

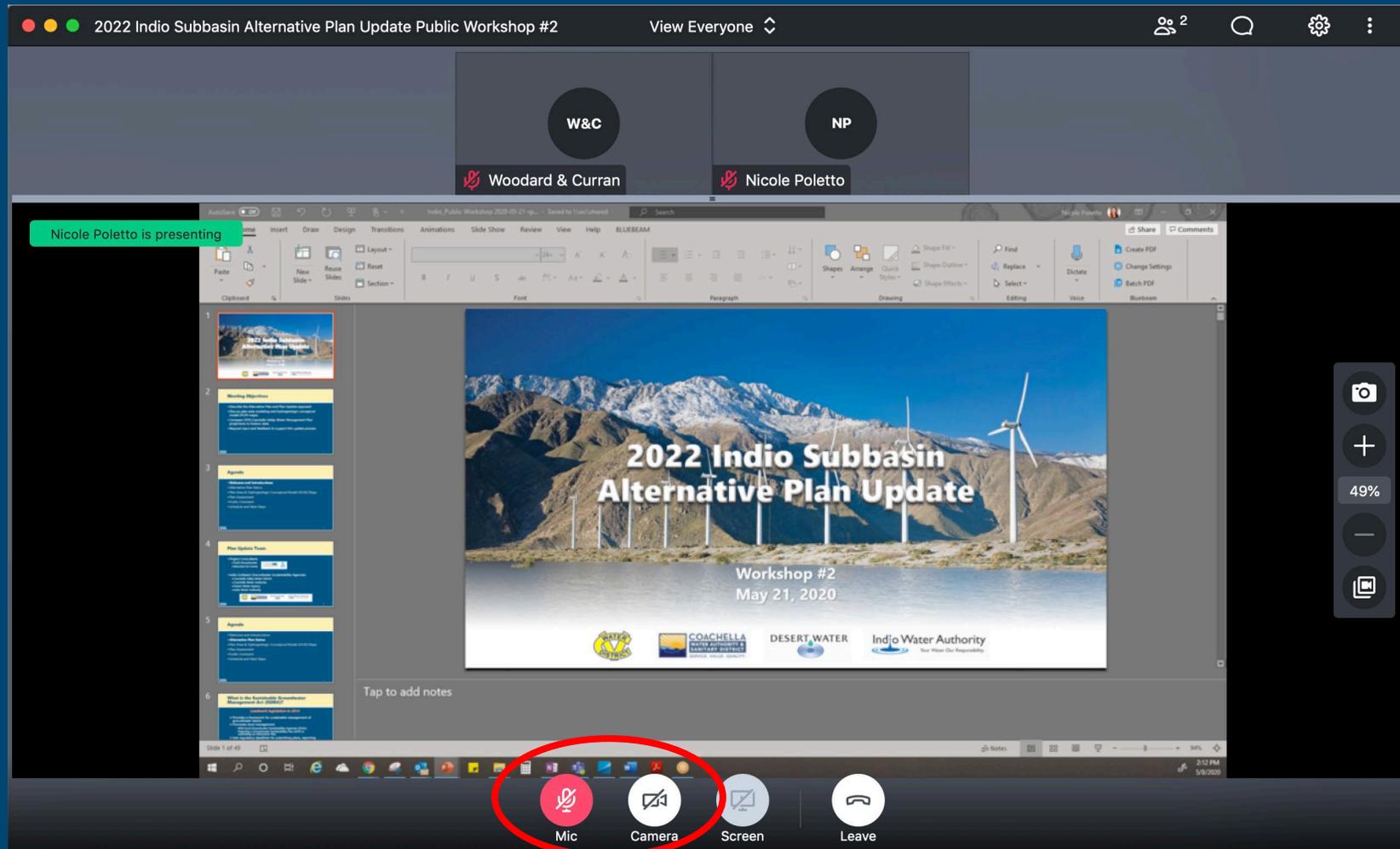
2022 Indio Subbasin Alternative Plan Update

Workshop #5
June 24, 2021



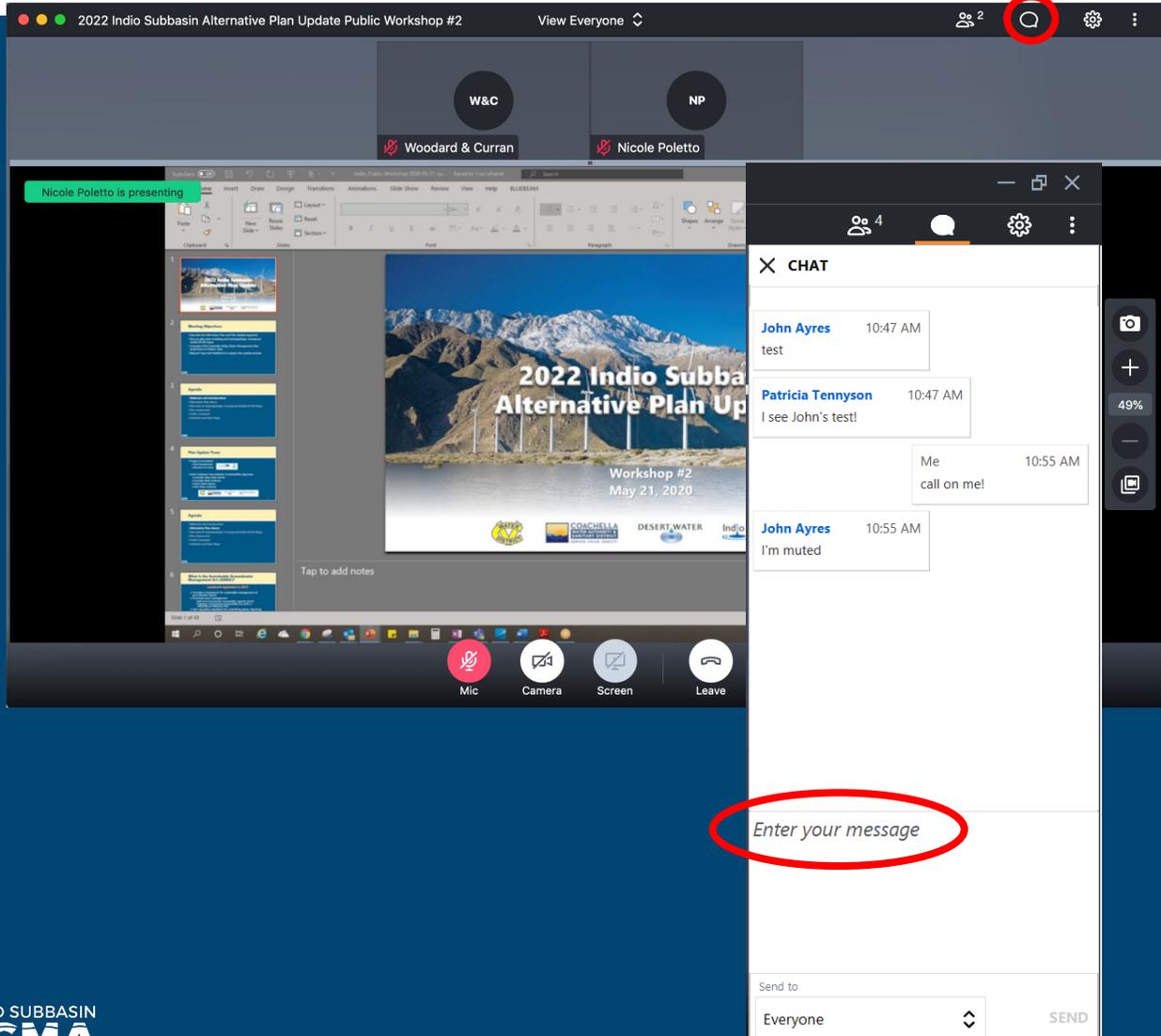
GoToMeeting – Quick How To

- Your screen should look like this:



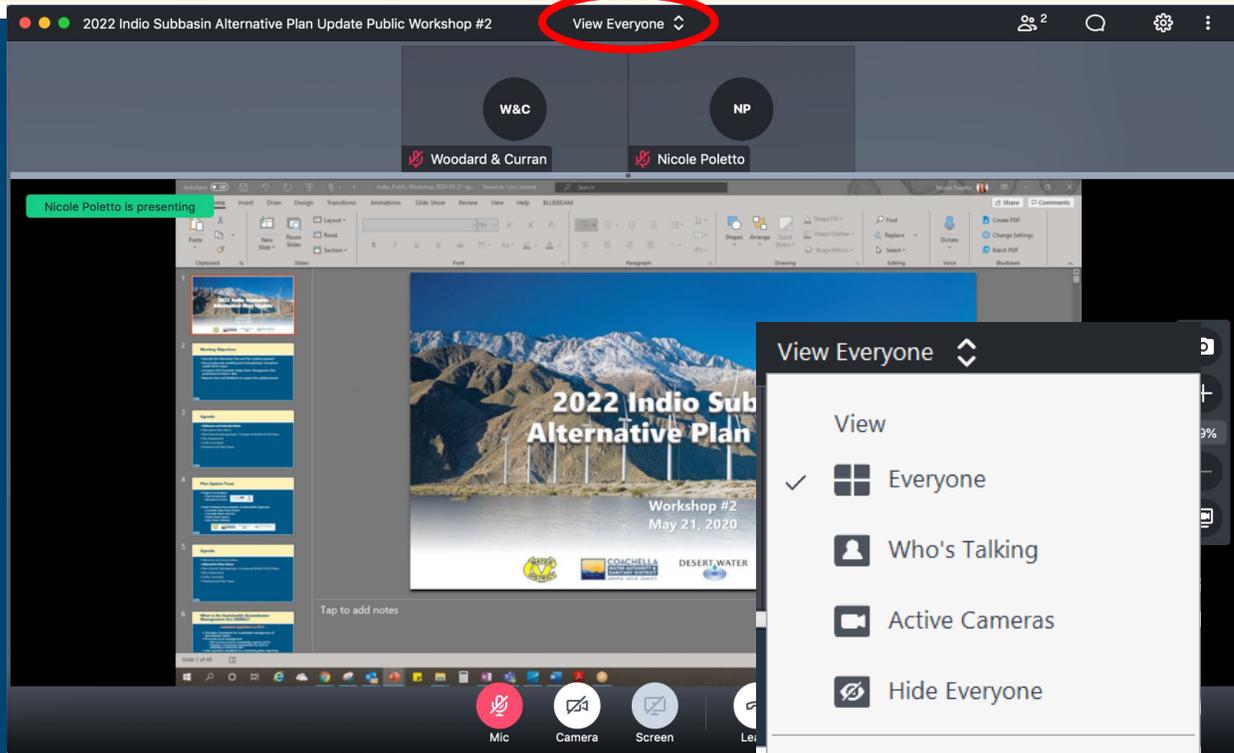
- Turn on/off your Mic (mute) and Camera (video) using the controls along the bottom
- During the meeting, you may need to wiggle your mouse to make the controls appear
- For Callers: use *6 to unmute on the phone

GoToMeeting – How to Ask a Question



- Our organizer will mute everyone at the beginning of the meeting
- Let us know you have a question by clicking the **Chat** icon in the top right
 - ❖ Click on *Enter your message*, type your message and hit SEND
- Once we receive your Chat, we will call on you and answer your question
- For Callers: when ask for your questions or comments, use *6 to unmute

GoToMeeting – How to See Everyone



- To change your display options, select the **View** menu in the top center
 - ❖ Select View-Everyone to display all attendees in the meetings
 - ❖ Select Camera Viewer-Top to display participant images along the top of your screen
- The grey divider can be raised or lowered, which will change the screen size

Meeting Objectives

- Provide overview and status of the Alternative Plan Update
- Discuss Groundwater Conditions for water quality and GDEs
- Present an update on Sustainable Management
- Update on status of the Groundwater Model Update and modeling for Plan Scenarios
- Request input and feedback to support the Plan Update

Agenda

- **Welcome and Introductions**
- Alternative Plan Status
- Groundwater Conditions
- Sustainable Management
- Groundwater Model and Plan Scenarios
- Public Comment
- Get Involved

Plan Update Team

- Project Consultants

- ❖ Todd Groundwater
- ❖ Woodard & Curran



- Indio Subbasin Groundwater Sustainability Agencies

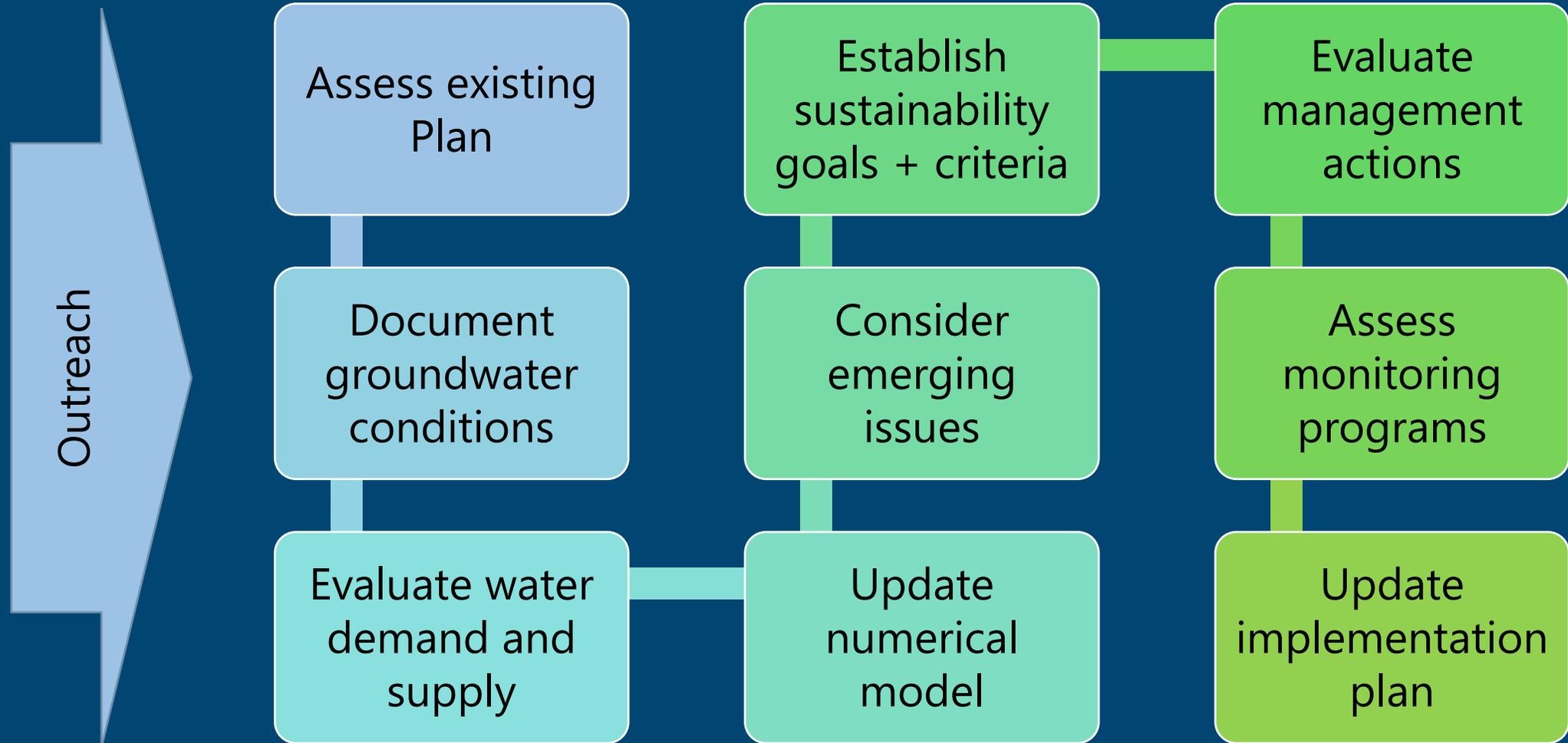
- ❖ Coachella Valley Water District
- ❖ Coachella Water Authority
- ❖ Desert Water Agency
- ❖ Indio Water Authority



Agenda

- Welcome and Introductions
- **Alternative Plan Status**
- Groundwater Conditions
- Sustainable Management
- Groundwater Model and Plan Scenarios
- Public Comment
- Get Involved

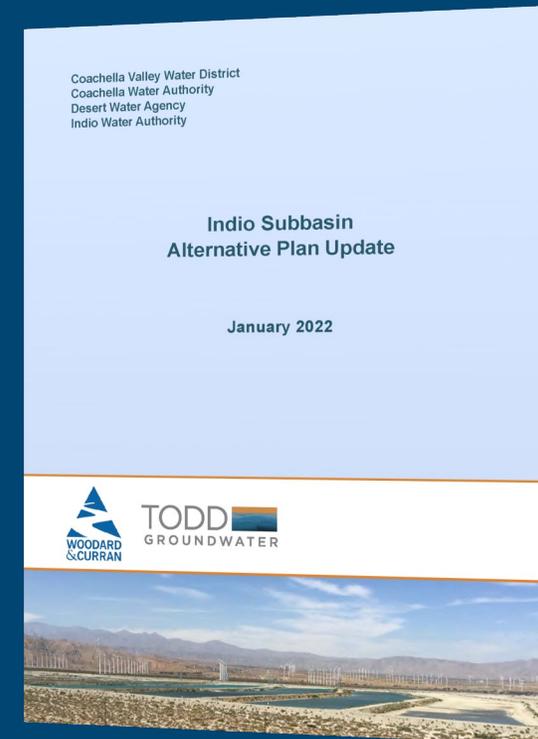
Status of Alternative Plan Update



Status of Alternative Plan Update

Outline of 2022 Alternative Plan Update presents a progression of work

1. Introduction
2. Plan Area
3. Hydrogeologic Conceptual Model
4. Groundwater Conditions
5. Water Demand Projections
6. Existing Water Supplies
7. Water Budgets and Plan Scenarios
8. Emerging Issues
9. Sustainable Management Criteria
10. Monitoring Program
11. Projects and Management Actions
12. Implementation Plan



Agenda

- Welcome and Introductions
- Alternative Plan Status
- **Groundwater Conditions: Quality**
- Sustainable Management
- Groundwater Model and Plan Scenarios
- Public Comment
- Get Involved

Groundwater Conditions: Water Quality

Alternative Plan Update includes:

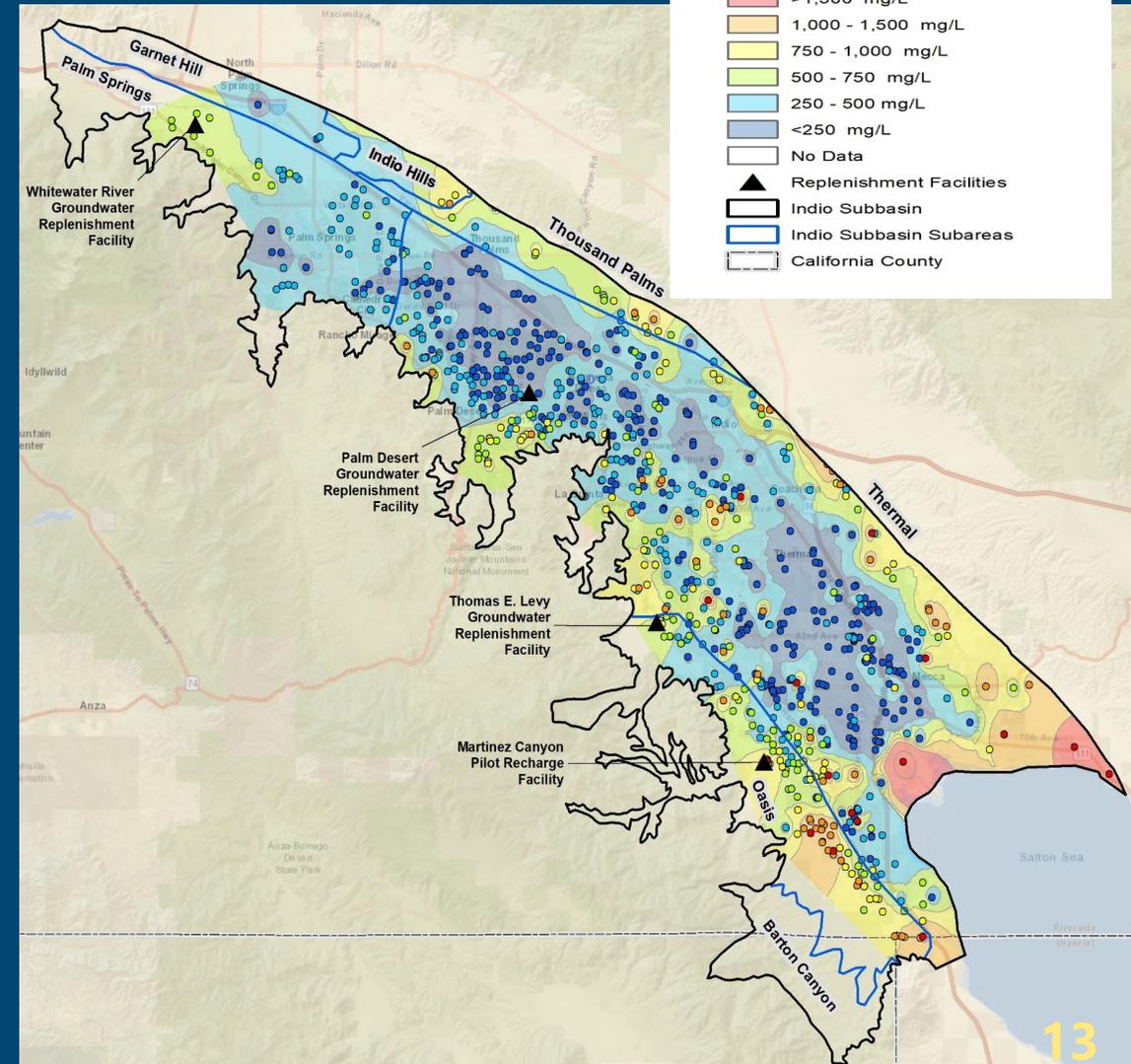
- Groundwater quality analysis
- Maps for eight constituents
 - ❖ Most recent samples from 1990-2019
 - ❖ Relatively deep wells (>300 feet) in production zones
- Cross-sections for TDS, NO₃, Arsenic, Cr-6 to show vertical variation
- Time concentration plots for TDS and nitrate
- Discussion of significance, source(s), distribution factors

Constituents of Concern Included

- Salinity (TDS)
- Nitrate
- Arsenic
- Hexavalent chromium (Cr-6)
- Fluoride
- Perchlorate
- Uranium
- DBCP

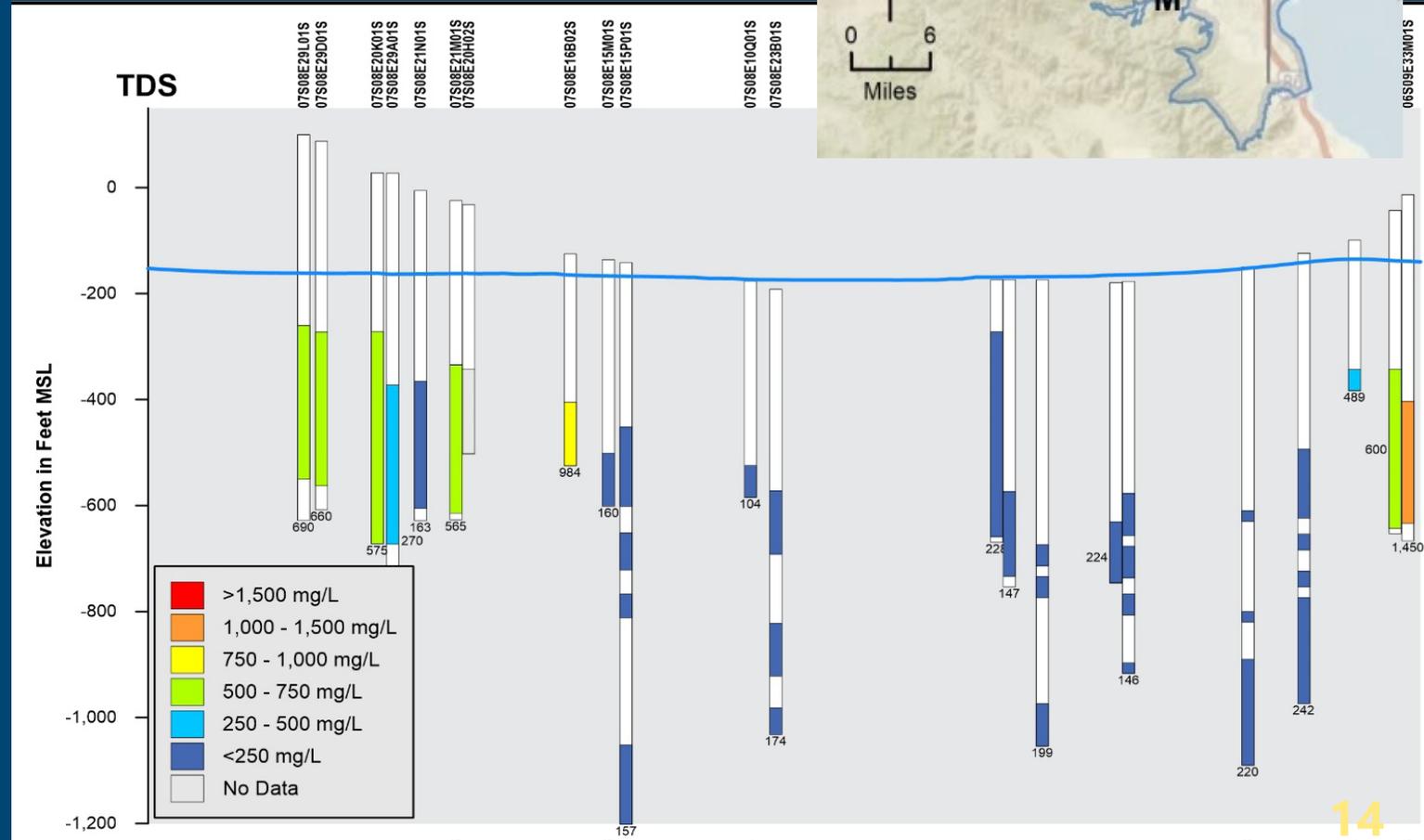
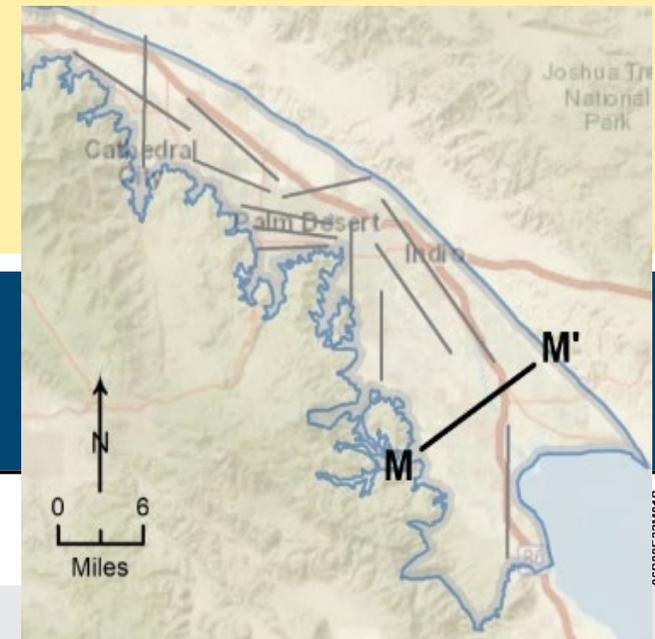
Groundwater Conditions: TDS

- SWRCB Consumer Acceptance Levels
 - recommended 500 mg/L
 - upper 1,000 mg/L
 - short-term 1,500 mg/L
- From natural sources, return flows, imported water recharge, septic and wastewater disposal, subsurface inflow, and historical seawater inflow
- Large areas are <500 mg/L with highest concentrations near Salton Sea and along basin margins



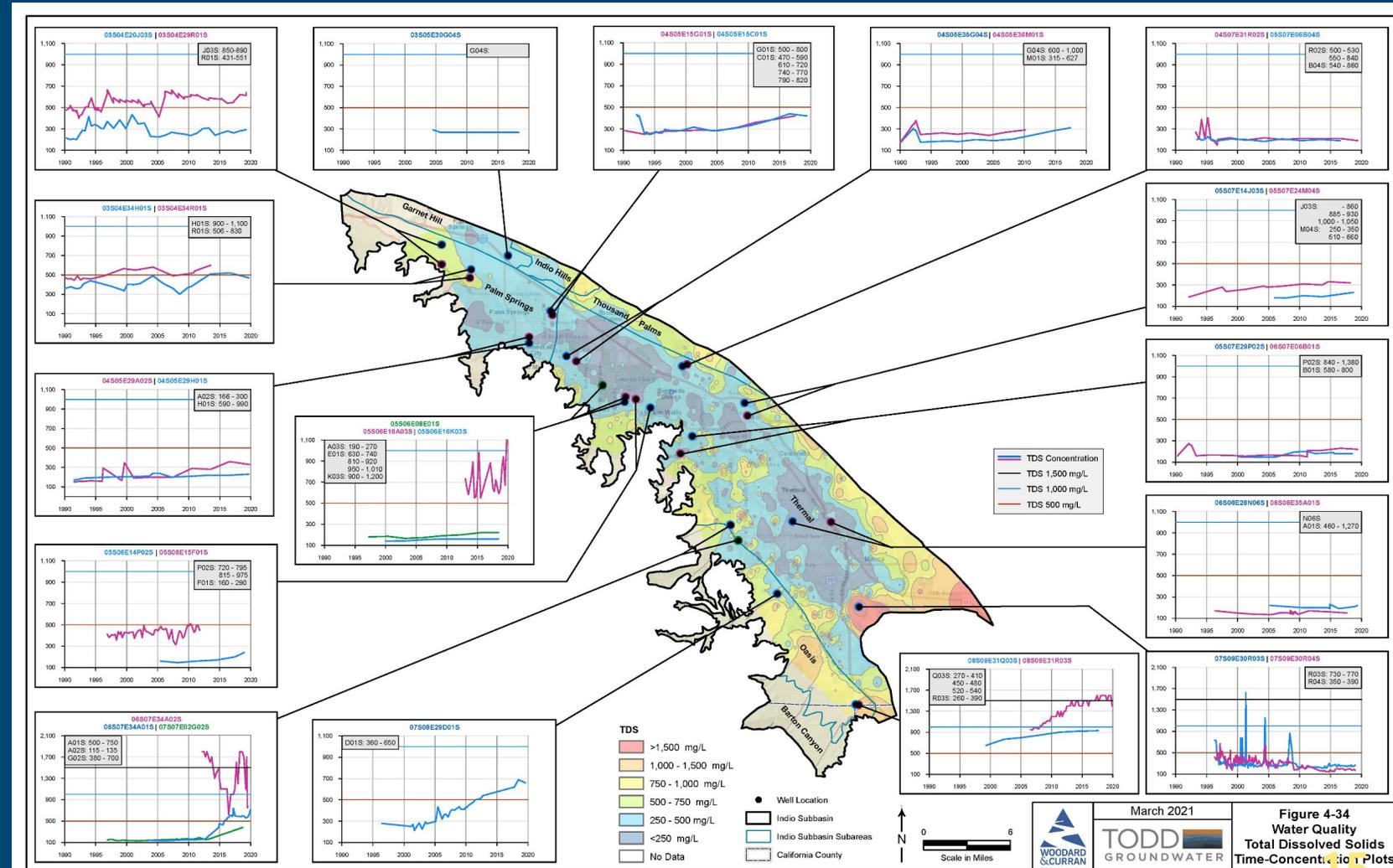
TDS Cross Sections

- 14 cross sections with TDS
- Shallow wells (<300 feet) included to show vertical variations
- Higher concentrations in shallower zones
- Lower concentrations in deep wells



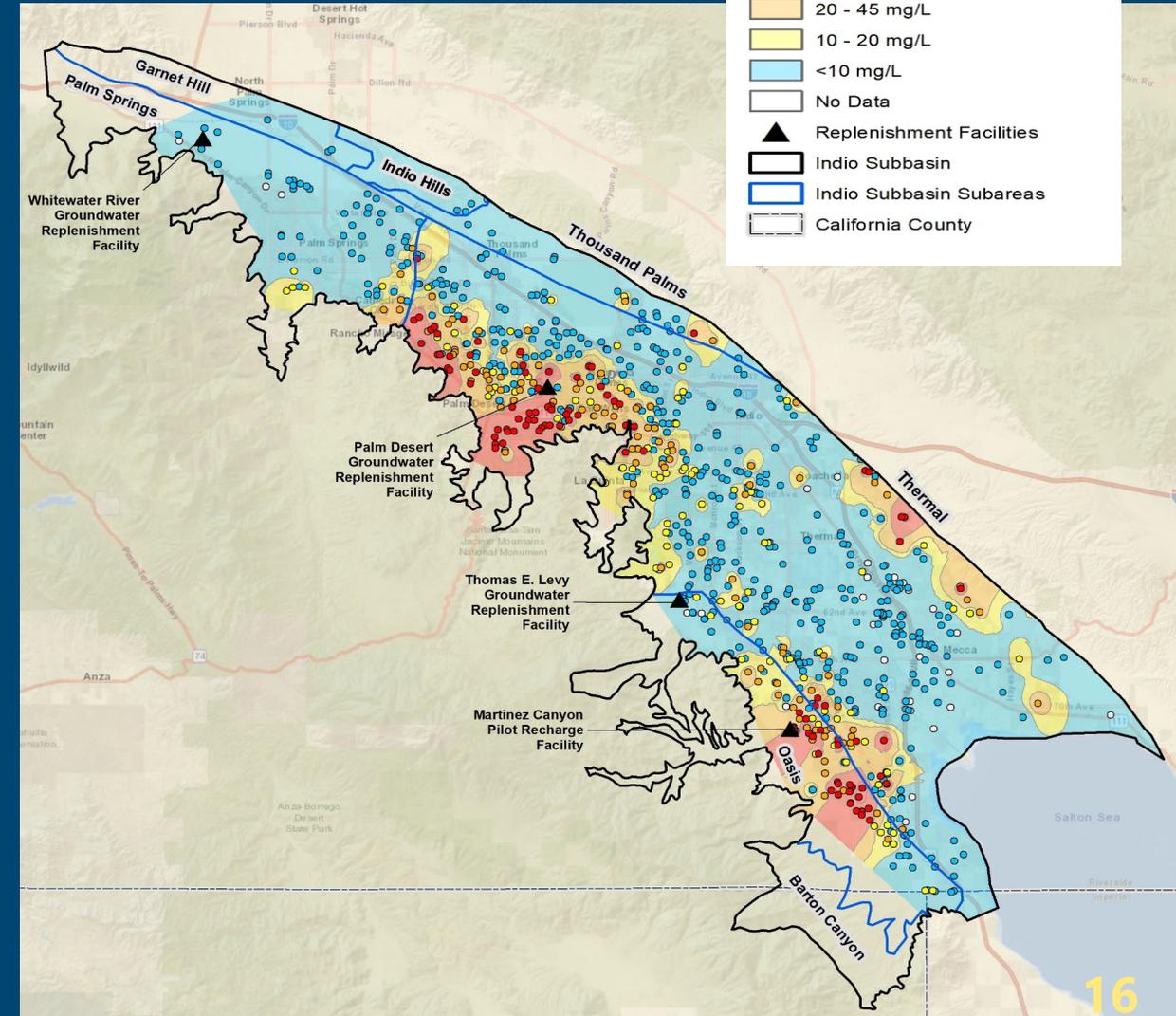
TDS Time-Concentration Plots

- Shallow zones tend to have higher and more variable TDS
- Increases in TDS since 1990 are shown with lower rates of increase in deep zones and in central/eastern Thermal subarea
- These data will be used in CV-SNMP



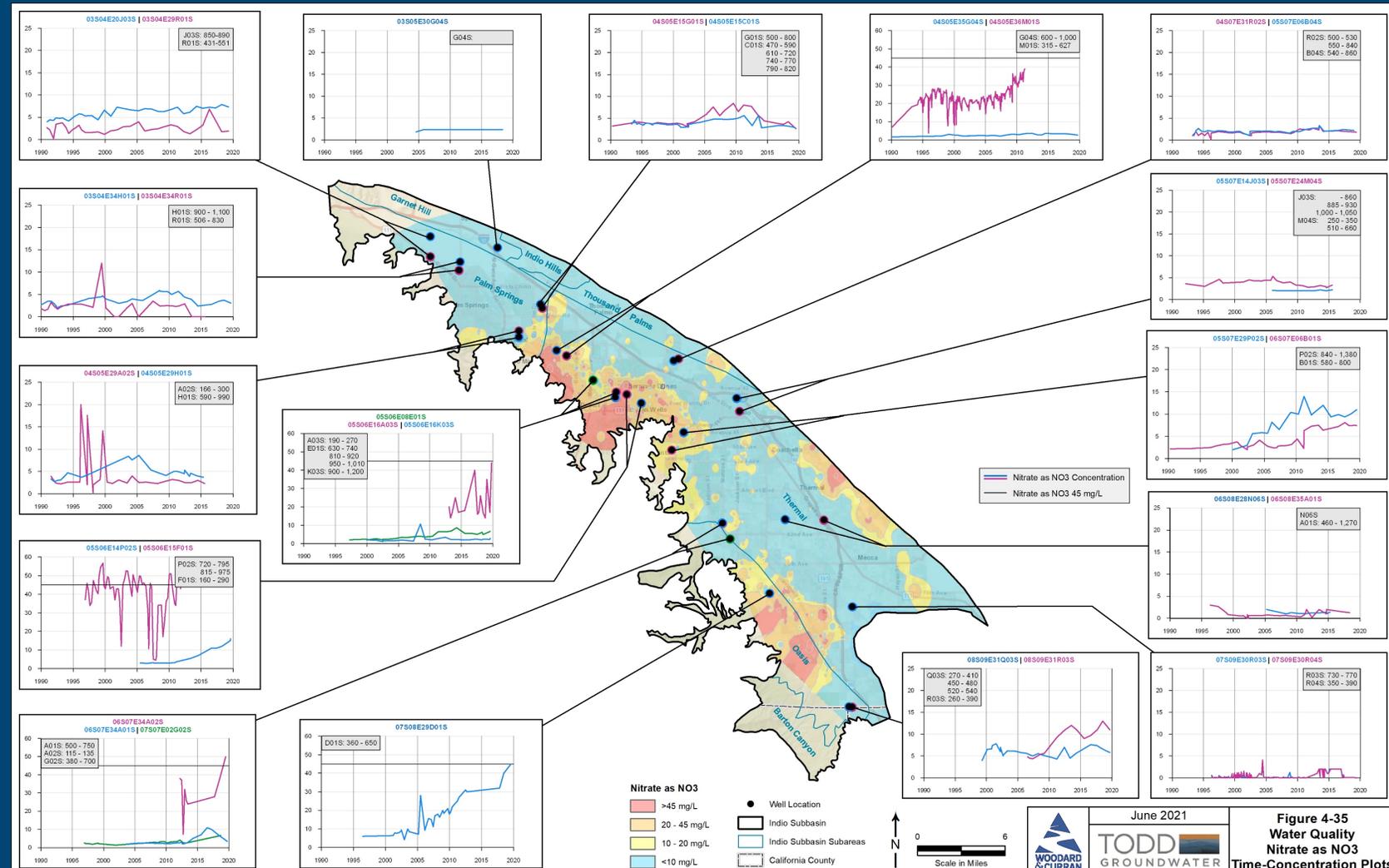
Groundwater Conditions: Nitrate

- MCL is 45 mg/L as NO_3
- Natural mesquite sources and loading from historical agriculture, landscaping, septic and wastewater disposal
- Higher concentrations in shallow groundwater



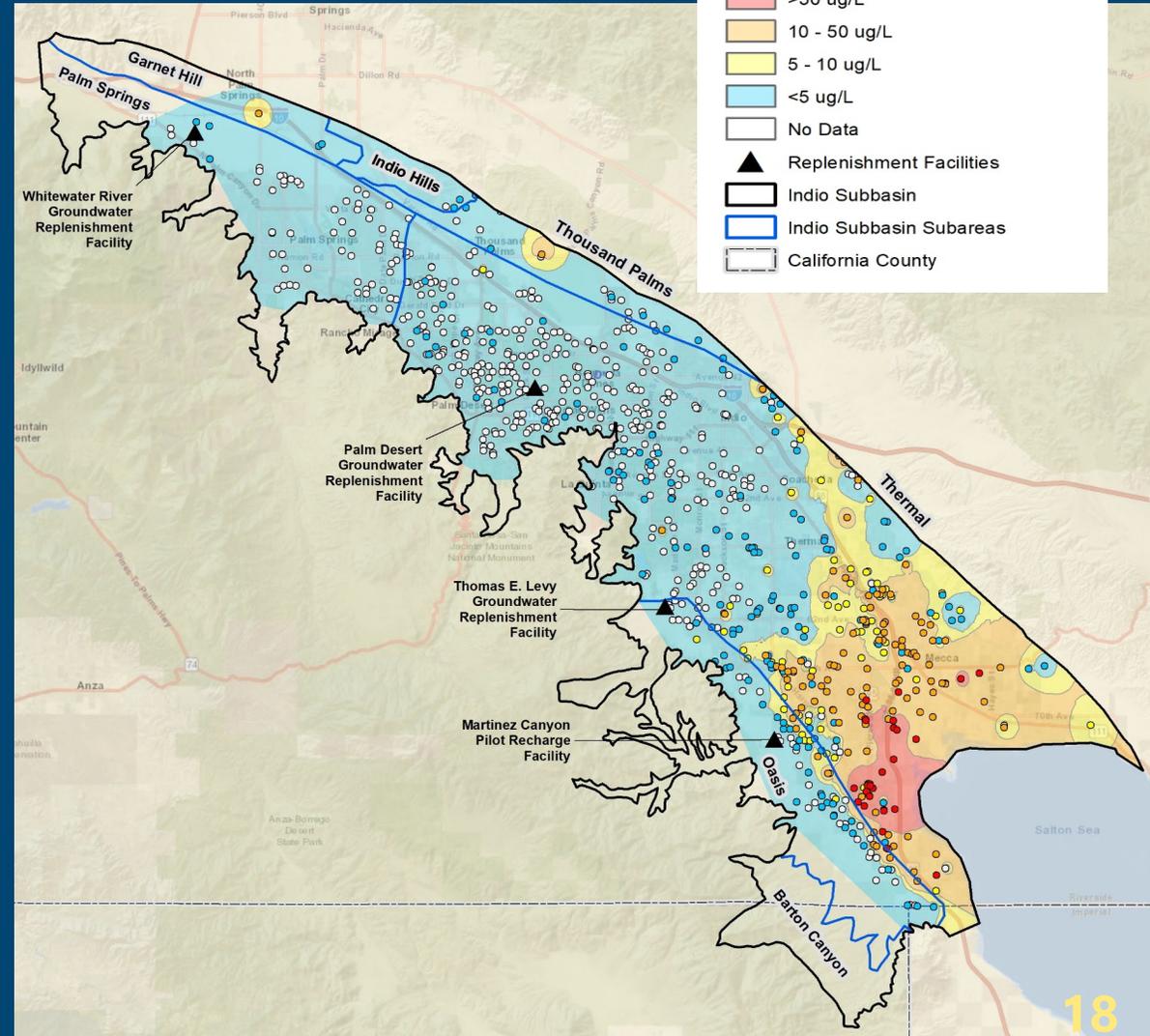
Time-Concentration Plots: Nitrate

- Higher NO_3 in shallow zones than deep and more variable through time
- Locally increasing in western areas that already have higher concentrations in shallow wells
- These data will be used in CV-SNMP



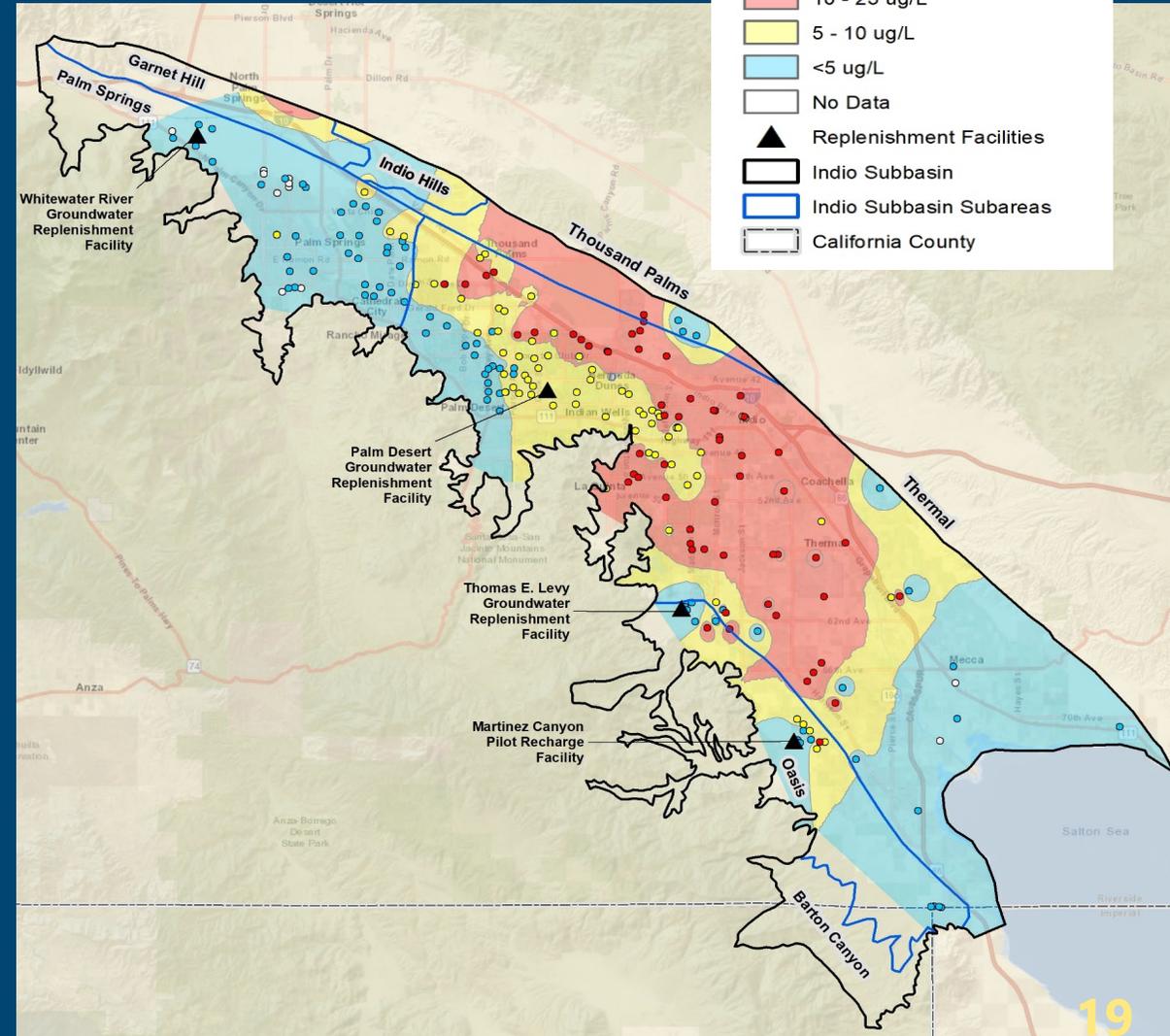
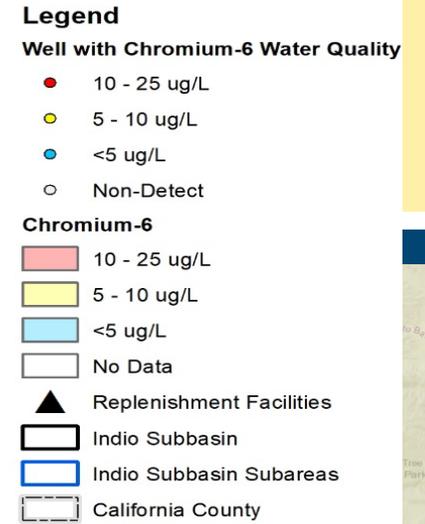
Groundwater Conditions: Arsenic

- MCL is 10 $\mu\text{g/L}$
- Natural due to geochemistry and/or geothermal factors
- Wide occurrence in East Valley
- Higher levels at depth



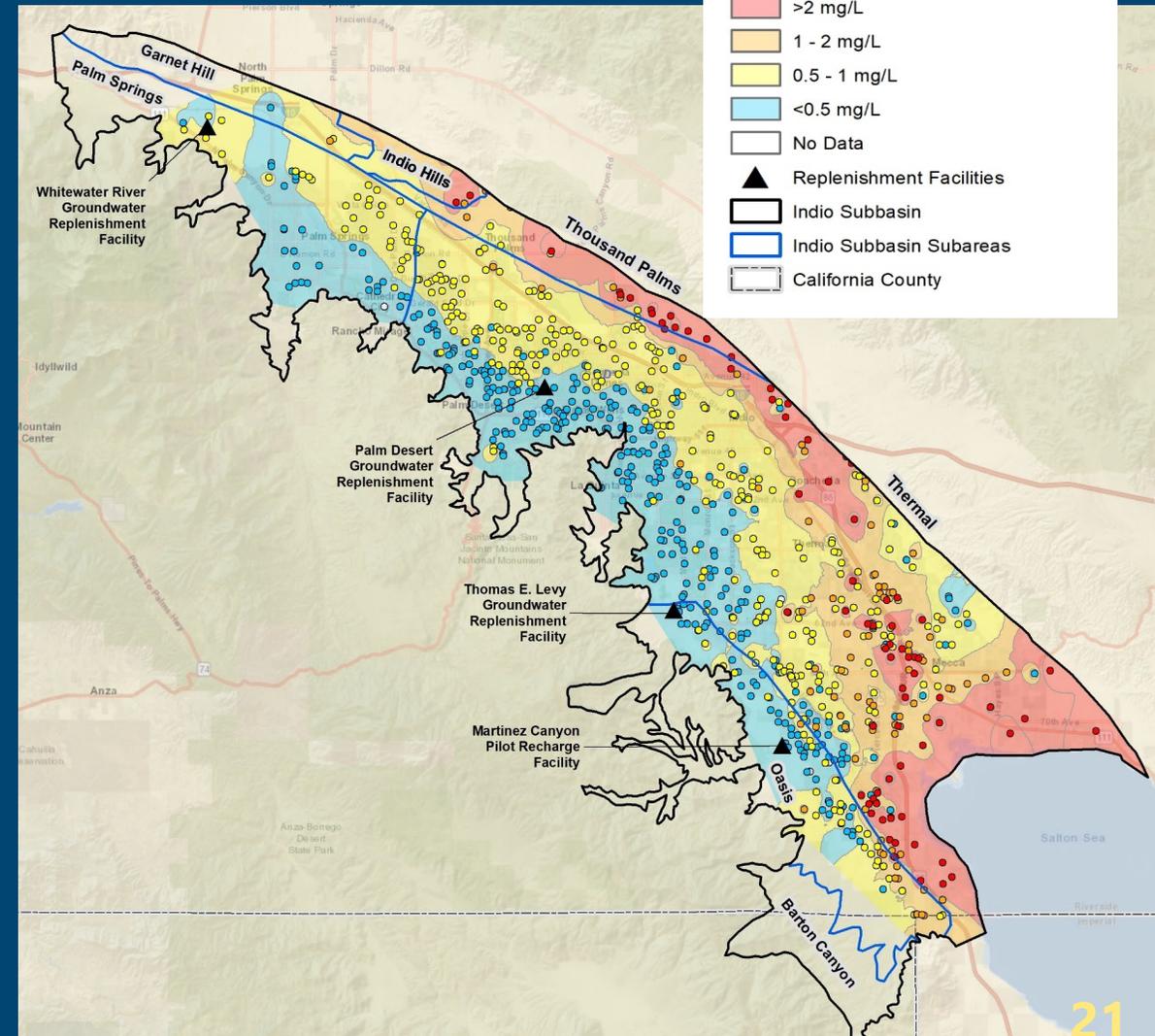
Groundwater Conditions: Chromium-6

- MCL is 50 ug/L for total chromium
- MCL for Cr-6 may be set lower requiring treatment
- Natural sources likely in Indio Subbasin
- Higher concentrations at depth
- Levels are stable in most wells and decreasing near GRFs



Groundwater Conditions: Fluoride

- MCL of 2 mg/L
- Naturally occurring
- Associated with faulting and with geothermal areas near Salton Sea



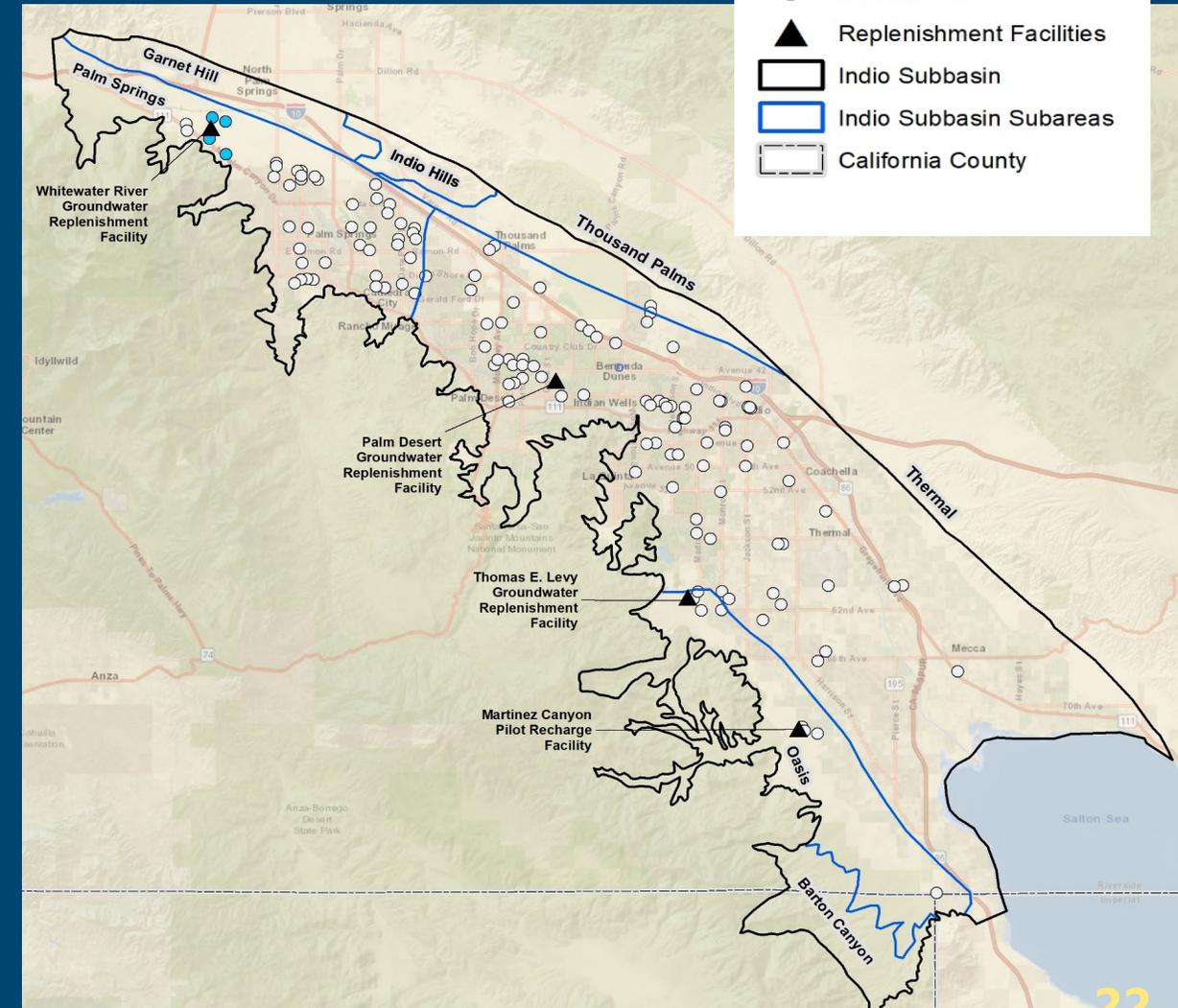
Groundwater Conditions: Perchlorate

- MCL of 6 ug/L
- Potential sources include industrial, fertilizer, and natural
- Localized detections in groundwater are below MCL

Legend

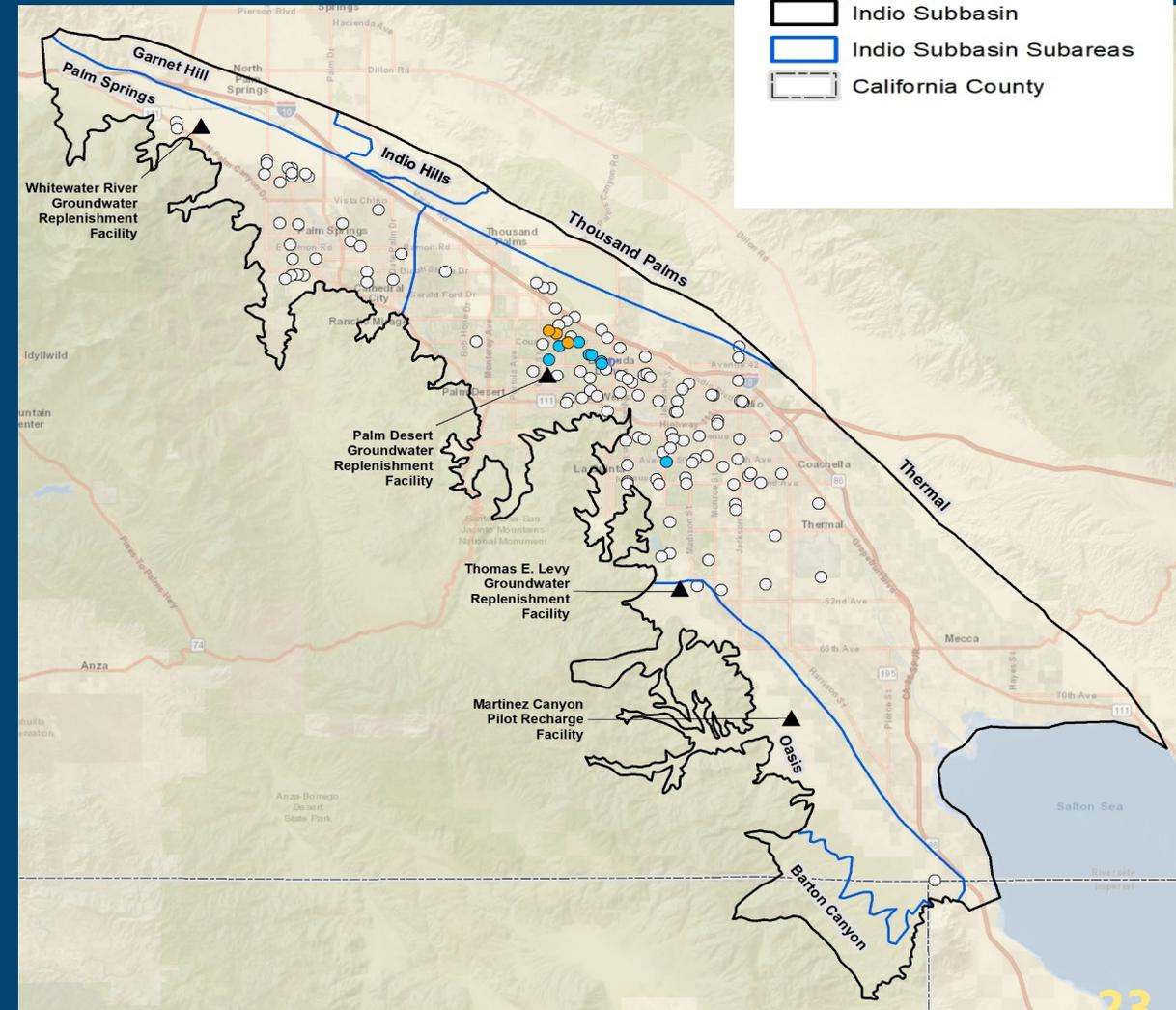
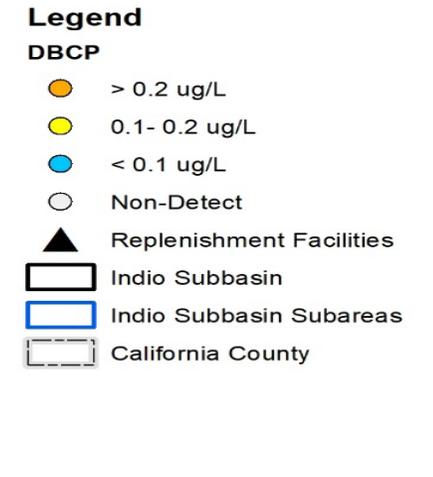
Perchlorate

- >6 ug/L
- 4-6 ug/L
- 2-4 ug/L
- <2 ug/L
- Non-Detect
- ▲ Replenishment Facilities
- ▭ Indio Subbasin
- ▭ Indio Subbasin Subareas
- ▭ California County



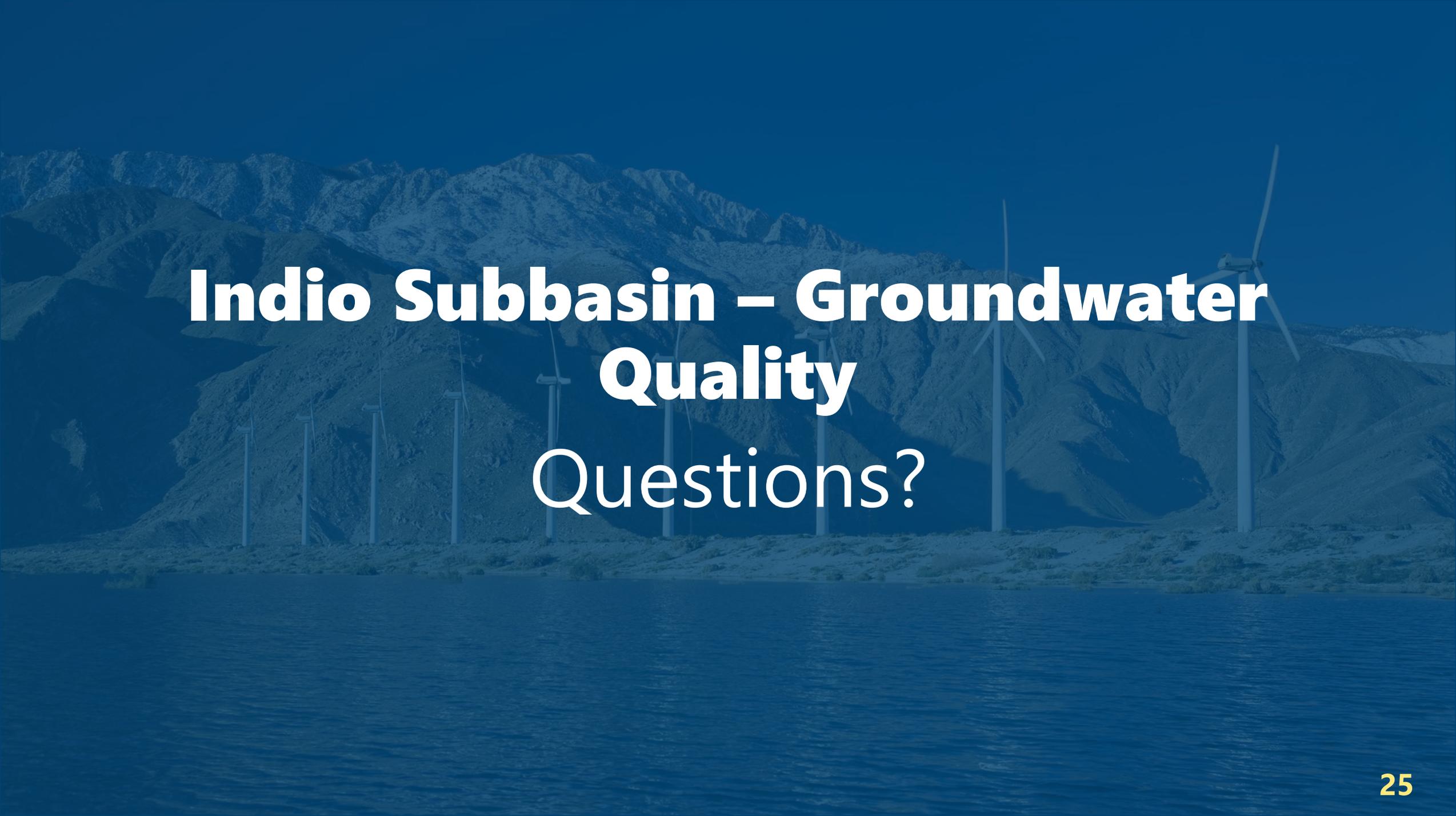
Groundwater Conditions: DBCP

- MCL of 0.2 ug/L
- Pesticide banned since 1979
- Persistent in groundwater
- Detected in small historical agricultural area
- Most recent water samples show levels above MCL in only three private irrigation wells



Summary of Groundwater Quality

- These constituents are being tracked by GSAs
- Water from large water systems meets all drinking water standards
- Domestic wells and small water systems may be affected by some constituents
 - ❖ Nitrate (multiple sources)
 - ❖ Naturally occurring Cr-6
 - ❖ Naturally occurring Arsenic



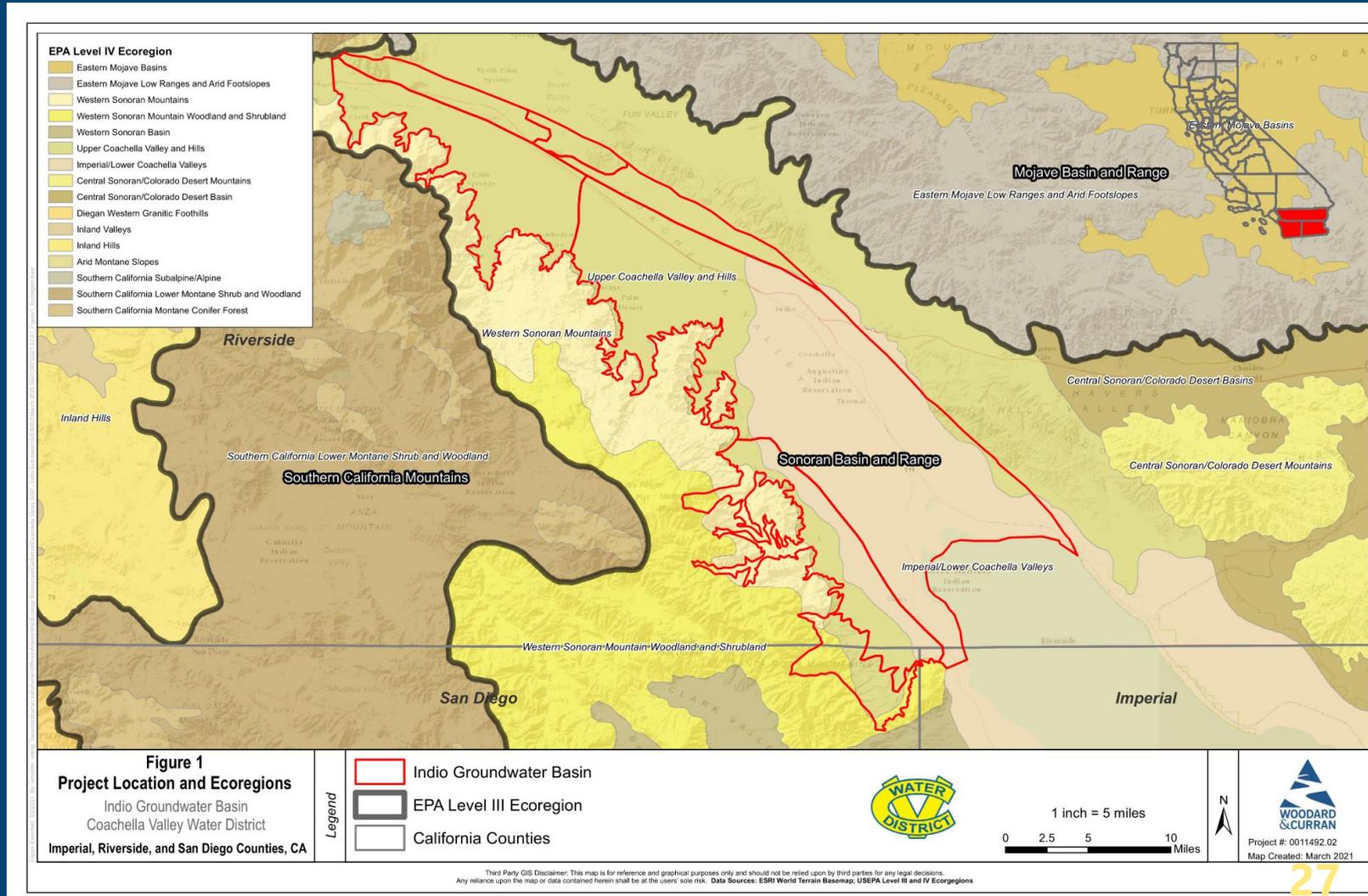
Indio Subbasin – Groundwater Quality Questions?

Agenda

- Welcome and Introductions
- Alternative Plan Status
- **Groundwater Conditions: GDEs**
- Sustainable Management
- Groundwater Model and Plan Scenarios
- Public Comment
- Get Involved

Review of USEPA Ecoregions

- USEPA Level III and IV Ecoregions
- Indio Subbasin sits within the *Sonoran Basin and Range*
- Hot, dry mix of desert scrub and woodlands that occupy washes and canyons



Review of Coachella Valley MSHCP

- Indio Subbasin is largely covered by the Coachella Valley Multiple Species Habitat Conservation Plan (MSHCP)
- CVWD, CWA, and IWA are permittees

		DEPARTMENT OF THE INTERIOR U.S. FISH AND WILDLIFE SERVICE	DATE 10/11/2008
FEDERAL FISH AND WILDLIFE PERMIT		1. AUTHORITY STATUTES 16 USC 1532(a) 16 USC 1532(b)	2. PERMIT NUMBER 16 USC 1532(a) 16 USC 1532(b)
3. PERMITTEE COACHELLA VALLEY MSHCP PERMITTEES (SEE ATTACHMENT A) SACRAMENTO, CA U.S.A.		4. PERMIT TYPE 50 CFR 15.122 50 CFR 15.123 50 CFR 15.124 50 CFR 15.125 50 CFR 15.126 50 CFR 15.127 50 CFR 15.128 50 CFR 15.129 50 CFR 15.130 50 CFR 15.131 50 CFR 15.132 50 CFR 15.133 50 CFR 15.134 50 CFR 15.135 50 CFR 15.136 50 CFR 15.137 50 CFR 15.138 50 CFR 15.139 50 CFR 15.140 50 CFR 15.141 50 CFR 15.142 50 CFR 15.143 50 CFR 15.144 50 CFR 15.145 50 CFR 15.146 50 CFR 15.147 50 CFR 15.148 50 CFR 15.149 50 CFR 15.150 50 CFR 15.151 50 CFR 15.152 50 CFR 15.153 50 CFR 15.154 50 CFR 15.155 50 CFR 15.156 50 CFR 15.157 50 CFR 15.158 50 CFR 15.159 50 CFR 15.160 50 CFR 15.161 50 CFR 15.162 50 CFR 15.163 50 CFR 15.164 50 CFR 15.165 50 CFR 15.166 50 CFR 15.167 50 CFR 15.168 50 CFR 15.169 50 CFR 15.170 50 CFR 15.171 50 CFR 15.172 50 CFR 15.173 50 CFR 15.174 50 CFR 15.175 50 CFR 15.176 50 CFR 15.177 50 CFR 15.178 50 CFR 15.179 50 CFR 15.180 50 CFR 15.181 50 CFR 15.182 50 CFR 15.183 50 CFR 15.184 50 CFR 15.185 50 CFR 15.186 50 CFR 15.187 50 CFR 15.188 50 CFR 15.189 50 CFR 15.190 50 CFR 15.191 50 CFR 15.192 50 CFR 15.193 50 CFR 15.194 50 CFR 15.195 50 CFR 15.196 50 CFR 15.197 50 CFR 15.198 50 CFR 15.199 50 CFR 15.200	5. PERMIT TYPE 50 CFR 15.122 50 CFR 15.123 50 CFR 15.124 50 CFR 15.125 50 CFR 15.126 50 CFR 15.127 50 CFR 15.128 50 CFR 15.129 50 CFR 15.130 50 CFR 15.131 50 CFR 15.132 50 CFR 15.133 50 CFR 15.134 50 CFR 15.135 50 CFR 15.136 50 CFR 15.137 50 CFR 15.138 50 CFR 15.139 50 CFR 15.140 50 CFR 15.141 50 CFR 15.142 50 CFR 15.143 50 CFR 15.144 50 CFR 15.145 50 CFR 15.146 50 CFR 15.147 50 CFR 15.148 50 CFR 15.149 50 CFR 15.150
6. MAKE AND TITLE OF ORIGINAL ORDER (if it is a renewal)		7. DATE OF PERMIT 10/07/2008	
8. CONDITIONS AND RESTRICTIONS 8.1. COACHELLA VALLEY MSHCP PERMITTEES (SEE ATTACHMENT A) SACRAMENTO, CA U.S.A.			
9. CONDITIONS AND RESTRICTIONS 9.1. ADDITIONAL CONDITIONS AND RESTRICTIONS SHALL APPLY AS REPORTED REQUIREMENTS			
10. SIGNATURE OF PERMITTEE _____ TITLE DEPUTY DIRECTOR, CALIFORNIA REGION		11. DATE 10/11/08	

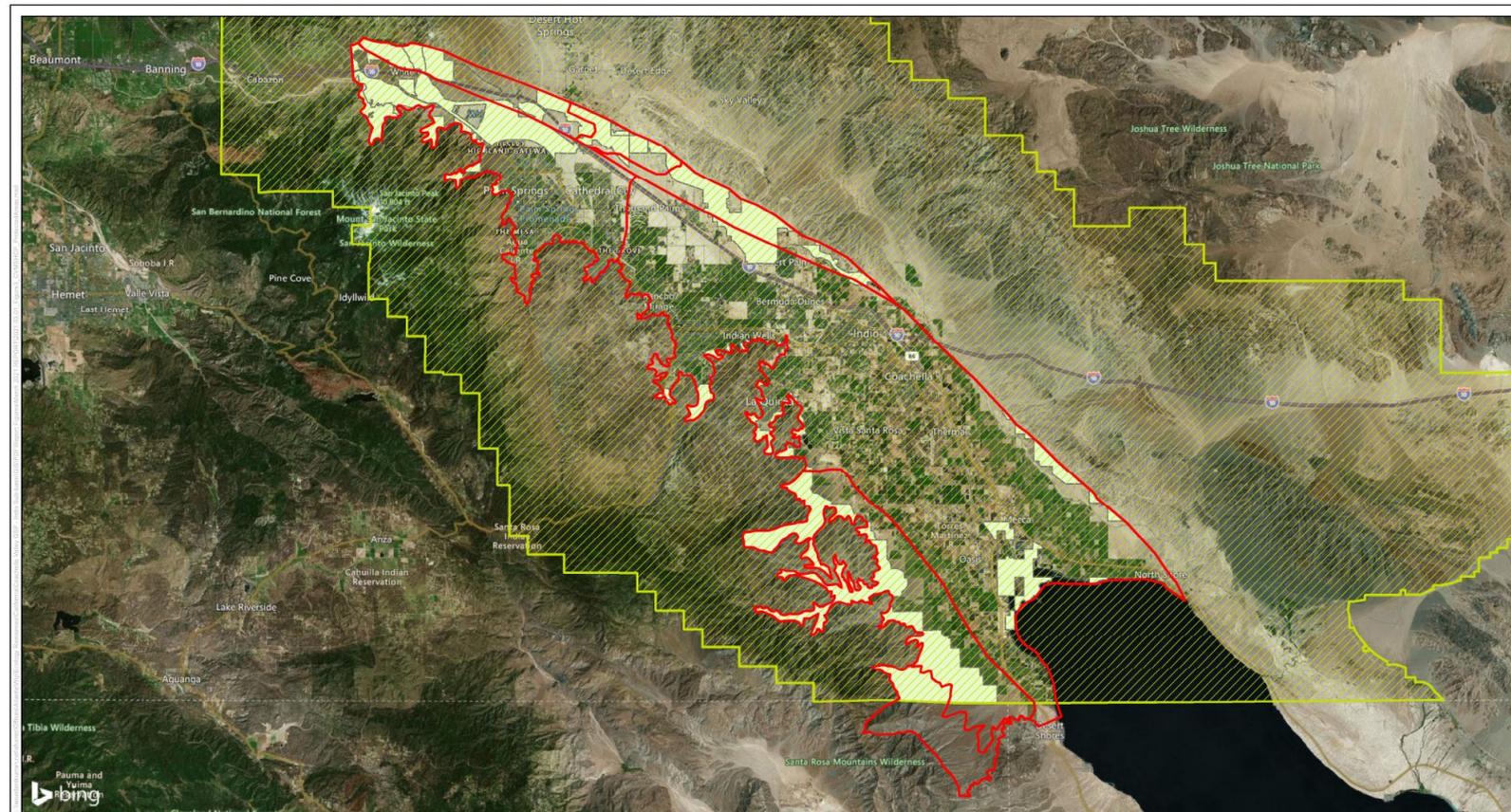


Figure 3
Coachella Valley Protected Areas
 Indio Groundwater Basin
 Coachella Valley Water District
 Imperial, Riverside, and San Diego Counties, CA

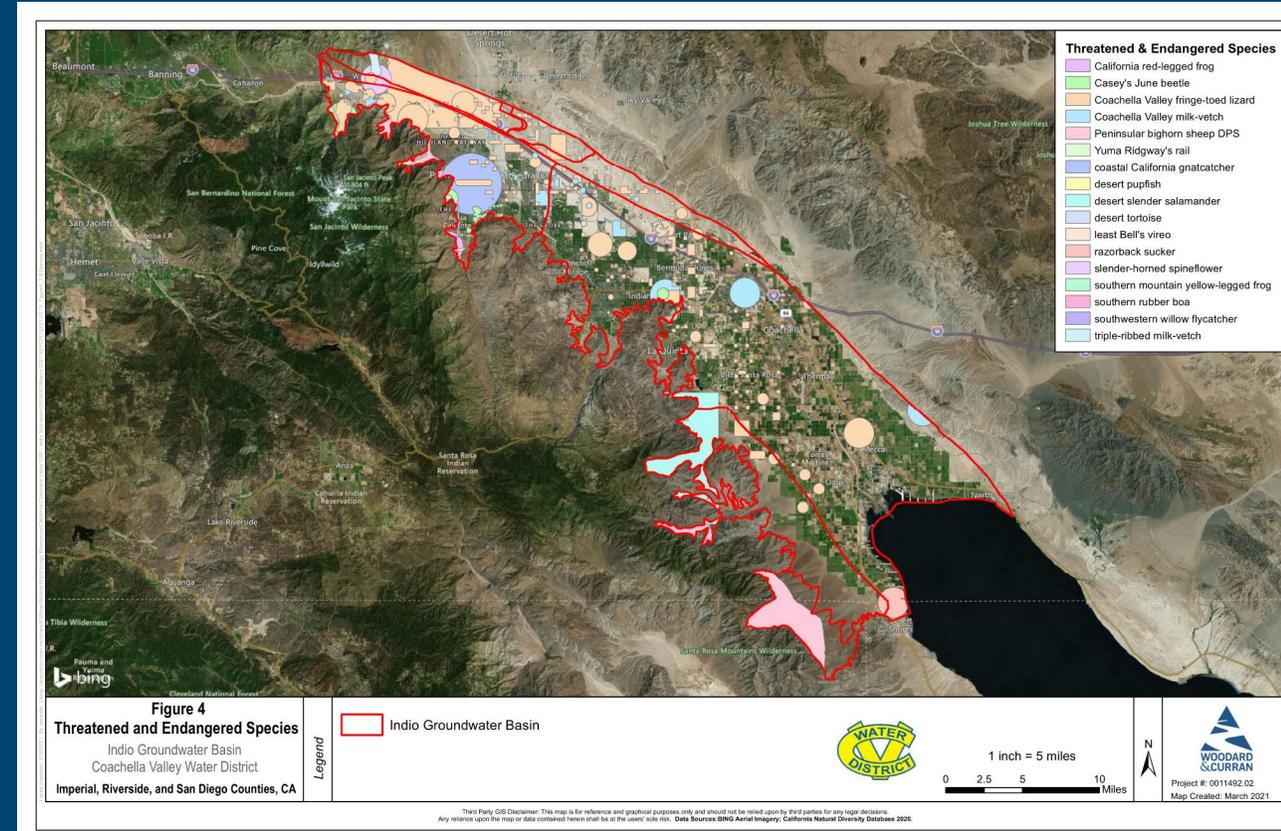
Legend <ul style="list-style-type: none"> Indio Groundwater Basin Coachella Valley Multiple Species Habitat Conservation Plan Boundary CVMSHCP Conservation Areas in Indio Groundwater Basin 	 1 inch = 5 miles 0 2.5 5 10 Miles
---	--

 N	 Project #: 0011492.02 Map Created: March 2021
-------	--

Third Party GIS Disclaimer: This map is for reference and graphical purposes only and should not be relied upon by third parties for any legal decisions. Any reliance upon the map or data contained herein shall be at the users' sole risk. Data Sources: Microsoft Bing Aerial Imagery; CVMSHCP Dataset 2021.

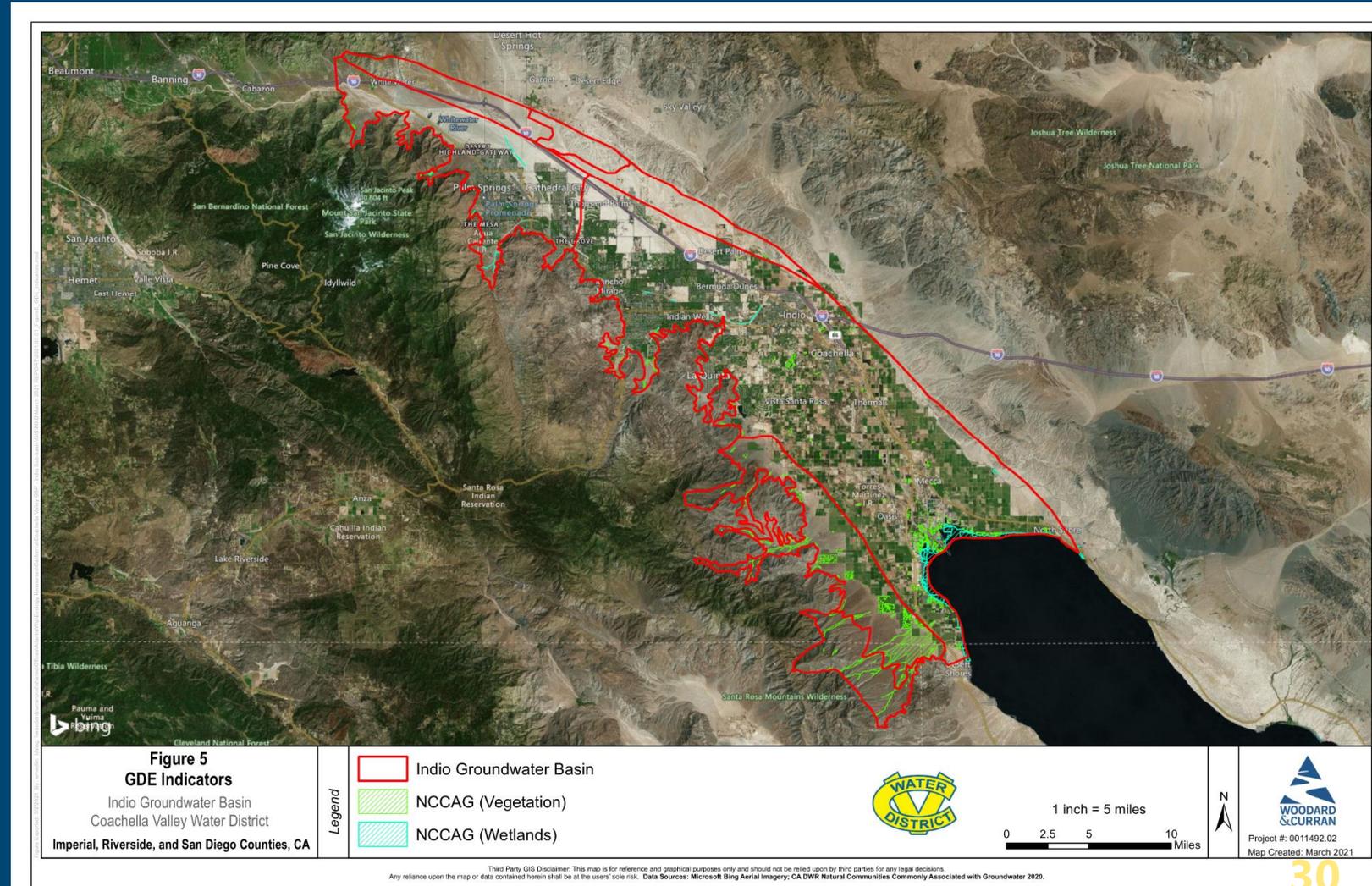
Review of Protected Species

- Focused only on federal- and state-listed "Threatened & Endangered" species
- 17 listed species in Indio Subbasin (CNDDDB 2020)
 - ❖ 6 species "direct" reliance on groundwater
 - ❖ 7 species "indirect" reliance on groundwater
- ❖ Habitats along the mountain front may provide habitat for southwest willow flycatcher and least bell's vireo
- ❖ Habitats around Salton Sea may provide habitat for desert pupfish and Yuma Ridgway's rail



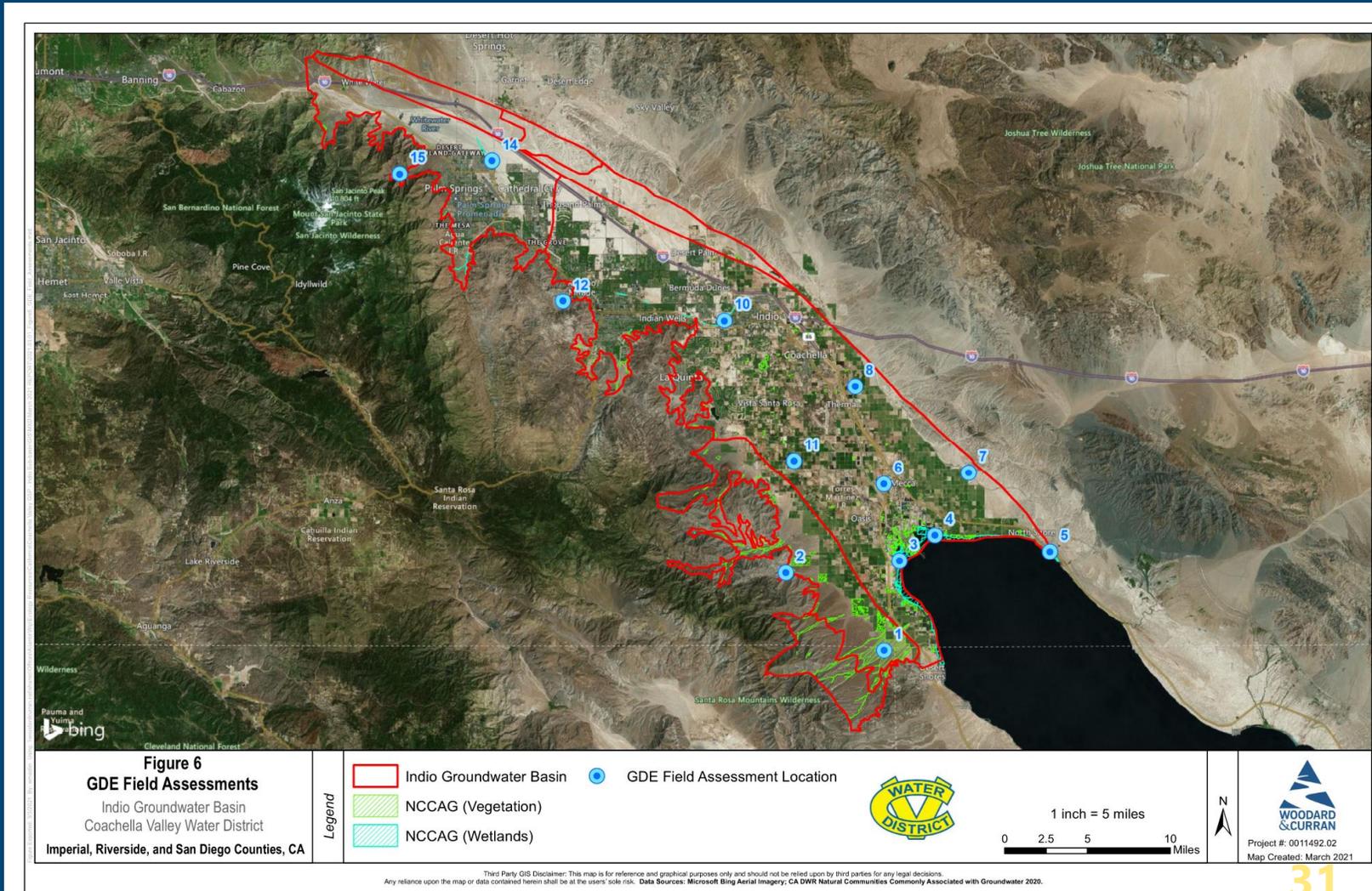
Groundwater Dependent Ecosystem (GDE) Assessment and Results

- Preliminary desktop analysis completed in 2020
- Focused only on 882 mapped NCCAG Polygons
 - ❖ 746 NCCAG Vegetation
 - ❖ 136 NCCAG Wetland



GDE Assessment and Results

- Field surveys completed in January 2021
- 15 sites originally planned
- Only 13 sites visited/surveyed due to access limitations
 - ❖ Probable GDE = 1 site (8%)
 - ❖ Probable Non-GDE = 9 sites (69%)
 - ❖ Playa Wetlands = 3 points (23%)



Probable GDEs – Site 15

- Site 15 may be the only “Probable GDE” out of the 13 locations assessed in the field
- Water was observed seeping from the ground during the field survey
- Hydrophytes and phreatophytes present



Probable Non-GDEs – Site 14

- Site 14 is within the floodplain of the Whitewater River, a dry wash
- No evidence of groundwater observed
- Per CVWD, this area floods once every 2-3 years



Probable Non-GDEs – Site 6

- Site 6 is a recently planted agricultural field
- Irrigation systems were observed actively watering fields
- No evidence of groundwater observed



Probable Non-GDEs – Site 2

- Site 2 is situated in a “bajada” or dry streambed full of alluvial material
- Per CVWD, this area floods once every 2-3 years
- No evidence of groundwater observed



Playa Wetlands – Site 4

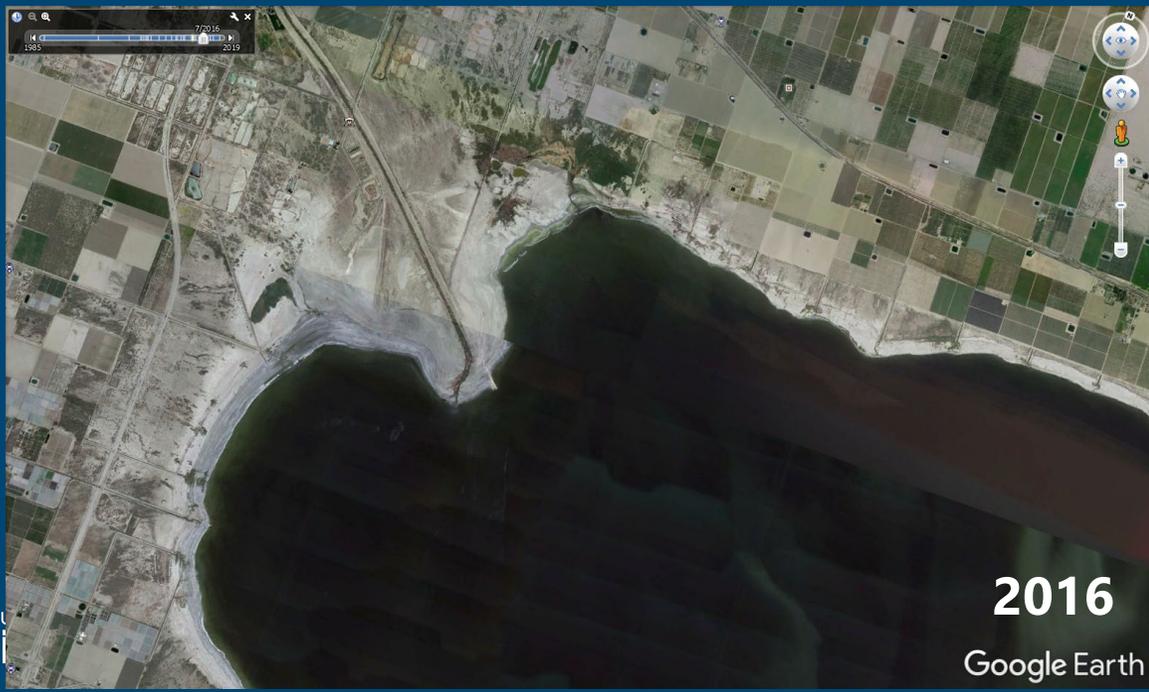
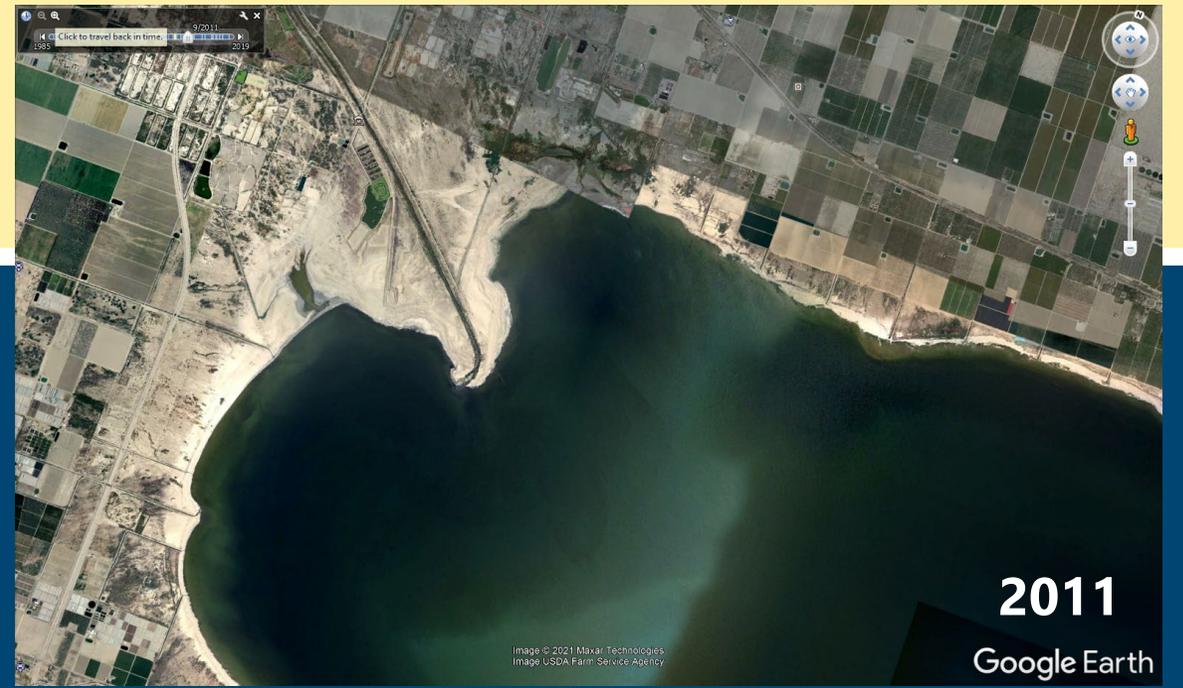
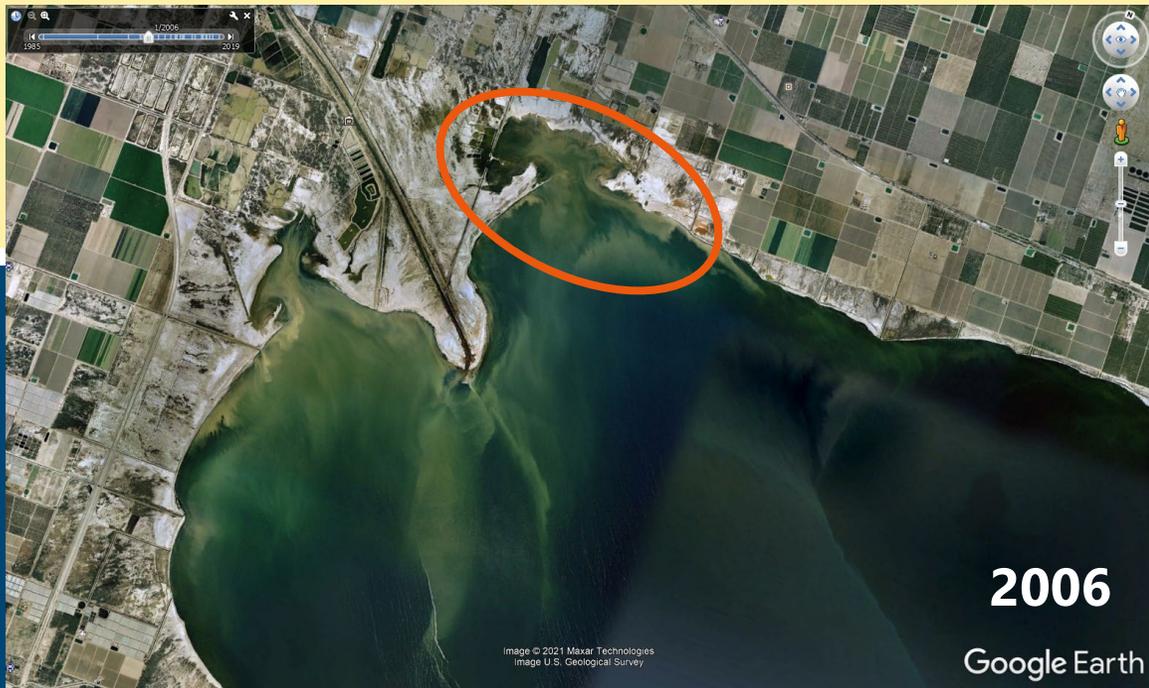
- Site 4 is a lacustrine fringe emergent marsh wetland that receives irrigation return flow from the Grant Street Drain
- Surface water and wetland dependent wildlife (fish and birds) observed
- Hydrophytes and phreatophytes present



Playa Wetlands – Site 3

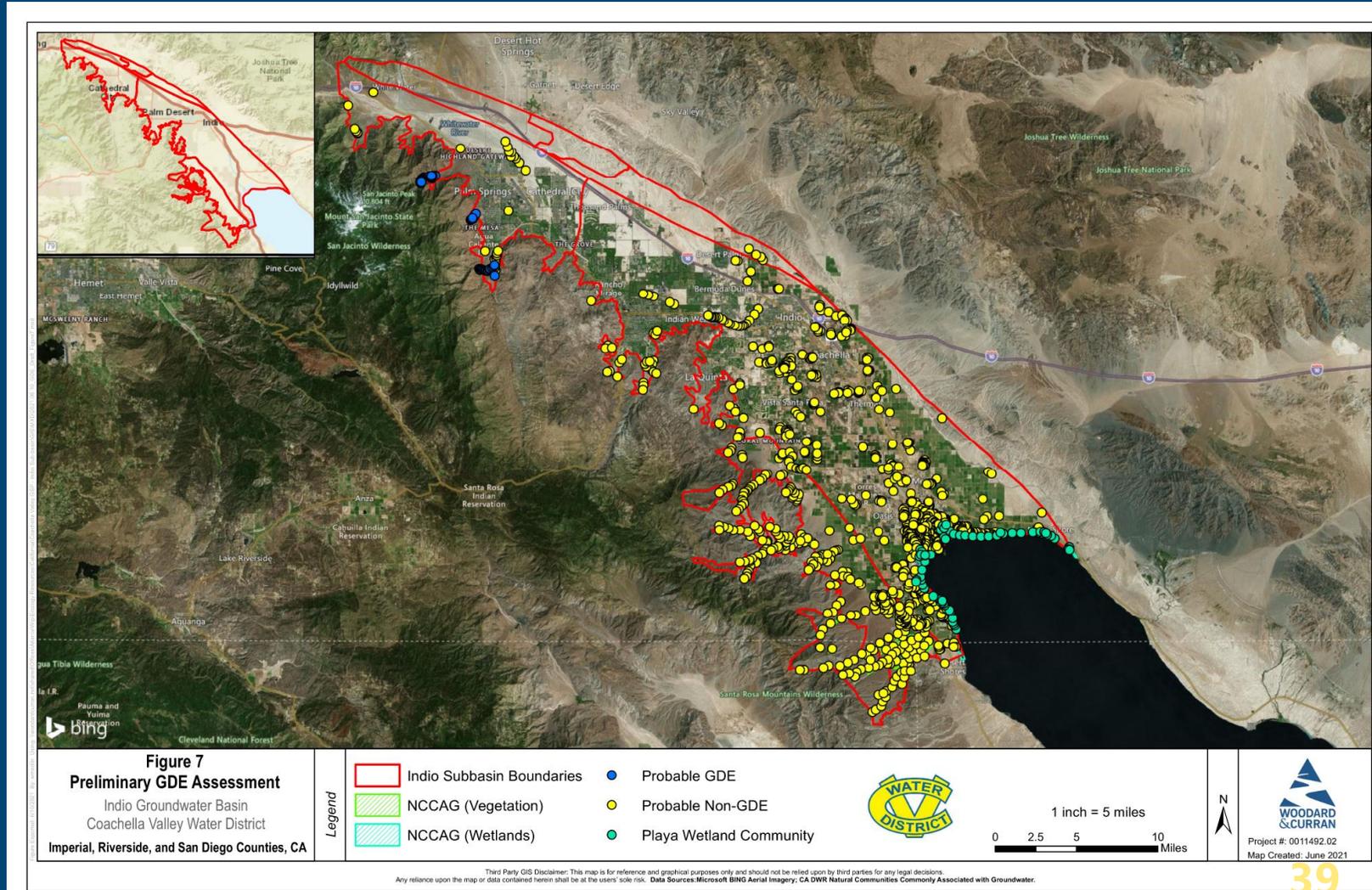
- Site 3 is an exposed alkaline flat dominated by halophytes
- Located east of the 74th Avenue Drain
- Evidence of periodic inundation and saturation observed
- Hydrophytes and phreatophytes present





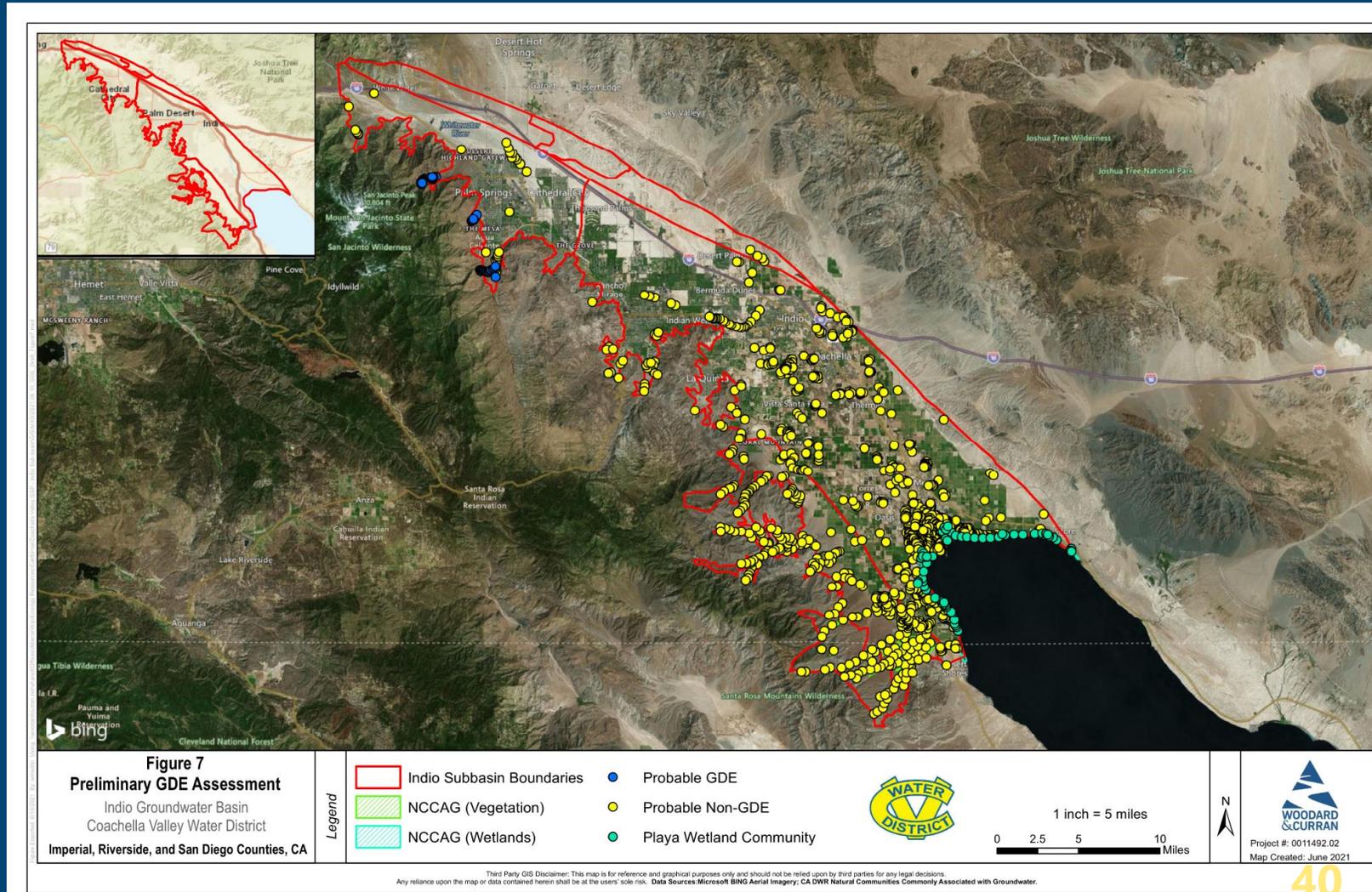
GDE Assessment and Results

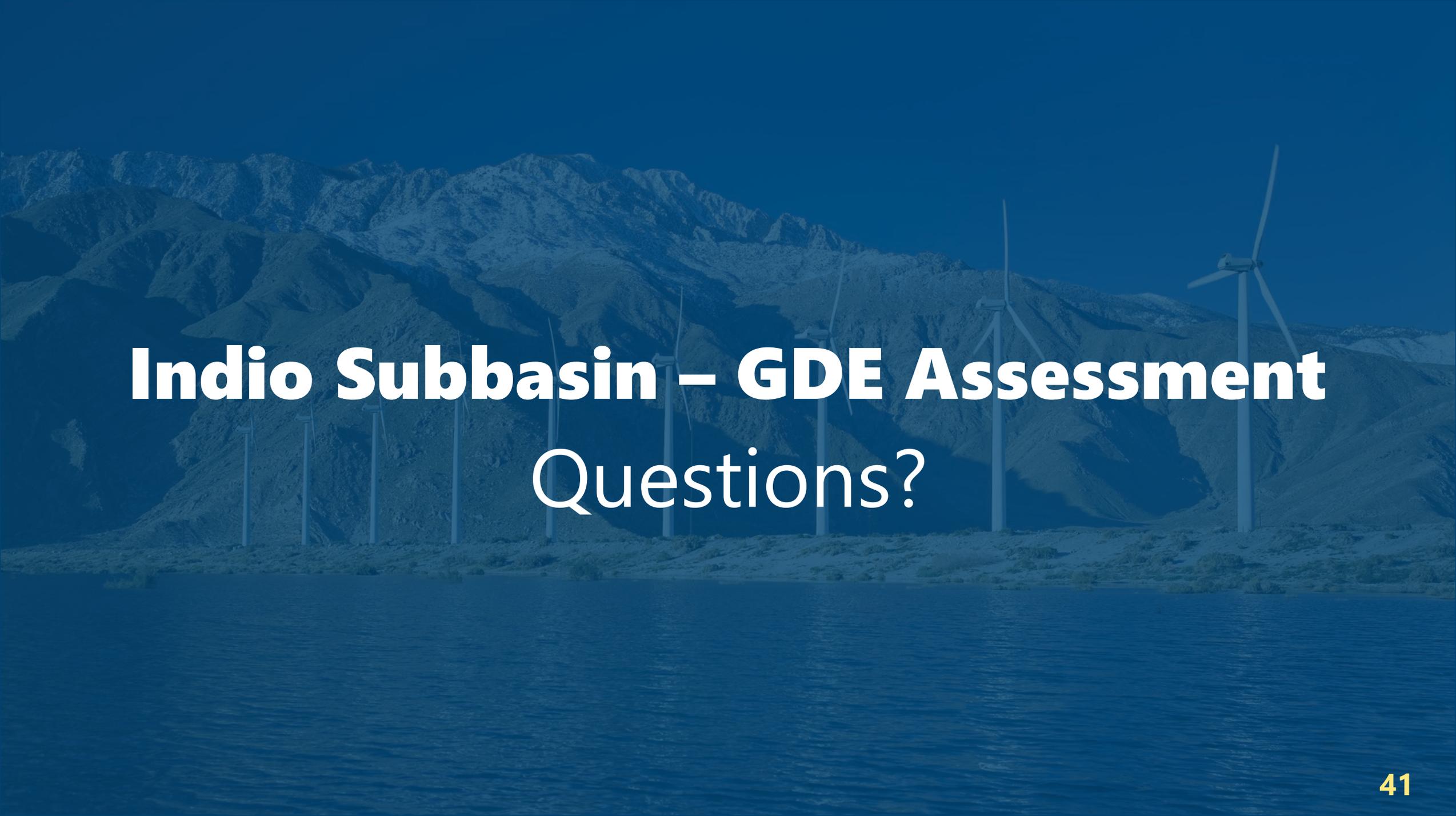
- Desktop work was then refined based on field survey information
- 1,045 assessment points
 - ❖ Probable GDE = 50 points (5%)
 - ❖ Probable Non-GDE = 932 points (89%)
 - ❖ Playa Wetlands = 63 points (6%)



GDE Assessment Conclusions

- GDEs have been assessed and mapped in the Indio Subbasin
- Probable GDEs occur in mountain-front canyons and may rely partially on surface water or snowmelt
- Playa wetlands occur along the Salton Sea exposed seabed near drain and surface water outlets





Indio Subbasin – GDE Assessment Questions?

Agenda

- Welcome and Introductions
- Alternative Plan Status
- Groundwater Conditions
- **Sustainable Management**
- Groundwater Model and Plan Scenarios
- Public Comment
- Get Involved

Sustainable Management: Recap



Chronic lowering of groundwater levels



Reduction of groundwater storage



Land subsidence



Degraded water quality



Seawater intrusion



Depletions of connected surface water with impacts on beneficial uses including GDEs

We discussed these criteria in detail last workshop. Here is a recap.

Sustainable Management: Recap

DWR Recommendations:

- ❖ Set Minimum Thresholds (MTs) for groundwater levels
- ❖ Consider using levels as a proxy for storage and subsidence

Groundwater levels, storage, and subsidence are correlated.

MT defined to avoid undesirable results of significant + unreasonable:

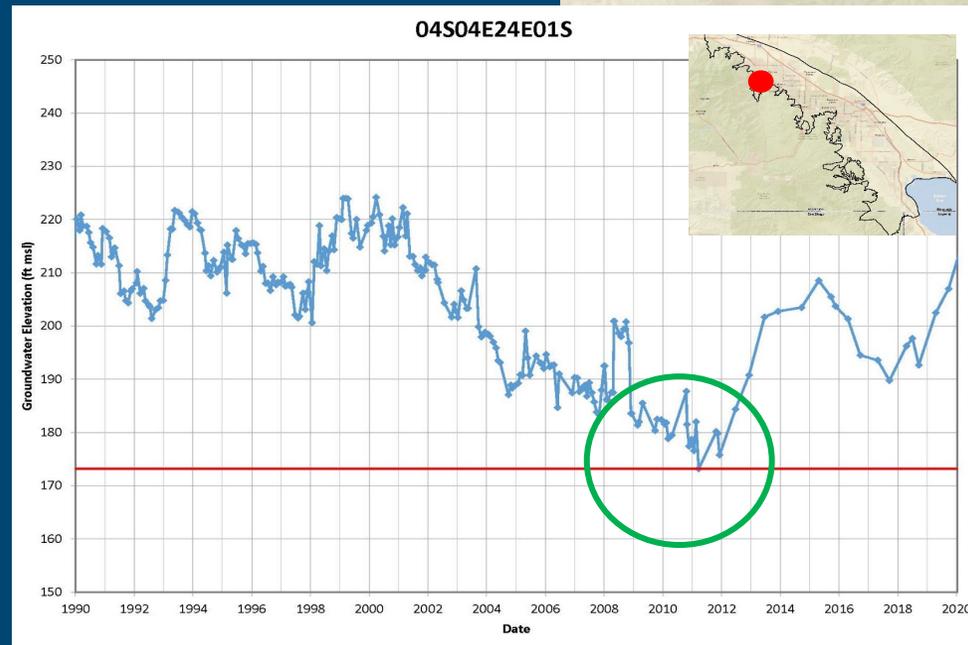
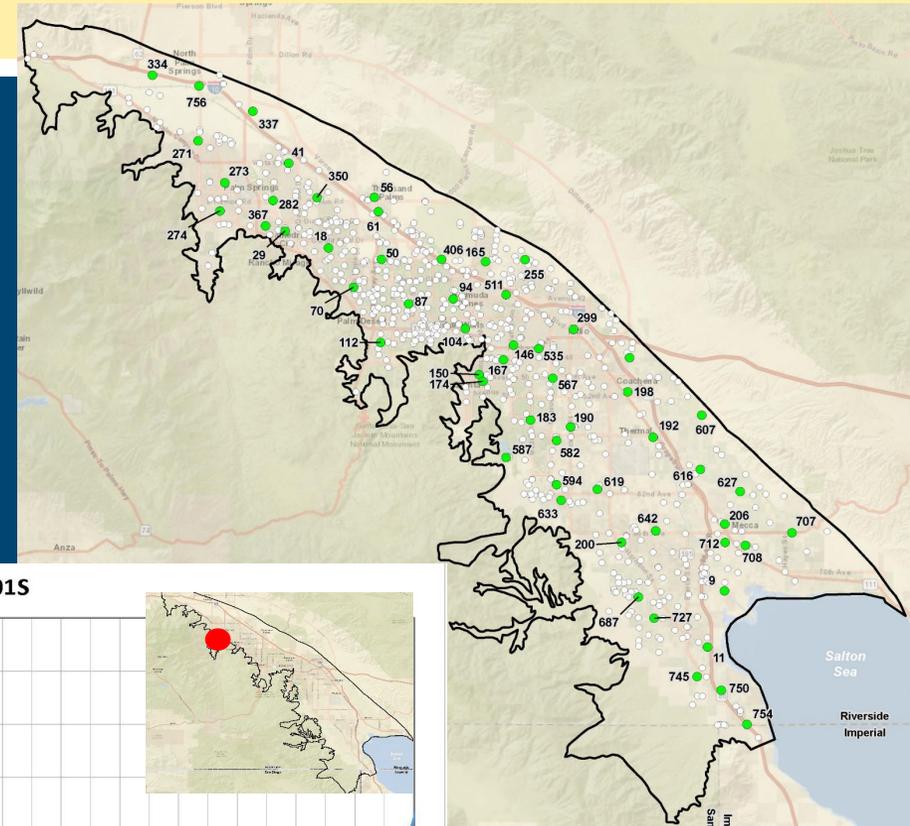
- Loss of yield from existing production wells due to chronic level decline
- Reduction of groundwater storage
- Reduction in the viability of water conveyance, flood control and other infrastructure due to subsidence

Sustainable Management: Recap

MTs for groundwater levels defined as historical lows as measured at 57 Key Wells:

An undesirable result occurs when the MT is crossed in five consecutive low-season monitoring events in 25% of wells across the subbasin

GSA's will monitor levels, respond as needed, and provide annual reporting



Sustainable Management Update



Chronic lowering of groundwater levels



Reduction of groundwater storage



Land subsidence



Degraded water quality



Seawater intrusion



Depletions of connected surface water with impacts on beneficial uses including GDEs

DWR provided specific recommendations for these criteria. Here is an update.

Sustainable Management: Water Quality

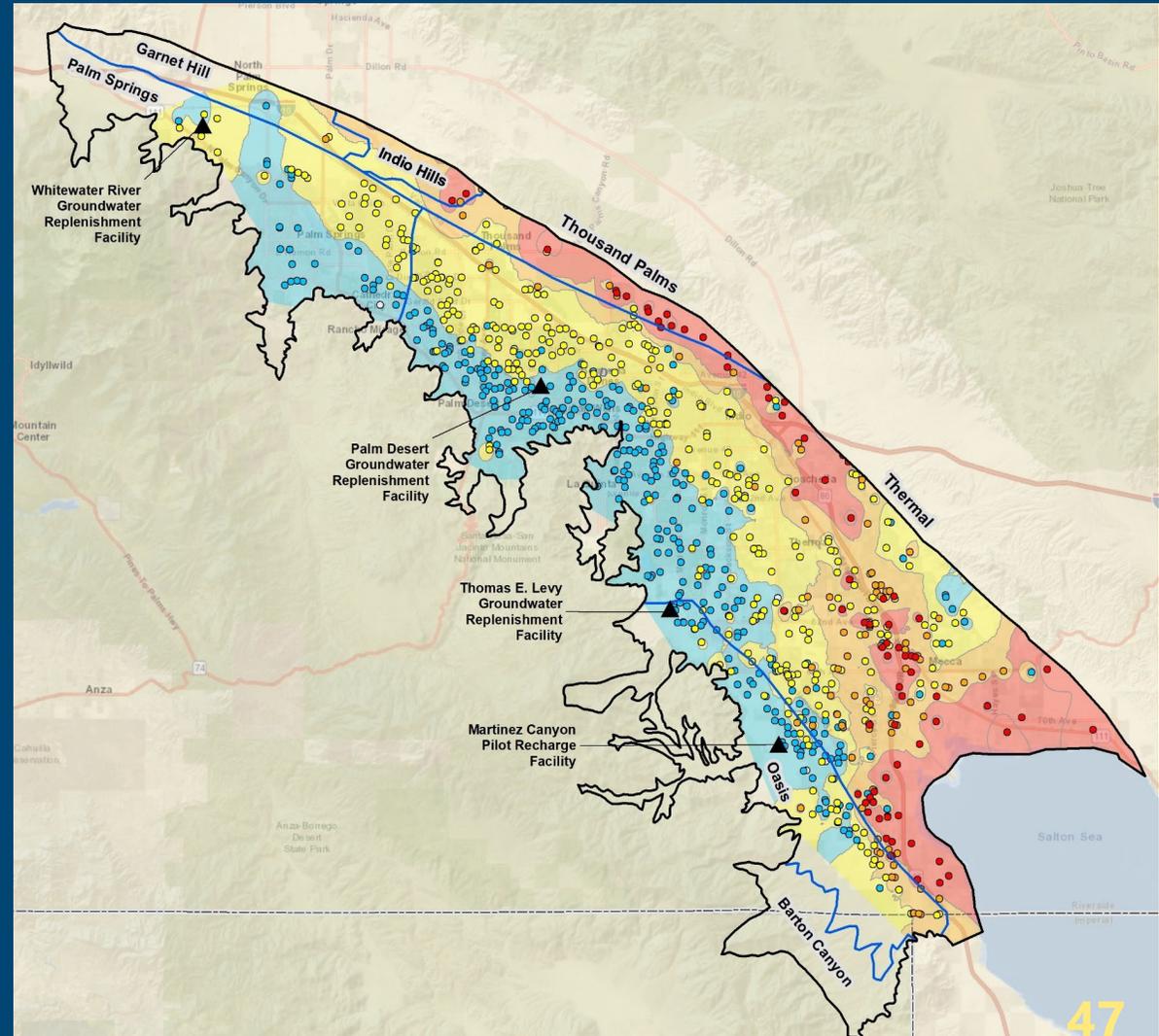
DWR Recommendation:

Provide maps of constituents of concern:

- Fluoride
- Arsenic
- Hexavalent chromium
- DBCP

This update also provided:

- Salinity
- Nitrate
- Uranium
- Perchlorate



Sustainable Management: Water Quality

DWR Recommendation:

- Continue to study the rate and level of increased salt contents in groundwater due to the importation of Colorado River water.
- Incorporate an approved Salt and Nutrient Management Plan into future iterations of the Alternative Plan.

Groundwater Conditions: Salinity Studies/SNMP

Alternative Plan Update includes:

- Substantial groundwater quality data compilation into databases
- Groundwater quality analyses including maps, cross-sections, time concentration plots for TDS and nitrate
- Discussion of significance, source(s), distribution factors
- Coordination with CV-SNMP update started in 2020
 - ❖ Monitoring workplan approved in February 2021
 - ❖ Workplan to update CV-SNMP submitted in May 2021
- Application to DWR for installation of additional monitoring wells
- Update and improvement of numerical flow model that can be basis for salt and nutrient balance studies

Sustainable Management: Water Quality and Drain Flows

DWR Recommendation:

Clarify: is there a minimum threshold associated with subsurface drain flow?

2002 CVWMP and 2010 CVWMP

- Recognized potential degradation of water quality, including downward migration of shallow water/return flows in the East Valley into deep zones
- Simulated (and implemented) a mix of projects to raise groundwater levels in deep productive zones and cause upward gradients/flow
- Available data indicate high groundwater levels generally protect deep zones
- While higher drain flows are beneficial--because they are associated with higher groundwater levels--they were not intended to be a numeric minimum threshold

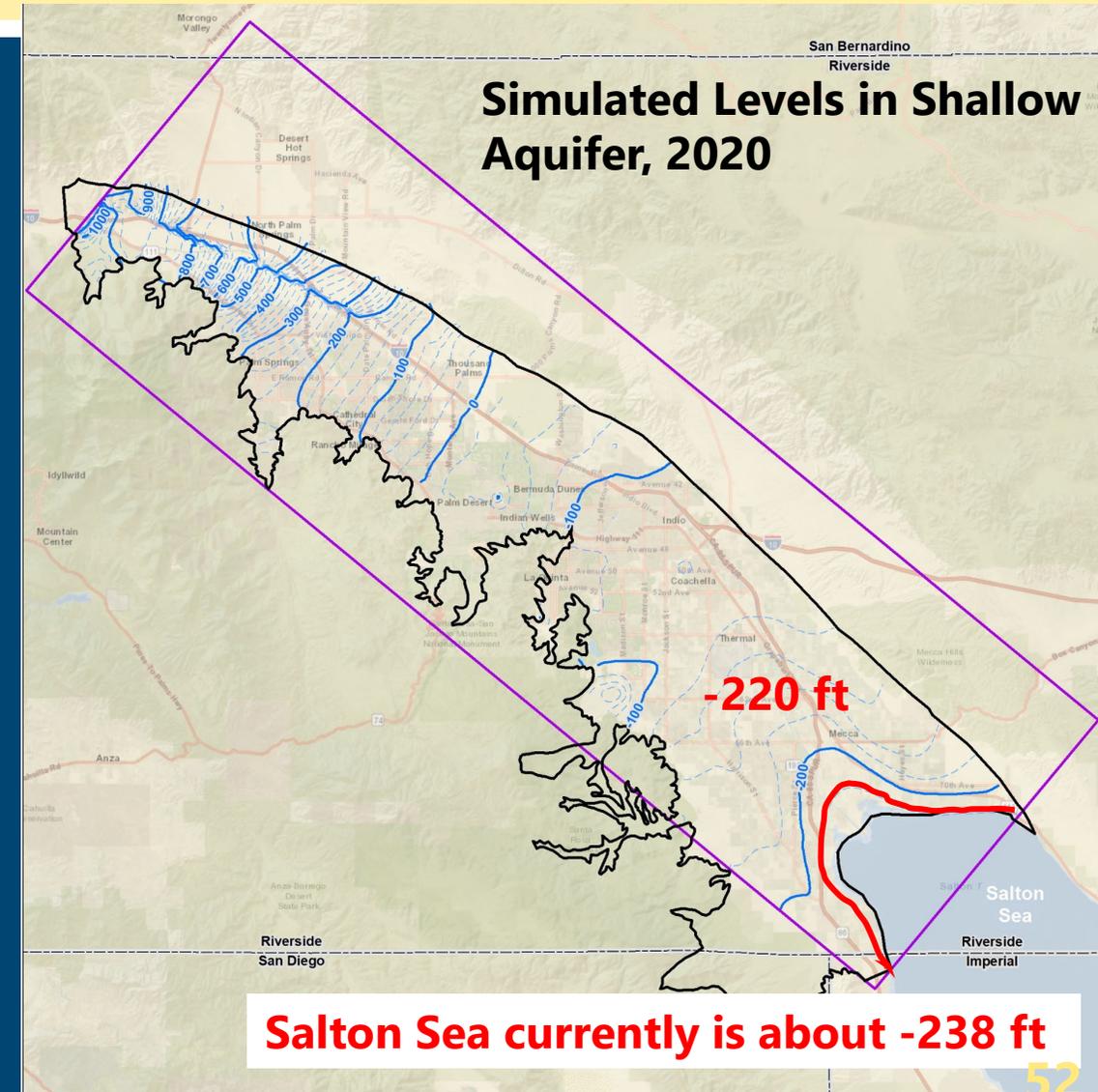
Sustainable Management: Seawater Intrusion

DWR Recommendation:

- Provide the modeled elevation that minimizes risk of saltwater intrusion
- Discuss how recent groundwater levels compare
- Correlate the inflow with recent groundwater levels and the model

Sustainable Management: Seawater Intrusion

- Modeling indicates:
 - ❖ net inflow from Sea 1997-2014
 - ❖ net outflow to Sea, 2015 on
- Simulated 2020 shallow groundwater contour (-220 feet) is higher than Salton Sea
- Simulated 2020 deep groundwater contour (-200 feet) is even higher (groundwater flowing upward)
- Modeling results match observed groundwater levels, rising from 2010 on



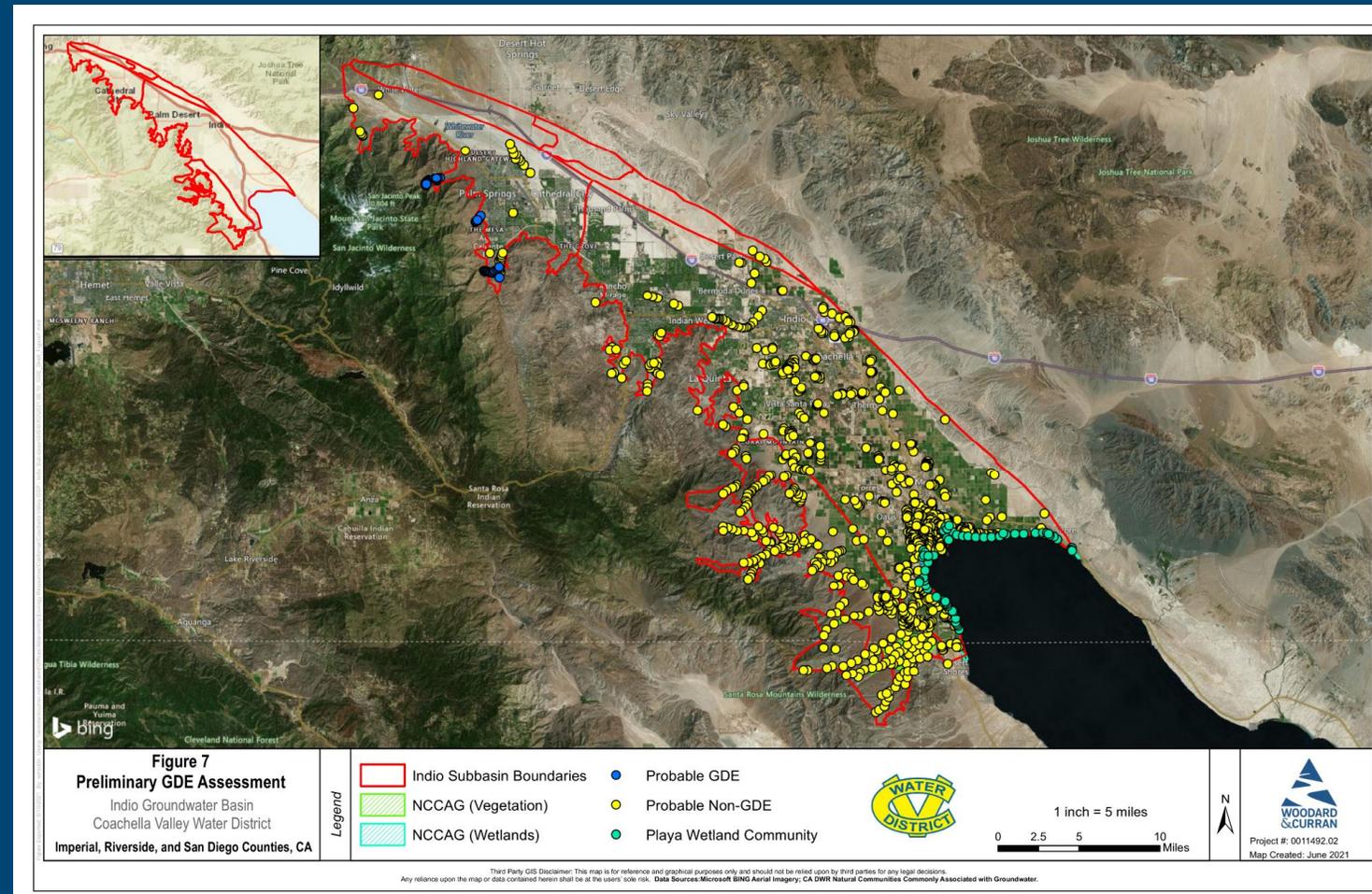
Sustainable Management: GDEs

DWR Recommendation:

- Provide an identification of GDEs in the Subbasin

Alternative Plan Update includes as an appendix:

Technical Memorandum, Indio Subbasin Groundwater Dependent Ecosystems Study

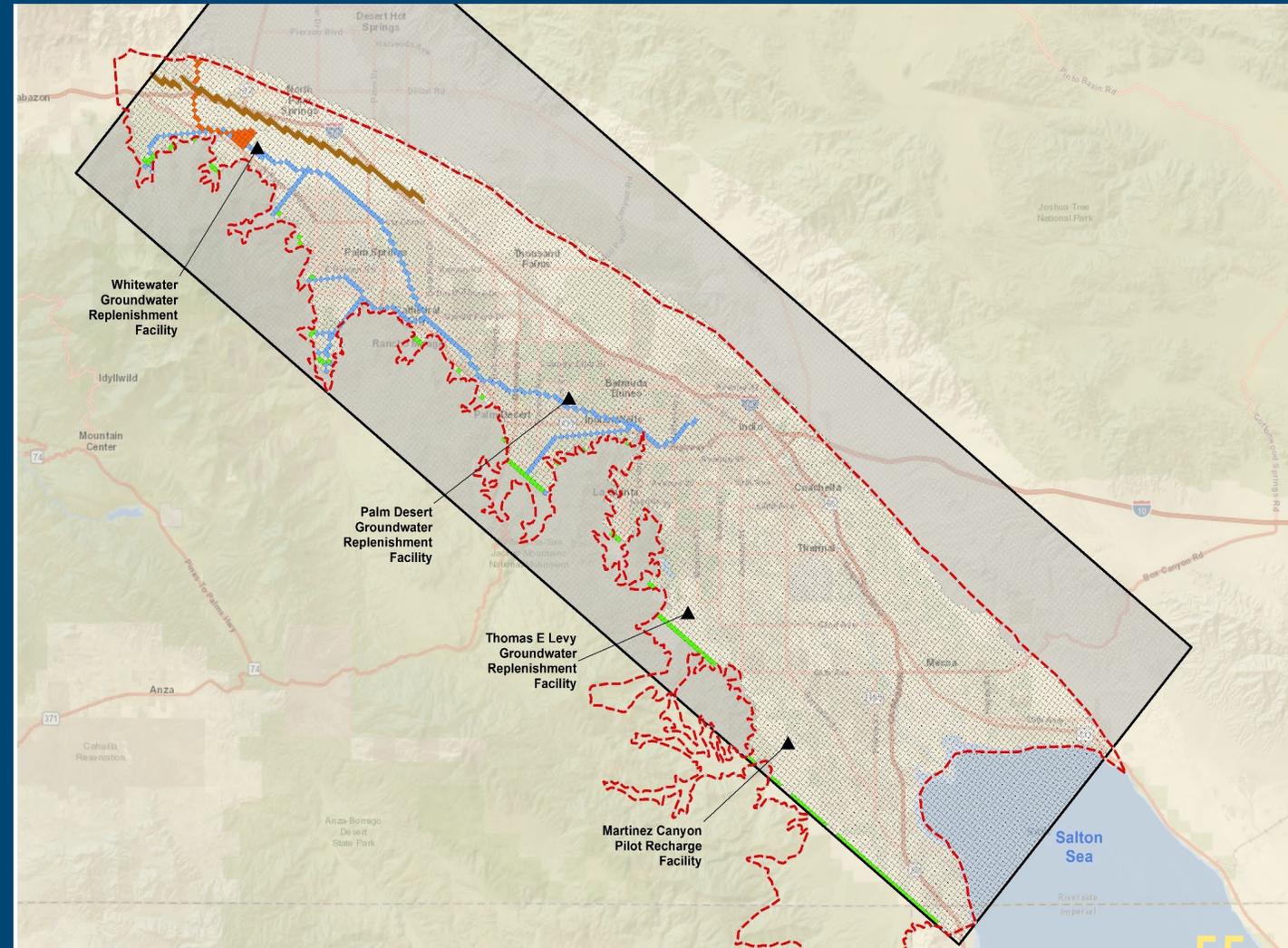


Agenda

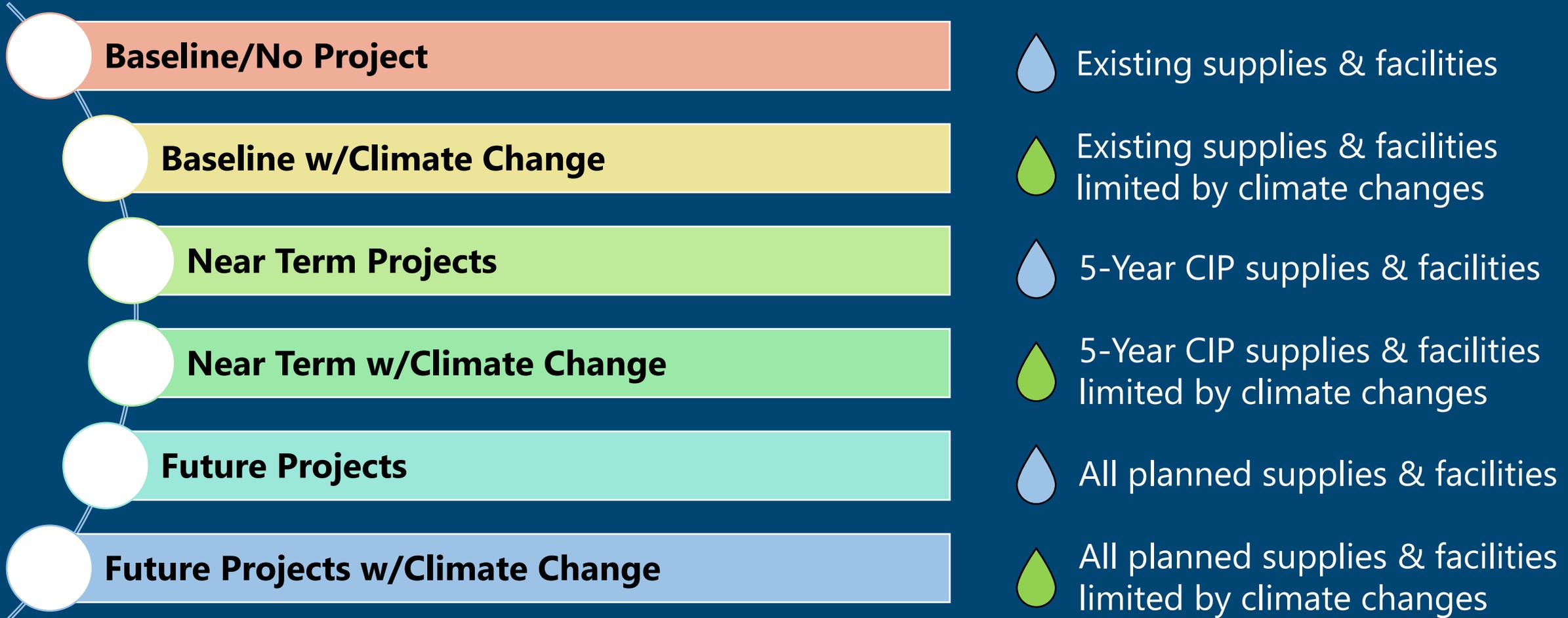
- Welcome and Introductions
- Alternative Plan Status
- Groundwater Conditions
- Sustainable Management
- **Groundwater Model and Plan Scenarios**
- Public Comment
- Get Involved

Groundwater Model Update

- Original Historical Simulation 1936-1996
- 2010 CVWMP Model Simulation (beginning in 1997)
- Updated and calibrated for historical period 2009-2017
- Being applied to future scenarios (revised)



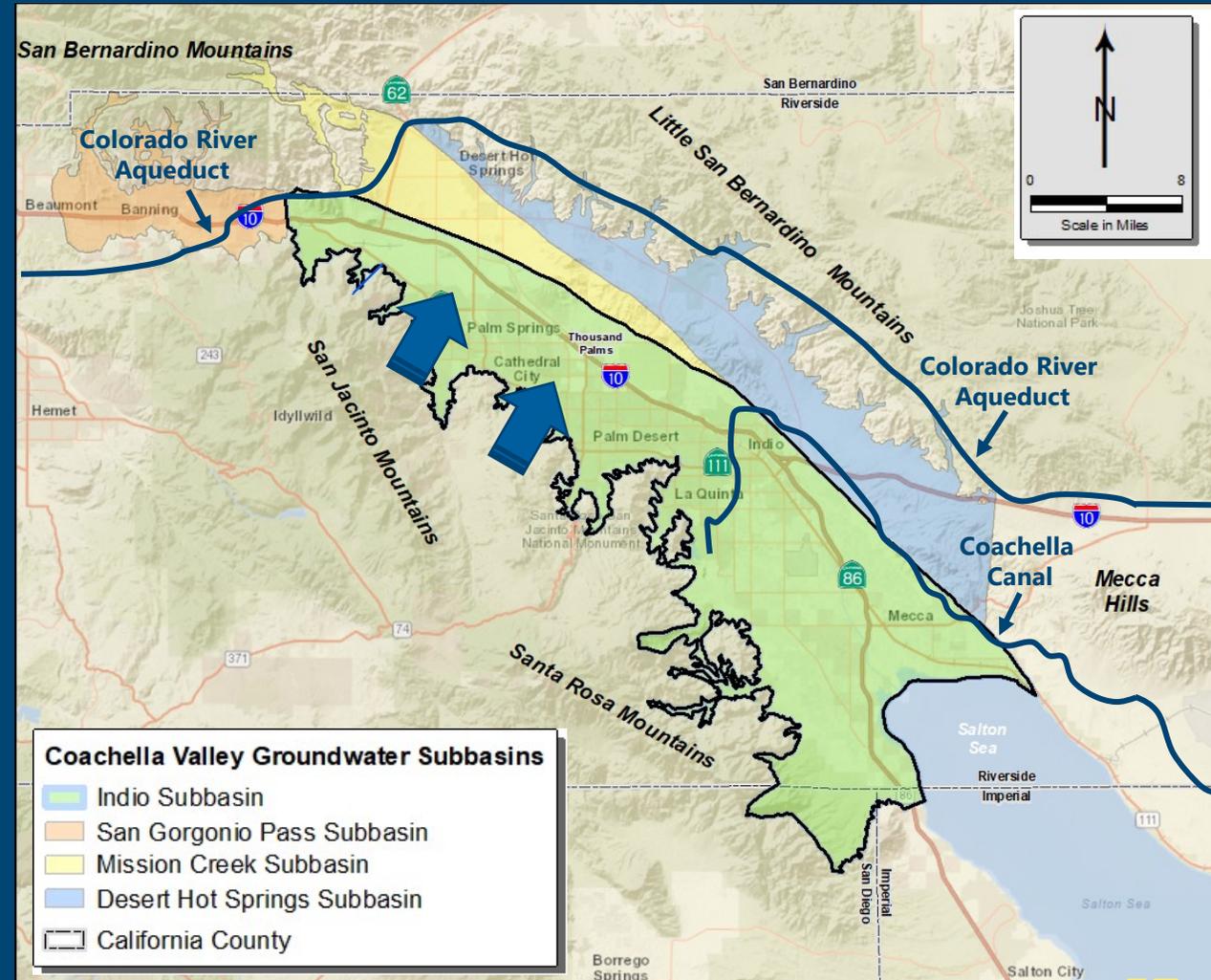
Revised Plan Scenarios



Local Hydrology

 **Baseline** – assumes 50-year hydrology, 1970-2019

 **Climate Change** – assumes more recent 25-year hydrology with multiple dry cycles, 1994-2019

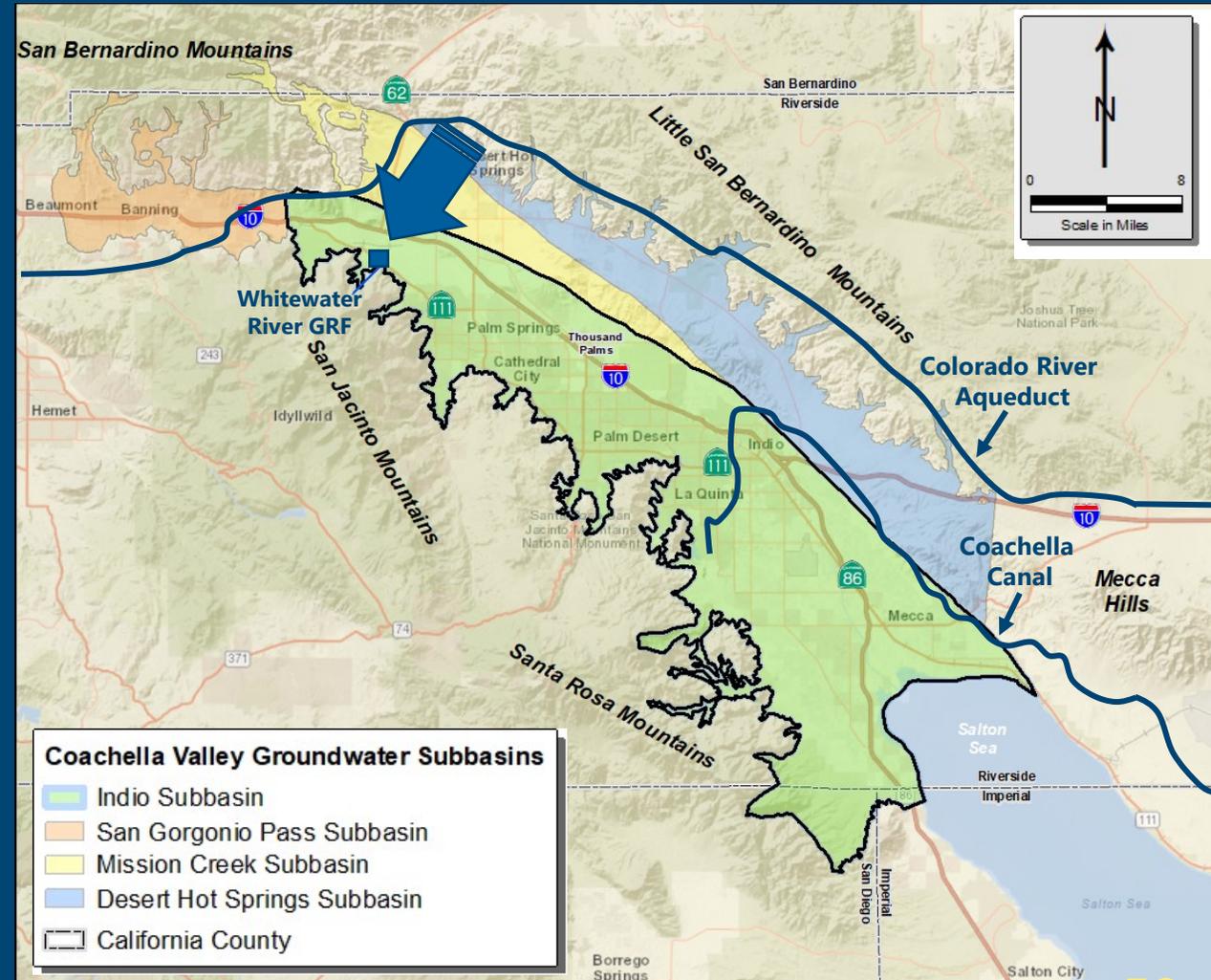


State Water Project (SWP) Water

 **Baseline** – assumes 45% reliability, the historical average since Wanger decision, 2007-2021

- ❖ **Future Projects** includes participation in Delta Conveyance Facility, which increases reliability to 58%

 **Climate Change** – assumes 45% reliability + DWR's projected climate change factor by 2045

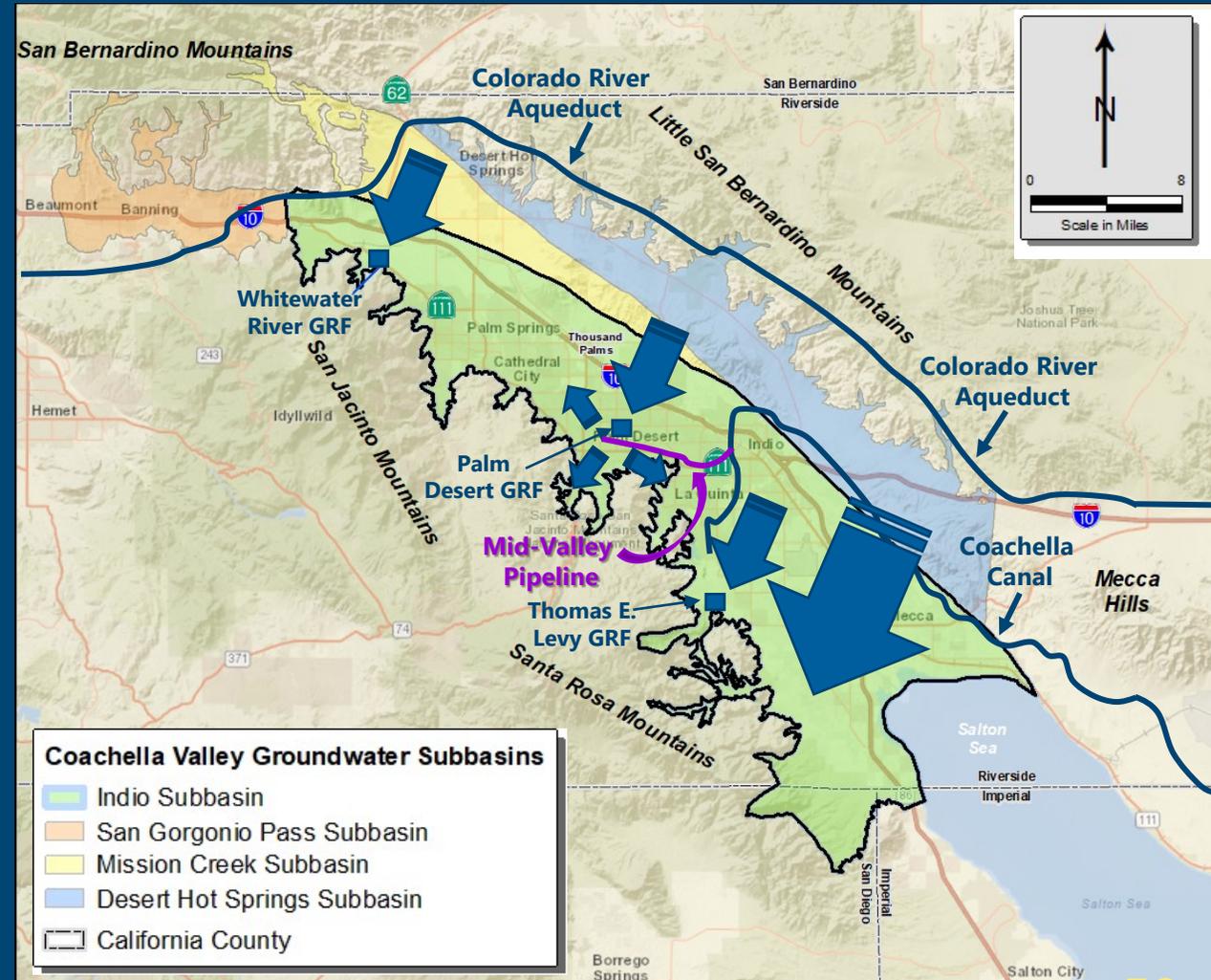


Colorado River Water

 **Baseline** – assumes QSA entitlement minus conveyance losses

❖ **Future Projects** includes expansion of NPW (Canal + RW) deliveries

 **Climate Change** – assumes QSA entitlement minus conveyance losses, with Lower Basin DCP contribution in phases

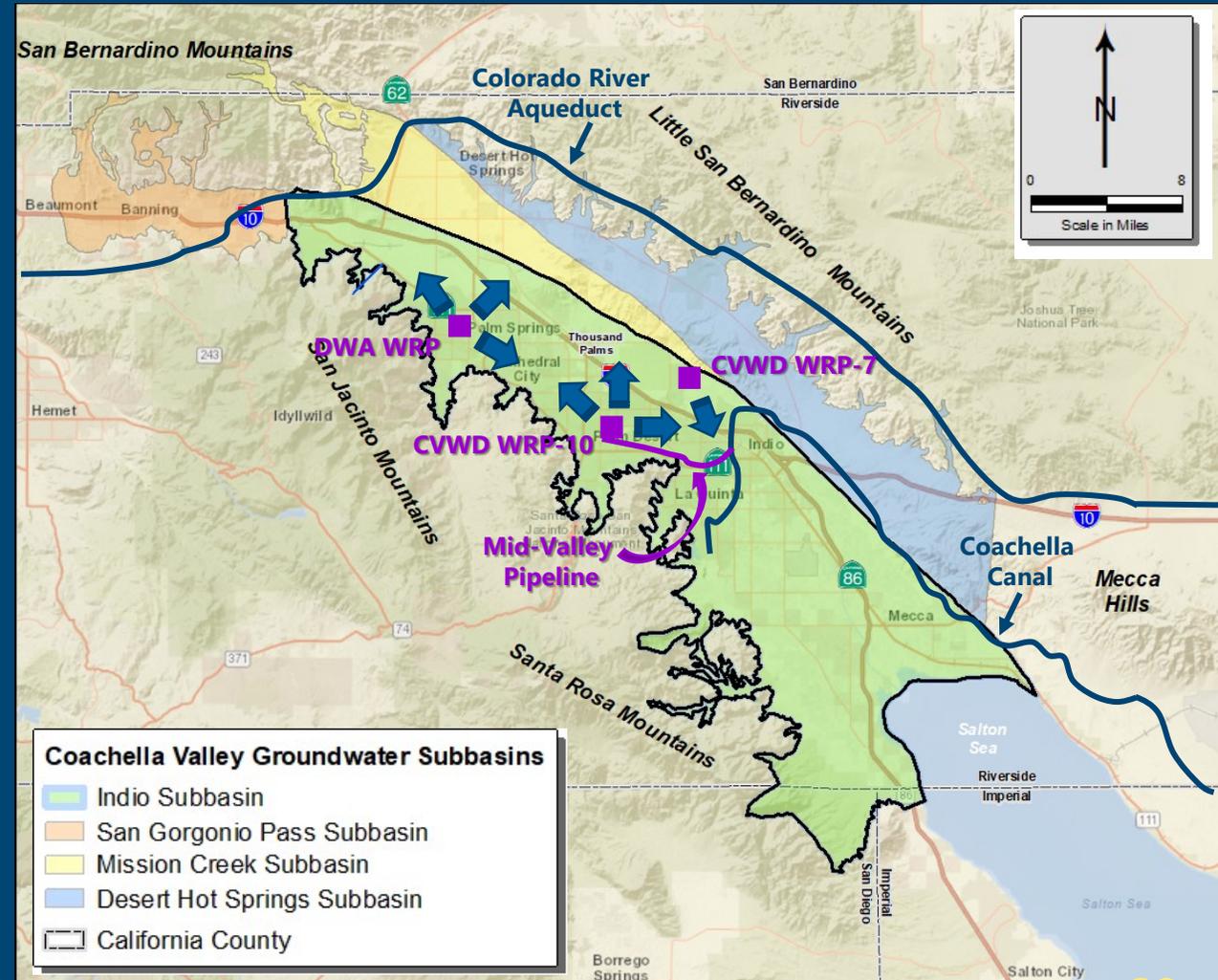


Recycled Water

 **Baseline** – assumes ~30% water demands return to sewer

❖ **Future Projects** includes expansion of NPW (Canal + RW) deliveries

 **Climate Change** – no change – assumes ~30% water demands return to sewer



Next Steps

- July 2021 – September 2021
 - ❖ Finalize Plan Scenarios in groundwater model and quantify water budgets
 - Review at next public workshop: August 26th
 - ❖ Publish DRAFT Indio Subbasin Alternative Plan Update for stakeholder review
 - Anticipated 45-day review: September/October
 - Will send an e-blast upon release of Alternative Plan Update

Agenda

- Welcome and Introductions
- Alternative Plan Status
- Groundwater Conditions
- Sustainable Management
- Groundwater Model and Plan Scenarios
- **Public Comment**
- Get Involved



Public Comment

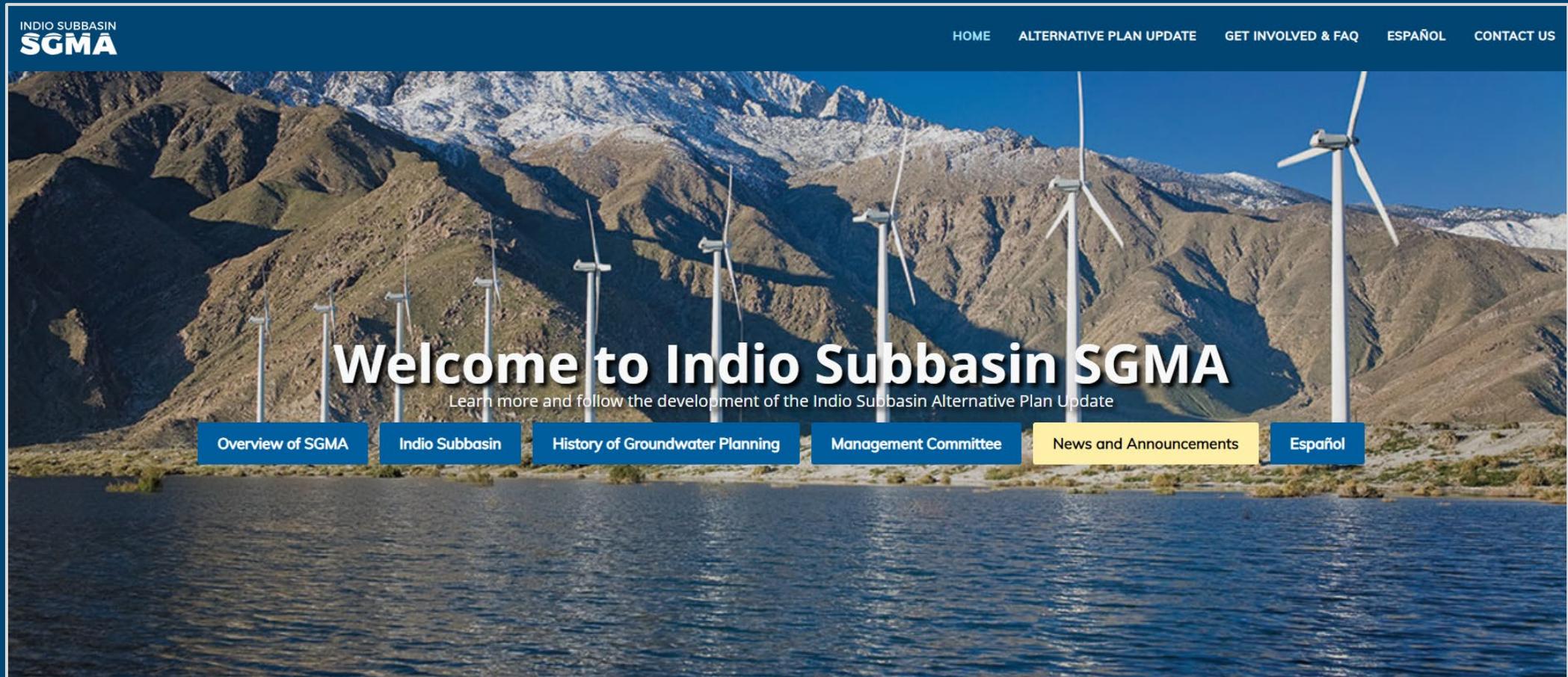
Input and feedback are welcomed

For Callers – you may need to press *6 to unmute

Agenda

- Welcome and Introductions
- Alternative Plan Status
- Groundwater Conditions
- Sustainable Management
- Groundwater Model and Plan Scenarios
- Public Comment
- **Get Involved**

Get Involved – Visit our Website



Get Involved – Visit our Website

Sign up for email invites, updates, and data/report releases at
www.IndioSubbasinSGMA.org

Stay Connected

Sign up to be on our mailing list for updates about the Indio Subbasin SGMA process.

Name *

Email *

Submit 

We will never share your information with anyone.

Get Involved – Next Workshop



August 26, 2021



2:00 – 4:00 PM



Location: TBD



For additional information,
please contact:

Rosalyn Prickett

IndioSubbasinSGMA@woodardcurran.com

(858) 875-7420