

Creating Reports in Microsoft Power BI using the VectorSurv Gateway



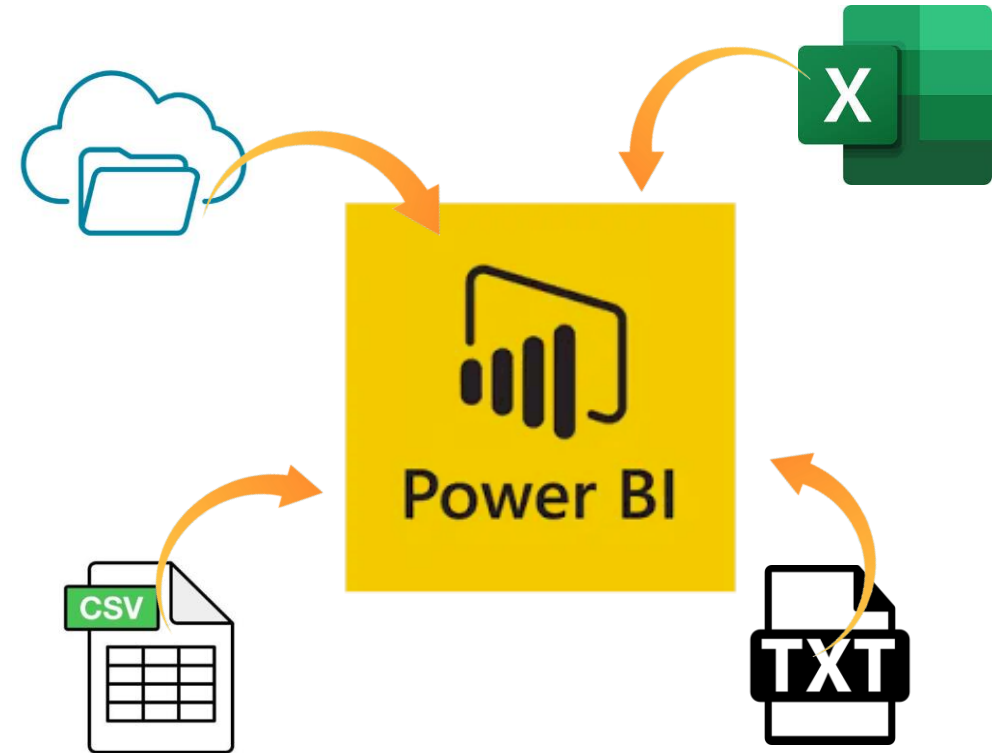
January 28th, 2025
MVCAC 93rd Annual Conference

Jung Ma
Assistant Vector Ecologist
San Gabriel Valley Mosquito and Vector Control District



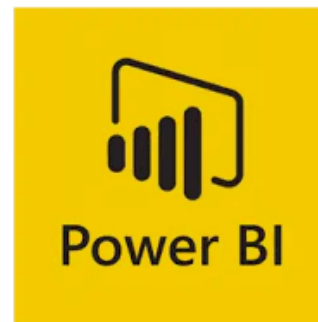
Power Business Intelligence (BI)

- Free data visualization and reporting platform
- Easily connect unrelated data and file types
 - Excel, text files, CSVs, XMLs, cloud-based sources
- Create visualizations: tables, graphs, maps, incorporations from R, ArcGIS, etc
- **Automatically updates changes in data**



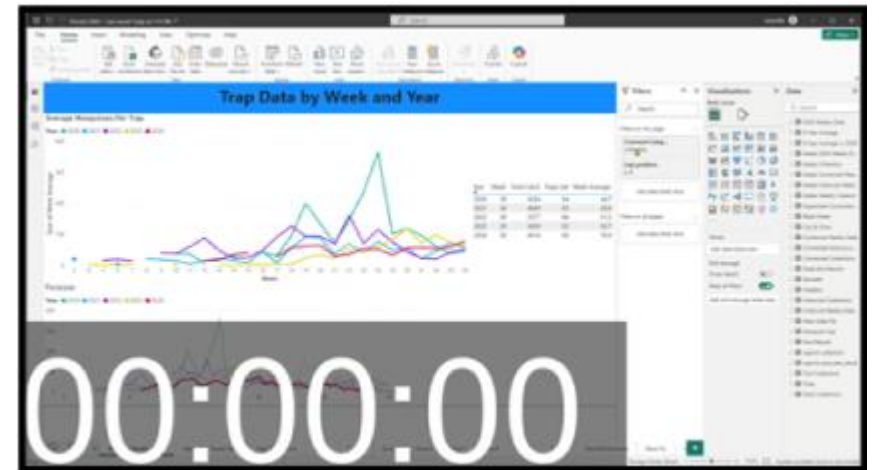
What we use it for

- Connect to mosquito data recorded in VectorSurv Gateway
- Easily generate reports and interactive dashboards that help make informed decisions
 - Automated report-generating process, save for manually changing certain data filters to the desired criteria



Workflow

- Surveillance Report Power BI file is pre-built
- Most of the work is as simple as changing the “Week” filter
- Export and finish

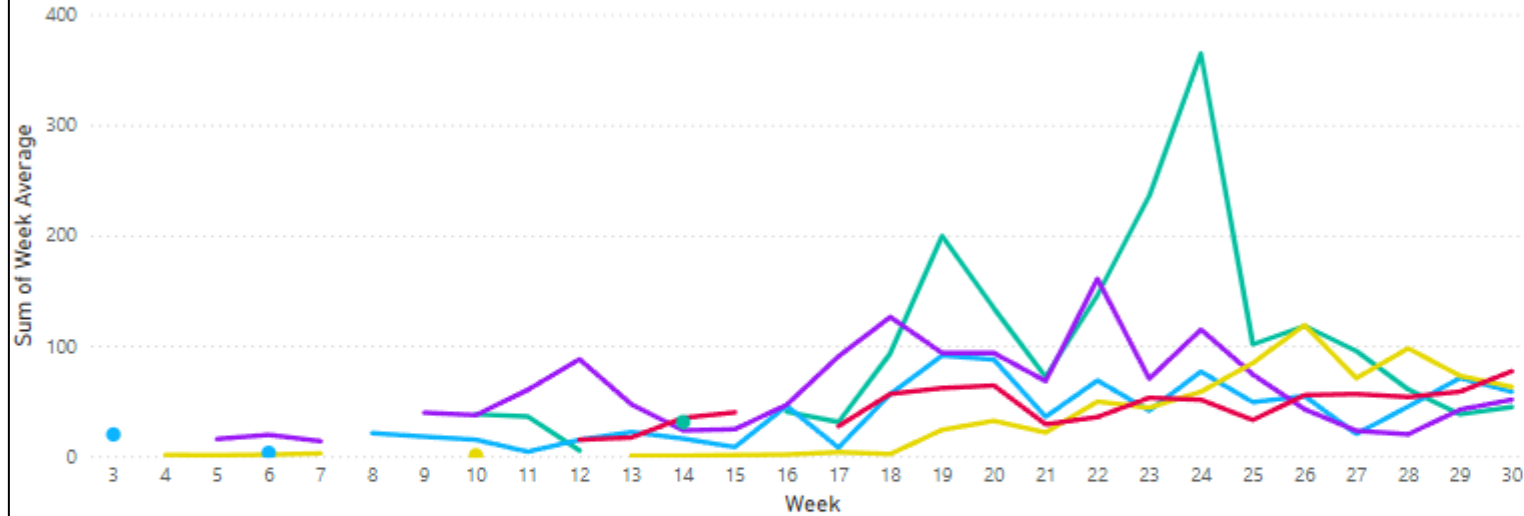


Report Summary

Trap Data by Week and Year

Average Mosquitoes Per Trap

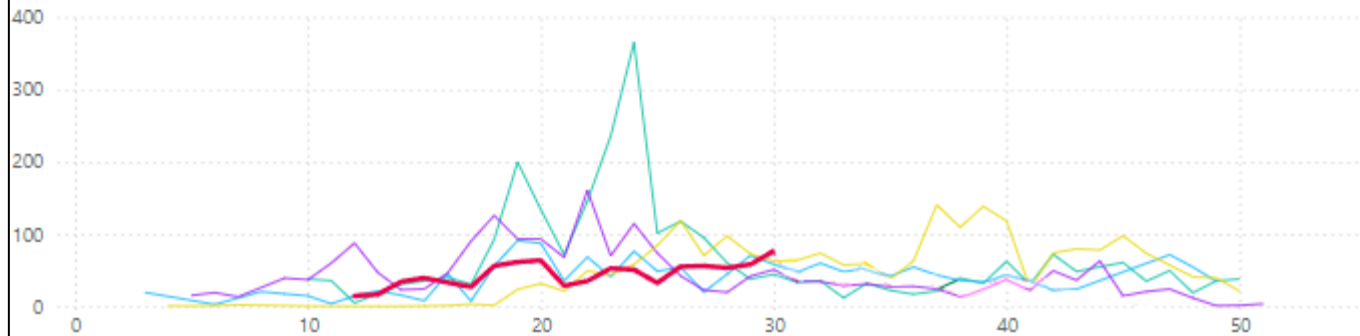
Year ● 2020 ● 2021 ● 2022 ● 2023 ● 2024



Year	Week	Total Catch	Traps Set	Week Average
2020	30	4204	94	44.7
2021	30	4849	83	58.4
2022	30	3377	66	51.2
2023	30	3450	55	62.7
2024	30	4614	60	76.9

Forecast

Year ● 2020 ● 2021 ● 2022 ● 2023 ● 2024



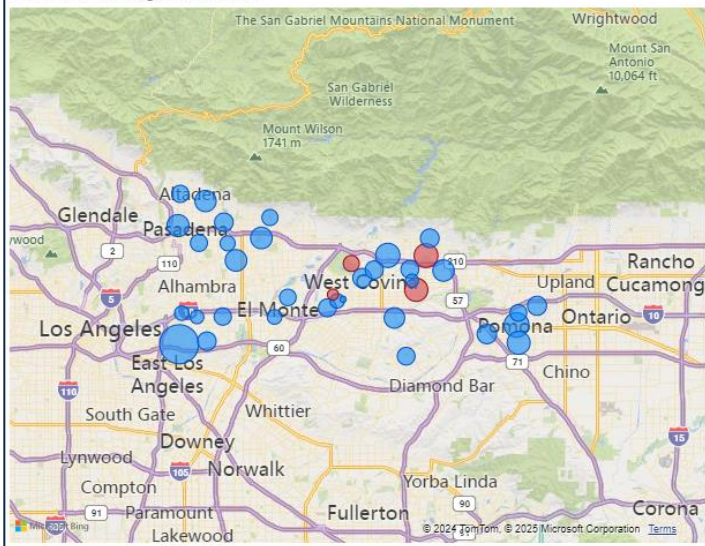
00:29:05

Week 30 WNV Tested Mosquito Pools

Zone	Site Name	Species	Test Target	Number in Pool	Results
4	Baldwin Park Library	Culex quinquefasciatus	WNV	19	Positive
5	Santa Fe Dam	Culex quinquefasciatus	WNV	47	Positive
7	Kahler Russel Park (formerly Wingate)	Culex quinquefasciatus	WNV	50	Positive
7	Mesa Glen Care Center (GL)	Culex quinquefasciatus	WNV	50	Positive
1	1296 Avenida Cesar Chavez	Culex quinquefasciatus	WNV	50	Negative
1	Granada Park	Culex quinquefasciatus	WNV	36	Negative
1	La Loma Park (MP)	Culex quinquefasciatus	WNV	50	Negative
1	Langley Senior (MP)	Culex quinquefasciatus	WNV	37	Negative
2	596 N Fair Oaks Ave	Culex quinquefasciatus	WNV	50	Negative
2	CAL Tech (PA)	Culex quinquefasciatus	WNV	49	Negative
2	Monte Vista Grove Homes	Culex quinquefasciatus	WNV	36	Negative
2	Mountain View Cemetery	Culex quinquefasciatus	WNV	48	Negative
2	Norman's Nursery (Duarte Rd)	Culex quinquefasciatus	WNV	50	Negative
2	Rubio Wash	Culex quinquefasciatus	WNV	50	Negative
2	Victory Park (PA)	Culex quinquefasciatus	WNV	50	Negative
3	Los Angeles Arboretum	Culex quinquefasciatus	WNV	50	Negative
3	Sierra Madre City Yard	Culex quinquefasciatus	WNV	47	Negative
4	Baldwin Park Unified School District	Culex quinquefasciatus	WNV	40	Negative
4	Church of Christ	Culex quinquefasciatus	WNV	50	Negative

Arbovirus Pool Locations

WNV Results ● Negative ● Positive

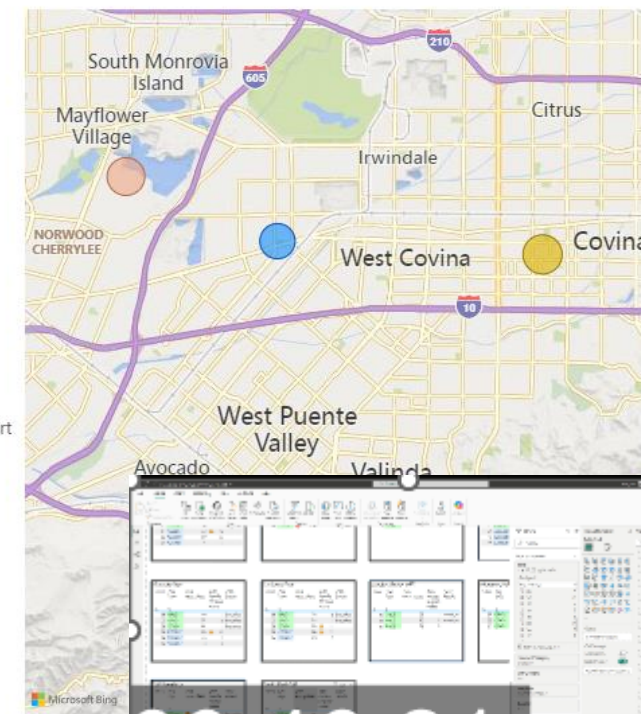


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High Trap Count Locations

Total Mosquitoes

Zone	Week	Site Name	Collection Date	Trap Type	Total Mosquitoes	Percent Males
6	29	Pacific Palms Resort	07/17/2024	GRVD	260	62%
7	29	311 S Albertson	07/17/2024	GRVD	213	17%
3	29	11878 Clark St	07/18/2024	GRVD	210	17%
4	29	Morgan Park	07/17/2024	GRVD	180	26%



Site Name
 ● 11878 Clark St
 ● 311 S Albertson
 ● Morgan Park
 ● Pacific Palms Resort

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00:46:21

Site Summary

Legend : ● - Total Mosquitoes is over 100 ● - Total Mosquitoes is over 175 ■ - No WNV+ ■ - One week of WNV+ ■ - Two weeks of WNV+ ■ - Three weeks of WNV+
 ▲ - Total Female Invasive Aedes (11-24) ▲ - Total Female Invasive Aedes (25-60) ▲ - Total Female Invasive Aedes (61+)

Week	Site Name
30	Los Ang
30	Los Ang
30	Sierra M
30	Sierra M
29	11878 C
29	Arcadia
29	Arcadia
29	Baldwin
29	Baldwin
29	Elm Cen
29	Temple
28	Los Ang
28	Los Ang
28	Sierra M
28	Sierra M
27	11878 C
27	Arcadia
27	Baldwin
27	Baldwin
27	Elm Cen
27	Temple
26	Los Ang
26	Los Ang
26	Sierra M
26	Sierra M
25	11878 C
25	Arcadia
25	Baldwin
25	Elm Cen
25	Temple

848 Alta St

Week	Trap Type	Total Mosquitoes	Total Female Invasive Aedes	WNV Results
35	GRVD	13	4	
33	GRVD	33	0	Negative
31	GRVD	33	3	Negative

Bike Trail (BR)

Week	Trap Type	Total Mosquitoes	Total Female Invasive Aedes	WNV Results
35	GRVD	13	6	
33	GRVD	57	2	Negative
31	GRVD	55	7	Positive

Bradbury Civic Center

Week	Trap Type	Total Mosquitoes	Total Female Invasive Aedes	WNV Results
35	GRVD	1	0	
33	GRVD	22	1	
31	GRVD	45	3	Negative
35	BGSENT	5	5	
33	BGSENT	2	2	
31	BGSENT	15	5	

Car Max Parking Lot

Week	Trap Type	Total Mosquitoes	Total Female Invasive Aedes	WNV Results
35	GRVD	11	3	
33	GRVD	43	4	Negative
31	GRVD	64	3	Negative
35	BGSENT	1	0	
33	BGSENT	6	3	
31	BGSENT	2	2	

Irwindale Park

Week	Trap Type	Total Mosquitoes	Total Female Invasive Aedes	WNV Results
36	GRVD	20	4	
34	GRVD	25	3	
32	GRVD	61	0	Negative

Kiwanis Park

Week	Trap Type	Total Mosquitoes	Total Female Invasive Aedes	WNV Results
35	GRVD	10	10	
33	GRVD	19	6	
31	GRVD	50	5	
35	BGSENT	39	▲ 26	
33	BGSENT	79	▲ 38	
31	BGSENT	94	▲ 16	

Library Park (MR)

Week	Trap Type	Total Mosquitoes	Total Female Invasive Aedes	WNV Results
35	GRVD	33	3	Negative
33	GRVD	99	6	Negative
31	GRVD	127	8	Negative

Royal Oaks Park (DU)

Week	Trap Type	Total Mosquitoes	Total Female Invasive Aedes	WNV Results
35	GRVD	15	4	
33	GRVD	24	5	
31	GRVD	54	1	Negative

Santa Fe Dam

Week	Trap Type	Total Mosquitoes	Total Female Invasive Aedes	WNV Results
36	GRVD	5	0	
34	GRVD	27	0	Negative
32	GRVD	14	0	
34	BGSENT	6	0	
32	BGSENT	8	0	

Sawpit Wash (DU)

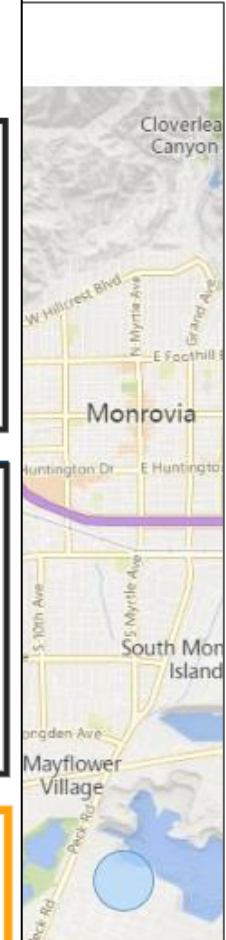
Week	Trap Type	Total Mosquitoes	Total Female Invasive Aedes	WNV Results
35	GRVD	9	1	
33	GRVD	18	2	
31	GRVD	41	1	Negative
33	BGSENT	5	2	
31	BGSENT	16	9	

Slauson Park

Week	Trap Type	Total Mosquitoes	Total Female Invasive Aedes	WNV Results
36	GRVD	36	▲ 11	Positive
34	GRVD	74	3	Positive
32	GRVD	60	7	Positive
36	BGSENT	19	8	
34	BGSENT	21	7	
32	BGSENT	27	5	

Valleydale Park (AZ)

Week	Trap Type	Total Mosquitoes	Total Female Invasive Aedes	WNV Results
36	GRVD	44		
34	GRVD	57		
32	GRVD	83		



Week 29 - 30 WNV Tested Birds

Dead Bird Locations

Results ● Negative



Week	Report Date	Submission Number	Zone	City	Species	Result
30	07/25/2024	24-1423	8	Claremont	Hummingbird	Negative
29	07/15/2024	24-1292	1	South Pasadena	Bushtit	Negative

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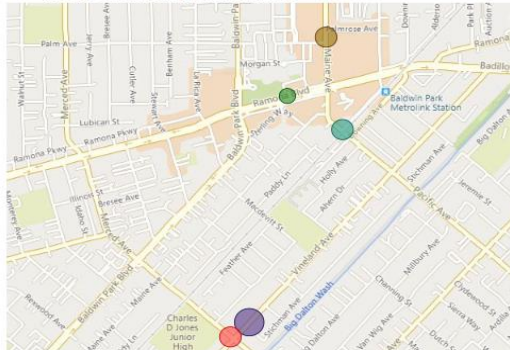
Underground Trapping

Week	Zone	City	Site Name	Total Mosquitoes	Percent Males	WNV Results
30	4	Baldwin Park	USDS - 3432 Vineland Ave (SITE ID 38104)	4	50%	
30	4	Baldwin Park	USDS - Maine Ave & Palm Ave (SITE ID 21108)	2	0%	
30	4	Baldwin Park	USDS - Merced Ave & Vineland Ave (SITE ID 21182)	2	0%	
30	4	Baldwin Park	USDS - Pacific Ave & Bogart Ave (SITE ID 40065)	2	0%	
30	4	Baldwin Park	USDS - Ramona Blvd & Cesar Chavez Dr (SITE ID 21219)	1	0%	
30	4	Baldwin Park	USDS - 14455 Ramona Blvd (SITE ID 21220)	0	0%	

Notes: Mosquito pool consists of mosquitoes from each trap

Underground Trapping Total Mosquitoes

- USDS - 14455 Ramona Blvd (SITE ID 21220)
- USDS - 3432 Vineland Ave (SITE ID 38104)
- USDS - Maine Ave & Palm Ave (SITE ID 21108)
- USDS - Merced Ave & Vineland Ave (SITE ID 21182)
- USDS - Pacific Ave & Bogart Ave (SITE ID 40065)
- USDS - Ramona Blvd & Cesar Chavez Dr (SITE ID 21219)



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Week 30 Black Fly Data

CO2 Traps

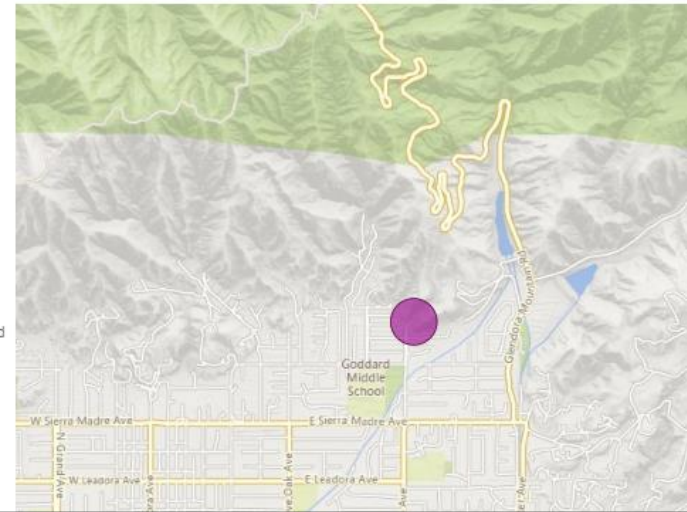
Zone	Site Name	Trap Type	Total Black Fly
7	Colby Trailhead	CO2	17

Other Traps

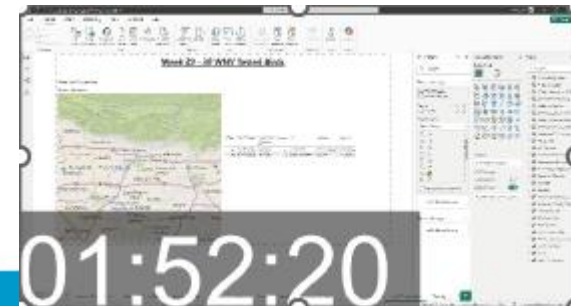
Zone	Site Name	Trap Type	Total Black Fly

Site Name

● Colby Trailhead



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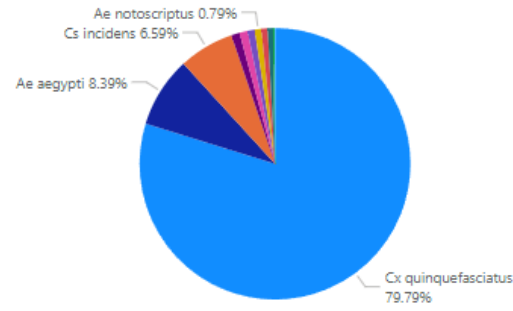
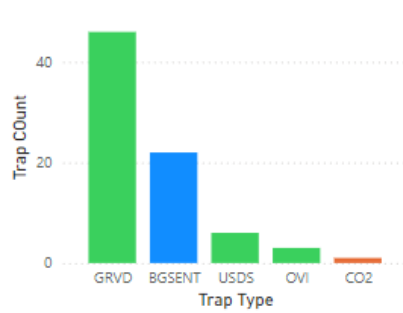
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Species	Total
Ae aegypti	405
Ae albopictus	47
Ae notoscriptus	38
Aedes_eggs	9
Cs incidens	318
Cx quinquefasciatus	3850
Cx stigmatosoma	41
Cx tarsalis	30
Cx thriambus	3
Unidentifiable Aedes	48
Unidentifiable Culex	36
Total	4825

All Trap Data

Week 30

Types of Traps Set



- Species
- Cx quinquefasciatus
 - Ae aegypti
 - Cs incidens
 - Unidentifiable Aedes
 - Ae albopictus
 - Cx stigmatosoma
 - Ae notoscriptus
 - Unidentifiable Culex
 - Cx tarsalis
 - Aedes_eggs

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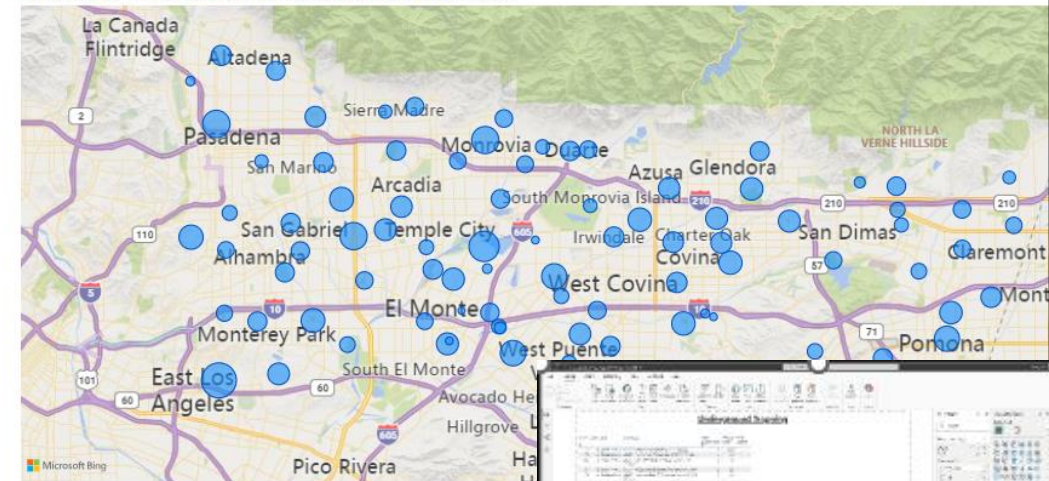
San Gabriel Valley Mosquito and Vector Control District

Community/City Avg Mosq per Trap

Alhambra	32
Altadena	42
Arcadia	63
Azusa	53
Baldwin Park	37
Bradbury	26
Claremont	23
Covina	53
Duarte	30
El Monte	39
Glendora	53
Industry	32
Irwindale	37
La Puente	48
La Verne	24
Monrovia	43
Monterey Park	88
Pasadena	39
Pomona	40
Rosemead	37
San Dimas	31
San Gabriel	45
Sierra Madre	25
South Pasadena	38
Temple City	51
Walnut	35
West Covina	49

2024 Average Mosquitoes per Trap

Average of Total Mosquitoes by latitude and longitude



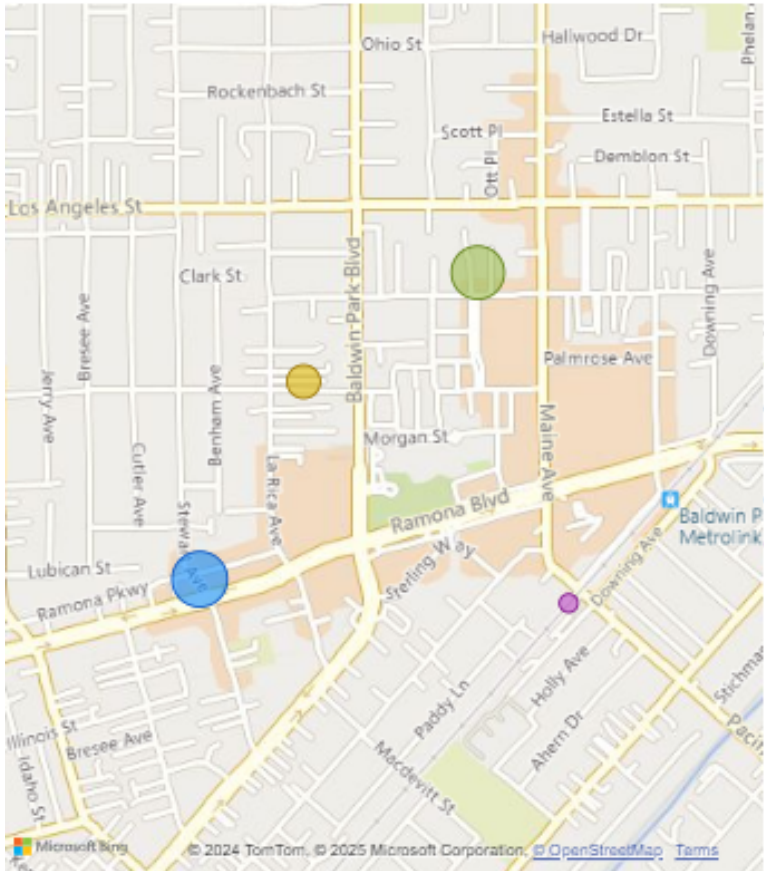
2024 Year
Total Mosquitoes Avg
75401

9/10

02:06:13

Enhanced Trapping: Baldwin Park

Week 34



- Site Name**
- 14315 Clark St - Clark Terrace
 - Baldwin Park Library
 - La Rica x Palm
 - Ramona Pkwy X Stewart Ave
 - Telacu Senior Court

Zone	Site Name	Collection Date	Trap Type	Total Mosquitoes	Percent Males	Total Female Invasive Aedes	Percent Invasive Aedes Males
4	14315 Clark St - Clark Terrace Apartments	08/22/2024	GRVD	81	4%	▲ 11	0%
4	Ramona Pkwy X Stewart Ave	08/22/2024	GRVD	89	33%	5	17%
4	La Rica x Palm	08/22/2024	GRVD	28	18%	4	0%
4	Telacu Senior Court	08/22/2024	GRVD	6	0%	2	0%
4	Baldwin Park Library	08/22/2024	GRVD	0	0%	0	0%

Note: This enhanced trapping was conducted in response to a WNV+ human case

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Workflow

- Work is front-loaded, a lot of time and effort goes into creating the Power BI file that creates the reports
 - Connecting directly to the API reduced time consuming, error-prone steps
- Data is imported, cleaned, and manipulated. Calculations set up
- Visuals like graphs and tables are pre-built
- Everything updates as data refreshes



Building the file

- Import data
- Make connections
 - Model View
 - Power Query
- Make the visual
 - Refine



Building the file: Import Data

The screenshot displays the Power BI Desktop interface. The main workspace shows a central prompt: "Add data to your report". Below this prompt, four data source options are presented as cards: "Import data from Excel" (highlighted with a yellow border), "Import data from SQL Server", "Paste data into a blank table", and "Use sample data". A link "Get data from another source →" is located below these cards. The top ribbon includes tabs for File, Home, Insert, Modeling, View, Optimize, and Help, with various icons for data connections and visualizations. The right-hand pane is divided into "Visualizations" and "Filters" sections, with a "Data" pane partially visible on the far right. The status bar at the bottom indicates "Page 1" and a "+" icon.

Building the file: Build Connections Model View

The screenshot displays the Power BI Desktop interface with the 'Model View' selected. Two tables are visible:

- 30 collections**:
 - calculated_neighborhood_distance
 - calculated_state
 - calculated_subcounty
 - city
 - code
 - collection_date
 - collection_id**
 - Column71
 - comments
- 30 pools**:
 - city
 - code
 - collection_date
 - collection_id**
 - comments
 - disease_week
 - group
 - latitude
 - longitude

A relationship line connects the **collection_id** fields of both tables, indicating a 1:1 relationship. An orange arrow points from the **collection_id** in the '30 pools' table to the **collection_id** in the '30 collections' table.

Building the file: Build Connections Power Query

The screenshot displays the Microsoft Power Query Editor interface. The main window shows a data table with the following columns: agency_code, agency_collection_num, collection_id, code, name, and street. The data is organized into 26 rows, with the first row being a header. The table content is as follows:

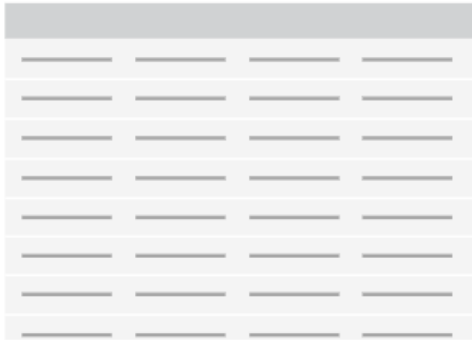
agency_code	agency_collection_num	collection_id	code	name	street	
1	SGVA	1200	3205805	1006	Lemon Creek Bicentennial Park (WA)	130 N Avenida Alipaz
2	SGVA	1201	3205806	8	Cal Poly Pomona University	3801 West Temple Ave
3	SGVA	1202	3205807	29	Pomona Cemetery	
4	SGVA	1203	3205808	956	Snow Creek Park (WA)	20633 Snow Creek Dr
5	SGVA	1204	3205809	469	Westmont Park (PO)	1808 W 9th St
6	SGVA	1205	3205810	1148	Lincoln Park (PO)	400 E Lincoln Ave
7	SGVA	1206	3205811	64	Cortez Park (WC)	501 S Citrus St
8	SGVA	1207	3205812	1076	Benedict Way(PO)	1753 Benedict Way
9	SGVA	1208	3205813	1066	Western University	309 E 2nd St
10	SGVA	1209	3205814	64	Cortez Park (WC)	501 S Citrus St
11	SGVA	1210	3205815	29	Pomona Cemetery	
12	SGVA	1211	3205816	956	Snow Creek Park (WA)	20633 Snow Creek Dr
13	SGVA	1212	3205817	1076	Benedict Way(PO)	1753 Benedict Way
14	SGVA	1213	3205818	469	Westmont Park (PO)	1808 W 9th St
15	SGVA	1214	3206215	291	El Monte Historical Museum	3150 Tyler Ave
16	SGVA	1215	3206217	887	Granada Park	2011 W. Hellman Ave.
17	SGVA	1216	3206219	505	La Loma Park (MP)	1950 Fulton Ave
18	SGVA	1217	3206220	450	Bassett Park (LP)	510 Vineland Ave
19	SGVA	1218	3206221	695	Klingerman Park (RO)	8797 Klingerman St
20	SGVA	1219	3206239	297	1296 Avenida Cesar Chavez	1292 Avenida Cesar Chavez
21	SGVA	1220	3206266	695	Klingerman Park (RO)	8797 Klingerman St
22	SGVA	1221	3206268	887	Granada Park	2011 W. Hellman Ave.
23	SGVA	1222	3206273	445	Garvey Park (RO)	7933 Emerson Pl
24	SGVA	1223	3206276	1071	Langley Senior (MP)	400 w emerson
25	SGVA	1224	3206278	291	El Monte Historical Museum	3150 Tyler Ave

The interface also shows a ribbon with various transformation options, a right-hand pane for query settings and applied steps, and a status bar at the bottom indicating 71 columns and 78 rows.



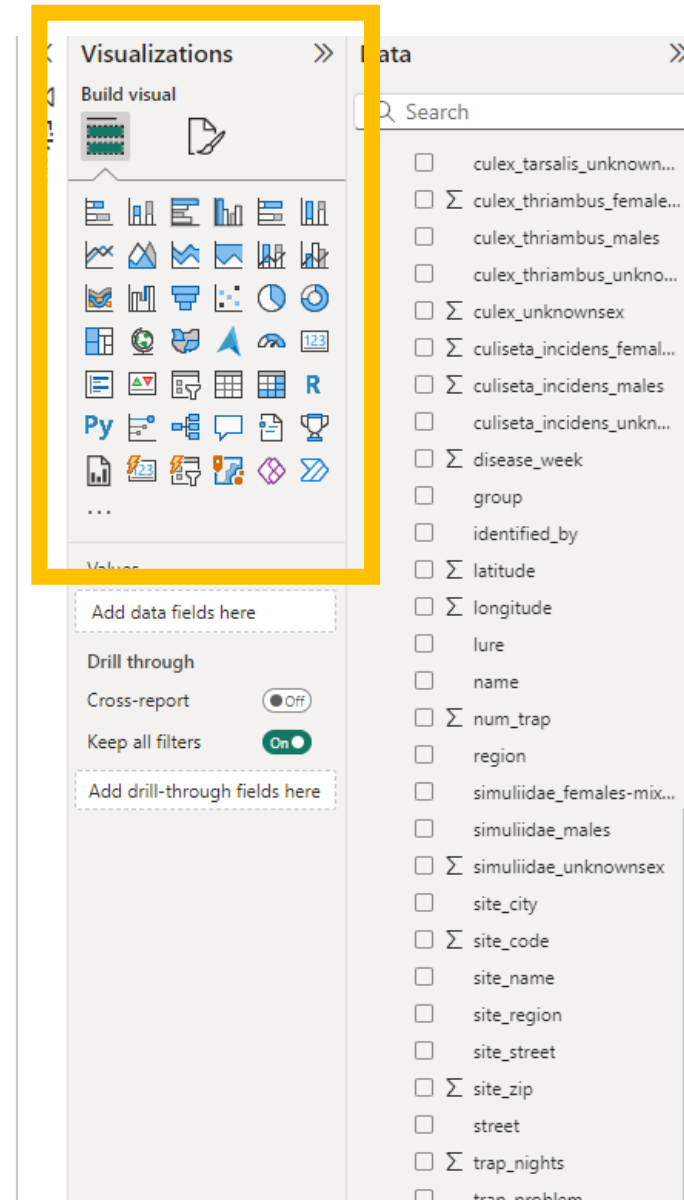
Building the file: Make visuals

① Select or drag fields to populate this visual



A placeholder for a table visualization, showing a grid of horizontal lines representing data rows.

① Select or drag fields to populate this visual



A screenshot of the Power BI Visualizations pane. The 'Visualizations' tab is active, showing a 'Build visual' section with a grid of visualization icons. A yellow box highlights this grid. Below the grid are options for 'Add data fields here', 'Drill through', 'Cross-report' (set to Off), and 'Keep all filters' (set to On). To the right, the 'Data' pane shows a list of fields with checkboxes, including 'culex_tarsalis_unknown...', 'culex_thriambus_female...', 'culex_thriambus_males', 'culex_thriambus_unkno...', 'culex_unknownsex', 'culiseta_incidens_femal...', 'culiseta_incidens_males', 'culiseta_incidens_unkn...', 'disease_week', 'group', 'identified_by', 'latitude', 'longitude', 'lure', 'name', 'num_trap', 'region', 'simuliidae_females-mix...', 'simuliidae_males', 'simuliidae_unknownsex', 'site_city', 'site_code', 'site_name', 'site_region', 'site_street', 'site_zip', 'street', and 'trap_nights'.

Building the file: Make visuals

① Select or drag fields to populate this visual

A placeholder for a table visualization, consisting of a grid of horizontal lines representing rows and columns.

① Select or drag fields to populate this visual



The screenshot shows the 'Build visual' pane in Power BI. The 'Visualizations' pane on the left contains various chart and table icons. The 'Data' pane on the right lists fields from a dataset. An orange arrow points from the 'Add data fields here' box in the 'Values' section to the 'site_code' and 'site_name' fields in the 'Data' pane, which are highlighted with a yellow box.

Visualizations

Build visual

Filters

Values

Add data fields here

Drill through

Cross-filter: Off

Keep filters: On

Add drill-through fields here

Data

Search

- culex_tarsalis_unknown...
- Σ culex_thriambus_female...
- culex_thriambus_males
- culex_thriambus_unkno...
- Σ culex_unknownsex
- Σ culiseta_incidens_femal...
- Σ culiseta_incidens_males
- culiseta_incidens_unkn...
- Σ disease_week
- group
- identified_by
- Σ latitude
- Σ longitude
- lure
- name
- Σ num_trap
- region
- simuliidae_females-mix...
- simuliidae_males
- Σ simuliidae_unknownsex
- site_city
- Σ site_code
- site_name
- site_street
- Σ site_zip
- street
- Σ trap_nights

Building the file: Make visuals

site_name	culex_quinquefasciatus_females-mixed	WNV Results
(A6) Casitas Ave	11	
1296 Avenida Cesar Chavez	418	Negative
596 N Fair Oaks Ave	84	Negative
Baldwin Park Library	19	Positive
Baldwin Park Unified School District	40	Negative
Bassett Park (LP)	1	
Bassett Park (LP)	16	
Bassett Park (Studies)	6	
Benedict Way(PO)	2	
Benedict Way(PO)	67	Negative
BP Neighborhood	5	
Cal Poly Pomona University	3	
CAL Tech (PA)	3	
CAL Tech (PA)	49	Negative
Church of Christ	74	Negative
Colby Trailhead		
Cortez Park (WC)	6	
Cortez Park (WC)	96	Negative
Creekside Park (WA)	62	Negative
El Monte Historical Museum	5	
El Monte Historical Museum	35	Negative
FC Jeanette Ln-Big Dalton		
FC-Dundry Ave-Big Dalton	1	Negative
Garvey Park (RO)	70	Negative
Granada Park	3	
Granada Park	36	Negative
Grand/Cienega Ave	30	Negative

Select or drag fields to populate this visual



Visualizations >> Data

Build visual

Filters

Columns

- site_name
- culex_quinquefasciatu...
- WNV Results

Drill through

Cross-report Off

Keep all filters On

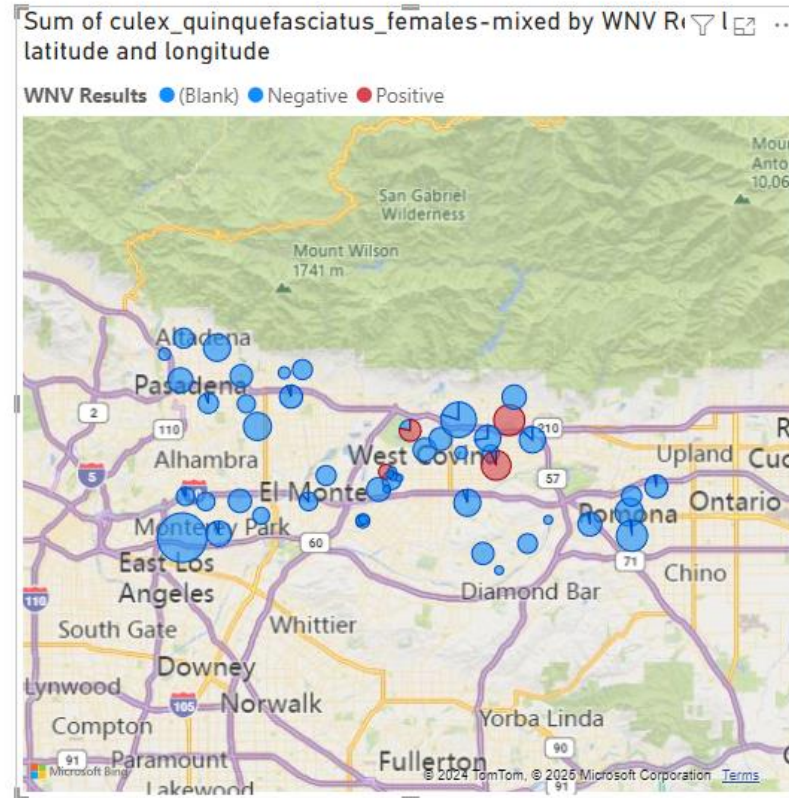
Add drill-through fields here

30 collections

30 pools

Building the file: Make visuals

site_name	culex_quinquefasciatus_females-mixed	WNV Results
(A6) Casitas Ave	11	
1296 Avenida Cesar Chavez	418	Negative
596 N Fair Oaks Ave	84	Negative
Baldwin Park Library	19	Positive
Baldwin Park Unified School District	40	Negative
Bassett Park (LP)	1	
Bassett Park (LP)	16	
Bassett Park (Studies)	6	
Benedict Way(PO)	2	
Benedict Way(PO)	67	Negative
BP Neighborhood	5	
Cal Poly Pomona University	3	
CAL Tech (PA)	3	
CAL Tech (PA)	49	Negative
Church of Christ	74	Negative
Colby Trailhead		
Cortez Park (WC)	6	
Cortez Park (WC)	96	Negative
Creeside Park (WA)	62	Negative
El Monte Historical Museum	5	
El Monte Historical Museum	35	Negative
FC Jeanette Ln-Big Dalton		
FC-Dundry Ave-Big Dalton	1	Negative
Garvey Park (RO)	70	Negative
Granada Park	3	
Granada Park	36	Negative
Grand/Cienega Ave	30	Negative



Visualizations

Build visual

Filters

Location

Add data fields here

Legend

WNV Results

Latitude

latitude

Longitude

longitude

Bubble size

Sum of culex_quinque...

Tooltips

Data

Search

- culex_quinquefasciat...
- Σ culex_quinquefasciat...
- Σ culex_quinquefasciat...
- culex_quinquefasciat...
- Σ culex_stigmatosoma...
- Σ culex_stigmatosoma...
- culex_stigmatosoma...
- Σ culex_tarsalis_females...
- Σ culex_tarsalis_males
- culex_tarsalis_unkno...
- Σ culex_thriambus_fem...
- Σ culex_thriambus_males
- culex_thriambus_unk...
- Σ culex_unknowsex
- Σ culiseta_incidens_fem...
- Σ culiseta_incidens_males
- culiseta_incidens_unk...
- Σ disease_week
- group
- Σ latitude
- Σ longitude
- ture
- name
- Σ num_trap
- species

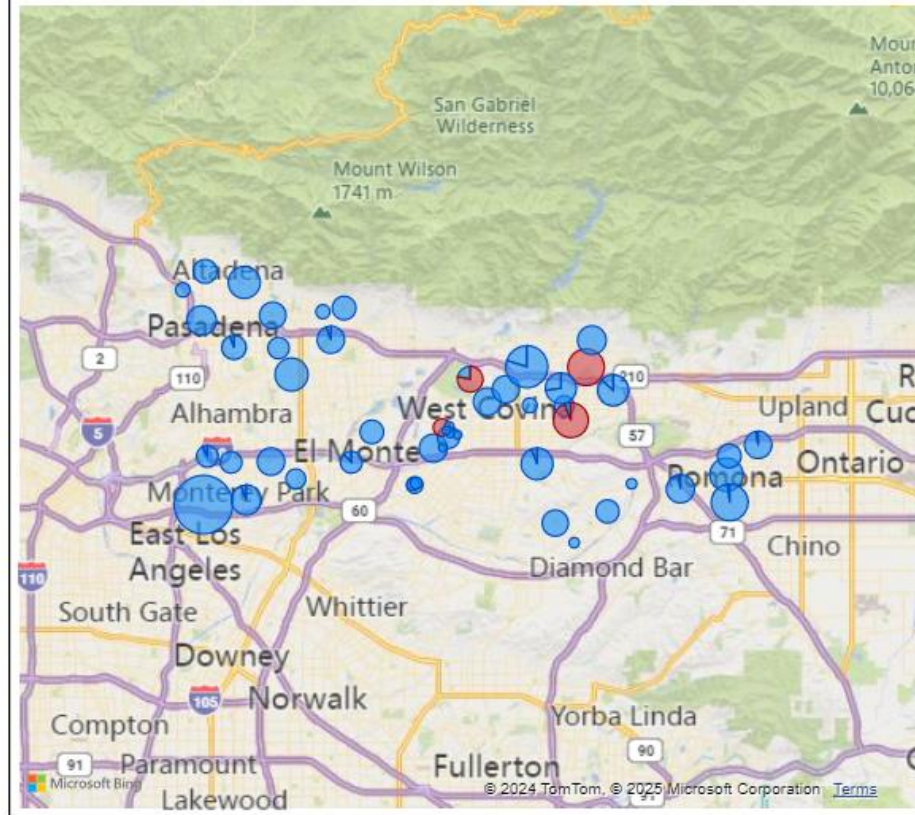
Building the file: Refine visuals

Cool Table

Site Name	Female Cx quinq	WNV Results
Mesa Glen Care Center (GL)	141	Positive
Kahler Russel Park (formerly Wingate)	119	Positive
Santa Fe Dam	47	Positive
Baldwin Park Library	19	Positive
1296 Avenida Cesar Chavez	418	Negative
Slauson Park	158	Negative
Pomona Cemetery	141	Negative
Western University	113	Negative
Norman's Nursery (Duarte Rd)	111	Negative
Rubio Wash	103	Negative
Cortez Park (WC)	96	Negative
596 N Fair Oaks Ave	84	Negative
Lone Hill Park	84	Negative
La Loma Park (MP)	82	Negative
Little Dalton Wash (GL)	78	Negative
Church of Christ	74	Negative

Nice Map

WNV Results ● (Blank) ● Negative ● Positive



Visualizations

Format page



Search

> Page information

> Canvas settings

> Canvas background

> Wallpaper

> Filter pane

> Filter cards

Pros

- Integrate many data sources into one comprehensive file
- Usable for non-technical users
- Once set up, mostly automated for established pages
- Can make new data visuals easily or just copy, paste, and edit



Cons

- Learning curve
- Time lag
 - Takes time for API to update with the latest entered data
- Power Bi can be “process hungry”, takes more CPU and memory resources to process large datasets
- Technical problems may need IT intervention



THANK YOU

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