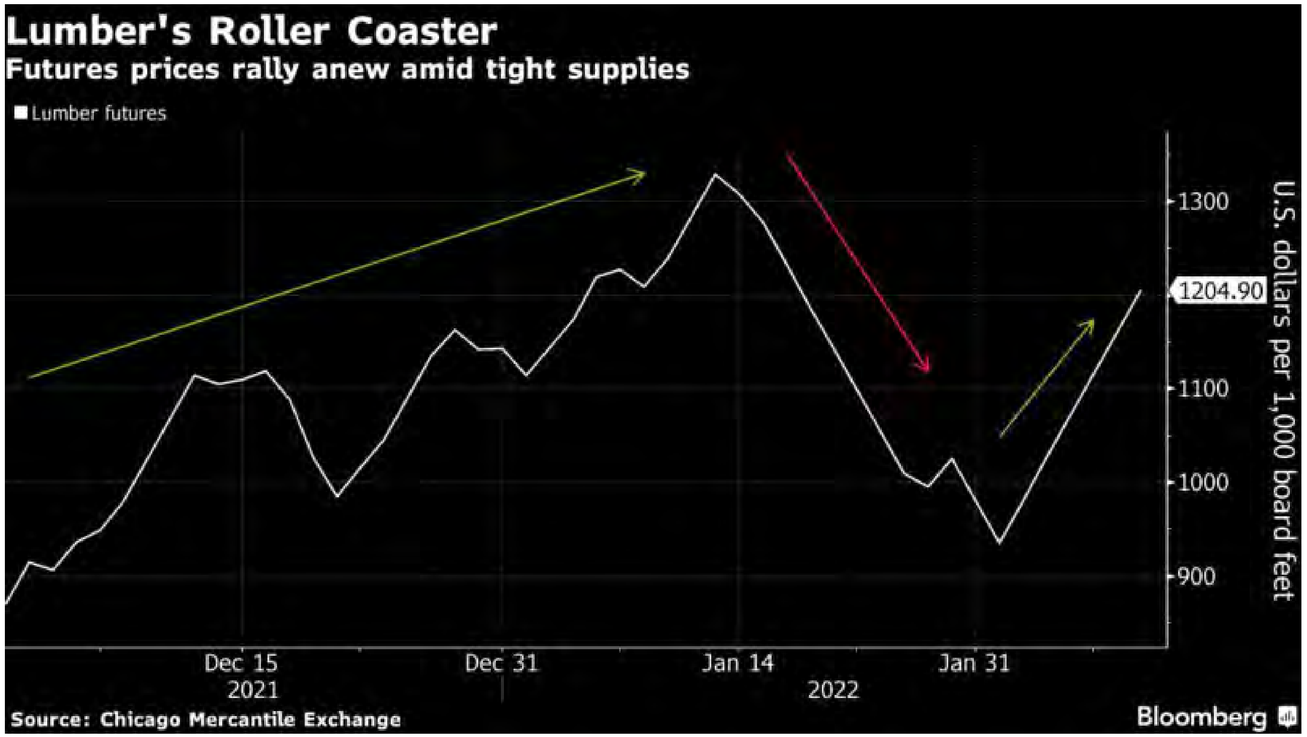
DESIGN PROCESS

Current Economic Conditions



2022

The current construction marketplace is experiencing rising material and labor costs. However, cities, counties, and states are also contending with rising costs and stagnant tax receipts.

DESIGN PROCESS

Construction Costs: Category 5 Construction

BUILDING TYPE	QUALITY STANDARD	COST PER SQUARE FOOT
Warehouse / Industrial	Low to Medium	$225 - $355
Standard Office Building	Medium	$315 - $520
Education / School Building	Low to High	$355 - $550
Fire Station	Low to Medium	$390 - $585
Police Station	Medium	$520 - $715
Emergency Operations Center	Medium	$550 - $910
Courthouse - Judicial	Medium to High	$585 - $1040
Communication Centers	Medium to High	$550 - $975

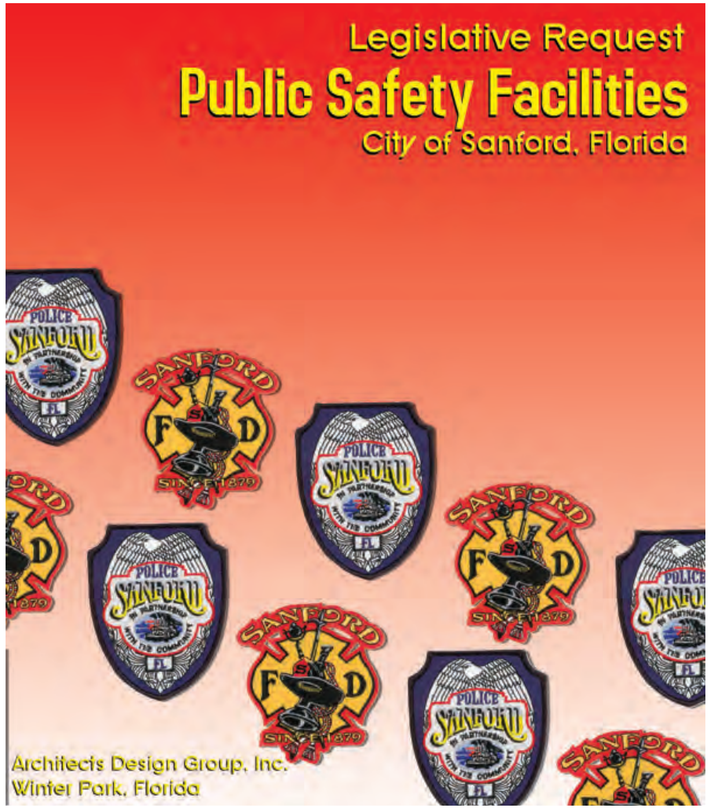
Costs based upon year 2022 construction values, Southeastern Region of the United States. It is NOT recommended that EOC's be designed to only withstand a Category 3 Storm. Cost of Technology Systems varies greatly based on criteria, may increase cost per square foot.

EOC DESIGN PROCESS

Construction Costs: Category 5 Construction

EOC DESIGN PROCESS

Funding Opportunities

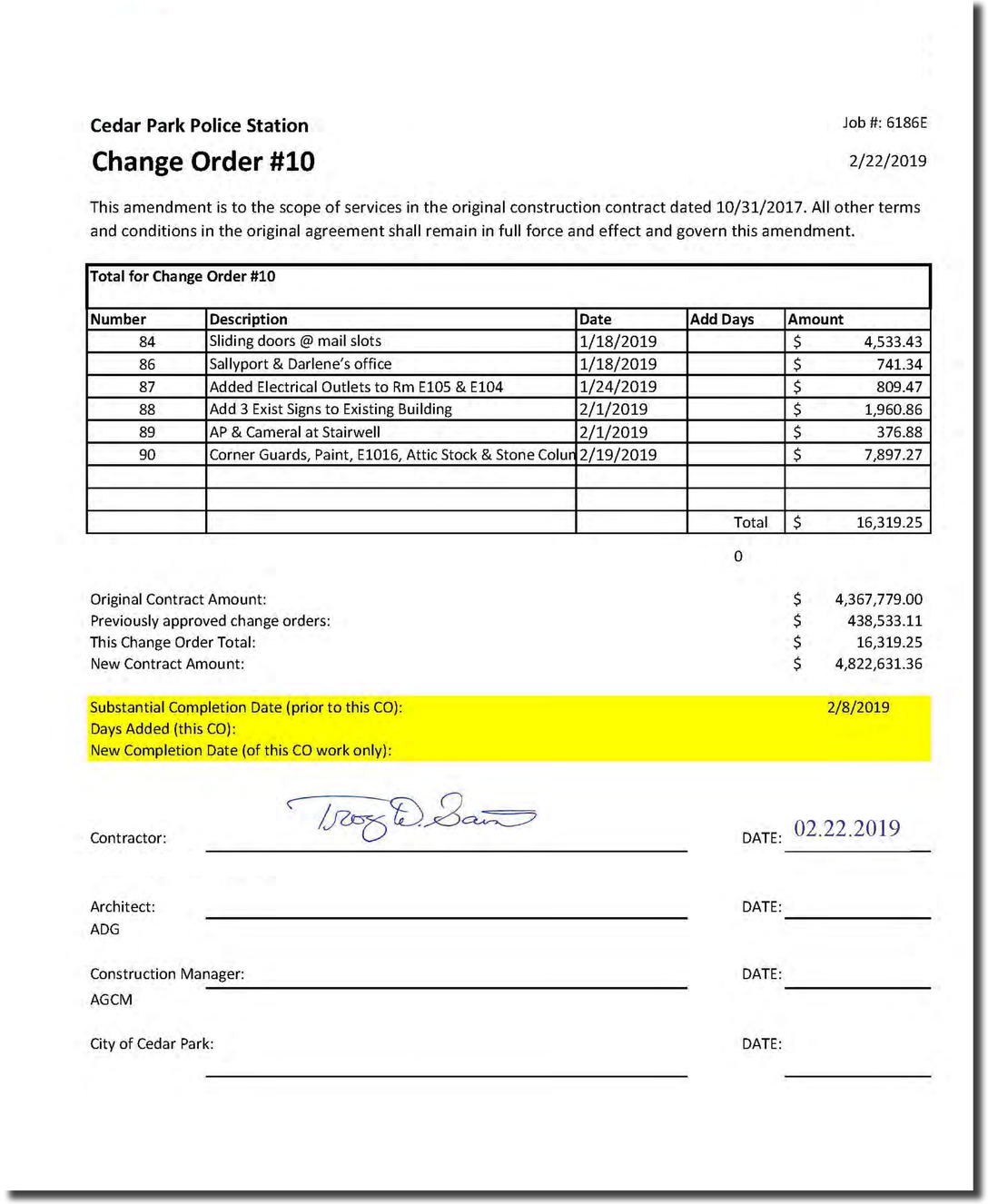


1. Sales tax savings program
2. New construction impact fees
3. General obligation bonds / voter referendum
4. Develop a detailed payout / draw schedule
5. Federal legislative request
6. Federal appropriations / earmarks
7. Grant programs
8. Public private partnerships (P3)
9. Public safety partners

IDENTIFYING FUNDING SOURCES

Sales Tax Savings Program

- Built into builder's contract
- Realistic 1.0% - 1.5% savings
- Use savings to fund FF&E



Cedar Park Police Station Job #: 6186E

Change Order #10 2/22/2019

This amendment is to the scope of services in the original construction contract dated 10/31/2017. All other terms and conditions in the original agreement shall remain in full force and effect and govern this amendment.

Total for Change Order #10

Number	Description	Date	Add Days	Amount
84	Sliding doors @ mail slots	1/18/2019		$ 4,533.43
86	Sallyport & Darlene's office	1/18/2019		$ 741.34
87	Added Electrical Outlets to Rm E105 & E104	1/24/2019		$ 809.47
88	Add 3 Exist Signs to Existing Building	2/1/2019		$ 1,960.86
89	AP & Cameral at Stairwell	2/1/2019		$ 376.88
90	Corner Guards, Paint, E1016, Attic Stock & Stone Colun	2/19/2019		$ 7,897.27
			Total	$ 16,319.25

0

Original Contract Amount:	$ 4,367,779.00
Previously approved change orders:	$ 438,533.11
This Change Order Total:	$ 16,319.25
New Contract Amount:	$ 4,822,631.36

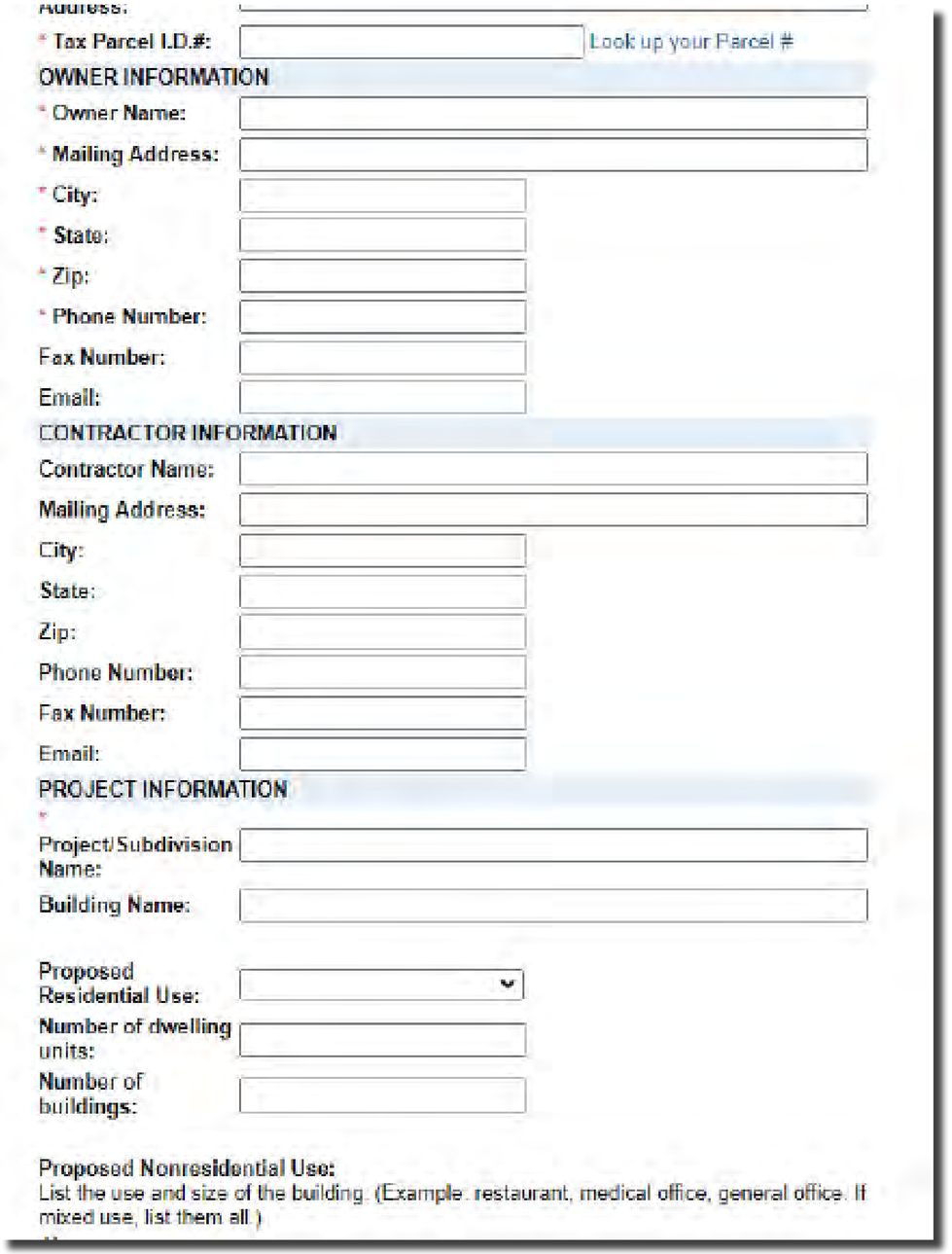
Substantial Completion Date (prior to this CO): 2/8/2019
Days Added (this CO):
New Completion Date (of this CO work only):

Contractor: _____ DATE: 02.22.2019

Architect: _____ DATE: _____
ADG

Construction Manager: _____ DATE: _____
AGCM

City of Cedar Park: DATE:
_____ _____


Address:
* Tax Parcel I.D.#: Look up your Parcel #
OWNER INFORMATION
* Owner Name:
* Mailing Address:
* City:
* State:
* Zip:
* Phone Number:
Fax Number:
Email:
CONTRACTOR INFORMATION
Contractor Name:
Mailing Address:
City:
State:
Zip:
Phone Number:
Fax Number:
Email:
PROJECT INFORMATION
*
Project/Subdivision Name:
Building Name:
Proposed Residential Use:
Number of dwelling units:
Number of buildings:
Proposed Nonresidential Use:
List the use and size of the building. (Example: restaurant, medical office, general office. If mixed use, list them all.)

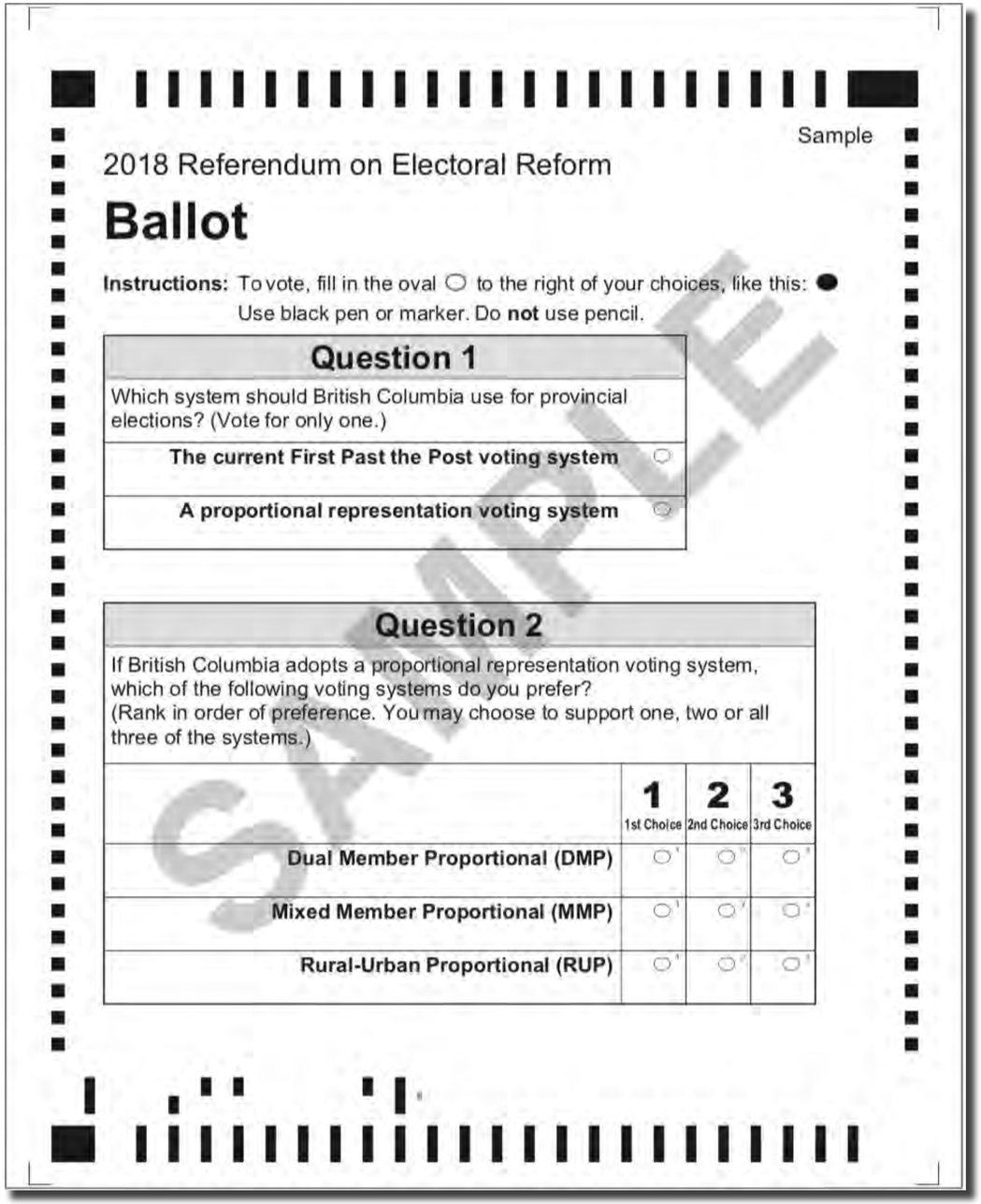
IDENTIFYING FUNDING SOURCES

New Construction Impact Fees

IDENTIFYING FUNDING SOURCES

General Obligation Bonds / Voter Referendum

- Minimum 90 days prior to referendum date
- Often requires multiple readings at council / commission meetings



Sample

2018 Referendum on Electoral Reform

Ballot

Instructions: To vote, fill in the oval ⬭ to the right of your choices, like this: ⬬
Use black pen or marker. Do **not** use pencil.

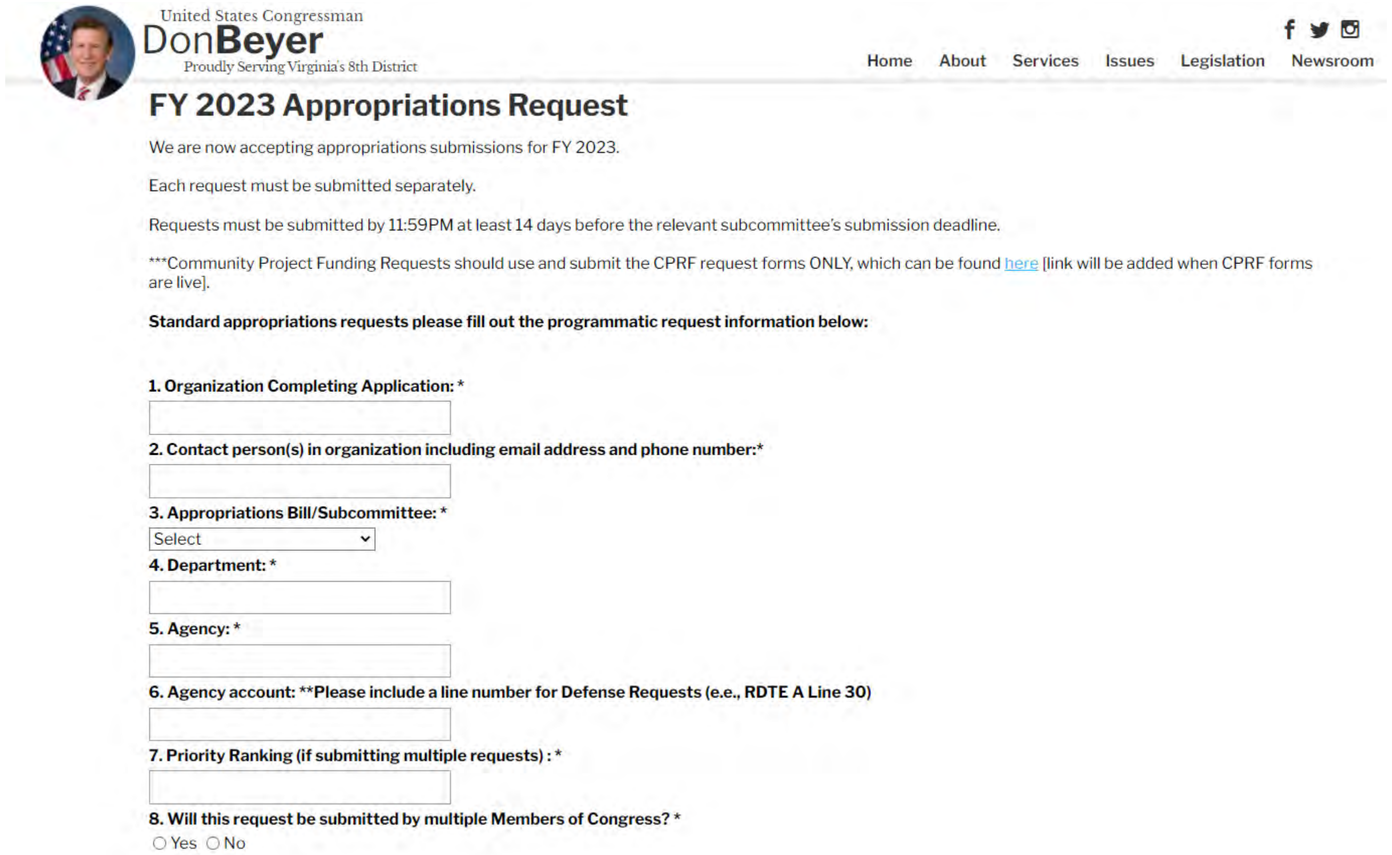
Question 1	
Which system should British Columbia use for provincial elections? (Vote for only one.)	
The current First Past the Post voting system	⬭
A proportional representation voting system	⬭

Question 2			
If British Columbia adopts a proportional representation voting system, which of the following voting systems do you prefer? (Rank in order of preference. You may choose to support one, two or all three of the systems.)			
	1 1st Choice	**2** 2nd Choice	**3** 3rd Choice
Dual Member Proportional (DMP)	⬭	⬭	⬭
Mixed Member Proportional (MMP)	⬭	⬭	⬭
Rural-Urban Proportional (RUP)	⬭	⬭	⬭

SAMPLE

EOC DESIGN PROCESS

Funding Opportunities



United States Congressman
DonBeyer
Proudly Serving Virginia's 8th District

Home About Services Issues Legislation Newsroom

FY 2023 Appropriations Request

We are now accepting appropriations submissions for FY 2023.

Each request must be submitted separately.

Requests must be submitted by 11:59PM at least 14 days before the relevant subcommittee's submission deadline.

***Community Project Funding Requests should use and submit the CPRF request forms ONLY, which can be found here [link will be added when CPRF forms are live].

Standard appropriations requests please fill out the programmatic request information below:

1. Organization Completing Application: *

2. Contact person(s) in organization including email address and phone number:*

3. Appropriations Bill/Subcommittee: *

Select

4. Department: *

5. Agency: *

6. Agency account: **Please include a line number for Defense Requests (e.e., RDTE A Line 30)

7. Priority Ranking (if submitting multiple requests) : *

8. Will this request be submitted by multiple Members of Congress? *

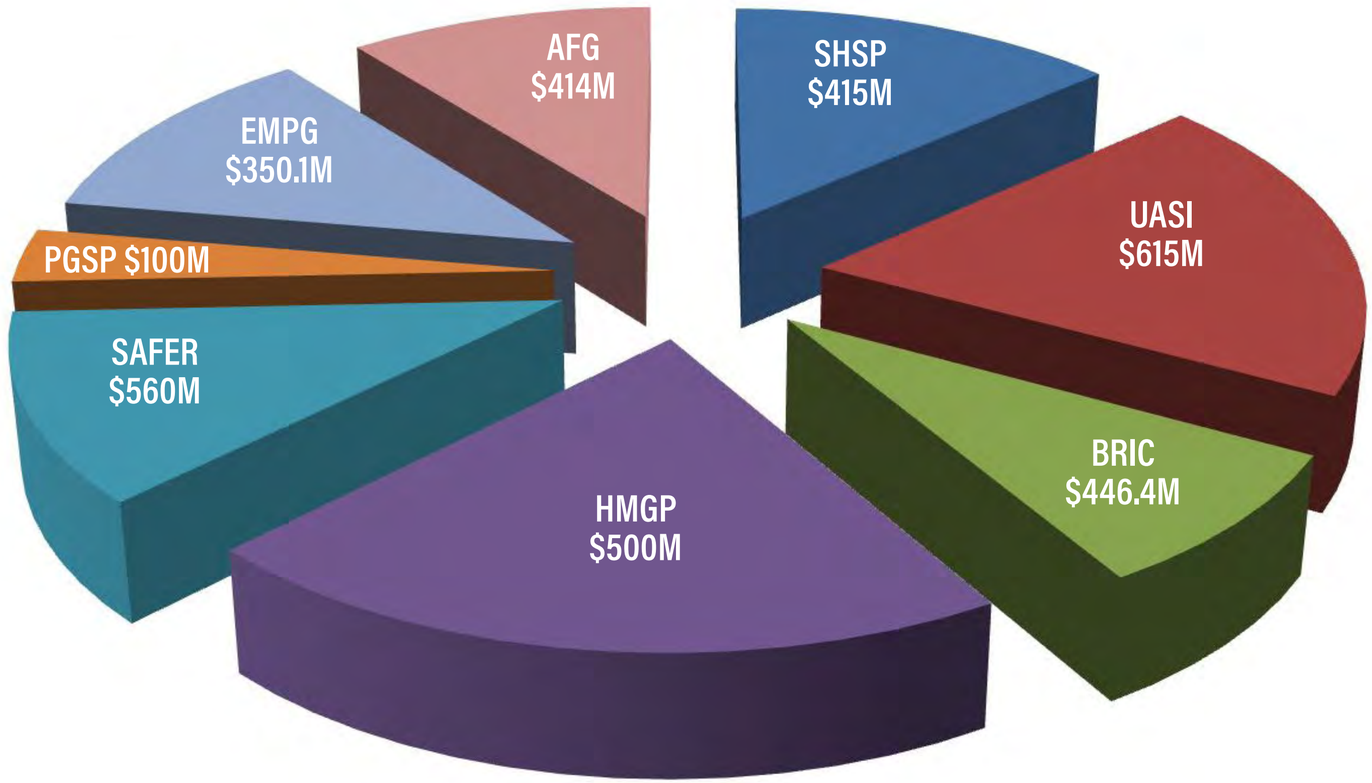
○ Yes ○ No

"Out of the box opportunities"- Legislative requests

EOC DESIGN PROCESS

Funding Opportunities - 2022 Grants

- State Homeland Security Program (SHSP) $415M
- Urban Areas Security Initiative (UASI) $615M
- Building Resilient Infrastructure & Communities (BRIC) $446.4M
- Hazardous Mitigation Grant Program (HMGP) $500M
- Staffing for Adequate Fire Emergency Response (SAFER) $560M
- Assistance to Firefighters Grant (AFG) $319.5M
- Port Security Grant Program (PSGP) $100M
- Emergency Management Performance Grant Program (EMPG) $355.1M



Total $3,959,000,000

IDENTIFYING FUNDING SOURCES

Grants Programs

		FY 2021	FY 2022
1.	State Homeland Security Program (SHSP)	$415M	$415M
2.	Urban Areas Security Initiative (UASI)	$615M	$615M
3.	Building Resilient Infrastructure & Communities (BRIC)	$1,000B	$1,000B
4.	Hazardous Mitigation Grant Program (HMGP)	$500M	$500M
5.	Staffing for Adequate Fire Emergency Response (SAFER)	$355M	$560M
6.	Port Security Grant Program (PSGP)	$100M	$100M
7.	Emergency Management Performance Grant Program (EMPG)	$355.1M	$355.1M
8.	Assistance to Firefighters Grant (AFG)	$319.5M	$414M
	Fiscal Year Total	$3,142B	$3,959B

2021 Increase of $5,300,000 over FY 2020
2022 Increase of $817,100,000 over FY 2021

IDENTIFYING FUNDING SOURCES

Federal Appropriations / Earmarks

- Law enforcement training centers
- Emergency operations centers
- Utilities infrastructure
- Fire-rescue facilities
- Joint-use / multi-jurisdictional facilities
- Transportation facilities
- Pre-disaster mitigation programs

IDENTIFYING FUNDING SOURCES

Grants Programs - Hazard Mitigation Assistance (HMA)

Umbrella program covering three grants

- Hazard mitigation grant program
- Flood mitigation assistance
- Pre-disaster mitigation grants

Goal

- Reduce the risk to individuals and property from natural disasters

Six core capabilities

- Threats and hazard identification
- Risk and disaster resilience assessment
- Planning
- Community resilience
- Public information and warning
- Operation coordination

Total $3,959,000,000

ENVIRONMENTAL EVENTS

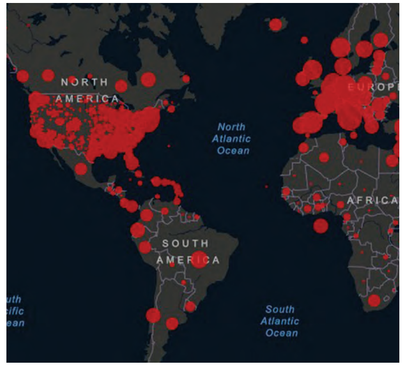
- Hurricanes
- Tornadoes
- Flooding
- Sea Level Rise
- Temperature Rise
- Droughts
- Severe Snow / Ice Storms
- Earthquakes
- Tornadoes
- Pandemics
- Nuclear Events









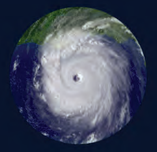

Billion Dollar Environmental Events (1980 - 2021)


DROUGHT


FLOODING


FREEZE


SEVERE STORMS


TROPICAL CYCLONE

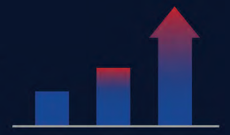

WILDFIRE


WINTER STORM

For more info:
www.ncdc.noaa.gov/billions/

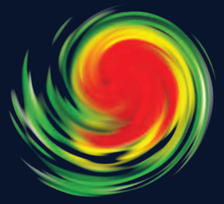
1980 The year NOAA started tracking billion-dollar disasters

20 Number of U.S. billion-dollar disasters in 2021



310 Number of billion-dollar disasters in the U.S. since 1980

4 Number of billion-dollar tropical cyclones that struck the U.S. in 2021

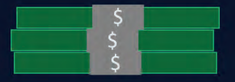


50 Number of states that have had at least one billion-dollar disaster

123 Number of billion-dollar events from 2010-2019

7.4 Average number of billion-dollar disasters per year since 1980

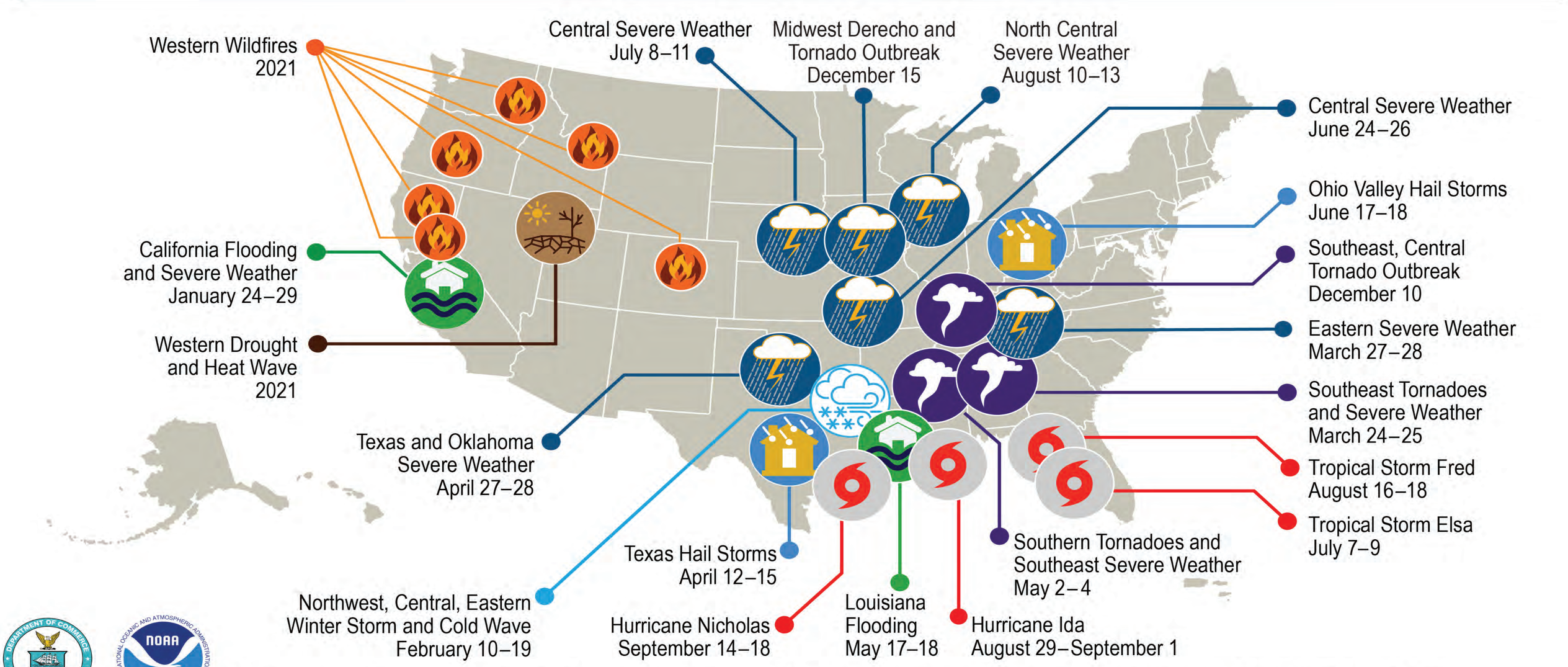
$2.155 *TRILLION* Total cost of the 310 billion-dollar disasters



17.2 Average number of billion-dollar disasters per year since 2017

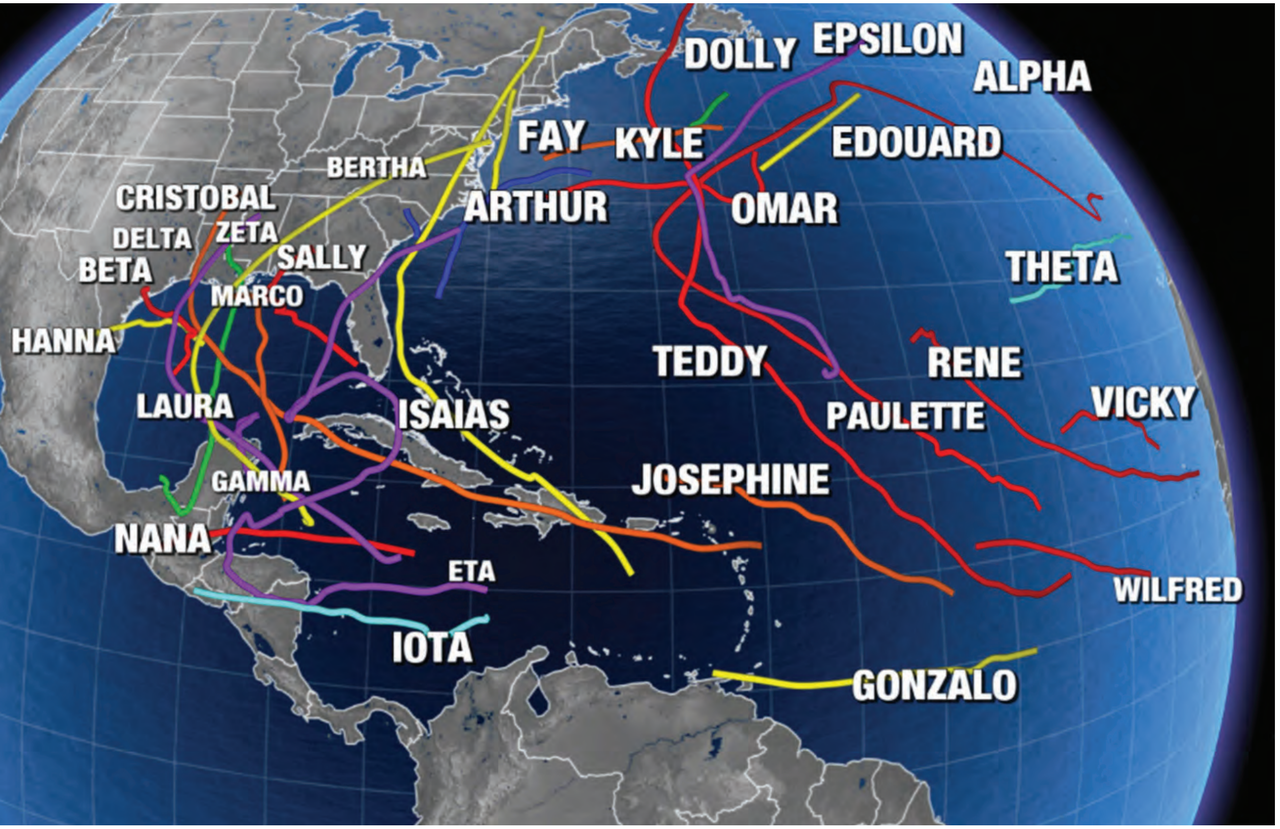
129 Number of billion-dollar disasters that have impacted Texas since 1980—the most of any state

U.S. 2021 Billion-Dollar Weather and Climate Disasters

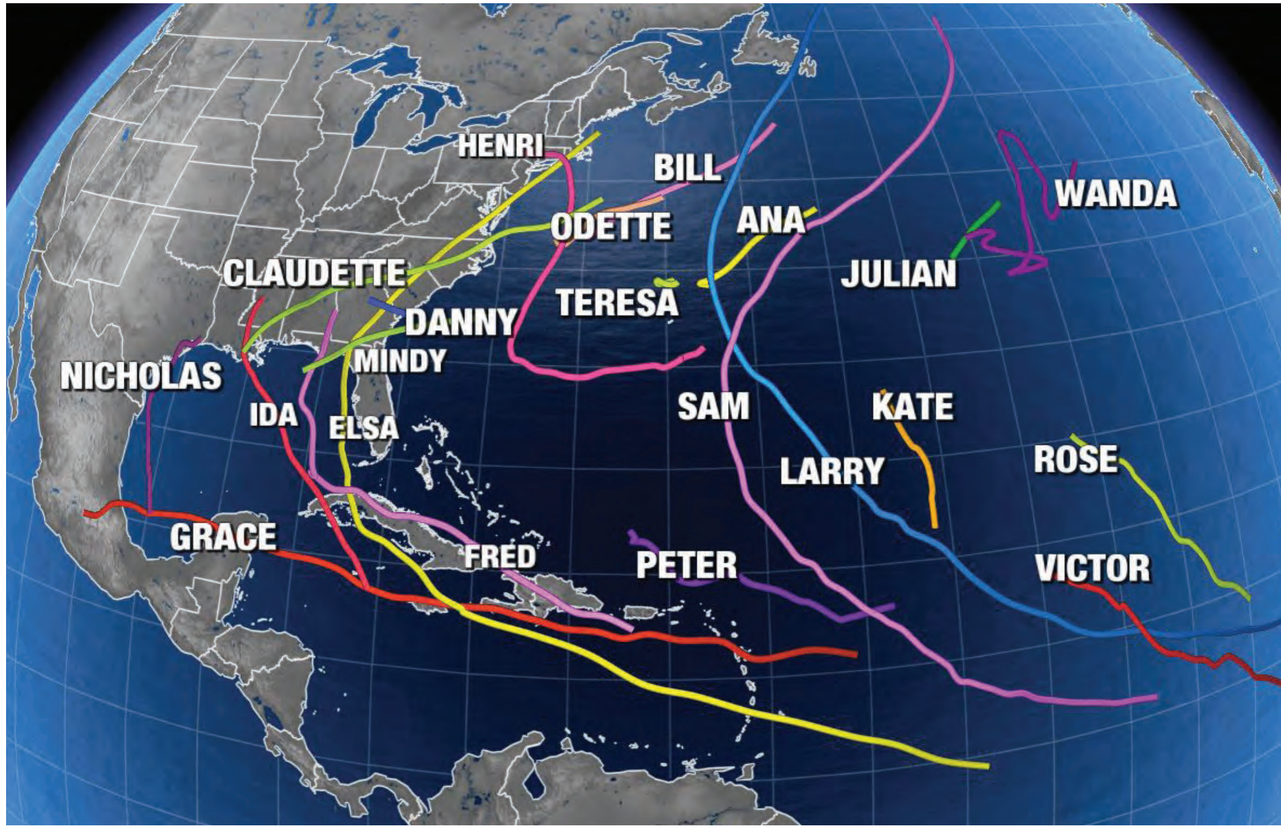


*This map denotes the approximate location for each of the **20 separate billion-dollar weather and climate disasters that impacted the United States in 2021***

2020 & 2021 HURRICANE TRACKS



13 Hurricanes
6 Major hurricanes
12 Storms hit the U.S. Coastline
10 Named storms that formed in September



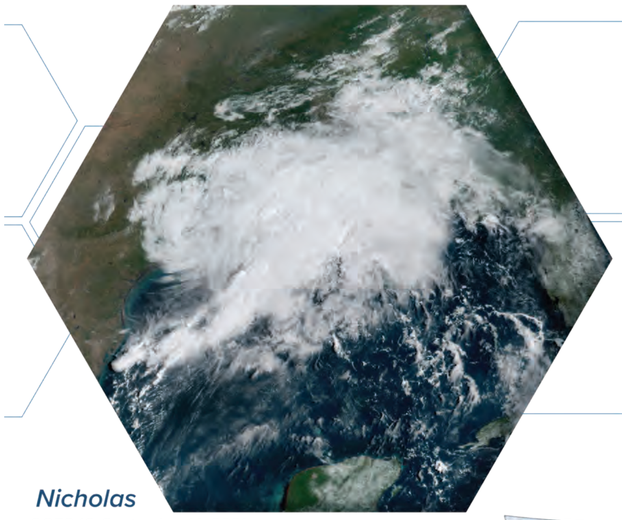
7 Hurricanes
4 Major hurricanes
8 Storms hit the U.S. Coastline
21 Named storms

Continental United States Hurricane Strikes 1950–2021*

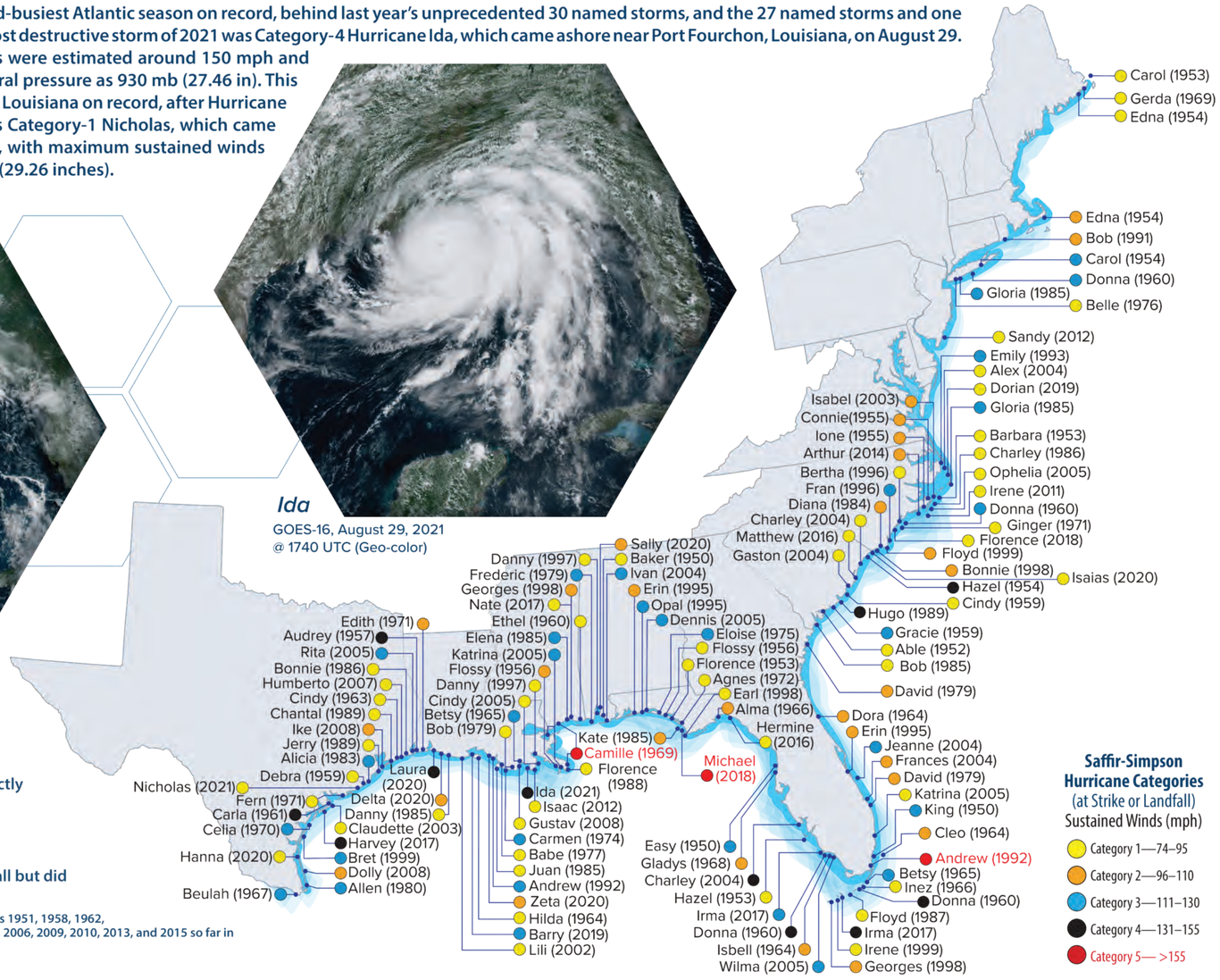
The GOES-16 enhanced imagery shows 2021 Hurricanes Ida and Nicholas in detail.

With 21 storms, the 2021 season ranks as the third-busiest Atlantic season on record, behind last year's unprecedented 30 named storms, and the 27 named storms and one unnamed storm that developed in 2005. The most destructive storm of 2021 was Category-4 Hurricane Ida, which came ashore near Port Fourchon, Louisiana, on August 29. When Ida made landfall, maximum sustained winds were estimated around 150 mph and reconnaissance aircraft estimated its minimum central pressure as 930 mb (27.46 in). This ranks as the second-most-intense hurricane to strike Louisiana on record, after Hurricane Katrina in 2005. The other landfalling hurricane was Category-1 Nicholas, which came ashore near Sargent Beach, Texas on September 14, with maximum sustained winds near 75 mph and a pressure estimated near 991 mb (29.26 inches).

Ida
GOES-16, August 29, 2021
@ 1740 UTC (Geo-color)



Nicholas
GOES-16, September 14, 2021
@ 1450 UTC (Geo-color)



Hurricane Information

Since 1950, there have been 123 hurricanes that have directly impacted the continental United States.

Due to coverage density of storms, actual strike locations are approximate.

*Strikes-include hurricanes that did not make direct landfall but did produce hurricane force winds over land.

There were no hurricane strikes in the continental United States for the years 1951, 1958, 1962, 1973, 1978, 1981, 1982, 1990, and 1994 in the 20th century, and 2000, 2001, 2006, 2009, 2010, 2013, and 2015 so far in the 21st century.

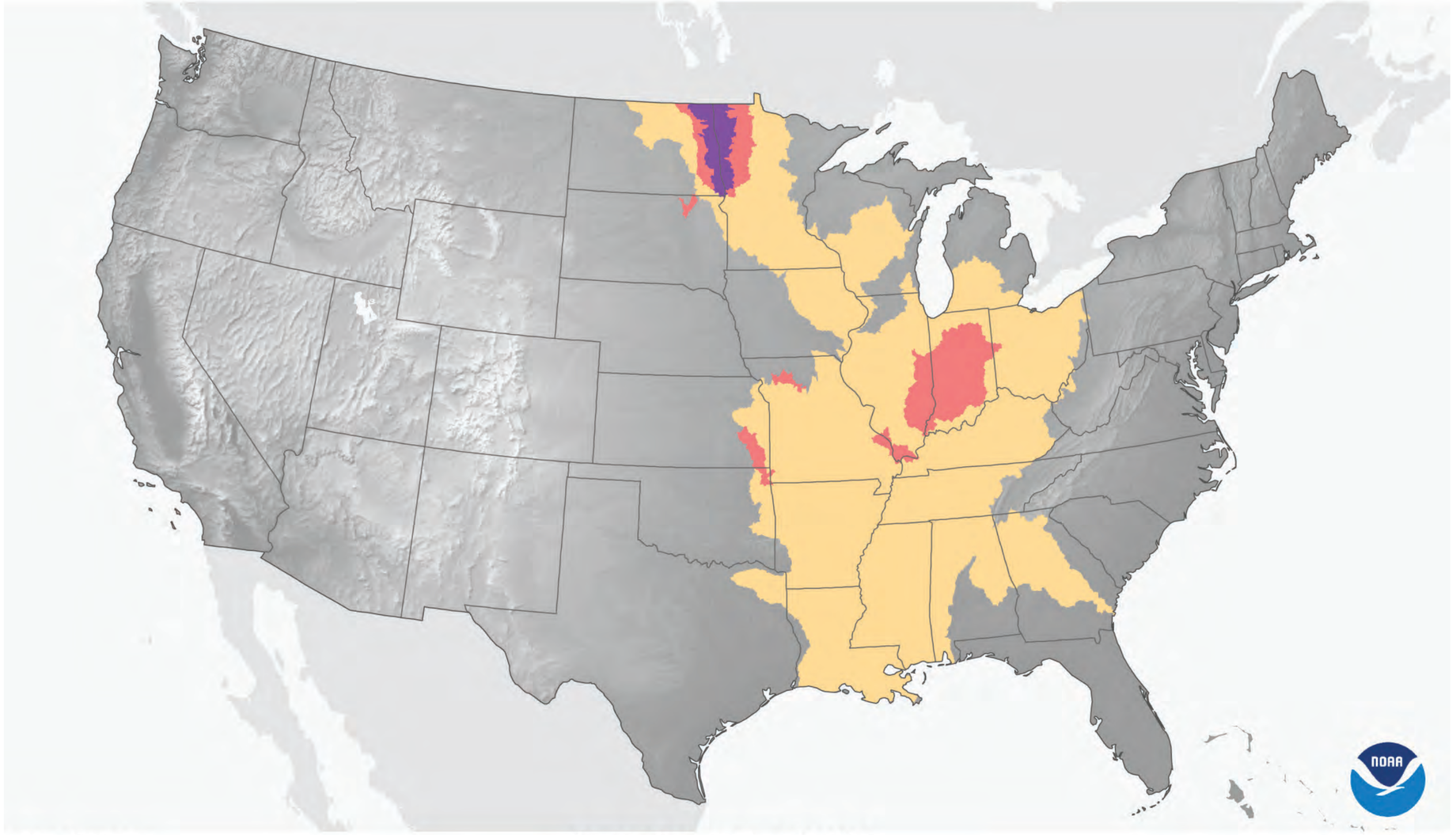
Image source: NOAA/NESDIS

Saffir-Simpson Hurricane Categories
(at Strike or Landfall)
Sustained Winds (mph)

- Category 1—74–95
- Category 2—96–110
- Category 3—111–130
- Category 4—131–155
- Category 5— >155

NOAA National Centers for Environmental Information
www.ncei.noaa.gov
February 2022

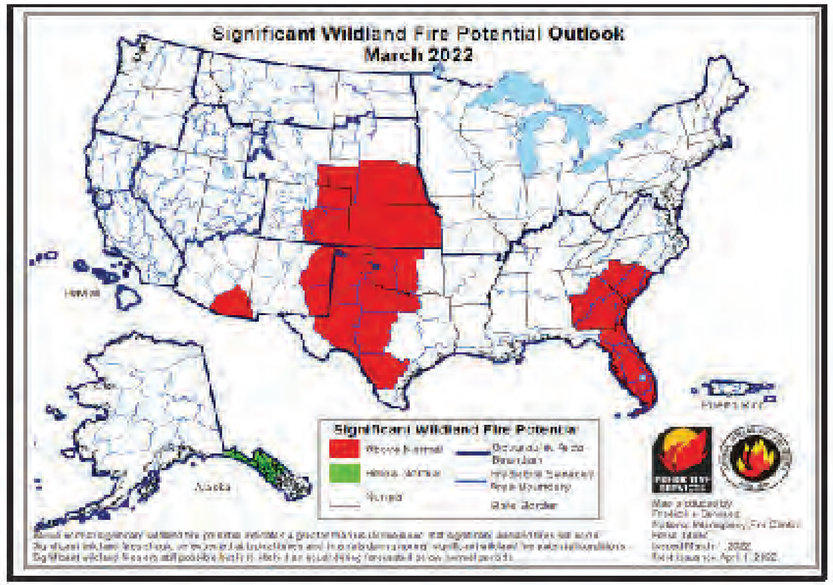
SPRING 2022 U.S. FLOOD OUTLOOK

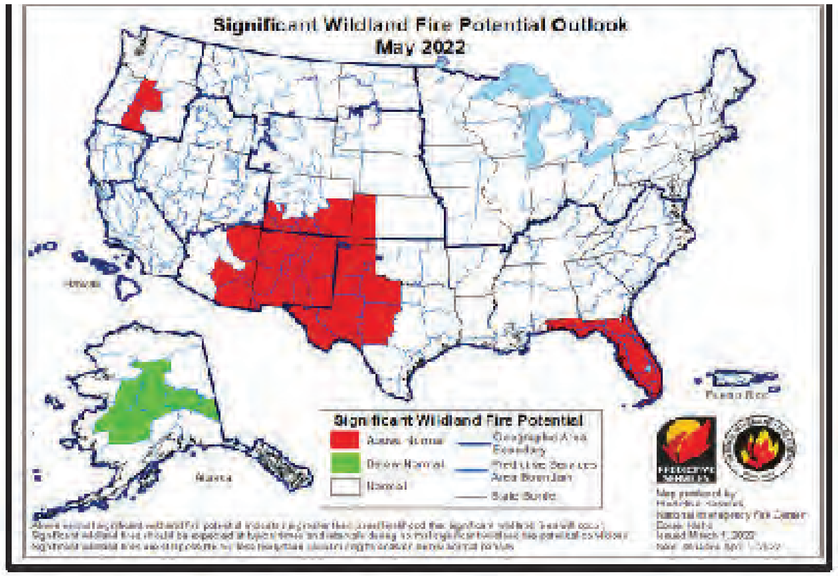


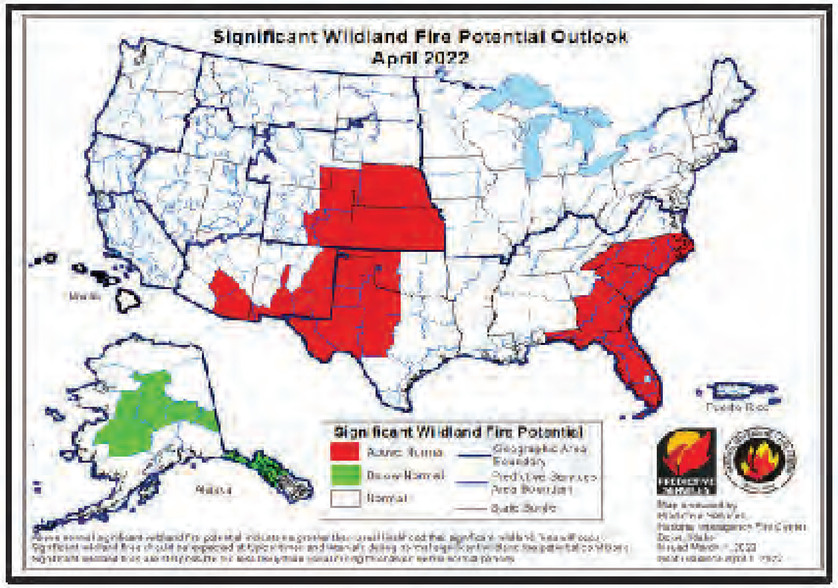
Flood Outlook
for March - May
Issued 2022 Mar 17

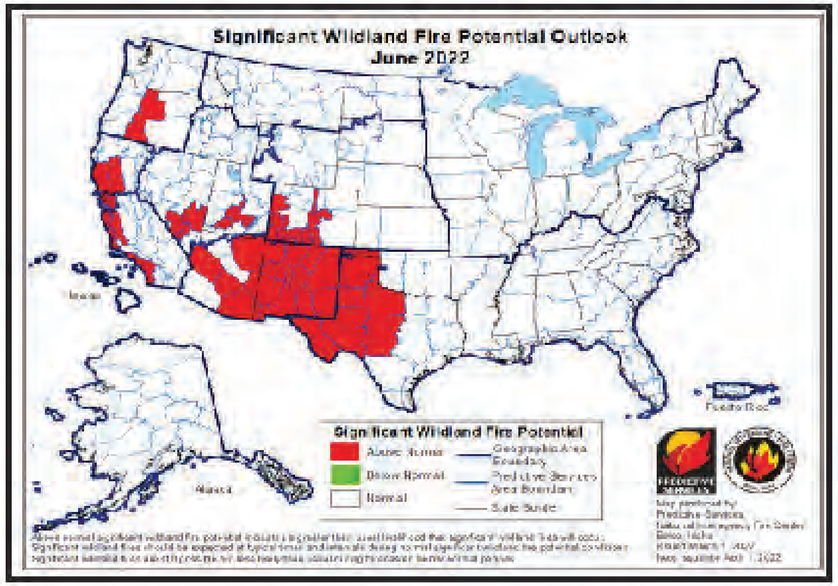
Climate.gov
Data: OWP

WILDFIRE POTENTIAL OUTLOOK 2022

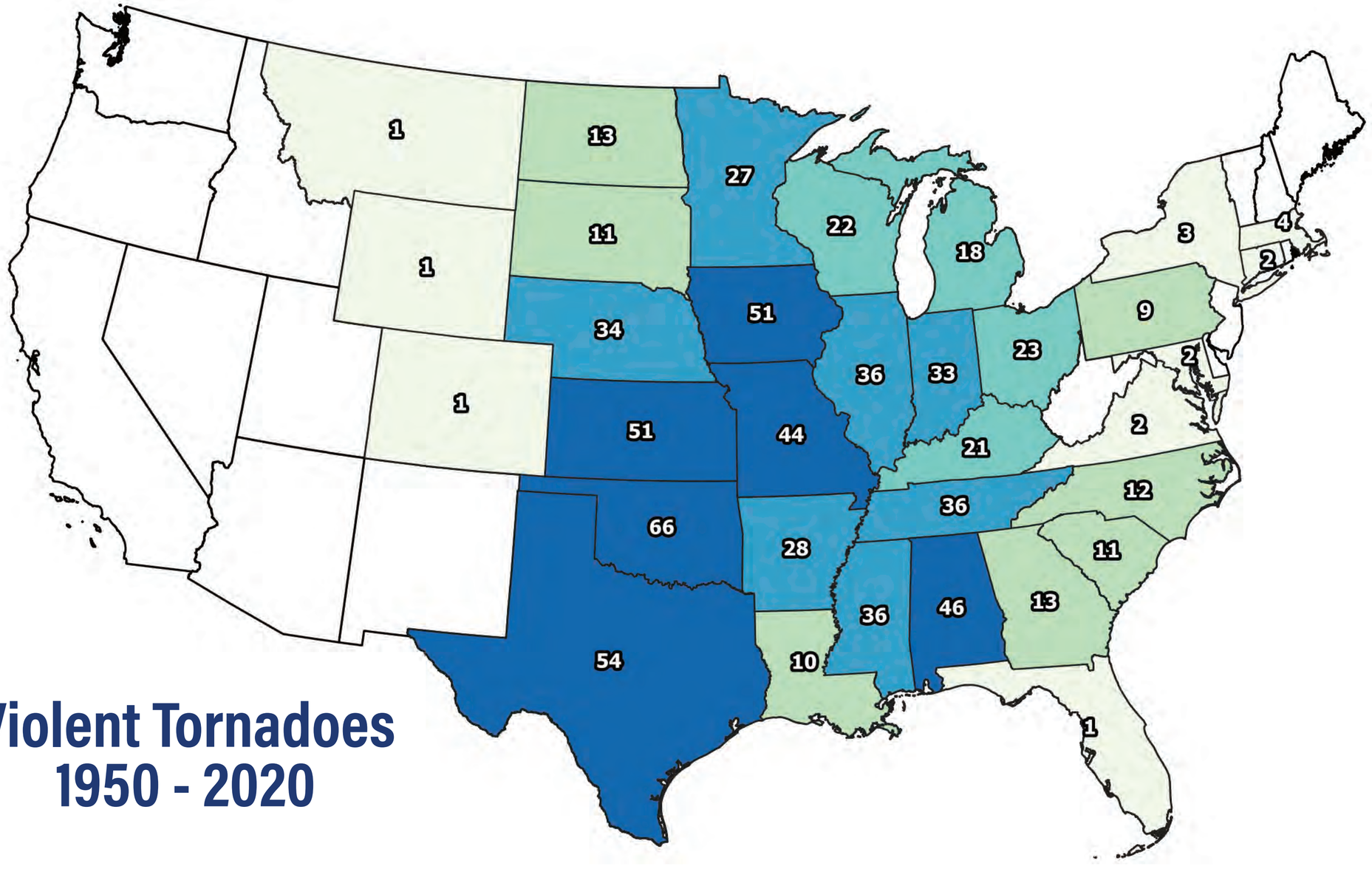






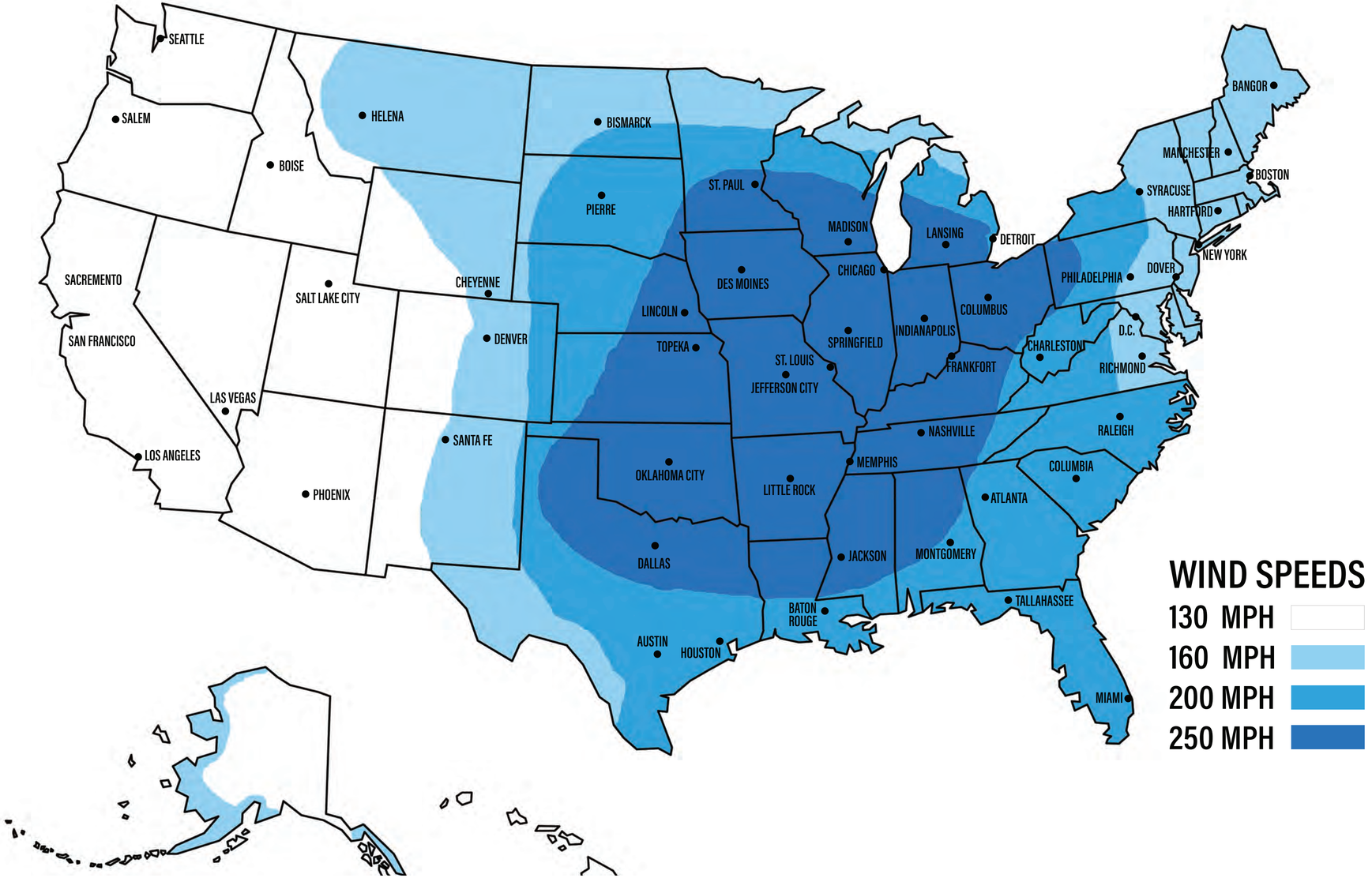


TORNADO ALLEY

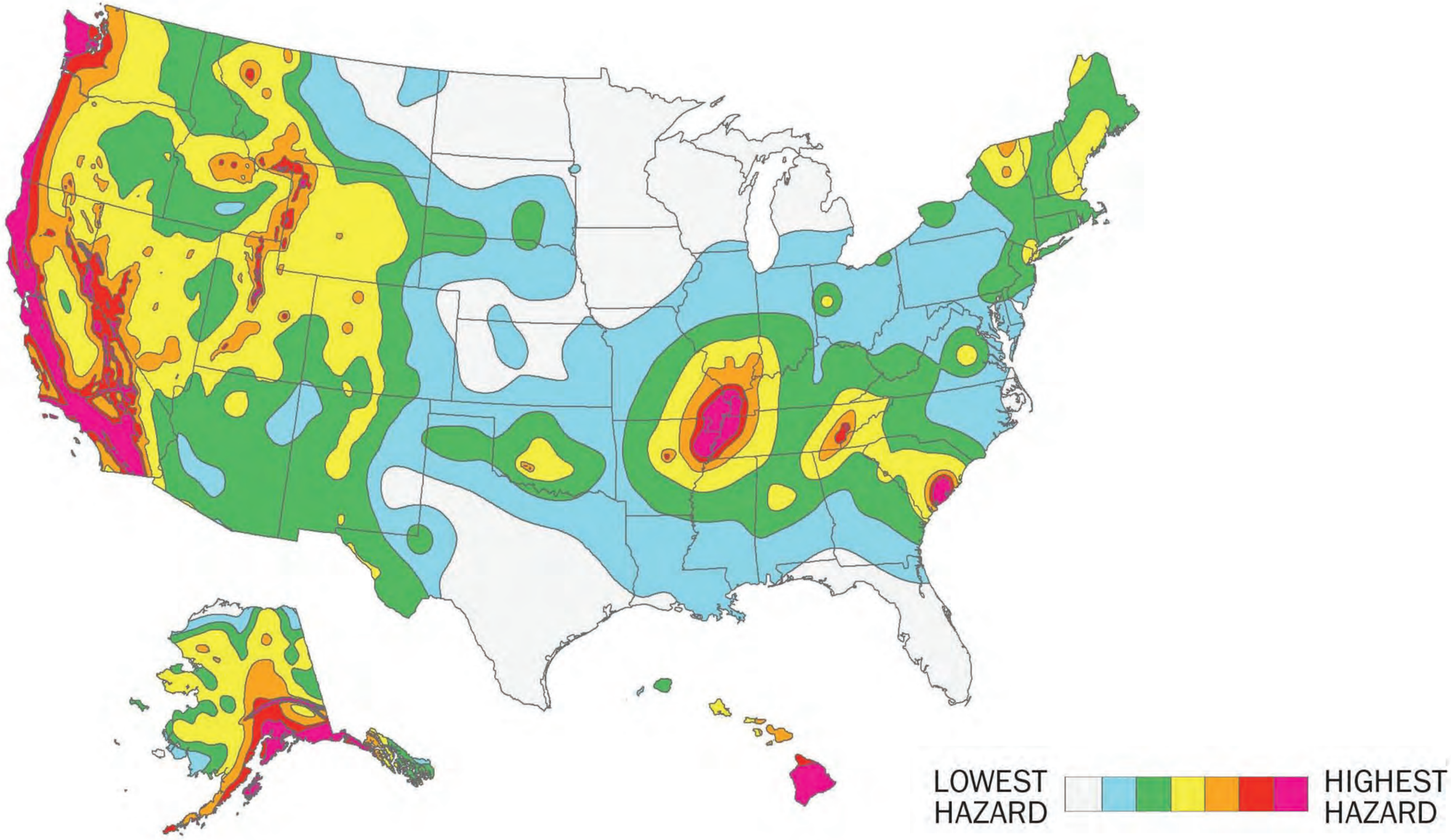


Violent Tornadoes
1950 - 2020

WIND ZONES

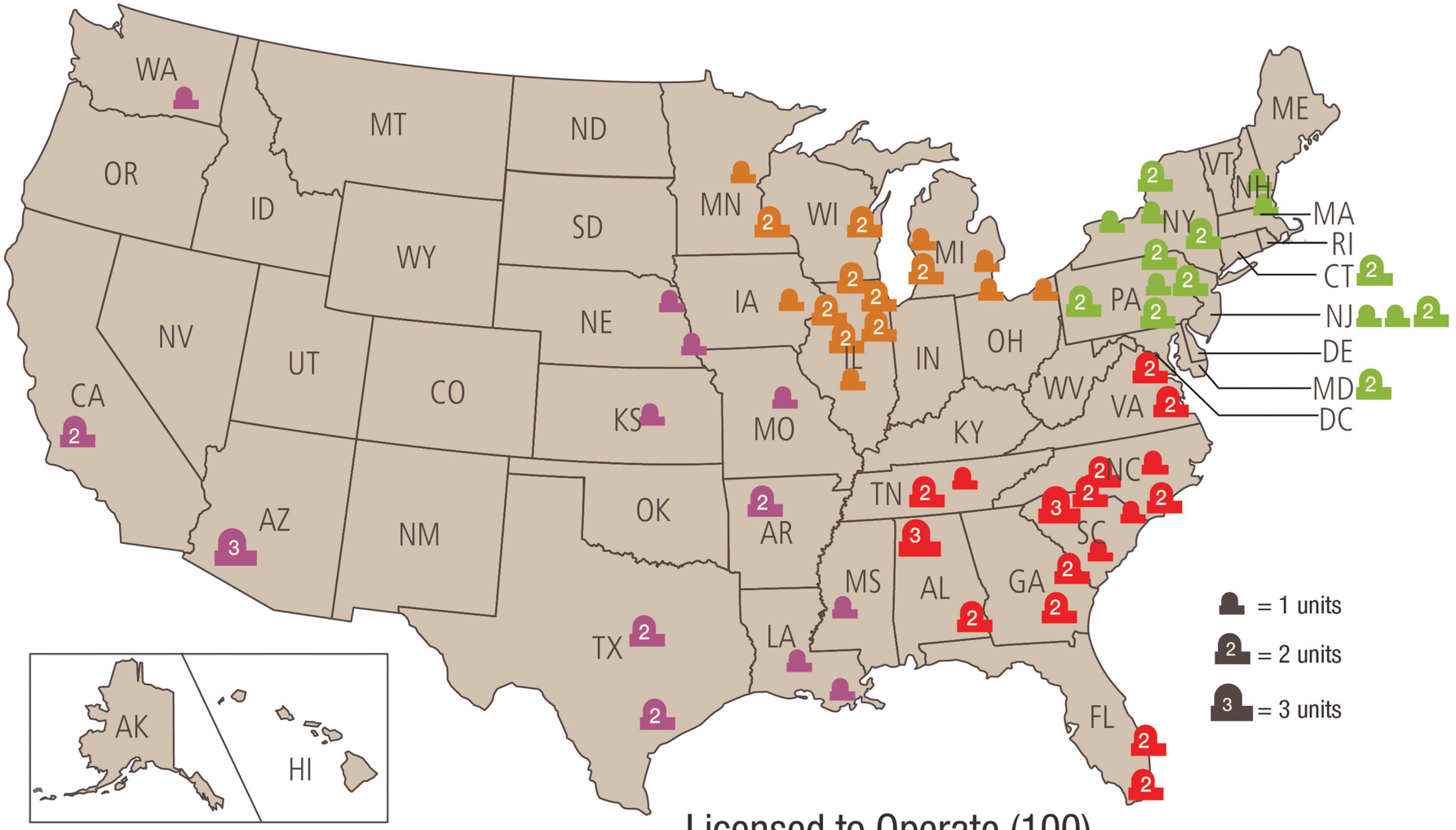

SEATTLE
SALEM
BOISE
HELENA
BISMARCK
PIERRE
ST. PAUL
MADISON
LANSING
DETROIT
BANGOR
MANCHESTER
BOSTON
SYRACUSE
HARTFORD
NEW YORK
PHILADELPHIA
DOVER
D.C.
RICHMOND
CHARLESTON
SACREMENTO
SAN FRANCISCO
SALT LAKE CITY
CHEYENNE
DENVER
DES MOINES
CHICAGO
LINCOLN
TOPEKA
SPRINGFIELD
INDIANAPOLIS
COLUMBUS
FRANKFORT
ST. LOUIS
JEFFERSON CITY
LAS VEGAS
LOS ANGELES
SANTA FE
PHOENIX
NASHVILLE
RALEIGH
MEMPHIS
COLUMBIA
OKLAHOMA CITY
LITTLE ROCK
ATLANTA
DALLAS
JACKSON
MONTGOMERY
TALLAHASSEE
BATON ROUGE
AUSTIN
HOUSTON
MIAMI
WIND SPEEDS
130 MPH
160 MPH
200 MPH
250 MPH

EARTHQUAKE FAULT ZONES



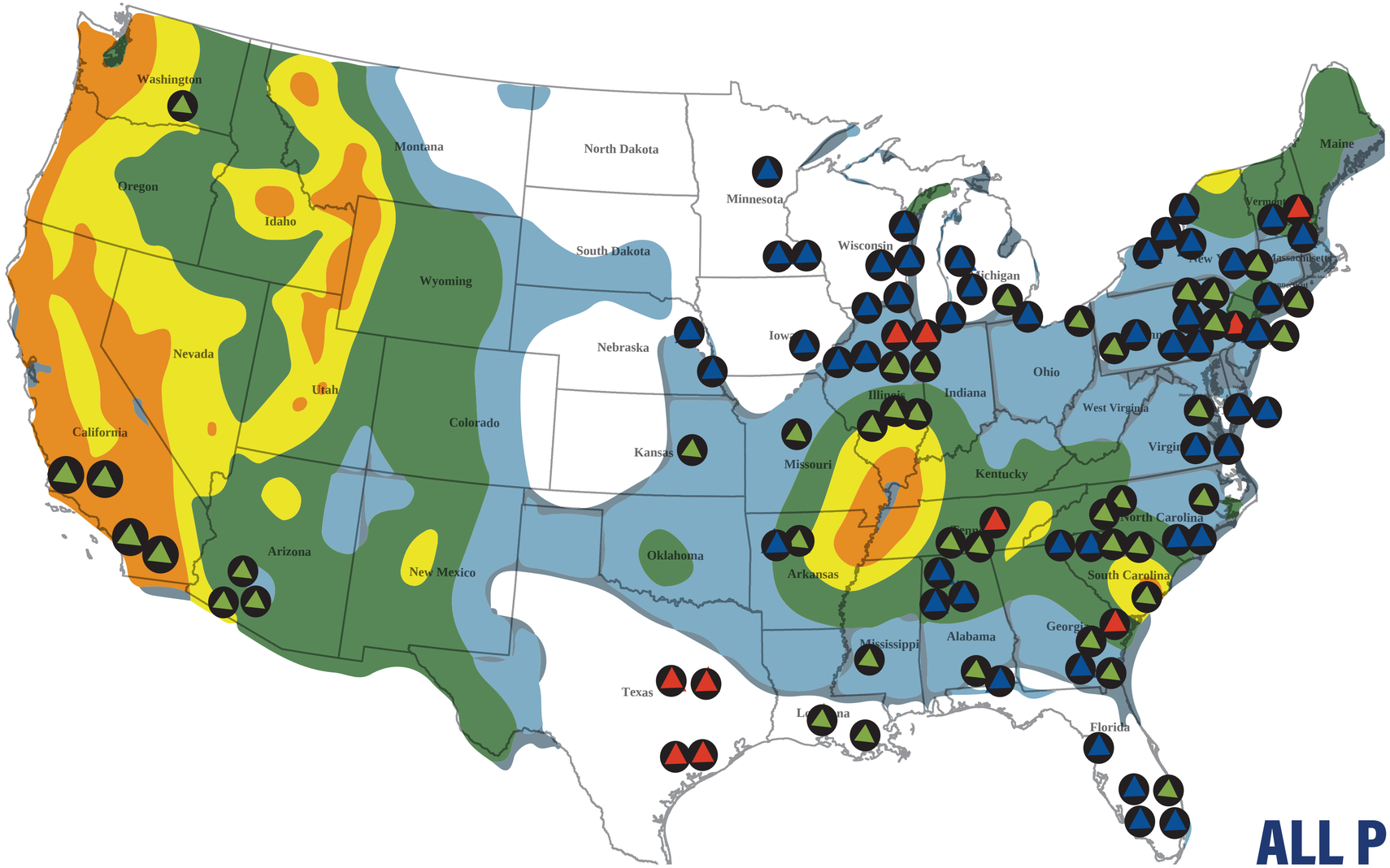
NUCLEAR FACILITIES IN THE U.S.A.

U.S. Operating Commercial Nuclear Power Reactors



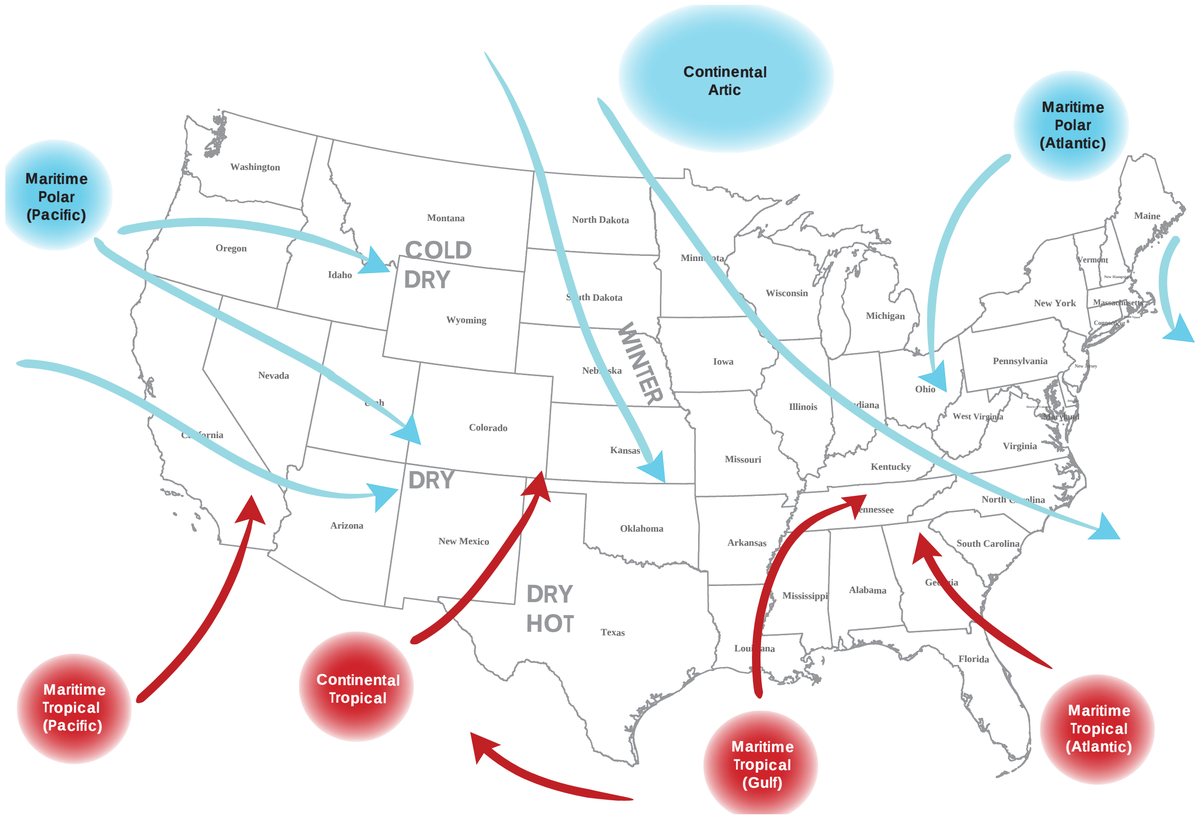
Licensed to Operate (100)

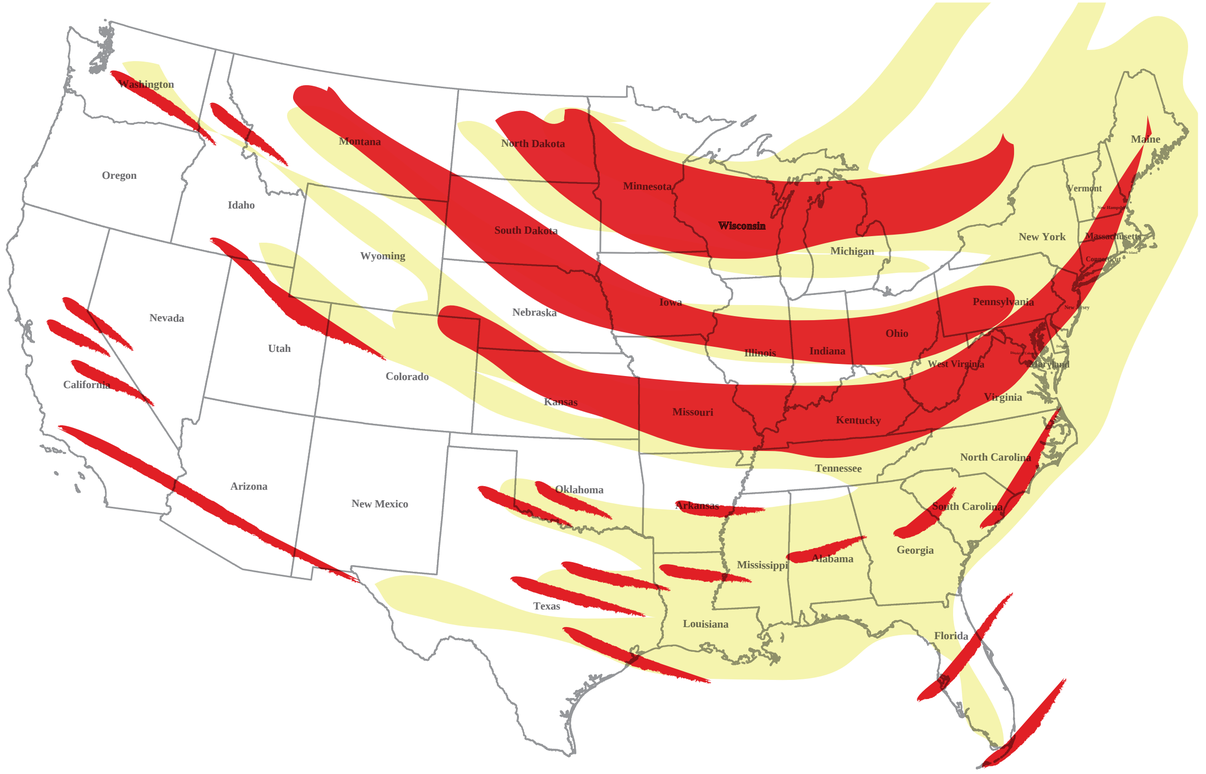
NUCLEAR FACILITIES IN FAULT ZONES



ALL PLANTS

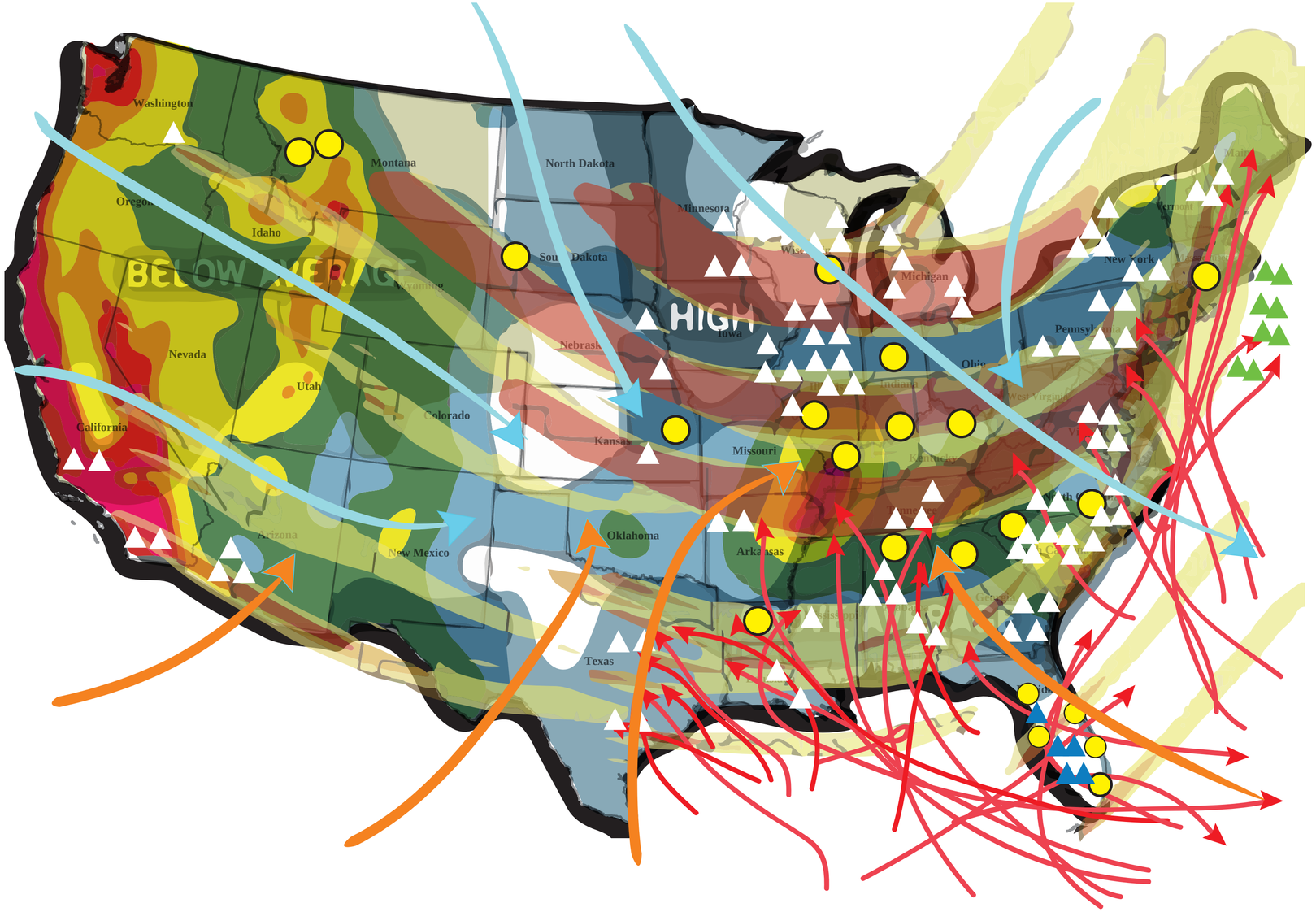
PREVAILING BREEZE





RADIOACTIVE FALLOUT

IS YOUR FACILITY CAPABLE OF WITHSTANDING THESE EVENTS?



MAN MADE TRENDS

- Civil Unrest
- Biohazards
- Energy Extraction Hazards
- Development Patterns
- Cyber Attacks

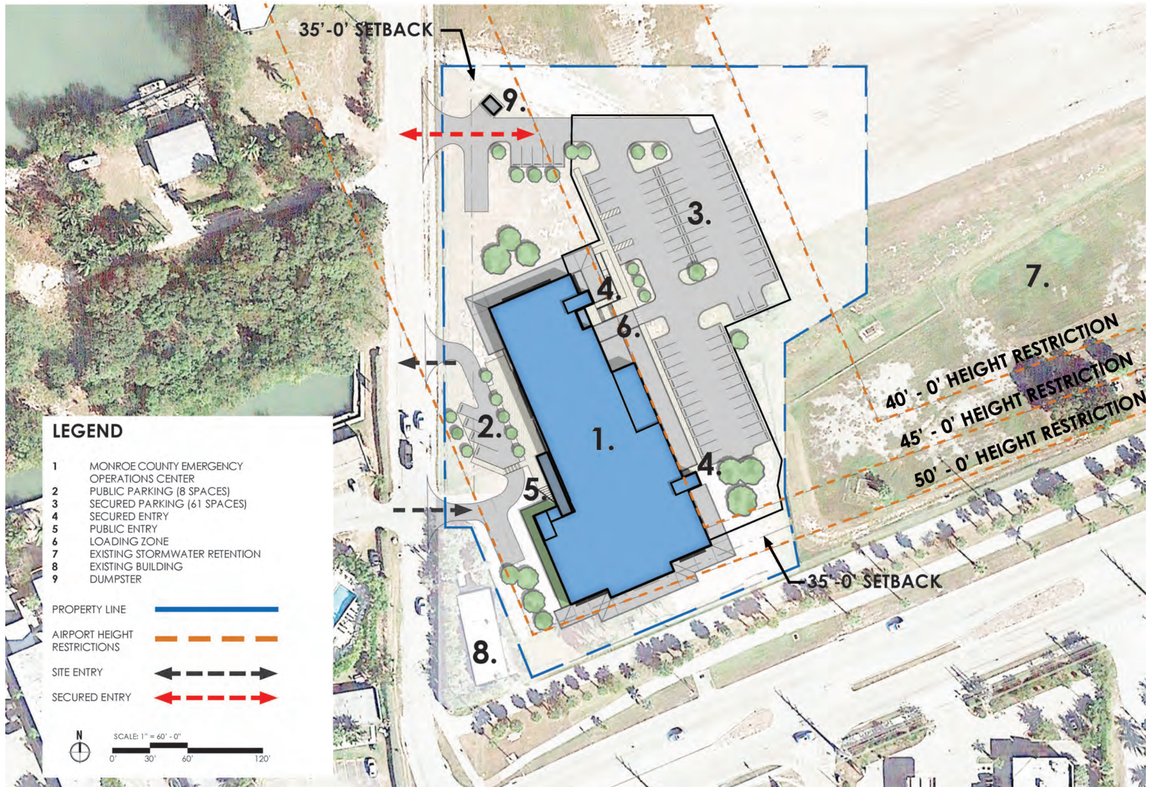
DESIGN CONSIDERATIONS

- Site selection
- Security
- Survivable/protective building envelope
- Sustainability (COOP) redundancy of systems
- Space need considerations
- Technology & emerging trends

DESIGN CONSIDERATIONS

Site Selection

- Appropriate size
- Transportation & utility access connectivity
- Ability to mitigate surrounding risks
- Cost considerations

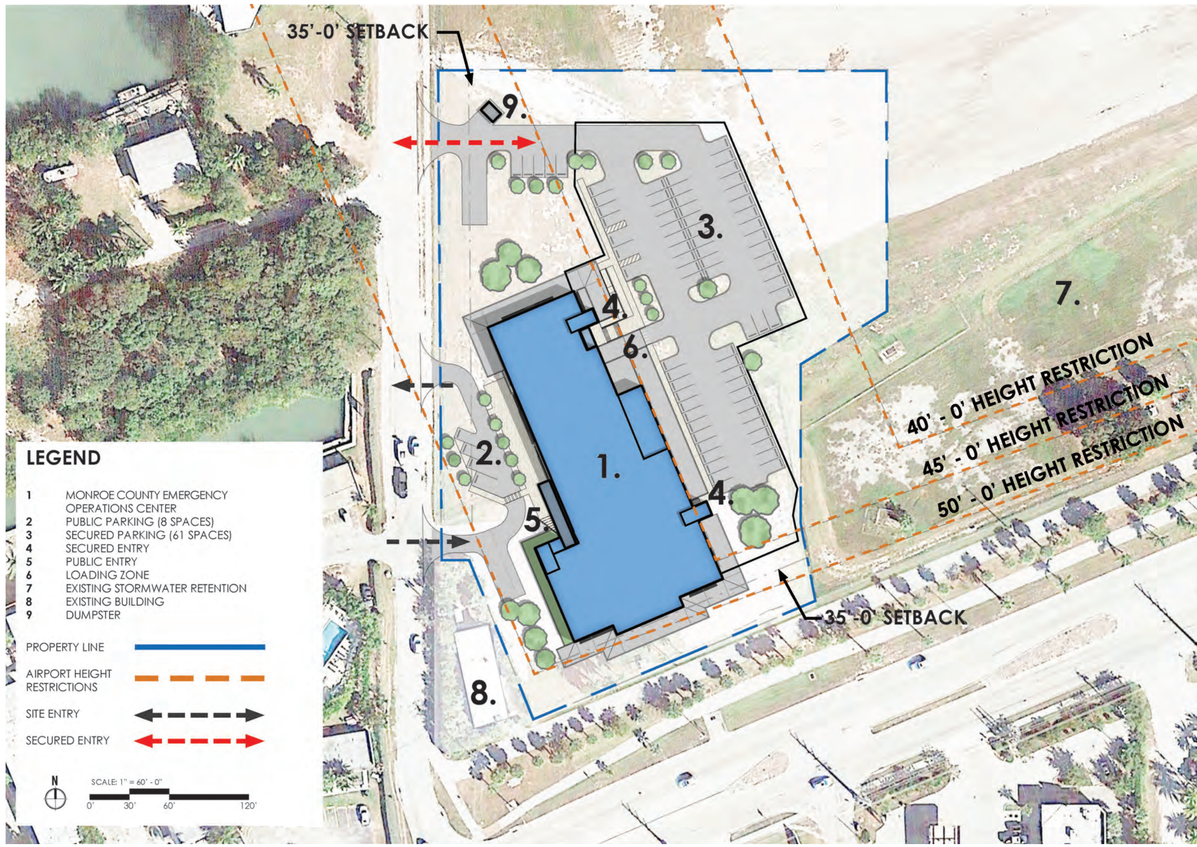


LESSONS LEARNED

10,000 Year Storm - Monroe County, FL Emergency Operations Center

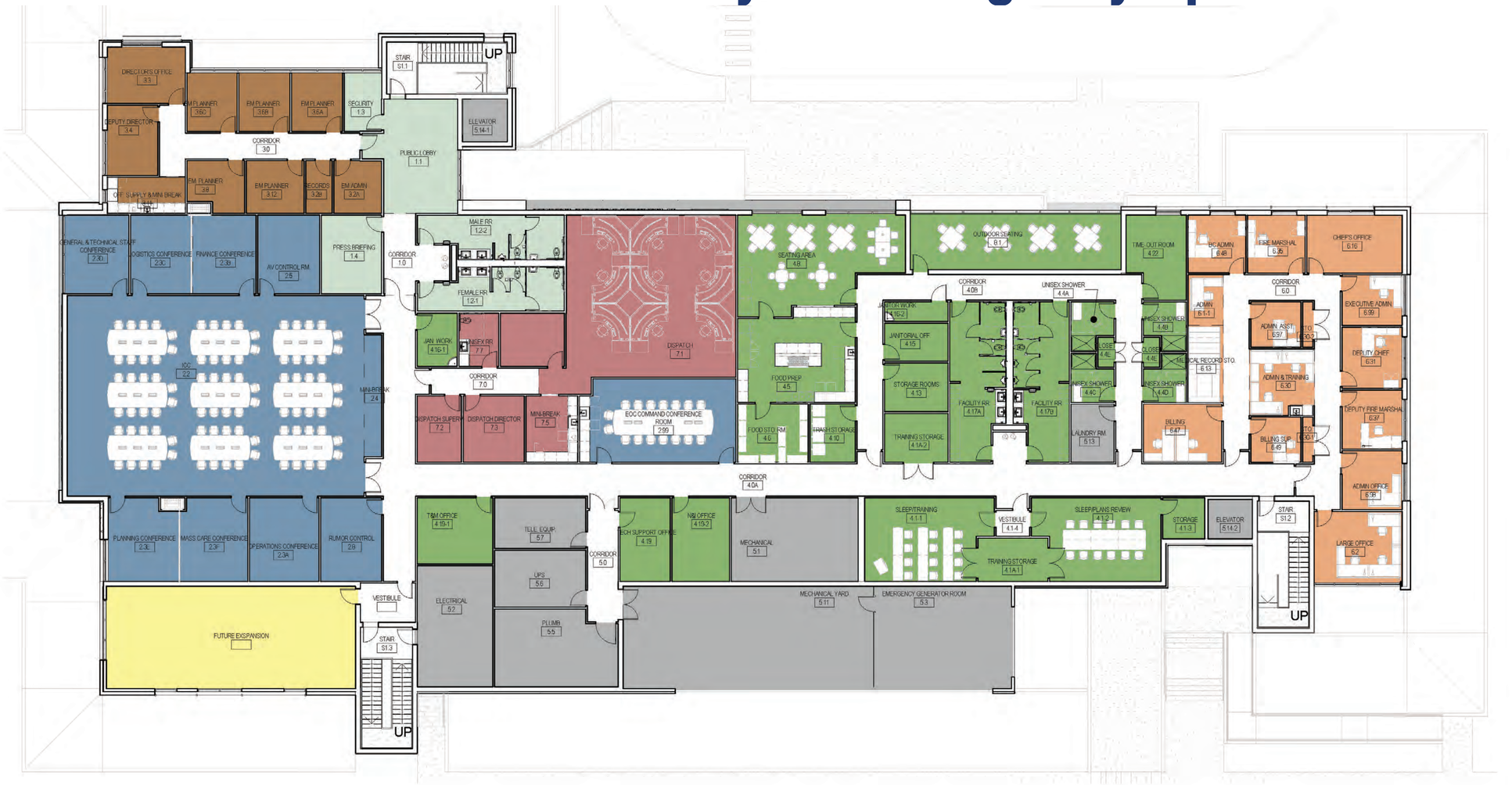
LESSONS LEARNED

10,000 Year Storm - Monroe County, FL Emergency Operations Center



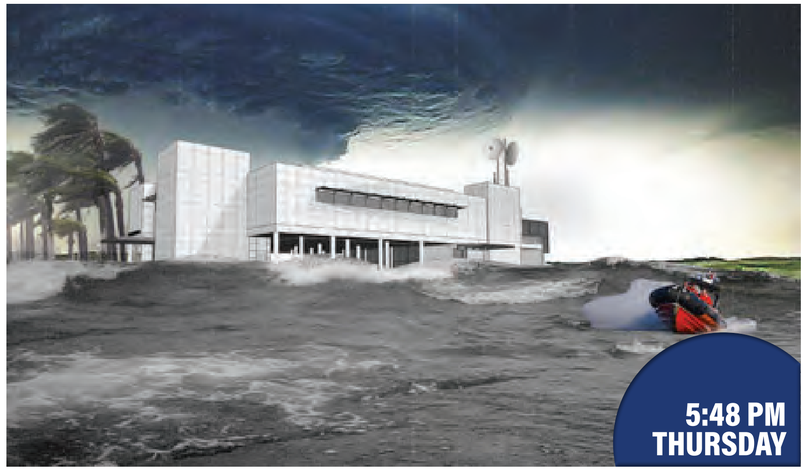
LESSONS LEARNED

10,000 Year Storm - Monroe County, FL Emergency Operations Center



LESSONS LEARNED

10,000 Year Storm - Monroe County, FL Emergency Operations Center



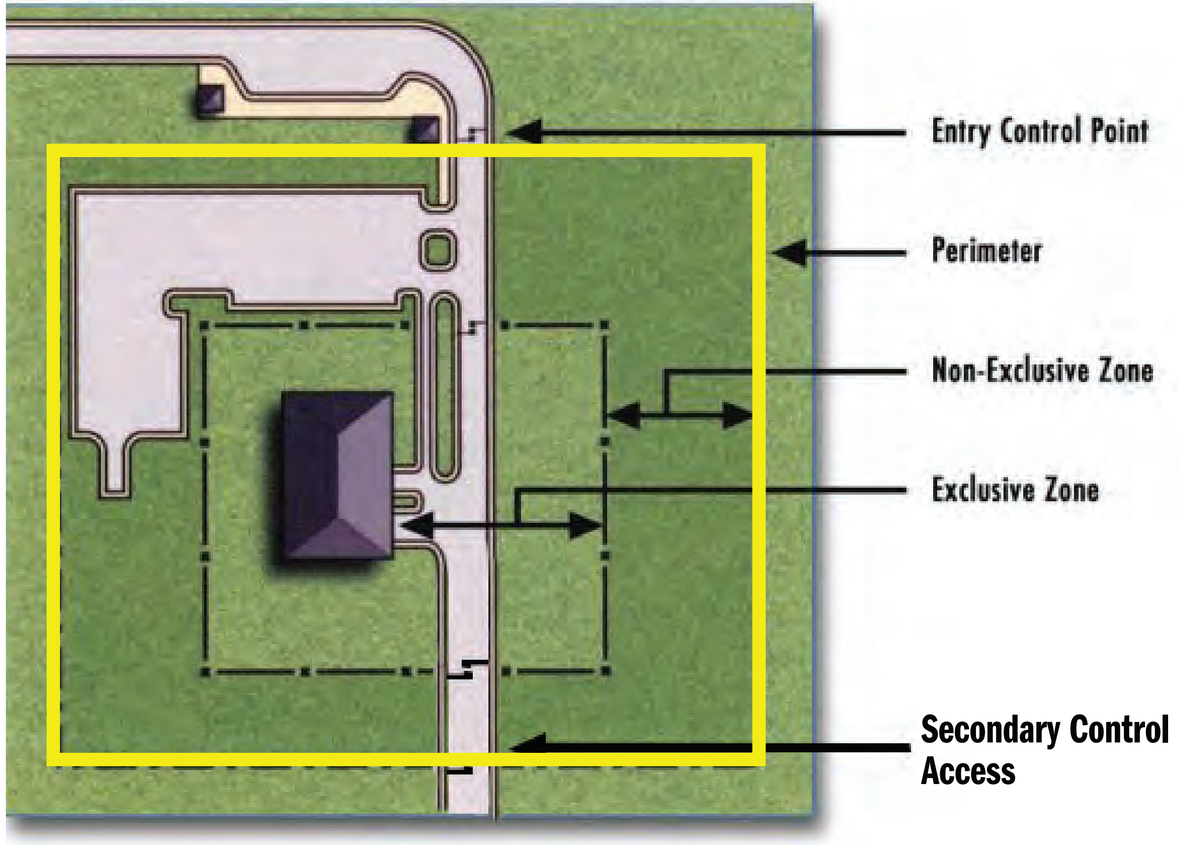
LESSONS LEARNED

10,000 Year Storm - Monroe County, FL Emergency Operations Center

DESIGN CONSIDERATIONS

Site and Facility Security - Multiple Levels / Layers

- Comprehensive Security Plan
- Access to site
- Access to building
- Access to areas within building
- Video observation



DESIGN CONSIDERATIONS

Survivability / The Protective Building Envelope

Exterior Wall Protection:

- Areas of primary concern are walls and the roof
- Special protection for windows areas(fixed and/or operable)
- Use materials that withstand impact
- Provide interior lateral support at walls
- Avoid building and elements that become projectiles

DESIGN CONSIDERATIONS

Survivability / The Protective Building Envelope

Protect all exterior surfaces:

- Doors: people and vehicle
- Windows: specialized systems
- Fresh air vents: protective closure
- Exhaust air vents: dual systems / shut-offs
- Service access panels: secured
- Plumbing vents: protected caps

DESIGN CONSIDERATIONS

Survivability / The Protective Building Envelope

The Public Entrance:

- Open and user friendly
- Permits natural light to enter buildings
- Covered and protected
- Steel door closure
- Manual and electrical capability
- Protection from air borne debris
- Consider all viable systems
- Ensure that the system has been approved

The Protective Envelope Activated

DESIGN CONSIDERATIONS

Survivability / The Protective Building Envelope - Glass

- Natural light
- Wind protection
- UV protection
- Energy efficiency
- Bullet resistance
- Blast resistance
- Fire resistance

DESIGN CONSIDERATIONS

Survivability / The Protective Building Envelope - Glass

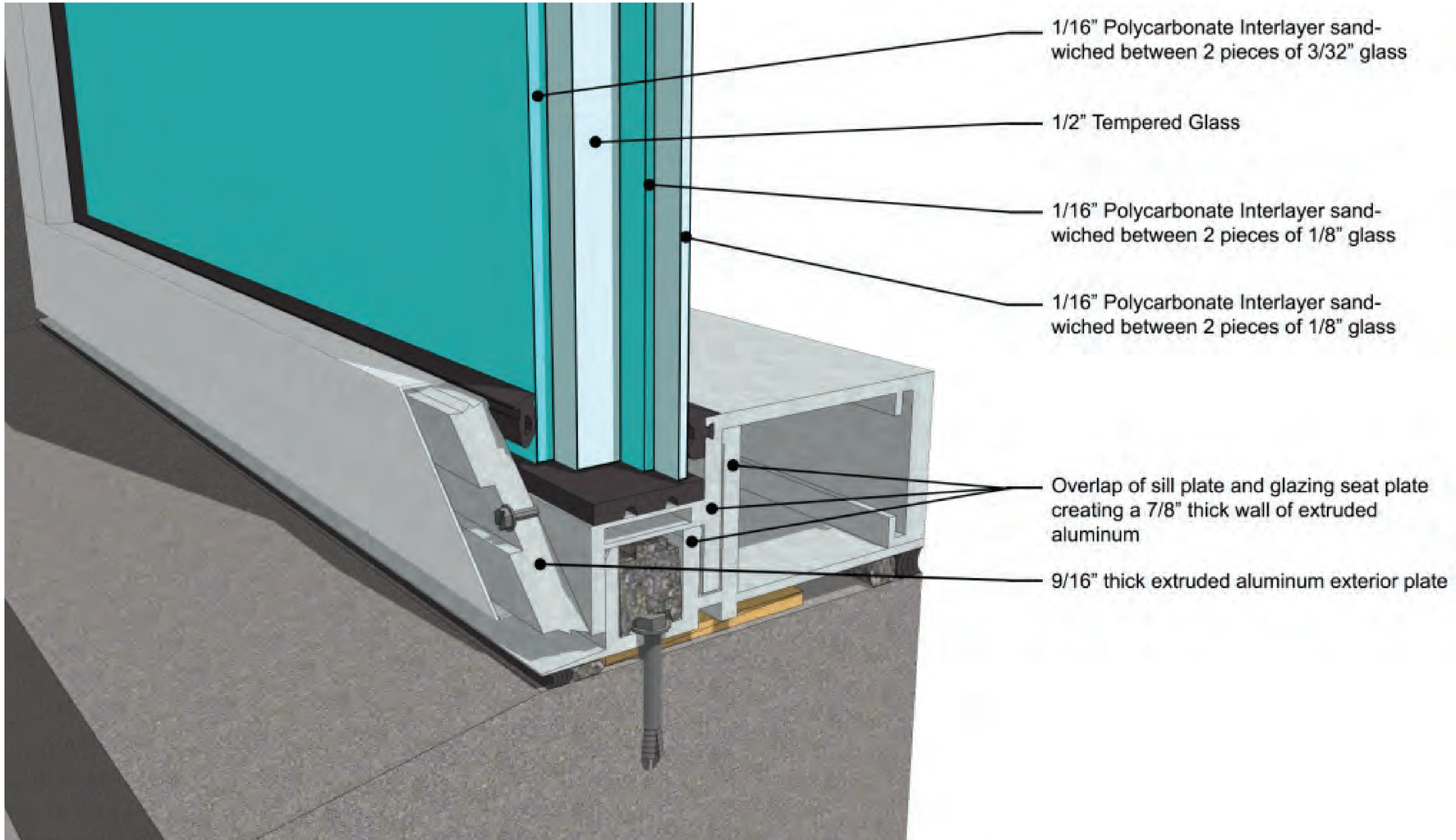
STRENGTH	SUSTAINED WIND SPEEDS (MPH)
Category 1	74 - 95
Category 2	96 - 110
Category 3	111 - 130
Category 4	131 - 155
Category 5	>155
Near Absolute	>225

- Composite products to resist impact are commonly available and safe
- Important to consider building for day-to-day operations and environmental effects on staff
- Important to consider natural and manmade threats

STANDARD THREAT LEVEL	CALIBER	REPRESENTATIVE WEAPON	BULLET WEIGHT & TYPE	STANDARD VELOCITY RANGE (FT./SEC.)	NUMBER OF SHOTS THAT MUST BE RESISTED
UL 752 | Level 1	9 x 19mm Parabellum	Pistol, Semi-automatic 5″ Barrel	124 gr. Full Metal Jacket with lead core	1,175 -0% + 10%	3
UL 752 | Level 2	.357 Magnum	Revolver 8-3/8″ Barrel	158 gr. Jacketed Soft Point	1,250 -0% + 10%	3
UL 752 | Level 3	.44 Magnum	Revolver, 6″ Barrel	240 gr. Gas checked Semi Wad Cutter	1,350 -0% + 10%	3
UL 752 | Level 4	.30-06' Springfield	Rifle, Bolt, Action 24″ Barrel	180 gr. Jacketed Soft Point	1,350 -0% + 10%	1
UL 752 | Level 5	7.62 mm	Rifle-Combat 21″ Barrel	150 gr. Ball M80	2,750 -0% + 10%	1
UL 752 | Level 6	9 x 19mm Parabellum	Pistol, Semi-automatic 5″ Barrel	124 gr. Full Metal Jacket with lead core	1,400 -0% + 10%	5
UL 752 | Level 7	5.56mm NATO	Rifle-Combat 20″ Barrel, M16A1 (USA)	55 gr. Ball M193	3,080 -0% + 10%	5
UL 752 | Level 8	7.62mm NATO	Rifle-Combat 21″ Barrel	150 gr. Ball M80	2,750 -0% + 10%	5

DESIGN CONSIDERATIONS

Survivability / The Protective Building Envelope - Glass



DESIGN CONSIDERATIONS

Survivability / The Protective Building Envelope - Glass

FIXED MOUNT

This particular style of window barrier is an architect's dream. Permanently mounted to the facility, they stand strong, silent, and secure. Storm Shield fixed mount barriers are ideal for sidelights, door lights, and custom shaped windows where egress is not an issue.

READY MOUNT

When a plan needs to be set in motion, Ready Mount can quickly be set in place. Easy to install, they can be put up or taken down at will. Occupants find them easy to store and a breeze to install when more than just a breeze is on the way. Storm Shield Ready Mounts are ready to protect during a heightened security alert, onset of inclement weather or entire hurricane season.

BAHAMA MOUNT

Commercial designers love this barrier. Nothing says "open for business" more than these Bahama Style shop windows. Ideal for Coffee shops, mercantile situations, offices or residential, they are easy to close when necessary and lock in place for superior protection. Storm Shield Bahama Mounts gives your facility that coastal look while deflecting 51% of harmful UV rays. Our top hinge design and arm track makes this item very attractive and strong.

SPLIT SASH MOUNT

This modified version of our Bahama design converts to an awning until needed for protection. The double shading serves as a cool look to any exterior.

SIDE HINGED MOUNT

Specifically designed with function in mind, Storm Shield Side Hinged units provide easy egress in an emergency with a single point release. The new "panic bar" has a unique cocking mechanism that allows it to be opened with ease. Superior engineering that provides peace of mind.

DESIGN CONSIDERATIONS

Survivability / The Protective Building Envelope - Glass

Normal operation shutter provides shading

Storm event shutter provides window protection

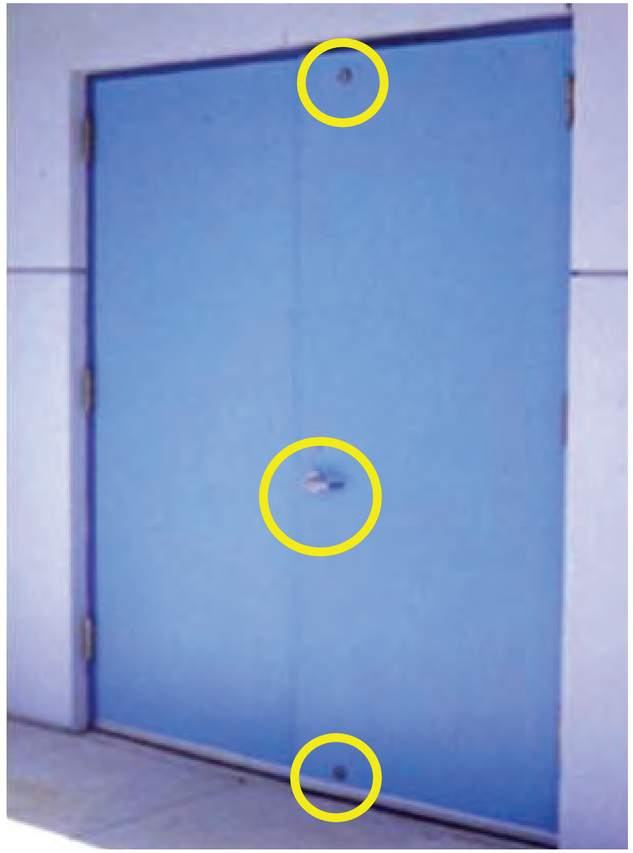
DESIGN CONSIDERATIONS

Survivability / The Protective Building Envelope - Vehicle Protection Area

ENVIRONMENTAL DESIGN CONSIDERATIONS

Survivability / The Protective Building Envelope - Exterior Access Panels

- Multiple dead bolt locks
- Provide “swing down” lateral bracing
- Locate in protected and covered environments
- Provide blast protection
- Provide debris impact protection
- Utilize redundant systems
- Account for louvers and exterior access panels



DESIGN CONSIDERATIONS

Steel enclosures for sealing air intake and exhaust

Exterior access panels

Protected environments for staff entry areas

DESIGN CONSIDERATIONS

Survivability / The Protective Building Envelope - Baffled Exhaust Systems

- Exhaust vents protected from impact of debris
- Heat is dispersed
- Locate away from air intake
- Long-life materials
- Protect air-intake vents

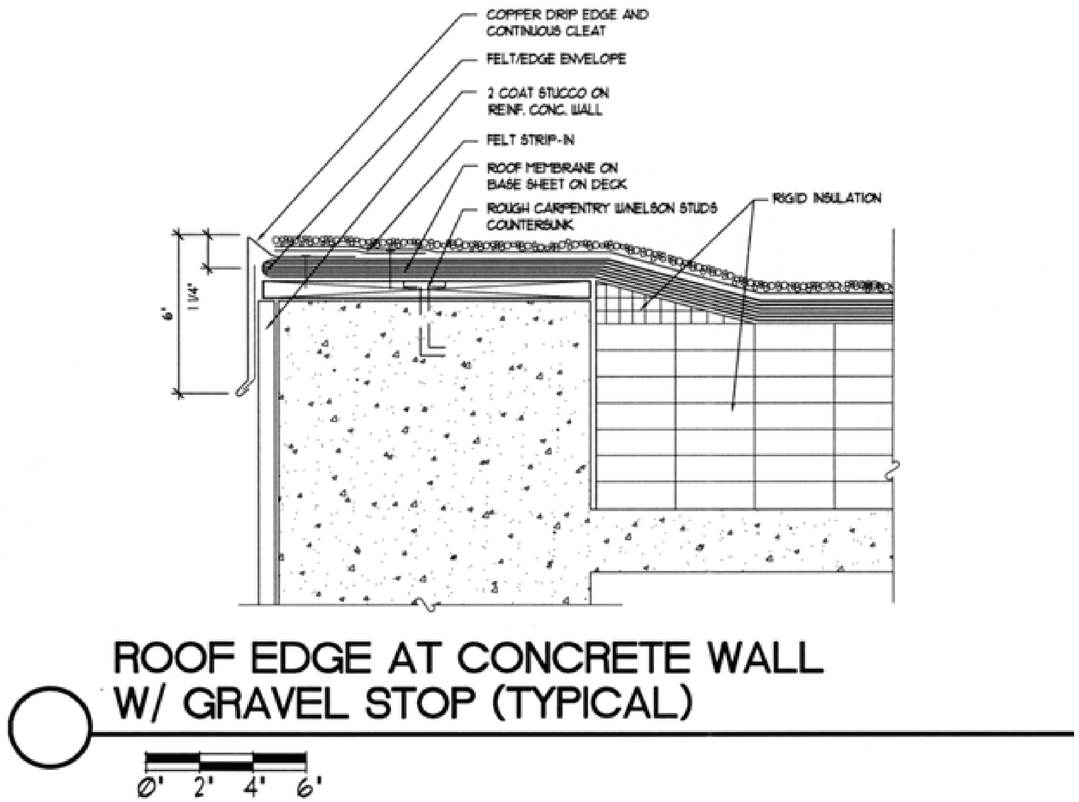
DESIGN CONSIDERATIONS

Survivability / The Protective Building Envelope - Protected Building Systems

- Impact resistant
- Protection from excessive wind forces
- Secure environment
- Clearance space around equipment

DESIGN CONSIDERATIONS

Survivability / The Protective Building Envelope - The Roof: The Weakest Link



- Requires specialized mechanical fasteners at all edge conditions
- Requires adhered roofing layers
- The point where the roof meets the wall is critical

“Consider the roofing system as an entire system”

DESIGN CONSIDERATIONS

Sustainability / Redundancy of Systems

- This is the critical factor in facility survivability
- Water supply: an independent well system
- Emergency power: multiple emergency generators or tank supply
- Sanitary sewer: septic tanks or holding tanks
- Communications: fold down antenna, power charging for wireless systems
- Gas: protected environment
- Fiber optics: underground systems

“The failure of any one of these systems may result in building failure”