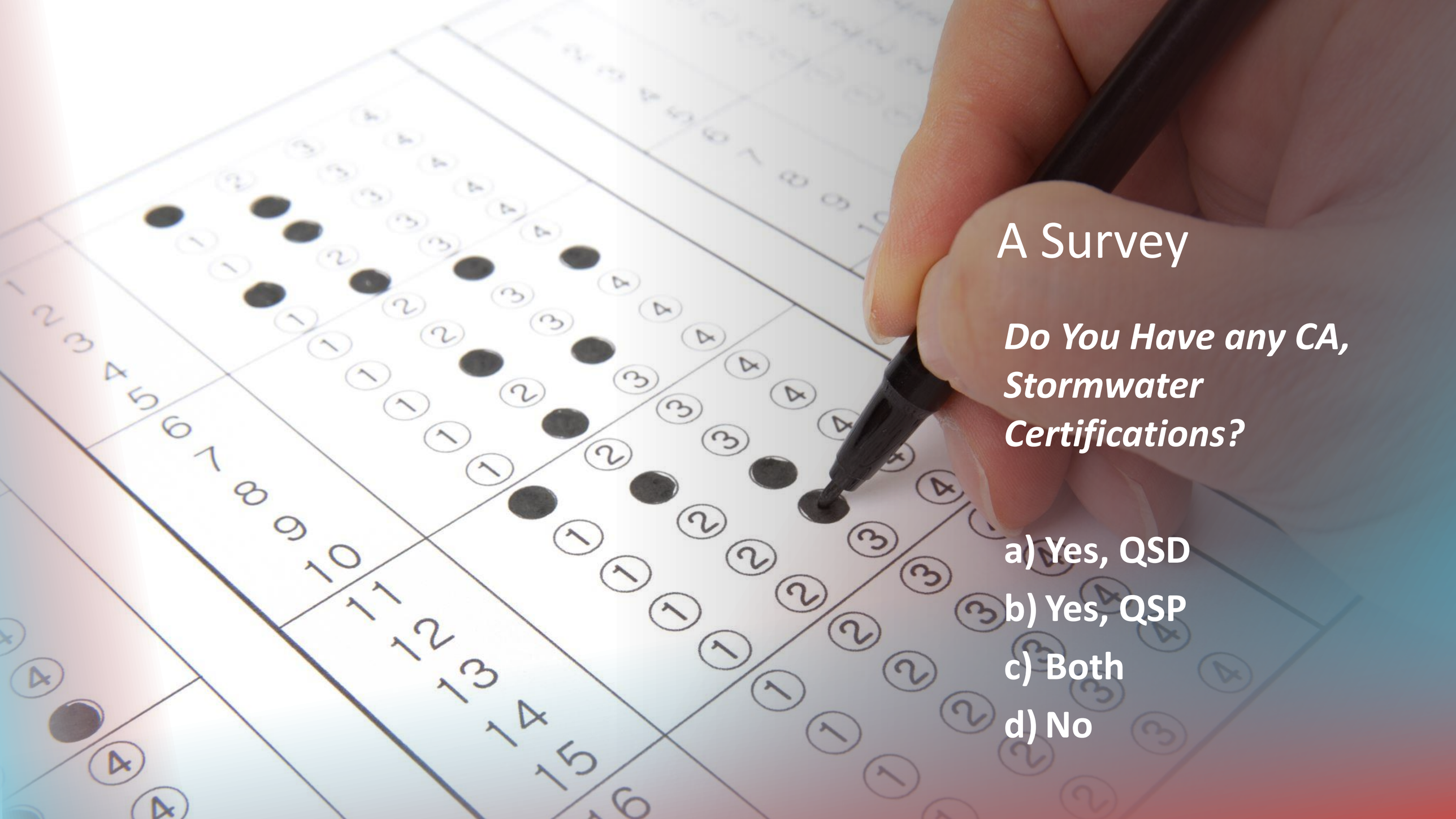
Automating QPE Predictions for Your Sites - 2022 CGP

QPE Assistant

Stormwater Awareness Week, 2024
John Price, Ph.D.
Dígame Systems
John.Price@digamesystems.com

September 26, 2024



A Survey

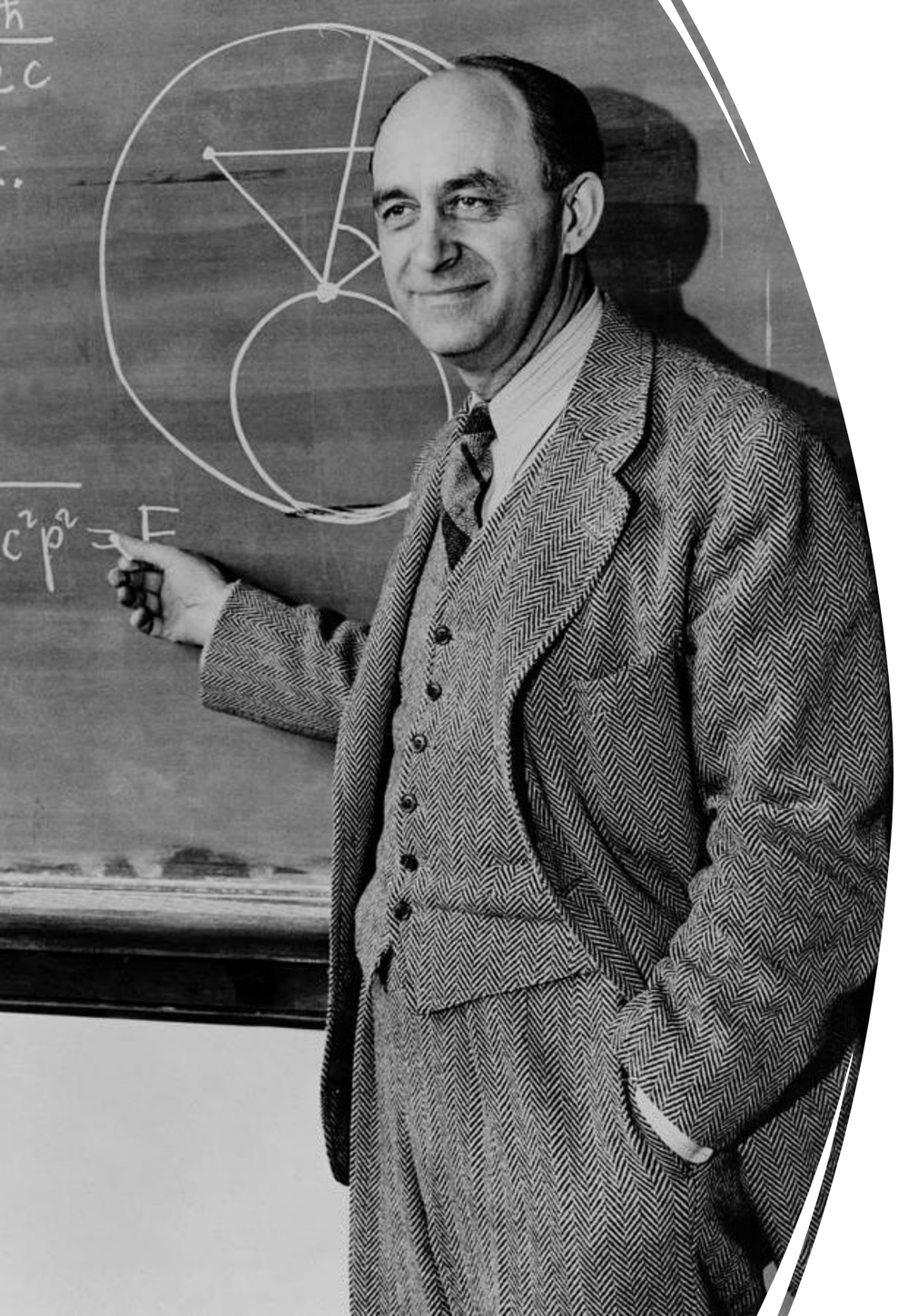
Do You Have any CA, Stormwater Certifications?

a) Yes, QSD

b) Yes, QSP

c) Both

d) No



Enrico Fermi, Ph.D., N.L.

"Never underestimate the joy a person takes in hearing something they already know."

(I'm relying on this today!)

Today

- An Admission
- A Philosophical Question
- Some History
- Some Policy – CGP 2022
- The Nuts and Bolts of QPEs
- Automating QPE Predictions (NWS API)
- QPE Assistant -A Demo
- Questions and Discussion

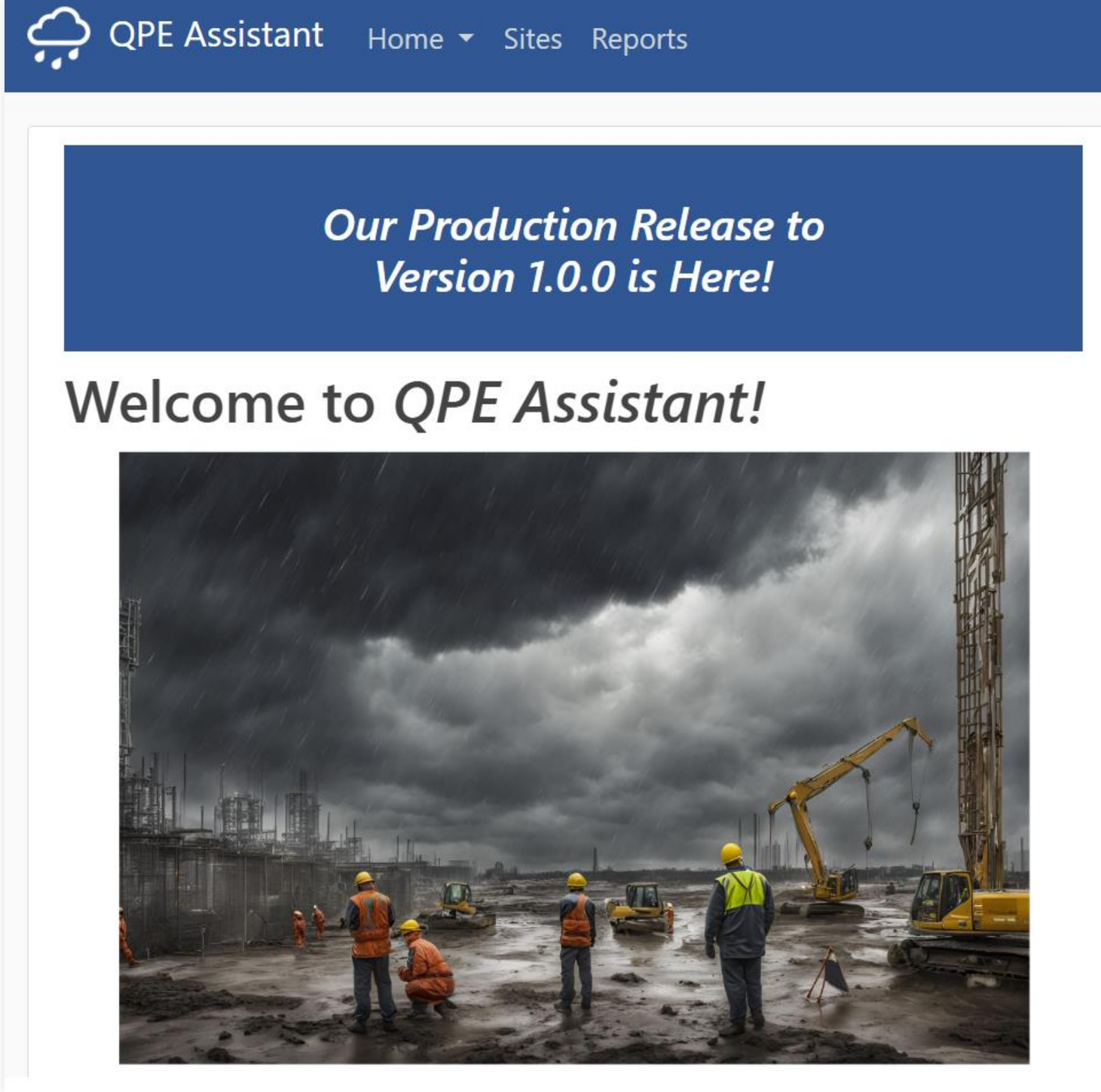
An Admission

John M. Price, Ph.D., ***"MT QSD/QSP"***

- Personal Background
  - Chemistry
  - Pacific NW National Laboratory (PNNL / EMSL)
  - Scientific Instrumentation
  - Software Engineering
  - Product Development

- Dígame Systems
  - Silicon Valley Software Consulting Firm
  - Custom IoT Application Development
  - Sensors / Wireless

- *Stormwater Management Credentials*
  - ***Married to a QSD/QSP***



Hanford Site

- The legacy of 40 years of plutonium production starting in WW2 with the B Reactor
- Cooled by the Columbia River which flows through prime farmland across Washington and out to Portland
- The largest toxic site in the country (586 sq. miles)

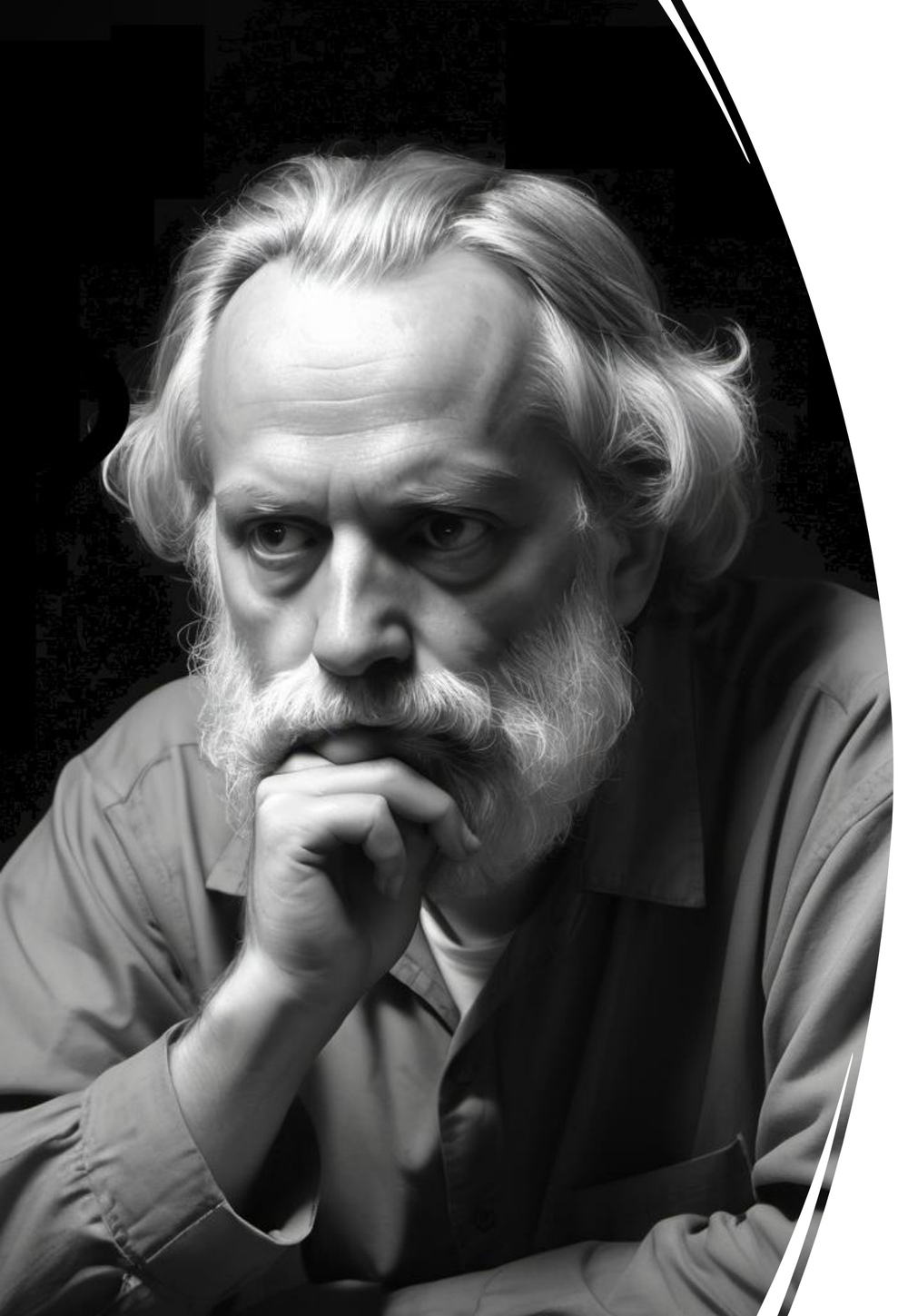
“Tank Farms”

- The Hanford site has ***177 underground tanks*** total, 28 double-shell and 149 single-shell, holding 53 million gallons of highly radioactive and hazardous waste

- ***67 of the single-shell tanks have assumed to have leaked into the groundwater***

- ***The Mission from the DOE****:*

  “New Technologies for Containment”

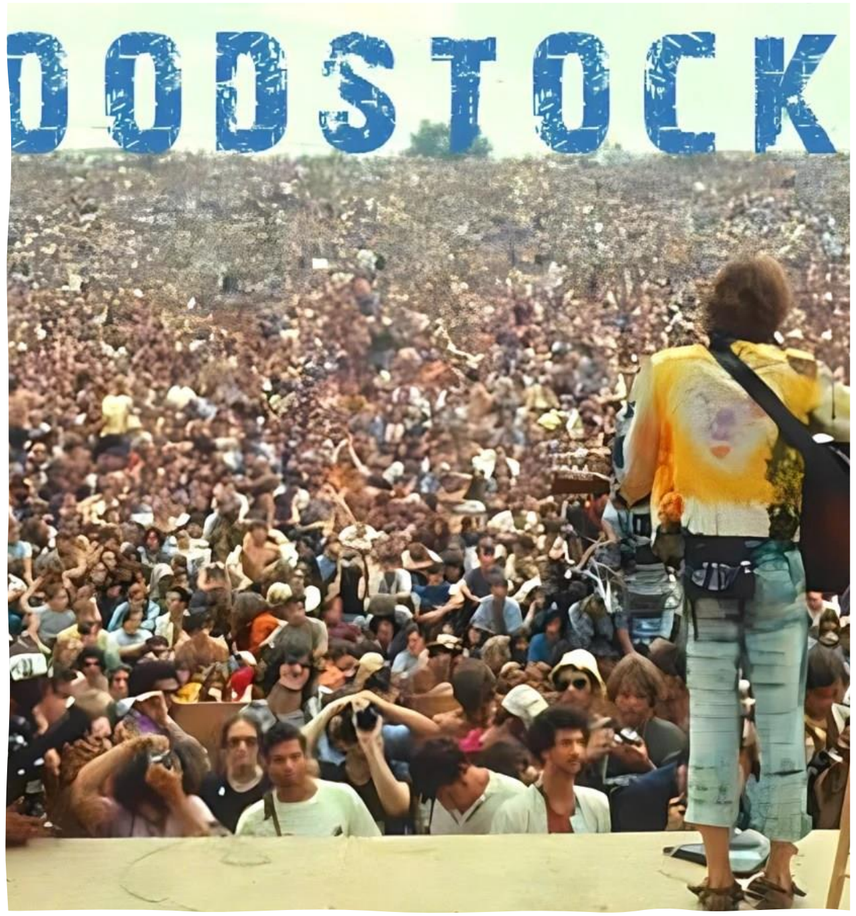


A Philosophical Question

“ Why are we here? ”

“ Do you mean: ‘Why do we exist’? ”

“ No. Why are we on Zoom at this Workshop? ”



Some History
1969

Woodstock

The Moon Landing

Little Johnny was 5…

Some History
1969

… and,

just outside of
Cleveland,

the Cuyahoga River
Catches Fire

…again.

“Again”?

Yes, the Cuyahoga River had caught fire before.

- Documentation is a bit sketchy, but there are clear accounts in newspapers of fires in:
  - 1868, 1883, 1887, 1912, 1922, 1936, 1941, 1948 and in 1952!
  - It was said that the river “oozes rather than flows.”
- As the Environmental movement in the U.S. gained momentum in the 1960’s the latest fire became a symbol of how bad things had gotten.
- Time Magazine and international publications came to take pictures of the “Man-made disaster” near Cleveland.

Some History
1972

NPDES

National Pollution Discharge Elimination System

“point sources”

Some History
1972

NPDES
National Pollution Discharge Elimination System

“point sources”

“The NPDES permit will contain limits on what you can discharge, monitoring and reporting requirements, and other provisions to ensure that the discharge does not hurt water quality or people's health.”

EPA Website

(NPDES Permit Basics | US EPA)

California Construction General Permit (CGP)

- The Federal Clean Water Act requires certain stormwater discharges to waters of the United States to be regulated by an NPDES permit
- The State Water Board of California adopted the existing statewide NPDES Construction Stormwater General Permit in 2009
- The 2009 permit expired in 2014 and is administratively extended

2022 CGP: Effective Date and Regulatory Transition Period

September 8, 2022

State Water Board adopts the 2022 CGP

December 17, 2022

Statewide programmatic permitting, under the 2009 CGP, available to implement Executive Order N-72-20

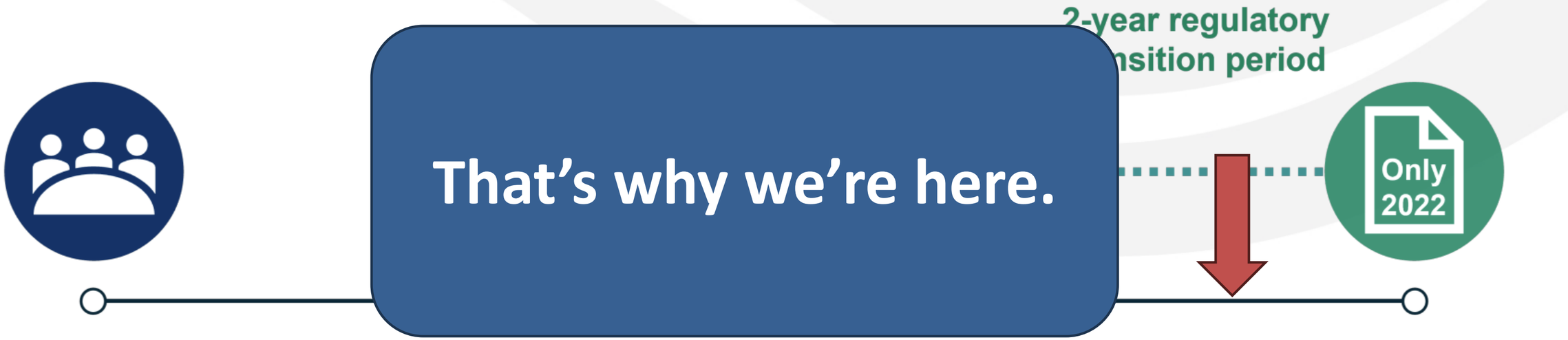
September 1, 2023

2022 CGP becomes effective

September 1, 2025

Regulatory transition period ends, the 2022 CGP is the only effective permit

2022 CGP: Effective Date and Regulatory Transition Period



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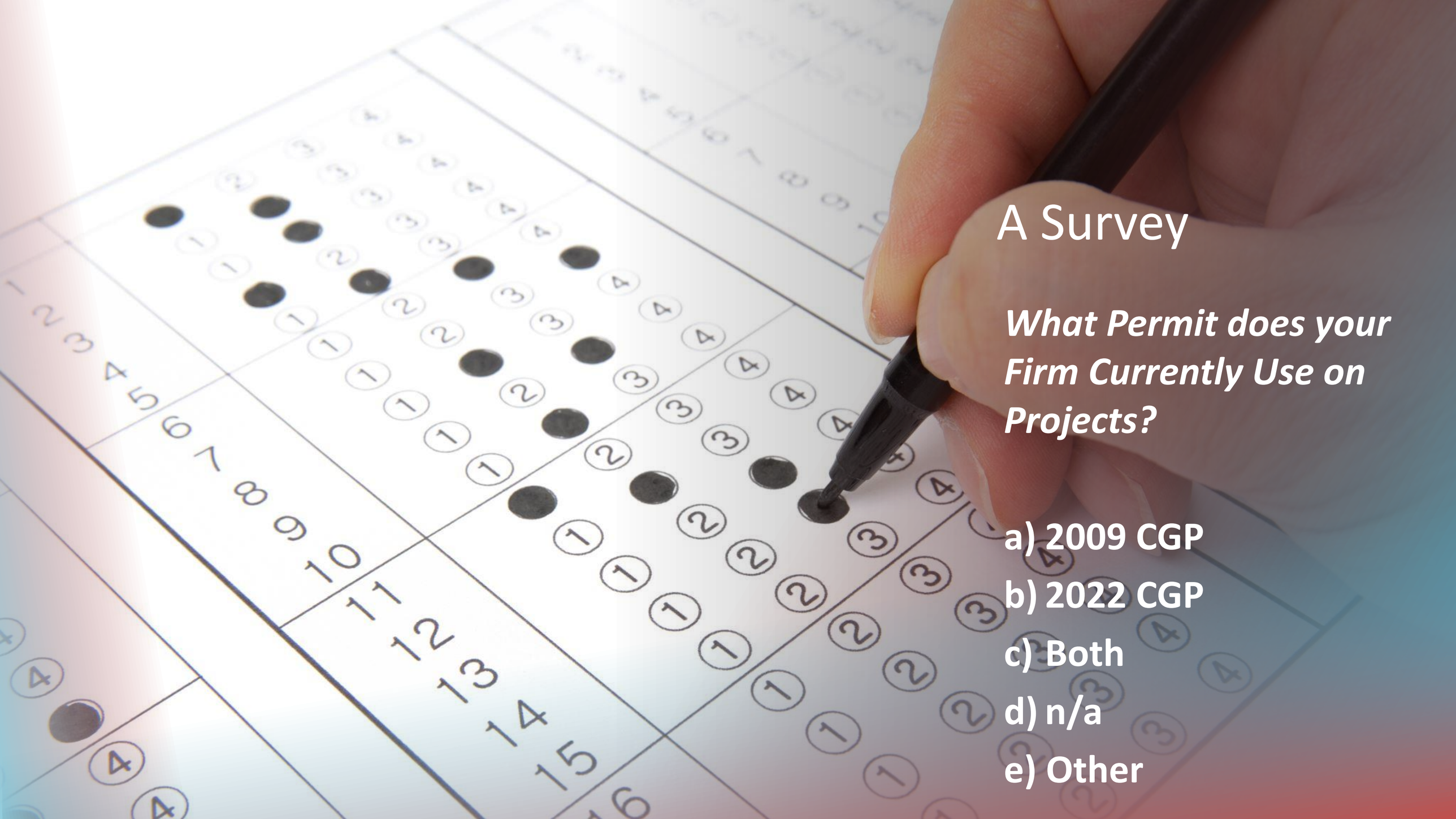


A Survey

What Permit does your Firm Currently Use on Projects?

a) 2009 CGP

b) 2022 CGP

c) Both

d) n/a

e) Other

The California 2022 CGP

Applying for Permit Coverage	Total Maximum Daily Load Implementation
Post-Construction Plan Submittals	Active Treatment Systems
Programmatic Permitting for Linear Projects	Passive Treatment
Notice of Non-Applicability	Exceptions to the California Ocean Plan
QSD/QSP Responsibilities	Dewatering Activities
Stormwater Professional Training	Surface Water Buffers
Qualifying Precipitation Events	Changes of Information
Site Inspections (Scheduling)	Inactive Project Status
Stormwater Discharge Monitoring	Reducing Acreage for Residential Lots
Non-Visible Pollutant Monitoring	Notice of Termination

Qualified SWPPP Developer / Practitioner (QSD/QSP) Responsibilities

- **QSDs** are required to prepare the site-specific SWPPP and *conduct inspections*:
  - Start of construction, when replacing a QSD, twice annually, and following a numeric action level exceedance
- **QSPs** oversee monitoring and implementation of the SWPPP and *conduct inspections*:
  - Once per month, pre-qualifying precipitation event, following a numeric action level exceedance, and for the Notice of Termination
  - Train Delegates (CASQA guidelines, February 2024)
- **QSP Trained Delegates –** Recent changes to formalize this role and responsibilities. (Talk today!)
- The 2022 permit allows the Water Boards to suspend or rescind QSD/QSP certifications as an enforcement action
  - ***More 'teeth' than the 2009 CGP.***

Inspections

Inspection Type	Qualified SWPP Developer (QSD)	Qualified SWPP Practitioner (QSP)	Trained Delegate
Weekly	X	X	X
Pre-Precipitation Event	X	X	
During Precipitation Event	X	X	X
Post-Precipitation Event	X	X	X
Inactive Projects (2 Weeks after Change of Information approval)	X		
Inactive Projects (Monthly Inspection and Pre-Precipitation Events)	X	X	X
Active Projects (Monthly Inspection)	X	X	
Twice-Annual Inspection	X		
Within 30 days of construction commencing or replacing a QSD	X		
Within 14 days of a NAL exceedance	X	X	
Prior to NOT and COI submissions	X	X	

QPE

Qualified Precipitation Events (QPEs)

Side Note: An “Event”, for the most part, has nothing to do with ***Actual Rainfall!***

Inspection requirements are based on ***Predictions*** *(PoPs and QPFs)*.

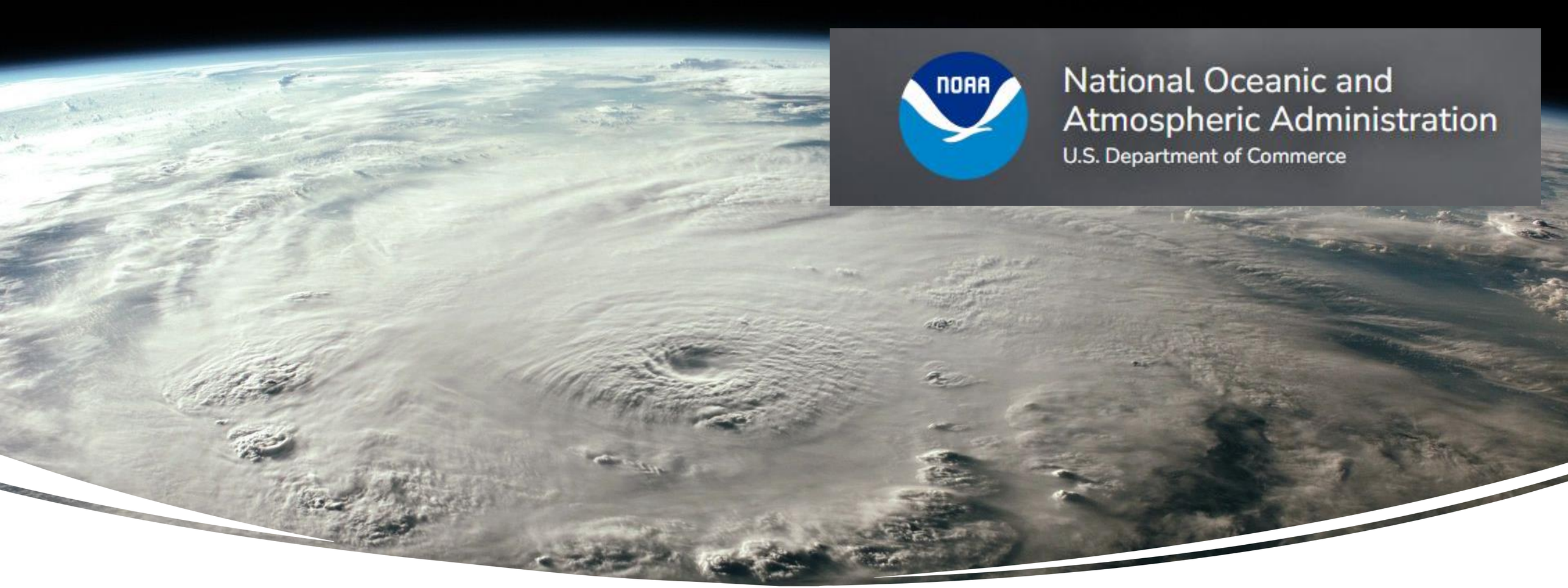
“Qualifying precipitation event is any weather pattern that is forecast to have a 50 percent or greater Probability of Precipitation (PoP) and a Quantitative Precipitation Forecast (QPF) of 0.5 inches or more within a 24-hour period.

The event begins with the 24-hour period when 0.5 inches has been forecast and continues on subsequent 24- hour periods when 0.25 inches of precipitation or more is forecast. “

ORDER WQ 2022-0057-DWQ NPDES No. CAS000002
ATTACHMENT B B-12, Page 328.

Predictions Drive Inspection Requirements

- **Pre-, during-, and post-qualifying precipitation event inspections**
  - Pre-qualifying precipitation event inspections must occur within 72 hours and up to 120 hours prior to event
  - Post-qualifying precipitation event inspections must occur within 96 hours of the last 24-hour period with 0.25 inches or more of precipitation
- **Weekly Inspections**
  - Pre-, during-, and post-qualifying precipitation event inspections may count towards the weekly inspection requirement



Where do These Predictions Come from?

NOAA / NWS - Your tax dollars at work

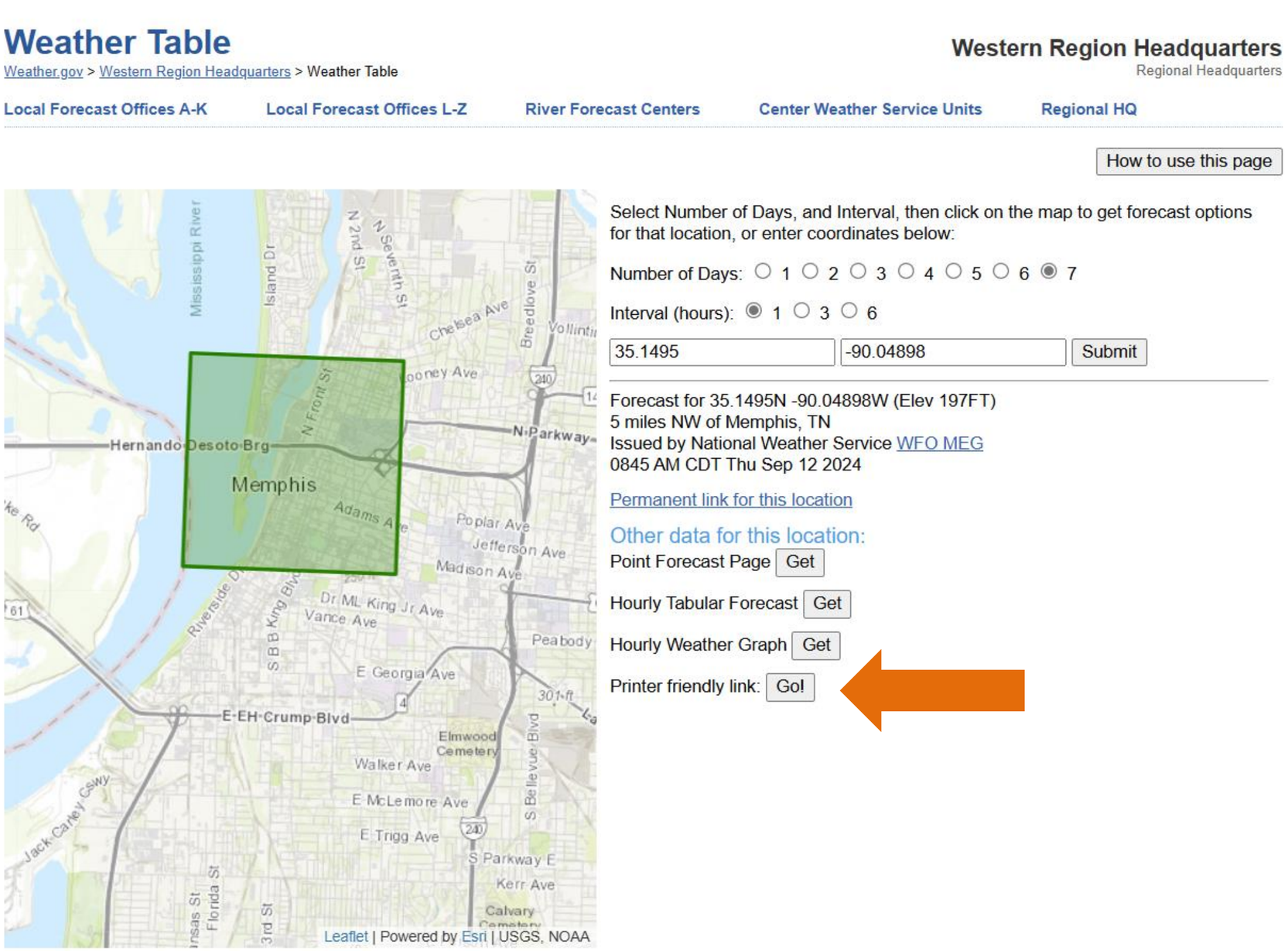
Up-to-date weather data including long-term predictions

Freely-available NWS web pages for users

api.weather.gov for Developers! (more below)

NWS Weather Table

- *The entire US is covered in 2.5 x 2.5 km ‘grid-points’*
- *Detailed forecast data available for each grid-point*
- *Data provided by 122 NWS state forecast field offices*



https://www.weather.gov/wrh/wxtable

NATIONAL WEATHER SERVICE

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

Forecast for 35.1495343N -90.0489801W (Elev 197FT)
5 miles NW of Memphis, TN
Issued by National Weather Service WFO MEG
0845 AM CDT Thu Sep 12 2024

Date	Thu Sep 12				Fri Sep 13				Sat Sep 14				Sun Sep 15				Mon Sep 16				Tue Sep 17				Wed Sep 18			
High Temp(F)	69				68				78				81				83				84				86			
Low Temp(F)	66				65				64				65				66				65				66			
Time	1am	7am	1pm	7pm	1am	7am	1pm	7pm	1am	7am	1pm	7pm	1am	7am	1pm	7pm	1am	7am	1pm	7pm	1am	7am	1pm	7pm	1am	7am	1pm	7pm
Temp(F)	65	75	74	68	66	79	76	69	67	80	77	69	65	81	78	69	66	83	80	72								
Dew Point	65	70	70	68	66	71	71	69	67	70	69	69	65	69	69	69	66	70	70	70								
Relative Humidity(%	100	84	87	100	100	77	85	100	100	72	76	100	100	67	74	100	100	65	72	93								
Wind Direc	N	N	NE	E	NE	NE	NE	E	E	NE	NE	E	E	N	NE	SE	SE	SW	SE	SE								
Wind Spee	2	6	3	2	2	6	5	2	2	7	5	2	2	6	5	2	3	6	5	3								
Wind Gust	7	10	7	5	6	10	9	8	7	10	8	7	7	9	8	7	8	10	8	8								
Cloud Cov	75	60	35	40	55	50	45	25	50	45	25	15	30	25	20	10	15	15	10	15								
Prob. of Precip(%)	80	95	90	50	75	65	40	30	20	30	15	15	15															--
6 Hr. Precip(in)	0.94	2.04	0.81	0.22	0.20	0.13	0.03	0.03	0.02	0.04	0.00	0.00	.00															0
6 Hr. Snow(in)													0.0															0.0
Snow Level(ft)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

"50 percent or greater Probability of Precipitation (PoP) and a Quantitative Precipitation Forecast (QPF) of 0.5 inches or more within a 24-hour period…

…and continues on subsequent 24- hour periods when 0.25 inches of precipitation or more is forecast."

QPE Starts

QPE Continues

QPE Over

Room for Interpretation

"24 Hour Period"?

Qualifying Precipitation Example #1

	December 31				January 1				January 2				January 3			
Time	4a	10a	4p	10p	4a	10a	4p	10p	4a	10a	4p	10p	4a	10a	4p	10p
PoP	55	95	100	40	15	-	-	-	-	5	50	55	30	30	30	35
QPF	0.02	0.13	0.83	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.1	0.01	0.01	0.01	0.04
QPE	**1st QPE – Start & End**				**No QPE**				**No QPE**				**No QPE**			

	January 4				January 5				January 6				January 7			
Time	4a	10a	4p	10p	4a	10a	4p	10p	4a	10a	4p	10p	4a	10a	4p	10p
PoP	35	45	60	80	75	55	35	30	20	15	15	15	-	-	-	-
QPF	0.05	0.11	0.28	0.51	0.35	0.30	0.27	0.11	0.07	0.05	0.00	0.00	0.00	0.00	0.00	0.00
QPE	**No QPE**		**2nd QPE – Day 1 (Start)**				**2nd QPE – Day 2 (End)**				**No QPE**				**No QPE**	

PoP = Probability of Precipitation QPF = Quantitative Precipitation Forecast

QPE = Qualifying Precipitation Event

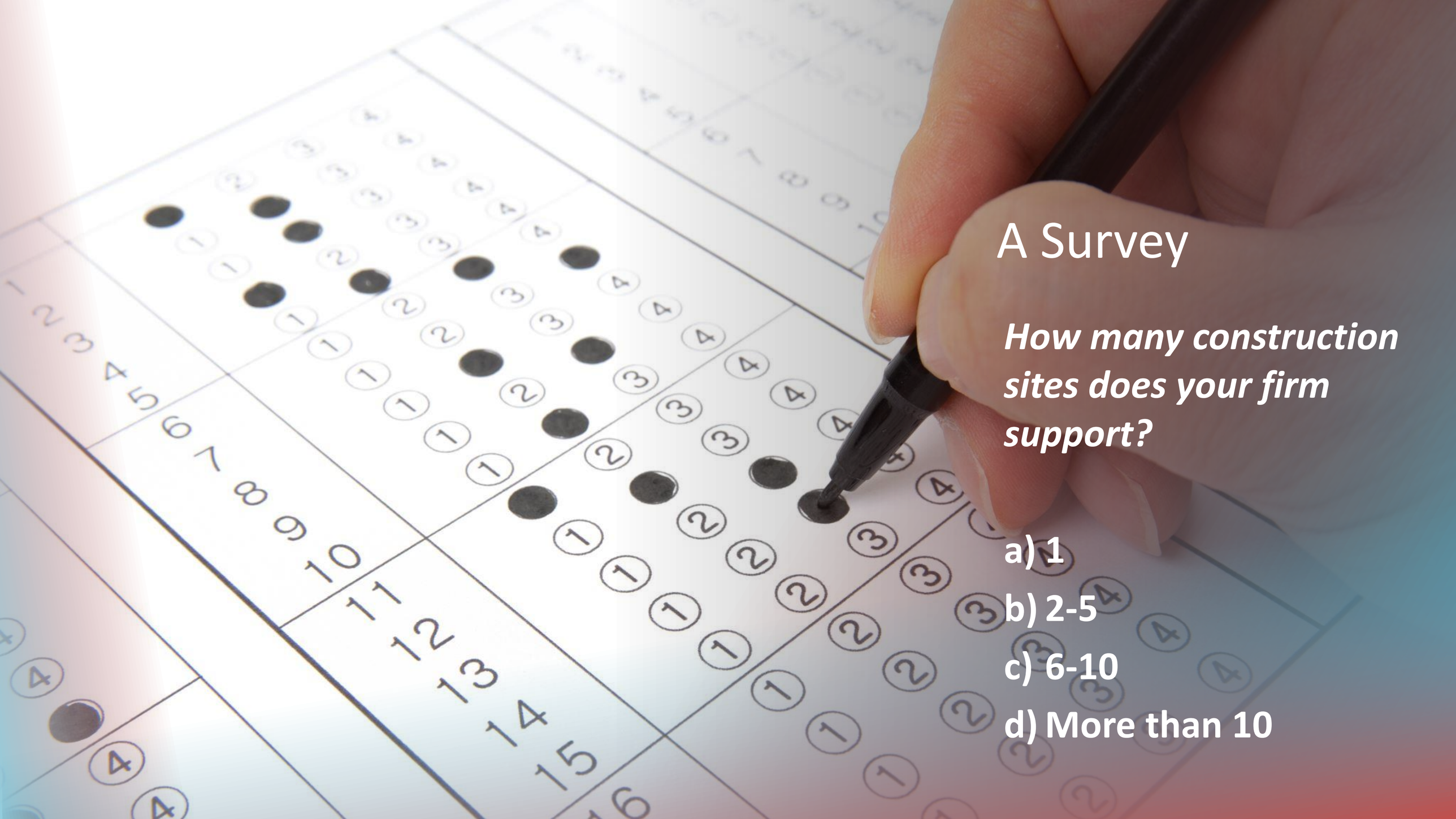
Real-Life Example

Courtesy of:
Teresa Price, P.E., QSD/QSP
Hanna-Brunetti, Gilroy, California

(She had 6 of these…)

Forecast for 37.1203N -121.6540W (Elev 331FT)
1 miles SW of Morgan Hill, CA
Issued by National Weather Service WFO MTR
1056 AM PST Wed Dec 13 2023

Date	Wed Dec 13				Thu Dec 14				Fri Dec 15				Sat Dec 16				Sun Dec 17				Mon Dec 18				Tue Dec 19			
High Temp(F)	67				69				70				74				62				63				61			
Low Temp(F)	39				42				44				46				49				51				49			
Time	4am	10am	4pm	10pm	4am	10am	4pm	10pm	4am	10am	4pm	10pm	4am	10am	4pm	10pm	4am	10am	4pm	10pm	4am	10am	4pm	10pm	4am	10am	4pm	10pm
Temp(F)	41	51	64	49	44	54	65	51	46	58	66	52	48	58	69	56	50	54	59	55	53	56	61	56	52	55	59	54
Dew Point(F)	41	44	40	41	37	38	37	37	35	39	37	35	32	34	37	38	40	49	50	52	52	56	55	54	52	55	52	51
Relative Humidity(%)	99	76	42	73	77	54	35	58	67	49	34	50	54	40	31	52	70	82	73	88	98	100	80	91	100	100	77	90
Wind Direction	N	NW	W	SE	E	SE	NW	E	E	E	E	E	E	SE	SE	E	E	E	SE	SE	SE	SE	S	SE	SE	S	SW	S
Wind Speed(mph)	3	6	7	3	2	5	6	3	3	6	8	6	6	10	10	6	8	10	12	9	9	10	10	7	5	8	10	8
Wind Gust(mph)	5	8	10	6	5	7	9	6	6	9	12	8	9	16	16	10	12	15	17	14	13	15	16	10	8	12	16	12
Cloud Cover(%)	20	5	30	60	50	35	70	55	55	50	70	40	15	20	55	0.84>0.5				0.46>0.25				0.20<0.25				70
Prob. of Precip(%)	--	--	--	--	--	--	--	--	--	--	--	--	--	15	35	55	70	85	90	85	80	80	70	50	40	60	60	55
6 Hr. Precip(in)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.09	0.26	0.31	0.18	0.07	0.22	0.09	0.08	0.02	0.03	0.07	0.08	0.17
6 Hr. Snow(in)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	QPE (begin)		0.0	0.	QPE (end)		0.0	No QPE			.0	0.0
Snow Level(ft)	5800	5800	5800	5700	5700	5700	5800	5800	6100	6000	6200	6600	6500	7500	8800	93(			3500	780			500	7			00	6600



A Survey

How many construction sites does your firm support?

a) 1

b) 2-5

c) 6-10

d) More than 10

The Cost of Compliance?

Inputs

Staff Cost ($/hr)

50

Number of Sites to Monitor

1

Min Per Site for QPE evaluation

2

Calculate Annual Staff Cost

Calculation

Cost = Staff Rate x
Num. Sites x
Hrs./Site x
Days/Week x
Weeks/Mo x
Mos./year

$ 430 / year

“We can automate this.” The NWS API

- Gives access to up-to-date weather information from the thousands of grid-point locations across the country
- Rich data sets for each location, updated multiple times per day
- Note: The NWS API is used to generate the Weather Table available from the NWS Web Site

What's an 'API'?

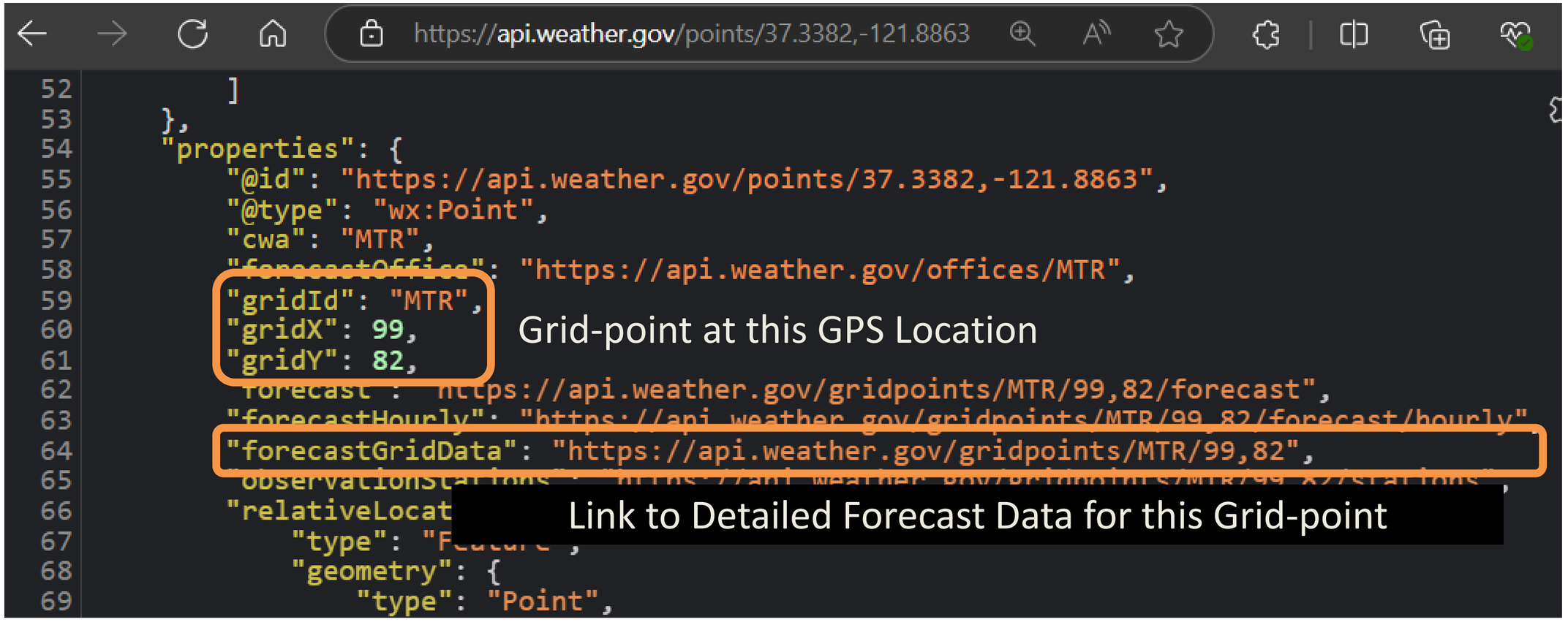
- API = "Application Programming Interface"
- A Web Browser provides a "User Interface"
- An API provides a "Developer Interface"
- Like your browser, the NWS API uses URLs (web addresses) to access data
- https://api.weather.gov/...
- Instead of a web page, the NWS API returns text in a nicely-structured format for other computers

Using the NWS API - Examples

Ask for information about a GPS location. (Lat, Lon)

https://api.weather.gov/points/{lat},{lon}

“nicely-structured”?

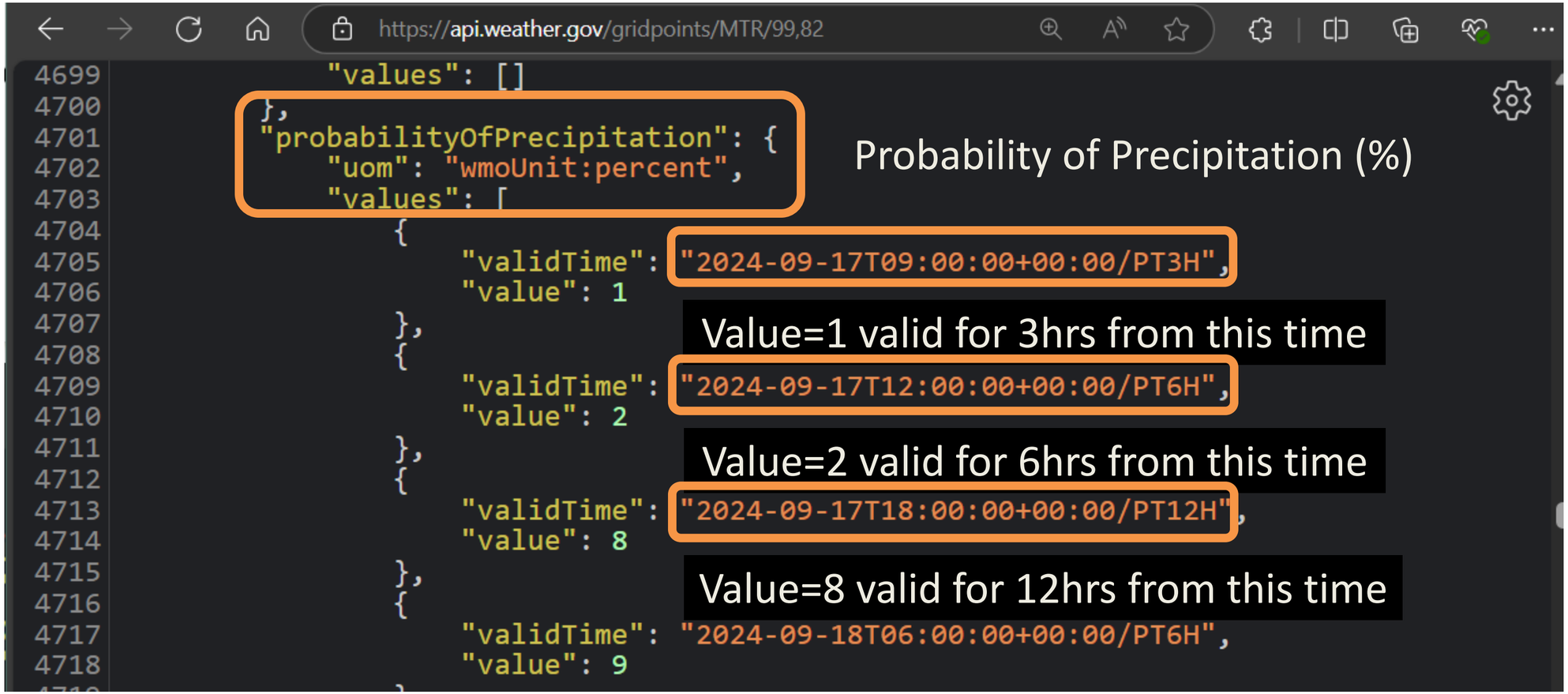


Using the NWS API - Examples

Ask for a forecast

`https://api.weather.gov/gridpoints`
`/{gridID}/{gridX},{gridY}`

> 8000 Lines



Using the NWS API - Examples

Ask for a forecast

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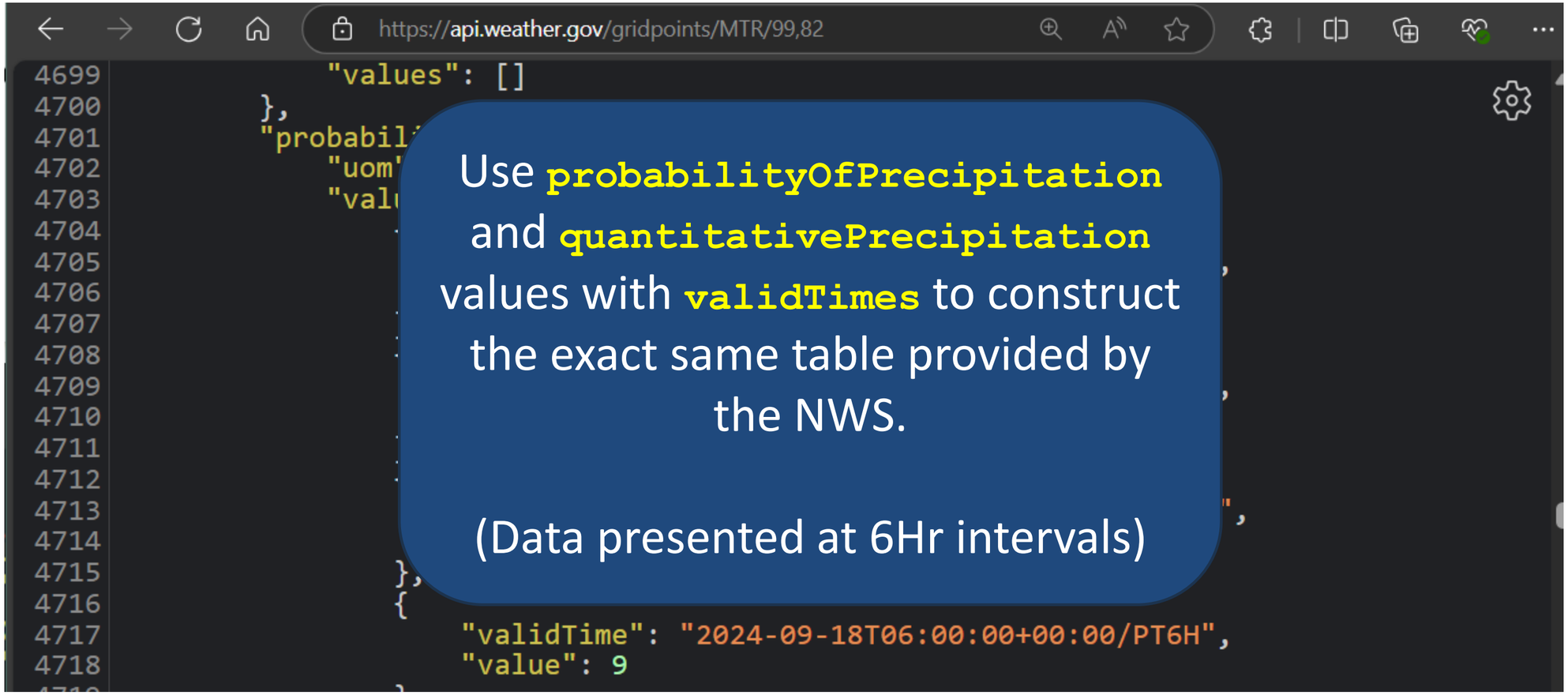


Reports View

National Weather Service Grid Point: MEG/42/67

Forecast Last Updated: Wednesday September, 11 - 09:41
Hourly Forecast Table: MEG/42/67
Hourly Graph: View

Sites

Site Name	Address
Memphis	Memphis, TN, USA

Qualifying Precipitation Events (QPEs)

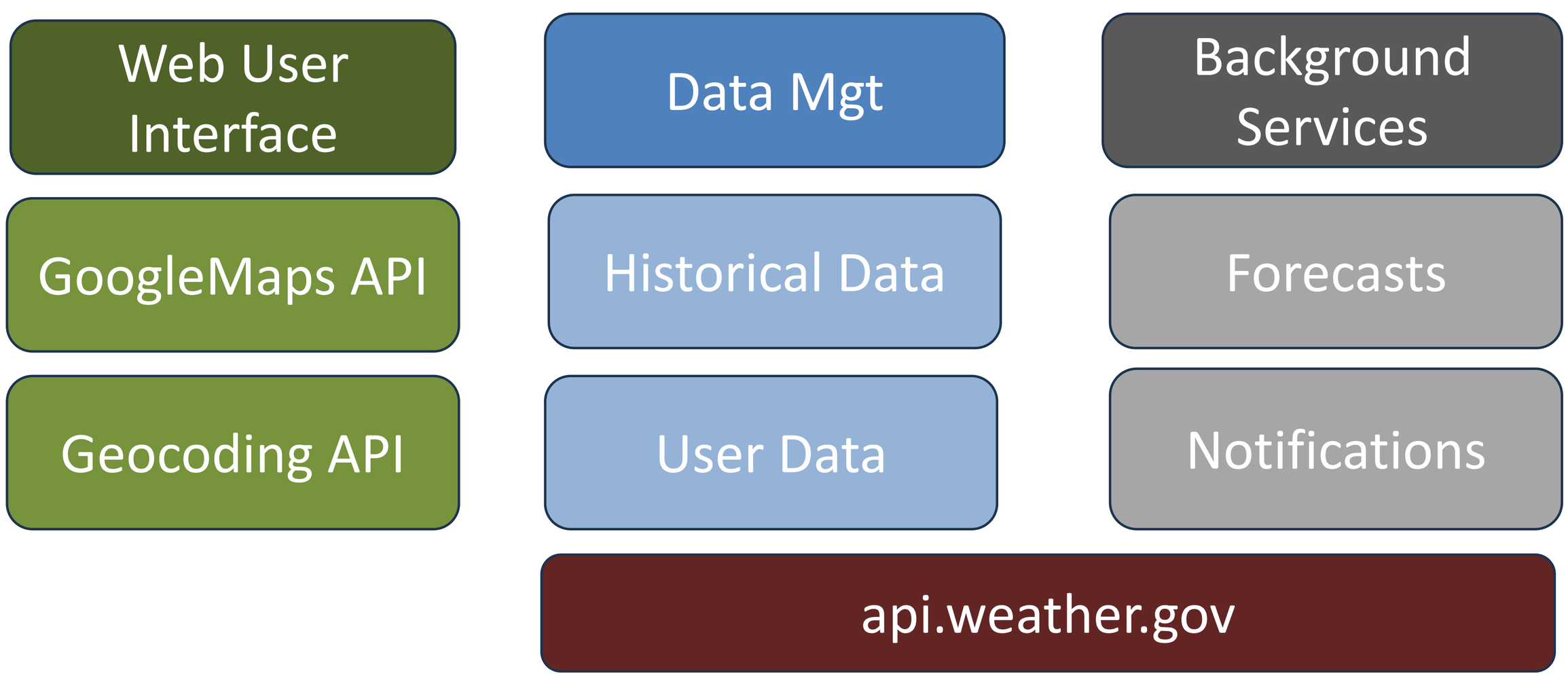
Number of QPE Events: 1

Wed Sep 11				Thu Sep 12				Fri Sep 13				Sat Sep 14				Sun Sep 15				Mon Sep 16				Tue Sep 17			
05am	11am	05pm	11pm	**05am**	**11am**	**05pm**	**11pm**	**05am**	**11am**	**05pm**	**11pm**	05am	11am	05pm	11pm	05am	11am	05pm	11pm	05am	11am	05pm	11pm	05am	11am	05pm	11pm
0%	0%	0%	5%	**85%**	**95%**	**85%**	**70%**	**60%**	**50%**	**30%**	**20%**	10%	15%	5%	10%	5%	15%	10%	10%	15%	20%	5%	10%	10%	15%	0%	5%
0.0	0.0	0.0	0.03	**1.24**	**1.43**	**0.52**	**0.26**	**0.19**	**0.09**	**0.02**	**0.0**	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.13
				3.45				**0.30**				0.00															

Event	Date	Time (US/Pacific)	Prob (%)	24 Hr.Quant (in)
Begins	2024-09-12	05:00	85	3.45
Ends	2024-09-14	05:00	10	0.00

QPE Assistant

A Tool for Stormwater Professionals



Demo Time

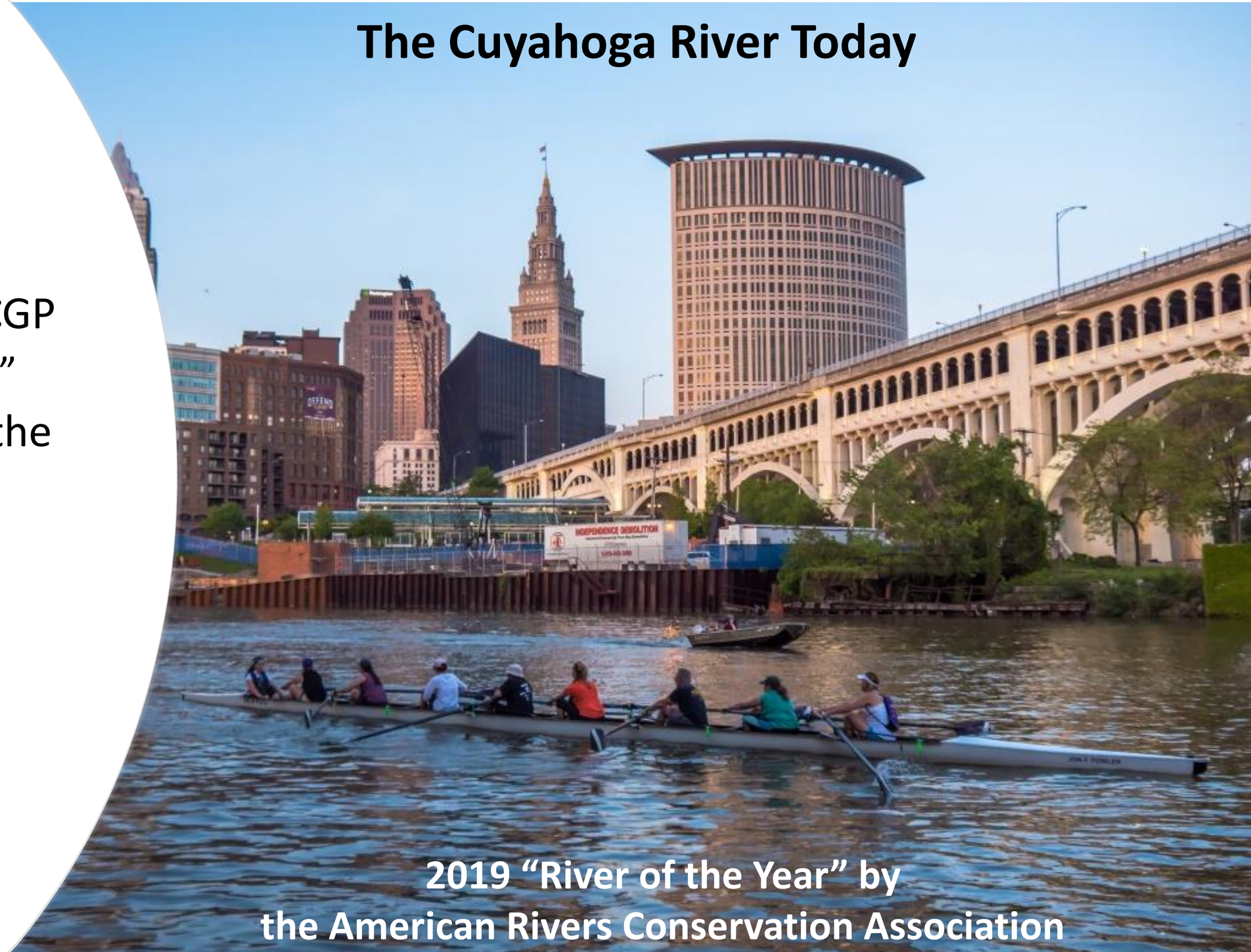
- Registering
- Creating a Site
- Running a Report
- NWS Forecast History
  - Example
  - Dealing with Forecast Variability
- Email Notifications
- Extended Plans

QPE Assistant

Summary

- The Origins of the CGP
  - “Why we are here?”
- An Introduction to the 2022 CGP
- Predicting QPEs
- QPEs and CGP 2022 Compliance
- An Introduction to ***QPE Assistant***
  - A resource for the community

The Cuyahoga River Today



2019 “River of the Year” by the American Rivers Conservation Association

QPE Assistant

Thank You!

…Questions?

Contact Us

QPE Assistant

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San Jose, CA 95113

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Daniel Gopen – daniel@digamesystems.com

QPE Assistant: www.qpeassistant.com

DEMO SLIDES

SCREENSHOTS

Demo Time

- Signing Up
- Creating a Site
- Running Reports
- NWS Forecast History
  - Example: Capitola 4/10-11
  - Forecast Timing
- Email Notifications
- Extended Plans

QPE Assistant

QPE Assistant

QPE Assistant Home Login Register

Our Production Release to Version 1.0.0 is Here!

Welcome to *QPE Assistant!*

Questions:

- Are you a California QSD, QSP or inspector?
- Do you need to monitor stormwater runoff at your construction sites?
- Are you looking for an automated way to predict when a significant rain event is likely to occur?

If so, you might want to try *QPE Assistant*. -- An evaluation licence is available for FREE.

Useful Links

- CA State Water Resources Control Board
- 2022 Construction General Stormwater Permit (CGSP)
- State Water Resource Control Board 2022 CGP Road Show Presentation
- NOAA Weather
- NWS Weather Table
- California SMARTS Database

QPE Assistant is a work in progress. Please contact us with any questions, comments or suggestions for improvement.

We hope you find it useful.

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QPE Assistant Home Sites Reports (Logged in as: John Price) - Account Logout

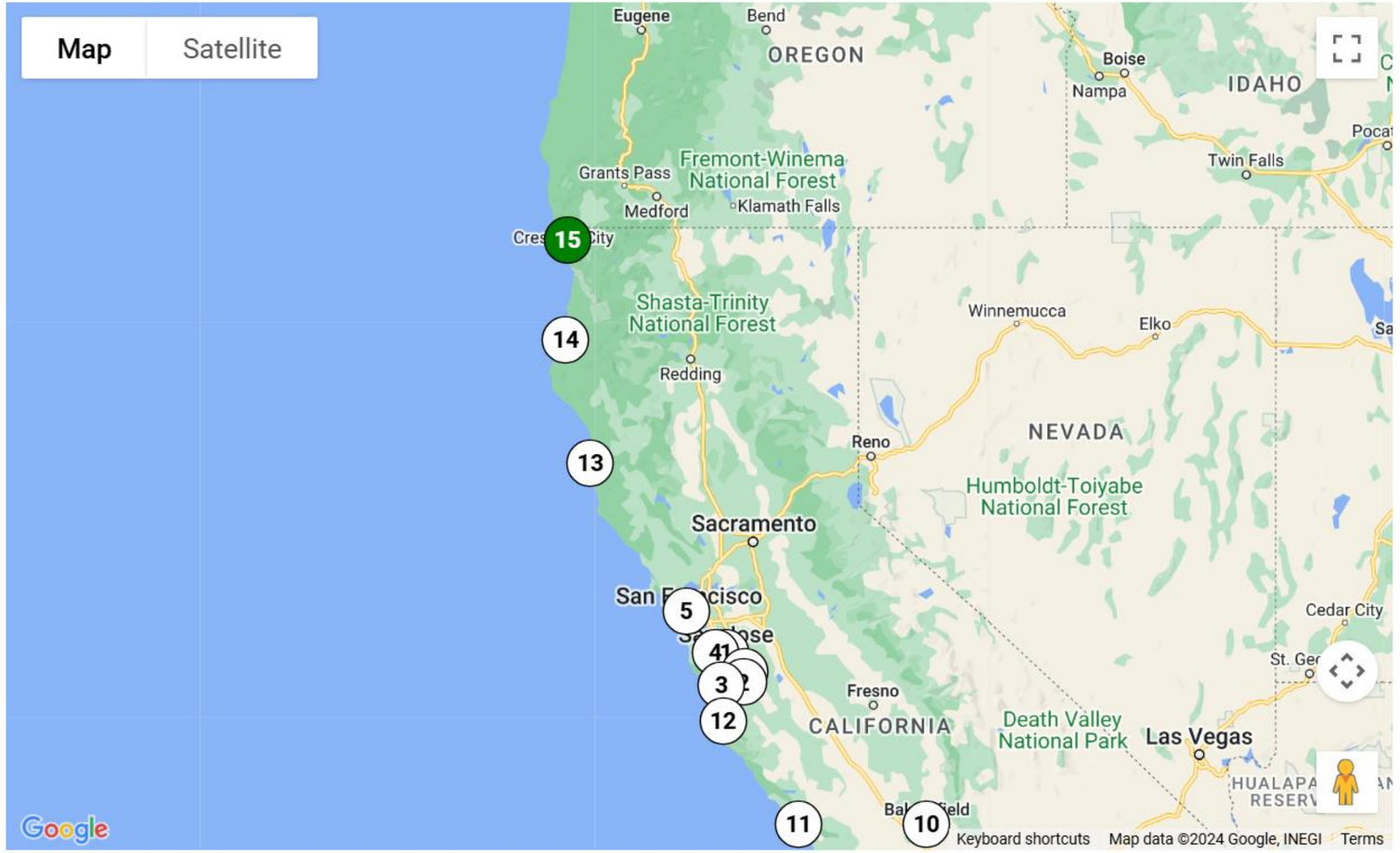
My Sites

Predicted QPE Arrival Time

The color of a site marker indicates whether a QPE is predicted and how soon it is expected to arrive.

- 0 - 24 hours (Active Event)
- 24 - 48 hours
- 48 - 72 hours
- 72 - 120 hours
- > 120 hours
- None predicted (white)

Create a New Site



#	Name	Address		

Sites View

Sites List

#	Name	Address		
1	The 88	The 88, 88 E San Fernando St UNIT 1511, San Jose, CA 95113, USA	Update	Delete
2	Gilroy Gardens Parking Lot	Gilroy Gardens Family Theme Park, 3050 Hecker Pass Hwy, Gilroy, CA 95020, USA	Update	Delete
3	Capitola Warf Repair	1400 Wharf Rd, Capitola, CA 95010, USA	Update	Delete
4	SensThys Expansion	21060 Homestead Rd #226, Cupertino, CA 95014, USA	Update	Delete
5	Lyon Center Development	3601 Lyon St, San Francisco, CA 94123, USA	Update	Delete
6	Morgan Hill Outdoor Sports Center	16500 Condit Rd, Morgan Hill, CA 95037, USA	Update	Delete

My Sites

Predicted QPE Arrival Time

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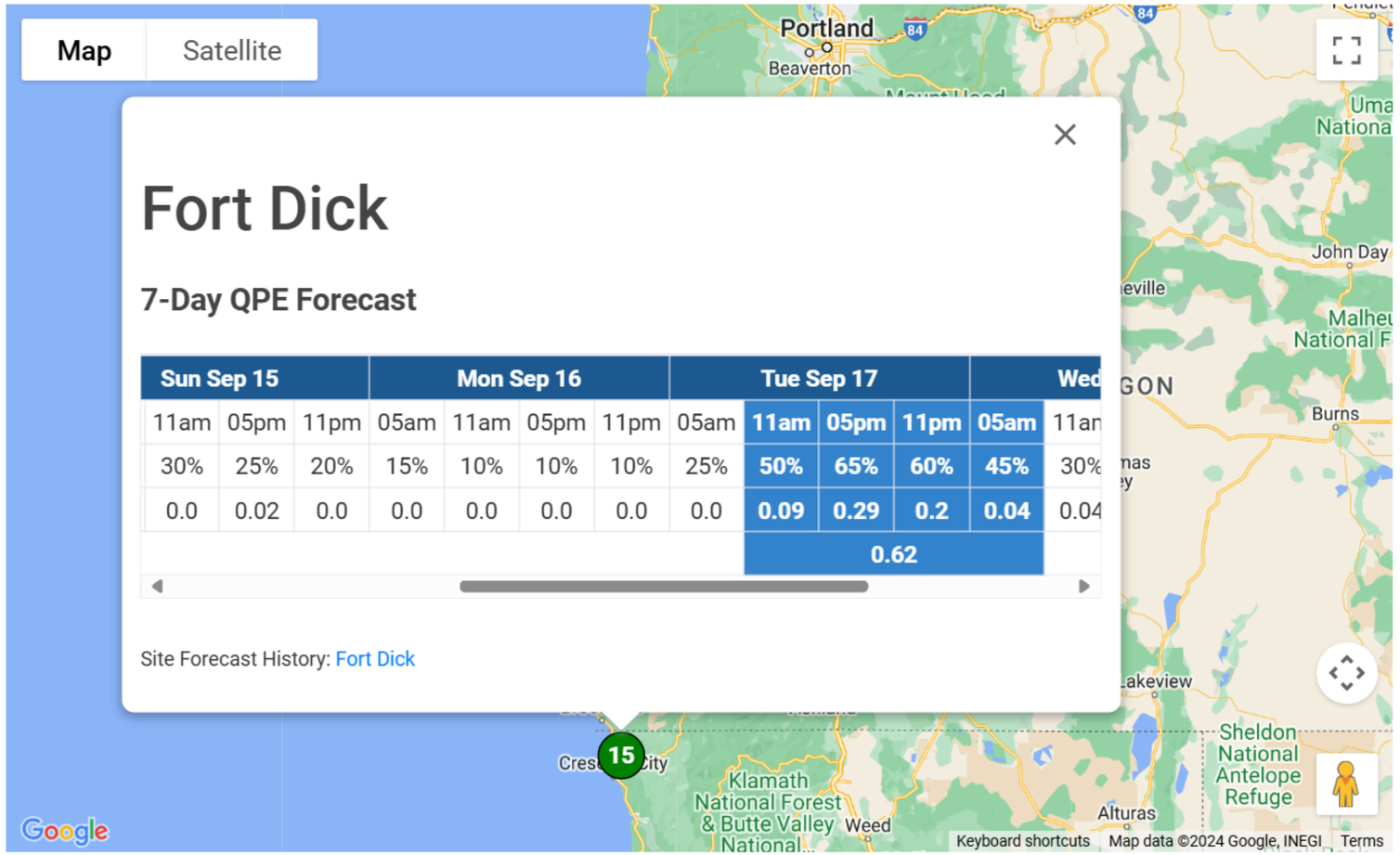
- 0 - 24 hours (Active Event)
- 24 - 48 hours
- 48 - 72 hours
- 72 - 120 hours
- > 120 hours
- None predicted (white)

Create a New Site



Sun Sep 15			Mon Sep 16				Tue Sep 17					
11am	05pm	11pm	05am	11am	05pm	11pm	05am	11am	05pm	11pm	05am	11am
30%	25%	20%	15%	10%	10%	10%	25%	50%	65%	60%	45%	30%
0.0	0.02	0.0	0.0	0.0	0.0	0.0	0.0	0.09	0.29	0.2	0.04	0.04
								0.62				

#	Name	Address		

Sites View

My Sites

Predicted QPE Arrival Time

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- 0 - 24 hours (Active Event)
- 24 - 48 hours
- 48 - 72 hours
- 72 - 120 hours
- > 120 hours
- None predicted (white)

Create a New Site

#	Name	Address		
1	The 88	The 88, 88 E San Fernando St UNIT 1511, San Jose, CA 95113, USA	Update	Delete

Create a Site

QPE Assistant Home Sites Reports (Logged in as: John Price) - Account Logout

Refine Site Details

Update Site | Create Another Site

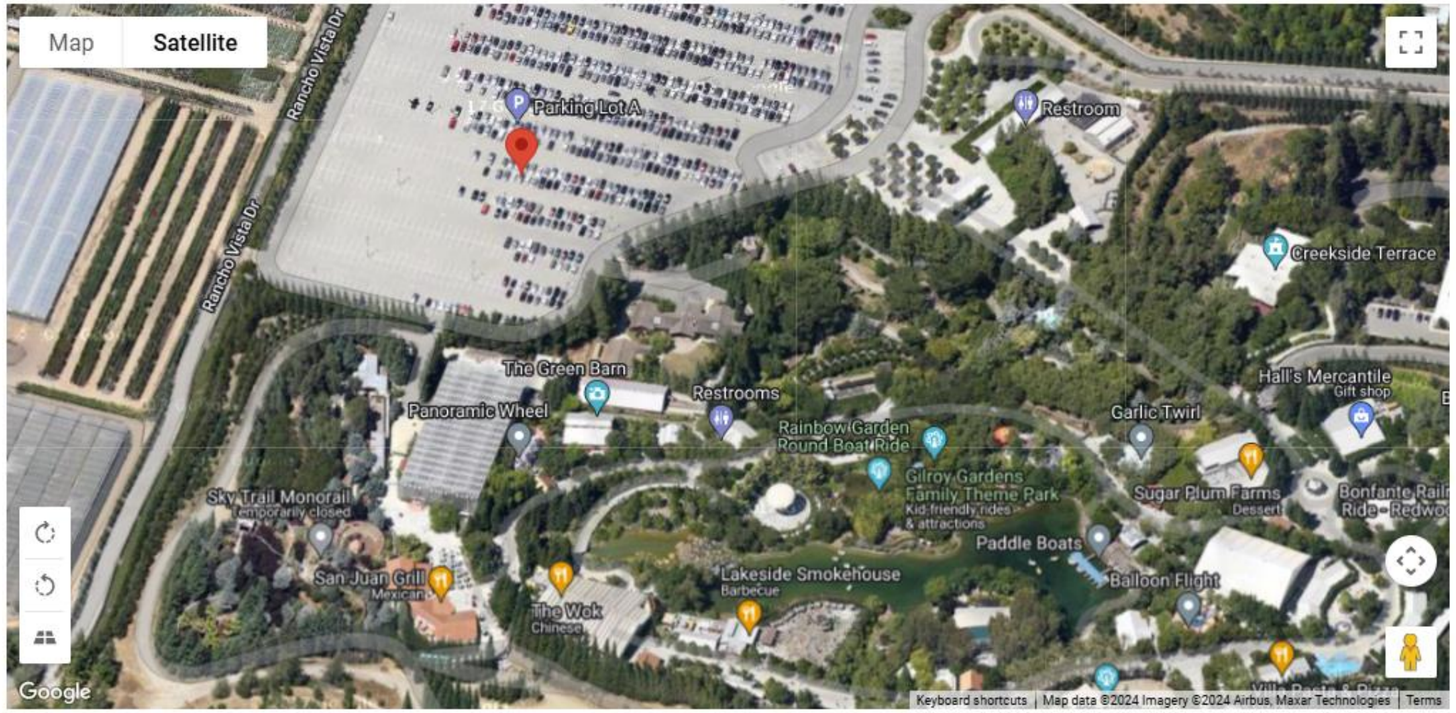
Site Name

Gilroy Gardens Parking Lot

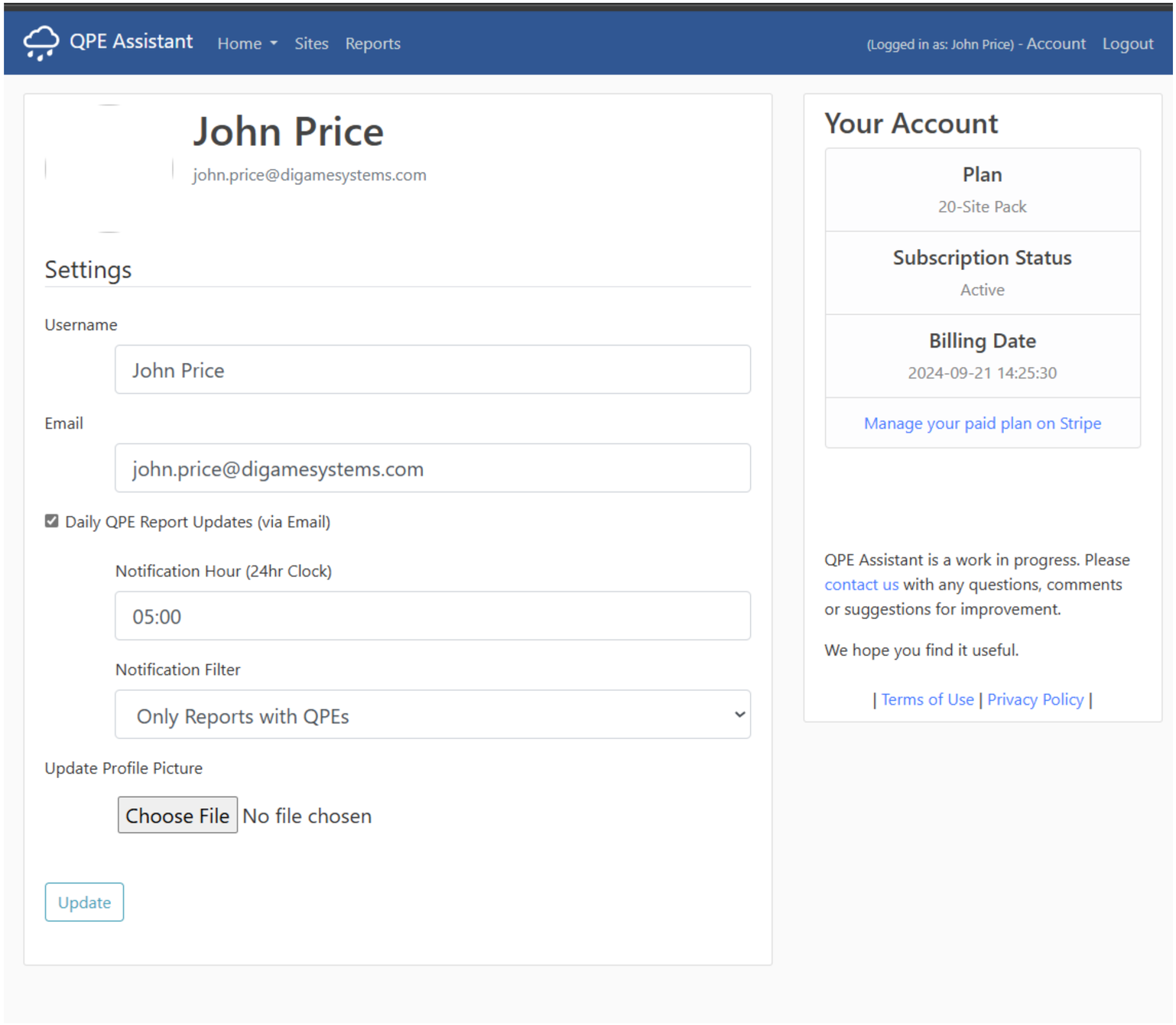
Address

Gilroy Gardens Family Theme Park, 3050 Hecker Pass Hwy, Gilroy, CA 95020, USA

GPS Coords: 37.006358478550474 -121.63079330702362



Account Information



Reports View

National Weather Service Grid Point: MEG/42/67

Forecast Last Updated: Wednesday September, 11 - 09:41
Hourly Forecast Table: MEG/42/67
Hourly Graph: View

Sites

Site Name	Address
Memphis	Memphis, TN, USA

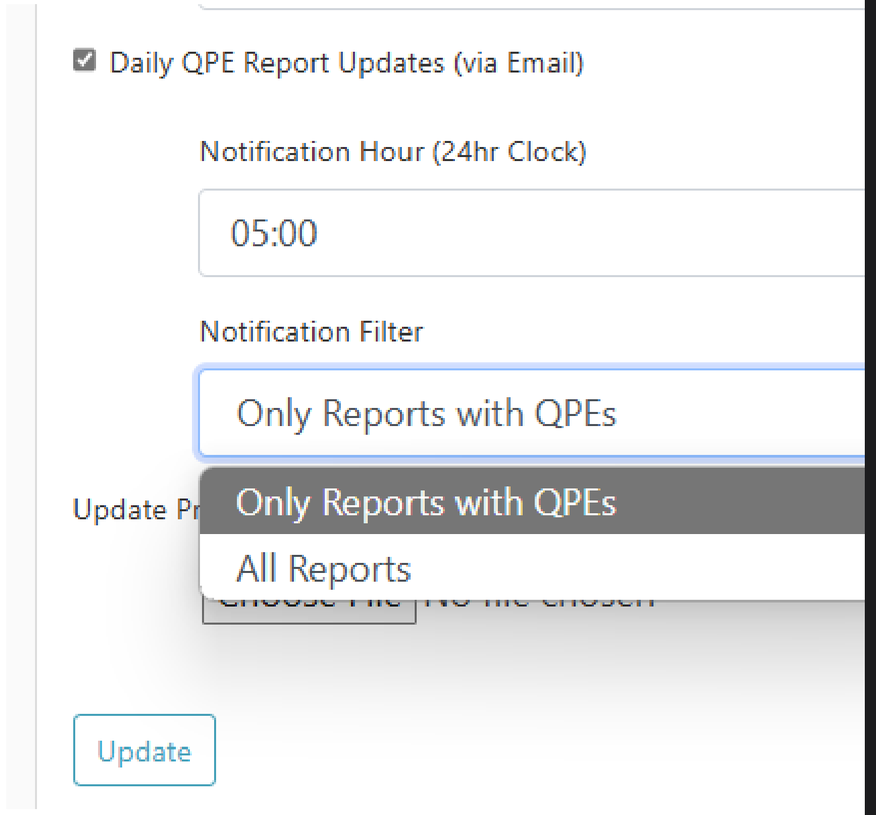
Qualifying Precipitation Events (QPEs)

Number of QPE Events: 1

Wed Sep 11				Thu Sep 12				Fri Sep 13				Sat Sep 14				Sun Sep 15				Mon Sep 16				Tue Sep 17			
05am	11am	05pm	11pm	**05am**	**11am**	**05pm**	**11pm**	**05am**	**11am**	**05pm**	**11pm**	05am	11am	05pm	11pm	05am	11am	05pm	11pm	05am	11am	05pm	11pm	05am	11am	05pm	11pm
0%	0%	0%	5%	**85%**	**95%**	**85%**	**70%**	**60%**	**50%**	**30%**	**20%**	10%	15%	5%	10%	5%	15%	10%	10%	15%	20%	5%	10%	10%	15%	0%	5%
0.0	0.0	0.0	0.03	**1.24**	**1.43**	**0.52**	**0.26**	**0.19**	**0.09**	**0.02**	**0.0**	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.13
				3.45				**0.30**				0.00															

Event	Date	Time (US/Pacific)	Prob (%)	24 Hr.Quant (in)
Begins	2024-09-12	05:00	85	3.45
Ends	2024-09-14	05:00	10	0.00

Email Report



National Weather Service Grid Point: HGX/65/97

Forecast Last Updated: Wednesday August, 28 - 04:31
Hourly Forecast Table: HGX/65/97
Hourly Graph: View

Sites

Site Name	Address
Houston	Houston, TX, USA

Qualifying Precipitation Events (QPEs)

Number of QPE Events: 1

Wed Aug 28				Thu Aug 29				Fri Aug 30				Sat Aug 31				Sun Sep 01				Mon Sep 02				Tue Sep 03			
05am	11am	05pm	11pm	05am	11am	05pm	11pm	05am	11am	05pm	11pm	05am	11am	05pm	11pm	05am	11am	05pm	11pm	05am	11am	05pm	11pm	05am	11am	05pm	11
15%	55%	15%	25%	55%	90%	25%	50%	60%	75%	40%	55%	60%	75%	40%	45%	45%	65%	40%	45%	50%	60%	50%	40%	45%	60%	35%	35
0.0	0.06	0.0	0.07	0.22	0.19	0.0	0.09	0.75	0.79	0.05	0.07	0.21	0.27	0.06	0.12	0.17	0.34	0.08	0.17	0.12	0.31	0.1	0.25	0.42	0.3	0.06	0.1
				0.50				1.66				0.66				0.76				0.78				0.91			

-

Event	Date	Time (US/Pacific)	Prob (%)	24 Hr.Quant (in)
Begins	2024-08-29	05:00	55	0.50
	Continuing into next week...	-	-	

Subscription Plans

QPE Assistant Plan Tiers

Your current plan is the: 20-Site Pack
For other options, consider one of the tiers below.

*Our pricing model is **simple**-- Starting at $1/mo per site for the 5-Site plan.*
Our ROI Calculator lets you explore what tier makes sense for your team. -- You may be surprised.

5-Site Pack

$1.00 per site

(Billed Monthly)

Fully-Featured
5-Sites
Site Map
Reporting
Persistent Site QPE History
Daily Email Notifications
Cancel at any time

Manage your current paid plan on Stripe

10-Site Pack

$1.00 per site

(Billed Monthly)

Fully-Featured
10-Sites
Site Map
Reporting
Persistent Site QPE History
Daily Email Notifications
Cancel at any time

Manage your current paid plan on Stripe

20-Site Pack

$1.00 per site

(Billed Monthly)

Fully-Featured
20-Sites
Site Map
Reporting
Persistent Site QPE History
Daily Email Notifications
Cancel at any time

Manage your current paid plan on Stripe

Need More Sites? -- Contact us!