

# Arroyo Avichi - Baccaglio Basin - Scottsdale Marsh and Pond - Lynwood Basin (ABSL) Complex and Nave Gardens Flood Drainage Improvements Feasibility Study

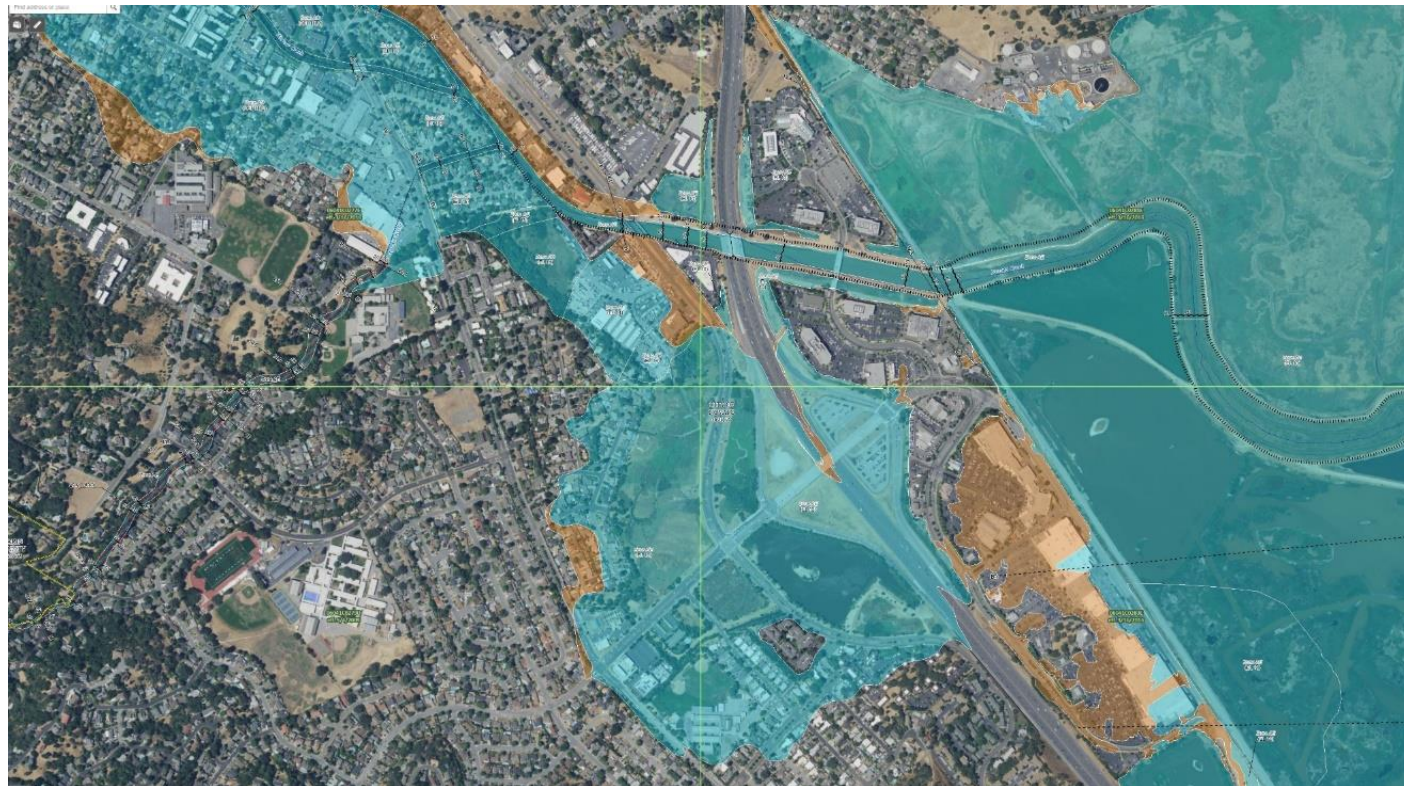
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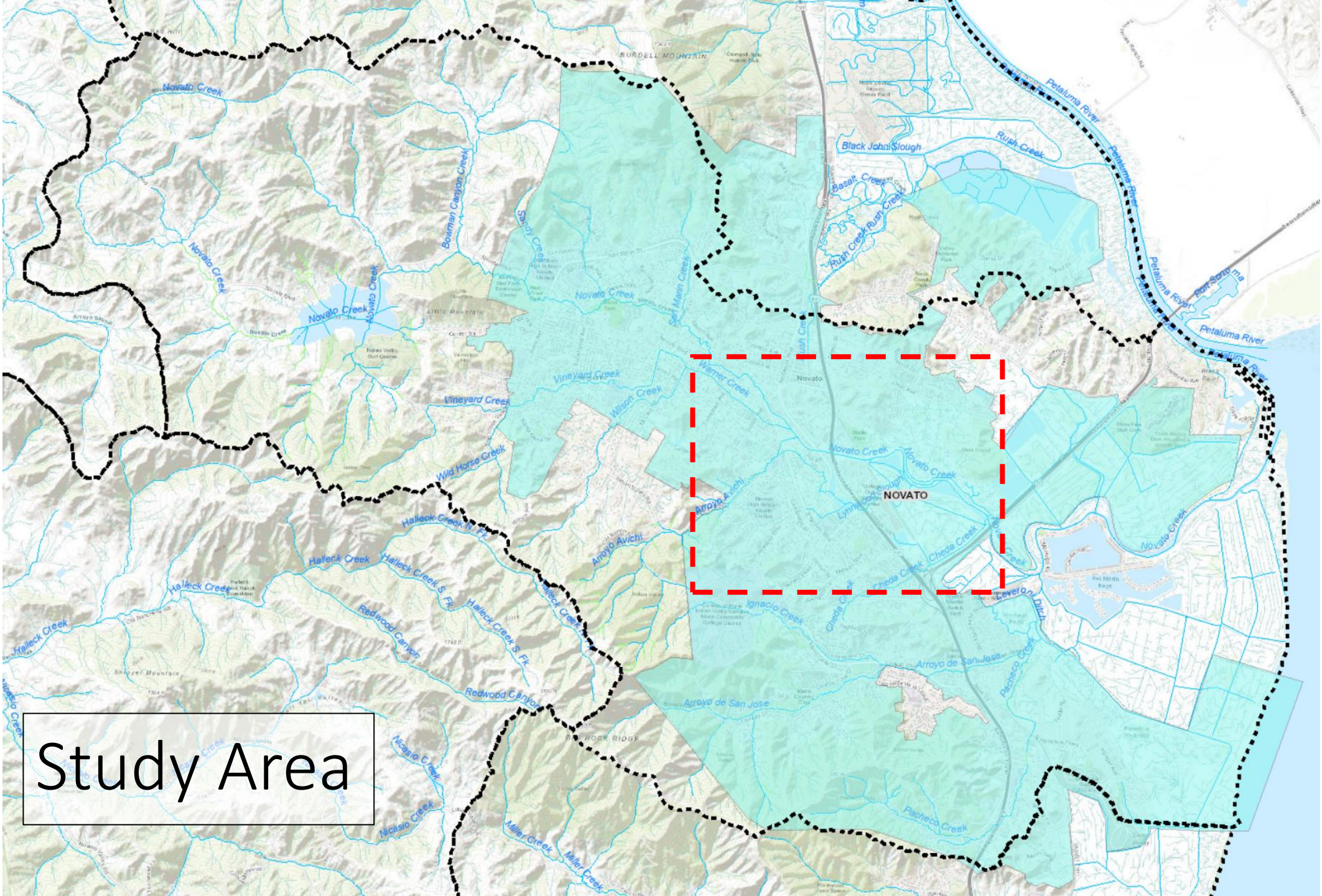
Marin County Flood Control District  
Zone 1 Meeting  
ABSL Complex Study Update  
February 23, 2023



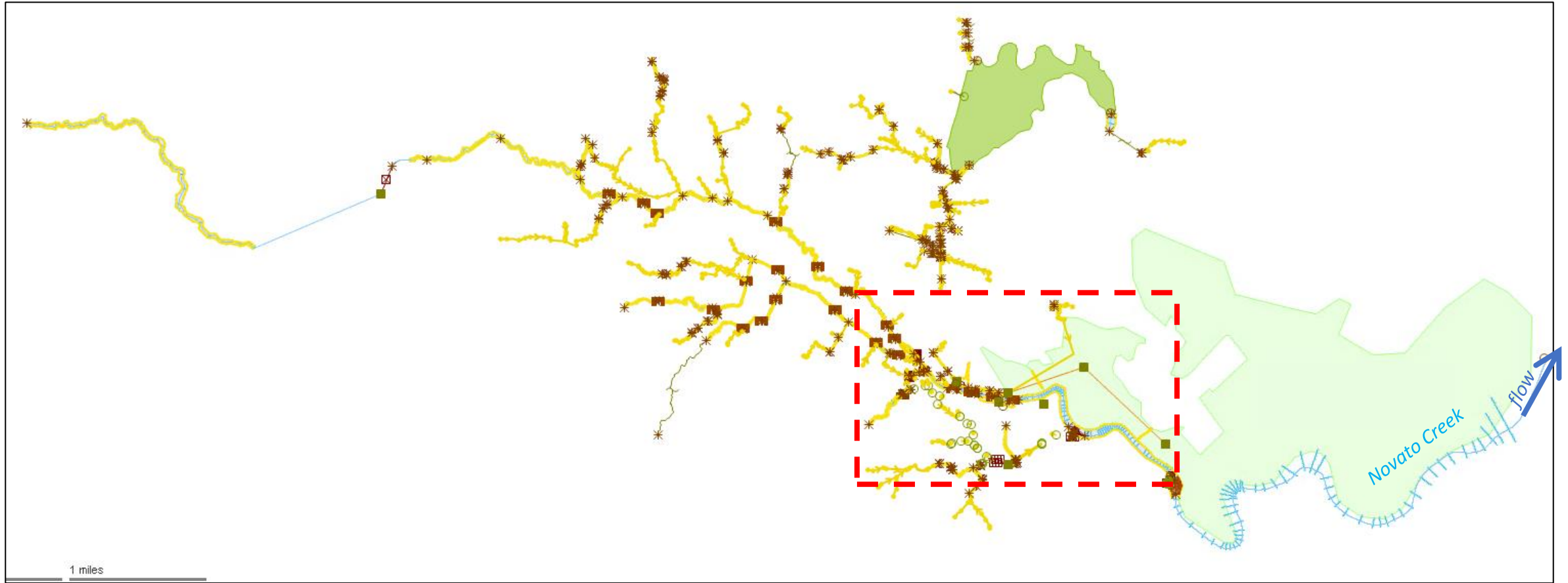
# Purpose

Evaluate the most feasible improvements to the ABSL complex of open spaces to assist with flood control in downtown Novato and the surrounding low elevation neighborhoods (e.g., Nave Gardens).

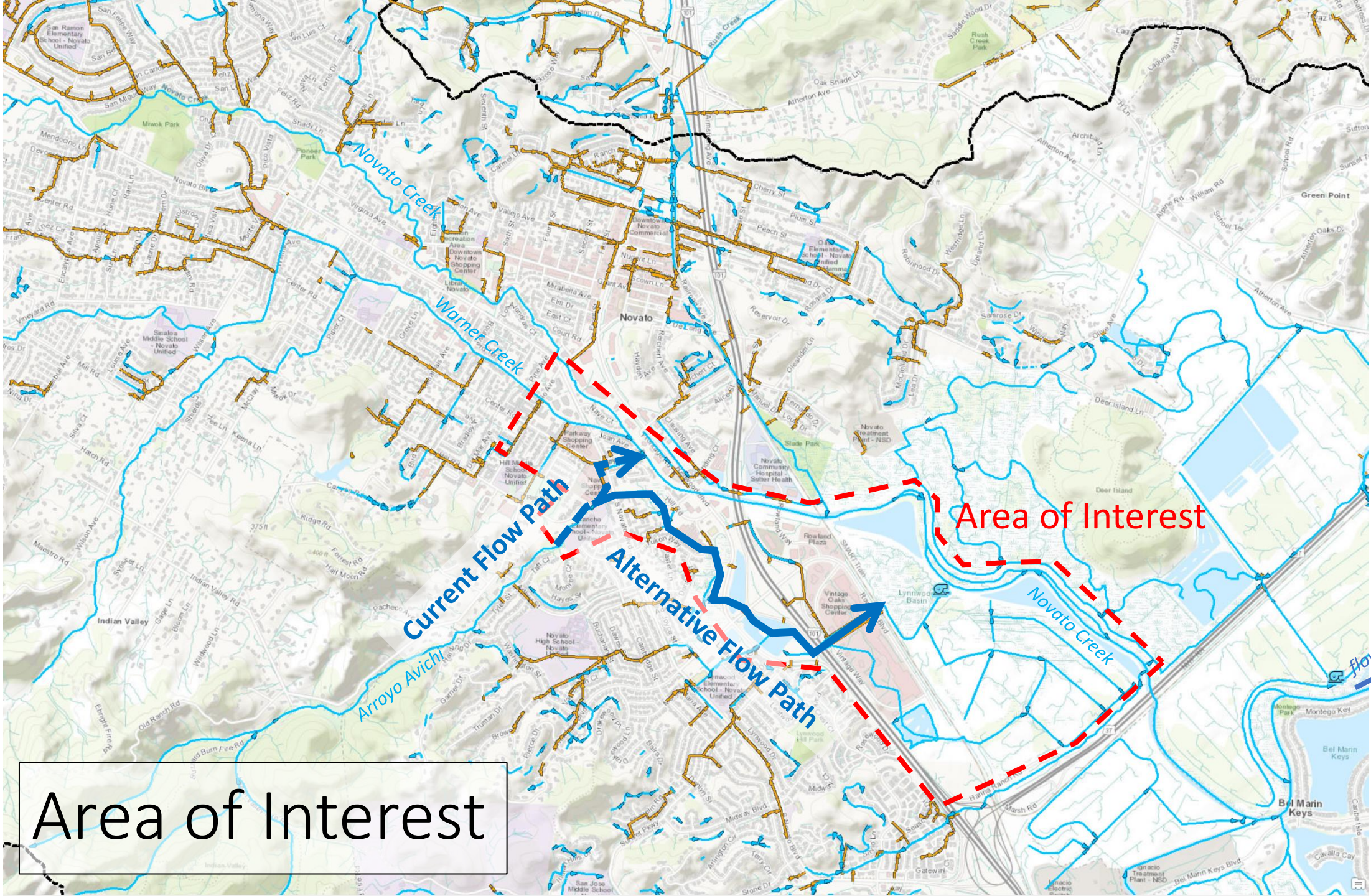




Study Area



Model Area



Area of Interest

Current Flow Path

Alternative Flow Path

Area of Interest

flow

# Scope of Work

- Background Review
- Existing Condition Characterization
- Hydrologic/Hydraulic Modeling
- Alternatives Analysis

complete

nearly complete (May 2023)

in progress (June 2023)

future (December 2023)



# Background Review complete

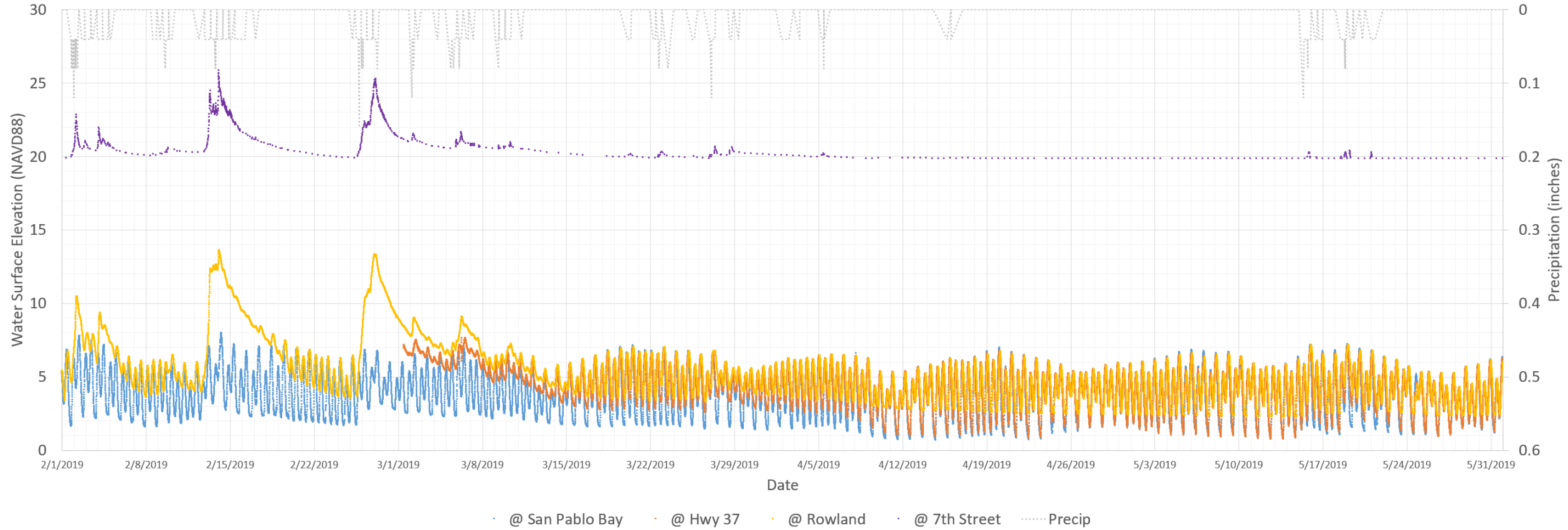
- 93 documents related to:
  - Hydrology and Hydraulics
  - Observed Flooding
  - Infrastructure Condition, Maintenance Activities, Operations
  - GIS databases
  - Utilities, Right-of-Way, Topographic Surveys
- Identify Data Gaps
- Scope Investigations to Fill Data Gaps

Novato Creek Hydraulic Study:  
 Alternatives Development and Hydraulic Analysis  
 Final Report: June, 2016

**Table ES-1: Novato Watershed Project: SHORT Term Alternative Summary**

		Preliminary Cost Estimate
<b>Novato Creek (Upstream of Hwy 101)</b>		
<b>Upper Novato Creek Storage and Floodplain Improvements</b>		
S-1	<b>Restore Floodplain Upstream of Bowman Canyon (Leveroni Creek)</b> to expand existing channel cross section on public parcels upstream and downstream of Bowman Canyon to increase the active flow area. Modify tributary outfalls to discharge across available floodplain. Protect/expand riparian corridor via floodplain excavation and grading.	\$ 1,500,000
<b>Lower Warner Creek Drainage Improvements</b>		
S-2	<b>Install Storm Drain Flap Gates: Nave Gardens and Center Rd</b> to reduce backflow from creeks to streets.	\$ 150,000
S-3	<b>Increase Arroyo Avichi Diversions to Lynwood Basin</b> to decrease volume of water and sediment being directed into the aggrading Novato Creek confluence by modifying the diversions structure, removing coarse sediment and increasing culvert capacity at So. Novato Blvd.	\$ 1,500,000
<b>Scottsdale Marsh Conveyance/Storage Improvements</b>		
S-4	<b>Increase Scottsdale Marsh Conveyance</b> to improve drainage from low lying portions of So. Novato Blvd. and Center Rd. install a pump in Scottsdale Pond to maintain discharges during large storm events.	\$ 4,000,000
<b>Novato Baylands (Downstream of Hwy 101)</b>		
<b>Novato Creek Dredge Reach:</b>		
S-5	<b>Redesign Dredge Reach /Reduce Coarse Sediment Loading</b> to reduce the excavation extent, volume and frequency while maintaining flood conveyance.	\$ 2,800,000
<b>Novato Creek Channel: Upper Bayland</b>		
S-6	<b>Spillway and Storm Water Basin for high flow bypass to No. DIB</b> to increase floodplain conveyance, attenuate peak flood WSEs and protect the NWPRR Bridge. Install culverts to provide gravity drainage of floodwaters from No. DIB back to Novato Creek during low tides.	\$ 2,270,000
S-7	<b>Remove Novato Creek South Levee (@Duckbill Pond and Heron's Beak Pond)</b> to increase the available flow area in an undredged reach. Removing the levees increases the available channel cross section by over 200%, improving flood and sediment conveyance and adding tidal prism to passively maintain a larger channel cross section.	\$ 3,240,000
<b>Novato Baylands: Lynwood Basin</b>		
S-8	<b>Divide Lynwood Basin (70% storm water/30% tidal)</b> To increase operational value, open a portion of the basin to tidal exchange, providing a sediment storage area and increasing tidal prism and downstream channel geometry. Add gated culverts to permit gravity drainage from the storm water basin during favorable tides.	\$ 5,400,000
<b>Novato Baylands: West Basin</b>		
S-9	<b>Restore Tidal Floodplain to West Basin Oxbow</b> to expand the available channel cross section, and increase bayland tidal exchange and the associated stable channel dimensions (reduces downstream dredging requirements).	\$ 3,900,000
<b>Preliminary Cost Total:</b>		<b>\$ 24,800,000</b>

# Background Review



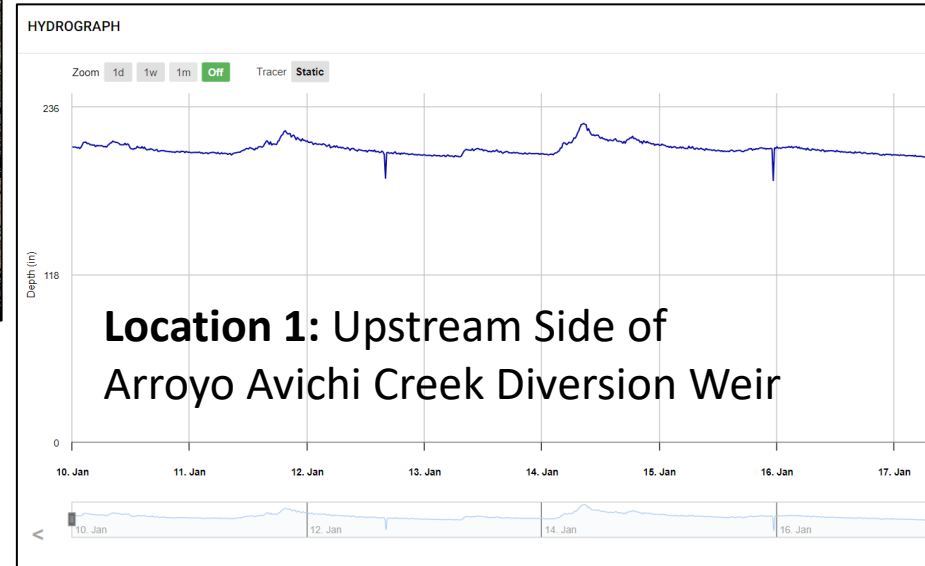
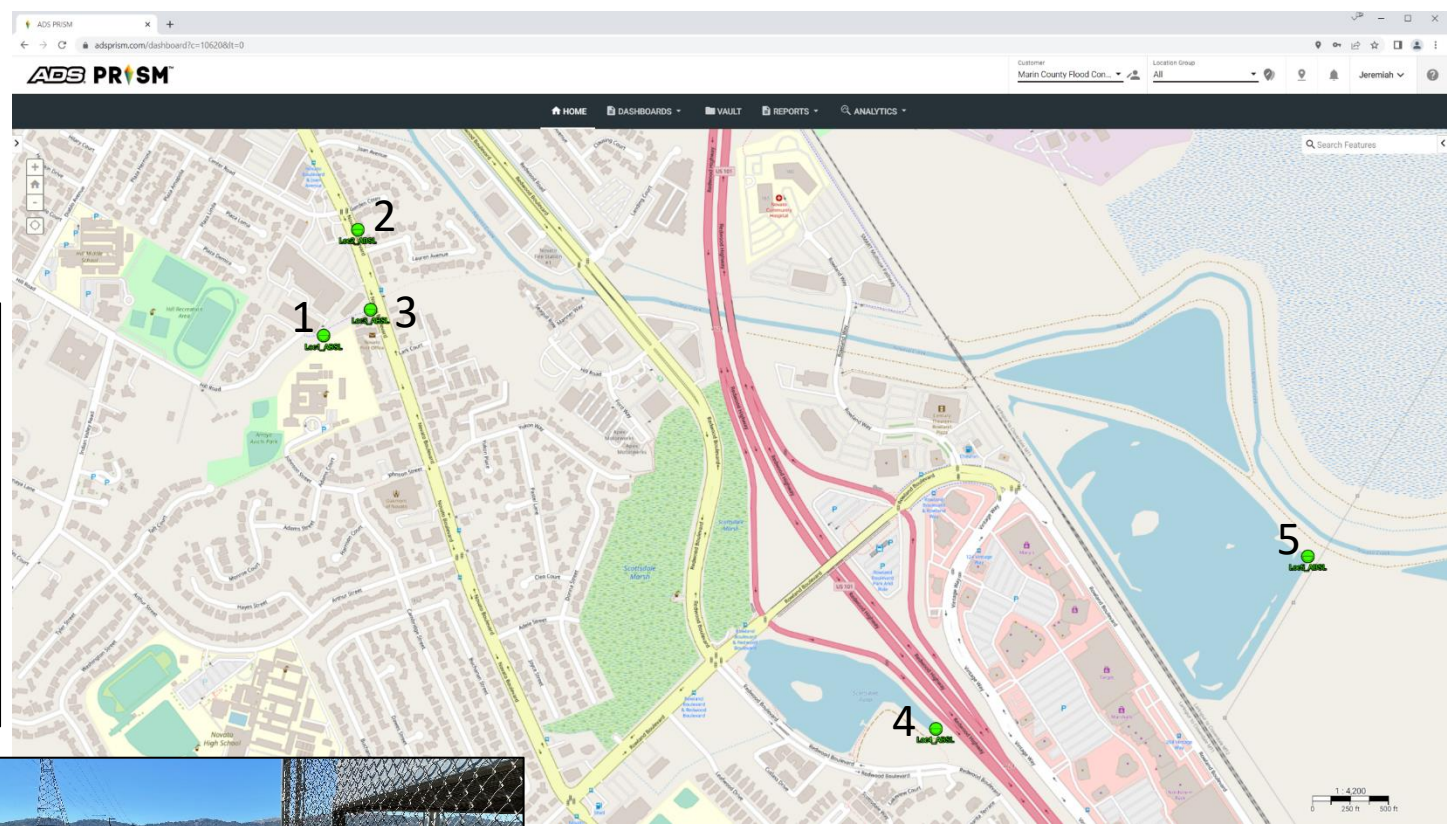
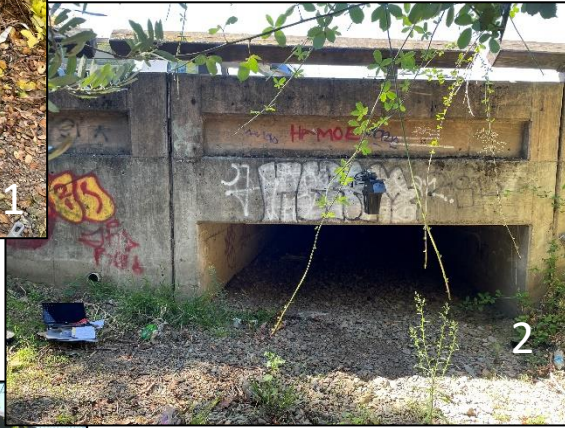


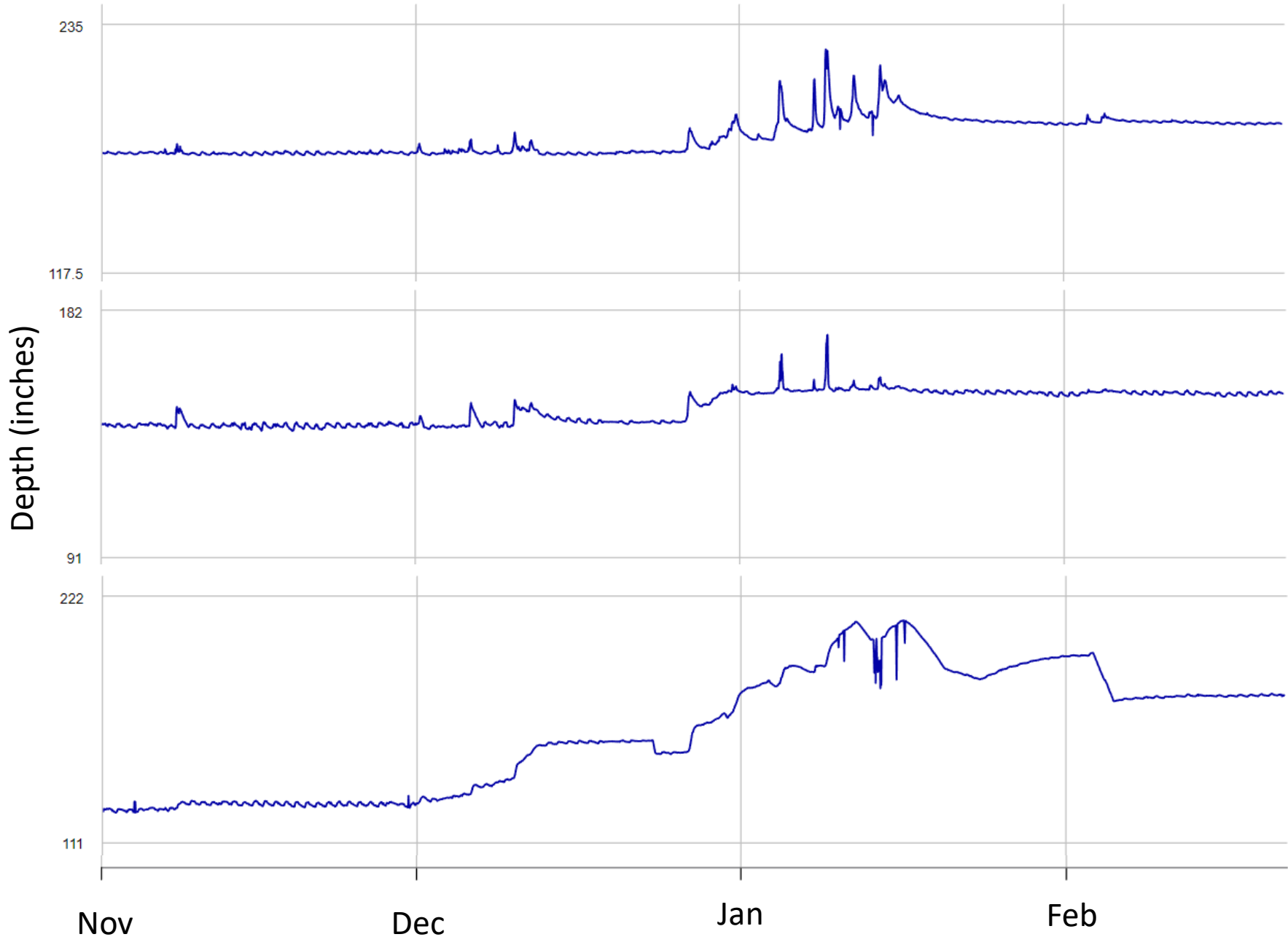
# Existing Condition Characterization

- Water Level Monitoring in progress (May 2023)
- Condition Assessment Field Inspection complete
- Topographic and Bathymetric Survey complete
- Utility and Base Map in progress (March 2023)
- Existing Conditions Technical Memorandum in progress (April 2023)



# Water Level Monitoring





**Location 2:** Outlet of Arroyo Avichi Box Culvert on East Side of Novato Blvd at Nave Gardens

**Location 3:** Inlet of Box Culvert for Diversion Channel on West Side of Novato Blvd

**Location 5:** Fence Post on South Side of Lynwood Basin Pump Station

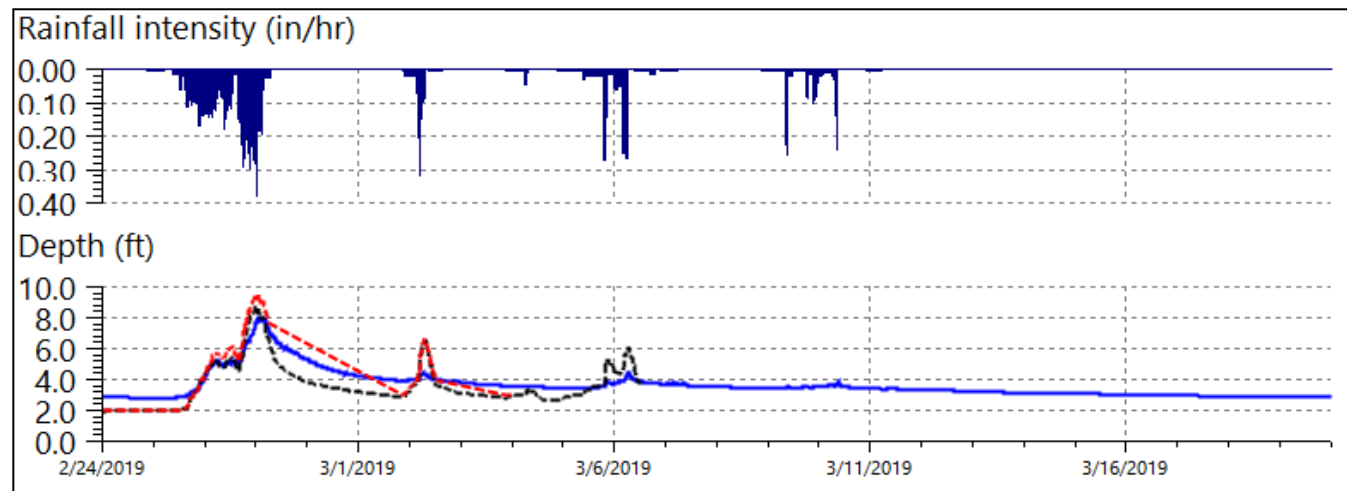


# Condition Assessment

\* Indicates Water Level Sensor Installation Site

# Hydrologic and Hydraulic Modeling

- Refine Model nearly complete (March 2023)
- Perform Calibration/Validation in progress (May 2023)
- Evaluate 2-, 10-, and 50-Year Event Flooding future (June 2023)
- Nave Gardens Evaluation future (June 2023)
- H&H Technical Memorandum in progress (July 2023)



# Alternatives Analysis

future

- Develop Preliminary Alternatives (July 2023)
- Model and Prioritize Preliminary Alternatives (August 2023)
- Nave Gardens Preliminary Alternatives (September 2023)
- Evaluate Flood Risk (HAZUS) & Life Cycle Cost (October 2023)
- Evaluate Habitat Impact & Benefit (October 2023)
- Alternatives Analysis Report (December 2023)

# Preliminary Alternatives

- Move pump from Lynwood to Scottsdale Pond. Send to Lynwood Pond.
- Increase hydraulic connection between Lynwood and Cheta pumps.
- Daylight Balderama Channel between Baccaglio and Scottsdale Marsh
- Add pipes into Scottsdale pond
- Add tide gates on Nave Garden outfalls w pumps.
- Add tide gate on Arroyo Avichi with pump
- Add diversion with lane lowering on Novato Blvd and Center Ave of Warner Creek overflow
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- Increase Baccaglio Storage
- Add diversion of Novato Creek high flows into Baccaglio