# ROSE CREEK WATERSHED

## HYDROLOGIC, HYDRAULIC, SEDIMENT TRANSPORT, AND GEOMORPHIC ANALYSES

## TASK 3 – DATA GAP SUMMARY REPORT

### BACKGROUND

The Rose Creek Watershed (RCW) consists of three planning basins, Rose Canyon, San Clemente Canyon, and Lower Rose Creek, which all flow into the northeast corner of Mission Bay (Figure 1). The Hydrologic, Hydraulic, Sediment Transport, and Geomorphic Analyses (RCW Analysis) is being conducted to build upon the previously completed RCW Opportunities Assessment (Assessment) and associated technical memorandums. The purpose of Task 3 of the RCW Analysis was to identify and document data gaps for the RCW Analysis based on a review of existing information (under Task 1) and field observations of the stream network (Task 2).

### SPATIAL AND TEMPORAL DATA GAPS

A summary of the spatial and temporal data gaps identified for the RCW is presented in Table 1. The spatial gaps are gaps related to location within the watershed. The locations of the spatial data gaps are illustrated in Figure 2. Temporal data gaps are gaps based on time period (e.g., data are too old), duration (e.g., one year vs. one day), and/or frequency of collection (e.g., annual collection vs. hourly collection). A timeline showing prior studies and data is presented in Figure 3 and this figure was used to assess temporal data gaps.

Precipitation patterns within the RCW reflect an orographic effect with higher precipitation in the upper watershed. Meteorological data includes precipitation, evaporation, cloud cover, and humidity conditions. Currently, there are no meteorological or precipitation gages within the watershed resulting in spatial and temporal gaps of meteorological data throughout the RCW. Continuous, long-term data (on the order of decades) are needed to establish initial conditions for the hydrologic analysis. The data interval can vary between daily to hourly frequencies.

Spatial gaps exist for the creek channel dimensions of Rose and San Clemente Creeks. The creek channel dimensions are defined by the primary flow paths following the thalweg of the creek. The field stream network assessment indicated the creek to be shallow and narrow with dense vegetation, especially in the lower portion of the watershed below the headwaters west of Interstate 15. Topography data can be used to define the creek channel dimensions. However, topography data obtained from the Assessment had resolutions of 20-ft and 100-ft contour intervals. Also, topography data derived from aerial photos may not be capable of defining the creek channel beneath the dense vegetation. Therefore, available contour intervals are not sufficient to accurately define the creek

channel and creek bed elevation, thereby resulting in a spatial gap of data west of Interstate 15 and a quality gap in topographic data attributed to resolution. These gaps limit the accuracy of the hydraulic analysis. Obtaining more accurate topographic data would be beneficial for improving the accuracy of the hydraulic and sediment transport analysis tools.

The locations of hydromodifications in the RCW were identified from prior studies. Hydromodifications include concrete channels, culverts, bridges, riprap, revetments, or other structures that may affect flows. Hydromodification data gaps are associated with cross section data including concrete channel dimensions, culvert dimensions, and bridge dimensions as well as the dimensions of other structures. Cross section data of modified channel dimensions are important to properly define the hydraulic system of the stream network for the hydraulic analysis. Previous hydraulic studies provide some cross section information for the engineered portions of lower Rose Creek. The hydraulic and sediment transport analyses for the RCW Analyses can benefit from more updated and accurate cross-section data.

Concrete channels are located along portions of Rose Creek along Interstate 5, beneath the Interstate 5 and State Highway 52 interchanges, along Santa Fe Avenue, and between Interstate 5 and Mission Bay Drive.

Along Rose Creek, culverts are located at Interstate 15, near Kearny Villa Road, Schilt Avenue, Obregon Avenue, Pless Road, and Genesee Avenue. Along San Clemente Creek, culverts are located at and near Interstate 15, downstream of Kearny Villa Road, and Convoy Street. Bridges along Rose Creek are located at Mitscher Way, several railroad crossings, Santa Fe Avenue, Mission Bay Drive, Garnet Avenue, and Grand Avenue. Along San Clemente Creek, bridges are located at Kearny Villa Road, Austin Avenue, Genesee Avenue, and Regents Road. Freeway bridges cross both Rose and San Clemente Creeks, however based on site observations during Task 2, the high bridge deck elevations are sufficiently high that it will not impede flows; hence the bridge deck elevations are not necessary for the hydraulic analysis. Smaller pedestrian bridges are also found along Rose Creek and tributaries of Rose Creek. The data gaps associated with bridge dimensions are limited to street and pedestrian bridges.

Other hydromodifications are found along both Rose and San Clemente Creeks. The largest of these structures are along Rose Creek and include a concrete weir structure near the Santa Fe Avenue Bridge and a concrete deflection structure at Mission Bay Drive. Rock revetments and gabion structures are also located along Rose and San Clemente Creeks.

The sediment grain size data influences the deposition and erosion conditions throughout the creek. Limited sediment grain size data within the stream network are available from prior studies, but there are no data from locations within the watershed outside the stream

network proper. Grain size data from sediment transported from the watershed are used in the sediment transport analysis. Thus, there is a spatial data gap for sediment grain sizes throughout the RCW. Obtaining sediment grain size data will improve the accuracy of the sediment transport analysis, especially since the potential variability in sediment grain size is likely to be quite high as observed during the field stream network assessment.

Aerial photos are used in the geomorphic analysis to assess the movement of the creek over time and the impacts of hydromodifications. There is a spatial data gap in historical aerial photos of the upper RCW and MCAS Miramar. This data gap limits the geomorphic analysis to the time frame and conditions for when aerial photos are available. Temporal data gaps also exist for aerial photos including before and after major wet years. For example, the 1940-41 wet season prior to the channelization of Rose Creek and the 2004-05 wet season with current conditions. A few historical aerial photographs, maps, and topographic surveys are available from the Assessment. This information is sufficient to conduct a preliminary, coarse-level geomorphic analysis for the RCW study. If additional aerial photos and data are available, then the quality of the geomorphic analyses can be improved in the future.

Based on the data availability, the following data gaps are identified for the RCW Analyses.

- Meteorological data
- Creek channel dimensions
- Concrete channel dimensions
- Culvert dimensions
- Bridge dimensions
- Other structure dimensions
- Sediment grain size distributions
- Aerial photos

The program to fill these data gaps will be provided in Task 4 (Data Gaps Program).

**Table 1 – Spatial and Temporal Data Gaps Summary**

| DATA | SPATIAL GAP | TEMPORAL GAP |
|---|---|---|
| Meteorological data | No monitoring locations within RCW | Long-term, continuous record |
| Creek channel dimensions | Definition of creek channel west of Interstate 15 | -- |
| Concrete channel dimensions | 4 concrete channel segments along Rose Creek | -- |
| Culvert dimensions | Rose Creek at I-15, near Kearny Villa Rd, Mitscher Way, Schilt Ave, Obregon Ave, Pless Rd, and Genesee Ave<br>San Clemente Creek at I-15, near Kearny Villa Rd, and Convoy St | -- |
| Bridge dimensions | Rose Creek at railroad bridges, Santa Fe Ave, Mission Bay Dr, Garnet Ave, and Grand Ave<br>San Clemente Creek at Kearny Villa Rd, Austin Ave, Genesee Ave, and Regents Rd | -- |
| Other structures dimensions | Rose Creek – concrete weir near Santa Fe Ave and concrete flow training vanes at Mission Bay Dr | -- |
| Sediment grain size distributions | No data east of Interstate 805 | -- |
| Aerial photos | No data east of Interstate 805 | Pre- and post-wet season (e.g., 1940-41 wet season prior to channelization of Rose Creek and 2004-05 wet season with current conditions) |

## RESTORATION PHASE DATA GAPS

The restoration phase category indicates a gap related to the sufficiency of the data for a certain phase in the project development process (i.e., large-scale planning, conceptual design, preliminary design/engineering, environmental review/permitting, final design/engineering, and long-term monitoring). The RCW Analysis falls into the large-scale (landscape scale) planning phase of the project development process.

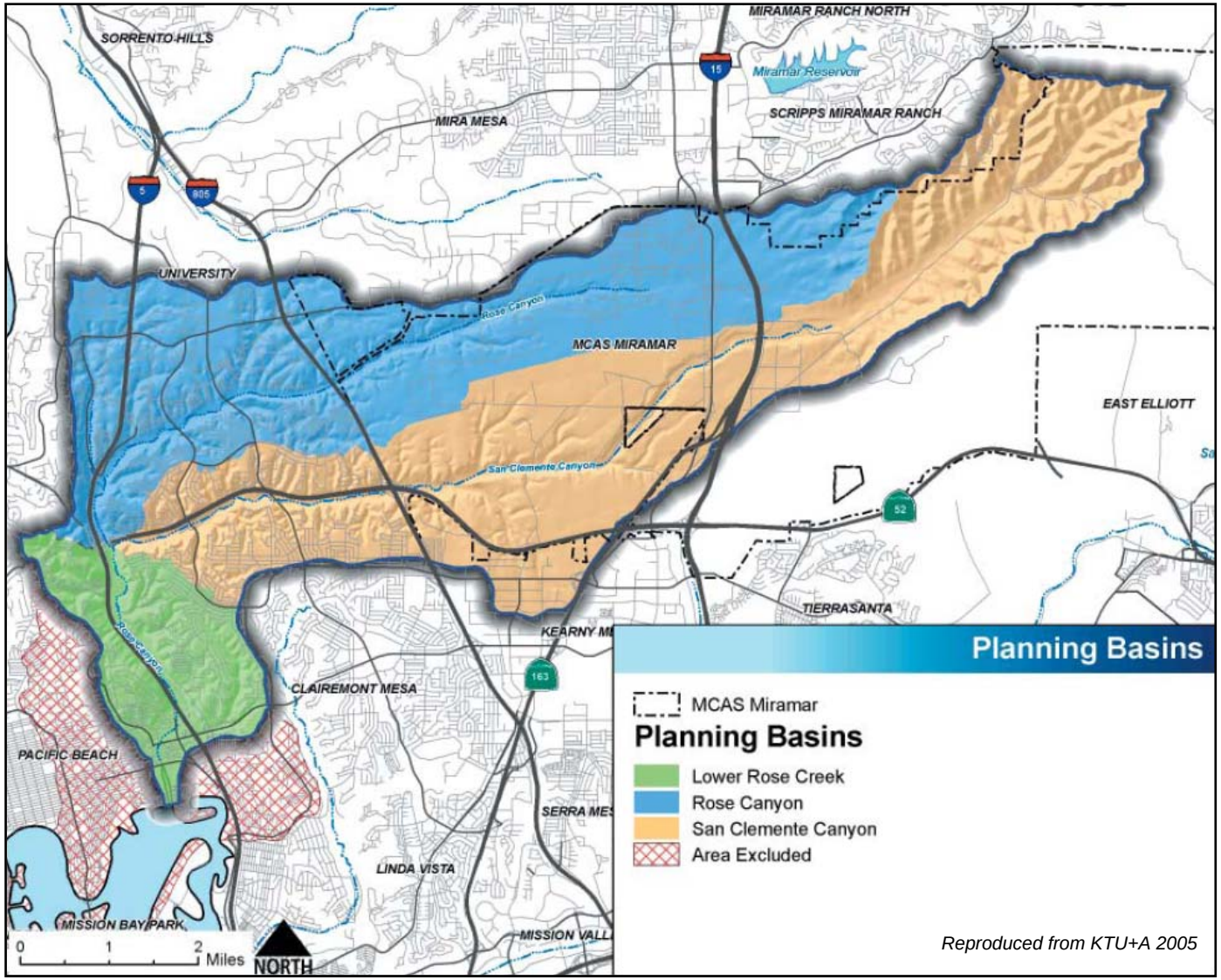


**Figure 1 – Rose Creek Watershed**

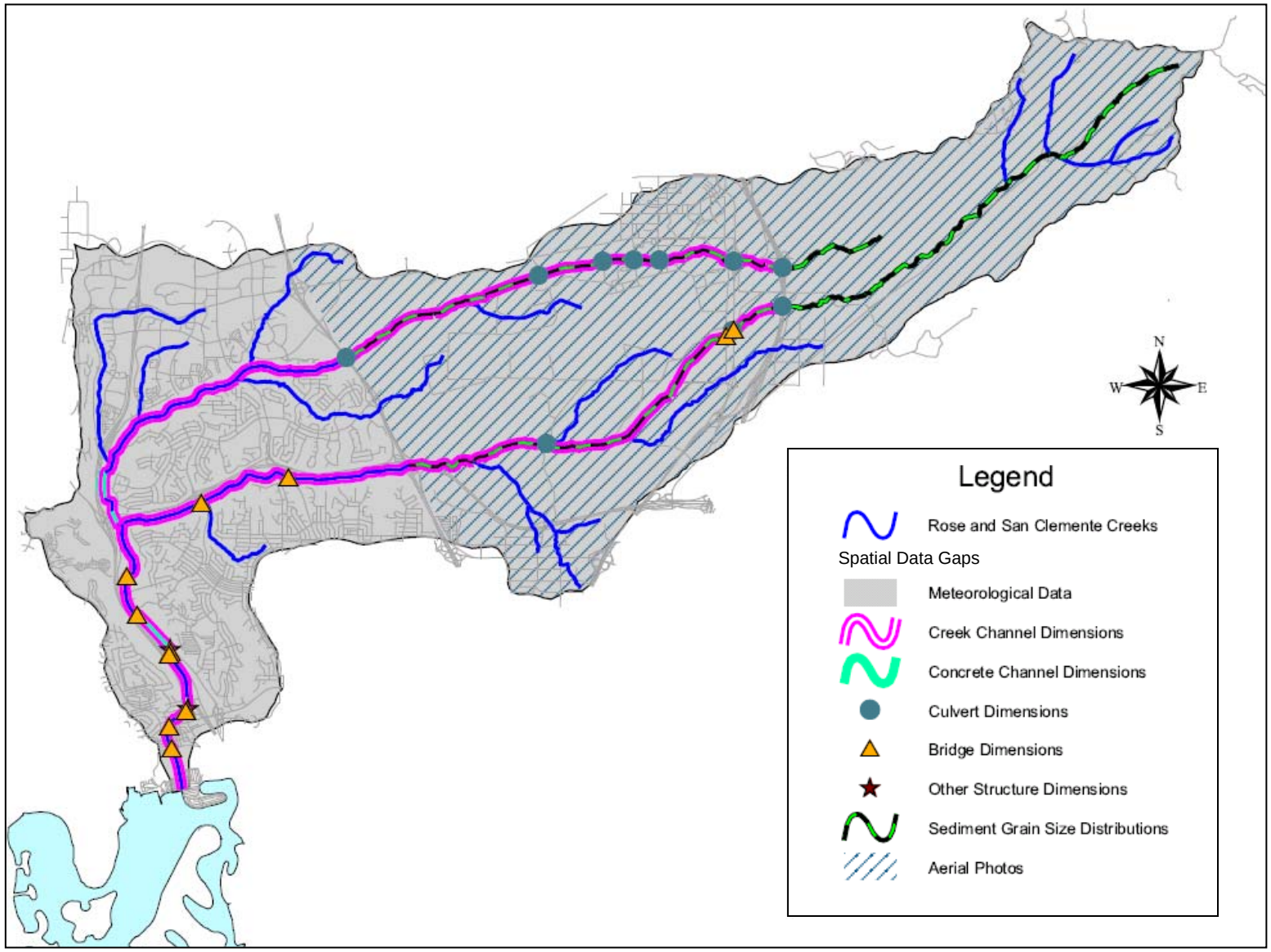


**Figure 2 – Spatial Data Gaps**

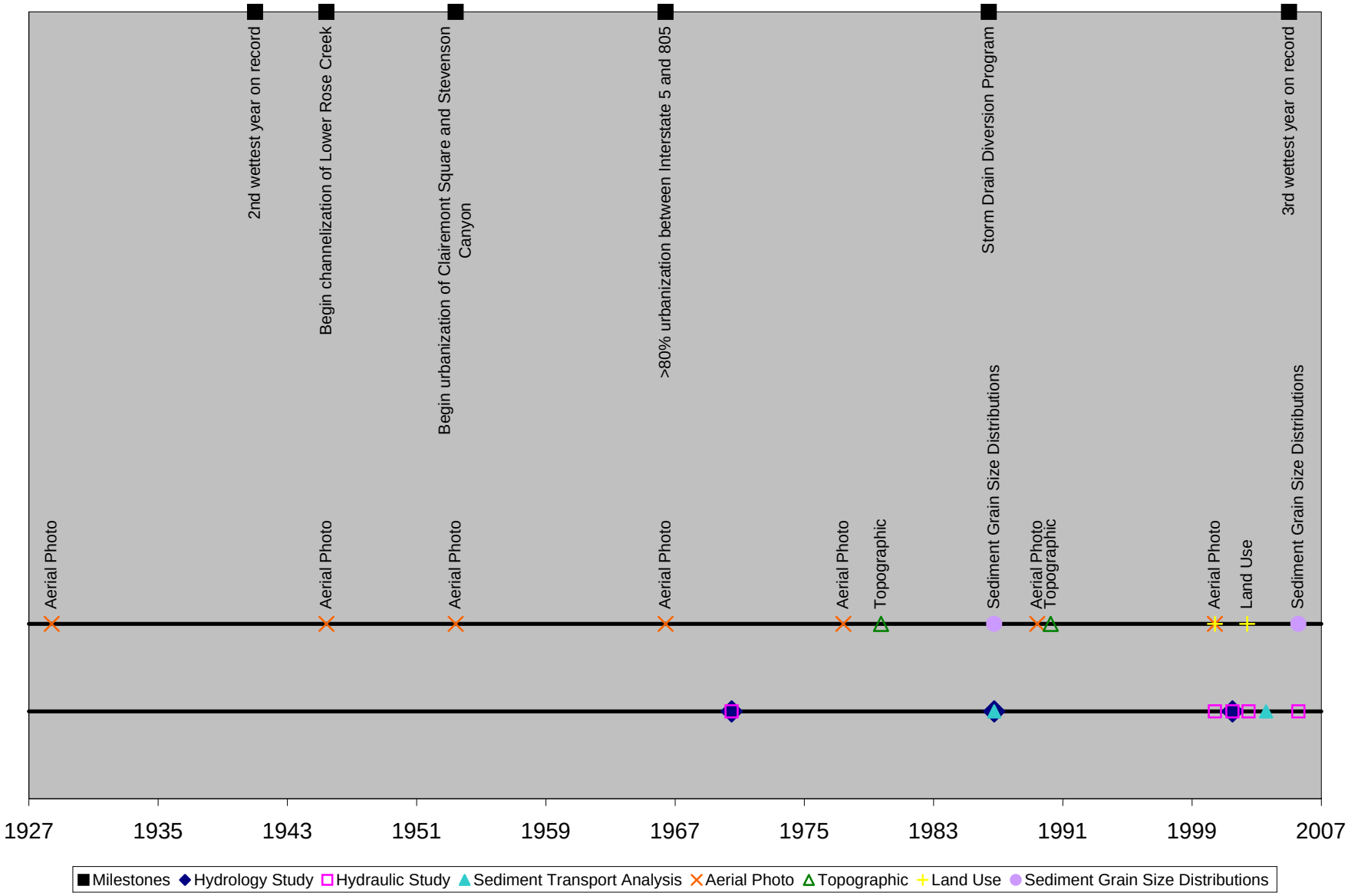


**Figure 3 - Timeline for Temporal Data Gaps**