

Tulare Lake Basin

GIS Collaborative

Steps to Problem Solving



1) What are the **FACTS**?



2) Is there a **pattern**?



3) What is the **BEST** response?



4) Implement a **solution**

Inspirations for Creating TLB GeoDataBase

“Incoherence and inaccessibility of data prohibit better understanding of problem and continuous assessment”

Dr Harter, UC Davis, May 2011

One of 7 key findings of Nitrate Study

“If you build it, they will come”

misquoted from Field Of Dreams, 1989

“Don’t let excellent become the enemy of good”

Voltaire “Le meglio e l’inimico del beno”, 1770

Overview of the TLB GeoDatabase

There is a wealth of GIS data available to study water issues in California. Unfortunately, this data is in a number of “data silos” using different conventions.

Tulare County GIS has tried to collect this data in a single geodatabase, using a consistent set of naming conventions, symbology, etc. Perfection is infinite & we are not... It is time to release this “work in process” so that others may point out imperfections & data gaps. It is hoped that others will participate by becoming “Data Stewards”

This data will be available in three formats:

- 1) Web Map which allow the public to explore the contents of the evolving geodatabase
<https://tularecounty.maps.arcgis.com/home/webmap/viewer.html?webmap=e2751e9a68de4165a427dc5c1cc1267b>
- 2) A set of ArcGIS LAYER files, which allows GIS users to connect to the TLB geodatabase (in read only mode) to reuse the data in their map.
- 3) Approved “Data Stewards” may edit the GIS data (location and attributes), allowing these edits to be shared with all members of the GIS Collaborative.
Initially, such edits will be limited to POINT data (Well Points & Address Points)

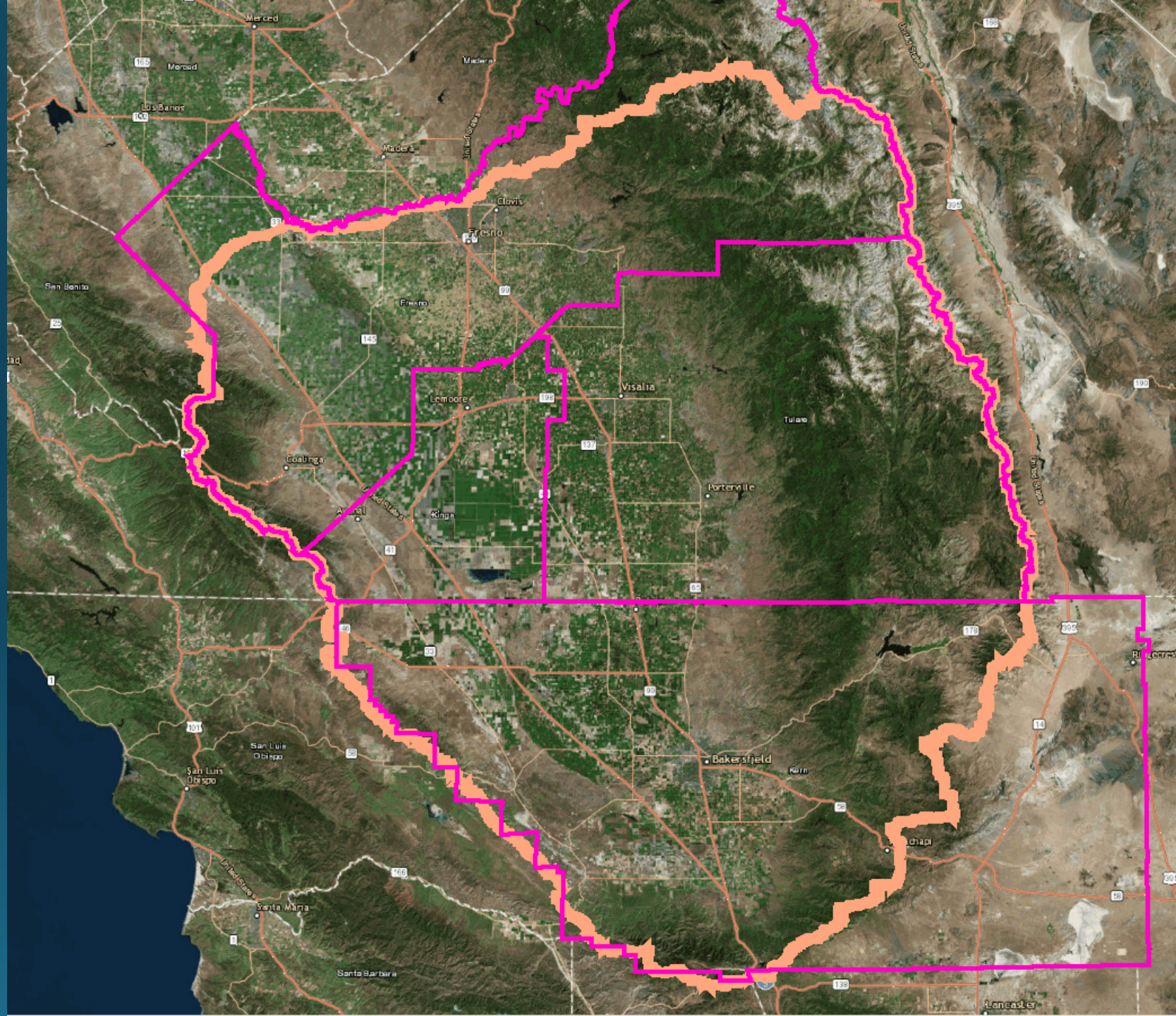
TLB01 - Framework

County Lines, Public Lands Survey System (PLSS) geometry, and Parcels are the basic framework which is used to locate all other data.

The PLSS data comes in a “basin wide” flavor using data from USGS/BLM.

There are “county wide versions” using authoritative data from each county. The Tulare County set is complete; the other counties are under development.

Parcel data is released in two flavors:
... Public data has redacted data
... Agency data is complete, but requires user to log-in



TLB02 – Districts

There are numerous overlapping agencies with differing responsibilities and authorities serving the people of the Tulare Lake Basin:

TLB02a – LAFCO Settlements

TLB02b – Planning Places

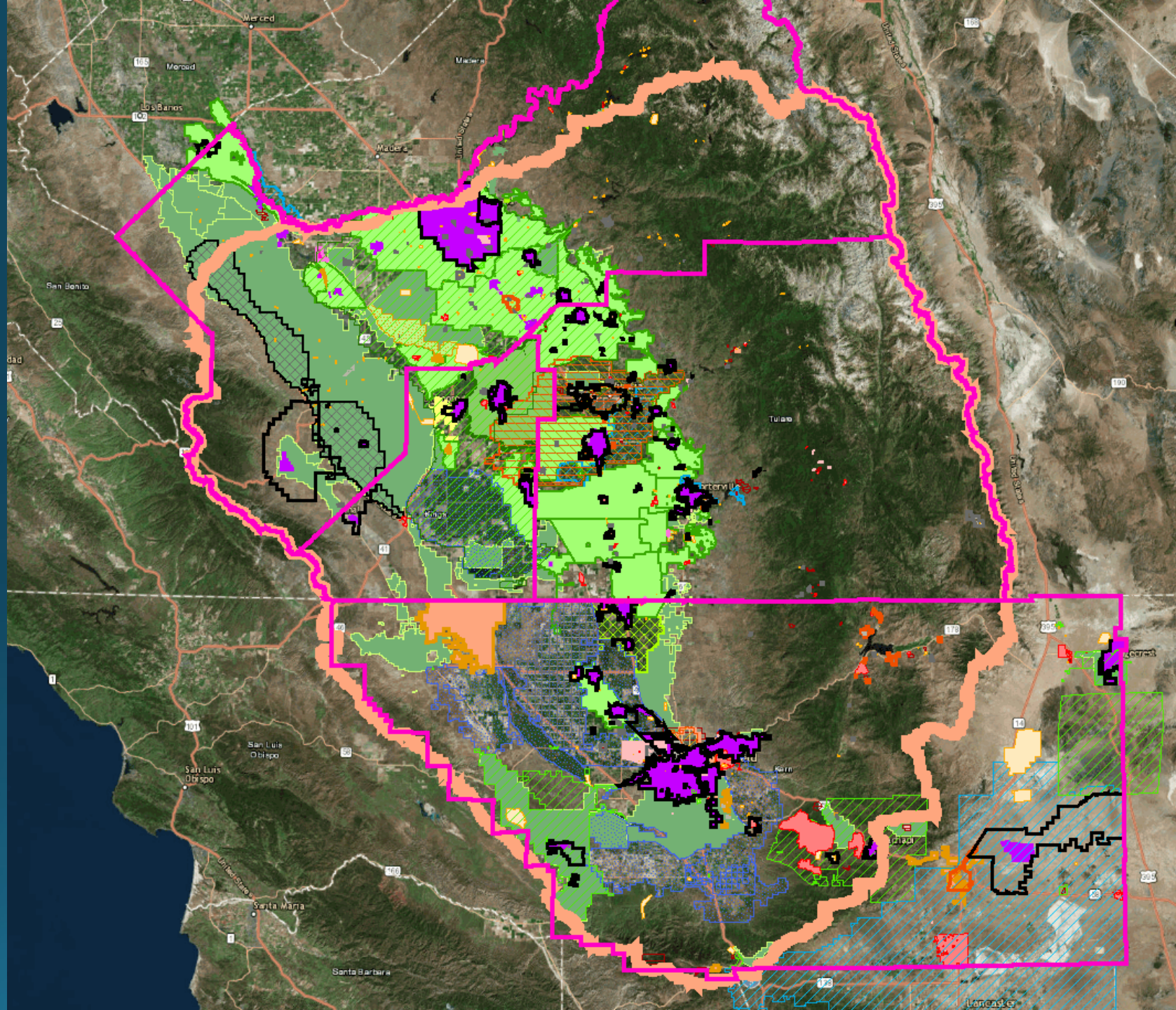
TLB02c – LAFCO Irrigation Systems

TLB02d – Community Water Systems

TLB02e – DACs

TLB02f – School Districts

TLB02j – GSAs



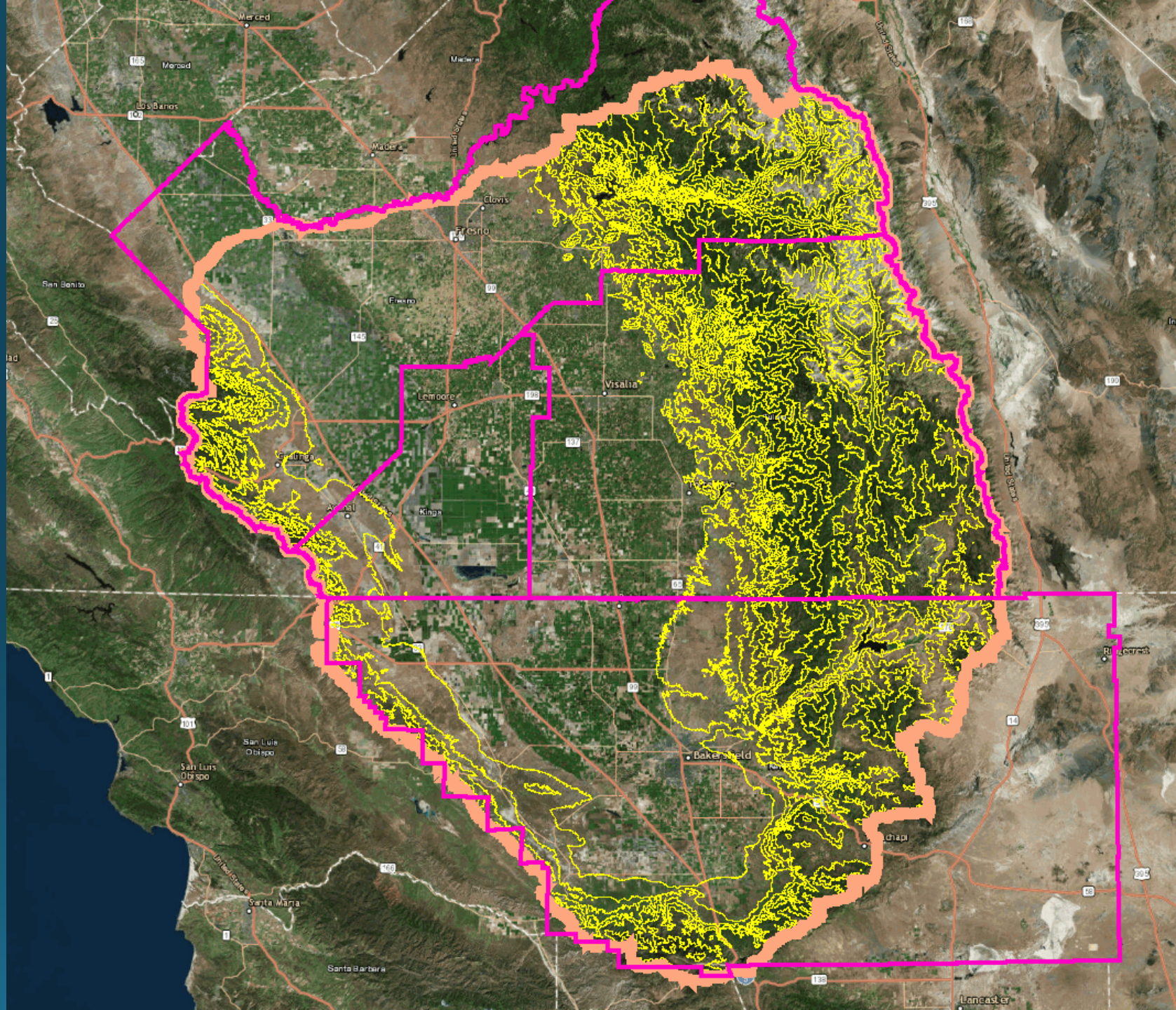
TLB03 - Topography

“Topography” may be the wrong word, but I will use it until a better word is suggested. There are three conceptual components:

SURFACE ... a digital elevation model of every point in TLB with sufficient resolution.

SOILS ... attributes of the “near below”... the suitability for agriculture, susceptibility to erosion, etc.

GEOLOGY ... attributes of the “deep below”



TLB04 – Surface Water

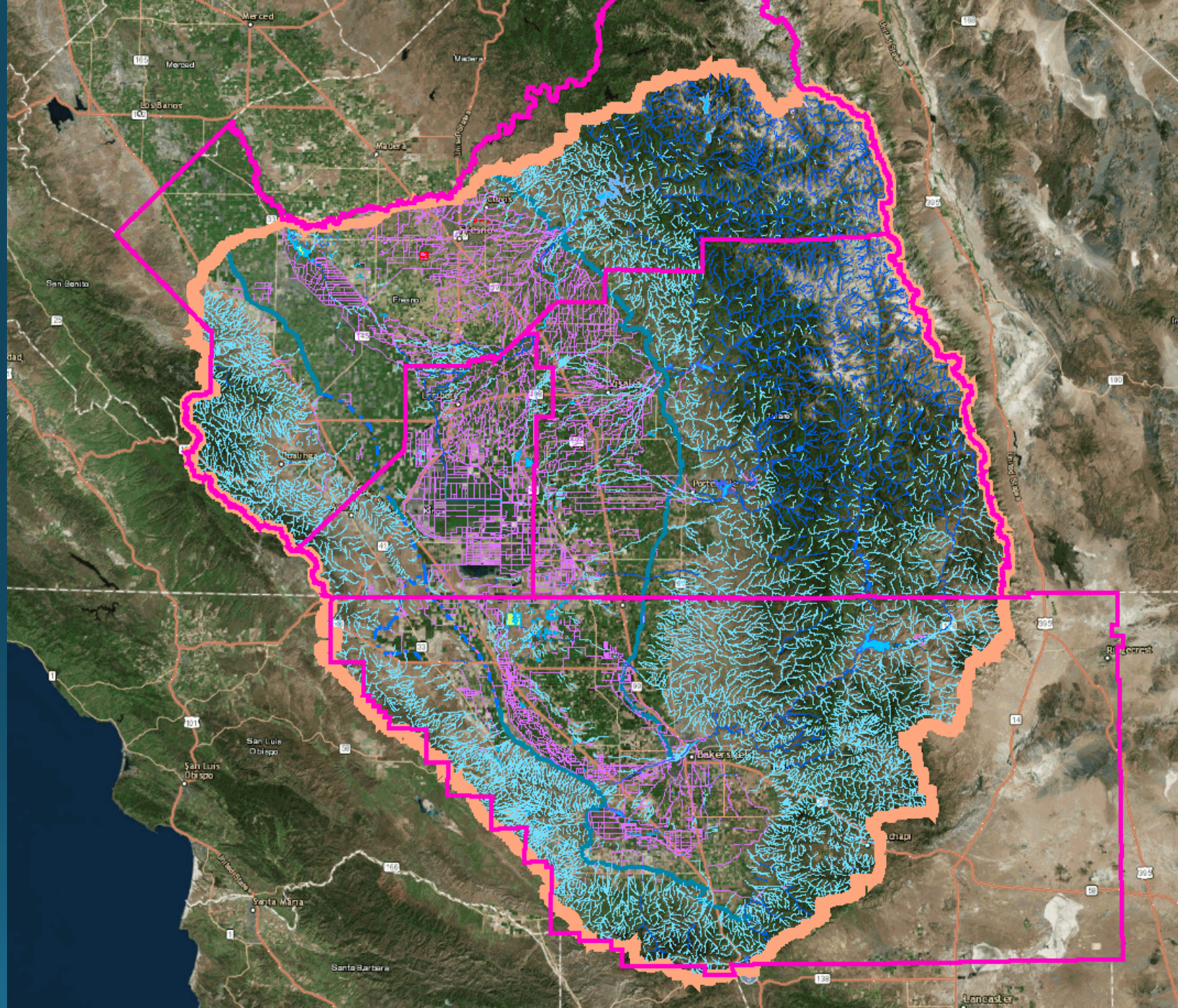
There are three national data sets covering surface water:

TLB04a – Water Sheds

TLB04b – Surface Water (NHD)

TLB04c – FEMA Flood Plains

Simulation models have been developed that tie this GIS data to precipitation data to predict water volume in each “reach”, potential flooding, and potential storage in water reservoirs ... potential for irrigation waters and drinking



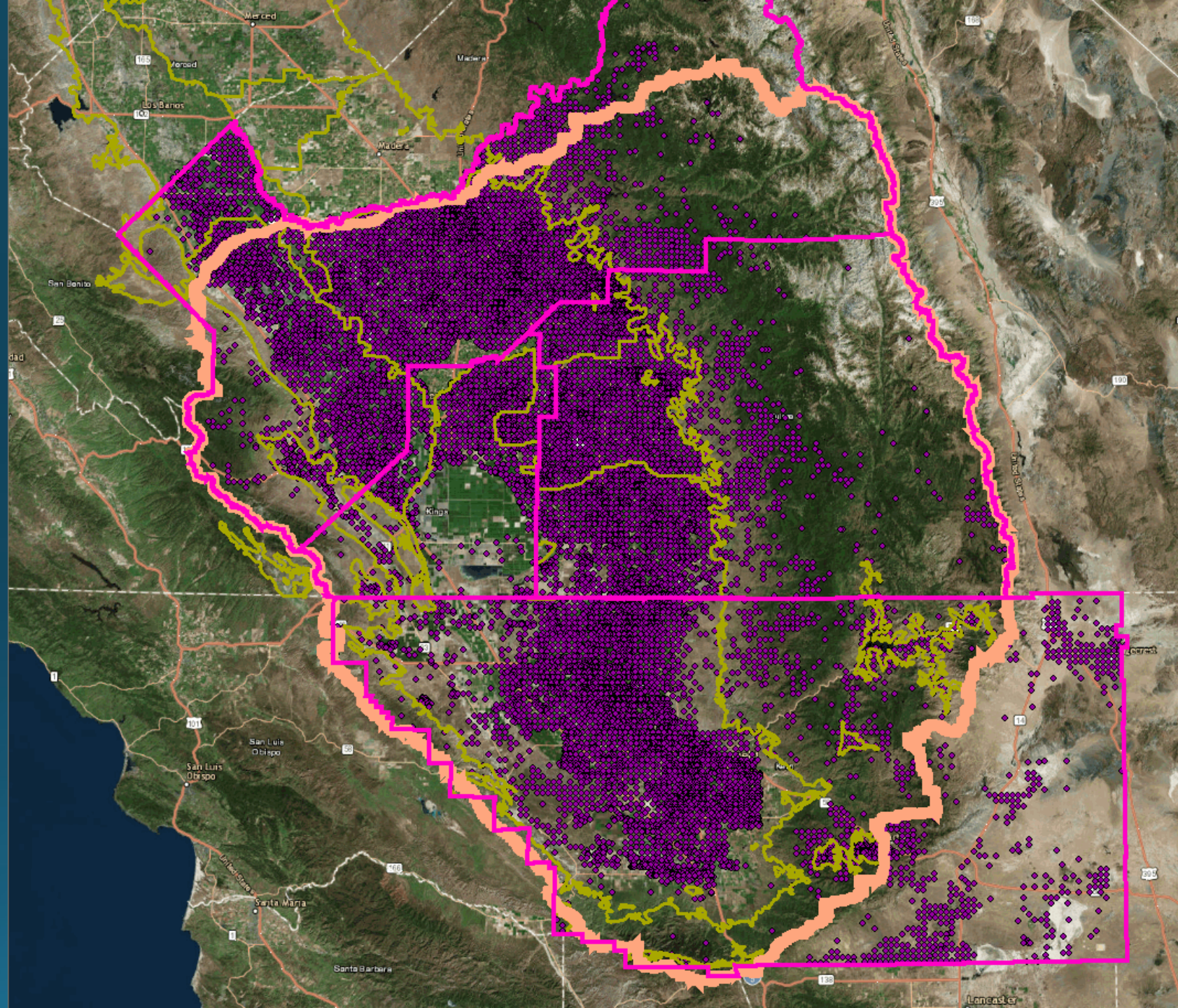
TLB05 – Ground Water (geometry)

TLB05a – Ground Water Basins
(aquifers)

TLB05b – Well Points
(numerous data sets
without a common ID)

There are 98586 wells that have been
hyperlinked to redacted WellLOGs





Wells located to center of Section.
GOAL is to provide Well Points with
hyperlinks to WellLOGs to the local
agencies (GSAs) to refine location
and attributes...

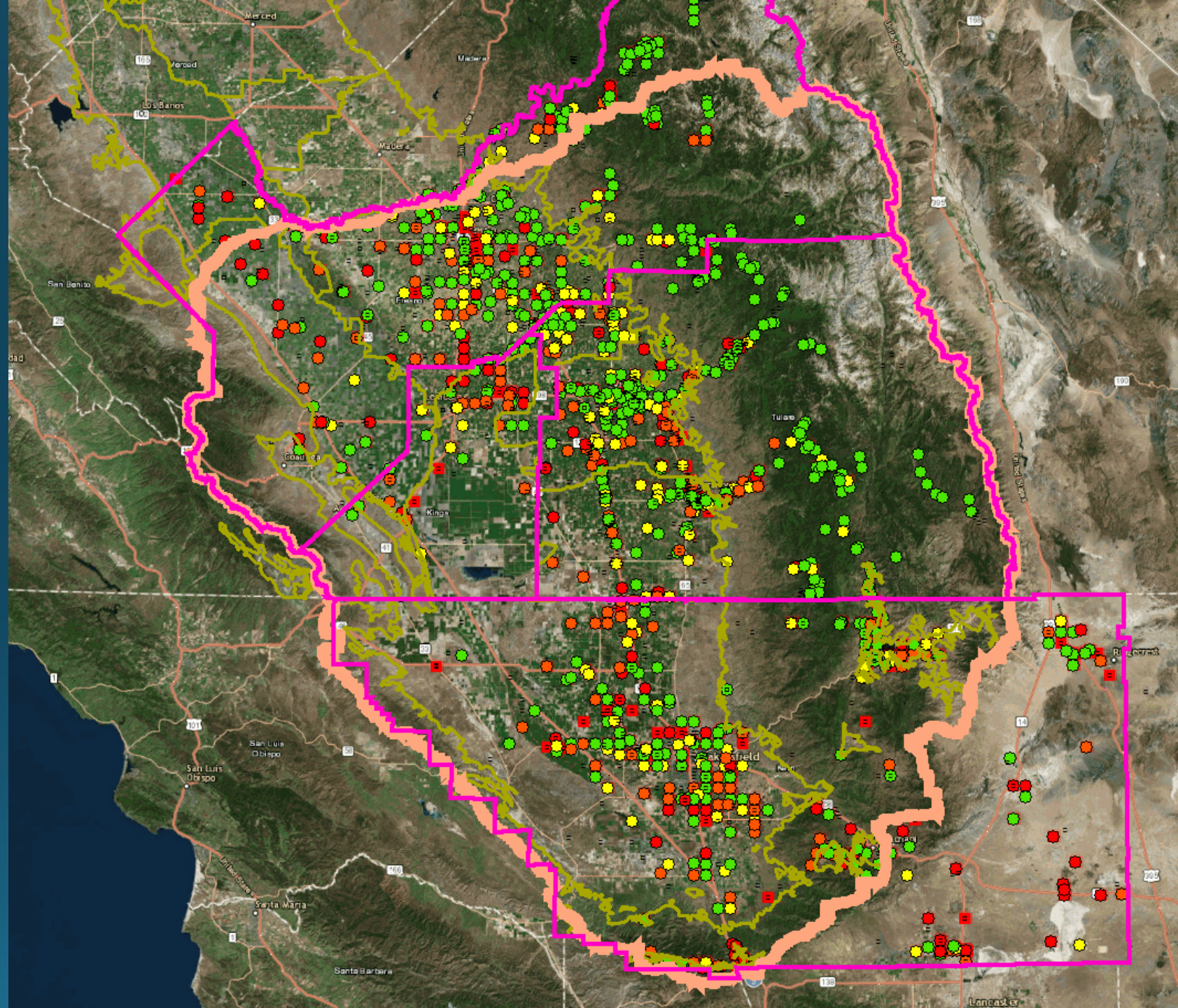


TLB05 – Ground Water (tabular data)

There are two large tabular data sets
(with millions of records) linked to
Well Points:

n05d - Depth to Ground Water
n05e - Water Quality Measures

- Water Systems (WaterQuality Ranking)
rankMAX
- = 0: No Data
 -  1: All Under MCL
 -  2: Mean Under MCL
 -  3: Mean Over MCL
 -  4: ALL Over MCL



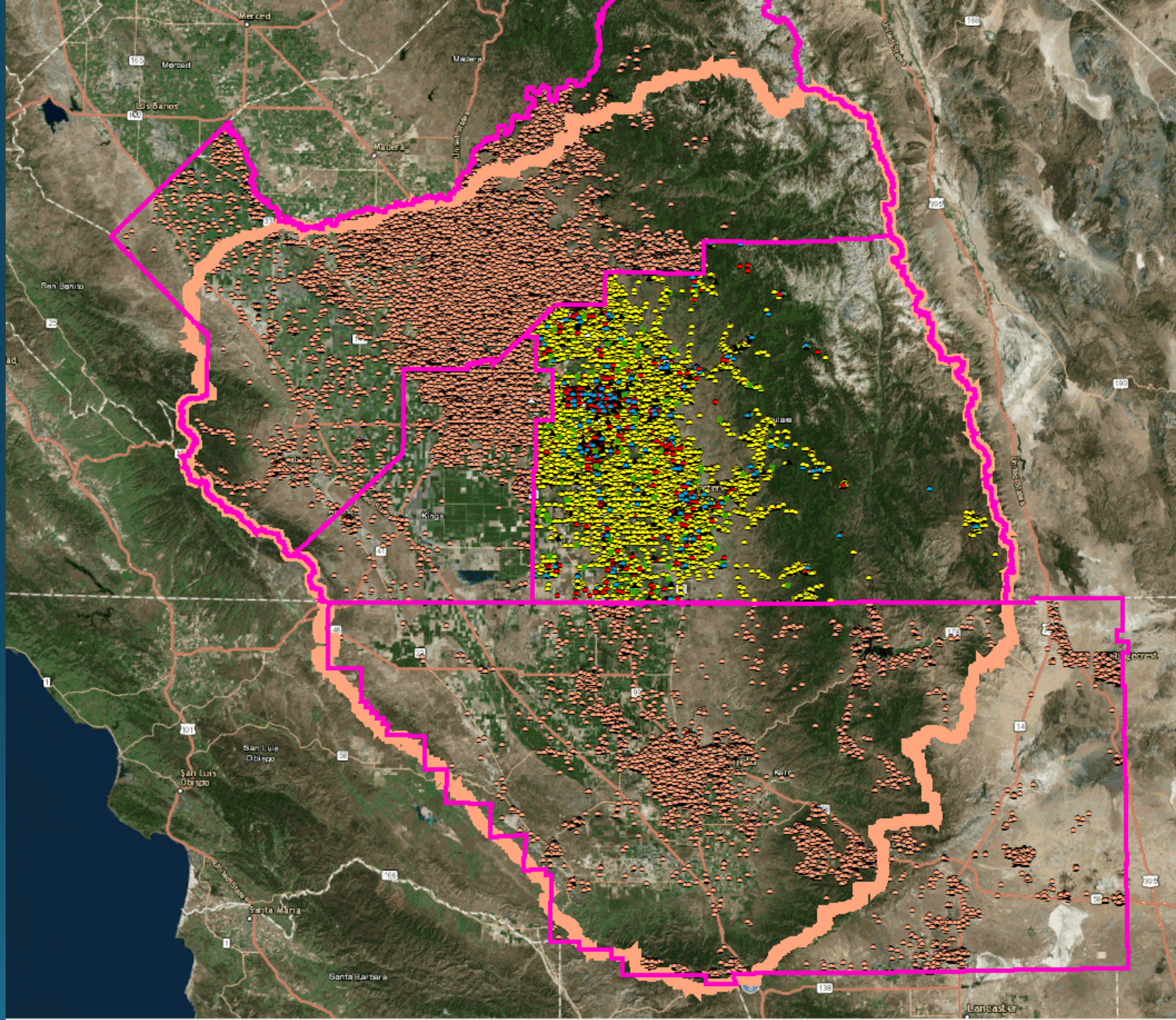
TLB07 – Demographics

Socio-Demographic data is derived from Address Points

TLB07a – Census Geometry

TLB07b – Address Points

n07a – Tabular Census Data
(millions of records linked to census geometry, which is linked to Address Points)



TLB08 – Transportation

TLB08a – Roadways

TLB08b – Public Transit

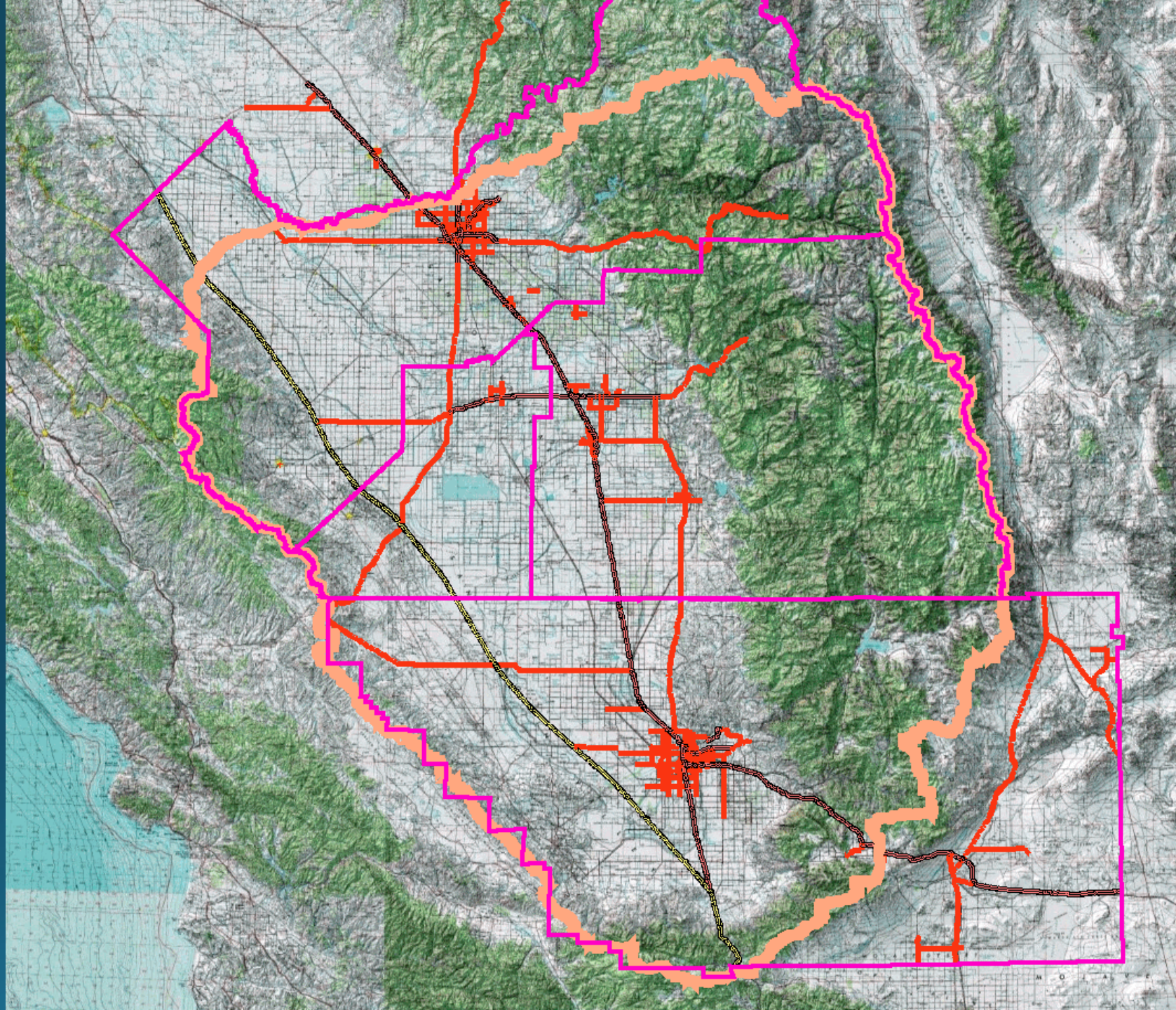
TLB08c – Railroads

TLB08d – Trails & Bikeways

TLB08e – Airports

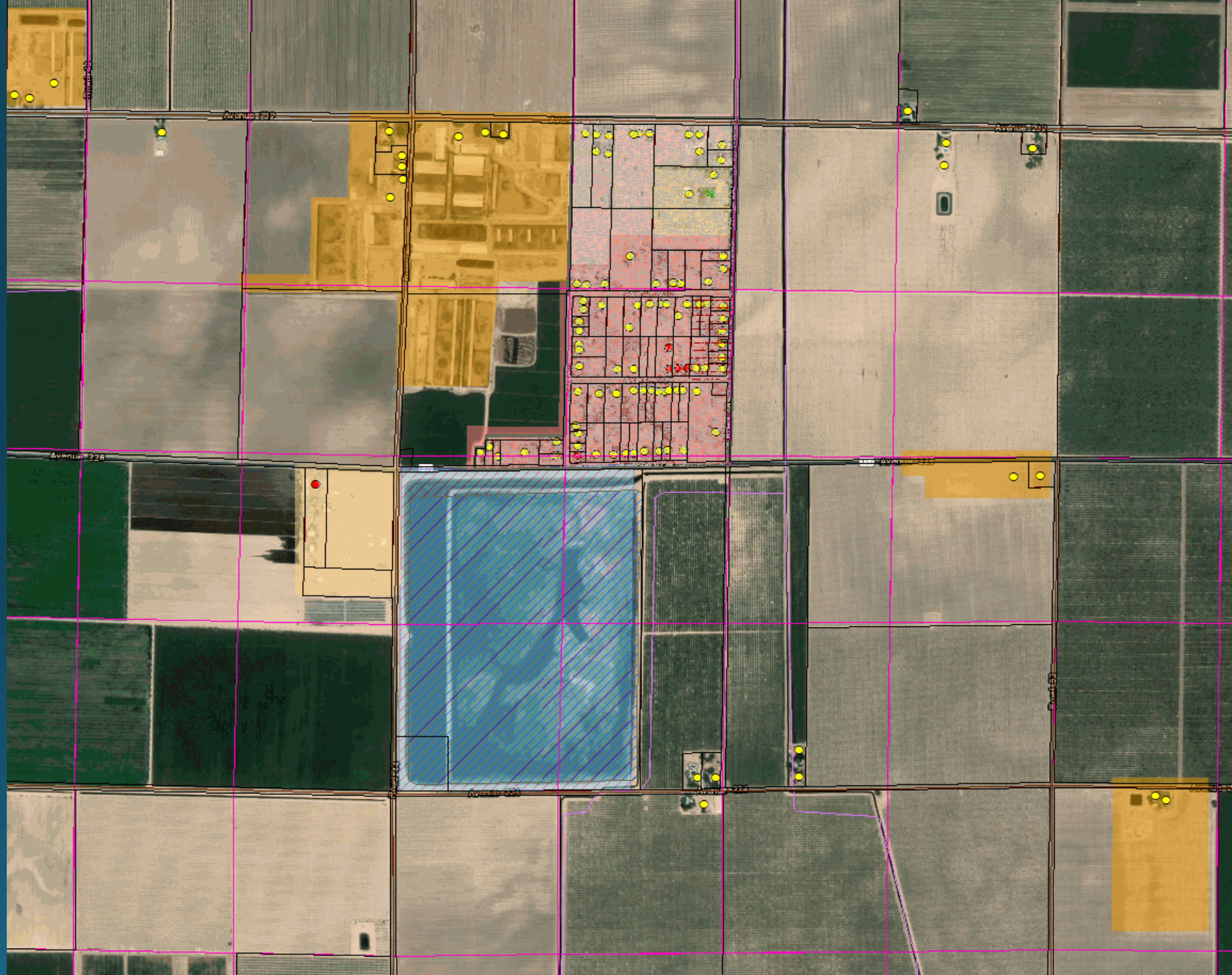
TLB08f – Pipe Lines

TLB08g – Power Grid



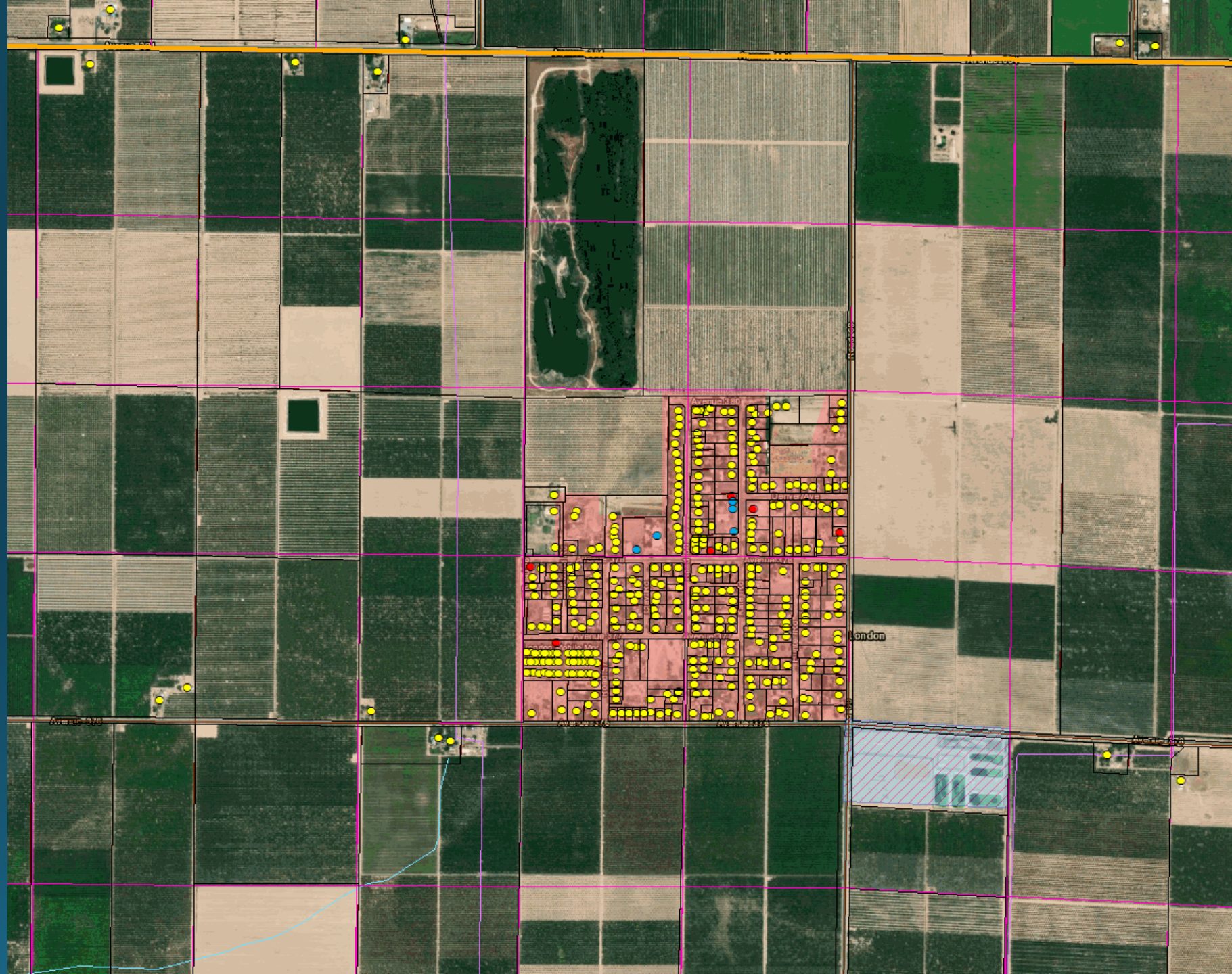
Community Map

Oakieville
Mutual Water Company



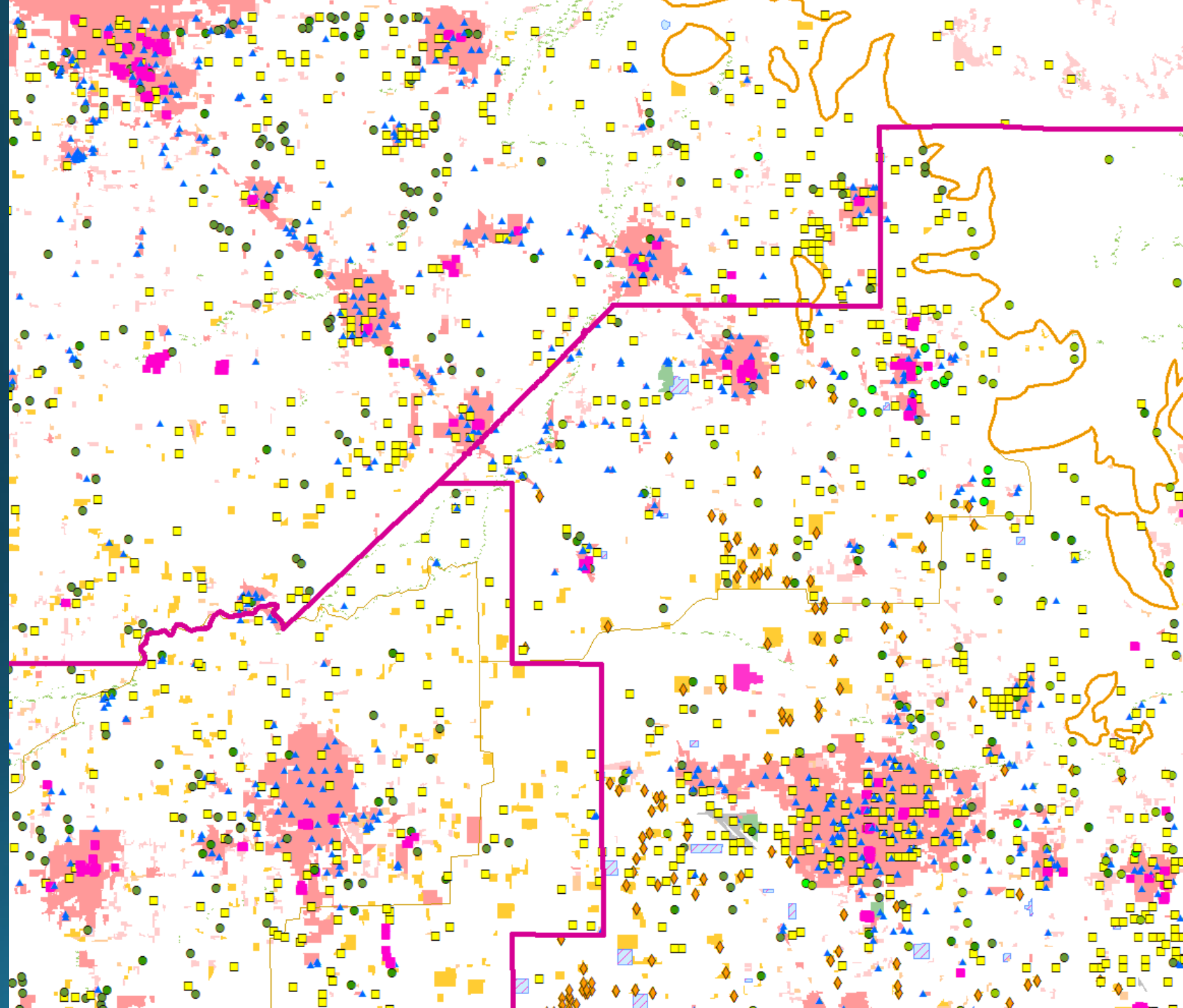
Community Map

London
Community Service District



Ground Water Wells without WellLOGs (from California GeoTracker GAMA)

- Wells without WellLOGs
 - TLB05b_GeoTracker_GPS_noWellLOGS
 - DataSET
 - ▲ DHS
 - DWR
 - EDF
 - GAMA
 - GAMA_Fresno
 - USGS
 - USGSNEW
 - TLB05b_TuCo_Wells_Dairy
 - ◆
- Development FootPrint - 2012
 - TLB06b_FootPrint_2012_Fresno
 - TLB06b_FootPrint_2012_Kern
 - TLB06b_FootPrint_2012_Kings
 - TLB06b_FootPrint_2012_Tulare
- D: Developed
- R: Developed (low density)
- sAC: SemiAG
- CE: Confined Animals
- Dos: Open Space
- Dlf: Land Fills
- Dx: Transportation
- Dw: Water Facilities
- W: Water
- nv: Native Veg



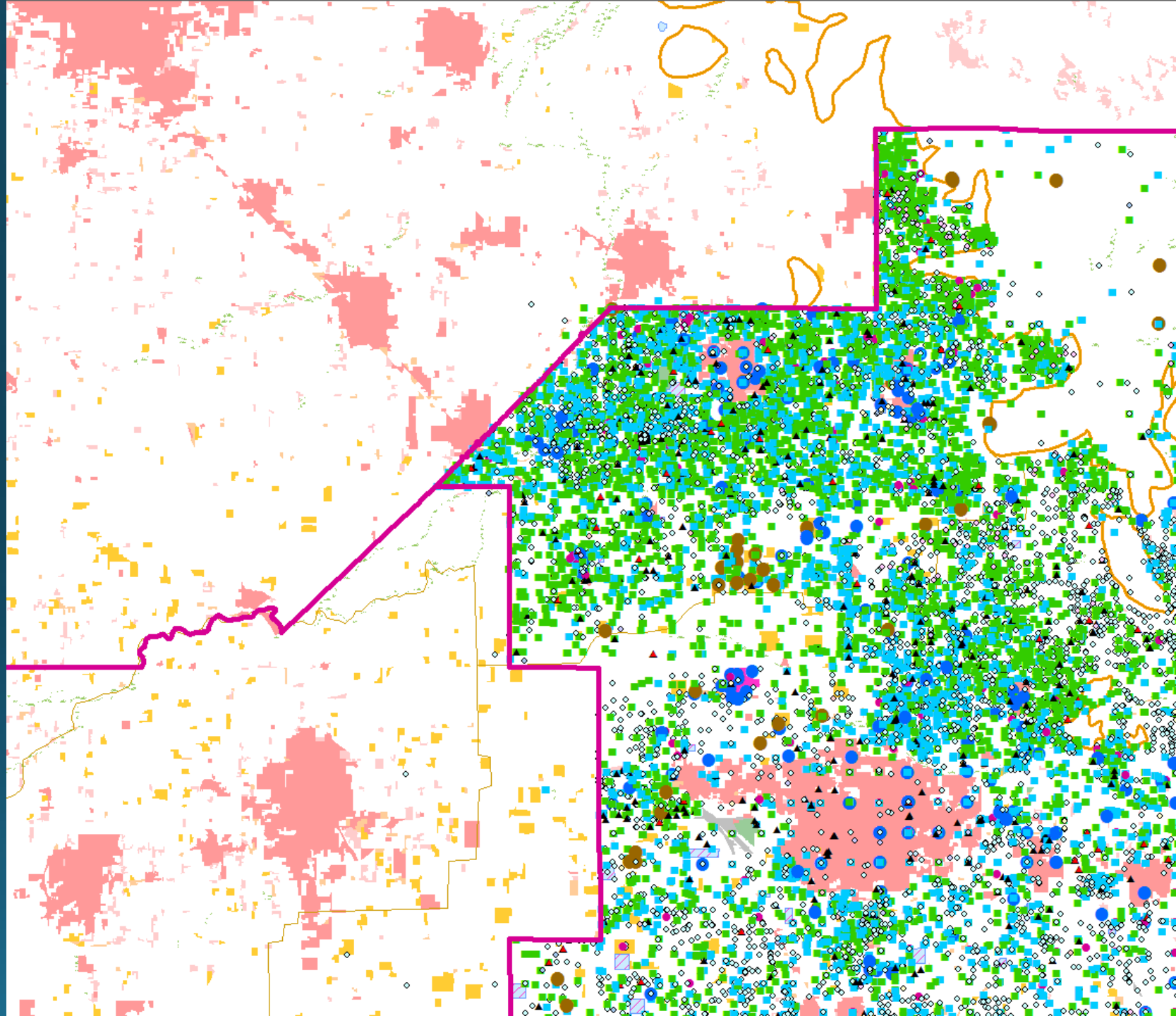
Ground Water

Tulare County Wells (2008) with Hyperlink to WellLOGs

- Wells with Hyperlinked WellLOGs
- TLB05b_TuCo_WellLOGs_Master
- m_WellUse
- ◇ 00: not YET captured
- 05: domestic (<5 connections)
- 06: municipal (5+ connections)
- 07: irrigation
- 08: industrial
- ◇ 09a: Monitoring (CUPA)
- ◇ 09b: Monitoring (dairy)
- ◇ 09c: Monitoring (depth to water)
- ◇ 10: Soil Boring
- ◇ 11: Test Well
- ◇ 12: Gas Exploration
- ◇ 13: Cathodic
- 14: Dairy Supply
- ◇ 15: Other
- ◇ 16: Tra Paperwork
- ▲ 17: Destroy Well
- ▲ 18: Cancel-NOTdrilled

TLB Redacted Wells (2017)

Fresno County	44,601
Kern County	21,775
Kings County	7,404
Tulare County	<u>24,806</u>
TLB total	98,586



Quest for a unique id for WellLOGs and Well Points

Well Counts (with WellLOGs - by Source)

Tulare County Well Logs key ID = [WellLOG_id] like "00070033"
 connects to Tulare County File Server with DWR_2008 un-redacted images or 'XX' or [SWN]

	Base Img	xTra	Total
Tulare	28853	3405	32258

DWR 2018 Well Log Images key ID = [WCR_id] like "WCR2007-000033"
 connects to DWR web site of redacted images

	Base Img	xTra	Total
Fresno	44601	5500	50101
Kern	21775	1554	23329
Kings	7404	1335	8739
Tulare	24806	3635	28441
TLB	98586	12024	110610

DWR 2017 Well Logs key ID = [WellLOG_id] like "00070033"
 connects to Tulare County File Server with DWR redacted images or 'XX' or [SWN]

	Base Img	xTra	Total
Fresno	44635	5518	50153
Kern	19821	3339	23160
Kings	7024	1706	8730
Tulare	24247	4101	28348
TLB	95727	14664	110391

DWR 2018 Well Log Data Table key IDs = [WCR_id] and [WellLOG_id]
 connects to Tulare County File Server with DWR redacted images

	Base Img	xTra	Total
Fresno	44601	0	44601
Kern	21775	0	21775
Kings	7404	0	7404
Tulare	24806	0	24806
TLB	98586	0	98586

Well Counts (without WellLOGs - by Source)

DWR "depth to water" Monitoring Wells

		key ID = [SWN]	like "54M.22S/23E-08A.001"
Tulare	2205		with links to "depth to water" database

RWQCB Dairy Wells

		key ID = [ID_PWS]	like "54bd101-iw002"
Tulare	4237		with links to WQ database

Dry Wells @2016

		key ID = [Address]	
Tulare	2343		

Wells with Water Quality Measures (without WellLOGs)

		key ID = [PWS_ID] like "5410010" or [SWN] or "54bd101"									
Fresno	1720	123	545	45	29	87	1	142	748		
Kern	1374	267	371	22	30	139	1	339	205		
Kings	454	20	76	4	1	17	130	125	81		
Tulare	2574	128	497	32	42	458	324	215	878		
TLB	6122	538	1489	103	102	701	456	821	1912		
<i>class</i>		<i>A+</i>	<i>A</i>	<i>A-</i>	<i>Ai</i>	<i>B</i>	<i>B+</i>	<i>C</i>	<i>D</i>		
WQ Well County		857	sites with NO data								
		5265	sites with 12559 wells with WQ data (& no WellLOG)								
System Classes:		<i>A+</i>	Public Water System (Community)								
		<i>A</i>	Public Water System ('N' or 'T')								
		<i>A-</i>	Community without PWS (identified by DAC Project)								
		<i>Ai</i>	inactive/abandoned/consolidated PWS								
		<i>B</i>	Rural Comestic Well with WQ samples								
		<i>B+</i>	Dairy (or other Animal Operations)								
		<i>C</i>	Environmental Monitoring Wells								
		<i>D</i>	Agricultural Chemical Monitoring Wells								

Estimate of Well Count - 2018 Consolidated Well Logs

	2017 redacted hyperlink to LOCAL	2018 redacted hyperlink to DWR	Singletons with hyperlink to DWR	Base with hyperlink to LOCAL	TOTAL with hyperlinks	xTra Paperwork
Fresno	50153	50101	34047	10554	44601	5500
Kern	23160	23329	11226	10549	21775	1554
Kings	8730	8739	5008	2396	7404	1335
Tulare	28348	28441	16585	8221	24806	3635
TLB	110391	110610	66866	31720	98586	12024

Looking for Collaborators



For More Info

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