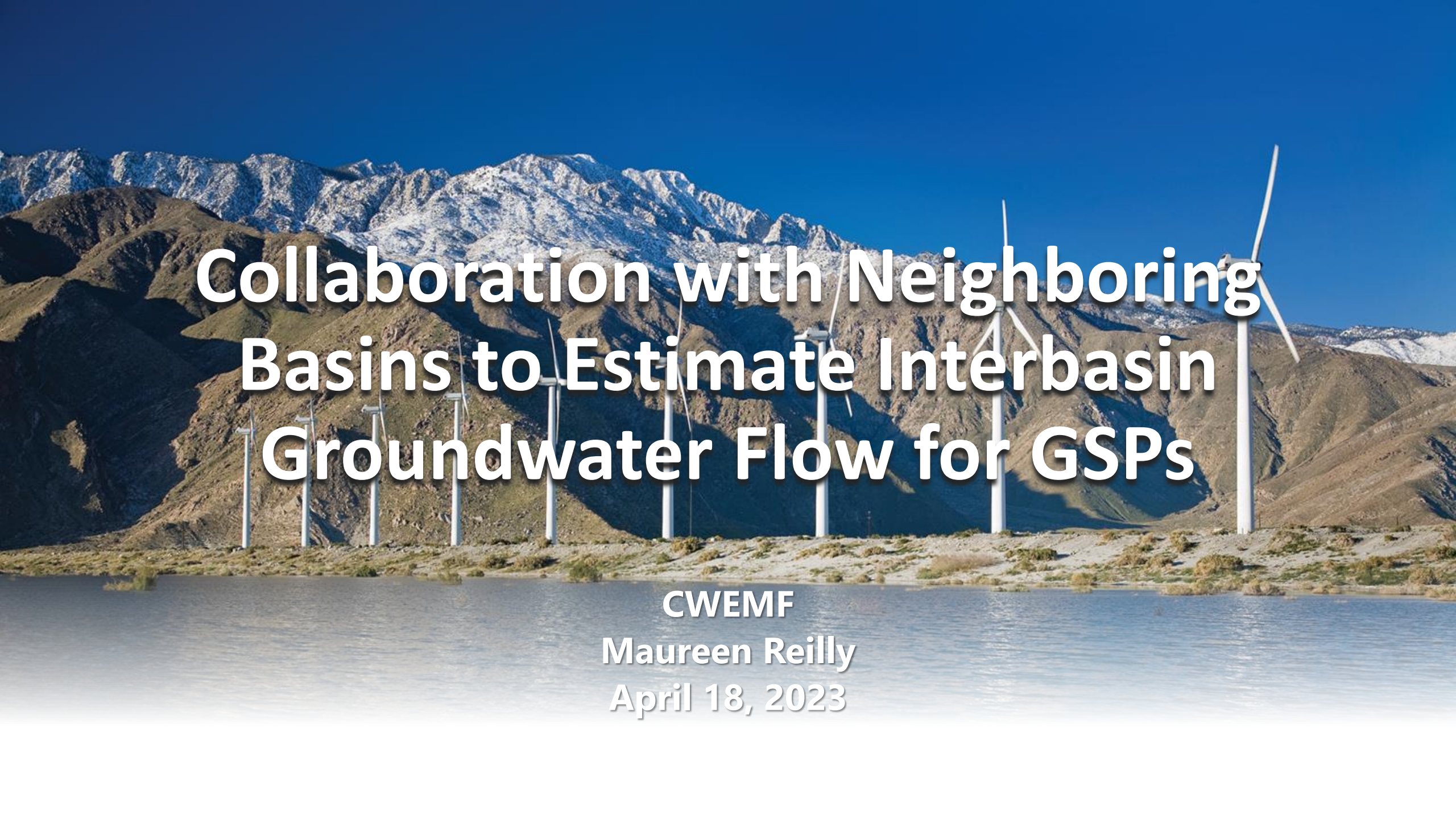


Collaboration with Neighboring Basins to Estimate Interbasin Groundwater Flow for GSPs

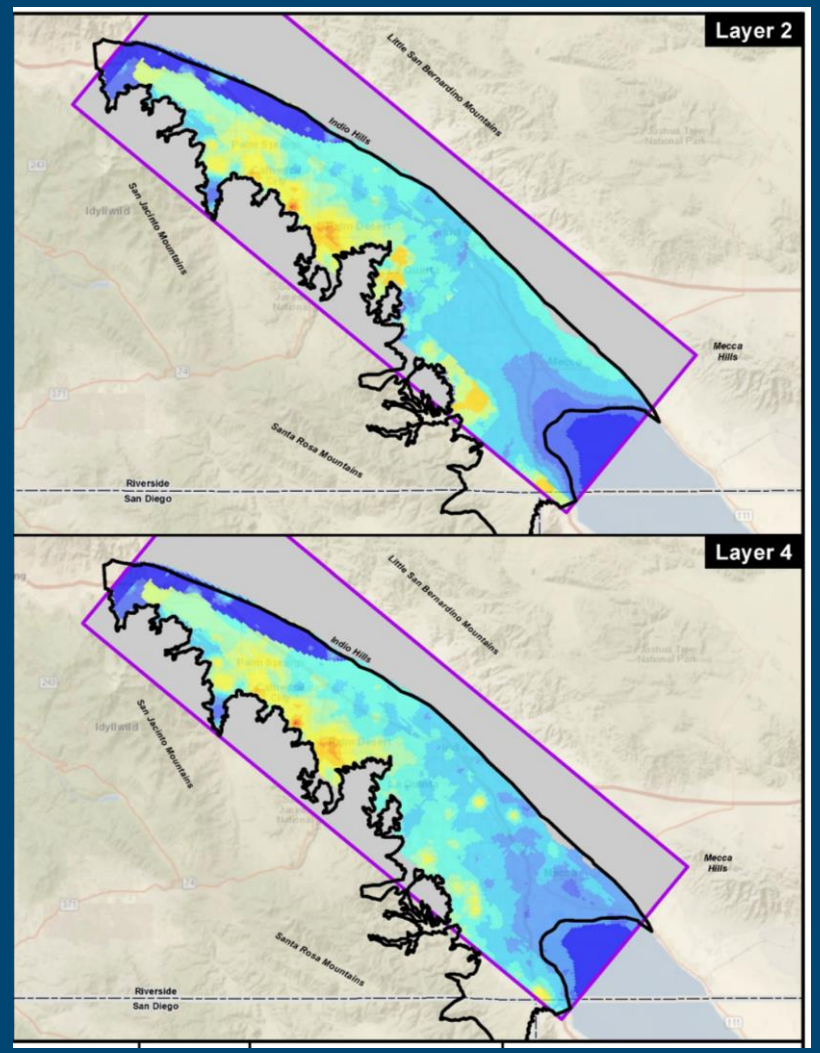
CWEMF
Maureen Reilly
April 18, 2023

Introduction

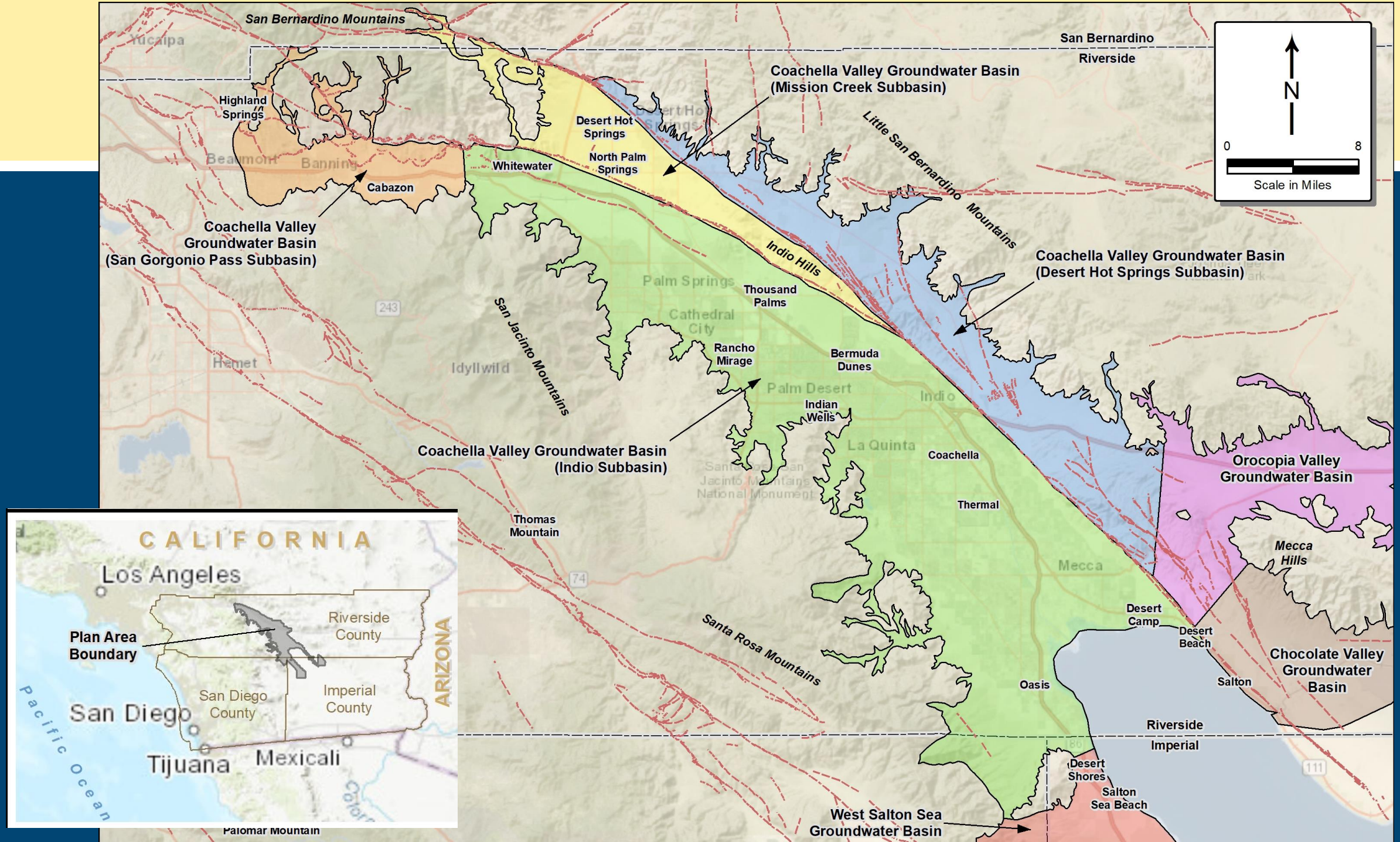
- Sustainable Groundwater Management Act (SGMA)
  - Groundwater Sustainability Plans (GSPs) for medium and high priority basins were due Jan 2022
  - Periodic Evaluations for Alternative Plans were also due Jan 2022
- Groundwater management doesn't end at a basin's boundary
  - Interbasin flow is often significant to a water budget
  - Management of neighboring basins will impact your water balance

Models are Critical to SGMA

- Groundwater models are the best tool we have to quantify groundwater flows, however:
  - Uncertainty especially with interbasin flow
  - One basin's outflow is another's inflow
  - Regional management requires regional approaches
- SGMA created an opportunity for coordination
- The challenge is to work cooperatively with our neighbors to find the best solution




Coachella Valley


San Bernardino Mountains
Yucaipa
San Bernardino
Riverside
Highland Springs
Coachella Valley Groundwater Basin
(Mission Creek Subbasin)
Desert Hot Springs
Little San Bernardino Mountains
Beaumont
Banning
Whitewater
North Palm Springs
Cabazon
Coachella Valley
Groundwater Basin
(San Gorgonio Pass Subbasin)
Indio Hills
Coachella Valley Groundwater Basin
(Desert Hot Springs Subbasin)
Palm Springs
Thousand Palms
243
San Jacinto Mountains
Cathedral City
Rancho Mirage
Bermuda Dunes
Hemet
Idyllwild
Palm Desert
Indian Wells
Indio
La Quinta
Coachella Valley Groundwater Basin
(Indio Subbasin)
Coachella
Orocopia Valley
Groundwater Basin
Thermal
Thomas Mountain
Mecca Hills
Mecca
74
Desert Camp
Desert Beach
Santa Rosa Mountains
Chocolate Valley
Groundwater
Basin
Oasis
Salton
Riverside
Imperial
Desert Shores
Salton Sea Beach
West Salton Sea
Groundwater Basin
111
Palomar Mountain
CALIFORNIA
Los Angeles
Riverside County
Plan Area Boundary
ARIZONA
San Diego County
Imperial County
San Diego
Tijuana
Mexicali
Pacific Ocean
N
0
8
Scale in Miles

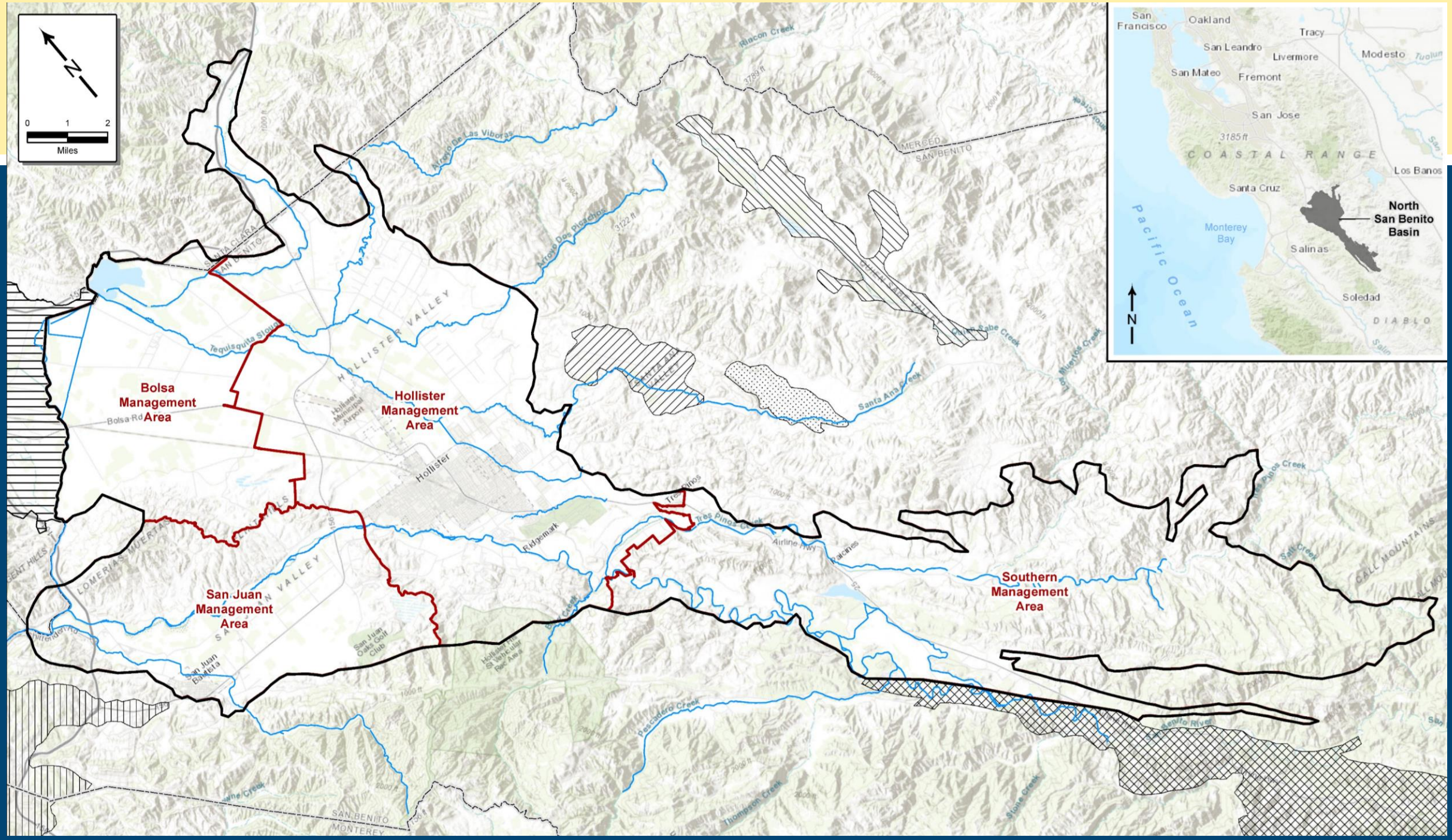
Indio and Mission Creek Subbasins

- Both subbasins were developing Periodic Evaluations for approved Alternative Plans
- Collaborating early in the process was key
  - GSAs iteratively worked together to develop interbasin inflows and outflows
  - Agreed on interbasin flow methodology and volumes
  - Updated the hydraulic parameters in the overlapping model areas
- San Gorgonino also borders Indio, however:
  - GSA coordination with San Gorgonino model team too late in the process
  - Both models were already calibrated and agreement could not be reached

Indio and Mission Creek Subbasins

- GSAs also collaborated to develop future scenarios
  - Built future hydrologic scenarios that incorporated the same assumptions in both subbasins
  - Simulated future projects and changes to interbasin flow in both subbasins
  - Showed the impact of groundwater management changes that each subbasin could have on the neighboring subbasin
- Partnership continuing through SGMA Implementation; GSAs are:
  - Sharing data for annual reports
  - Collaborating on grant applications
  - Maintaining ongoing communication and coordination


North San Benito Subbasin


N
0 1 2
Miles
Bolsa Management Area
Hollister Management Area
San Juan Management Area
Southern Management Area
HOLLISTER VALLEY
SAN JUAN VALLEY
Hollister
Bolsa Rd
Tequisquita Slough
Arroyo De Las Viboras
Arroyo Dos Picachos
Riaton Creek
Santa Ana Creek
Tres Pinos Creek
Ridgemark
Airline Hwy
Pescadero Creek
Thompson Creek
Stone Creek
Salt Creek
San Benito River
SAN BENITO
MONTEREY
MERCED
SANTA CLARA
COASTAL RANGE
DIABLO
San Francisco
Oakland
Tracy
San Leandro
Livermore
Modesto
San Mateo
Fremont
San Jose
Los Banos
Santa Cruz
Monterey Bay
Pacific Ocean
Salinas
Soledad
North San Benito Basin

North San Benito Subbasin

- Two Existing Models:
  - Llagas Subbasin in Santa Clara County
  - North San Benito Subbasin in San Benito County
- GSAs have longstanding cooperative relationship, and shared responsibility in the North San Benito Subbasin
- Previous attempts to compare flows over the boundary were unsuccessful

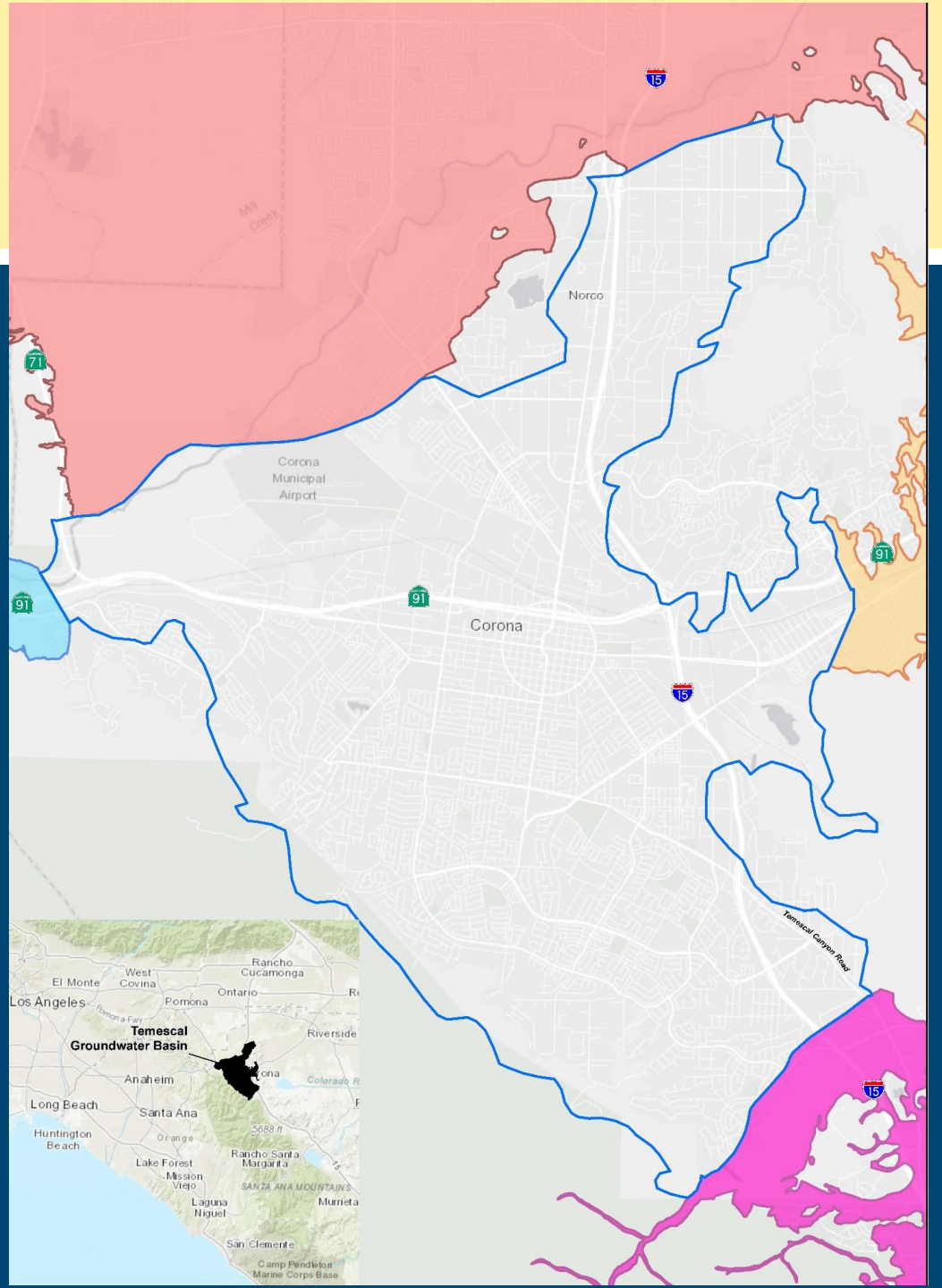
North San Benito Subbasin

- Models were updated for SGMA during Groundwater Sustainability Plan (GSP) preparation
- Model teams from both GSAs shared results and compared assumptions for updated models
- Iteratively reassessed model parameters and flow assumptions in both models
- This cooperation yielded more similar interbasin flows while not affecting model calibration


Temescal Subbasin

Temescal Basin

- Three upstream neighboring subbasins with existing groundwater plans
- One downstream neighboring basin with an approved alternative plan
- One upstream neighboring subbasin is adjudicated
- Two of the remaining three were further along in SGMA compliance



Temescal Basin

- Temescal GSA met with neighboring GSAs and the adjudicated subbasin Watermaster
  - Discussed future management and possible interbasin flow impacts
  - Upstream neighboring subbasins to the north and east have desalter pumping projects control water quality
    - Projects effectively reduce interbasin flow from these subbasins to zero
    - However, they are important part for watershed-wide regulatory-driven water quality control and couldn't be changed
  - Upstream subbasin to the south had same consultant team and flow was coordinated
  - Downstream basin shared the assumptions of flow in their approved Alternative Plan

Temescal Basin

- This coordination allowed Temescal GSA to reflect these changed conditions in recent and future model scenarios
- Sustainable yield and recent and future water budgets and for Temescal subbasin based on reduced subsurface inflow
- Temescal GSP long term planning reflects reduced inflow
- These conditions have also been important for downgradient basins

Conclusions

- Interbasin flow is not just a technical problem
- Timing was critical - Overall coordination with neighboring basins was more effective when the discussions occurred early in the process
- Coordination provides lasting effects, including:
  - Increased teamwork
  - Coordinated future model scenarios
  - Advancement of regional management solutions
  - Cooperative SGMA implementation, consistent with legislation


Questions ?