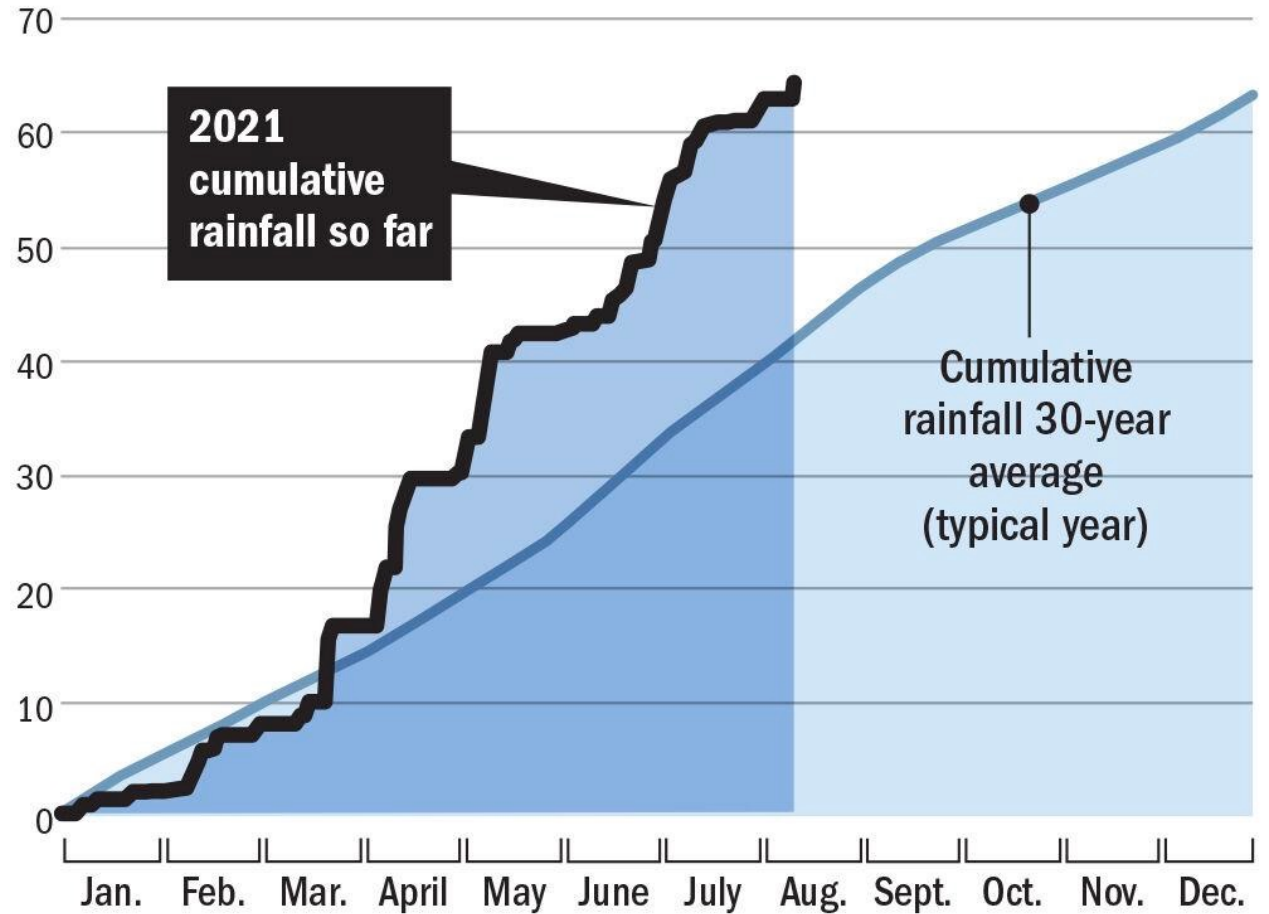
- NOLA's One of Highest Rainfall Totals in US
- Flash Flooding Common



# Rainfall 2021

2021 New Orleans had 86 inches of Rain  
(Average Annual Rainfall is 68 inches)

## Rainfall in New Orleans IN INCHES



Source: Louisiana Office of State Climatology

Staff graphic



# Impacts on Community

- Loss of Utilities
- Roads Impassable
- City Services Limited
- Health Services Limited
- Schools Shut Down
- Community Trauma



# MANAGING BREWERY OPERATIONS DURING A CLIMATE EVENT

## Written Emergency Operation Plan (Hurricane Plan)

- Checklist to prepare for a Climate Event
- Operational
- Human Resource
- Production Plan
- Communication Plan
- Business Interruption Plan



## 5 THINGS YOU MUST DO To Prepare For a HURRICANE



# Before The Climate Event

- Staff communication/evacuation plan activated
  - Where is staff going
  - How will you communicate during evacuation & how often
- Communicate with neighboring business/residents
- Staff response, who will return first and when
- Secure property including packing essential financial/legal docs, and other items such as computers
- Activate Production Plan:
  - Plan for no power
  - Crash tanks
  - Secure walk In coolers
  - Prep raw ingredients
  - Fill CLT and HLT full
  - Power plan post event

# During an Event



- Monitor local news and emergency outlets
- Stay in active communication with staff (and loved ones)
- Stay calm
- Prepare for response

# After an Event



- First response staff returns when safe
- Assess property and state of production
- Call relevant insurance companies
- Prepare for no power, utilities, city services for weeks
- Monitor and be aware of social and emotional support services that may be required
- If safe, open brewery to community as a place to gather, get fresh water, for emergency services to mobilize



# MITIGATION AND MOVING FORWARD

- Building to hurricane code
- Installing more solar and alternative energy
- Working with city/state on climate related improvement initiatives
- Working with local city and state services on partnerships to make the brewery an emergency response space



# Resources

- <https://www.fema.gov/emergency-managers/national-preparedness/plan>
- [ready.nola.gov](https://ready.nola.gov)
- <https://www.sba.gov/sites/default/files/2020-09/HurricanePreparednessSBA.pdf>
- <https://www.redcross.org/get-help/how-to-prepare-for-emergencies/types-of-emergencies/hurricane.html>



# Fire Does Not Discriminate

Experiences, Stories, & Insights  
from the 2017 – 2020  
Northern California Fire Season

Vinnie Cilurzo  
Russian River  
Brewing Company



# 2017: Tubbs Fire

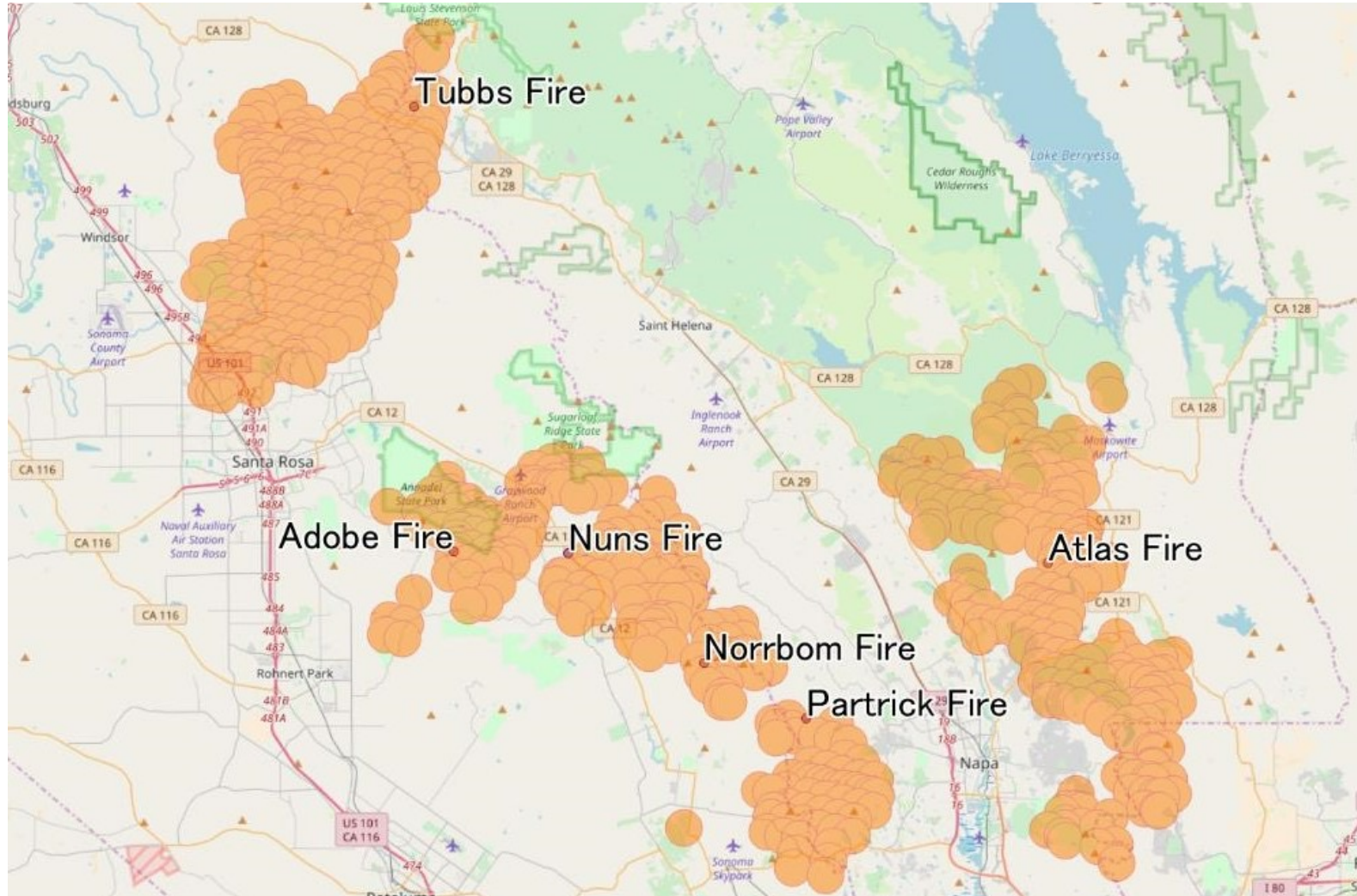


# 2017: Tubbs Fire

- Details
  - Start Date: October 8, 2017
  - Date Contained: October 31, 2017
  - Total Days: 23
  - Acres Burned: 36,807 Acres
  - 5,636 Structures Destroyed
  - Fatalities: 22
  - Counties: Sonoma & Napa
  - Effects on Brewery: Hundreds of thousands of dollars in lost sales, outside work limited by smoke
- What We Learned & Implemented:
  - This can happen to ANY community
  - Fire does not discriminate
  - Community gathering spot
  - Fund raiser helping local community



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# 2018: Camp Fire





# 2018: Camp Fire

- Details

- Start Date: November 8, 2018
- Date Contained: November 25, 2018
- Total Days: 17
- Acres Burned: 153,336 Acres
- 18,804 Structures Destroyed
- Fatalities: 85
- Counties: Butte
- Effects on Brewery: Outside work limited by smoke

- What We Learned & Implemented:

- Fire drill
- Rented industrial HEPA filters
- PPP safety equipment



# 2018: Camp Fire



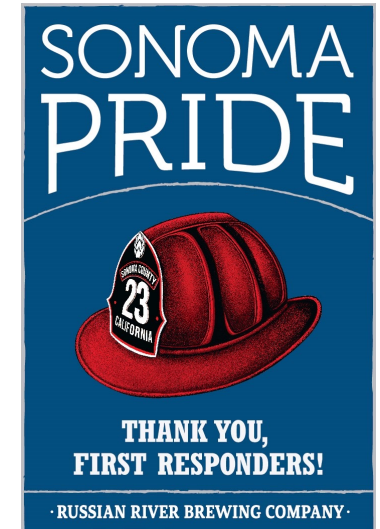
# 2019: Kincade Fire

- Details

- Start Date: October 23, 2019
- Date Contained: November 6, 2019
- Total Days: 13
- Acres Burned: 77,758 Acres
- 374 Structures Destroyed
- Fatalities: 0
- Counties: Sonoma
- Effects on Brewery: Hundreds of thousands of dollars in lost sales, outside work limited by smoke, open top fermenter rooms affected, interior smoke damage

- What We Learned & Implemented:

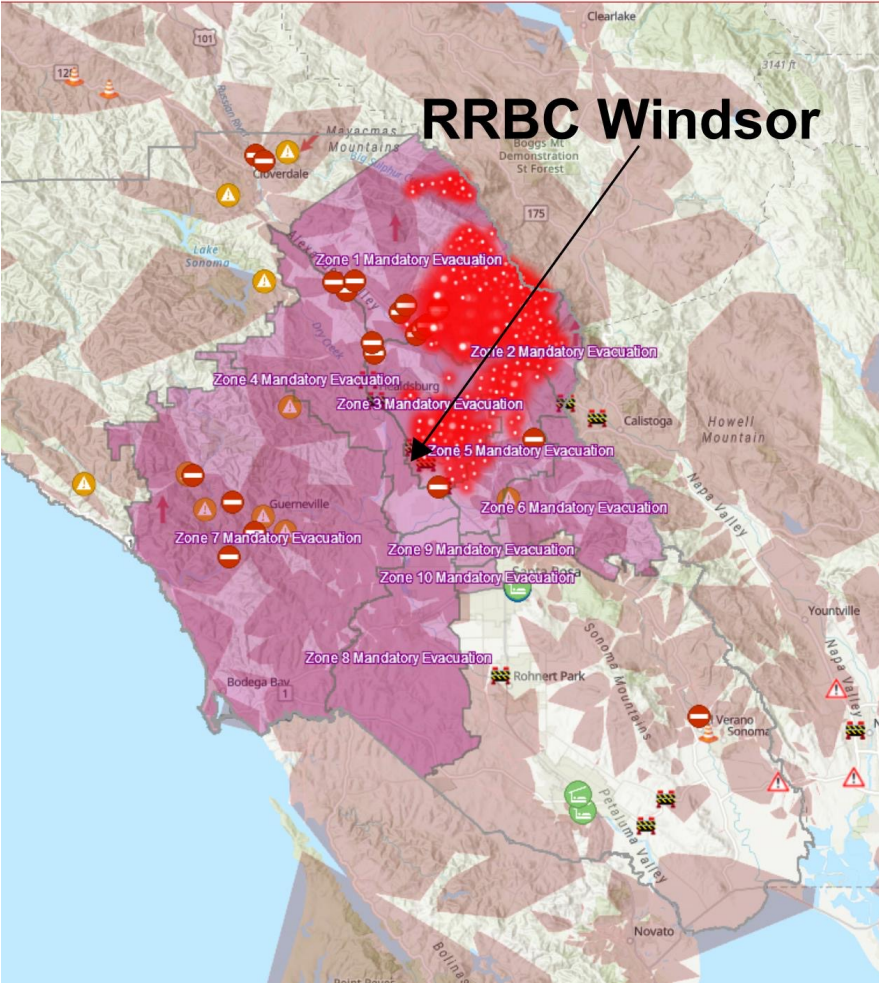
- Generator
  - What size?
- Evacuation plan
- Phone tree
- Insurance policy
- Outdoor cameras
- Purchased HEPA filters
  - Industrial size
  - Office size
- Key Equipment
  - Open top fermenter rooms
  - HVAC filters
- Fund raiser helping local community



# 2019: Kincade Fire



# 2019: Kincadee Fire



# 2020: LNU Lightning Complex (Wallbridge) Fire

- Details

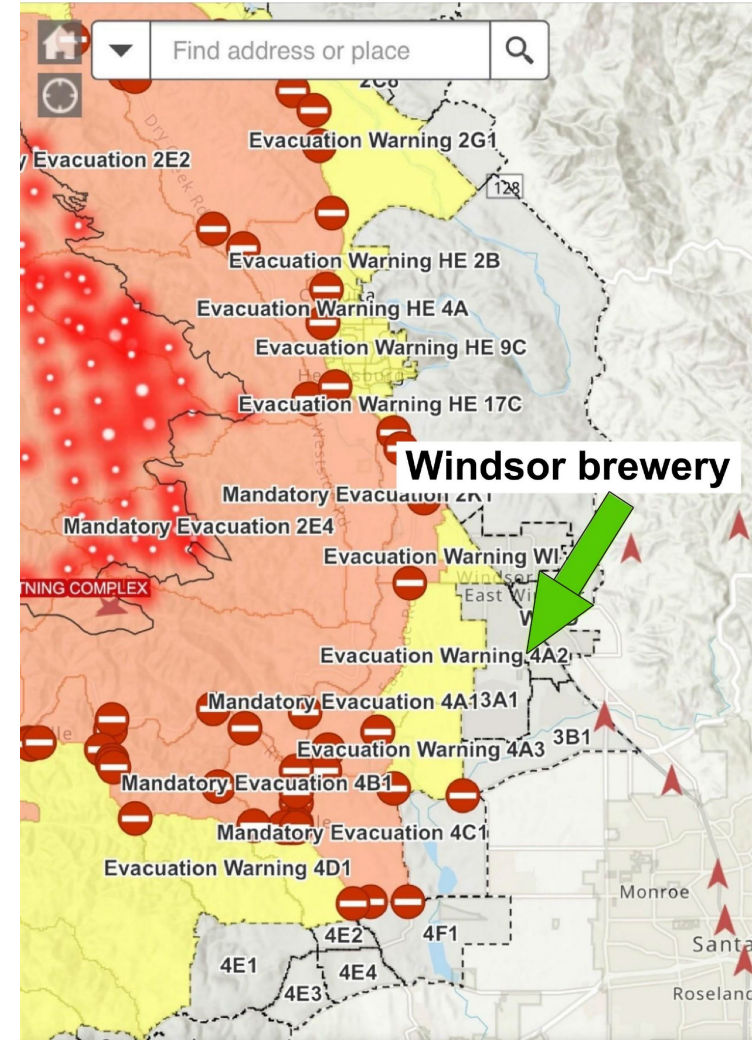
- Start Date: August 17, 2020
- Date Contained: October 2, 2020
- Total Days: 46
- Acres Burned: 363,220 Acres
- 1,491 Structures Destroyed
- Fatalities: 0
- Counties: Sonoma, Napa, Solano, Lake, Yolo
- Effects on Brewery: Tens of thousands of dollars in lost sales, outside work limited by smoke, limited use of open top fermenter rooms

- What We Learned & Implemented:

- Generator & switch gear
  - Risk / reward
- Purple Air - customer and employee wellness
- Key equipment action plan
- Employee wellness - PTSD



# 2020: LNU Lightning Complex (Wallbridge) Fire



# 2020: Glass Fire





# 2020: Glass Fire

- Details

- Start Date: September 27, 2020
- Date Contained: October 20, 2020
- Total Days: 23
- Acres Burned: 67,484 Acres
- 1,555 Structures Destroyed
- Fatalities: 0
- Counties: Sonoma & Napa
- Effects on Brewery: Tens of thousands of dollars in lost sales, outside work limited by smoke, limited use of open top fermenter rooms

- What We Learned & Implemented:
- Continued use of Purple Air
- Have more than one point persons for your emergency plans



# In Summary

- This can happen to ANY community
- Fire does not discriminate
- Community gathering spot
- Fund raising to help your local community
- Fire drill
- Rent or purchase both industrial and office HEPA filters
- PPP safety equipment
- Generator
- Evacuation plan
- Phone tree
- Insurance policy
- Outdoor cameras
- Key equipment action plan
- Purple Air
- Employee wellness – PTSD
- Have more then one point persons for your emergency plans

• **This can happen to ANY community!**



# Resources

- Photo credit: Russian River Brewing Company, Sierra Nevada Brewing Company, Cal Fire, California National Guard
- [Fire.ca.gov](http://Fire.ca.gov) (Cal Fire web site)
- [Socoemergency.org](http://Socoemergency.org)
- Natalie Cilurzo
- <https://www.pressdemocrat.com/article/news/inside-the-fight-to-save-windsor-from-the-kincade-fire/>

