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Technical Report No. ENV-2025-032

East Park Reservoir 2023 Sedimentation Survey and Sediment Coring

**Orland Project – California
California-Great Basin Region**



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East Park Reservoir 2023 Sedimentation Survey and Sediment Coring

**Orland Project – California
California-Great Basin Region**

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14. ABSTRACT We conducted a 2023 bathymetric survey and collected sediment cores on East Park Reservoir. We combined these underwater data with 2018 aerial lidar above water data to produce a seamless topobathymetric surface referenced to NAD83(2011) State Plane Coordinates, California Zone 2 (FIPS 0402), U.S. survey feet using the Reclamation Project Vertical Datum (RPVD), which a professional licensed surveyor measured to be 3.55 feet lower than NAVD88, Geoid 18. We calculated new area and capacity data using this topobathymetric surface and analyzed the sediment cores for physical properties and presence/absence and concentration of chemical constituents that might impact removal options. At the top of active conservation pool elevation (1199.68 feet, RPVD), the reservoir surface area is 1,801 acres, and the storage capacity is 46,188 acre-feet. As of 2023, East Park Reservoir has lost a total of 4,695 acre-feet (8.6 percent) of storage at elevation 1201.68 feet since dam closure in 1910. An estimated average sediment yield rate predicts another 1,062 acre-feet of storage loss by the year 2050. The dead pool has lost all its original storage volume.					
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East Park Reservoir 2023 Sedimentation Survey and Sediment Coring

Orland Project – California California-Great Basin Region

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Conversion Factors

U.S. Customary Units to International System of Units

Multiply	By	To Obtain
Length		
inch (in)	2.54	centimeter (cm)
foot (ft)	0.3048	meter (m)
mile (mi)	1. 609	kilometer (km)
Area		
acre	4,047	square meter (m ²)
acre	0.004047	square kilometer (km ²)
square mile (mi ²)	2.590	square kilometer (km ²)
Volume		
acre-foot (acre-ft)	1,233x10 ⁻⁶	cubic kilometer (km ³)
acre-foot (acre-ft)	1,233	cubic meter (m ³)

Datums

Vertical coordinate information for all survey data and elevations are referenced to the local Reclamation Project Vertical Datum (RPVD), unless otherwise noted. On July 31, 2023, James McCleary led a team of professional licensed surveyors (PLS) from Bureau of Reclamation's California-Great Basin (CGB) Regional Office in Sacramento, CA to conduct a static Global Positioning System (GPS) survey to establish control points that were used during the August 2023 bathymetric survey and to determine the vertical difference between the North American Vertical Datum of 1988 (NAVD88) and RPVD (McCleary et al. 2024). Mr. McCleary's survey determined the conversion from NAVD88 to RPVD is -3.55 feet (NAVD88 is 3.55 feet higher than RPVD). The full East Park Reservoir GPS control survey report is included in appendix B.

Horizontal coordinate information is referenced to the North American Datum of 1983 (NAD83) 2011, State Plane Coordinates, California Zone 2 (FIPS 0402), U.S. survey feet.

Acronyms and Abbreviations

acre-ft	acre-feet
AF mi ⁻² yr ⁻¹	acre-feet per square mile per year
ACAP v2.0	Area-CAPacity (ACAP) Program Version 2.0
CL	lean clay
DEM	digital elevation model
ft	feet
ft ³ /s	cubic feet per second
mg/kg	milligrams per kilogram
mi	miles
mi ²	square miles
ML	silt
MTBS	Monitoring Trends in Burn Severity
NAVD88	North American Vertical Datum, established 1988
NHD	National Hydrography Data
NID	National Inventory of Dams
NLCD	National Land Cover Database
Reclamation	Bureau of Reclamation
RPVD	Reclamation Project Vertical Datum
SGMC	State Geologic Map Compilation
TSC	Technical Service Center
USGS	U.S. Geological Survey

Symbols

% percent

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Executive Summary

The Bureau of Reclamation's (Reclamation) Technical Service Center (TSC) conducted an extensive bathymetric survey and soils analysis of East Park Reservoir, impounded by East Park Dam on Little Stony and Indian Creeks located approximately 20 miles (mi) southwest of Willows, California. East Park Reservoir began storage in 1910. The last resurvey of the reservoir, a range line survey in 1962 conducted by the U.S. Geological Survey (USGS), indicated storage loss of 1,960 acre-feet (acre-ft, table ES-2) at that time. We collected new multibeam bathymetric data with nearly full coverage August 6–9, 2023. We combined our new bathymetric data with 2018 topographic lidar data collected by the USGS to create a seamless topobathymetric surface, and used this surface to create new area-capacity tables for East Park Reservoir that helped inform sedimentation rates and future reservoir operations.

We identified key elevation zones from the standing operating procedures at East Park Dam and Reservoir (Reclamation 2018) and used our new topobathymetric data to constrain both total and zonal storage values for these key elevations (table ES-1, table ES-3, and table ES-4).

Our new topobathymetric data and soils testing yields the following results:

- Current, total reservoir storage capacity at top of surcharge pool and maximum water surface elevation of 1201.68 feet (ft) is 49,885 acre-ft, representing a total capacity loss of 4,695 acre-ft (8.6 percent [%]) since storage began in 1910.
- There was a loss of 2,752 acre-ft of storage at elevation 1199.68 ft (top of active conservation pool) between the 1962 and 2023 surveys.
- The lowest surveyed elevation near the dam was 1135.2 ft. The top of dead pool is at 1131.68 ft, indicating no remaining dead pool storage and that sediment is making its way to the dam.
- The Little Stony Creek arm has a relatively consistent slope as compared to the Indian Creek arm indicating not as many localized areas of sediment deposition.
- Physical properties and constituent's analyses on sediment cores showed high clay content and detections of oil compounds and metals, including mercury.

Using the long-term trend in sedimentation, the average sediment yield rate for the sediment-contributing drainage area is 0.407 acre-feet per square mile per year ($\text{AF mi}^{-2} \text{ yr}^{-1}$). This value represents sedimentation and reservoir management practices between the years 1910 and 2023 and is classified as a “low” sedimentation rate by Reclamation (2006). Using this rate, we estimate that East Park Reservoir will lose an additional 1,062 acre-ft of total storage by the year 2050, which is roughly 2% of the original reservoir's design storage. We note that this estimate of future sedimentation is based on an average rate and past management practices. Extrapolating this rate into the future assumes similar background sedimentation and similar management

practices into the future. Despite the uncertainty in sediment yield, we find that the estimate of a 2% loss in reservoir storage by 2050 may serve as a valuable planning tool for future reservoir surveys. It's important to keep in mind that extreme events such as wildfires and floods can result in decades worth of reservoir sedimentation in a single season. Any extreme event that produces a large sediment influx to the reservoir should be considered when planning for future reservoir surveys, especially if this sediment influx is not coupled with proactive sediment removal. Aside from an extreme event, another survey is recommended within the next 20 years to gain a better understanding of the sediment accumulation rate through comparing like survey methods.

Table ES-1.—Reservoir and dam information

Reservoir Information			
Reservoir name	East Park Reservoir	Dam Name	East Park Dam
Reclamation Reservoir Asset ID	03-0022-00001	Dam latitude (DD)	39.3567°N
Owner	Bureau of Reclamation	Dam longitude (DD)	122.515°W
Region	California-Great Basin	National Inventory of Dams (NID) ID	CA10145
Area office	Northern California Area Office	Vertical datum	Local (RPVD)
Operator	Orland Unit Water Users' Association	Dam crest elevation (ft)	1198.68
Stream	Little Stony and Indian Creeks	Maximum water surface elevation (ft)	1201.68
County	Glen or Colusa County	Top of spillway gates elevation (ft)	N/A
State	California	Top of active conservation elevation (ft)	1199.68
Reservoir length (mi)	3.3–4.3	Spillway crest elevation (ft)	1198.18
Average reservoir width (mi)	0.5	Outlet works invert elevations (ft)	1111.68 / 1131.68 / 1141.68 / 1163.48
HUC8	18020115	Hydraulic height (ft)	90
Total drainage area (mi²)	98.7	Date storage began	1910
Dam purpose	Irrigation, fish propagation, wildlife habitat, and recreation.		

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Table ES-2.—Summary of surveys conducted

Date	Type of Survey	Number of Range Lines or Surface Resolution	Sediment Contributing Drainage Area (mi ²)	Capacity Loss for Period ¹ (acre-ft)	Cumulative Capacity Loss (acre-ft)	Lowest Measured Bottom Elevation (ft)	Remaining Portion of Dead Storage (%)
1910	–	–	98.9	N/A	N/A	1104.0	100
1962	Range line	21	98.9	1,960	1,960	1109.7	–
2023	Multi-beam bathymetric	3-ft digital surface resolution	98.7	2,490	4,450	1135.2	0

¹ Capacity loss below top of spillway without flashboards installed at elevation 1198.18 ft (RPVD).

Table ES-3.—1910 Original design

Storage Zone of Interest	Top Pool Elevation (ft)	Base Pool Elevation (ft)	Surface Area at Top Elevation (acres)	Zonal Capacity (acre-ft)	Gross Capacity (acre-ft)
Surcharge	1201.68	1199.68 ¹	–	3,700	54,580
Active conservation	1199.68 ¹	1131.68	1,820	50,600	50,880
Dead	1131.68	1109.68	–	280	280

¹ Spillway crest with 18-inch flashboards installed.

Table ES-4.—2023 Resurvey

Storage Zone of Interest	Top Pool Elevation (ft)	Base Pool Elevation (ft)	Surface Area at Top Elevation (acres)	Zonal Capacity (acre-ft)	Gross Capacity (acre-ft)
Surcharge	1201.68	1199.68 ¹	1,879	3,697	49,885
Active conservation	1199.68 ¹	1131.68	1,801	46,188	46,188
Dead	1131.68	1109.68	N/A	0	0

¹ Spillway crest with 18-inch flashboards installed.

1.0 Introduction

The Bureau of Reclamation's (Reclamation) Asset Management Division requested a topo-bathymetric survey and sediment coring of East Park Reservoir, located in north-central California (figure 1). These efforts were used to update the reservoir storage area and capacity data of the reservoir along with testing for constituents of concern in the reservoir sediments to inform future studies that may assess the need for dredging. The Sedimentation and River Hydraulics Group from Reclamation's Technical Service Center (TSC) conducted the survey of East Park Reservoir August 6–10, 2023. East Park Reservoir began storing water in December 1910. Two (documentable) previous surveys of the reservoir exist: (1) the original survey pre-dating reservoir filling in 1910, assumed to be based on contours developed from a plane table survey; and (2) a 1962 survey consisting of 21 range lines conducted by the U.S. Geological Survey (USGS). Two other surveys are worth noting even though they are not referenced in this study. They occurred in 1946 by the Soil Conservation Service and in 1960 by the USGS. After completion of the 1960 survey, irregularities were discovered in the 1946 survey that propagated through the 1960 survey data, prompting the USGS to re-survey the reservoir in 1962.

All rivers transport sediment and debris. Dams hinder the transport of sediment and debris downstream, trapping this material in the upstream reservoir. Large dams, such as East Park Dam, which impounds East Park Reservoir, typically have a high trap efficiency, or ability to trap sediment and debris; East Park Dam has a documented trap efficiency of 96 percent (%) (Knott and Dunnam 1969). The infilling of sediment and debris into reservoirs (reservoir sedimentation) diminishes reservoir storage capacity through time. Reservoir surveys measure the current reservoir surface area and associated storage capacity while repeat surveys help constrain sedimentation rates and inform how and when sediment may impact important dam structures. Because reservoir capacity loss is due to the infilling of sediment and debris in the reservoir, we infer that the capacity loss volume directly represents the volume of sedimentation and therefore use these terms interchangeably throughout the report.

1.1 Reservoir Site

East Park Reservoir and Dam are part of the Orland Project, which is one of the smallest projects ever undertaken by Reclamation, irrigating 1 % (20,000 acres) of the Sacramento Valley's total irrigable soil. The project comprises of two main dams (East Park and Stony Gorge) for water storage, two diversion dams, 17 miles of canals, and 139 miles of laterals ([Orland Project](#)). It is also one of the oldest Federal Reclamation projects in the country and one of the first undertaken in California, getting authorized in 1907. East Park Reservoir is primarily utilized for storing irrigation water and recreation. There is one National Inventory of Dams (NID 2024) designated dam located in the watershed upstream of East Park Reservoir. Upper Letts Reservoir (NID ID CA10302) was completed in 1958 and has a reported reservoir storage capacity of 319 acre-feet (acre-ft).

East Park Dam is located roughly 20 miles southwest of Willows, California storing runoff from Little Stony Creek and Indian Creek (figure 1). The dam is owned by Reclamation and operated by the Orland Unit Water Users' Association. East Park Dam is a concrete arch-type structure with a structural height of 139 feet (ft) and crest elevation of 1198.68 ft. There is a 3-ft-high parapet wall on the dam crest that increases the maximum water surface elevation to 1201.68 ft. The spillway is a separate structure roughly 2,000 ft south of the dam with an uncontrolled crest elevation of 1198.18 ft, although, 1.5-ft-high flashboards are sometimes placed on the spillway (elevation 1199.68 ft) to increase storage capacity. Design discharge over the spillway is 9,200 cubic feet per second (ft³/s) at elevation 1201.68 ft. The outlet works consists of an intake tower on the left upstream face of the dam with three slide gates at various elevations and a low elevation manually operated gate valve leading to a 2-ft diameter cast iron conduit for the intended use of sluicing that all combine for a total outlet capacity of 750 ft³/s at elevation 1198.18 ft. The gate valve is not currently operational as it is buried in silt. The original reservoir had a design storage capacity of 50,880 acre-ft at the top of active conservation pool (1199.68 ft).

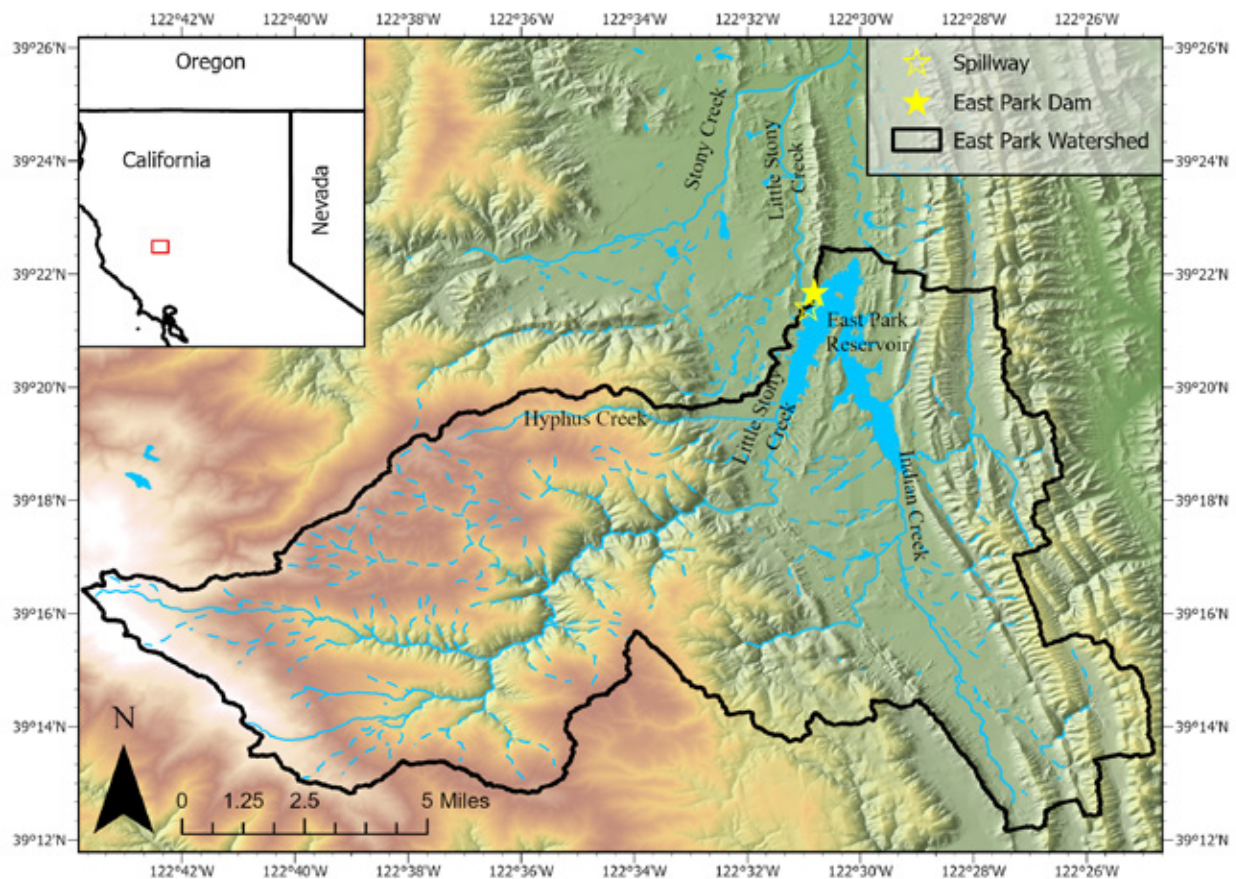


Figure 1.—Location map for East Park Dam and Reservoir, located approximately 20 miles southwest of Willows, California.

East Park Reservoir consists of two main arms running primarily north to south. The west arm encompasses the Little Stony Creek drainage and forms the main reservoir body, while the east arm is fed from Indian Creek and joins the west arm roughly across from the dam. The west and east arms are approximately 3.3 and 3.1 miles (mi) in length, respectively. The reservoir is widest at the dam at approximately 0.7 mi and narrows to the north and south. In general, the west arm is wider than the east arm. When the reservoir is full, sedimentation and a prominent delta are hard to observe. However, in some historical aerial imagery sets, sediment deposits are visible near the Little Stony and Indian Creek inputs (figure 2).



Figure 2.—Deltas from the Little Stony and Indian Creek inflow. The left image shows a low reservoir water surface elevation (2021) while the right image shows a high reservoir water surface elevation (2023).

A local monitoring station (ID EPK) managed by the California Department of Water Resources has been recording a variety of parameters on East Park Reservoir including daily water levels since 2001 (figure 3) and posting them via the California Data Exchange Center (CDEC). According to this data, the reservoir is predominately operated in the active conservation pool with a top elevation of 1198.18 or 1199.68 ft depending on if the removable spillway flashboards are in place. Like most reservoirs this size, there are annual fluctuations in the water surface elevation. Water surface elevations have dropped into the dead pool only once (in late 2021) in the last 25 years of record and have never exceeded the top of surcharge (parapet wall on the crest of the dam). The drawdown in 2021 (figure 4) was purposeful to facilitate a repair on the dam and seeing the elevated sediment levels is what prompted the survey request to update the reservoir's storage capacity. The 3-year period from 2020–2022 was the lowest the reservoir has dropped annually in recent history outside of 2002 and 2014. Since 2001, the reservoir has filled to the top of active conservation nearly every year.

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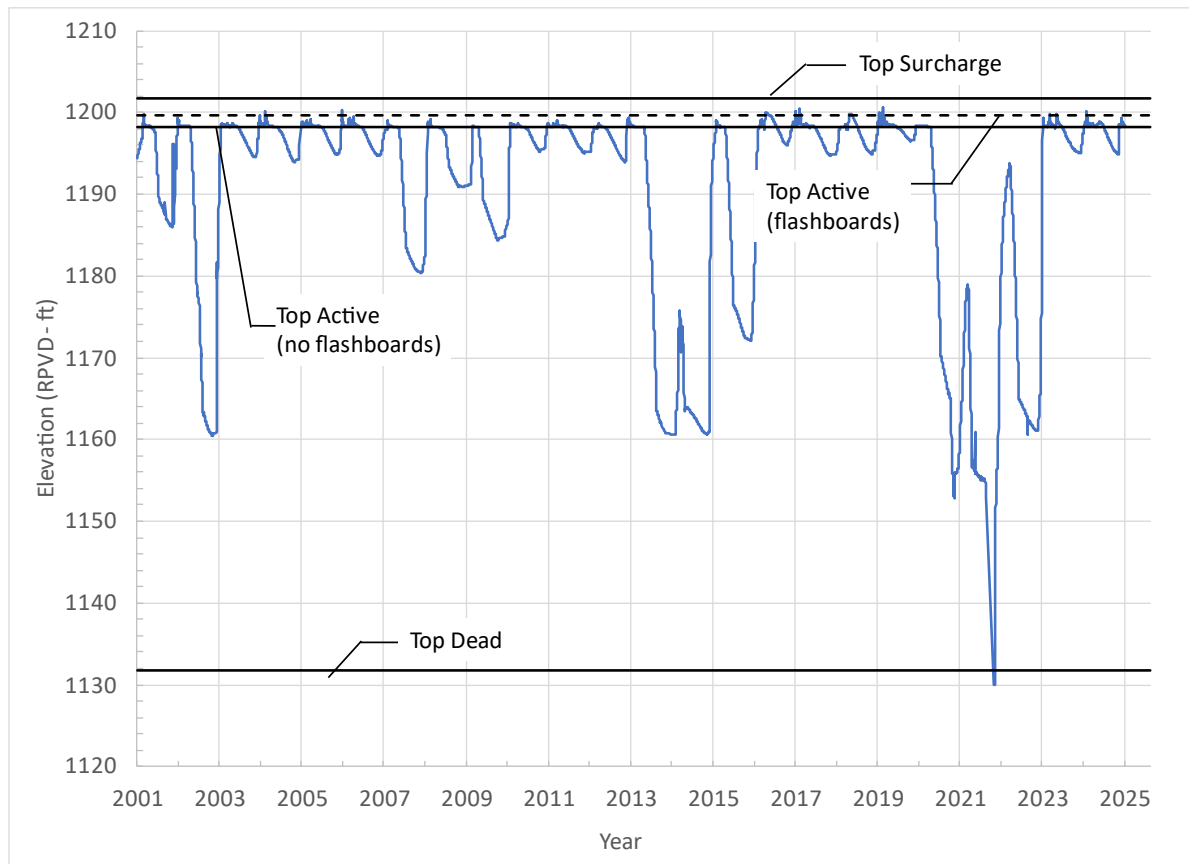


Figure 3.—Recent historical water surface elevations for East Park Reservoir. Source data from CDEC database (Station ID EPK).



Figure 4.—Sediment deposition at dam during 2021 drawdown.

Although mean daily inflow and outflow values are not available through CDEC, there are daily storage change data. It could be assumed that a positive storage change (net gain) equates to a net inflow, while a negative storage change (net loss) equates to a net outflow (figure 5). The largest net inflow occurred in late 2014 immediately following the low water level seen in figure 3, likely the result of a forecasted event. The largest net outflow occurred in 2021, corresponding to the lowest water level in the most recent 25 years. However, the larger outflows don't always correlate to lower reservoir levels. Overall, there are larger and more numerous inflow events than outflow events.

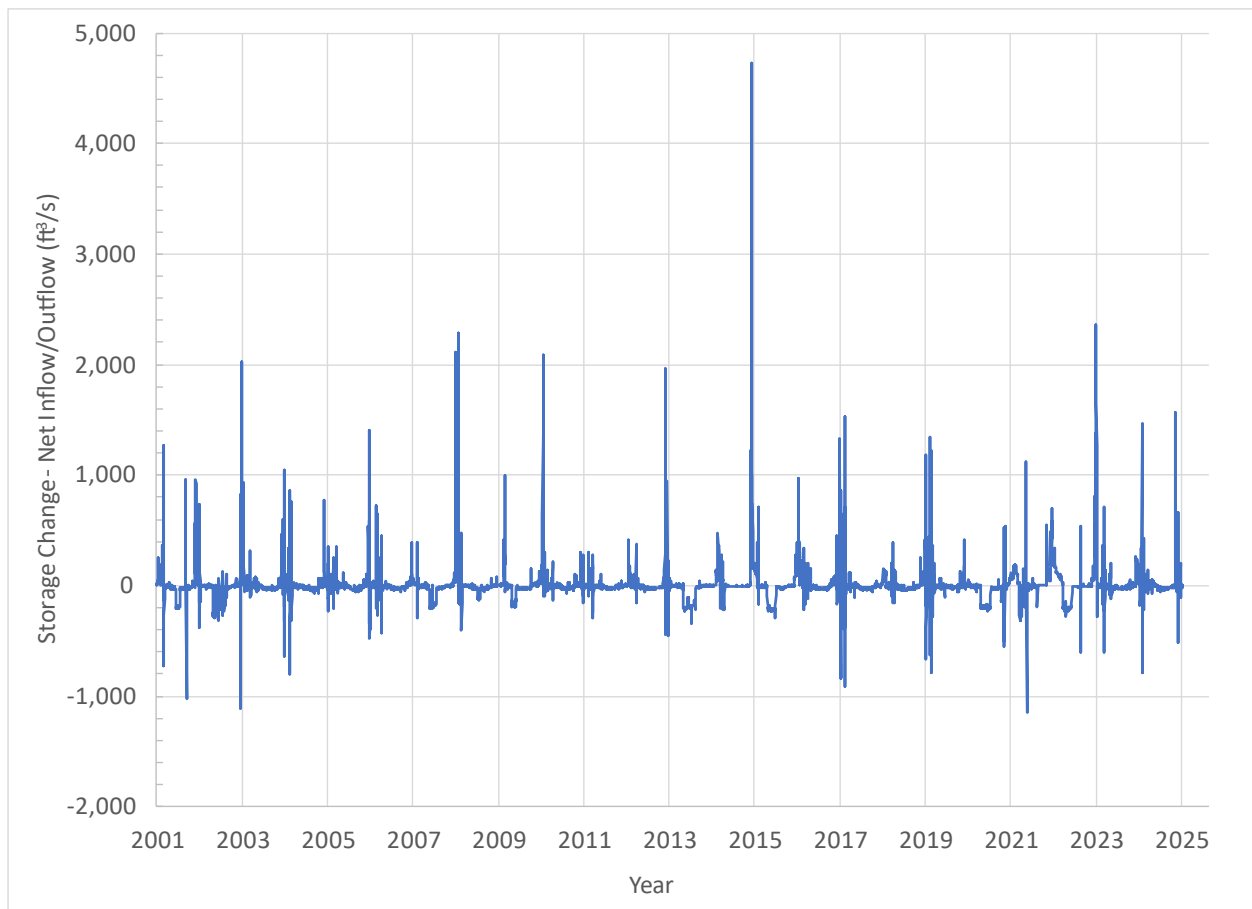


Figure 5.—Mean daily net inflows (positive values) and outflows (negative values) to East Park Reservoir assumed from daily storage change records. Source data from CDEC database (Station ID EPK).

1.2 East Park Reservoir Watershed

The East Park Reservoir watershed is in Northern California on the east side of California Coast Ranges about 2 miles east of the small town of Stonyford. The entire watershed is in Colusa County, near the western boundary of the Central Valley. The western arm of the reservoir occupies the Little Stony Creek drainage, and the eastern arm occupies the Indian Creek

drainage. The drainage area of the watershed measured at the East Park Dam is 98.7 square miles (mi²), according to the National Hydrography Data (NHD) Plus medium-resolution flowlines ([NHD 2023](#)). Elevations in the basin range from 1187 ft (North American Vertical Datum, established 1988 [NAVD88]) to 6114 ft at the Summit of Goat Mountain on the western edge of the basin (USGS 2019).

More than 90% of the basin is classified as grassland or shrubland in the National Land Cover Database (NLCD; Jin et al. 2019). About 4% of the basin is classified as developed and only about 2% of the basin is forested, mostly evergreen forest at higher elevations in the western portion of the drainage. The NLCD classification is shown in figure 6 and summarized in table 1.

The climate in the basin is classified as temperate with either hot or warm, dry summers (Csa or Csb) in Köppen-Geiger climate classification system (Beck 2018; figure 7, and table 2). The basin averages 32.5 inches of precipitation a year (USGS 2019).

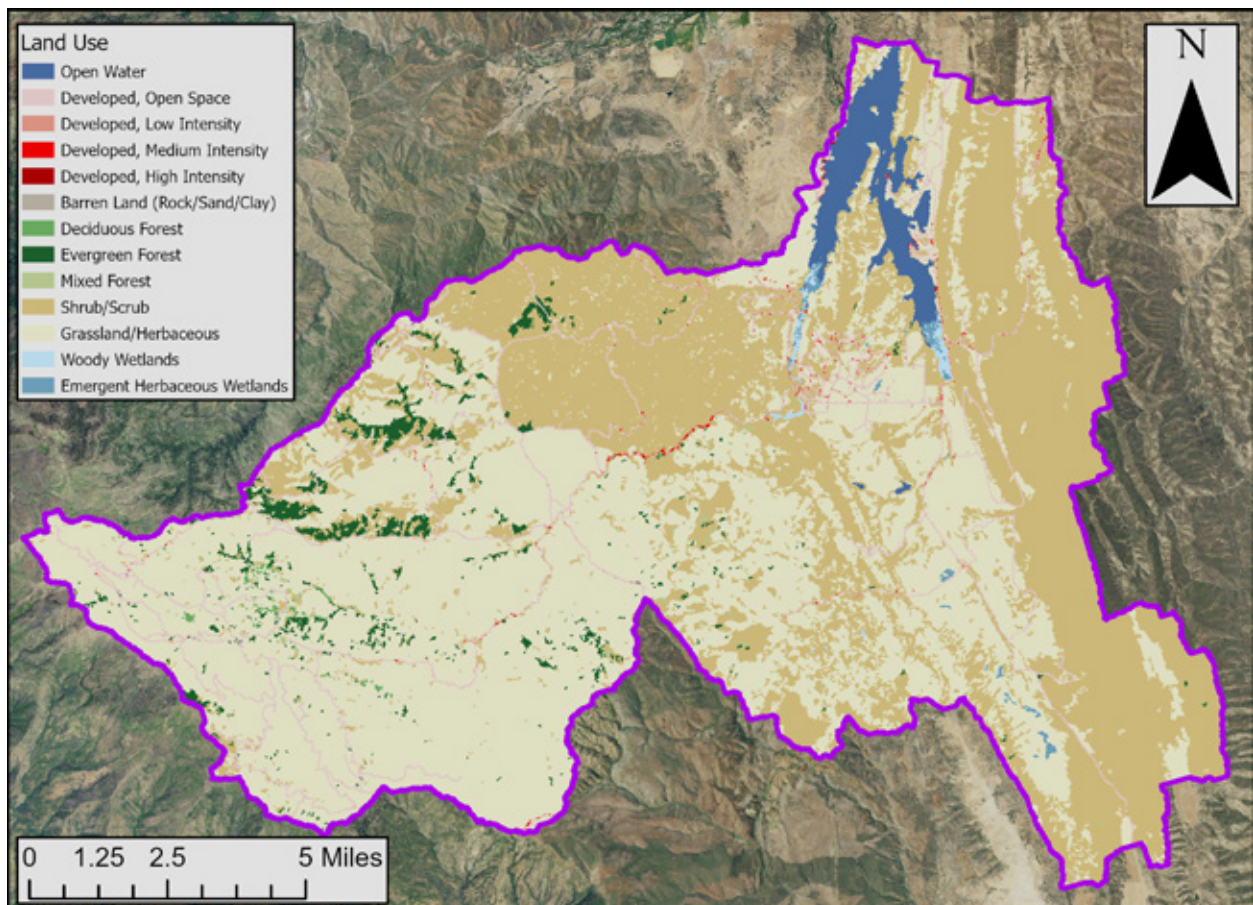


Figure 6.—Land cover classification in the East Park Reservoir watershed (Jin et al. 2019).

Table 1.—The percentage of the basin by land cover classification. Classes and descriptions from Jin et al. (2019)

Fraction of Basin	Land Use Class	Description
50.9%	Grassland/ herbaceous	Areas dominated by graminoid or herbaceous vegetation, generally greater than 80% of total vegetation. These areas are not subject to intensive management such as tilling but can be utilized for grazing.
39.5%	Shrub/scrub	Areas dominated by shrubs; less than 5 meters tall with shrub canopy typically greater than 20% of total vegetation. This class includes true shrubs, young trees in an early successional stage or trees stunted from environmental conditions.
3.8%	Developed, open space	Areas with a mixture of some constructed materials, but mostly vegetation in the form of lawn grasses. Impervious surfaces account for less than 20% of total cover. These areas most commonly include large-lot single-family housing units, parks, golf courses, and vegetation planted in developed settings for recreation, erosion control, or aesthetic purposes.
2.5%	Open water	Areas of open water, generally with less than 25% cover of vegetation or soil.
1.9%	Evergreen forest	Areas dominated by trees generally greater than 5 meters tall, and greater than 20% of total vegetation cover. More than 75% of the tree species maintain their leaves all year. Canopy is never without green foliage.
1.4%	Other	Including developed land, mixed and deciduous forest, and wetlands

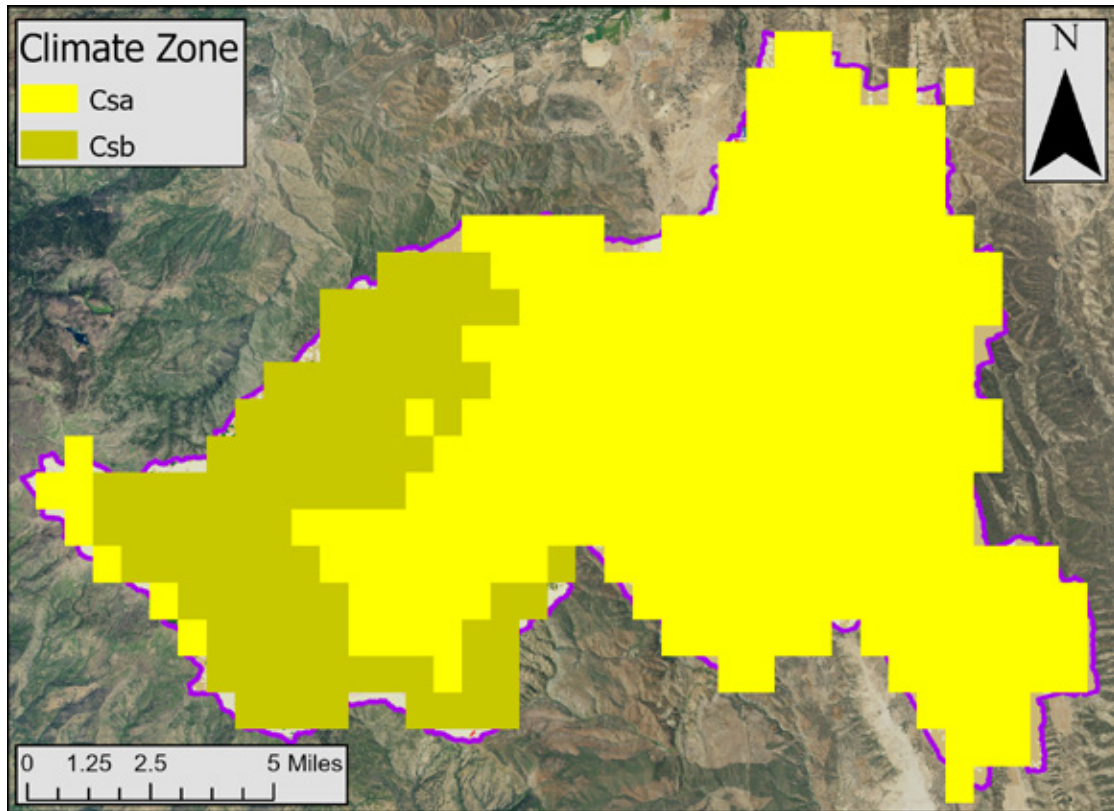


Figure 7.—The Köppen-Geiger climate classification of the basin. (Beck 2018). The climate is temperate with hot, dry summers (Csa) in the lower elevations in the eastern part of the basin and temperate with warm, dry summers (Csb) in the higher elevation areas to the west.

Table 2.—The Köppen-Geiger climate classification of the basin (Beck 2018)

Fraction of Basin	Class Code	Description
74.7%	Csa	Temperate, dry summer, hot summer
25.3%	Csb	Temperate, dry summer, warm summer

1.3 Basin Geology and Sediment Sources

The East Park Reservoir watershed is underlain by upper Jurassic to lower Cretaceous sedimentary rocks of the Great Valley Sequence on the eastern side of the basin and the similarly aged sedimentary, igneous, and metamorphic rocks of the Franciscan Complex on the west side. According to the USGS State Geologic Map Compilation (SGMC; Horton 2017), about 72% of the bedrock in the basin is fine grained sedimentary rocks. The generalized bedrock geology is shown in figure 8 and summarized in table 3.

The mapping of McLaughlin et al., (2018, partially reproduced in figure 9) in the western half of the basin differs from the SGMC in the extent of the Franciscan Mélange (the unit labeled fym) and include metasandstone and conglomerate (labeled fys) in rocks mapped as sandstone in the SGMC.

The SGMC mapping does not include any landslide deposits in the basin. A surficial geology map of the basin compiled from several sources (McLaughlin et al. 2018; Brown et al. 1961; Rich 1971, figure 9) shows that areas mapped as Quaternary landslide deposits make up nearly 7% of the basin, mostly in the headwaters of Little Stony Creek. These deposits are highlighted in figure 9 and are likely composed of mobile sediment that could contribute to reservoir sedimentation.

The landslides mapped in figure 9 may not be the only landslides in the basin. The most recent source in that figure was published in 2018. About 50% of the basin burned in the Ranch Fire in 2018 and more than 70% of the basin has burned since 2012 (figures 10 and 11). Burned areas are known to disproportionately produce sediment and are prone to landslides and debris flows in post-fire rainstorms (e.g., Rengers et al. 2020).

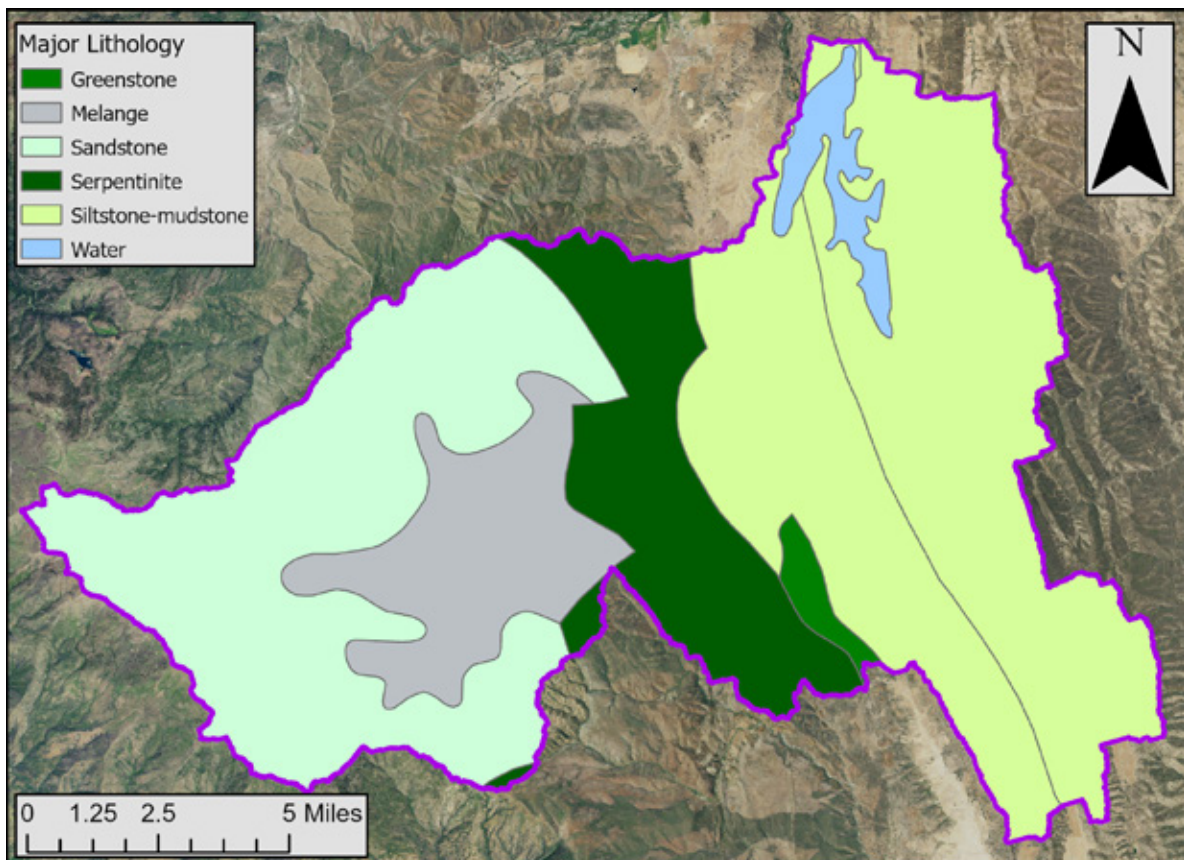


Figure 8.—Generalized bedrock geology of the basin. The geologic map is from the USGS State Geologic Map Compilation (Horton 2017).

Table 3.—Generalized bedrock geology of the basin (Horton 2017)

Lithology	Total Area (square miles)	Percentage of Basin
Siltstone-mudstone	41.6	42.3%
Sandstone	29.1	29.7%
Serpentinite	13.2	13.5%
Mélange	10.6	10.8%
Water	2.5	2.6%
Greenstone	1.1	1.1%

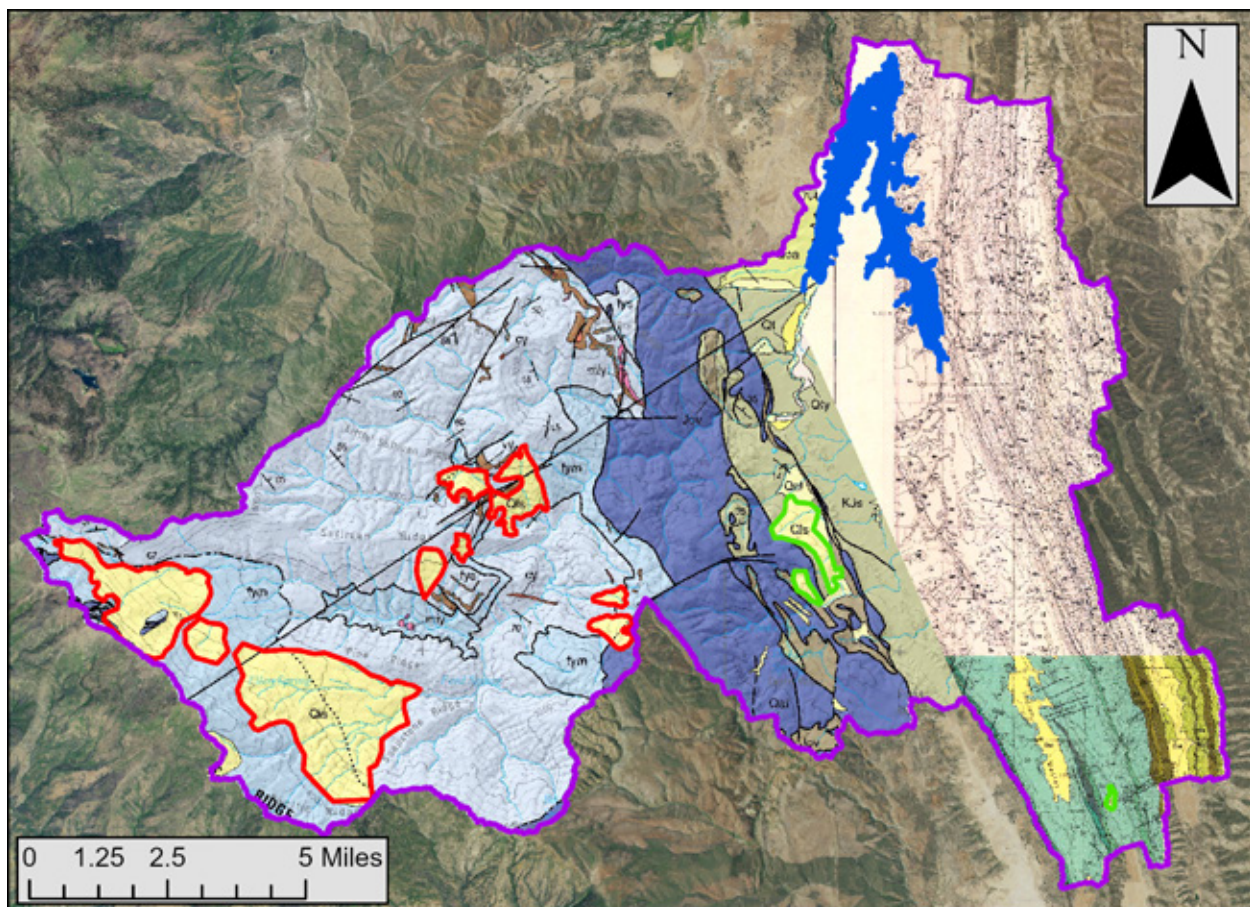


Figure 9.—Surfacial geology of the basin. Red polygons outline mapped landslide deposits in the Little Stony Creek watershed. Lime green polygons outline mapped landslides in the Indian Creek watershed. Total mapped landslide area is about 6.7 mi², about 6.8% of the basin area. Map compiled from McLaughlin et al. (2018) in the west, Brown et al. (1961) in the northeast, and Rich (1971) in the southeast. The blank area in the northeast portion of the map is where the maps don't overlap, with no data available.

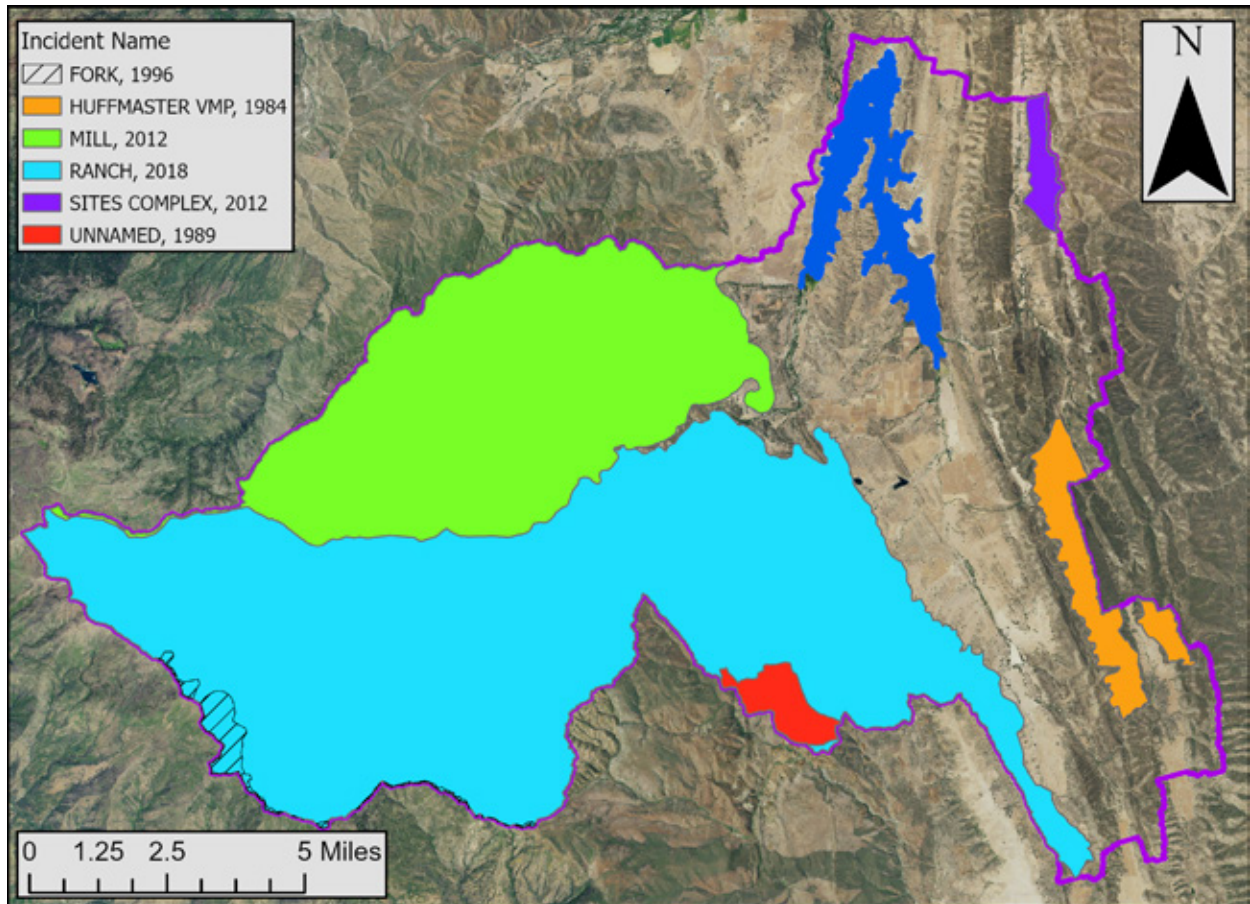


Figure 10.—Fire history in the basin between 1984 and 2024 (MTBS 2024).

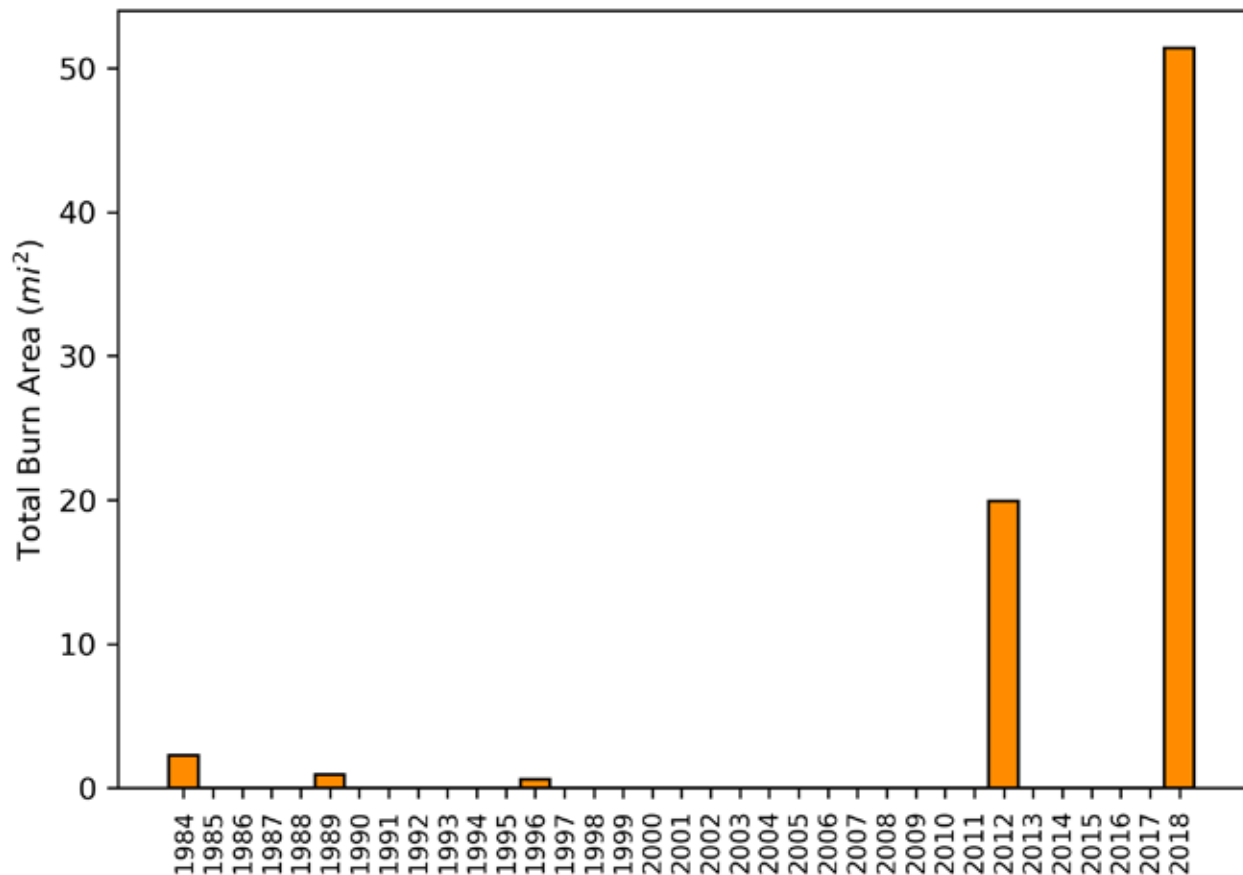


Figure 11.—The area in the basin burned in each year since 1984 (MTBS 2024). Basin size is 98.7 mi².

2.0 Data Collection Methods

2.1 Reservoir Bathymetric Survey

We collected bathymetric survey data in East Park Reservoir from August 6–9, 2023 using an 18-ft flat bottom aluminum boat equipped with a multibeam sonar system. Lidar data was obtained from the USGS collected in 2018 to represent the above-water topography. The water surface elevation on the reservoir was high at the time of the bathymetric survey (1197.2 ft) and the lidar dataset was collected when the reservoir was at a lower water surface elevation (1194.5 ft). However, assuming the shallowest useable bathymetric data is 5 ft below the water surface (1192.2 ft), there was no overlap with the lidar and a vertical data gap of roughly 2.3 ft that needed to be interpolated across. Additional details about the data collection can be found in appendix A.

2.2 Sediment Coring

Included with the bathymetric survey was a sediment investigation to look at physical properties along with a constituent's analysis. A total of five sediment cores were collected on August 10, 2023, from the same vessel used for the bathymetry survey using a Vibracore sampler with 8-ft-long 3-inch-diameter acrylic tubes. Two samples were collected on the Little Stony Creek arm with the other three on the Indian Creek arm. All were collected on what was assumed to be the reservoir delta in roughly 10-ft of water (depth). Physical properties testing included gradation with hydrometer, Atterberg limits, specific gravity, and classifications using the Unified Soil Classification System. Constituents testing looked for potential contaminants including petroleum hydrocarbons, pesticides, herbicides, and metals.

3.0 Data Analysis Methods

3.1 Surface Creation

The topobathymetric digital elevation model (DEM) for East Park Reservoir was created by combining bathymetric data (collected and interpolated) with a lidar-derived DEM (figure 12); the collected bathymetric data yielded nearly complete coverage of the reservoir. All data processing was done in ArcGIS® Pro software. The lidar DEM was converted to points and elevations shifted from North American Vertical Datum of 1988 (NAVD88) to Reclamation Project Vertical Datum (RPVD) using a conversion factor based on a GPS control survey conducted in July 2023 by California-Great Basin professional land survey crew personnel (appendix B). Open water portions from the lidar DEM, represented as a flat (constant) water surface elevation at the time of the lidar flight, were removed and replaced with both collected and interpolated bathymetry data. The only interpolated bathymetry data was on the west arm (Little Stony Creek) delta, which utilized the existing delta slope to assign elevations to points along a series of breaklines to better represent the transition from the bathymetric data to the above-water bare earth lidar data.

As mentioned above, there was no overlap between the lidar and bathymetric datasets. Therefore, areas between these datasets were interpolated by removing all data within an applied buffer of the bathymetry data and allowing the interpolation routine to solve across the gap. All three data sources were combined, and using the natural neighbor interpolation routine, a floating-point raster on a 3-ft grid spacing was generated to represent the final surface (figure 13). The raster was clipped to an elevation of 1255 ft and along the dam crest to exclude any lower surface elevations outside of the reservoir pool for the area-capacity calculations. A mapbook detailing the 2023 East Park Reservoir DEM is included in appendix C.

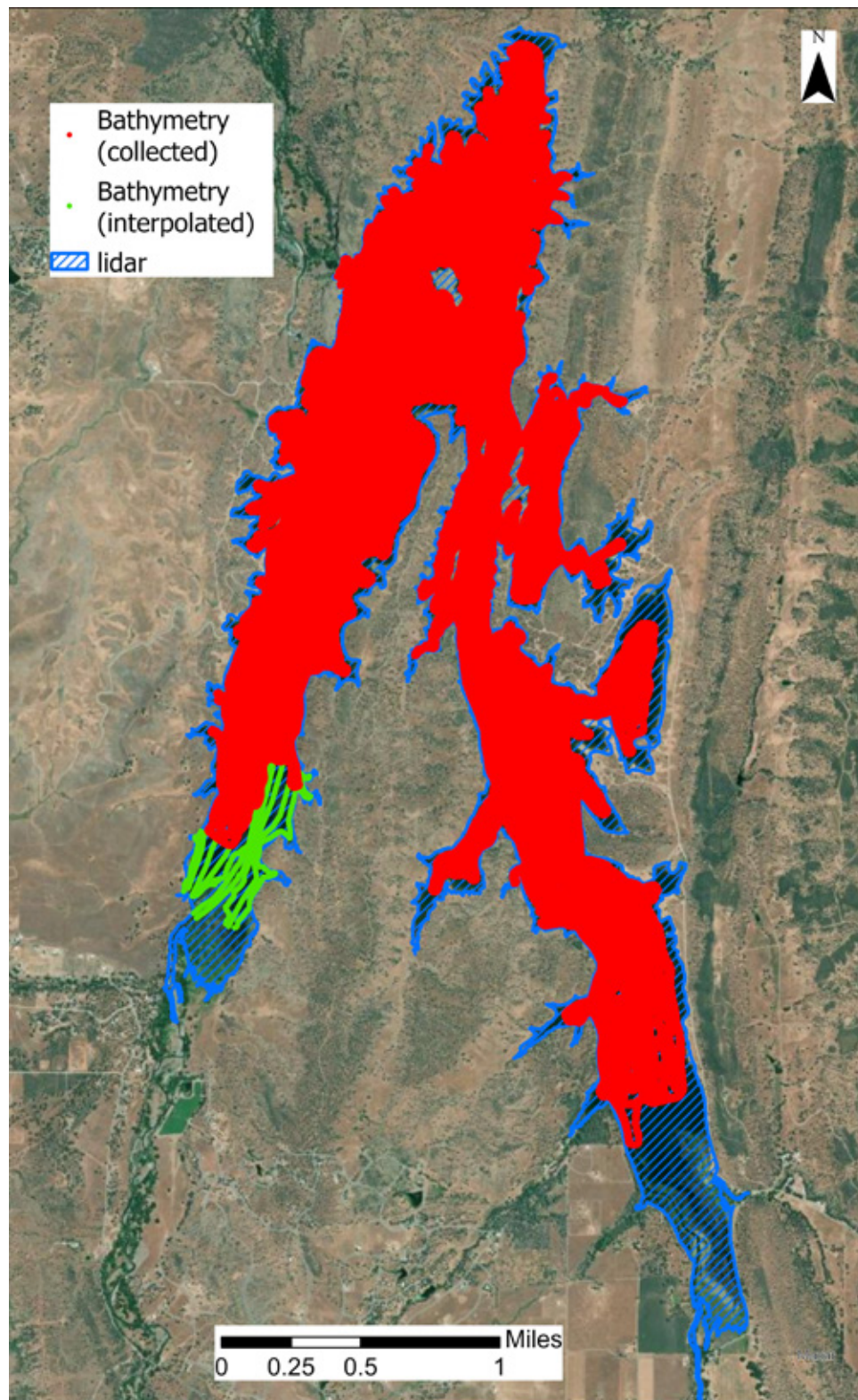


Figure 12.—Data sources used in the creation of the topobathymetric surface for East Park Reservoir.

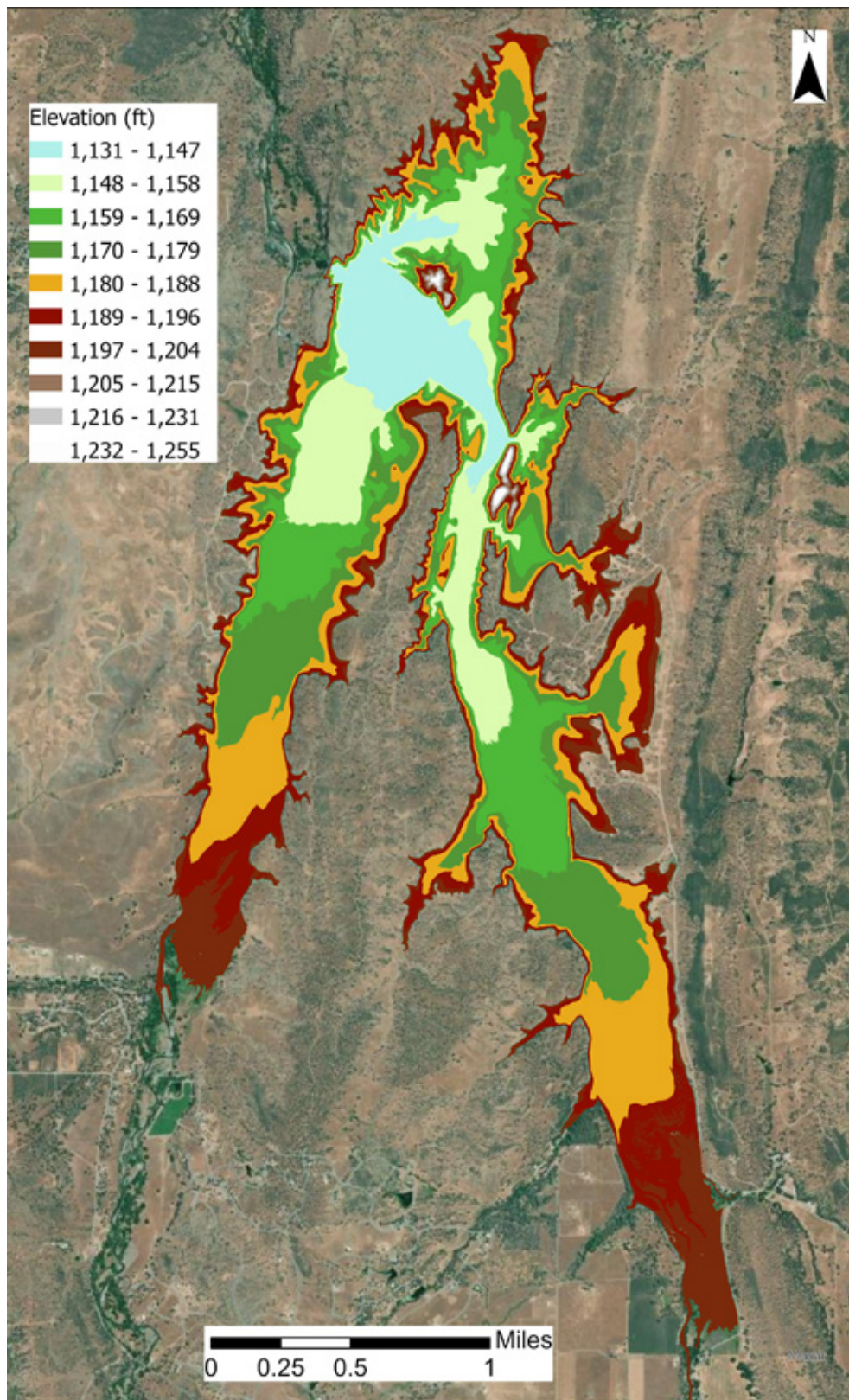


Figure 13.—The final topobathymetric surface for East Park Reservoir.

3.2 Computation of Reservoir Surface Area, Storage Capacity, and Sedimentation Volume

We used our final topobathymetric surface to create a new surface area and capacity relation for East Park Reservoir. We computed horizontal surface areas at 1-ft vertical increments using an in-house ArcGIS® tool (Area-CAPacity [ACAP] Program Version 2.0 [Bradley 2021]). The tool smoothly interpolates the reservoir surface areas and capacities to 0.1- and 0.01-ft increments between each 1-ft interval (for detailed methods see Bradley 2021). ACAP v2.0 is a replacement for the ACAP85 Program (Reclamation 1985).

The ACAP v2.0 program interpolates the reservoir storage capacity at the i^{th} interpolation point between 1-ft intervals, so that:

$$V_i = V_b + A_b(y_i - y_b) + C(y_i - y_b)^m \quad (1)$$

where:

1. V_i is the storage capacity (acre-ft) at the target elevation y_i (ft),
2. V_b is the storage capacity (acre-ft) at the bottom of the 1-ft elevation increment y_b (ft),
3. A_b is the surface area (acres) at the bottom of the 1-ft elevation increment y_b (ft),
4. C is a coefficient for the nonlinear rate of increase in storage capacity, and
5. m is an exponent of nonlinearity in the increase in storage capacity.

The surface area A_i (acres) is then calculated at the target elevation y_i (ft), as the derivative of the volume equation (equation 1), where:

$$A_i = A_b + Cm(y_i - y_b)^{m-1} \quad (2)$$

Here, the elevation increment is 1 ft, such that $\Delta y = y_t - y_b = 1$ ft, where y_t represents the top of the elevation interval. The final coefficients for C and m must ensure the surface areas and the corresponding storage capacities at the 1-ft vertical increments remain unchanged. Therefore, we treat the storage volumes, V_t and V_b (acre-ft), and surface areas, A_t and A_b (acres), as known values measured at elevations y_t and y_b , respectively. We can then solve for C and m between elevations y_t and y_b :

$$C = \frac{V_t - V_b - A_b \Delta y}{\Delta y^m} \quad (3)$$

$$m = \frac{(A_t - A_b) \Delta y}{V_t - V_b - A_b \Delta y} \quad (4)$$

Using this methodology, the areas and capacities for the dead pool, active conservation pool, dam crest, and maximum water surface (surcharge) were calculated in ArcGIS Pro based on the surface geometry discussed in the previous section. Comparing capacities to previous surveys yielded historic as well as future trends in sedimentation volume.

3.3 Sediment Yield Model

We provide estimates of future sedimentation at East Park Reservoir from a national sedimentation model (Foster et al. 2023), which implements model framework developed by Minear and Kondolf (2009). Dams included in the model snap to a National Hydrography (NHD) Plus Medium Resolution flowline within 250 meters; in the case of East Park, the only upstream NID dam is not within 250 meters and therefore not included in the model.

This model uses surveyed reservoir capacities to numerically constrain sediment yield rates throughout a basin. The model numerically solves for a sediment yield rate that incorporates the emplacement of upstream dams, the accumulation of sediment at upstream dams, and changing trapping efficiency at dams through time. This model enables the incorporation of reservoir survey data from differing time periods on multiple reservoir subbasins, including nested reservoir subbasins, to constrain sediment yield rates within larger basins. For reservoirs lacking survey data, the model applies the solution for sediment yield at the closest downstream, surveyed reservoir.

The model uses repeat survey data from the first and most recent available surveys, typically measured at the top of the conservation pool or joint use pool, to constrain the volume of sediment deposited between two surveys at a reservoir of interest:

$$V_{a_{sed}} = V_{a_{cap1}} - V_{a_{cap2}} \quad (5)$$

where $V_{a_{sed}}$ is the volume of sediment in cubic meters (m^3) at reservoir a , $V_{a_{cap1}}$ is the reservoir storage volume (water) for reservoir a at the earlier survey 1 in acre-ft, and $V_{a_{cap2}}$ is the reservoir storage volume (water) for reservoir a at the later survey 2 in acre-ft. A volumetric sediment yield rate in acre-feet per square mile per year ($AF \cdot mi^{-2} \cdot yr^{-1}$) is calculated at reservoir a by dividing the volumetric sedimentation rate by the time-weighted effective sediment-contributing drainage area ($A_{sedeff_{a,\bar{t}}}$), such that:

$$Y_{a_{vol}} = \frac{V_{a_{sed}}}{(t_{a,survey_2} - t_{a,survey_1})A_{sedeff_{a,\bar{t}}}} \quad (6)$$

The $A_{sedeff_{a,\bar{t}}}$ accounts for the emplacement of upstream dams through time (dams b to n in Equation 7), their trap efficiency, and the trap efficiency at the downstream dam of interest (at reservoir a), where:

$$A_{sed_{a,t}} = A_{tot_a} - \sum_{b=1}^n T_{E_{b,t}}(A_{tot_b}) + T_{E_{b+1,t}}(A_{tot_c}) \dots + T_{E_{n-1,t}}(A_{tot_{n-1}}) + T_{E_{n,t}}(A_{tot_n}) \quad (7)$$

$$A_{sedeff_{a,t}} = (A_{sed_{a,t}})(T_{E_{a,t}}) \quad (8)$$

$$\sum_{t=1}^n A_{sedeff_{a,\bar{t}}} = \frac{A_{sedeff_{a,t}} + A_{sedeff_{a,t+1}} \dots + A_{sedeff_{a,n-1}} + A_{sedeff_{a,n}}}{n} = (A_{sed_{a,\bar{t}}}) (T_{E_{a,\bar{t}}}) \quad (9)$$

where T_E is trap efficiency, reservoir a is the farthest downstream dam, reservoirs b through n are upstream dams, A_{tot} is the total drainage area associated with reservoirs a through n , $A_{sed_{a,t}}$ is the sediment contributing drainage area at reservoir a at time t , $A_{sedeff_{a,t}}$ is the effective sediment contributing drainage area for reservoir a at time t (Miner and Kondolf 2009), and $A_{sedeff_{a,\bar{t}}}$ is the time-weighted effective sediment-contributing drainage area between surveys, occurring at times $t=1$ and $t=n$.

Trap efficiency is calculated using the Brown (1944) equation. The Brune (1953) trap efficiency equation is more commonly implemented but requires inflow data. Because the Foster et al. (2023) study includes many reservoirs lacking inflow data, they opt to use the Brown equation, such that:

$$T_{E_{a,t}} = 1 - \frac{1}{1 + \kappa \frac{C_{a,(t-1)}}{A_{tot_a}}} \quad (10)$$

where $T_{E_{a,t}}$ is the trap efficiency at reservoir a for time t , expressed as a decimal value between 0 and 1 (also commonly multiplied by 100 and expressed as a percentage). κ is a coefficient applied to represent sediment size, here $\kappa=0.1$ to represent silt-sized sediment, consistent with the design assumption for reservoir sedimentation. The κ value varies for sand or clay-sized sediment, resulting in higher trap efficiencies for sand and lower trap efficiencies for clay. $C_{a,(t-1)}$ is the storage capacity (acre-ft) at reservoir a for the previous timestep ($t-1$) and A_{tot_a} is the total upstream drainage area at reservoir a in square miles (mi^2).

At reservoirs with survey data, the sedimentation model uses the reservoir capacity during the first survey (V_{cap1}) and iteratively solves for a volumetric sediment yield rate resulting in a reservoir capacity within 0.01% of the reported value for the second survey (V_{cap2}). The model steps through time, accumulating sediment at upstream reservoirs and adjusting the sediment-contributing drainage area and trap efficiency for all dams at every timestep ($dt=1$). The power of this model is that it incorporates survey data from multiple reservoirs over different time periods while also accounting for trapping at unsurveyed sites. Consistent with Miner and Kondolf (2009), the model does not account for propagated error associated with reservoir survey capacity because the error associated with these surveys is rarely, if ever, reported. The model uses the first and last available survey data in hopes that magnitude of capacity loss between surveys greatly exceeds the magnitude of capacity error associated surveys. We note that users should be cognizant of the unconstrained error associated with modeled sediment yield rates and

sediment-contributing drainage areas. However, at East Park Reservoir, the sediment-contributing drainage area ($A_{sed_{a,t}}$) is equal to the total drainage area because there are not any dams upstream from East Park Reservoir included in the national model.

Because these predictions are modified from a national model, there are many simplifying assumptions. Sedimentation is greatly influenced by stochastic events such as floods and wildfires, which the model does not account for in these projections. It is important to recognize that the model produces an average projection based on past processes, including both the average sedimentation yield and any previous reservoir management and sediment management practices. We offer this analysis for the purpose of comparison and for consistency in our approach to evaluating sedimentation at other Reclamation reservoirs.

4.0 Results

4.1 Area-Capacity

The 2023 topobathymetric surface for East Park Reservoir yielded a surface area of 1,730 acres and corresponding capacity of 43,542 acre-ft at elevation 1198.18 ft (top of active conservation without flashboards installed; figure 15). This represents a total capacity loss of 4,483 acre-ft (9.3%) from the original (1910) design. During the 61-year period between the 1962 and 2023 surveys, the total reservoir capacity reduced by 2,523 acre-ft. There was a similar loss in capacity between 1910 and 1962 of 1,960 acre-ft over a similar period. A portion of this loss is likely due to a change in survey approaches from a range line technique to a much more detailed multi-beam sonar approach. Further, the lowest measured elevation in the reservoir is 1135.2 ft, which is 3.5 ft above the reported top of dead pool elevation, suggesting there is no more dead pool capacity remaining in East Park Reservoir. Appendix D contains the complete tables of 2023 surface areas and storage capacities from ACAP v2.0 computed at various elevation increments.

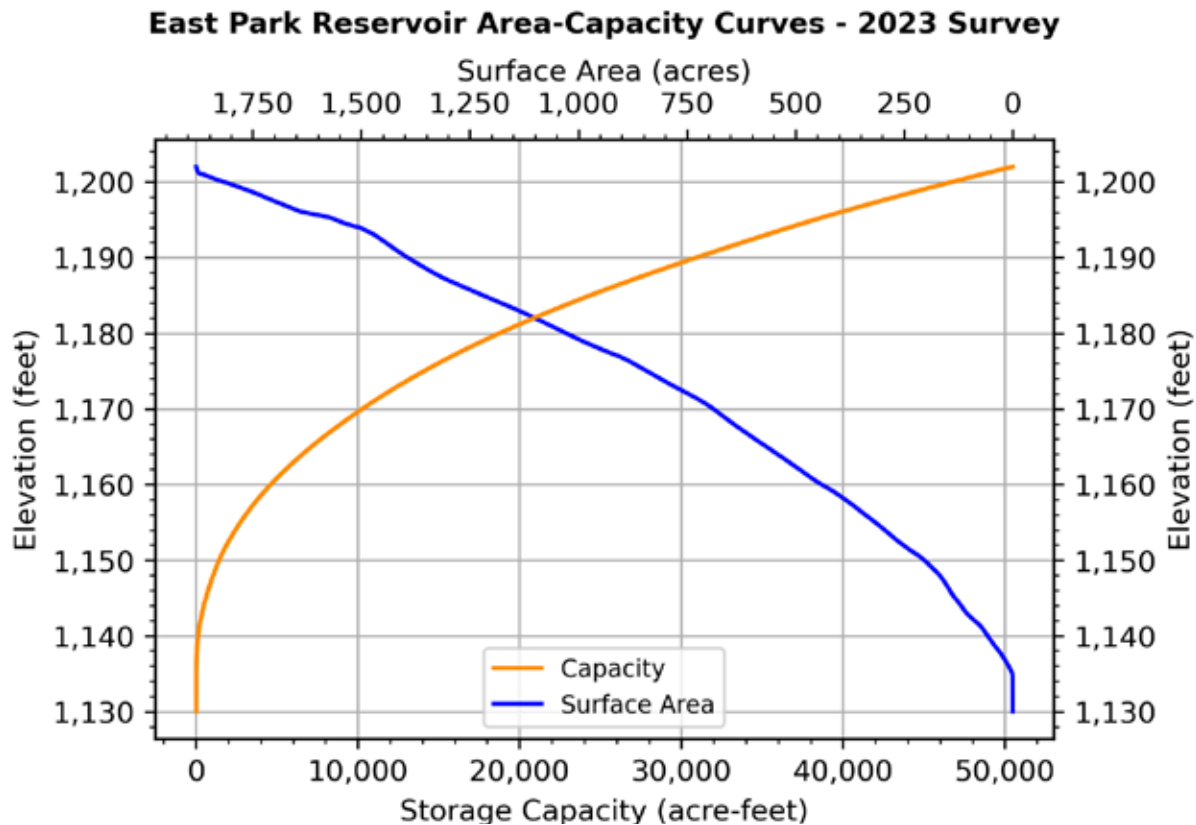


Figure 14.—Area-capacity curves for East Park Reservoir from 2023 survey data.

4.2 Sediment Physical Properties

The soil from all sediment cores were classified as lean clay (CL) except for one of the cores on the Little Stony Creek arm, which was classified as silt (ML). In general, the sediment on the Little Stony Creek arm had higher silt content, while sediment from the Indian Creek arm had higher clay content. All samples were highly plastic, and all had very high void ratios, ranging from 1.36 to 1.81. Complete details of the soil physical properties test results including drill logs and sample photos are documented in a separate report (Oligney 2024).

4.3 Sediment Constituents

The soil samples were analyzed for the priority pollutant list compounds found in the Clean Water Act, Part 423. This list is comprised of 126 chemicals that the Environmental Protection Agency regulates when developing discharge standards to surface water sources. Chemicals typically found in reservoirs are pesticides and herbicides from agricultural use and their corresponding metals, gasoline and diesel from motorized boats, and dioxins and furans which are now banned but persist in soil. Results detected total petroleum hydrocarbons oil range compounds (C28-C40) and metals, including 0.13 milligrams per kilogram (mg/kg) of mercury.

No pesticides, herbicides, or dioxins/furans were detected. It was concluded that further sampling and analysis will be needed to aid in the determination as to whether the sediment is acceptable for re-use or disposal based on regulatory requirements. Complete details of the soil constituents test results are documented in a separate report (Pederson 2024).

5.0 Interpretation of Area Capacity Changes

5.1 Reservoir Sediment Spatial Distribution

According to a sedimentation study conducted by the USGS in the upper Stony Creek basin during 1957–1962 (Knott and Dunnam 1969), a moderate amount of sediment accumulation was observed. Most of the sediment was deposited in the deeper parts of the reservoir in and along the main channels; degradation is taking place along the channel thalwegs at the upstream end of each arm. Also, sediment thickness increased in the downstream direction in both principal arms of the reservoir. It was shown that sediment enters the reservoir during the early part of runoff season, while the water is low, and is transported to lower reaches before it is deposited.

With a full dead pool, there is obviously sediment reaching the dam. Longitudinal profiles were generated up each arm (figure 15) to evaluate the presence/absence of a delta front via a pivot point or obvious areas of deposition through flatter sloped areas. Little Stony Creek has a relatively consistent slope compared to the Indian Creek drainage. This corroborates with the natural pinch points (width constrictions) that are observed along the Indian Creek arm that tend to result in a damming effect of the sediment deposits. Also, there appears to be a slope break after the two arms merge together, steepening the channel as it approaches the dam.

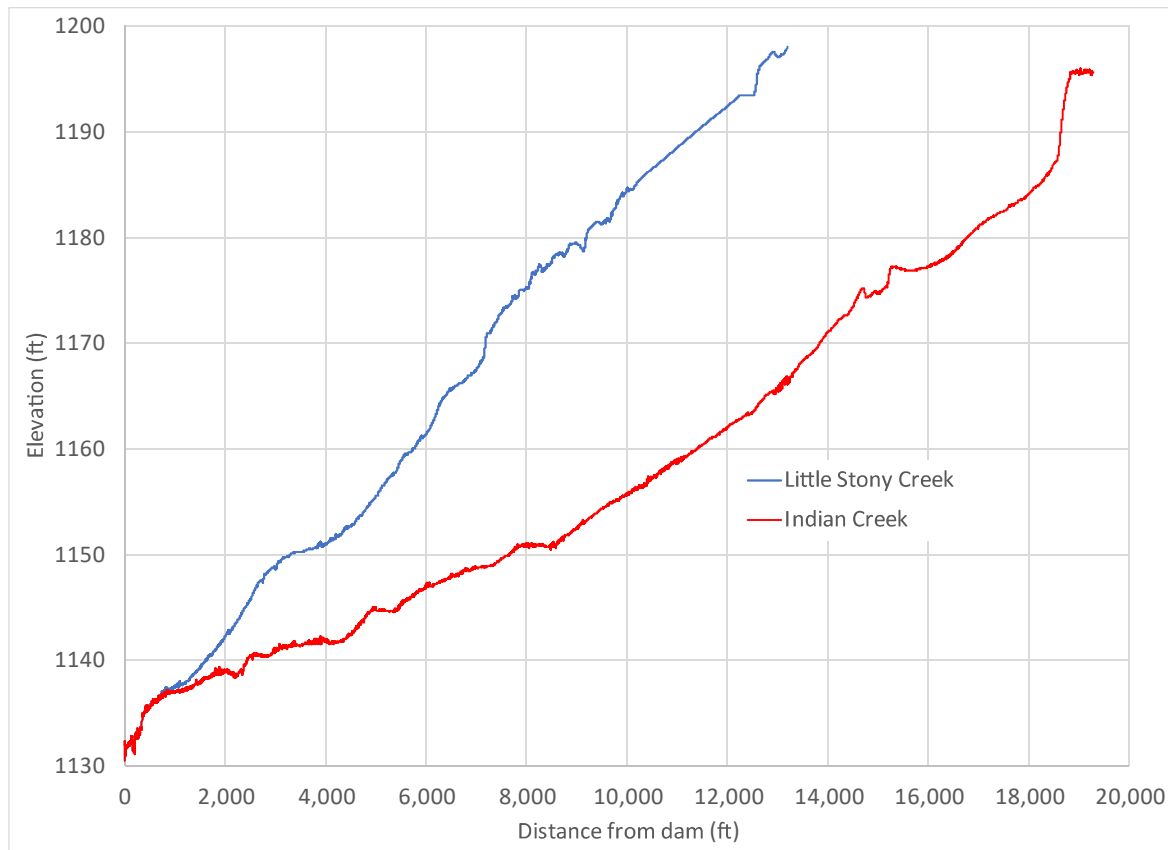


Figure 15.—Longitudinal profiles of each drainage arm in East Park Reservoir.

5.2 Trends in Sedimentation and Trap Efficiency

At East Park Reservoir, the sediment-contributing drainage area (A_{sed}) is impacted by only the emplacement of Upper Letts Reservoir, which has a total capacity of 319 acre-ft and a total drainage area of 0.6 mi². The national sediment yield model does not include this dam because it was not located within 820 ft (250 meters) of a NHD flowline. However, its impact to sedimentation at East Park, which has an upstream drainage area of 98.7 mi², would be very minimal. Because the national model does not include any dams upstream from East Park, the sediment-contributing drainage area ($A_{sed_{a,t}}$, equation 7) is constant through time and equal to the total drainage area.

The model numerically solves for the sediment yield rate between 1910 and 2023 which best matches measured survey results in 2023. The modeled sediment yield rate is 0.422 AF mi⁻² yr⁻¹, resulting in a model capacity of 43,576 acre-ft at elevation 1198.18 in 2023, matching the surveyed capacity in 2023. The modeled sediment yield reflects the time-averaged sediment contributing drainage area ($A_{sed_{a,\bar{t}}}$) and the trap efficiency ($T_{E_{a,\bar{t}}}$) between 1910 and 2023. We use this sediment yield rate to project future sedimentation at East Park Reservoir (figure 17). To provide a range of future potential sedimentation, we also reran the model using the interim 1962

survey to find the highest and lowest sediment yield rates. The highest sediment yield rate was $0.422 \text{ AF mi}^{-2} \text{ yr}^{-1}$, between 1962 and 2023, and the lowest sediment yield rate was $0.390 \text{ AF mi}^{-2} \text{ yr}^{-1}$, between 1910 and 1962 (table 4); this is consistent with a USGS study that estimated a sediment yield rate of $0.37 \text{ AF mi}^{-2} \text{ yr}^{-1}$ during this same period (Knott and Dunnam 1969). Using these sediment yield rates, the model projects that East Park Reservoir will lose an additional 1,016 to 1,101 acre-ft of capacity by year 2050 (table 5), assuming there are no major changes in reservoir operations or uncharacteristically large sediment-influx events.

Table 4.—Summary table of model results of sediment-contributing drainage area, trap efficiency, and sediment yield rates for East Park Reservoir

Summary Data	Capacity Loss (acre-ft) Between Surveys		
	1910–1962	1962–2023	1910–2023
Total sedimentation between surveys (acre-ft), measured, at 1198.18 ft	1,960	2,489	4,449
Total sedimentation between surveys (acre-ft), modeled, at 1198.18 ft	2,049	2,400	4,449
Years between surveys	52	61	113
Time-weighted $A_{sedeff_{a,\bar{t}}}$ between surveys (mi^2)	96.72	96.62	96.66
Time-weighted T_E between surveys	0.9794 (97.94%)	0.9784 (97.84%)	0.9789 (97.89%)
Modeled sediment yield rate ($\text{AF mi}^{-2} \text{ yr}^{-1}$)	0.390 ^a	0.422 ^a	0.407

^a Sediment yield rates between surveys were generated from separate model runs using data from those specific surveys. The reported values for modeled sediment volume, time-weighted $A_{sedeff_{a,\bar{t}}}$ and time-weighted T_E are reported from the national model using the 1910 and 2023 survey data.

Table 5.—Modeled capacity and sediment volume at East Park Reservoir for year 2050

Elevation	2050 Modeled Capacity (acre-ft)			2050 Modeled Sediment Volume (acre-ft) ^a		
	Low SY	Mean SY	High SY	Low SY	Mean SY	High SY
1198.18 ^a	42,560	42,514	47,475	1,016	1,062	1,101

^a For year 2023, the modeled reservoir capacity was 43,576 acre-ft, matching the measured capacity of 43,576 acre-ft. To calculate the sedimentation volume in 2050, we deduct the modeled 2050 capacity from 43,576.

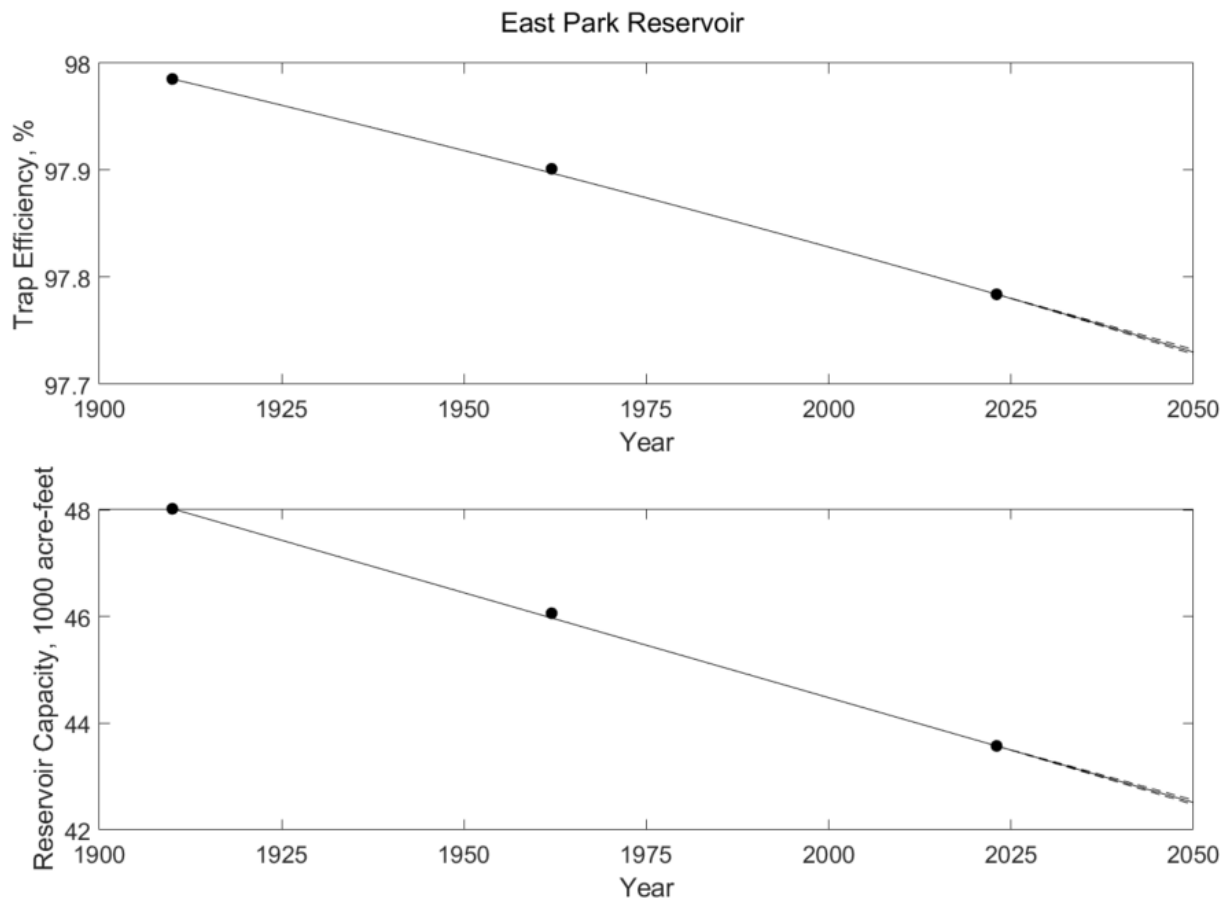


Figure 16.—Modeled trap efficiency (top plot) and capacity loss (bottom plot) through time. Survey capacities and trap efficiencies, computed from the Brown equation, are shown as solid black points. For the years 2023–2050, the solid line prediction represents predictions using the mean sediment yield rate and the dashed lines represent predictions using the low and high sediment yield rates.

6.0 Conclusions and Recommendations

The closure of East Park Dam in 1910 led to the creation of East Park Reservoir, a key asset within the Orland Project that is primarily utilized for recreation and storing irrigation water. East Park Reservoir was designed with an original storage capacity of 54,580 acre-ft at maximum water surface elevation of 1201.68 ft and 50,880 acre-ft at the top of active conservation pool elevation 1199.68 ft. Reclamation completed a detailed multi-beam bathymetric survey of the reservoir in August 2023, which we combined with 2018 topographic lidar data to create a seamless topobathymetric surface. We used this surface in conjunction with our in-house ACAP v2.0 program to generate new area and capacity tables for East Park Reservoir. Our 2023 survey reveals a loss of 4,695 acre-ft (8.6%) of total storage (below

elevation 1201.68 ft) that includes a complete loss of the dead storage pool below elevation 1131.68 ft; the lowest surveyed elevation at the dam was 1135.2 ft. Calculated sediment yield rates show a slight increase in sediment accumulation since the last survey in 1962 with a projected 1,062 acre-ft of additional storage loss by 2050.

A previous USGS study indicated most of the sediment was being deposited in the deeper parts of the reservoir in and along the main channels and that sediment thickness increased in the downstream direction. Longitudinal profiles were generated up each arm to evaluate the presence/absence of a delta front and/or areas of deposition. The Little Stony Creek arm was seen to have a relatively consistent slope indicating not as many localized areas of sediment deposition as compared to the Indian Creek arm. Additionally, physical properties and constituent's analyses were conducted on sediment core samples collected from each drainage arm that showed high clay content and detections of oil compounds and metals, including mercury. We recommend another resurvey of East Park Reservoir within the next 20 years to gain a better understanding of the sediment accumulation rate by comparing like survey methods. An addendum to our recommendation would be the occurrence of widespread wildfires in the watershed or a major flood event delivering large volumes of sediment to the reservoir, which would also be cause for another survey.

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Acknowledgments

Authors would like to acknowledge Reclamation's Asset Management Division that provided the funding for this survey. The survey crew out of Reclamation's California-Great Basin Regional Office established control for the reservoir. Erin Connor, David Varyu, and Mike Sixta with Reclamation's Sedimentation and River Hydraulics (SRH) Group at the TSC conducted the bathymetric survey and sediment cores collection in August 2023. Also, with the TSC, Lise Pederson with the Materials and Corrosion Laboratory Group and Blake Armstrong with the Geotechnical Laboratory and Field Support Group received, tested, and prepped the sediment samples in addition to providing summary reports. Bathymetric data were processed by Erin Connor and Mike Sixta (SRH). Jack Truax with the TSC Geographic Applications and Analysis Group built the digital elevation model and produced the digital elevation mapbook (Appendix C). Melissa Foster (SRH) performed the sediment yield modeling. Nate Bradley (SRH) summarized the basin geology and watershed characteristics. David Varyu (SRH) provided technical review of the final digital elevation model. Rob Hildale (SRH) peer reviewed this report. Thank you all!

Appendix A

Hydrographic Survey and Sediment Coring Equipment and Methods

Hydrographic Survey and Sediment Coring Equipment and Methods

We conducted the hydrographic survey of East Park Reservoir from August 6–9, 2023. We collected bathymetry at nearly complete coverage (figure 13) using a 18-ft, flat bottom, aluminum boat equipped with GPS and a multibeam sonar system (figure A-1). We fitted the same survey vessel with a gantry crane on the bow (figure A-2) used in conjunction with a Vibracore sampler for collecting sediment cores on the east and west arms of the reservoir. This effort was conducted on August 10, 2023.



Figure A-1.—Survey vessel and multibeam system used for bathymetry collection.



Figure A-2.—Survey vessel equipped with gantry crane for sediment coring.

On the first day of the bathymetric survey (August 6, 2023), we set up our GPS base station over a new control point that was established the previous month by the Bureau of Reclamation (McCleary et al. 2024) near the left abutment spillway (figure A-3). We used this control point for the entire duration of the survey to collect reservoir bathymetry as well as to measure features on the dam with known elevations, other control points along the reservoir, and water surface elevations using traditional land surveying techniques. These measurements were used to confirm that NAVD88, Geoid18 (vertical datum used during the 2023 bathymetric survey) is 3.55 ft higher than RPVD (vertical datum used during dam construction).

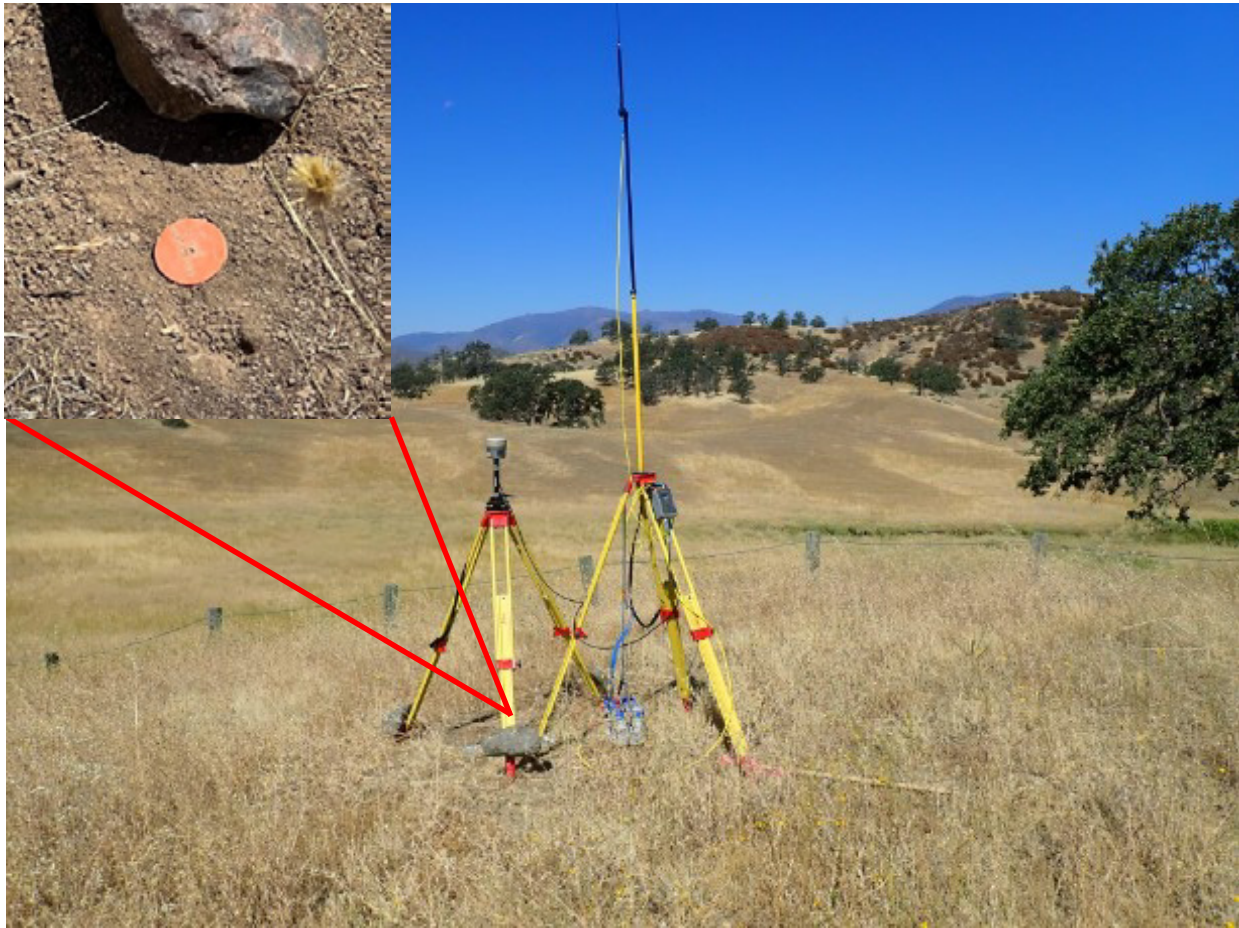


Figure A-3.—Reclamation control point near the left abutment of spillway with GPS base station set up used for the entirety of the bathymetric survey.

Appendix B

East Park Reservoir GPS Control Survey Report



— BUREAU OF —
RECLAMATION

RTK GPS Survey Results and Conversions

East Park Dam and Reservoir Bathymetry Control

Orland Project

California-Great Basin, Interior Region 10



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RTK GPS Survey Results and Conversions

East Park Dam and Reservoir Bathymetry Control

Orland Project

California – Great Basin Interior Region 10

prepared by

**CGB-220 Surveys and Mapping Branch
James McCleary, Engineering Technician (ret.)
Robert Keller, Engineering Technician (Civil)
Susan Boos, Land Surveyor, PLS**

**United States Department of the Interior
Bureau of Reclamation
California – Great Basin Interior Region 10
2800 Cottage Way, Room 2916
Sacramento, California 95825**

Cover Photo: Reclamation

Page 13: Reclamation / Stephenie Wilhoite

Pages 14-21 Reclamation / Robert Keller

Mission Statements

The U.S. Department of the Interior protects and manages the Nation's natural resources and cultural heritage; provides scientific and other information about those resources; honors its trust responsibilities or special commitments to American Indians, Alaska Natives, and affiliated Island Communities.

The mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public.

EAST PARK DAM AND RESERVOIR

BATHYMETRY CONTROL PROJECT – RTK GPS SURVEY

This survey was conducted using GPS methods to establish a horizontal/vertical control network.

Data was collected using our Trimble R8 GNSS receivers #1 (OPUS point) and #3 (RTK Rover). Data processing was done through OPUS (National Geodetic Survey's **O**nline **P**ositioning **U**ser **S**ervice online processing software tied to the National Spatial Reference System (NSRS)). Data was then imported into Trimble Business Center for quality control checks and translation from NAVD88 elevations to the established local vertical datum (East Park Vertical Datum 1910).

The translated elevations were calculated based on field ties to the existing benchmarks (see list) and verified with ties to nearby control points from previous survey work.

No specific information was found on the 1910 vertical datum. It may be that the datum is a local, project-based datum, established either by spirit leveling from a nearby leveling line, or oftentimes in more isolated areas, based off an elevation or altitude transferred by barometric pressure from the nearest reference point of known elevation.

An interesting article by Jerry Penry in American Surveyor magazine begins:

"During the 1896 field season, the surveying crews of the U. S. Geological Survey (USGS) engaged in higher quality and more precise topographic mapping and spirit leveling than had been previously attempted. This change was largely prompted by an act issued by the Fifty-Fourth Congress on June 11, 1896.

...it would be impossible for USGS to accurately record the monuments to their exact height above sea level. Attempting to do so would have required running thousands of miles of precise levels from points already known to be accurate.

...a plan was designed to permit the acceptance of one fixed monument within each region of a particular topographic mapping area to be used as a central datum only for that area. The elevation of each initial bench mark, regardless of its relationship to the true sea-level datum, was usually derived from an outside source such as a railroad company, a river commission, or a local city datum. The elevations of these starting bench marks were of uncertain precision, but the assumption was made that they were very close to sea-level

datum ... It was anticipated that through the course of the work, connections would eventually be made with precise monuments established by an agency such as the U. S. Coast & Geodetic Survey (USC&GS). Thus, adjustments in elevation could later be made to the USGS monuments....

"...bench marks stamped with an elevation of 33 feet too high ...because of spurious information supplied by a railroad company" and "...stamped 49 feet too low on the "NP" datum because of an incorrect elevation supplied by the Northern Pacific Railroad."

"The exact number of early USGS vertical datums is unknown since a concise list has not been found, but published records indicate there were hundreds of different datums located across the United States. ... Some datums were designed by a date instead of a letter code. The "1906" datum in Colorado had a different origin than the "1906" datums established in Illinois, Kentucky and Oregon....

The final two paragraphs are untouched:

"The early use of isolated datums by USGS mostly ended by 1910 but continued as late as 1920 in some areas. By the 1930's, USGS began their level lines upon benchmarks having precise sea-level elevations on the Sea Level Datum of 1929 (later renamed NGVD29) and ending them upon others. The benchmark monuments established during that era were mostly domed bronze or aluminum disks set in concrete and were published in the Level Line sheets.

"Many of the original USGS benchmarks established over a century ago still exist and most have never had accurate sea-level based elevations established upon them unless they were included in newer leveling. Surveyors have wrongly assumed that these early benchmarks are on the NGVD 1929 Datum, while not correctly understanding that they were established much earlier on local assumed datums with unknown certainty to true sea-level elevations.

Jerry Penry is a licensed land surveyor in Nebraska and South Dakota. He is a frequent contributor to the magazine."

Penry, Jerry, PS. "The Early Vertical Datums of the U. S. Geological Survey." *The American Surveyor*, May 2, 2014, <https://amerisurv.com/2014/05/02/the-early-vertical-datums-of-the-u-s-geological-survey/>. Accessed 19 Dec. 2023.

THE COORDINATE SYSTEM FOR THIS SURVEY

Name: United States/NAD83

Zone: California Zone 2 (402)

Horizontal Reference datum: NAD83(2011)

Reference epoch: 2010.0000

Unit of Measurement: U.S. Survey Foot

Vertical datum(s): Local NAVD88 (based on GPS observations)

Local Vertical Datum: East Park Vertical Datum 1910 (No information)

POINT FILES INCLUDED

EAST PARK DAM AND RESERVOIR REPORT.docx (This Report)

East Park Bathy Control_Final.csv.pdf

East Park Bathy Control_Final.csv__ANNOTATED.txt.pdf

NCAT Results__Edited.xls.pdf

East Park Control Points__All Labeled.pdf (Photographs)

NOTE:

According to the NGS Coordinate Conversion and Transformation Tool (NCAT), the NAVD88 to NGVD29 datum separation at the Lat/Lon of H 301 is currently 2.904ft, with an average Sigma of 0.089 ft.

NCAT Website: <https://beta.ngs.noaa.gov/NCAT/>

NCAT only shows settings for NAVD88 and NGVD29, but the '88 to '29 separation varies for each measured point by geographic location so these conversions are influenced by geoid modeling.

FIELD NOTES SUMMARY

Location: East Park Dam and Reservoir

07/31/2023 - Sunny, 86°F, calm.

Trimble R8 #1 (Base), H 301 (1933), Ht. = 4.446ft to Center of Bumper Elev. 1238.439

OPUS Derived Position - FILE: 86482120.23o OP1690913462926

Data Length: 06:07:30hrs

Northing (Y) [feet] 2254570.527 Easting (X) [feet] 6407054.581

Latitude 39 21 06.25363 Longitude 122 32 48.38590

Ellipsoid Height: 348.520 (m)

Ortho Height: 377.477 (m) [NAVD88 (Computed using GEOID18)] 1238.439 (ft)

Trimble R8 #3 (Rover), Ht. = 6.562ft to Base of Antenna Mount

Point	Fixed Point Descriptions	NAVD 88
1502	Dam Crest Elevation (no point)	Elev. 1202.18
1504	Dam Crest Elevation (no point)	Elev. 1202.12
1507	Set new USBR BC on Dam Crest	Elev. 1202.17
1509	Found USRS BC on dam parapet wall, stamped [Elev.] "1205"	Elev. 1205.13
1510	Water Surface Elevation at 14:00 07-31-2023	Elev. 1201.01
1513	Found "Bathy" brand T-Bar w/stainless steel cap	Elev. 1206.70
1514	Found USBR AC in concrete post D/S Rt. end of Spillway	Elev. 1198.27
1515	"LADOGA 1949", Coast & Geodetic Survey BC in concrete	Elev. 1282.11
1516	Rebar/orange cap, Coyote Cove Day Use Area (Restrooms)	Elev. 1203.39
1517	Rebar/orange cap, Coyote Cove Day Use Area (Day Use Sign)	Elev. 1203.77

According to the California Data Exchange Center (CDEC), on 07-31-2023 at 14:00, the reservoir elevation at East Park Reservoir was 1197.46 ft, likely based on the 1929 standard vertical datum (NGVD29). This shows a difference between the CDEC elevation and our measured water surface elevation of 0.768 ft.

2,2254570.53,6407054.58,1238.44,H 301 USGS
1500,2258011.89,6416505.06,1202.15,HARD NAIL/SHINER
1502,2258102.33,6416522.51,1202.18,DAM CREST
1503,2258043.63,6416514.35,1202.16,DAM CREST
1504,2258003.93,6416501.21,1202.12,DAM CREST
1505,2257958.40,6416476.57,1202.15,DAM CREST
1506,2257914.41,6416441.22,1202.15,DAM CREST
1507,2258024.66,6416509.52,1202.17,NEW BC ON DAM
1509,2257997.08,6416504.50,1205.13,USRS BC 1205-PARAPET WALL
1510,2257885.98,6416437.08,1201.01,WS ELEV @ 1400
1511,2256012.81,6415734.31,1208.38,BATHY W/ CAP
1513,2256274.21,6415829.58,1206.70,BATH W/CAP
1514,2256536.21,6415703.60,1198.27,USBR AL DISK IN CONC
1515,2236049.60,6422573.64,1282.11,LADOGA-CHK
1516,2249356.04,6421307.05,1203.39,RBC COYOTE COVE DAY USE
1517,2249138.89,6421561.29,1203.77,RBC COYOTE COVE DAY USE

BUREAU OF RECLAMATION
CGB REGION 10, SURVEYS AND MAPPING BRANCH, SACRAMENTO, CA
EAST PARK DAM AND RESERVOIR - BATHYMETRY CONTROL FOR TSC
July 31, 2023

POINT	NORTHING	EASTING	ELEVATION	DESCRIPTION
2	2254570.53	6407054.58	1238.44	H 301 USGS (BASE Receiver for RTK Survey) NGS_PID_KT0547
1500	2258011.89	6416505.06	1202.15	HARD NAIL/SHINER ON DAM CREST
1502	2258102.33	6416522.51	1202.18	DAM CREST PROFILE
1503	2258043.63	6416514.35	1202.16	DAM CREST PROFILE
1504	2258003.93	6416501.21	1202.12	DAM CREST PROFILE
1505	2257958.40	6416476.57	1202.15	DAM CREST PROFILE
1506	2257914.41	6416441.22	1202.15	DAM CREST PROFILE
1507	2258024.66	6416509.52	1202.17	NEW USBR BRASS CAP ON DAM (JULY 2023)
1509	2257997.08	6416504.50	1205.13	Found USRS BC 1205-PARAPET WALL
1510	2257885.98	6416437.08	1201.01	WS ELEV @ 1400
1511	2256012.81	6415734.31	1208.38	Found BATHY BAR W/CAP AT SPILLWAY LEFT ABUTMENT
1513	2256274.21	6415829.58	1206.7	Found BATHY BAR W/CAP
1514	2256536.21	6415703.60	1198.27	Found USBR ALUMINUM DISK IN CONC, D/S RIGHT OF SPILLWAY
1515	2236049.60	6422573.64	1282.11	Found LADOGA (USC&GS BRASS CAP IN 12" SQ. CONCRETE POST, NGS PID KT1873) (RTK MEASUREMENT FROM H 103)
1516	2249356.04	6421307.05	1203.39	Recovered RBC COYOTE COVE DAY USE AREA, 5/8" REBAR w/ORANGE CAP "USBR CONTROL"
1517	2249138.89	6421561.29	1203.77	Recovered RBC COYOTE COVE DAY USE AREA, 5/8" REBAR w/ORANGE CAP "USBR CONTROL"

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1510                                1201.01                WS ELEV @ 14:00 (RTK) (NAVD 88)

                                1198.23                WS ELEV @ 14:00 (NGVD 29)
CDEC ELEVATION                    1197.46                RESERVOIR ELEVATION @ 1400
                                0.768ft
-----

```

```

Output from GEOID12B
      latitude            longitude            N            error (95%
confidence interval)
Station Name      ddd mm ss.sssss  ddd mm ss.sssss  meters  meters
H 103 USGS       39 21  6.23663   122 32 48.38717  -28.935  0.074
https://geodesy.noaa.gov/GEOID/GEOID12B/computation.html

```

```

Output from GEOID18
      latitude            longitude            N            error (95%
confidence interval)
Station Name      ddd mm ss.sssss  ddd mm ss.sssss  meters  meters
H 103 USGS       39 21  6.23663   122 32 48.38717  -28.957  0.060

```

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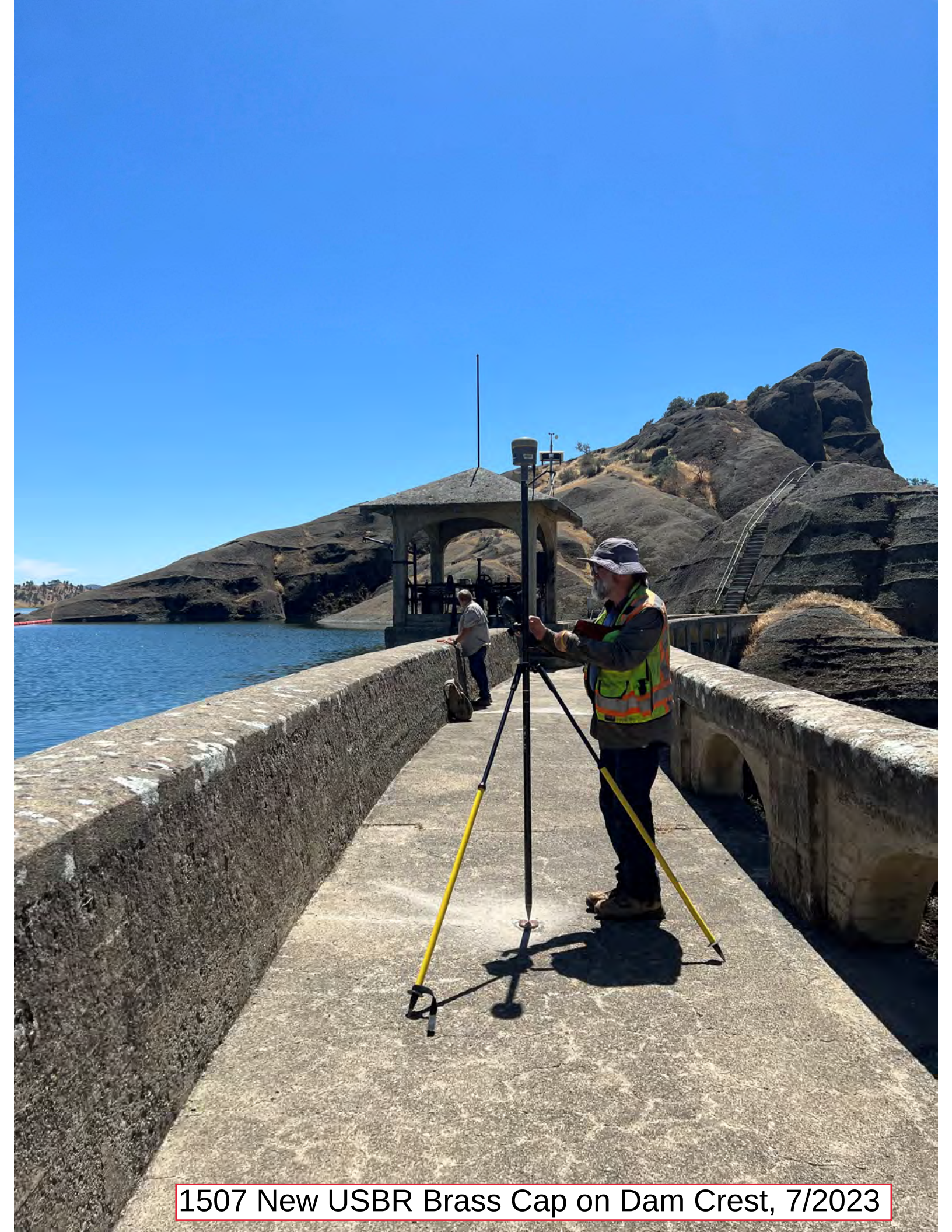
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According to NGS Coordinate Conversion and Transformation Tool (NCAT):
    NGVD29 to NAVD88 datum separation at the Lat/Lon of H 103 is 2.904ft
https://beta.ngs.noaa.gov/NCAT/
    It does not specify the use of any particular GEOID model.
-----

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EAST PARK DAM AND RESERVOIR

BATHYMETRY CONTROL PROJECT - GPS SURVEY

[illegible]



1507 New USBR Brass Cap on Dam Crest, 7/2023



1507 Details

1509 Old USRS Brass Cap
on Parapet Wall





1509 Details



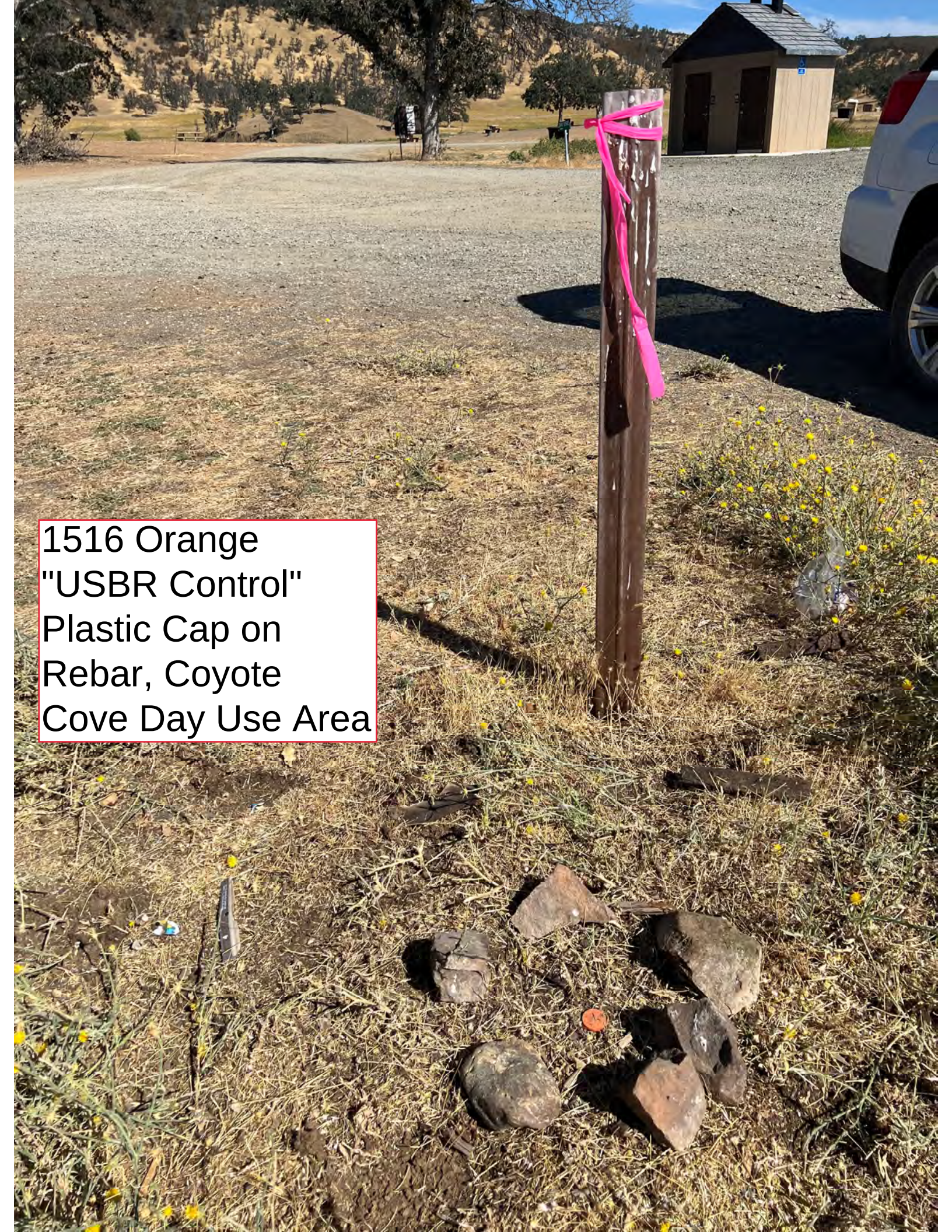
1511 Orange Plastic Cap on Rebar,
South of East Park Spillway



1511, 1516, 1517 Details



1513 Bathy T-Bar w/Cap,
D/S Left Corner of Spillway



1516 Orange
"USBR Control"
Plastic Cap on
Rebar, Coyote
Cove Day Use Area

1516 Behind Truck



1517 Orange "USBR Control" Plastic Cap on Rebar,
Coyote Cove Day Use Area

1502 to 1510

1502

1503

1507

1500

1504

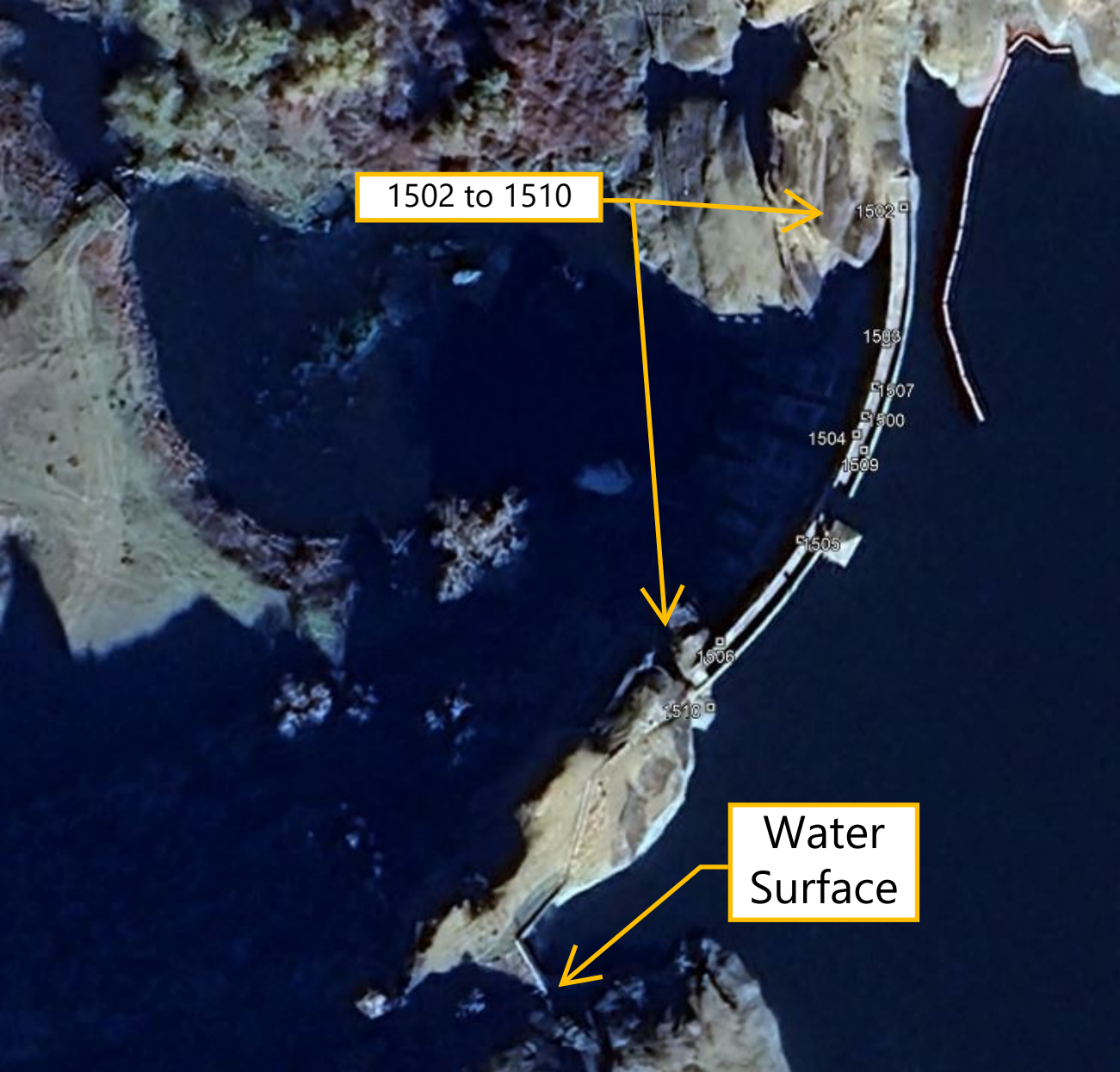
1509

1505

1506

1510

Water
Surface



1511 to 1514

1514

1513

East Park Road

1512 1511





1516

1517

1516 and 1517

Coyote Cove
Day Use Area
Access Road

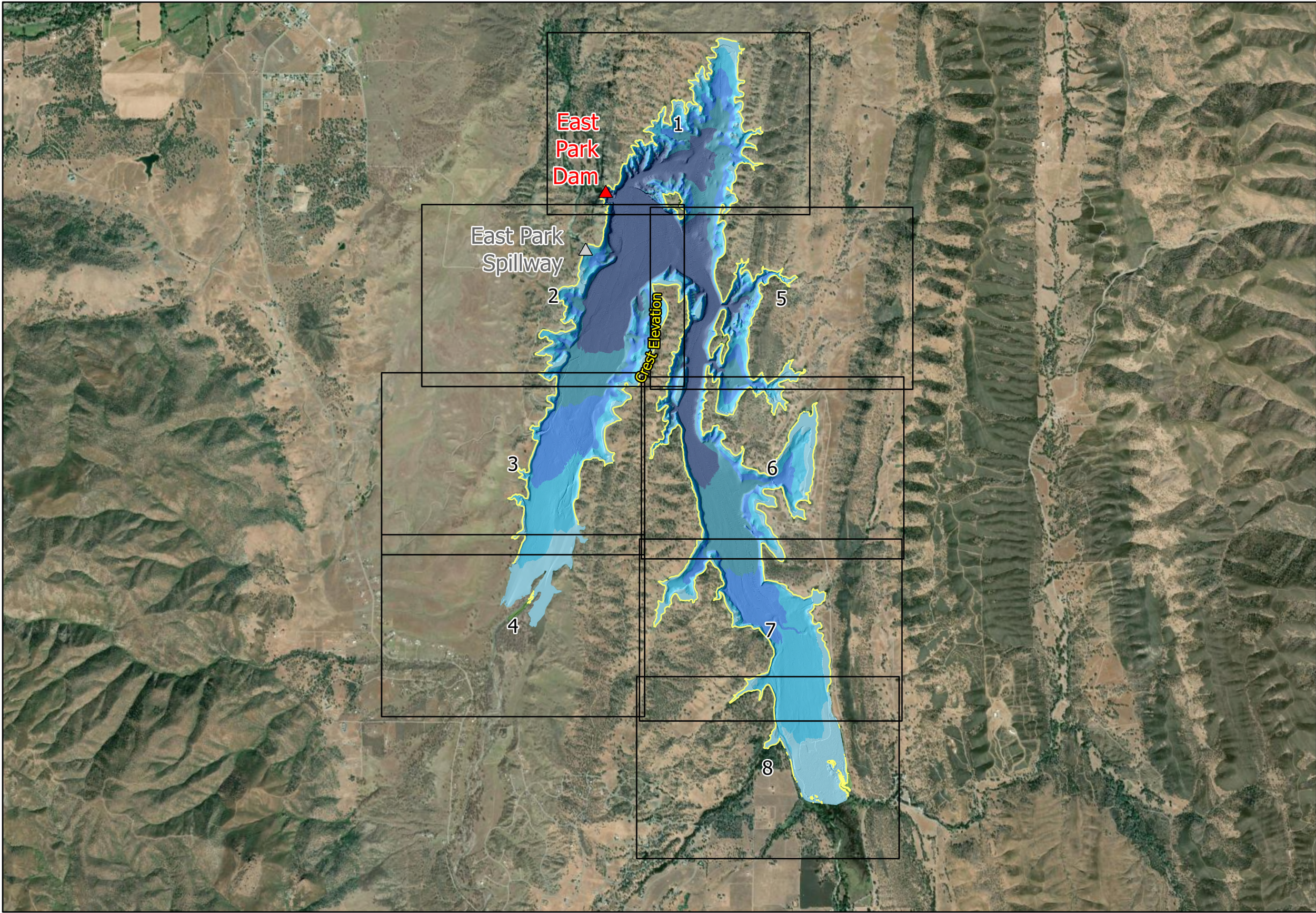
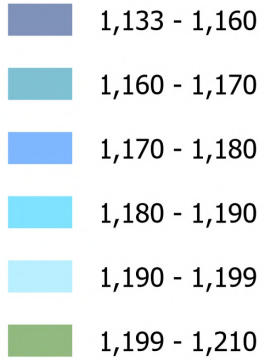
Appendix C

Digital Elevation Mapbook of East Park Reservoir

East Park Reservoir 2023
Bathymetric Survey

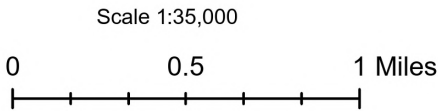
Overview Map

Elevations (ft)



Horizontal Datum: NAD 1983 2011 State Plane California II FIPS 0402 Ft US
Unit of Measurement: US Survey Feet

Vertical Datum: Reclamation Project Vertical Datum (RPVD)
Unit of Measurement: US Survey Feet



Map Prepared By:
Geographic Applications & Analysis Group
Bureau of Reclamation
Technical Service Center - 01/25

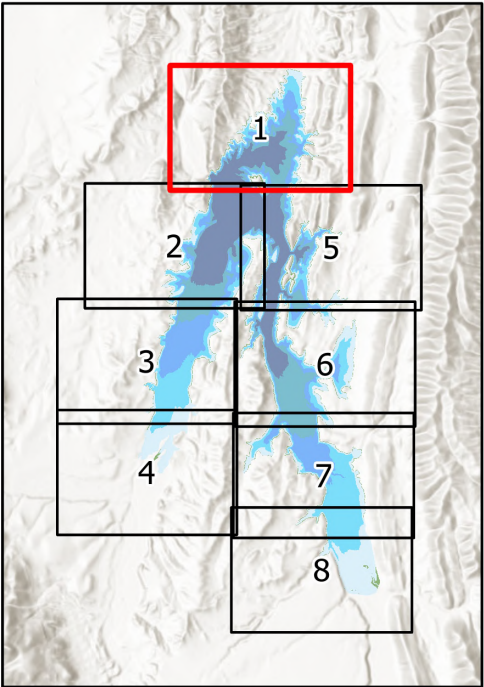
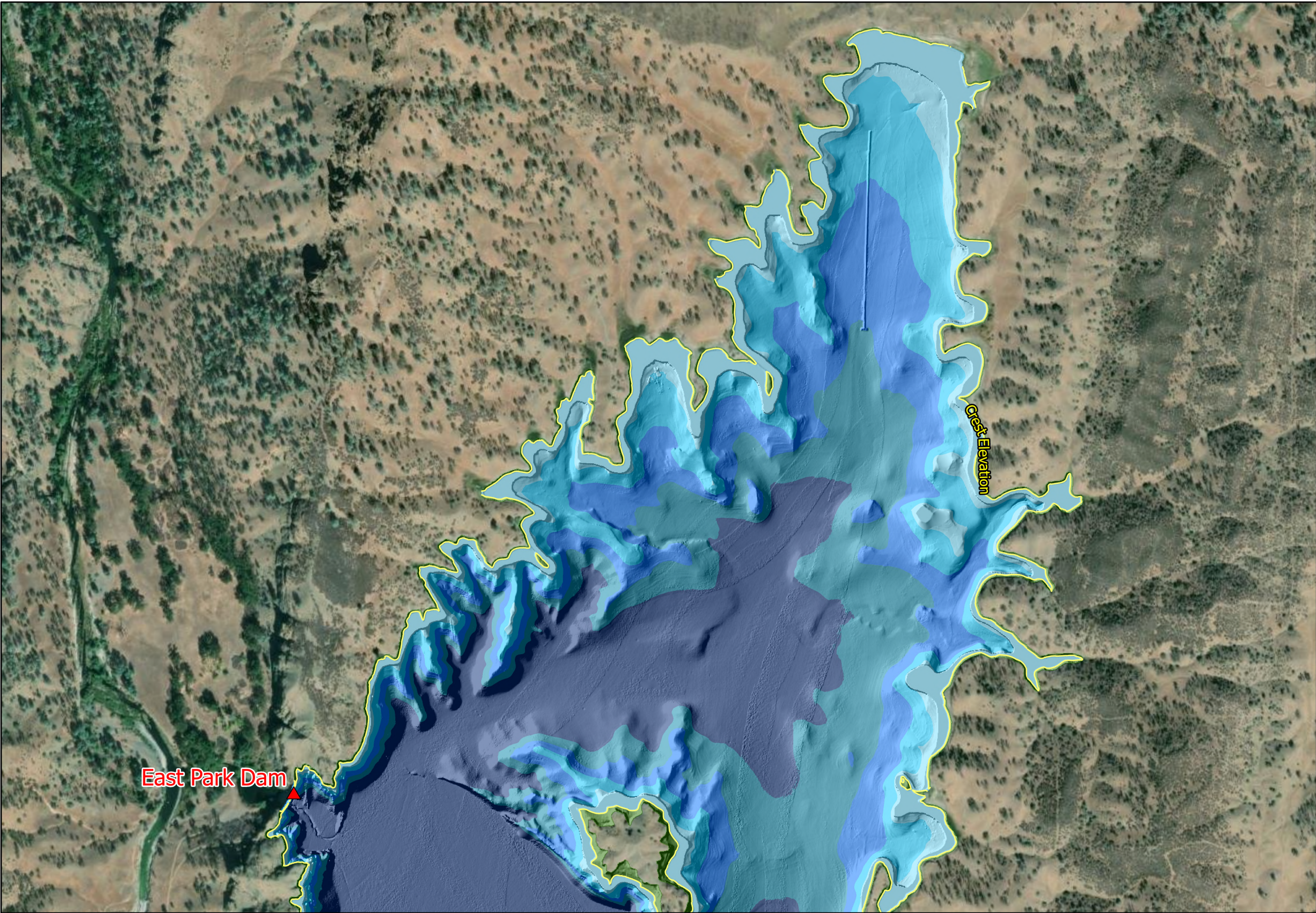
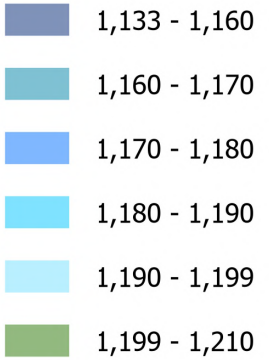
Data Sources:
2023 East Park Reservoir Survey, 2018 LiDAR USGS, World Imagery: Maxar
World Hillshade: Esri, USGS



East Park Reservoir 2023
Bathymetric Survey

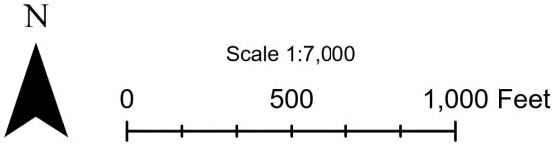
Sheet 1

Elevations (ft)



Horizontal Datum: NAD 1983 2011 State Plane California II FIPS 0402 Ft US
Unit of Measurement: US Survey Feet

Vertical Datum: Reclamation Project Vertical Datum (RPVD)
Unit of Measurement: US Survey Feet



Map Prepared By:
Geographic Applications & Analysis Group
Bureau of Reclamation
Technical Service Center - 01/25

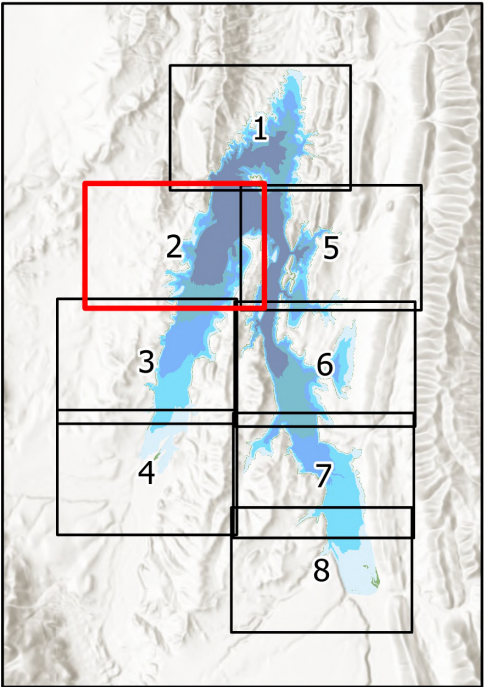
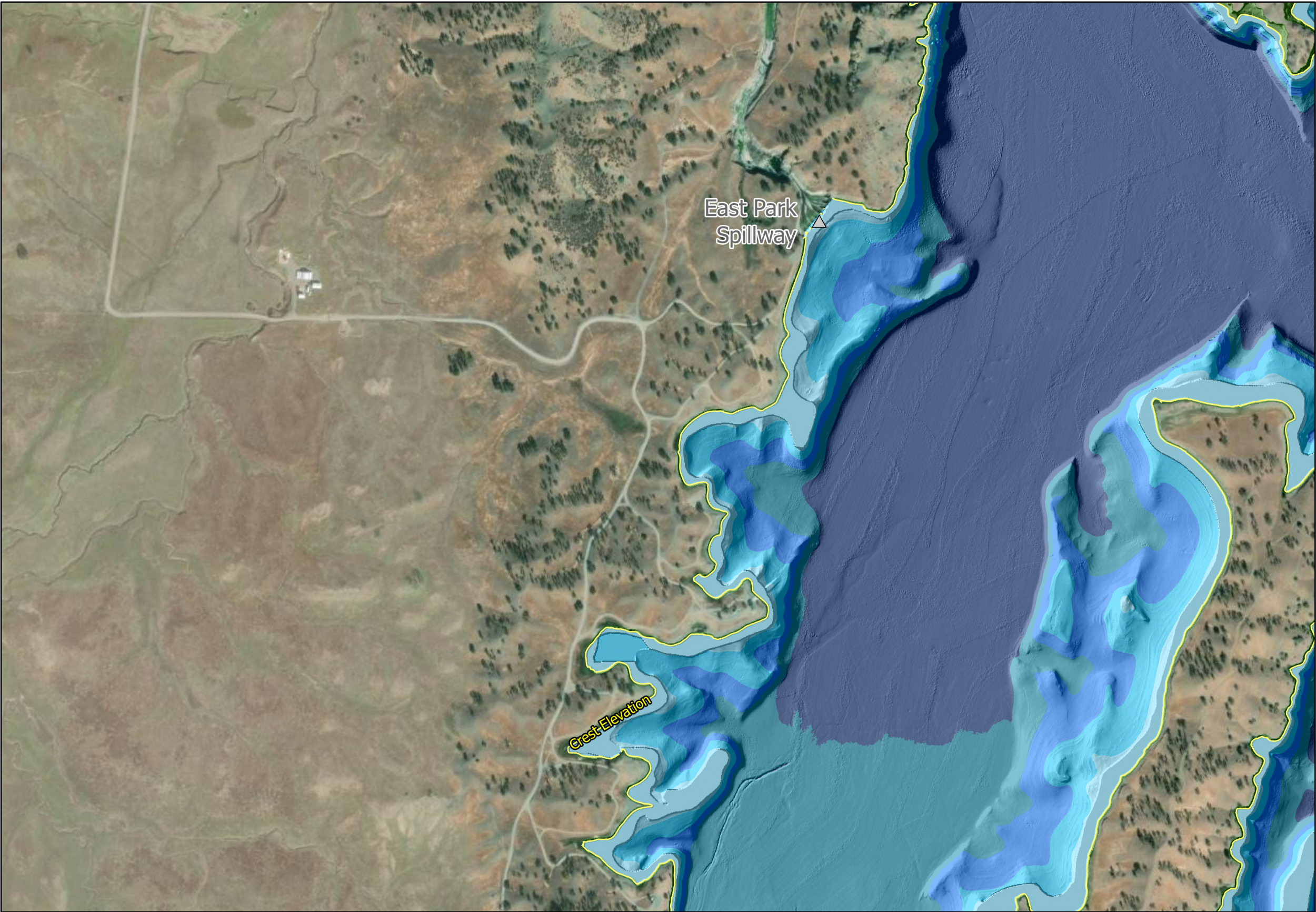
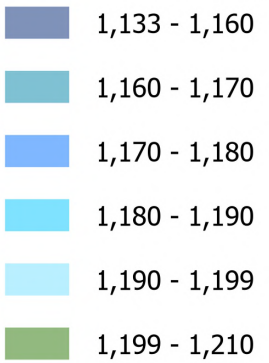
Data Sources:
2023 East Park Reservoir Survey, 2018 LiDAR USGS, World Imagery: Maxar
World Hillshade: Esri, NASA, NGA, USGS



East Park Reservoir 2023
Bathymetric Survey

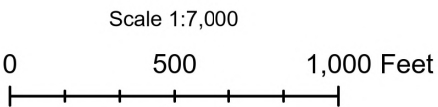
Sheet 2

Elevations (ft)



Horizontal Datum: NAD 1983 2011 State Plane California II FIPS 0402 Ft US
Unit of Measurement: US Survey Feet

Vertical Datum: Reclamation Project Vertical Datum (RPVD)
Unit of Measurement: US Survey Feet



2023 East Park Reservoir Survey, 2018 LIDAR USGS, World Hillshade: Esri, NASA, NGA, USGS, FEMA
World Imagery: Maxar

Map Prepared By:
Geographic Applications & Analysis Group
Bureau of Reclamation
Technical Service Center - 01/25

Data Sources:
NASA, NGA, USGS, FEMA
World Imagery: Maxar



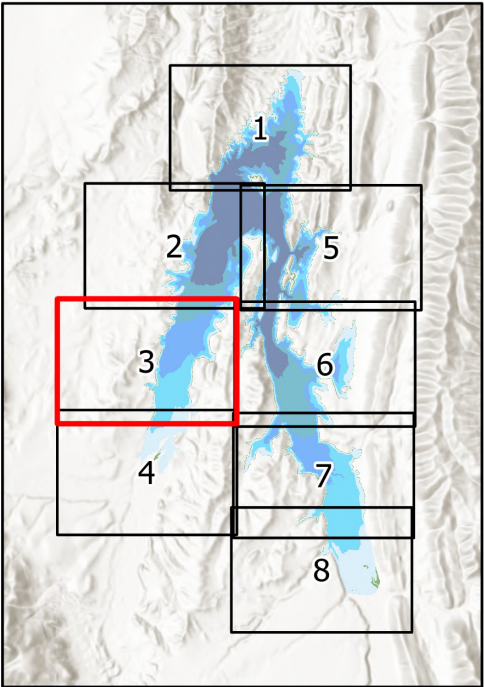
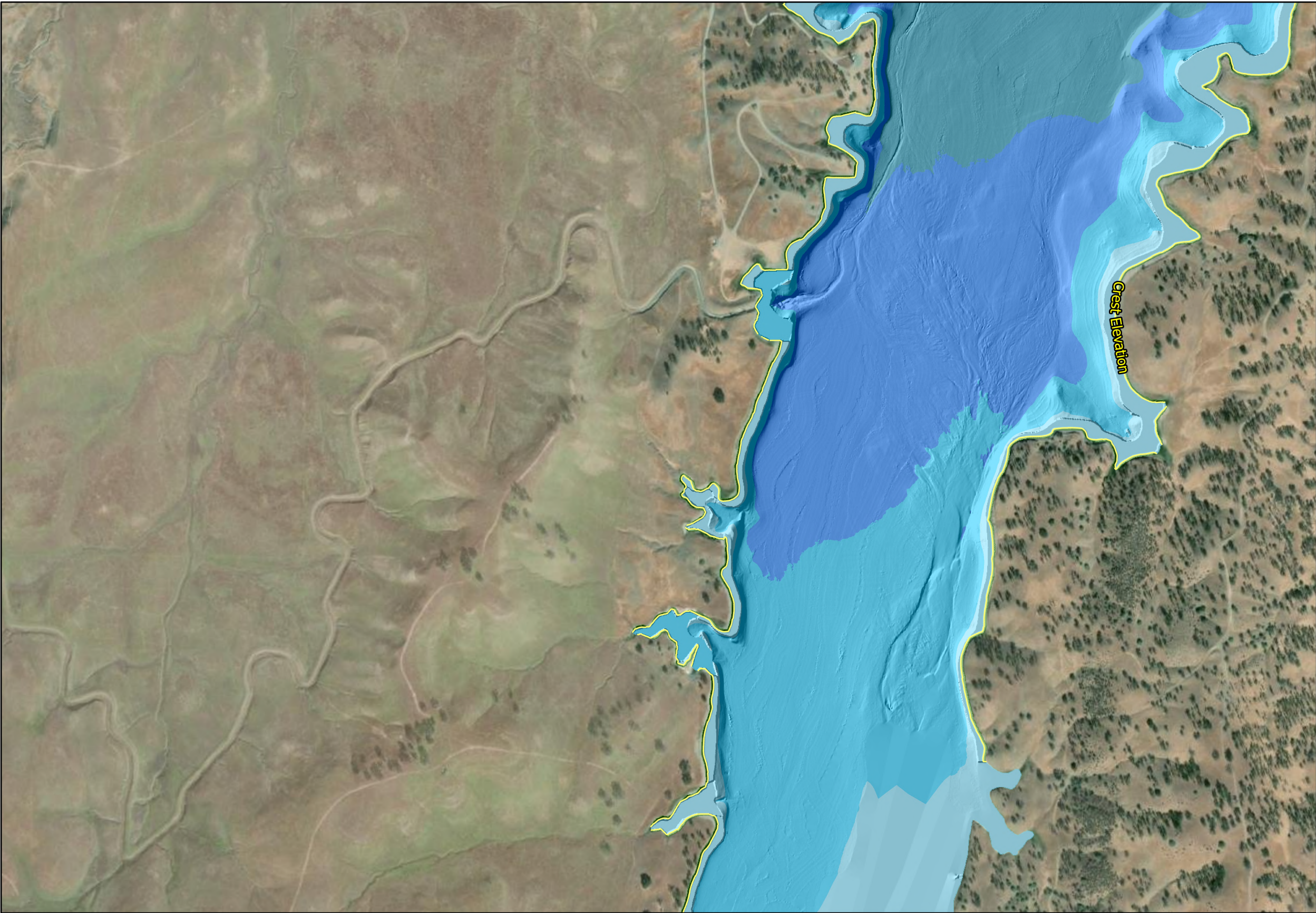
— BUREAU OF —
RECLAMATION

East Park Reservoir 2023
Bathymetric Survey

Sheet 3

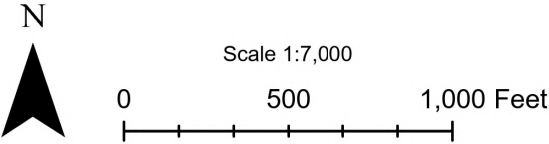
Elevations (ft)

- 1,133 - 1,160
- 1,160 - 1,170
- 1,170 - 1,180
- 1,180 - 1,190
- 1,190 - 1,199
- 1,199 - 1,210



Horizontal Datum: NAD 1983 2011 State Plane California II FIPS 0402 Ft US
Unit of Measurement: US Survey Feet

Vertical Datum: Reclamation Project Vertical Datum (RPVD)
Unit of Measurement: US Survey Feet



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Bureau of Reclamation
Technical Service Center - 01/25

Data Sources:
2023 East Park Reservoir Survey, 2018 LiDAR USGS, World Imagery: Maxar
World Hillshade: Esri, NASA, NGA, USGS

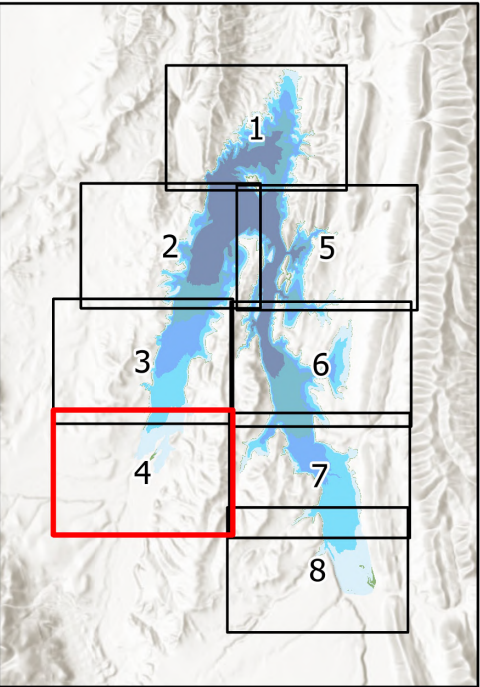


East Park Reservoir 2023
Bathymetric Survey

Sheet 4

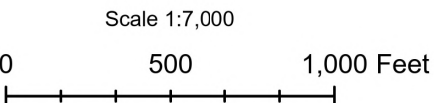
Elevations (ft)

- 1,133 - 1,160
- 1,160 - 1,170
- 1,170 - 1,180
- 1,180 - 1,190
- 1,190 - 1,199
- 1,199 - 1,210



Horizontal Datum: NAD 1983 2011 State Plane California II FIPS 0402 Ft US
Unit of Measurement: US Survey Feet

Vertical Datum: Reclamation Project Vertical Datum (RPVD)
Unit of Measurement: US Survey Feet



2023 East Park Reservoir Survey, 2018 LIDAR USGS, World Hillshade: Esri, NASA, NGA, USGS, FEMA
World Imagery: Maxar

Map Prepared By:
Geographic Applications & Analysis Group
Bureau of Reclamation
Technical Service Center - 01/25

Data Sources:
World Imagery: Maxar



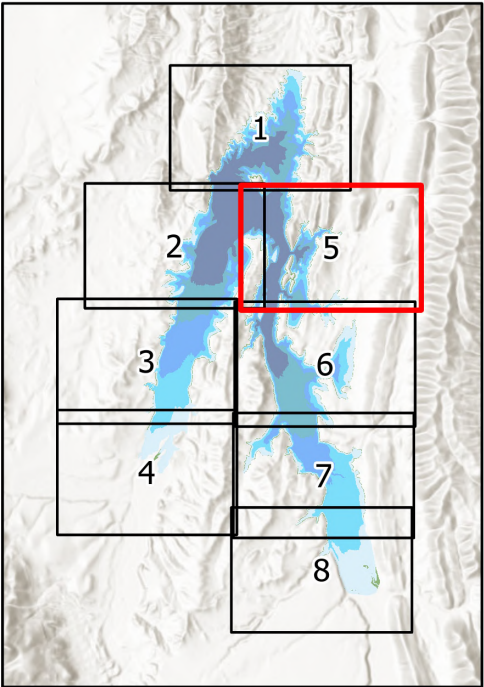
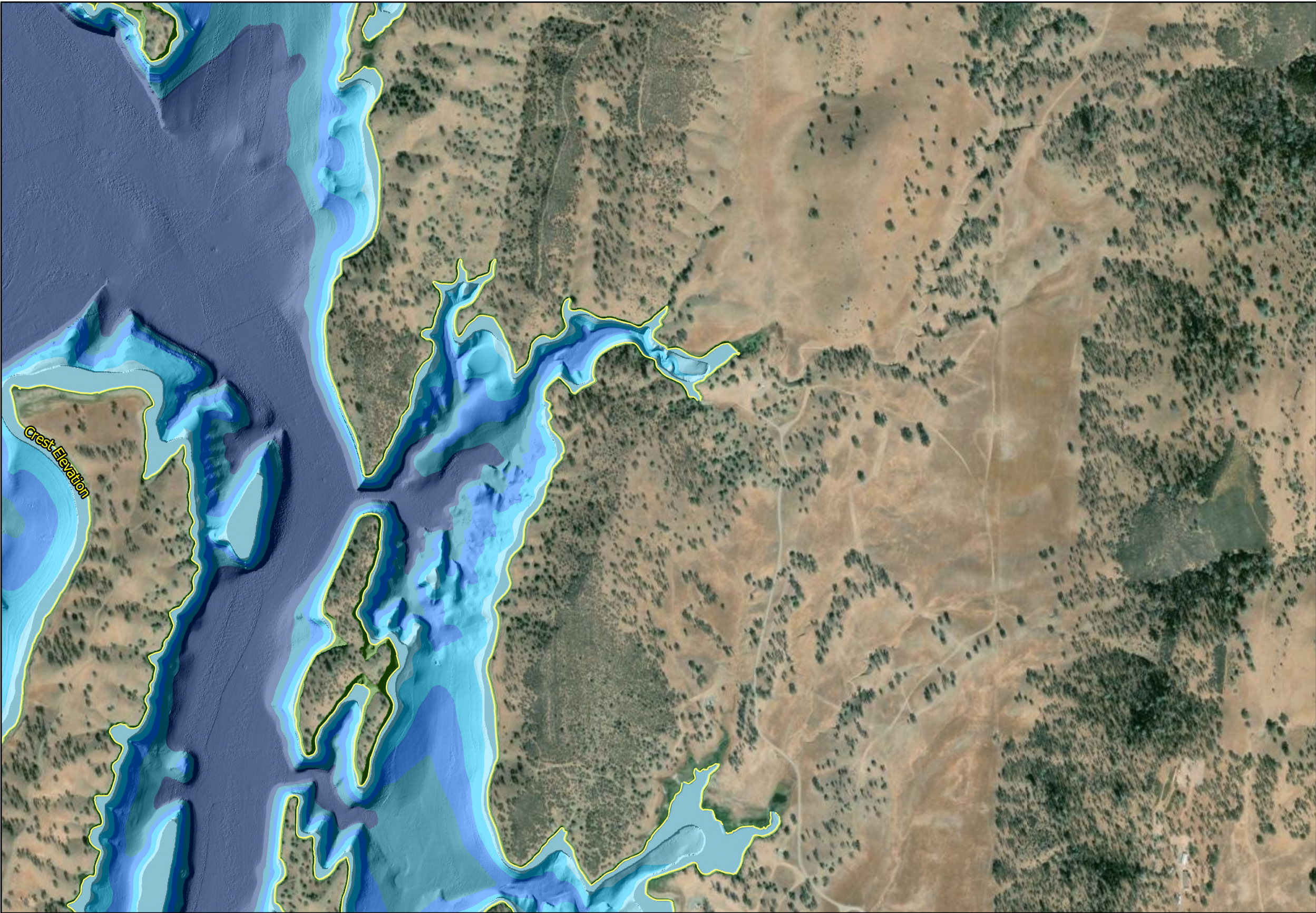
— BUREAU OF —
RECLAMATION

East Park Reservoir 2023
Bathymetric Survey

Sheet 5

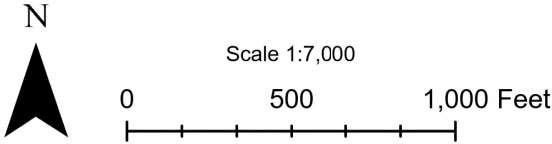
Elevations (ft)

- 1,133 - 1,160
- 1,160 - 1,170
- 1,170 - 1,180
- 1,180 - 1,190
- 1,190 - 1,199
- 1,199 - 1,210



Horizontal Datum: NAD 1983 2011 State Plane California II FIPS 0402 Ft US
Unit of Measurement: US Survey Feet

Vertical Datum: Reclamation Project Vertical Datum (RPVD)
Unit of Measurement: US Survey Feet



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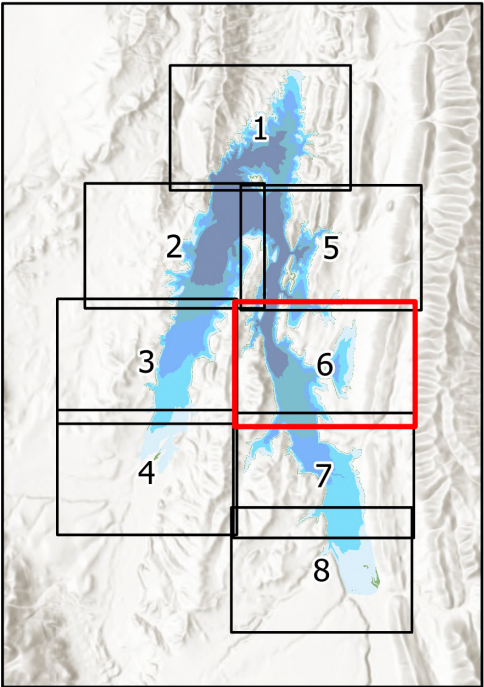
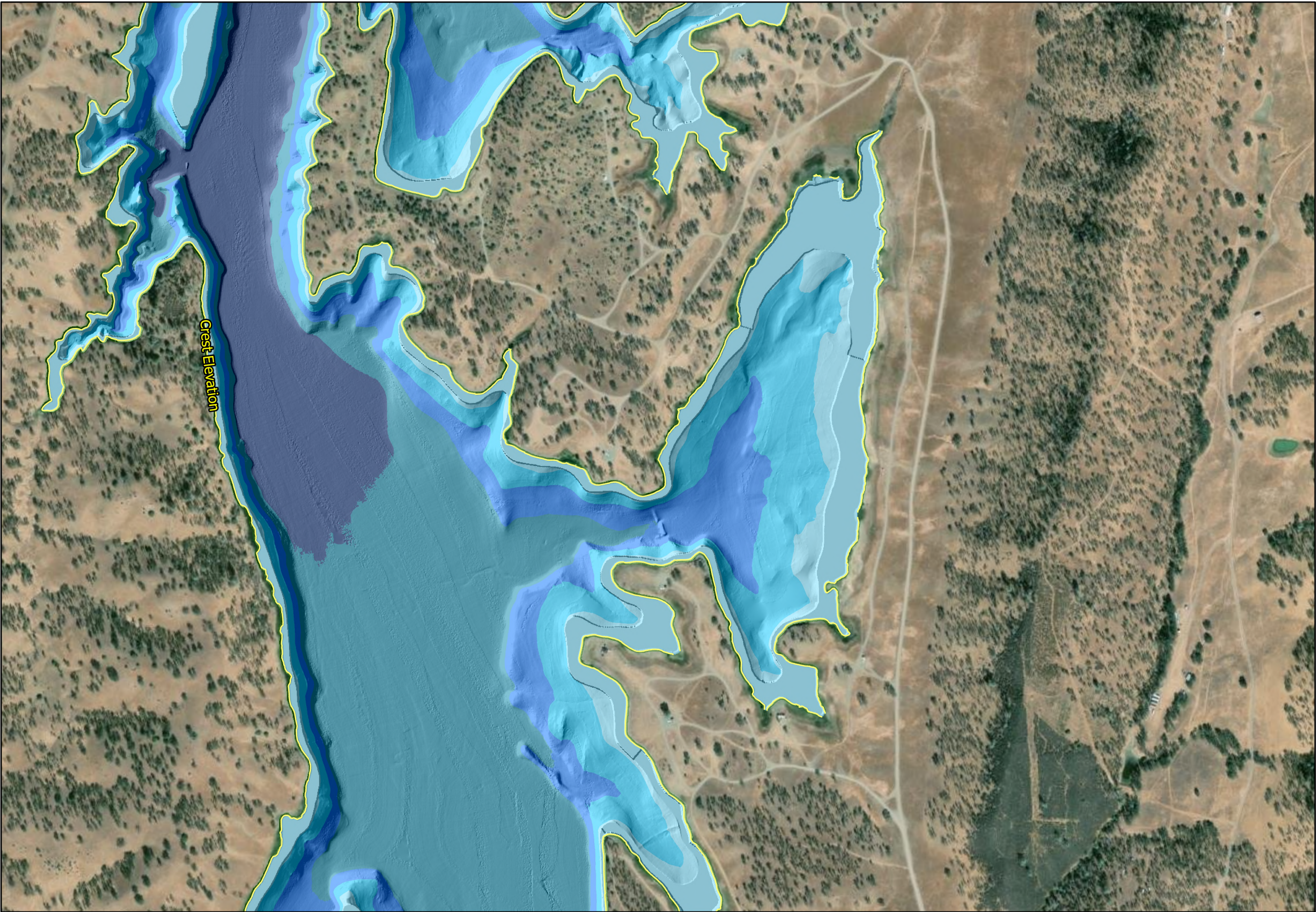
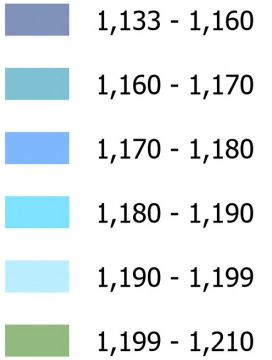
Data Sources:
2023 East Park Reservoir Survey, 2018 LiDAR USGS, World Imagery: Maxar
World Hillshade: Esri, NASA, NGA, USGS



**East Park Reservoir 2023
Bathymetric Survey**

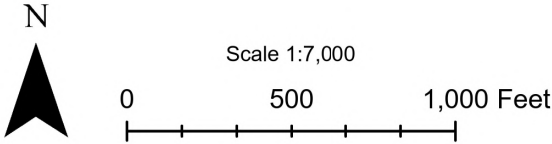
Sheet 6

Elevations (ft)



Horizontal Datum: NAD 1983 2011 State Plane California II FIPS 0402 Ft US
Unit of Measurement: US Survey Feet

Vertical Datum: Reclamation Project Vertical Datum (RPVD)
Unit of Measurement: US Survey Feet



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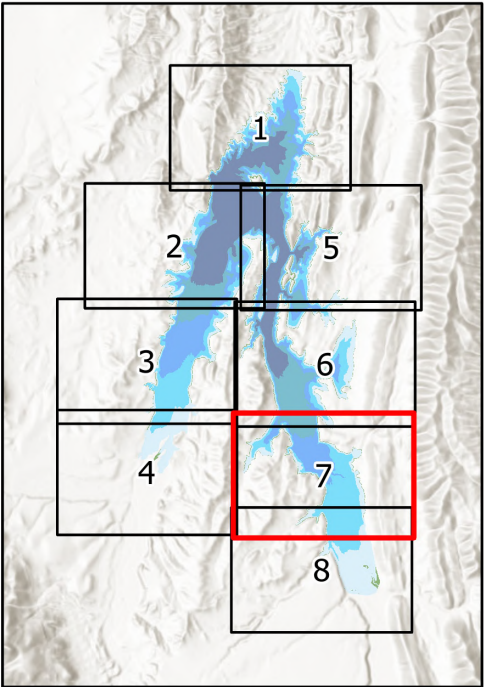
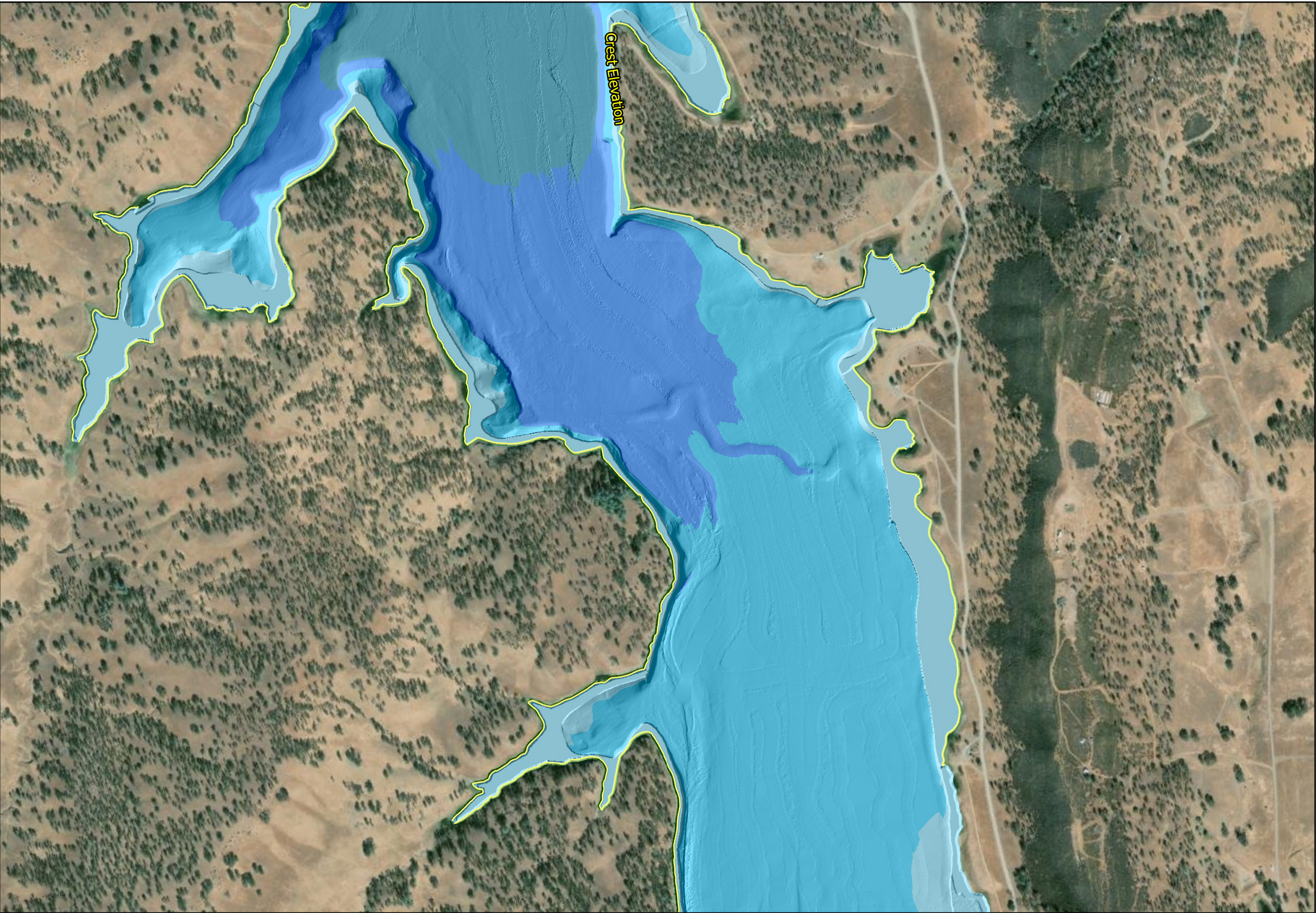
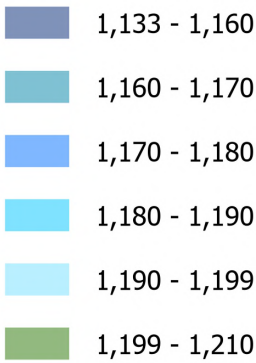
Data Sources:
2023 East Park Reservoir Survey, 2018 LiDAR USGS, World Imagery: Maxar
World Hillshade: Esri, NASA, NGA, USGS



East Park Reservoir 2023
Bathymetric Survey

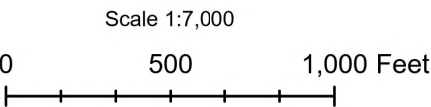
Sheet 7

Elevations (ft)



Horizontal Datum: NAD 1983 2011 State Plane California II FIPS 0402 Ft US
Unit of Measurement: US Survey Feet

Vertical Datum: Reclamation Project Vertical Datum (RPVD)
Unit of Measurement: US Survey Feet



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Data Sources:
2023 East Park Reservoir Survey, 2018 LiDAR USGS, World Imagery: Maxar
World Hillshade: Esri, NASA, NGA, USGS

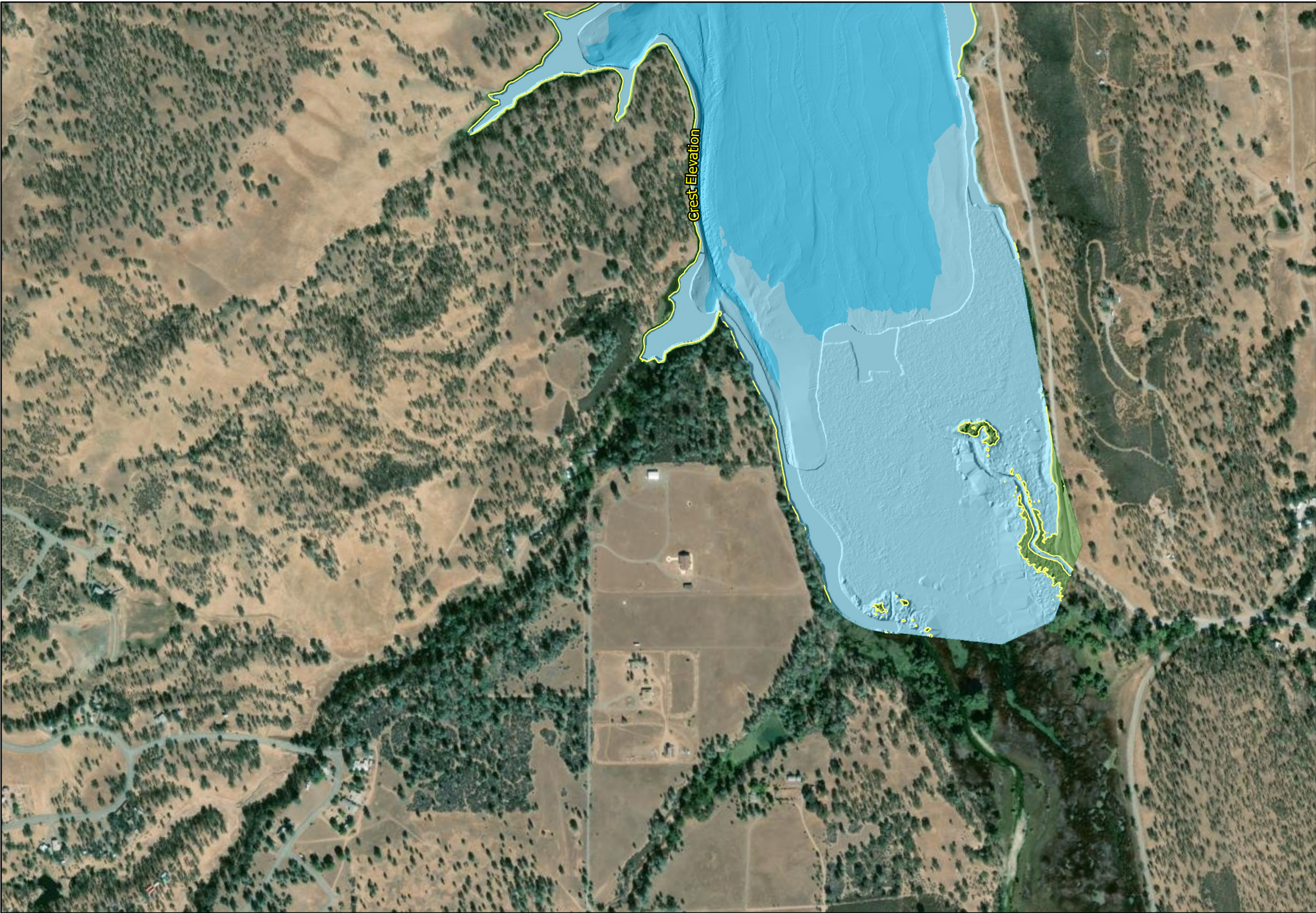
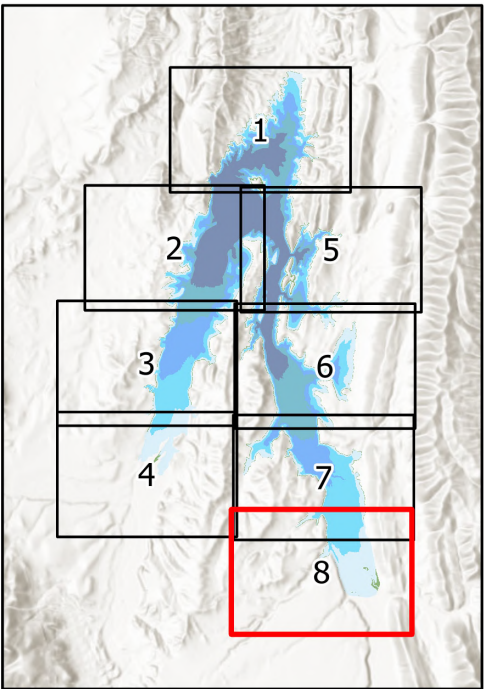
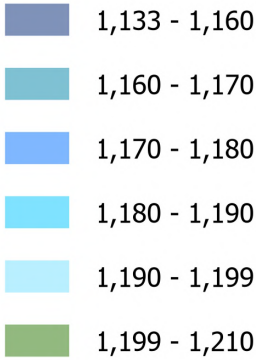


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East Park Reservoir 2023
Bathymetric Survey

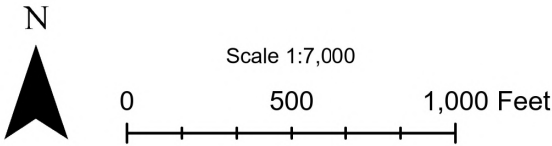
Sheet 8

Elevations (ft)



Horizontal Datum: NAD 1983 2011 State Plane California II FIPS 0402 Ft US
Unit of Measurement: US Survey Feet

Vertical Datum: Reclamation Project Vertical Datum (RPVD)
Unit of Measurement: US Survey Feet



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Data Sources:
2023 East Park Reservoir Survey, 2018 LiDAR USGS, World Imagery: Maxar
World Hillshade: Esri, NASA, NGA, USGS



Appendix D

2023 Surface Areas and Storage Capacities for East Park Reservoir
from ACAP v2.0

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East Park Reservoir 2023 Sedimentation Survey and Sediment Coring – Appendix D

Table D-1.—2023 Survey coefficients used in the interpolation of area and capacity values, based on Equations (1) and (2) in Section 3.2 of the East Park Reservoir 2023 Sedimentation Survey Report

Equation Number	Elevation Base (RPVD, feet)	Storage Capacity V (acre-feet)	Surface Area A (acres)	Rate Coefficient C	Capacity Exponent M
1	1130	0	0	0	2
2	1131	0	0.0001	0.0015	4.0598
3	1132	0.0016	0.0063	0.0127	2.529
4	1133	0.0206	0.0384	0.0258	2.4443
5	1134	0.0848	0.1014	0.1053	4.6359
6	1135	0.2914	0.5894	4.2461	2.1129
7	1136	5.127	9.5608	5.0376	2.0348
8	1137	19.7253	19.8111	5.6133	2.1116
9	1138	45.1497	31.6642	7.0974	1.9386
10	1139	83.9113	45.4234	6.0971	2.021
11	1140	135.4318	57.7455	5.9437	2.0535
12	1141	199.121	69.9511	8.0838	2.2362
13	1142	277.1559	88.0285	9.424	1.937
14	1143	374.6084	106.2828	6.3966	2.0037
15	1144	487.2878	119.0994	6.6428	2.1085
16	1145	613.0301	133.1056	6.179	1.9049
17	1146	752.3147	144.8762	5.0933	2.1019
18	1147	902.2843	155.582	6.1073	2.0889
19	1148	1063.974	168.3397	8.2537	2.0734
20	1149	1240.567	185.4526	9.0162	2.0554
21	1150	1435.036	203.9843	10.9022	2.1348
22	1151	1649.922	227.2581	13.2708	1.8804
23	1152	1890.451	252.2124	11.4351	1.9416
24	1153	2154.099	274.4141	10.384	2.0272
25	1154	2438.897	295.465	10.2279	2.0937
26	1155	2744.59	316.8789	11.6205	2.0011
27	1156	3073.089	340.133	10.791	2.0245
28	1157	3424.013	361.9796	11.7144	2.0073
29	1158	3797.707	385.4939	12.4292	2.0526
30	1159	4195.63	411.0061	14.2604	2.0652
31	1160	4620.897	440.4567	13.6668	1.9502
32	1161	5075.02	467.1098	12.0393	2.0081
33	1162	5554.169	491.286	12.4075	2.0057
34	1163	6057.863	516.1721	12.6972	2.0087
35	1164	6586.732	541.6765	12.6209	2.0268
36	1165	7141.03	567.257	12.7211	2.0139
37	1166	7721.008	592.8757	13.091	1.9548
38	1167	8326.974	618.4655	12.362	1.9983
39	1168	8957.802	643.1679	11.7287	2.0049
40	1169	9612.698	666.6822	11.4661	2.0054
41	1170	10290.85	689.6768	12.7941	2.0909
42	1171	10993.32	716.4281	15.2425	2.0394
43	1172	11724.99	747.5141	16.902	1.9892
44	1173	12489.4	781.1349	15.4878	2.01
45	1174	13286.03	812.2652	15.3138	1.9953
46	1175	14113.61	842.8209	15.5641	2.0326

Table D-1.—2023 Survey coefficients used in the interpolation of area and capacity values, based on Equations (1) and (2) in Section 3.2 of the East Park Reservoir 2023 Sedimentation Survey Report

Equation Number	Elevation Base (RPVD, feet)	Storage Capacity V (acre-feet)	Surface Area A (acres)	Rate Coefficient C	Capacity Exponent M
47	1176	14971.99	874.4559	16.2643	2.0975
48	1177	15862.71	908.5698	23.103	1.9109
49	1178	16794.38	952.7177	20.6055	1.9457
50	1179	17767.71	992.8093	18.3059	1.9773
51	1180	18778.82	1029.006	17.6099	2.0046
52	1181	19825.44	1064.307	18.0498	2.0345
53	1182	20907.79	1101.028	18.5638	2.022
54	1183	22027.39	1138.565	20.1476	2.0437
55	1184	23186.1	1179.741	20.1907	1.9899
56	1185	24386.03	1219.919	20.5719	1.995
57	1186	25626.52	1260.96	19.5042	2.0086
58	1187	26906.99	1300.137	18.0761	1.932
59	1188	28225.2	1335.06	15.002	1.9911
60	1189	29575.26	1364.93	14.6211	1.9876
61	1190	30954.81	1393.991	13.2408	1.9696
62	1191	32362.04	1420.069	12.2674	1.9997
63	1192	33794.38	1444.6	12.4202	2.0342
64	1193	35251.4	1469.866	17.5868	2.016
65	1194	36738.85	1505.32	31.0733	1.7761
66	1195	38275.25	1560.509	32.6941	2.3476
67	1196	39868.45	1637.263	22.1238	1.991
68	1197	41527.84	1681.311	21.5017	1.9867
69	1198	43230.65	1724.028	20.546	2.1163
70	1199	44975.22	1767.51	24.1826	2.056
71	1200	46766.91	1817.229	25.1963	1.9024
72	1201	48609.34	1865.163	12.174	1.2863
73	1202	50486.68	1880.822	–	–

Note: Storage capacity and area values are presented as integers in the main text, which is more consistent with the accuracy of the survey results. Here, we include values with more precision to aid in recreation of the calculations.

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Table D-2.—Surface area at 1-foot elevation increments (areas in acres)

Elevation (feet)	0 ft	1 ft	2 ft	3 ft	4 ft	5 ft	6 ft	7 ft	8 ft	9 ft
1130	0	0	0	0	0	1	10	20	32	45
1140	58	70	88	106	119	133	145	156	168	185
1150	204	227	252	274	295	317	340	362	385	411
1160	440	467	491	516	542	567	593	618	643	667
1170	690	716	748	781	812	843	874	909	953	993
1180	1029	1064	1101	1139	1180	1220	1261	1300	1335	1365
1190	1394	1420	1445	1470	1505	1561	1637	1681	1724	1768
1200	1817	1865	1881	–	–	–	–	–	–	–

Table D-3.—Storage capacity at 1-foot elevation increments (capacities in acre-feet)

Elevation (feet)	0 ft	1 ft	2 ft	3 ft	4 ft	5 ft	6 ft	7 ft	8 ft	9 ft
1130	0	0	0	0	0	0	5	20	45	84
1140	135	199	277	375	487	613	752	902	1064	1241
1150	1435	1650	1890	2154	2439	2745	3073	3424	3798	4196
1160	4621	5075	5554	6058	6587	7141	7721	8327	8958	9613
1170	10291	10993	11725	12489	13286	14114	14972	15863	16794	17768
1180	18779	19825	20908	22027	23186	24386	25627	26907	28225	29575
1190	30955	32362	33794	35251	36739	38275	39868	41528	43231	44975
1200	46767	48609	50487	–	–	–	–	–	–	–

Table D-4.—Surface area at 0.1-foot (tenths) elevation increments (areas in acres)

Elevation (feet)	0.0 ft	0.1 ft	0.2 ft	0.3 ft	0.4 ft	0.5 ft	0.6 ft	0.7 ft	0.8 ft	0.9 ft
1130	0	0	0	0	0	0	0	0	0	0
1131	0	0	0	0	0	0	0	0	0	0
1132	0	0	0	0	0	0	0	0	0	0
1133	0	0	0	0	0	0	0	0	0	0
1134	0	0	0	0	0	0	0	0	0	0
1135	1	1	2	3	4	5	6	7	8	9
1136	10	11	11	13	14	15	16	17	18	19
1137	20	21	22	23	24	25	27	28	29	30
1138	32	33	35	36	37	39	40	42	43	44
1139	45	47	48	49	50	51	53	54	55	56
1140	58	59	60	61	62	64	65	66	67	69
1141	70	71	72	74	76	78	80	82	84	86
1142	88	90	92	94	96	98	99	101	103	105
1143	106	108	109	110	111	113	114	115	117	118
1144	119	120	121	123	124	126	127	129	130	132
1145	133	135	136	137	138	139	141	142	143	144
1146	145	146	147	148	149	150	151	152	153	154
1147	156	157	158	159	160	162	163	164	166	167
1148	168	170	171	173	175	176	178	180	182	184
1149	185	187	189	191	192	194	196	198	200	202
1150	204	206	208	210	212	215	217	220	222	225
1151	227	231	233	236	238	241	243	245	248	250
1152	252	255	257	259	262	264	266	268	270	272
1153	274	276	278	281	283	285	287	289	291	293
1154	295	297	299	301	303	305	308	310	312	315
1155	317	319	322	324	326	328	331	333	335	338
1156	340	342	344	346	349	351	353	355	358	360
1157	362	364	367	369	371	374	376	378	381	383
1158	385	388	390	393	395	398	400	403	406	408
1159	411	414	416	419	422	425	428	431	434	437
1160	440	443	446	449	452	454	457	459	462	465
1161	467	469	472	474	477	479	482	484	486	489
1162	491	494	496	499	501	504	506	509	511	514
1163	516	519	521	524	526	529	531	534	537	539
1164	542	544	547	549	552	554	557	559	562	565
1165	567	570	572	575	577	580	583	585	588	590
1166	593	596	598	601	604	606	609	611	614	616
1167	618	621	623	626	628	631	633	636	638	641
1168	643	645	648	650	653	655	657	660	662	664
1169	667	669	671	674	676	678	680	683	685	687
1170	690	692	694	697	700	702	705	708	711	714
1171	716	719	722	725	728	732	735	738	741	744
1172	748	751	754	758	761	764	768	771	774	778
1173	781	784	787	790	793	797	800	803	806	809
1174	812	815	818	821	825	828	831	834	837	840
1175	843	846	849	852	855	858	861	865	868	871
1176	874	877	880	884	887	890	894	898	901	905
1177	909	914	919	923	928	932	936	940	945	949

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Table D-4.—Surface area at 0.1-foot (tenths) elevation increments (areas in acres)

Elevation (feet)	0.0 ft	0.1 ft	0.2 ft	0.3 ft	0.4 ft	0.5 ft	0.6 ft	0.7 ft	0.8 ft	0.9 ft
1178	953	957	961	966	970	974	977	981	985	989
1179	993	997	1000	1004	1008	1011	1015	1018	1022	1025
1180	1029	1032	1036	1040	1043	1047	1050	1054	1057	1061
1181	1064	1068	1071	1075	1079	1082	1086	1090	1093	1097
1182	1101	1105	1108	1112	1116	1120	1123	1127	1131	1135
1183	1139	1142	1146	1150	1154	1159	1163	1167	1171	1175
1184	1180	1184	1188	1192	1196	1200	1204	1208	1212	1216
1185	1220	1224	1228	1232	1236	1241	1245	1249	1253	1257
1186	1261	1265	1269	1273	1277	1280	1284	1288	1292	1296
1187	1300	1304	1308	1312	1315	1318	1322	1325	1329	1332
1188	1335	1338	1341	1344	1347	1350	1353	1356	1359	1362
1189	1365	1368	1371	1374	1377	1380	1382	1385	1388	1391
1190	1394	1397	1399	1402	1405	1407	1410	1412	1415	1418
1191	1420	1423	1425	1427	1430	1432	1435	1437	1440	1442
1192	1445	1447	1449	1452	1454	1457	1459	1462	1465	1467
1193	1470	1473	1477	1480	1484	1487	1491	1495	1498	1502
1194	1505	1515	1521	1527	1532	1538	1542	1547	1552	1556
1195	1561	1564	1569	1576	1583	1591	1599	1608	1617	1627
1196	1637	1642	1646	1651	1655	1659	1664	1668	1673	1677
1197	1681	1686	1690	1694	1699	1703	1707	1711	1716	1720
1198	1724	1727	1731	1735	1740	1744	1749	1753	1758	1763
1199	1768	1772	1777	1781	1786	1791	1797	1802	1807	1812
1200	1817	1823	1828	1833	1838	1843	1847	1852	1856	1861
1201	1865	1873	1875	1876	1877	1878	1879	1879	1880	1880
1202	1881	–	–	–	–	–	–	–	–	–

Table D-5.—Storage capacity at 0.1-foot (tenths) elevation increments (capacities in acre-feet)

Elevation (feet)	0 ft	0.1 ft	0.2 ft	0.3 ft	0.4 ft	0.5 ft	0.6 ft	0.7 ft	0.8 ft	0.9 ft
1130	0	0	0	0	0	0	0	0	0	0
1131	0	0	0	0	0	0	0	0	0	0
1132	0	0	0	0	0	0	0	0	0	0
1133	0	0	0	0	0	0	0	0	0	0
1134	0	0	0	0	0	0	0	0	0	0
1135	0	0	1	1	1	2	2	3	3	4
1136	5	6	7	8	10	11	13	14	16	18
1137	20	22	24	26	28	31	34	36	39	42
1138	45	48	52	55	59	63	67	71	75	79
1139	84	89	93	98	103	108	113	119	124	130
1140	135	141	147	153	159	166	172	179	185	192
1141	199	206	213	221	228	236	244	252	260	268
1142	277	286	295	304	314	324	333	343	354	364
1143	375	385	396	407	418	429	441	452	464	475
1144	487	499	511	524	536	548	561	574	587	600
1145	613	626	640	654	667	681	695	709	724	738
1146	752	767	781	796	811	826	841	856	871	887
1147	902	918	934	949	965	982	998	1014	1031	1047
1148	1064	1081	1098	1115	1133	1150	1168	1186	1204	1222
1149	1241	1259	1278	1297	1316	1335	1355	1375	1395	1415
1150	1435	1456	1476	1497	1518	1540	1561	1583	1605	1627
1151	1650	1673	1696	1719	1743	1767	1791	1816	1840	1865
1152	1890	1916	1941	1967	1993	2020	2046	2073	2100	2127
1153	2154	2182	2209	2237	2265	2294	2322	2351	2380	2409
1154	2439	2469	2498	2528	2559	2589	2620	2651	2682	2713
1155	2745	2776	2808	2841	2873	2906	2939	2972	3006	3039
1156	3073	3107	3142	3176	3211	3246	3281	3316	3352	3388
1157	3424	3460	3497	3534	3571	3608	3645	3683	3721	3759
1158	3798	3836	3875	3914	3954	3993	4033	4074	4114	4155
1159	4196	4237	4278	4320	4362	4405	4447	4490	4533	4577
1160	4621	4665	4710	4754	4799	4845	4890	4936	4982	5028
1161	5075	5122	5169	5216	5264	5312	5360	5408	5456	5505
1162	5554	5603	5653	5703	5753	5803	5853	5904	5955	6006
1163	6058	6110	6162	6214	6266	6319	6372	6425	6479	6533
1164	6587	6641	6696	6750	6805	6861	6916	6972	7028	7084
1165	7141	7198	7255	7312	7370	7428	7486	7544	7603	7662
1166	7721	7780	7840	7900	7960	8021	8082	8143	8204	8265
1167	8327	8389	8451	8514	8576	8639	8703	8766	8830	8894
1168	8958	9022	9087	9152	9217	9282	9348	9414	9480	9546
1169	9613	9679	9746	9814	9881	9949	10017	10085	10153	10222
1170	10291	10360	10429	10499	10569	10639	10709	10780	10851	10922
1171	10993	11065	11137	11210	11282	11355	11429	11502	11576	11650
1172	11725	11800	11875	11951	12027	12103	12180	12257	12334	12411
1173	12489	12568	12646	12725	12804	12884	12964	13044	13124	13205
1174	13286	13367	13449	13531	13613	13696	13779	13862	13946	14029
1175	14114	14198	14283	14368	14453	14539	14625	14711	14798	14885
1176	14972	15060	15147	15236	15324	15413	15502	15592	15682	15772
1177	15863	15954	16045	16138	16230	16323	16417	16510	16605	16699

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Table D-5.—Storage capacity at 0.1-foot (tenths) elevation increments (capacities in acre-feet)

Elevation (feet)	0 ft	0.1 ft	0.2 ft	0.3 ft	0.4 ft	0.5 ft	0.6 ft	0.7 ft	0.8 ft	0.9 ft
1178	16794	16890	16986	17082	17179	17276	17374	17472	17570	17669
1179	17768	17867	17967	18067	18168	18269	18370	18472	18574	18676
1180	18779	18882	18985	19089	19193	19298	19403	19508	19613	19719
1181	19825	19932	20039	20146	20254	20362	20470	20579	20688	20798
1182	20908	21018	21129	21240	21351	21463	21575	21688	21800	21914
1183	22027	22141	22256	22371	22486	22602	22718	22834	22951	23068
1184	23186	23304	23423	23542	23661	23781	23901	24022	24143	24264
1185	24386	24508	24631	24754	24877	25001	25125	25250	25375	25501
1186	25627	25753	25879	26007	26134	26262	26390	26519	26648	26777
1187	26907	27037	27168	27299	27430	27562	27694	27826	27959	28092
1188	28225	28359	28493	28627	28762	28897	29032	29167	29303	29439
1189	29575	29712	29849	29986	30124	30261	30400	30538	30677	30816
1190	30955	31094	31234	31374	31515	31655	31796	31937	32079	32220
1181	19825	19932	20039	20146	20254	20362	20470	20579	20688	20798
1182	20908	21018	21129	21240	21351	21463	21575	21688	21800	21914
1183	22027	22141	22256	22371	22486	22602	22718	22834	22951	23068
1184	23186	23304	23423	23542	23661	23781	23901	24022	24143	24264
1185	24386	24508	24631	24754	24877	25001	25125	25250	25375	25501
1186	25627	25753	25879	26007	26134	26262	26390	26519	26648	26777
1187	26907	27037	27168	27299	27430	27562	27694	27826	27959	28092
1188	28225	28359	28493	28627	28762	28897	29032	29167	29303	29439
1189	29575	29712	29849	29986	30124	30261	30400	30538	30677	30816
1190	30955	31094	31234	31374	31515	31655	31796	31937	32079	32220
1191	32362	32504	32647	32789	32932	33075	33219	33362	33506	33650
1192	33794	33939	34084	34229	34374	34520	34666	34812	34958	35105
1193	35251	35399	35546	35694	35842	35991	36140	36289	36439	36589
1194	36739	36890	37042	37194	37347	37501	37655	37809	37964	38119
1195	38275	38431	38588	38745	38903	39062	39221	39382	39543	39705
1196	39868	40032	40197	40362	40527	40693	40859	41025	41192	41360
1197	41528	41696	41865	42034	42204	42374	42544	42715	42887	43058
1198	43231	43403	43576	43749	43923	44097	44272	44447	44623	44799
1199	44975	45152	45330	45508	45686	45865	46044	46224	46405	46585
1200	46767	46949	47132	47315	47498	47682	47867	48052	48237	48423
1201	48609	48796	48984	49171	49359	49547	49735	49923	50111	50299
1202	50487	–	–	–	–	–	–	–	–	–

Table D-6.—Surface area at 0.01-foot (hundredths) elevation increments (areas in acres)

Elevation (feet)	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
1130	0	0	0	0	0	0	0	0	0	0
1130.1	0	0	0	0	0	0	0	0	0	0
1130.2	0	0	0	0	0	0	0	0	0	0
1130.3	0	0	0	0	0	0	0	0	0	0
1130.4	0	0	0	0	0	0	0	0	0	0
1130.5	0	0	0	0	0	0	0	0	0	0
1130.6	0	0	0	0	0	0	0	0	0	0
1130.7	0	0	0	0	0	0	0	0	0	0
1130.8	0	0	0	0	0	0	0	0	0	0
1130.9	0	0	0	0	0	0	0	0	0	0
1131	0	0	0	0	0	0	0	0	0	0
1131.1	0	0	0	0	0	0	0	0	0	0
1131.2	0	0	0	0	0	0	0	0	0	0
1131.3	0	0	0	0	0	0	0	0	0	0
1131.4	0	0	0	0	0	0	0	0	0	0
1131.5	0	0	0	0	0	0	0	0	0	0
1131.6	0	0	0	0	0	0	0	0	0	0
1131.7	0	0	0	0	0	0	0	0	0	0
1131.8	0	0	0	0	0	0	0	0	0	0
1131.9	0	0	0	0	0	0	0	0	0	0
1132	0	0	0	0	0	0	0	0	0	0
1132.1	0	0	0	0	0	0	0	0	0	0
1132.2	0	0	0	0	0	0	0	0	0	0
1132.3	0	0	0	0	0	0	0	0	0	0
1132.4	0	0	0	0	0	0	0	0	0	0
1132.5	0	0	0	0	0	0	0	0	0	0
1132.6	0	0	0	0	0	0	0	0	0	0
1132.7	0	0	0	0	0	0	0	0	0	0
1132.8	0	0	0	0	0	0	0	0	0	0
1132.9	0	0	0	0	0	0	0	0	0	0
1133	0	0	0	0	0	0	0	0	0	0
1133.1	0	0	0	0	0	0	0	0	0	0
1133.2	0	0	0	0	0	0	0	0	0	0
1133.3	0	0	0	0	0	0	0	0	0	0
1133.4	0	0	0	0	0	0	0	0	0	0
1133.5	0	0	0	0	0	0	0	0	0	0
1133.6	0	0	0	0	0	0	0	0	0	0
1133.7	0	0	0	0	0	0	0	0	0	0
1133.8	0	0	0	0	0	0	0	0	0	0
1133.9	0	0	0	0	0	0	0	0	0	0
1134	0	0	0	0	0	0	0	0	0	0
1134.1	0	0	0	0	0	0	0	0	0	0
1134.2	0	0	0	0	0	0	0	0	0	0
1134.3	0	0	0	0	0	0	0	0	0	0
1134.4	0	0	0	0	0	0	0	0	0	0
1134.5	0	0	0	0	0	0	0	0	0	0
1134.6	0	0	0	0	0	0	0	0	0	0
1134.7	0	0	0	0	0	0	0	0	0	0
1134.8	0	0	0	0	0	0	0	0	0	0
1134.9	0	0	0	0	0	1	1	1	1	1
1135	1	1	1	1	1	1	1	1	1	1
1135.1	1	1	1	2	2	2	2	2	2	2
1135.2	2	2	2	2	2	3	3	3	3	3

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Table D-6.—Surface area at 0.01-foot (hundredths) elevation increments (areas in acres)

Elevation (feet)	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
1135.3	3	3	3	3	3	3	3	4	4	4
1135.4	4	4	4	4	4	4	4	4	5	5
1135.5	5	5	5	5	5	5	5	5	5	6
1135.6	6	6	6	6	6	6	6	6	6	7
1135.7	7	7	7	7	7	7	7	7	7	7
1135.8	8	8	8	8	8	8	8	8	8	8
1135.9	9	9	9	9	9	9	9	9	9	9
1136	10	10	10	10	10	10	10	10	10	10
1136.1	11	11	11	11	11	11	11	11	11	11
1136.2	11	12	12	12	12	12	12	12	12	12
1136.3	13	13	13	13	13	13	13	13	13	13
1136.4	14	14	14	14	14	14	14	14	14	14
1136.5	15	15	15	15	15	15	15	15	15	15
1136.6	16	16	16	16	16	16	16	16	16	17
1136.7	17	17	17	17	17	17	17	17	17	18
1136.8	18	18	18	18	18	18	18	18	19	19
1136.9	19	19	19	19	19	19	19	19	20	20
1137	20	20	20	20	20	20	20	20	21	21
1137.1	21	21	21	21	21	21	21	21	22	22
1137.2	22	22	22	22	22	22	22	23	23	23
1137.3	23	23	23	23	23	24	24	24	24	24
1137.4	24	24	24	24	25	25	25	25	25	25
1137.5	25	25	26	26	26	26	26	26	26	26
1137.6	27	27	27	27	27	27	27	27	28	28
1137.7	28	28	28	28	28	28	29	29	29	29
1137.8	29	29	29	29	30	30	30	30	30	30
1137.9	30	30	31	31	31	31	31	31	31	32
1138	32	32	32	32	32	32	33	33	33	33
1138.1	33	33	34	34	34	34	34	34	34	35
1138.2	35	35	35	35	35	35	36	36	36	36
1138.3	36	36	36	37	37	37	37	37	37	37
1138.4	37	38	38	38	38	38	38	38	39	39
1138.5	39	39	39	39	39	40	40	40	40	40
1138.6	40	40	40	41	41	41	41	41	41	41
1138.7	42	42	42	42	42	42	42	42	43	43
1138.8	43	43	43	43	43	43	44	44	44	44
1138.9	44	44	44	45	45	45	45	45	45	45
1139	45	46	46	46	46	46	46	46	46	46
1139.1	47	47	47	47	47	47	47	47	48	48
1139.2	48	48	48	48	48	48	49	49	49	49
1139.3	49	49	49	49	50	50	50	50	50	50
1139.4	50	50	51	51	51	51	51	51	51	51
1139.5	51	52	52	52	52	52	52	52	52	53
1139.6	53	53	53	53	53	53	53	54	54	54
1139.7	54	54	54	54	54	55	55	55	55	55
1139.8	55	55	55	56	56	56	56	56	56	56
1139.9	56	57	57	57	57	57	57	57	57	58
1140	58	58	58	58	58	58	58	58	59	59
1140.1	59	59	59	59	59	59	60	60	60	60
1140.2	60	60	60	60	60	61	61	61	61	61
1140.3	61	61	61	62	62	62	62	62	62	62
1140.4	62	63	63	63	63	63	63	63	63	64
1140.5	64	64	64	64	64	64	64	64	65	65

Table D-6.—Surface area at 0.01-foot (hundredths) elevation increments (areas in acres)

Elevation (feet)	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
1140.6	65	65	65	65	65	65	66	66	66	66
1140.7	66	66	66	67	67	67	67	67	67	67
1140.8	67	68	68	68	68	68	68	68	68	69
1140.9	69	69	69	69	69	69	69	70	70	70
1141	70	70	70	70	70	70	71	71	71	71
1141.1	71	71	71	71	72	72	72	72	72	72
1141.2	72	73	73	73	73	73	73	74	74	74
1141.3	74	74	74	75	75	75	75	75	75	76
1141.4	76	76	76	76	77	77	77	77	77	77
1141.5	78	78	78	78	78	79	79	79	79	79
1141.6	80	80	80	80	80	81	81	81	81	81
1141.7	82	82	82	82	82	83	83	83	83	83
1141.8	84	84	84	84	85	85	85	85	85	86
1141.9	86	86	86	86	87	87	87	87	88	88
1142	88	88	88	89	89	89	89	90	90	90
1142.1	90	90	91	91	91	91	91	91	92	92
1142.2	92	92	92	93	93	93	93	93	94	94
1142.3	94	94	94	94	95	95	95	95	95	96
1142.4	96	96	96	96	96	97	97	97	97	97
1142.5	98	98	98	98	98	98	99	99	99	99
1142.6	99	100	100	100	100	100	100	101	101	101
1142.7	101	101	101	102	102	102	102	102	102	103
1142.8	103	103	103	103	104	104	104	104	104	104
1142.9	105	105	105	105	105	105	106	106	106	106
1143	106	106	107	107	107	107	107	107	107	107
1143.1	108	108	108	108	108	108	108	108	109	109
1143.2	109	109	109	109	109	109	110	110	110	110
1143.3	110	110	110	110	111	111	111	111	111	111
1143.4	111	112	112	112	112	112	112	112	112	113
1143.5	113	113	113	113	113	113	113	114	114	114
1143.6	114	114	114	114	114	115	115	115	115	115
1143.7	115	115	115	116	116	116	116	116	116	116
1143.8	117	117	117	117	117	117	117	117	118	118
1143.9	118	118	118	118	118	118	119	119	119	119
1144	119	119	119	119	119	120	120	120	120	120
1144.1	120	120	120	121	121	121	121	121	121	121
1144.2	121	122	122	122	122	122	122	122	123	123
1144.3	123	123	123	123	123	123	124	124	124	124
1144.4	124	124	124	125	125	125	125	125	125	125
1144.5	126	126	126	126	126	126	126	127	127	127
1144.6	127	127	127	127	128	128	128	128	128	128
1144.7	129	129	129	129	129	129	129	130	130	130
1144.8	130	130	130	130	131	131	131	131	131	131
1144.9	132	132	132	132	132	132	132	133	133	133
1145	133	133	133	134	134	134	134	134	134	134
1145.1	135	135	135	135	135	135	135	135	136	136
1145.2	136	136	136	136	136	136	137	137	137	137
1145.3	137	137	137	137	138	138	138	138	138	138
1145.4	138	138	138	139	139	139	139	139	139	139
1145.5	139	140	140	140	140	140	140	140	140	140
1145.6	141	141	141	141	141	141	141	141	141	142
1145.7	142	142	142	142	142	142	142	142	143	143
1145.8	143	143	143	143	143	143	143	143	144	144

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Table D-6.—Surface area at 0.01-foot (hundredths) elevation increments (areas in acres)

Elevation (feet)	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
1145.9	144	144	144	144	144	144	144	145	145	145
1146	145	145	145	145	145	145	145	145	146	146
1146.1	146	146	146	146	146	146	146	146	146	147
1146.2	147	147	147	147	147	147	147	147	148	148
1146.3	148	148	148	148	148	148	148	148	149	149
1146.4	149	149	149	149	149	149	149	150	150	150
1146.5	150	150	150	150	150	150	151	151	151	151
1146.6	151	151	151	151	151	152	152	152	152	152
1146.7	152	152	152	152	153	153	153	153	153	153
1146.8	153	153	153	154	154	154	154	154	154	154
1146.9	154	155	155	155	155	155	155	155	155	155
1147	156	156	156	156	156	156	156	156	156	157
1147.1	157	157	157	157	157	157	157	157	158	158
1147.2	158	158	158	158	158	158	159	159	159	159
1147.3	159	159	159	159	160	160	160	160	160	160
1147.4	160	160	161	161	161	161	161	161	161	161
1147.5	162	162	162	162	162	162	162	162	163	163
1147.6	163	163	163	163	163	164	164	164	164	164
1147.7	164	164	165	165	165	165	165	165	165	165
1147.8	166	166	166	166	166	166	166	167	167	167
1147.9	167	167	167	167	168	168	168	168	168	168
1148	168	168	169	169	169	169	169	169	169	170
1148.1	170	170	170	170	170	171	171	171	171	171
1148.2	171	172	172	172	172	172	172	173	173	173
1148.3	173	173	173	174	174	174	174	174	174	175
1148.4	175	175	175	175	175	176	176	176	176	176
1148.5	176	177	177	177	177	177	178	178	178	178
1148.6	178	178	179	179	179	179	179	179	180	180
1148.7	180	180	180	181	181	181	181	181	181	182
1148.8	182	182	182	182	183	183	183	183	183	183
1148.9	184	184	184	184	184	185	185	185	185	185
1149	185	186	186	186	186	186	186	187	187	187
1149.1	187	187	187	188	188	188	188	188	188	189
1149.2	189	189	189	189	190	190	190	190	190	190
1149.3	191	191	191	191	191	192	192	192	192	192
1149.4	192	193	193	193	193	193	194	194	194	194
1149.5	194	195	195	195	195	195	196	196	196	196
1149.6	196	196	197	197	197	197	197	198	198	198
1149.7	198	198	199	199	199	199	199	200	200	200
1149.8	200	200	200	201	201	201	201	201	202	202
1149.9	202	202	202	203	203	203	203	203	204	204
1150	204	204	204	204	205	205	205	205	205	205
1150.1	206	206	206	206	206	207	207	207	207	208
1150.2	208	208	208	208	209	209	209	209	209	210
1150.3	210	210	210	211	211	211	211	212	212	212
1150.4	212	212	213	213	213	213	214	214	214	214
1150.5	215	215	215	215	216	216	216	216	217	217
1150.6	217	217	218	218	218	218	219	219	219	219
1150.7	220	220	220	220	221	221	221	221	222	222
1150.8	222	222	223	223	223	223	224	224	224	224
1150.9	225	225	225	225	226	226	226	226	227	227
1151	227	228	228	228	229	229	229	230	230	230
1151.1	231	231	231	231	232	232	232	233	233	233

Table D-6.—Surface area at 0.01-foot (hundredths) elevation increments (areas in acres)

Elevation (feet)	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
1151.2	233	234	234	234	234	235	235	235	235	236
1151.3	236	236	236	237	237	237	237	238	238	238
1151.4	238	239	239	239	239	240	240	240	240	241
1151.5	241	241	241	242	242	242	242	242	243	243
1151.6	243	243	244	244	244	244	245	245	245	245
1151.7	245	246	246	246	246	247	247	247	247	248
1151.8	248	248	248	248	249	249	249	249	250	250
1151.9	250	250	250	251	251	251	251	252	252	252
1152	252	253	253	253	253	254	254	254	254	255
1152.1	255	255	255	255	256	256	256	256	257	257
1152.2	257	257	258	258	258	258	258	259	259	259
1152.3	259	260	260	260	260	260	261	261	261	261
1152.4	262	262	262	262	262	263	263	263	263	264
1152.5	264	264	264	264	265	265	265	265	266	266
1152.6	266	266	266	267	267	267	267	267	268	268
1152.7	268	268	269	269	269	269	269	270	270	270
1152.8	270	270	271	271	271	271	271	272	272	272
1152.9	272	273	273	273	273	273	274	274	274	274
1153	274	275	275	275	275	275	276	276	276	276
1153.1	276	277	277	277	277	277	278	278	278	278
1153.2	278	279	279	279	279	279	280	280	280	280
1153.3	281	281	281	281	281	282	282	282	282	282
1153.4	283	283	283	283	283	284	284	284	284	285
1153.5	285	285	285	285	286	286	286	286	286	287
1153.6	287	287	287	288	288	288	288	288	289	289
1153.7	289	289	289	290	290	290	290	291	291	291
1153.8	291	291	292	292	292	292	292	293	293	293
1153.9	293	294	294	294	294	294	295	295	295	295
1154	295	296	296	296	296	296	296	297	297	297
1154.1	297	297	298	298	298	298	298	299	299	299
1154.2	299	299	300	300	300	300	300	301	301	301
1154.3	301	301	302	302	302	302	302	303	303	303
1154.4	303	304	304	304	304	304	305	305	305	305
1154.5	305	306	306	306	306	307	307	307	307	307
1154.6	308	308	308	308	309	309	309	309	310	310
1154.7	310	310	310	311	311	311	311	312	312	312
1154.8	312	312	313	313	313	313	314	314	314	314
1154.9	315	315	315	315	315	316	316	316	316	317
1155	317	317	317	318	318	318	318	319	319	319
1155.1	319	319	320	320	320	320	321	321	321	321
1155.2	322	322	322	322	322	323	323	323	323	324
1155.3	324	324	324	325	325	325	325	325	326	326
1155.4	326	326	327	327	327	327	328	328	328	328
1155.5	328	329	329	329	329	330	330	330	330	331
1155.6	331	331	331	332	332	332	332	332	333	333
1155.7	333	333	334	334	334	334	335	335	335	335
1155.8	335	336	336	336	336	337	337	337	337	338
1155.9	338	338	338	339	339	339	339	339	340	340
1156	340	340	341	341	341	341	341	342	342	342
1156.1	342	342	343	343	343	343	343	344	344	344
1156.2	344	345	345	345	345	345	346	346	346	346
1156.3	346	347	347	347	347	348	348	348	348	348
1156.4	349	349	349	349	350	350	350	350	350	351

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Table D-6.—Surface area at 0.01-foot (hundredths) elevation increments (areas in acres)

Elevation (feet)	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
1156.5	351	351	351	352	352	352	352	352	353	353
1156.6	353	353	354	354	354	354	354	355	355	355
1156.7	355	356	356	356	356	356	357	357	357	357
1156.8	358	358	358	358	358	359	359	359	359	360
1156.9	360	360	360	360	361	361	361	361	362	362
1157	362	362	362	363	363	363	363	364	364	364
1157.1	364	365	365	365	365	365	366	366	366	366
1157.2	367	367	367	367	368	368	368	368	369	369
1157.3	369	369	369	370	370	370	370	371	371	371
1157.4	371	372	372	372	372	372	373	373	373	373
1157.5	374	374	374	374	375	375	375	375	376	376
1157.6	376	376	377	377	377	377	377	378	378	378
1157.7	378	379	379	379	379	380	380	380	380	381
1157.8	381	381	381	381	382	382	382	382	383	383
1157.9	383	383	384	384	384	384	385	385	385	385
1158	385	386	386	386	386	387	387	387	387	388
1158.1	388	388	388	388	389	389	389	389	390	390
1158.2	390	390	391	391	391	391	392	392	392	392
1158.3	393	393	393	393	394	394	394	394	395	395
1158.4	395	395	396	396	396	397	397	397	397	398
1158.5	398	398	398	399	399	399	399	400	400	400
1158.6	400	401	401	401	401	402	402	402	402	403
1158.7	403	403	404	404	404	404	405	405	405	405
1158.8	406	406	406	406	407	407	407	408	408	408
1158.9	408	409	409	409	409	410	410	410	410	411
1159	411	411	411	412	412	412	412	413	413	413
1159.1	414	414	414	414	415	415	415	415	416	416
1159.2	416	417	417	417	417	418	418	418	419	419
1159.3	419	419	420	420	420	421	421	421	422	422
1159.4	422	422	423	423	423	424	424	424	424	425
1159.5	425	425	426	426	426	427	427	427	427	428
1159.6	428	428	429	429	429	430	430	430	431	431
1159.7	431	431	432	432	432	433	433	433	434	434
1159.8	434	435	435	435	435	436	436	436	437	437
1159.9	437	438	438	438	439	439	439	440	440	440
1160	440	441	441	441	442	442	442	443	443	443
1160.1	443	444	444	444	445	445	445	445	446	446
1160.2	446	447	447	447	447	448	448	448	448	449
1160.3	449	449	449	450	450	450	451	451	451	451
1160.4	452	452	452	452	453	453	453	453	454	454
1160.5	454	455	455	455	455	456	456	456	456	457
1160.6	457	457	457	458	458	458	458	459	459	459
1160.7	459	460	460	460	460	461	461	461	462	462
1160.8	462	462	463	463	463	463	464	464	464	464
1160.9	465	465	465	465	466	466	466	466	467	467
1161	467	467	468	468	468	468	469	469	469	469
1161.1	469	470	470	470	470	471	471	471	471	472
1161.2	472	472	472	473	473	473	473	474	474	474
1161.3	474	475	475	475	475	475	476	476	476	476
1161.4	477	477	477	477	478	478	478	478	479	479
1161.5	479	479	480	480	480	480	481	481	481	481
1161.6	482	482	482	482	483	483	483	483	483	484
1161.7	484	484	484	485	485	485	485	486	486	486

Table D-6.—Surface area at 0.01-foot (hundredths) elevation increments (areas in acres)

Elevation (feet)	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
1161.8	486	487	487	487	487	488	488	488	488	489
1161.9	489	489	489	490	490	490	490	491	491	491
1162	491	492	492	492	492	493	493	493	493	493
1162.1	494	494	494	494	495	495	495	495	496	496
1162.2	496	496	497	497	497	497	498	498	498	498
1162.3	499	499	499	499	500	500	500	500	501	501
1162.4	501	501	502	502	502	502	503	503	503	503
1162.5	504	504	504	504	505	505	505	505	506	506
1162.6	506	506	507	507	507	507	508	508	508	508
1162.7	509	509	509	509	510	510	510	510	511	511
1162.8	511	511	512	512	512	512	513	513	513	513
1162.9	514	514	514	514	515	515	515	515	516	516
1163	516	516	517	517	517	517	518	518	518	518
1163.1	519	519	519	519	520	520	520	520	521	521
1163.2	521	521	522	522	522	522	523	523	523	523
1163.3	524	524	524	525	525	525	525	526	526	526
1163.4	526	527	527	527	527	528	528	528	528	529
1163.5	529	529	529	530	530	530	530	531	531	531
1163.6	531	532	532	532	532	533	533	533	533	534
1163.7	534	534	534	535	535	535	536	536	536	536
1163.8	537	537	537	537	538	538	538	538	539	539
1163.9	539	539	540	540	540	540	541	541	541	541
1164	542	542	542	542	543	543	543	543	544	544
1164.1	544	544	545	545	545	545	546	546	546	546
1164.2	547	547	547	547	548	548	548	548	549	549
1164.3	549	549	550	550	550	550	551	551	551	551
1164.4	552	552	552	552	553	553	553	553	554	554
1164.5	554	554	555	555	555	556	556	556	556	557
1164.6	557	557	557	558	558	558	558	559	559	559
1164.7	559	560	560	560	560	561	561	561	561	562
1164.8	562	562	563	563	563	563	564	564	564	564
1164.9	565	565	565	565	566	566	566	566	567	567
1165	567	567	568	568	568	568	569	569	569	569
1165.1	570	570	570	570	571	571	571	572	572	572
1165.2	572	573	573	573	573	574	574	574	574	575
1165.3	575	575	575	576	576	576	576	577	577	577
1165.4	577	578	578	578	578	579	579	579	579	580
1165.5	580	580	580	581	581	581	581	582	582	582
1165.6	583	583	583	583	584	584	584	584	585	585
1165.7	585	585	586	586	586	586	587	587	587	587
1165.8	588	588	588	588	589	589	589	590	590	590
1165.9	590	591	591	591	591	592	592	592	592	593
1166	593	593	593	594	594	594	595	595	595	595
1166.1	596	596	596	597	597	597	597	598	598	598
1166.2	598	599	599	599	599	600	600	600	600	601
1166.3	601	601	601	602	602	602	603	603	603	603
1166.4	604	604	604	604	605	605	605	605	606	606
1166.5	606	606	607	607	607	607	608	608	608	608
1166.6	609	609	609	609	610	610	610	610	611	611
1166.7	611	611	612	612	612	612	613	613	613	613
1166.8	614	614	614	614	615	615	615	615	616	616
1166.9	616	616	617	617	617	617	617	618	618	618
1167	618	619	619	619	619	620	620	620	620	621

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Table D-6.—Surface area at 0.01-foot (hundredths) elevation increments (areas in acres)

Elevation (feet)	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
1167.1	621	621	621	622	622	622	622	623	623	623
1167.2	623	624	624	624	624	625	625	625	625	626
1167.3	626	626	626	627	627	627	627	628	628	628
1167.4	628	629	629	629	629	630	630	630	630	631
1167.5	631	631	631	632	632	632	632	633	633	633
1167.6	633	634	634	634	634	635	635	635	635	636
1167.7	636	636	636	637	637	637	637	637	638	638
1167.8	638	638	639	639	639	639	640	640	640	640
1167.9	641	641	641	641	642	642	642	642	643	643
1168	643	643	644	644	644	644	645	645	645	645
1168.1	645	646	646	646	646	647	647	647	647	648
1168.2	648	648	648	649	649	649	649	649	650	650
1168.3	650	650	651	651	651	651	652	652	652	652
1168.4	653	653	653	653	653	654	654	654	654	655
1168.5	655	655	655	656	656	656	656	657	657	657
1168.6	657	657	658	658	658	658	659	659	659	659
1168.7	660	660	660	660	661	661	661	661	661	662
1168.8	662	662	662	663	663	663	663	664	664	664
1168.9	664	665	665	665	665	666	666	666	666	666
1169	667	667	667	667	668	668	668	668	668	669
1169.1	669	669	669	670	670	670	670	671	671	671
1169.2	671	671	672	672	672	672	673	673	673	673
1169.3	674	674	674	674	674	675	675	675	675	676
1169.4	676	676	676	677	677	677	677	677	678	678
1169.5	678	678	679	679	679	679	680	680	680	680
1169.6	680	681	681	681	681	682	682	682	682	683
1169.7	683	683	683	683	684	684	684	684	685	685
1169.8	685	685	686	686	686	686	686	687	687	687
1169.9	687	688	688	688	688	689	689	689	689	689
1170	690	690	690	690	690	691	691	691	691	692
1170.1	692	692	692	693	693	693	693	694	694	694
1170.2	694	695	695	695	695	696	696	696	696	697
1170.3	697	697	697	698	698	698	698	699	699	699
1170.4	700	700	700	700	701	701	701	701	702	702
1170.5	702	703	703	703	703	704	704	704	704	705
1170.6	705	705	706	706	706	706	707	707	707	708
1170.7	708	708	708	709	709	709	710	710	710	710
1170.8	711	711	711	712	712	712	712	713	713	713
1170.9	714	714	714	714	715	715	715	716	716	716
1171	716	717	717	717	718	718	718	718	719	719
1171.1	719	720	720	720	720	721	721	721	722	722
1171.2	722	723	723	723	723	724	724	724	725	725
1171.3	725	726	726	726	727	727	727	727	728	728
1171.4	728	729	729	729	730	730	730	731	731	731
1171.5	732	732	732	732	733	733	733	734	734	734
1171.6	735	735	735	736	736	736	737	737	737	738
1171.7	738	738	739	739	739	739	740	740	740	741
1171.8	741	741	742	742	742	743	743	743	744	744
1171.9	744	745	745	745	746	746	746	747	747	747
1172	748	748	748	749	749	749	750	750	750	751
1172.1	751	751	752	752	752	753	753	753	754	754
1172.2	754	755	755	755	756	756	756	757	757	757
1172.3	758	758	758	759	759	759	760	760	760	761

Table D-6.—Surface area at 0.01-foot (hundredths) elevation increments (areas in acres)

Elevation (feet)	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
1172.4	761	761	762	762	762	763	763	763	764	764
1172.5	764	765	765	765	766	766	766	767	767	767
1172.6	768	768	768	769	769	769	770	770	770	771
1172.7	771	771	772	772	772	773	773	773	774	774
1172.8	774	775	775	775	776	776	776	777	777	777
1172.9	778	778	778	779	779	779	780	780	780	781
1173	781	781	782	782	782	783	783	783	784	784
1173.1	784	784	785	785	785	786	786	786	787	787
1173.2	787	788	788	788	789	789	789	789	790	790
1173.3	790	791	791	791	792	792	792	793	793	793
1173.4	793	794	794	794	795	795	795	796	796	796
1173.5	797	797	797	798	798	798	798	799	799	799
1173.6	800	800	800	801	801	801	802	802	802	803
1173.7	803	803	803	804	804	804	805	805	805	806
1173.8	806	806	807	807	807	808	808	808	808	809
1173.9	809	809	810	810	810	811	811	811	812	812
1174	812	813	813	813	814	814	814	814	815	815
1174.1	815	816	816	816	817	817	817	818	818	818
1174.2	818	819	819	819	820	820	820	821	821	821
1174.3	821	822	822	822	823	823	823	824	824	824
1174.4	825	825	825	825	826	826	826	827	827	827
1174.5	828	828	828	829	829	829	829	830	830	830
1174.6	831	831	831	832	832	832	832	833	833	833
1174.7	834	834	834	835	835	835	836	836	836	836
1174.8	837	837	837	838	838	838	839	839	839	839
1174.9	840	840	840	841	841	841	842	842	842	843
1175	843	843	843	844	844	844	845	845	845	845
1175.1	846	846	846	847	847	847	848	848	848	849
1175.2	849	849	849	850	850	850	851	851	851	852
1175.3	852	852	853	853	853	854	854	854	854	855
1175.4	855	855	856	856	856	857	857	857	858	858
1175.5	858	859	859	859	860	860	860	861	861	861
1175.6	861	862	862	862	863	863	863	864	864	864
1175.7	865	865	865	866	866	866	867	867	867	868
1175.8	868	868	869	869	869	870	870	870	871	871
1175.9	871	872	872	872	872	873	873	873	874	874
1176	874	875	875	875	875	876	876	876	877	877
1176.1	877	877	878	878	878	879	879	879	880	880
1176.2	880	881	881	881	882	882	882	883	883	883
1176.3	884	884	884	885	885	885	886	886	886	887
1176.4	887	887	888	888	888	889	889	889	890	890
1176.5	890	891	891	891	892	892	893	893	893	894
1176.6	894	894	895	895	895	896	896	896	897	897
1176.7	898	898	898	899	899	899	900	900	900	901
1176.8	901	902	902	902	903	903	903	904	904	904
1176.9	905	905	906	906	906	907	907	907	908	908
1177	909	909	910	910	911	911	912	912	913	913
1177.1	914	914	915	915	916	916	917	917	918	918
1177.2	919	919	920	920	921	921	922	922	922	923
1177.3	923	924	924	925	925	926	926	926	927	927
1177.4	928	928	929	929	929	930	930	931	931	932
1177.5	932	932	933	933	934	934	935	935	935	936
1177.6	936	937	937	938	938	938	939	939	940	940

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Table D-6.—Surface area at 0.01-foot (hundredths) elevation increments (areas in acres)

Elevation (feet)	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
1177.7	940	941	941	942	942	943	943	943	944	944
1177.8	945	945	945	946	946	947	947	947	948	948
1177.9	949	949	949	950	950	951	951	952	952	952
1178	953	953	954	954	955	955	956	956	956	957
1178.1	957	958	958	959	959	959	960	960	961	961
1178.2	961	962	962	963	963	964	964	964	965	965
1178.3	966	966	966	967	967	968	968	968	969	969
1178.4	970	970	970	971	971	972	972	972	973	973
1178.5	974	974	974	975	975	975	976	976	977	977
1178.6	977	978	978	979	979	979	980	980	981	981
1178.7	981	982	982	982	983	983	984	984	984	985
1178.8	985	986	986	986	987	987	987	988	988	989
1178.9	989	989	990	990	991	991	991	992	992	992
1179	993	993	994	994	994	995	995	996	996	996
1179.1	997	997	997	998	998	998	999	999	1000	1000
1179.2	1000	1001	1001	1001	1002	1002	1003	1003	1003	1004
1179.3	1004	1004	1005	1005	1005	1006	1006	1007	1007	1007
1179.4	1008	1008	1008	1009	1009	1009	1010	1010	1010	1011
1179.5	1011	1012	1012	1012	1013	1013	1013	1014	1014	1014
1179.6	1015	1015	1015	1016	1016	1017	1017	1017	1018	1018
1179.7	1018	1019	1019	1019	1020	1020	1020	1021	1021	1022
1179.8	1022	1022	1023	1023	1023	1024	1024	1024	1025	1025
1179.9	1025	1026	1026	1027	1027	1027	1028	1028	1028	1029
1180	1029	1029	1030	1030	1030	1031	1031	1031	1032	1032
1180.1	1032	1033	1033	1034	1034	1034	1035	1035	1035	1036
1180.2	1036	1036	1037	1037	1037	1038	1038	1038	1039	1039
1180.3	1040	1040	1040	1041	1041	1041	1042	1042	1042	1043
1180.4	1043	1043	1044	1044	1044	1045	1045	1046	1046	1046
1180.5	1047	1047	1047	1048	1048	1048	1049	1049	1049	1050
1180.6	1050	1050	1051	1051	1052	1052	1052	1053	1053	1053
1180.7	1054	1054	1054	1055	1055	1055	1056	1056	1057	1057
1180.8	1057	1058	1058	1058	1059	1059	1059	1060	1060	1060
1180.9	1061	1061	1061	1062	1062	1063	1063	1063	1064	1064
1181	1064	1065	1065	1065	1066	1066	1066	1067	1067	1067
1181.1	1068	1068	1068	1069	1069	1069	1070	1070	1071	1071
1181.2	1071	1072	1072	1072	1073	1073	1073	1074	1074	1075
1181.3	1075	1075	1076	1076	1076	1077	1077	1077	1078	1078
1181.4	1079	1079	1079	1080	1080	1080	1081	1081	1081	1082
1181.5	1082	1083	1083	1083	1084	1084	1084	1085	1085	1086
1181.6	1086	1086	1087	1087	1087	1088	1088	1089	1089	1089
1181.7	1090	1090	1090	1091	1091	1092	1092	1092	1093	1093
1181.8	1093	1094	1094	1095	1095	1095	1096	1096	1096	1097
1181.9	1097	1098	1098	1098	1099	1099	1100	1100	1100	1101
1182	1101	1101	1102	1102	1102	1103	1103	1104	1104	1104
1182.1	1105	1105	1105	1106	1106	1106	1107	1107	1108	1108
1182.2	1108	1109	1109	1109	1110	1110	1111	1111	1111	1112
1182.3	1112	1112	1113	1113	1113	1114	1114	1115	1115	1115
1182.4	1116	1116	1116	1117	1117	1118	1118	1118	1119	1119
1182.5	1120	1120	1120	1121	1121	1121	1122	1122	1123	1123
1182.6	1123	1124	1124	1124	1125	1125	1126	1126	1126	1127
1182.7	1127	1127	1128	1128	1129	1129	1129	1130	1130	1131
1182.8	1131	1131	1132	1132	1132	1133	1133	1134	1134	1134
1182.9	1135	1135	1135	1136	1136	1137	1137	1137	1138	1138

Table D-6.—Surface area at 0.01-foot (hundredths) elevation increments (areas in acres)

Elevation (feet)	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
1183	1139	1139	1139	1140	1140	1140	1141	1141	1142	1142
1183.1	1142	1143	1143	1143	1144	1144	1145	1145	1145	1146
1183.2	1146	1147	1147	1147	1148	1148	1149	1149	1149	1150
1183.3	1150	1151	1151	1152	1152	1152	1153	1153	1154	1154
1183.4	1154	1155	1155	1156	1156	1156	1157	1157	1158	1158
1183.5	1159	1159	1159	1160	1160	1161	1161	1161	1162	1162
1183.6	1163	1163	1164	1164	1164	1165	1165	1166	1166	1167
1183.7	1167	1167	1168	1168	1169	1169	1169	1170	1170	1171
1183.8	1171	1172	1172	1172	1173	1173	1174	1174	1175	1175
1183.9	1175	1176	1176	1177	1177	1178	1178	1178	1179	1179
1184	1180	1180	1181	1181	1181	1182	1182	1183	1183	1183
1184.1	1184	1184	1185	1185	1185	1186	1186	1187	1187	1188
1184.2	1188	1188	1189	1189	1190	1190	1190	1191	1191	1192
1184.3	1192	1192	1193	1193	1194	1194	1194	1195	1195	1196
1184.4	1196	1196	1197	1197	1198	1198	1198	1199	1199	1200
1184.5	1200	1200	1201	1201	1202	1202	1202	1203	1203	1204
1184.6	1204	1204	1205	1205	1206	1206	1206	1207	1207	1208
1184.7	1208	1208	1209	1209	1210	1210	1210	1211	1211	1212
1184.8	1212	1212	1213	1213	1214	1214	1214	1215	1215	1216
1184.9	1216	1216	1217	1217	1218	1218	1218	1219	1219	1220
1185	1220	1220	1221	1221	1222	1222	1222	1223	1223	1224
1185.1	1224	1224	1225	1225	1226	1226	1227	1227	1227	1228
1185.2	1228	1229	1229	1229	1230	1230	1231	1231	1231	1232
1185.3	1232	1233	1233	1234	1234	1234	1235	1235	1236	1236
1185.4	1236	1237	1237	1238	1238	1238	1239	1239	1240	1240
1185.5	1241	1241	1241	1242	1242	1243	1243	1243	1244	1244
1185.6	1245	1245	1245	1246	1246	1247	1247	1247	1248	1248
1185.7	1249	1249	1250	1250	1250	1251	1251	1252	1252	1252
1185.8	1253	1253	1254	1254	1254	1255	1255	1256	1256	1256
1185.9	1257	1257	1258	1258	1259	1259	1259	1260	1260	1261
1186	1261	1261	1262	1262	1262	1263	1263	1264	1264	1264
1186.1	1265	1265	1266	1266	1266	1267	1267	1268	1268	1268
1186.2	1269	1269	1269	1270	1270	1271	1271	1271	1272	1272
1186.3	1273	1273	1273	1274	1274	1275	1275	1275	1276	1276
1186.4	1277	1277	1277	1278	1278	1278	1279	1279	1280	1280
1186.5	1280	1281	1281	1282	1282	1282	1283	1283	1284	1284
1186.6	1284	1285	1285	1286	1286	1286	1287	1287	1288	1288
1186.7	1288	1289	1289	1289	1290	1290	1291	1291	1291	1292
1186.8	1292	1293	1293	1293	1294	1294	1295	1295	1295	1296
1186.9	1296	1297	1297	1297	1298	1298	1299	1299	1299	1300
1187	1300	1301	1301	1301	1302	1302	1303	1303	1303	1304
1187.1	1304	1305	1305	1305	1306	1306	1306	1307	1307	1308
1187.2	1308	1308	1309	1309	1309	1310	1310	1310	1311	1311
1187.3	1312	1312	1312	1313	1313	1313	1314	1314	1314	1315
1187.4	1315	1315	1316	1316	1316	1317	1317	1317	1318	1318
1187.5	1318	1319	1319	1319	1320	1320	1320	1321	1321	1321
1187.6	1322	1322	1323	1323	1323	1324	1324	1324	1325	1325
1187.7	1325	1326	1326	1326	1327	1327	1327	1328	1328	1328
1187.8	1329	1329	1329	1329	1330	1330	1330	1331	1331	1331
1187.9	1332	1332	1332	1333	1333	1333	1334	1334	1334	1335
1188	1335	1335	1336	1336	1336	1337	1337	1337	1338	1338
1188.1	1338	1338	1339	1339	1339	1340	1340	1340	1341	1341
1188.2	1341	1341	1342	1342	1342	1343	1343	1343	1344	1344

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Table D-6.—Surface area at 0.01-foot (hundredths) elevation increments (areas in acres)

Elevation (feet)	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
1188.3	1344	1344	1345	1345	1345	1346	1346	1346	1347	1347
1188.4	1347	1347	1348	1348	1348	1349	1349	1349	1349	1350
1188.5	1350	1350	1351	1351	1351	1352	1352	1352	1352	1353
1188.6	1353	1353	1354	1354	1354	1355	1355	1355	1355	1356
1188.7	1356	1356	1357	1357	1357	1358	1358	1358	1358	1359
1188.8	1359	1359	1360	1360	1360	1360	1361	1361	1361	1362
1188.9	1362	1362	1363	1363	1363	1363	1364	1364	1364	1365
1189	1365	1365	1366	1366	1366	1366	1367	1367	1367	1368
1189.1	1368	1368	1369	1369	1369	1369	1370	1370	1370	1371
1189.2	1371	1371	1371	1372	1372	1372	1373	1373	1373	1373
1189.3	1374	1374	1374	1375	1375	1375	1376	1376	1376	1376
1189.4	1377	1377	1377	1378	1378	1378	1378	1379	1379	1379
1189.5	1380	1380	1380	1380	1381	1381	1381	1382	1382	1382
1189.6	1382	1383	1383	1383	1384	1384	1384	1384	1385	1385
1189.7	1385	1386	1386	1386	1387	1387	1387	1387	1388	1388
1189.8	1388	1389	1389	1389	1389	1390	1390	1390	1391	1391
1189.9	1391	1391	1392	1392	1392	1393	1393	1393	1393	1394
1190	1394	1394	1395	1395	1395	1395	1396	1396	1396	1397
1190.1	1397	1397	1397	1398	1398	1398	1398	1399	1399	1399
1190.2	1399	1400	1400	1400	1401	1401	1401	1401	1402	1402
1190.3	1402	1402	1403	1403	1403	1403	1404	1404	1404	1404
1190.4	1405	1405	1405	1405	1406	1406	1406	1407	1407	1407
1190.5	1407	1408	1408	1408	1408	1409	1409	1409	1409	1410
1190.6	1410	1410	1410	1411	1411	1411	1411	1412	1412	1412
1190.7	1412	1413	1413	1413	1413	1414	1414	1414	1414	1415
1190.8	1415	1415	1416	1416	1416	1416	1417	1417	1417	1417
1190.9	1418	1418	1418	1418	1419	1419	1419	1419	1420	1420
1191	1420	1420	1421	1421	1421	1421	1422	1422	1422	1422
1191.1	1423	1423	1423	1423	1424	1424	1424	1424	1424	1425
1191.2	1425	1425	1425	1426	1426	1426	1426	1427	1427	1427
1191.3	1427	1428	1428	1428	1428	1429	1429	1429	1429	1430
1191.4	1430	1430	1430	1431	1431	1431	1431	1432	1432	1432
1191.5	1432	1433	1433	1433	1433	1434	1434	1434	1434	1435
1191.6	1435	1435	1435	1436	1436	1436	1436	1437	1437	1437
1191.7	1437	1437	1438	1438	1438	1438	1439	1439	1439	1439
1191.8	1440	1440	1440	1440	1441	1441	1441	1441	1442	1442
1191.9	1442	1442	1443	1443	1443	1443	1444	1444	1444	1444
1192	1445	1445	1445	1445	1446	1446	1446	1446	1446	1447
1192.1	1447	1447	1447	1448	1448	1448	1448	1449	1449	1449
1192.2	1449	1450	1450	1450	1450	1451	1451	1451	1451	1452
1192.3	1452	1452	1452	1453	1453	1453	1453	1454	1454	1454
1192.4	1454	1455	1455	1455	1455	1456	1456	1456	1456	1457
1192.5	1457	1457	1457	1458	1458	1458	1458	1459	1459	1459
1192.6	1459	1460	1460	1460	1461	1461	1461	1461	1462	1462
1192.7	1462	1462	1463	1463	1463	1463	1464	1464	1464	1464
1192.8	1465	1465	1465	1465	1466	1466	1466	1466	1467	1467
1192.9	1467	1468	1468	1468	1468	1469	1469	1469	1469	1470
1193	1470	1470	1471	1471	1471	1472	1472	1472	1473	1473
1193.1	1473	1474	1474	1474	1475	1475	1475	1476	1476	1476
1193.2	1477	1477	1477	1478	1478	1479	1479	1479	1480	1480
1193.3	1480	1481	1481	1481	1482	1482	1482	1483	1483	1483
1193.4	1484	1484	1485	1485	1485	1486	1486	1486	1487	1487
1193.5	1487	1488	1488	1488	1489	1489	1490	1490	1490	1491

Table D-6.—Surface area at 0.01-foot (hundredths) elevation increments (areas in acres)

Elevation (feet)	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
1193.6	1491	1491	1492	1492	1492	1493	1493	1493	1494	1494
1193.7	1495	1495	1495	1496	1496	1496	1497	1497	1497	1498
1193.8	1498	1498	1499	1499	1500	1500	1500	1501	1501	1501
1193.9	1502	1502	1502	1503	1503	1504	1504	1504	1505	1505
1194	1505	1507	1508	1509	1510	1511	1512	1512	1513	1514
1194.1	1515	1515	1516	1517	1517	1518	1519	1519	1520	1521
1194.2	1521	1522	1522	1523	1524	1524	1525	1525	1526	1526
1194.3	1527	1528	1528	1529	1529	1530	1530	1531	1531	1532
1194.4	1532	1533	1533	1534	1535	1535	1536	1536	1537	1537
1194.5	1538	1538	1539	1539	1540	1540	1541	1541	1541	1542
1194.6	1542	1543	1543	1544	1544	1545	1545	1546	1546	1547
1194.7	1547	1548	1548	1549	1549	1549	1550	1550	1551	1551
1194.8	1552	1552	1553	1553	1554	1554	1554	1555	1555	1556
1194.9	1556	1557	1557	1557	1558	1558	1559	1559	1560	1560
1195	1561	1561	1561	1561	1562	1562	1562	1563	1563	1564
1195.1	1564	1564	1565	1565	1566	1566	1567	1568	1568	1569
1195.2	1569	1570	1570	1571	1572	1572	1573	1574	1574	1575
1195.3	1576	1576	1577	1578	1578	1579	1580	1581	1581	1582
1195.4	1583	1584	1584	1585	1586	1587	1587	1588	1589	1590
1195.5	1591	1591	1592	1593	1594	1595	1596	1596	1597	1598
1195.6	1599	1600	1601	1602	1603	1603	1604	1605	1606	1607
1195.7	1608	1609	1610	1611	1612	1613	1614	1614	1615	1616
1195.8	1617	1618	1619	1620	1621	1622	1623	1624	1625	1626
1195.9	1627	1628	1629	1630	1631	1632	1633	1634	1635	1636
1196	1637	1638	1638	1639	1639	1640	1640	1640	1641	1641
1196.1	1642	1642	1643	1643	1644	1644	1644	1645	1645	1646
1196.2	1646	1647	1647	1648	1648	1648	1649	1649	1650	1650
1196.3	1651	1651	1652	1652	1652	1653	1653	1654	1654	1655
1196.4	1655	1655	1656	1656	1657	1657	1658	1658	1659	1659
1196.5	1659	1660	1660	1661	1661	1662	1662	1662	1663	1663
1196.6	1664	1664	1665	1665	1666	1666	1666	1667	1667	1668
1196.7	1668	1669	1669	1670	1670	1670	1671	1671	1672	1672
1196.8	1673	1673	1673	1674	1674	1675	1675	1676	1676	1677
1196.9	1677	1677	1678	1678	1679	1679	1680	1680	1680	1681
1197	1681	1682	1682	1683	1683	1684	1684	1684	1685	1685
1197.1	1686	1686	1687	1687	1687	1688	1688	1689	1689	1690
1197.2	1690	1690	1691	1691	1692	1692	1693	1693	1693	1694
1197.3	1694	1695	1695	1696	1696	1696	1697	1697	1698	1698
1197.4	1699	1699	1699	1700	1700	1701	1701	1702	1702	1702
1197.5	1703	1703	1704	1704	1705	1705	1705	1706	1706	1707
1197.6	1707	1708	1708	1708	1709	1709	1710	1710	1711	1711
1197.7	1711	1712	1712	1713	1713	1713	1714	1714	1715	1715
1197.8	1716	1716	1716	1717	1717	1718	1718	1719	1719	1719
1197.9	1720	1720	1721	1721	1721	1722	1722	1723	1723	1724
1198	1724	1724	1725	1725	1725	1726	1726	1726	1727	1727
1198.1	1727	1728	1728	1728	1729	1729	1730	1730	1730	1731
1198.2	1731	1732	1732	1732	1733	1733	1734	1734	1735	1735
1198.3	1735	1736	1736	1737	1737	1737	1738	1738	1739	1739
1198.4	1740	1740	1741	1741	1741	1742	1742	1743	1743	1744
1198.5	1744	1745	1745	1745	1746	1746	1747	1747	1748	1748
1198.6	1749	1749	1750	1750	1750	1751	1751	1752	1752	1753
1198.7	1753	1754	1754	1755	1755	1756	1756	1757	1757	1757
1198.8	1758	1758	1759	1759	1760	1760	1761	1761	1762	1762

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Table D-6.—Surface area at 0.01-foot (hundredths) elevation increments (areas in acres)

Elevation (feet)	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
1198.9	1763	1763	1764	1764	1765	1765	1766	1766	1767	1767
1199	1768	1768	1768	1769	1769	1770	1770	1771	1771	1771
1199.1	1772	1772	1773	1773	1774	1774	1775	1775	1776	1776
1199.2	1777	1777	1778	1778	1779	1779	1779	1780	1780	1781
1199.3	1781	1782	1782	1783	1783	1784	1784	1785	1785	1786
1199.4	1786	1787	1787	1788	1788	1789	1789	1790	1790	1791
1199.5	1791	1792	1792	1793	1793	1794	1794	1795	1795	1796
1199.6	1797	1797	1798	1798	1799	1799	1800	1800	1801	1801
1199.7	1802	1802	1803	1803	1804	1804	1805	1805	1806	1806
1199.8	1807	1807	1808	1808	1809	1809	1810	1810	1811	1811
1199.9	1812	1813	1813	1814	1814	1815	1815	1816	1816	1817
1200	1817	1818	1819	1819	1820	1820	1821	1822	1822	1823
1200.1	1823	1824	1824	1825	1825	1826	1826	1827	1827	1828
1200.2	1828	1829	1829	1830	1830	1831	1831	1832	1832	1833
1200.3	1833	1834	1834	1835	1835	1836	1836	1837	1837	1838
1200.4	1838	1839	1839	1840	1840	1841	1841	1841	1842	1842
1200.5	1843	1843	1844	1844	1845	1845	1846	1846	1847	1847
1200.6	1847	1848	1848	1849	1849	1850	1850	1851	1851	1852
1200.7	1852	1852	1853	1853	1854	1854	1855	1855	1856	1856
1200.8	1856	1857	1857	1858	1858	1859	1859	1860	1860	1860
1200.9	1861	1861	1862	1862	1863	1863	1863	1864	1864	1865
1201	1865	1869	1870	1871	1871	1872	1872	1872	1873	1873
1201.1	1873	1873	1874	1874	1874	1874	1874	1875	1875	1875
1201.2	1875	1875	1875	1875	1876	1876	1876	1876	1876	1876
1201.3	1876	1876	1876	1877	1877	1877	1877	1877	1877	1877
1201.4	1877	1877	1877	1877	1878	1878	1878	1878	1878	1878
1201.5	1878	1878	1878	1878	1878	1878	1878	1878	1879	1879
1201.6	1879	1879	1879	1879	1879	1879	1879	1879	1879	1879
1201.7	1879	1879	1879	1879	1880	1880	1880	1880	1880	1880
1201.8	1880	1880	1880	1880	1880	1880	1880	1880	1880	1880
1201.9	1880	1880	1880	1881	1881	1881	1881	1881	1881	1881
1202	1881	-	-	-	-	-	-	-	-	-

Table D-7.—Storage capacity at 0.01-foot (hundredths) elevation increments (capacities in acre-feet)

Elevation (feet)	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
1130	0	0	0	0	0	0	0	0	0	0
1130.1	0	0	0	0	0	0	0	0	0	0
1130.2	0	0	0	0	0	0	0	0	0	0
1130.3	0	0	0	0	0	0	0	0	0	0
1130.4	0	0	0	0	0	0	0	0	0	0
1130.5	0	0	0	0	0	0	0	0	0	0
1130.6	0	0	0	0	0	0	0	0	0	0
1130.7	0	0	0	0	0	0	0	0	0	0
1130.8	0	0	0	0	0	0	0	0	0	0
1130.9	0	0	0	0	0	0	0	0	0	0
1131	0	0	0	0	0	0	0	0	0	0
1131.1	0	0	0	0	0	0	0	0	0	0
1131.2	0	0	0	0	0	0	0	0	0	0
1131.3	0	0	0	0	0	0	0	0	0	0
1131.4	0	0	0	0	0	0	0	0	0	0
1131.5	0	0	0	0	0	0	0	0	0	0
1131.6	0	0	0	0	0	0	0	0	0	0
1131.7	0	0	0	0	0	0	0	0	0	0
1131.8	0	0	0	0	0	0	0	0	0	0
1131.9	0	0	0	0	0	0	0	0	0	0
1132	0	0	0	0	0	0	0	0	0	0
1132.1	0	0	0	0	0	0	0	0	0	0
1132.2	0	0	0	0	0	0	0	0	0	0
1132.3	0	0	0	0	0	0	0	0	0	0
1132.4	0	0	0	0	0	0	0	0	0	0
1132.5	0	0	0	0	0	0	0	0	0	0
1132.6	0	0	0	0	0	0	0	0	0	0
1132.7	0	0	0	0	0	0	0	0	0	0
1132.8	0	0	0	0	0	0	0	0	0	0
1132.9	0	0	0	0	0	0	0	0	0	0
1133	0	0	0	0	0	0	0	0	0	0
1133.1	0	0	0	0	0	0	0	0	0	0
1133.2	0	0	0	0	0	0	0	0	0	0
1133.3	0	0	0	0	0	0	0	0	0	0
1133.4	0	0	0	0	0	0	0	0	0	0
1133.5	0	0	0	0	0	0	0	0	0	0
1133.6	0	0	0	0	0	0	0	0	0	0
1133.7	0	0	0	0	0	0	0	0	0	0
1133.8	0	0	0	0	0	0	0	0	0	0
1133.9	0	0	0	0	0	0	0	0	0	0
1134	0	0	0	0	0	0	0	0	0	0
1134.1	0	0	0	0	0	0	0	0	0	0
1134.2	0	0	0	0	0	0	0	0	0	0
1134.3	0	0	0	0	0	0	0	0	0	0
1134.4	0	0	0	0	0	0	0	0	0	0
1134.5	0	0	0	0	0	0	0	0	0	0
1134.6	0	0	0	0	0	0	0	0	0	0
1134.7	0	0	0	0	0	0	0	0	0	0
1134.8	0	0	0	0	0	0	0	0	0	0
1134.9	0	0	0	0	0	0	0	0	0	0
1135	0	0	0	0	0	0	0	0	0	0
1135.1	0	0	0	0	0	0	0	0	1	1
1135.2	1	1	1	1	1	1	1	1	1	1

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Table D-7.—Storage capacity at 0.01-foot (hundredths) elevation increments (capacities in acre-feet)

Elevation (feet)	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
1135.3	1	1	1	1	1	1	1	1	1	1
1135.4	1	1	1	1	1	1	1	1	1	2
1135.5	2	2	2	2	2	2	2	2	2	2
1135.6	2	2	2	2	2	2	2	3	3	3
1135.7	3	3	3	3	3	3	3	3	3	3
1135.8	3	3	4	4	4	4	4	4	4	4
1135.9	4	4	4	4	5	5	5	5	5	5
1136	5	5	5	5	6	6	6	6	6	6
1136.1	6	6	6	6	7	7	7	7	7	7
1136.2	7	7	7	8	8	8	8	8	8	8
1136.3	8	9	9	9	9	9	9	9	9	10
1136.4	10	10	10	10	10	10	11	11	11	11
1136.5	11	11	11	12	12	12	12	12	12	12
1136.6	13	13	13	13	13	13	14	14	14	14
1136.7	14	14	15	15	15	15	15	15	16	16
1136.8	16	16	16	17	17	17	17	17	17	18
1136.9	18	18	18	18	19	19	19	19	19	20
1137	20	20	20	20	21	21	21	21	21	22
1137.1	22	22	22	22	23	23	23	23	23	24
1137.2	24	24	24	25	25	25	25	25	26	26
1137.3	26	26	27	27	27	27	28	28	28	28
1137.4	28	29	29	29	29	30	30	30	30	31
1137.5	31	31	31	32	32	32	32	33	33	33
1137.6	34	34	34	34	35	35	35	35	36	36
1137.7	36	37	37	37	37	38	38	38	38	39
1137.8	39	39	40	40	40	41	41	41	41	42
1137.9	42	42	43	43	43	44	44	44	45	45
1138	45	45	46	46	46	47	47	47	48	48
1138.1	48	49	49	49	50	50	50	51	51	51
1138.2	52	52	52	53	53	54	54	54	55	55
1138.3	55	56	56	56	57	57	58	58	58	59
1138.4	59	59	60	60	61	61	61	62	62	62
1138.5	63	63	64	64	64	65	65	66	66	66
1138.6	67	67	68	68	68	69	69	70	70	70
1138.7	71	71	72	72	73	73	73	74	74	75
1138.8	75	76	76	76	77	77	78	78	79	79
1138.9	79	80	80	81	81	82	82	83	83	83
1139	84	84	85	85	86	86	87	87	88	88
1139.1	89	89	89	90	90	91	91	92	92	93
1139.2	93	94	94	95	95	96	96	97	97	98
1139.3	98	99	99	100	100	101	101	102	102	103
1139.4	103	104	104	105	105	106	106	107	107	108
1139.5	108	109	109	110	110	111	111	112	112	113
1139.6	113	114	114	115	115	116	117	117	118	118
1139.7	119	119	120	120	121	121	122	122	123	124
1139.8	124	125	125	126	126	127	127	128	129	129
1139.9	130	130	131	131	132	133	133	134	134	135
1140	135	136	137	137	138	138	139	139	140	141
1140.1	141	142	142	143	144	144	145	145	146	147
1140.2	147	148	148	149	150	150	151	151	152	153
1140.3	153	154	154	155	156	156	157	158	158	159
1140.4	159	160	161	161	162	163	163	164	164	165
1140.5	166	166	167	168	168	169	170	170	171	172

Table D-7.—Storage capacity at 0.01-foot (hundredths) elevation increments (capacities in acre-feet)

Elevation (feet)	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
1140.6	172	173	173	174	175	175	176	177	177	178
1140.7	179	179	180	181	181	182	183	183	184	185
1140.8	185	186	187	187	188	189	189	190	191	192
1140.9	192	193	194	194	195	196	196	197	198	198
1141	199	200	201	201	202	203	203	204	205	205
1141.1	206	207	208	208	209	210	210	211	212	213
1141.2	213	214	215	216	216	217	218	218	219	220
1141.3	221	221	222	223	224	224	225	226	227	227
1141.4	228	229	230	230	231	232	233	233	234	235
1141.5	236	237	237	238	239	240	241	241	242	243
1141.6	244	244	245	246	247	248	248	249	250	251
1141.7	252	253	253	254	255	256	257	257	258	259
1141.8	260	261	262	263	263	264	265	266	267	268
1141.9	268	269	270	271	272	273	274	275	275	276
1142	277	278	279	280	281	282	282	283	284	285
1142.1	286	287	288	289	290	291	292	292	293	294
1142.2	295	296	297	298	299	300	301	302	303	304
1142.3	304	305	306	307	308	309	310	311	312	313
1142.4	314	315	316	317	318	319	320	321	322	323
1142.5	324	325	326	327	328	329	330	331	331	332
1142.6	333	334	335	336	337	338	339	340	341	342
1142.7	343	345	346	347	348	349	350	351	352	353
1142.8	354	355	356	357	358	359	360	361	362	363
1142.9	364	365	366	367	368	369	370	371	372	374
1143	375	376	377	378	379	380	381	382	383	384
1143.1	385	386	387	389	390	391	392	393	394	395
1143.2	396	397	398	399	400	402	403	404	405	406
1143.3	407	408	409	410	411	413	414	415	416	417
1143.4	418	419	420	421	423	424	425	426	427	428
1143.5	429	430	432	433	434	435	436	437	438	440
1143.6	441	442	443	444	445	446	448	449	450	451
1143.7	452	453	454	456	457	458	459	460	461	463
1143.8	464	465	466	467	468	470	471	472	473	474
1143.9	475	477	478	479	480	481	483	484	485	486
1144	487	488	490	491	492	493	494	496	497	498
1144.1	499	500	502	503	504	505	506	508	509	510
1144.2	511	513	514	515	516	517	519	520	521	522
1144.3	524	525	526	527	528	530	531	532	533	535
1144.4	536	537	538	540	541	542	543	545	546	547
1144.5	548	550	551	552	553	555	556	557	558	560
1144.6	561	562	564	565	566	567	569	570	571	573
1144.7	574	575	576	578	579	580	582	583	584	585
1144.8	587	588	589	591	592	593	595	596	597	598
1144.9	600	601	602	604	605	606	608	609	610	612
1145	613	614	616	617	618	620	621	622	624	625
1145.1	626	628	629	630	632	633	635	636	637	639
1145.2	640	641	643	644	645	647	648	649	651	652
1145.3	654	655	656	658	659	660	662	663	665	666
1145.4	667	669	670	672	673	674	676	677	678	680
1145.5	681	683	684	685	687	688	690	691	692	694
1145.6	695	697	698	699	701	702	704	705	707	708
1145.7	709	711	712	714	715	716	718	719	721	722
1145.8	724	725	726	728	729	731	732	734	735	736

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Table D-7.—Storage capacity at 0.01-foot (hundredths) elevation increments (capacities in acre-feet)

Elevation (feet)	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
1145.9	738	739	741	742	744	745	747	748	749	751
1146	752	754	755	757	758	760	761	762	764	765
1146.1	767	768	770	771	773	774	776	777	779	780
1146.2	781	783	784	786	787	789	790	792	793	795
1146.3	796	798	799	801	802	804	805	807	808	810
1146.4	811	812	814	815	817	818	820	821	823	824
1146.5	826	827	829	830	832	833	835	836	838	839
1146.6	841	842	844	846	847	849	850	852	853	855
1146.7	856	858	859	861	862	864	865	867	868	870
1146.8	871	873	874	876	878	879	881	882	884	885
1146.9	887	888	890	891	893	895	896	898	899	901
1147	902	904	905	907	909	910	912	913	915	916
1147.1	918	919	921	923	924	926	927	929	930	932
1147.2	934	935	937	938	940	942	943	945	946	948
1147.3	949	951	953	954	956	957	959	961	962	964
1147.4	965	967	969	970	972	973	975	977	978	980
1147.5	982	983	985	986	988	990	991	993	994	996
1147.6	998	999	1001	1003	1004	1006	1008	1009	1011	1012
1147.7	1014	1016	1017	1019	1021	1022	1024	1026	1027	1029
1147.8	1031	1032	1034	1036	1037	1039	1041	1042	1044	1046
1147.9	1047	1049	1051	1052	1054	1056	1057	1059	1061	1062
1148	1064	1066	1067	1069	1071	1072	1074	1076	1077	1079
1148.1	1081	1083	1084	1086	1088	1089	1091	1093	1095	1096
1148.2	1098	1100	1101	1103	1105	1107	1108	1110	1112	1113
1148.3	1115	1117	1119	1120	1122	1124	1126	1127	1129	1131
1148.4	1133	1134	1136	1138	1140	1141	1143	1145	1147	1148
1148.5	1150	1152	1154	1155	1157	1159	1161	1163	1164	1166
1148.6	1168	1170	1171	1173	1175	1177	1179	1180	1182	1184
1148.7	1186	1188	1189	1191	1193	1195	1197	1198	1200	1202
1148.8	1204	1206	1207	1209	1211	1213	1215	1217	1218	1220
1148.9	1222	1224	1226	1228	1229	1231	1233	1235	1237	1239
1149	1241	1242	1244	1246	1248	1250	1252	1254	1255	1257
1149.1	1259	1261	1263	1265	1267	1269	1270	1272	1274	1276
1149.2	1278	1280	1282	1284	1286	1287	1289	1291	1293	1295
1149.3	1297	1299	1301	1303	1305	1307	1308	1310	1312	1314
1149.4	1316	1318	1320	1322	1324	1326	1328	1330	1332	1334
1149.5	1335	1337	1339	1341	1343	1345	1347	1349	1351	1353
1149.6	1355	1357	1359	1361	1363	1365	1367	1369	1371	1373
1149.7	1375	1377	1379	1381	1383	1385	1387	1389	1391	1393
1149.8	1395	1397	1399	1401	1403	1405	1407	1409	1411	1413
1149.9	1415	1417	1419	1421	1423	1425	1427	1429	1431	1433
1150	1435	1437	1439	1441	1443	1445	1447	1449	1451	1453
1150.1	1456	1458	1460	1462	1464	1466	1468	1470	1472	1474
1150.2	1476	1478	1480	1482	1485	1487	1489	1491	1493	1495
1150.3	1497	1499	1501	1503	1505	1508	1510	1512	1514	1516
1150.4	1518	1520	1522	1525	1527	1529	1531	1533	1535	1537
1150.5	1540	1542	1544	1546	1548	1550	1552	1555	1557	1559
1150.6	1561	1563	1565	1568	1570	1572	1574	1576	1579	1581
1150.7	1583	1585	1587	1590	1592	1594	1596	1598	1601	1603
1150.8	1605	1607	1609	1612	1614	1616	1618	1621	1623	1625
1150.9	1627	1630	1632	1634	1636	1639	1641	1643	1645	1648
1151	1650	1652	1654	1657	1659	1661	1664	1666	1668	1671
1151.1	1673	1675	1677	1680	1682	1684	1687	1689	1691	1694

Table D-7.—Storage capacity at 0.01-foot (hundredths) elevation increments (capacities in acre-feet)

Elevation (feet)	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
1151.2	1696	1698	1701	1703	1705	1708	1710	1712	1715	1717
1151.3	1719	1722	1724	1727	1729	1731	1734	1736	1738	1741
1151.4	1743	1746	1748	1750	1753	1755	1758	1760	1762	1765
1151.5	1767	1770	1772	1774	1777	1779	1782	1784	1786	1789
1151.6	1791	1794	1796	1799	1801	1804	1806	1808	1811	1813
1151.7	1816	1818	1821	1823	1826	1828	1831	1833	1836	1838
1151.8	1840	1843	1845	1848	1850	1853	1855	1858	1860	1863
1151.9	1865	1868	1870	1873	1875	1878	1880	1883	1885	1888
1152	1890	1893	1896	1898	1901	1903	1906	1908	1911	1913
1152.1	1916	1918	1921	1923	1926	1929	1931	1934	1936	1939
1152.2	1941	1944	1947	1949	1952	1954	1957	1959	1962	1965
1152.3	1967	1970	1972	1975	1978	1980	1983	1985	1988	1991
1152.4	1993	1996	1999	2001	2004	2006	2009	2012	2014	2017
1152.5	2020	2022	2025	2027	2030	2033	2035	2038	2041	2043
1152.6	2046	2049	2051	2054	2057	2059	2062	2065	2067	2070
1152.7	2073	2075	2078	2081	2083	2086	2089	2092	2094	2097
1152.8	2100	2102	2105	2108	2110	2113	2116	2119	2121	2124
1152.9	2127	2129	2132	2135	2138	2140	2143	2146	2149	2151
1153	2154	2157	2160	2162	2165	2168	2171	2173	2176	2179
1153.1	2182	2184	2187	2190	2193	2195	2198	2201	2204	2207
1153.2	2209	2212	2215	2218	2221	2223	2226	2229	2232	2235
1153.3	2237	2240	2243	2246	2249	2251	2254	2257	2260	2263
1153.4	2265	2268	2271	2274	2277	2280	2282	2285	2288	2291
1153.5	2294	2297	2300	2302	2305	2308	2311	2314	2317	2320
1153.6	2322	2325	2328	2331	2334	2337	2340	2343	2345	2348
1153.7	2351	2354	2357	2360	2363	2366	2369	2372	2374	2377
1153.8	2380	2383	2386	2389	2392	2395	2398	2401	2404	2407
1153.9	2409	2412	2415	2418	2421	2424	2427	2430	2433	2436
1154	2439	2442	2445	2448	2451	2454	2457	2460	2463	2466
1154.1	2469	2471	2474	2477	2480	2483	2486	2489	2492	2495
1154.2	2498	2501	2504	2507	2510	2513	2516	2519	2522	2525
1154.3	2528	2531	2534	2537	2540	2543	2546	2549	2553	2556
1154.4	2559	2562	2565	2568	2571	2574	2577	2580	2583	2586
1154.5	2589	2592	2595	2598	2601	2604	2607	2610	2614	2617
1154.6	2620	2623	2626	2629	2632	2635	2638	2641	2644	2647
1154.7	2651	2654	2657	2660	2663	2666	2669	2672	2675	2679
1154.8	2682	2685	2688	2691	2694	2697	2700	2704	2707	2710
1154.9	2713	2716	2719	2722	2726	2729	2732	2735	2738	2741
1155	2745	2748	2751	2754	2757	2760	2764	2767	2770	2773
1155.1	2776	2780	2783	2786	2789	2792	2796	2799	2802	2805
1155.2	2808	2812	2815	2818	2821	2825	2828	2831	2834	2837
1155.3	2841	2844	2847	2850	2854	2857	2860	2863	2867	2870
1155.4	2873	2876	2880	2883	2886	2890	2893	2896	2899	2903
1155.5	2906	2909	2913	2916	2919	2922	2926	2929	2932	2936
1155.6	2939	2942	2946	2949	2952	2955	2959	2962	2965	2969
1155.7	2972	2975	2979	2982	2985	2989	2992	2995	2999	3002
1155.8	3006	3009	3012	3016	3019	3022	3026	3029	3032	3036
1155.9	3039	3043	3046	3049	3053	3056	3060	3063	3066	3070
1156	3073	3076	3080	3083	3087	3090	3094	3097	3100	3104
1156.1	3107	3111	3114	3117	3121	3124	3128	3131	3135	3138
1156.2	3142	3145	3148	3152	3155	3159	3162	3166	3169	3173
1156.3	3176	3180	3183	3186	3190	3193	3197	3200	3204	3207
1156.4	3211	3214	3218	3221	3225	3228	3232	3235	3239	3242

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Table D-7.—Storage capacity at 0.01-foot (hundredths) elevation increments (capacities in acre-feet)

Elevation (feet)	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
1156.5	3246	3249	3253	3256	3260	3263	3267	3270	3274	3277
1156.6	3281	3285	3288	3292	3295	3299	3302	3306	3309	3313
1156.7	3316	3320	3324	3327	3331	3334	3338	3341	3345	3348
1156.8	3352	3356	3359	3363	3366	3370	3374	3377	3381	3384
1156.9	3388	3392	3395	3399	3402	3406	3410	3413	3417	3420
1157	3424	3428	3431	3435	3439	3442	3446	3449	3453	3457
1157.1	3460	3464	3468	3471	3475	3479	3482	3486	3490	3493
1157.2	3497	3501	3504	3508	3512	3515	3519	3523	3526	3530
1157.3	3534	3537	3541	3545	3548	3552	3556	3560	3563	3567
1157.4	3571	3574	3578	3582	3586	3589	3593	3597	3600	3604
1157.5	3608	3612	3615	3619	3623	3627	3630	3634	3638	3642
1157.6	3645	3649	3653	3657	3660	3664	3668	3672	3676	3679
1157.7	3683	3687	3691	3694	3698	3702	3706	3710	3713	3717
1157.8	3721	3725	3729	3733	3736	3740	3744	3748	3752	3755
1157.9	3759	3763	3767	3771	3775	3778	3782	3786	3790	3794
1158	3798	3802	3805	3809	3813	3817	3821	3825	3829	3832
1158.1	3836	3840	3844	3848	3852	3856	3860	3864	3867	3871
1158.2	3875	3879	3883	3887	3891	3895	3899	3903	3907	3910
1158.3	3914	3918	3922	3926	3930	3934	3938	3942	3946	3950
1158.4	3954	3958	3962	3966	3970	3974	3978	3982	3985	3989
1158.5	3993	3997	4001	4005	4009	4013	4017	4021	4025	4029
1158.6	4033	4037	4041	4045	4049	4053	4057	4061	4065	4070
1158.7	4074	4078	4082	4086	4090	4094	4098	4102	4106	4110
1158.8	4114	4118	4122	4126	4130	4134	4138	4142	4147	4151
1158.9	4155	4159	4163	4167	4171	4175	4179	4183	4187	4192
1159	4196	4200	4204	4208	4212	4216	4220	4224	4229	4233
1159.1	4237	4241	4245	4249	4253	4258	4262	4266	4270	4274
1159.2	4278	4283	4287	4291	4295	4299	4303	4308	4312	4316
1159.3	4320	4324	4329	4333	4337	4341	4345	4350	4354	4358
1159.4	4362	4366	4371	4375	4379	4383	4388	4392	4396	4400
1159.5	4405	4409	4413	4417	4422	4426	4430	4434	4439	4443
1159.6	4447	4451	4456	4460	4464	4469	4473	4477	4482	4486
1159.7	4490	4494	4499	4503	4507	4512	4516	4520	4525	4529
1159.8	4533	4538	4542	4546	4551	4555	4560	4564	4568	4573
1159.9	4577	4581	4586	4590	4595	4599	4603	4608	4612	4616
1160	4621	4625	4630	4634	4639	4643	4647	4652	4656	4661
1160.1	4665	4670	4674	4678	4683	4687	4692	4696	4701	4705
1160.2	4710	4714	4719	4723	4727	4732	4736	4741	4745	4750
1160.3	4754	4759	4763	4768	4772	4777	4781	4786	4790	4795
1160.4	4799	4804	4808	4813	4817	4822	4827	4831	4836	4840
1160.5	4845	4849	4854	4858	4863	4867	4872	4877	4881	4886
1160.6	4890	4895	4899	4904	4909	4913	4918	4922	4927	4931
1160.7	4936	4941	4945	4950	4954	4959	4964	4968	4973	4977
1160.8	4982	4987	4991	4996	5001	5005	5010	5015	5019	5024
1160.9	5028	5033	5038	5042	5047	5052	5056	5061	5066	5070
1161	5075	5080	5084	5089	5094	5098	5103	5108	5112	5117
1161.1	5122	5127	5131	5136	5141	5145	5150	5155	5159	5164
1161.2	5169	5174	5178	5183	5188	5193	5197	5202	5207	5211
1161.3	5216	5221	5226	5230	5235	5240	5245	5249	5254	5259
1161.4	5264	5269	5273	5278	5283	5288	5292	5297	5302	5307
1161.5	5312	5316	5321	5326	5331	5336	5340	5345	5350	5355
1161.6	5360	5364	5369	5374	5379	5384	5389	5393	5398	5403
1161.7	5408	5413	5418	5422	5427	5432	5437	5442	5447	5452

Table D-7.—Storage capacity at 0.01-foot (hundredths) elevation increments (capacities in acre-feet)

Elevation (feet)	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
1161.8	5456	5461	5466	5471	5476	5481	5486	5491	5495	5500
1161.9	5505	5510	5515	5520	5525	5530	5535	5539	5544	5549
1162	5554	5559	5564	5569	5574	5579	5584	5589	5594	5598
1162.1	5603	5608	5613	5618	5623	5628	5633	5638	5643	5648
1162.2	5653	5658	5663	5668	5673	5678	5683	5688	5693	5698
1162.3	5703	5708	5713	5718	5723	5728	5733	5738	5743	5748
1162.4	5753	5758	5763	5768	5773	5778	5783	5788	5793	5798
1162.5	5803	5808	5813	5818	5823	5828	5833	5838	5843	5848
1162.6	5853	5858	5864	5869	5874	5879	5884	5889	5894	5899
1162.7	5904	5909	5914	5919	5925	5930	5935	5940	5945	5950
1162.8	5955	5960	5965	5970	5976	5981	5986	5991	5996	6001
1162.9	6006	6012	6017	6022	6027	6032	6037	6042	6048	6053
1163	6058	6063	6068	6073	6079	6084	6089	6094	6099	6104
1163.1	6110	6115	6120	6125	6130	6136	6141	6146	6151	6156
1163.2	6162	6167	6172	6177	6182	6188	6193	6198	6203	6209
1163.3	6214	6219	6224	6230	6235	6240	6245	6251	6256	6261
1163.4	6266	6272	6277	6282	6287	6293	6298	6303	6309	6314
1163.5	6319	6324	6330	6335	6340	6346	6351	6356	6361	6367
1163.6	6372	6377	6383	6388	6393	6399	6404	6409	6415	6420
1163.7	6425	6431	6436	6441	6447	6452	6457	6463	6468	6474
1163.8	6479	6484	6490	6495	6500	6506	6511	6517	6522	6527
1163.9	6533	6538	6543	6549	6554	6560	6565	6570	6576	6581
1164	6587	6592	6598	6603	6608	6614	6619	6625	6630	6636
1164.1	6641	6646	6652	6657	6663	6668	6674	6679	6685	6690
1164.2	6696	6701	6706	6712	6717	6723	6728	6734	6739	6745
1164.3	6750	6756	6761	6767	6772	6778	6783	6789	6794	6800
1164.4	6805	6811	6816	6822	6827	6833	6839	6844	6850	6855
1164.5	6861	6866	6872	6877	6883	6888	6894	6900	6905	6911
1164.6	6916	6922	6927	6933	6939	6944	6950	6955	6961	6966
1164.7	6972	6978	6983	6989	6994	7000	7006	7011	7017	7022
1164.8	7028	7034	7039	7045	7051	7056	7062	7068	7073	7079
1164.9	7084	7090	7096	7101	7107	7113	7118	7124	7130	7135
1165	7141	7147	7152	7158	7164	7169	7175	7181	7186	7192
1165.1	7198	7204	7209	7215	7221	7226	7232	7238	7244	7249
1165.2	7255	7261	7266	7272	7278	7284	7289	7295	7301	7307
1165.3	7312	7318	7324	7330	7335	7341	7347	7353	7358	7364
1165.4	7370	7376	7381	7387	7393	7399	7405	7410	7416	7422
1165.5	7428	7434	7439	7445	7451	7457	7463	7468	7474	7480
1165.6	7486	7492	7498	7503	7509	7515	7521	7527	7533	7538
1165.7	7544	7550	7556	7562	7568	7574	7579	7585	7591	7597
1165.8	7603	7609	7615	7621	7626	7632	7638	7644	7650	7656
1165.9	7662	7668	7674	7680	7685	7691	7697	7703	7709	7715
1166	7721	7727	7733	7739	7745	7751	7757	7763	7769	7774
1166.1	7780	7786	7792	7798	7804	7810	7816	7822	7828	7834
1166.2	7840	7846	7852	7858	7864	7870	7876	7882	7888	7894
1166.3	7900	7906	7912	7918	7924	7930	7936	7942	7948	7954
1166.4	7960	7966	7972	7978	7985	7991	7997	8003	8009	8015
1166.5	8021	8027	8033	8039	8045	8051	8057	8063	8069	8075
1166.6	8082	8088	8094	8100	8106	8112	8118	8124	8130	8136
1166.7	8143	8149	8155	8161	8167	8173	8179	8185	8192	8198
1166.8	8204	8210	8216	8222	8228	8234	8241	8247	8253	8259
1166.9	8265	8271	8278	8284	8290	8296	8302	8308	8315	8321
1167	8327	8333	8339	8346	8352	8358	8364	8370	8377	8383

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Table D-7.—Storage capacity at 0.01-foot (hundredths) elevation increments (capacities in acre-feet)

Elevation (feet)	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
1167.1	8389	8395	8401	8408	8414	8420	8426	8432	8439	8445
1167.2	8451	8457	8464	8470	8476	8482	8489	8495	8501	8507
1167.3	8514	8520	8526	8532	8539	8545	8551	8558	8564	8570
1167.4	8576	8583	8589	8595	8601	8608	8614	8620	8627	8633
1167.5	8639	8646	8652	8658	8665	8671	8677	8684	8690	8696
1167.6	8703	8709	8715	8722	8728	8734	8741	8747	8753	8760
1167.7	8766	8772	8779	8785	8791	8798	8804	8811	8817	8823
1167.8	8830	8836	8842	8849	8855	8862	8868	8874	8881	8887
1167.9	8894	8900	8906	8913	8919	8926	8932	8939	8945	8951
1168	8958	8964	8971	8977	8984	8990	8996	9003	9009	9016
1168.1	9022	9029	9035	9042	9048	9055	9061	9067	9074	9080
1168.2	9087	9093	9100	9106	9113	9119	9126	9132	9139	9145
1168.3	9152	9158	9165	9171	9178	9184	9191	9197	9204	9210
1168.4	9217	9223	9230	9237	9243	9250	9256	9263	9269	9276
1168.5	9282	9289	9295	9302	9309	9315	9322	9328	9335	9341
1168.6	9348	9354	9361	9368	9374	9381	9387	9394	9401	9407
1168.7	9414	9420	9427	9434	9440	9447	9453	9460	9467	9473
1168.8	9480	9486	9493	9500	9506	9513	9520	9526	9533	9540
1168.9	9546	9553	9559	9566	9573	9579	9586	9593	9599	9606
1169	9613	9619	9626	9633	9639	9646	9653	9659	9666	9673
1169.1	9679	9686	9693	9700	9706	9713	9720	9726	9733	9740
1169.2	9746	9753	9760	9767	9773	9780	9787	9794	9800	9807
1169.3	9814	9820	9827	9834	9841	9847	9854	9861	9868	9874
1169.4	9881	9888	9895	9901	9908	9915	9922	9929	9935	9942
1169.5	9949	9956	9962	9969	9976	9983	9990	9996	10003	10010
1169.6	10017	10024	10030	10037	10044	10051	10058	10065	10071	10078
1169.7	10085	10092	10099	10105	10112	10119	10126	10133	10140	10147
1169.8	10153	10160	10167	10174	10181	10188	10195	10201	10208	10215
1169.9	10222	10229	10236	10243	10250	10256	10263	10270	10277	10284
1170	10291	10298	10305	10312	10318	10325	10332	10339	10346	10353
1170.1	10360	10367	10374	10381	10388	10395	10401	10408	10415	10422
1170.2	10429	10436	10443	10450	10457	10464	10471	10478	10485	10492
1170.3	10499	10506	10513	10520	10527	10534	10541	10548	10555	10562
1170.4	10569	10576	10583	10590	10597	10604	10611	10618	10625	10632
1170.5	10639	10646	10653	10660	10667	10674	10681	10688	10695	10702
1170.6	10709	10716	10723	10730	10737	10744	10751	10758	10766	10773
1170.7	10780	10787	10794	10801	10808	10815	10822	10829	10836	10844
1170.8	10851	10858	10865	10872	10879	10886	10893	10900	10908	10915
1170.9	10922	10929	10936	10943	10950	10958	10965	10972	10979	10986
1171	10993	11000	11008	11015	11022	11029	11036	11044	11051	11058
1171.1	11065	11072	11079	11087	11094	11101	11108	11116	11123	11130
1171.2	11137	11144	11152	11159	11166	11173	11181	11188	11195	11202
1171.3	11210	11217	11224	11231	11239	11246	11253	11260	11268	11275
1171.4	11282	11290	11297	11304	11311	11319	11326	11333	11341	11348
1171.5	11355	11363	11370	11377	11385	11392	11399	11407	11414	11421
1171.6	11429	11436	11443	11451	11458	11465	11473	11480	11487	11495
1171.7	11502	11510	11517	11524	11532	11539	11547	11554	11561	11569
1171.8	11576	11584	11591	11598	11606	11613	11621	11628	11636	11643
1171.9	11650	11658	11665	11673	11680	11688	11695	11703	11710	11718
1172	11725	11732	11740	11747	11755	11762	11770	11777	11785	11792
1172.1	11800	11807	11815	11822	11830	11838	11845	11853	11860	11868
1172.2	11875	11883	11890	11898	11905	11913	11921	11928	11936	11943
1172.3	11951	11958	11966	11974	11981	11989	11996	12004	12012	12019

Table D-7.—Storage capacity at 0.01-foot (hundredths) elevation increments (capacities in acre-feet)

Elevation (feet)	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
1172.4	12027	12034	12042	12050	12057	12065	12072	12080	12088	12095
1172.5	12103	12111	12118	12126	12134	12141	12149	12157	12164	12172
1172.6	12180	12187	12195	12203	12210	12218	12226	12233	12241	12249
1172.7	12257	12264	12272	12280	12287	12295	12303	12311	12318	12326
1172.8	12334	12342	12349	12357	12365	12373	12380	12388	12396	12404
1172.9	12411	12419	12427	12435	12443	12450	12458	12466	12474	12482
1173	12489	12497	12505	12513	12521	12528	12536	12544	12552	12560
1173.1	12568	12576	12583	12591	12599	12607	12615	12623	12631	12638
1173.2	12646	12654	12662	12670	12678	12686	12694	12701	12709	12717
1173.3	12725	12733	12741	12749	12757	12765	12773	12781	12788	12796
1173.4	12804	12812	12820	12828	12836	12844	12852	12860	12868	12876
1173.5	12884	12892	12900	12908	12916	12924	12932	12940	12948	12956
1173.6	12964	12972	12980	12988	12996	13004	13012	13020	13028	13036
1173.7	13044	13052	13060	13068	13076	13084	13092	13100	13108	13116
1173.8	13124	13132	13140	13148	13156	13165	13173	13181	13189	13197
1173.9	13205	13213	13221	13229	13237	13245	13254	13262	13270	13278
1174	13286	13294	13302	13310	13319	13327	13335	13343	13351	13359
1174.1	13367	13376	13384	13392	13400	13408	13416	13425	13433	13441
1174.2	13449	13457	13465	13474	13482	13490	13498	13506	13515	13523
1174.3	13531	13539	13548	13556	13564	13572	13580	13589	13597	13605
1174.4	13613	13622	13630	13638	13646	13655	13663	13671	13679	13688
1174.5	13696	13704	13713	13721	13729	13737	13746	13754	13762	13771
1174.6	13779	13787	13796	13804	13812	13820	13829	13837	13845	13854
1174.7	13862	13870	13879	13887	13896	13904	13912	13921	13929	13937
1174.8	13946	13954	13962	13971	13979	13988	13996	14004	14013	14021
1174.9	14029	14038	14046	14055	14063	14072	14080	14088	14097	14105
1175	14114	14122	14130	14139	14147	14156	14164	14173	14181	14190
1175.1	14198	14206	14215	14223	14232	14240	14249	14257	14266	14274
1175.2	14283	14291	14300	14308	14317	14325	14334	14342	14351	14359
1175.3	14368	14376	14385	14393	14402	14410	14419	14428	14436	14445
1175.4	14453	14462	14470	14479	14487	14496	14505	14513	14522	14530
1175.5	14539	14547	14556	14565	14573	14582	14590	14599	14608	14616
1175.6	14625	14633	14642	14651	14659	14668	14677	14685	14694	14702
1175.7	14711	14720	14728	14737	14746	14754	14763	14772	14780	14789
1175.8	14798	14806	14815	14824	14832	14841	14850	14859	14867	14876
1175.9	14885	14893	14902	14911	14920	14928	14937	14946	14955	14963
1176	14972	14981	14989	14998	15007	15016	15025	15033	15042	15051
1176.1	15060	15068	15077	15086	15095	15103	15112	15121	15130	15139
1176.2	15147	15156	15165	15174	15183	15191	15200	15209	15218	15227
1176.3	15236	15244	15253	15262	15271	15280	15289	15298	15306	15315
1176.4	15324	15333	15342	15351	15360	15369	15377	15386	15395	15404
1176.5	15413	15422	15431	15440	15449	15458	15467	15475	15484	15493
1176.6	15502	15511	15520	15529	15538	15547	15556	15565	15574	15583
1176.7	15592	15601	15610	15619	15628	15637	15646	15655	15664	15673
1176.8	15682	15691	15700	15709	15718	15727	15736	15745	15754	15763
1176.9	15772	15781	15790	15799	15808	15817	15826	15835	15845	15854
1177	15863	15872	15881	15890	15899	15908	15917	15926	15936	15945
1177.1	15954	15963	15972	15981	15990	16000	16009	16018	16027	16036
1177.2	16045	16055	16064	16073	16082	16091	16101	16110	16119	16128
1177.3	16138	16147	16156	16165	16175	16184	16193	16202	16212	16221
1177.4	16230	16239	16249	16258	16267	16277	16286	16295	16305	16314
1177.5	16323	16332	16342	16351	16360	16370	16379	16388	16398	16407
1177.6	16417	16426	16435	16445	16454	16463	16473	16482	16492	16501

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Table D-7.—Storage capacity at 0.01-foot (hundredths) elevation increments (capacities in acre-feet)

Elevation (feet)	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
1177.7	16510	16520	16529	16539	16548	16557	16567	16576	16586	16595
1177.8	16605	16614	16624	16633	16642	16652	16661	16671	16680	16690
1177.9	16699	16709	16718	16728	16737	16747	16756	16766	16775	16785
1178	16794	16804	16813	16823	16833	16842	16852	16861	16871	16880
1178.1	16890	16899	16909	16919	16928	16938	16947	16957	16967	16976
1178.2	16986	16995	17005	17015	17024	17034	17044	17053	17063	17073
1178.3	17082	17092	17101	17111	17121	17131	17140	17150	17160	17169
1178.4	17179	17189	17198	17208	17218	17227	17237	17247	17257	17266
1178.5	17276	17286	17296	17305	17315	17325	17335	17344	17354	17364
1178.6	17374	17383	17393	17403	17413	17423	17432	17442	17452	17462
1178.7	17472	17481	17491	17501	17511	17521	17531	17540	17550	17560
1178.8	17570	17580	17590	17599	17609	17619	17629	17639	17649	17659
1178.9	17669	17679	17688	17698	17708	17718	17728	17738	17748	17758
1179	17768	17778	17788	17798	17807	17817	17827	17837	17847	17857
1179.1	17867	17877	17887	17897	17907	17917	17927	17937	17947	17957
1179.2	17967	17977	17987	17997	18007	18017	18027	18037	18047	18057
1179.3	18067	18077	18087	18097	18107	18117	18128	18138	18148	18158
1179.4	18168	18178	18188	18198	18208	18218	18228	18238	18249	18259
1179.5	18269	18279	18289	18299	18309	18319	18329	18340	18350	18360
1179.6	18370	18380	18390	18401	18411	18421	18431	18441	18451	18462
1179.7	18472	18482	18492	18502	18512	18523	18533	18543	18553	18564
1179.8	18574	18584	18594	18604	18615	18625	18635	18645	18656	18666
1179.9	18676	18686	18697	18707	18717	18727	18738	18748	18758	18769
1180	18779	18789	18799	18810	18820	18830	18841	18851	18861	18872
1180.1	18882	18892	18903	18913	18923	18934	18944	18954	18965	18975
1180.2	18985	18996	19006	19016	19027	19037	19048	19058	19068	19079
1180.3	19089	19099	19110	19120	19131	19141	19152	19162	19172	19183
1180.4	19193	19204	19214	19225	19235	19245	19256	19266	19277	19287
1180.5	19298	19308	19319	19329	19340	19350	19361	19371	19382	19392
1180.6	19403	19413	19424	19434	19445	19455	19466	19476	19487	19497
1180.7	19508	19518	19529	19539	19550	19560	19571	19582	19592	19603
1180.8	19613	19624	19634	19645	19656	19666	19677	19687	19698	19709
1180.9	19719	19730	19740	19751	19762	19772	19783	19794	19804	19815
1181	19825	19836	19847	19857	19868	19879	19889	19900	19911	19921
1181.1	19932	19943	19953	19964	19975	19985	19996	20007	20018	20028
1181.2	20039	20050	20060	20071	20082	20093	20103	20114	20125	20136
1181.3	20146	20157	20168	20179	20189	20200	20211	20222	20232	20243
1181.4	20254	20265	20276	20286	20297	20308	20319	20330	20340	20351
1181.5	20362	20373	20384	20394	20405	20416	20427	20438	20449	20460
1181.6	20470	20481	20492	20503	20514	20525	20536	20547	20557	20568
1181.7	20579	20590	20601	20612	20623	20634	20645	20656	20666	20677
1181.8	20688	20699	20710	20721	20732	20743	20754	20765	20776	20787
1181.9	20798	20809	20820	20831	20842	20853	20864	20875	20886	20897
1182	20908	20919	20930	20941	20952	20963	20974	20985	20996	21007
1182.1	21018	21029	21040	21051	21062	21073	21084	21095	21107	21118
1182.2	21129	21140	21151	21162	21173	21184	21195	21206	21217	21229
1182.3	21240	21251	21262	21273	21284	21295	21307	21318	21329	21340
1182.4	21351	21362	21373	21385	21396	21407	21418	21429	21440	21452
1182.5	21463	21474	21485	21496	21508	21519	21530	21541	21553	21564
1182.6	21575	21586	21597	21609	21620	21631	21642	21654	21665	21676
1182.7	21688	21699	21710	21721	21733	21744	21755	21767	21778	21789
1182.8	21800	21812	21823	21834	21846	21857	21868	21880	21891	21902
1182.9	21914	21925	21936	21948	21959	21971	21982	21993	22005	22016

Table D-7.—Storage capacity at 0.01-foot (hundredths) elevation increments (capacities in acre-feet)

Elevation (feet)	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
1183	22027	22039	22050	22062	22073	22084	22096	22107	22119	22130
1183.1	22141	22153	22164	22176	22187	22199	22210	22221	22233	22244
1183.2	22256	22267	22279	22290	22302	22313	22325	22336	22348	22359
1183.3	22371	22382	22394	22405	22417	22428	22440	22451	22463	22474
1183.4	22486	22497	22509	22521	22532	22544	22555	22567	22578	22590
1183.5	22602	22613	22625	22636	22648	22660	22671	22683	22694	22706
1183.6	22718	22729	22741	22753	22764	22776	22787	22799	22811	22822
1183.7	22834	22846	22857	22869	22881	22893	22904	22916	22928	22939
1183.8	22951	22963	22974	22986	22998	23010	23021	23033	23045	23057
1183.9	23068	23080	23092	23104	23115	23127	23139	23151	23163	23174
1184	23186	23198	23210	23222	23233	23245	23257	23269	23281	23292
1184.1	23304	23316	23328	23340	23352	23364	23375	23387	23399	23411
1184.2	23423	23435	23447	23459	23470	23482	23494	23506	23518	23530
1184.3	23542	23554	23566	23578	23590	23602	23613	23625	23637	23649
1184.4	23661	23673	23685	23697	23709	23721	23733	23745	23757	23769
1184.5	23781	23793	23805	23817	23829	23841	23853	23865	23877	23889
1184.6	23901	23913	23925	23937	23949	23961	23974	23986	23998	24010
1184.7	24022	24034	24046	24058	24070	24082	24094	24107	24119	24131
1184.8	24143	24155	24167	24179	24191	24203	24216	24228	24240	24252
1184.9	24264	24276	24289	24301	24313	24325	24337	24349	24362	24374
1185	24386	24398	24410	24423	24435	24447	24459	24472	24484	24496
1185.1	24508	24520	24533	24545	24557	24569	24582	24594	24606	24619
1185.2	24631	24643	24655	24668	24680	24692	24705	24717	24729	24742
1185.3	24754	24766	24779	24791	24803	24816	24828	24840	24853	24865
1185.4	24877	24890	24902	24914	24927	24939	24952	24964	24976	24989
1185.5	25001	25014	25026	25038	25051	25063	25076	25088	25101	25113
1185.6	25125	25138	25150	25163	25175	25188	25200	25213	25225	25238
1185.7	25250	25263	25275	25288	25300	25313	25325	25338	25350	25363
1185.8	25375	25388	25400	25413	25425	25438	25450	25463	25476	25488
1185.9	25501	25513	25526	25538	25551	25564	25576	25589	25601	25614
1186	25627	25639	25652	25664	25677	25690	25702	25715	25728	25740
1186.1	25753	25765	25778	25791	25803	25816	25829	25841	25854	25867
1186.2	25879	25892	25905	25918	25930	25943	25956	25968	25981	25994
1186.3	26007	26019	26032	26045	26057	26070	26083	26096	26108	26121
1186.4	26134	26147	26160	26172	26185	26198	26211	26223	26236	26249
1186.5	26262	26275	26287	26300	26313	26326	26339	26352	26364	26377
1186.6	26390	26403	26416	26429	26441	26454	26467	26480	26493	26506
1186.7	26519	26532	26544	26557	26570	26583	26596	26609	26622	26635
1186.8	26648	26661	26674	26687	26699	26712	26725	26738	26751	26764
1186.9	26777	26790	26803	26816	26829	26842	26855	26868	26881	26894
1187	26907	26920	26933	26946	26959	26972	26985	26998	27011	27024
1187.1	27037	27050	27063	27076	27089	27102	27116	27129	27142	27155
1187.2	27168	27181	27194	27207	27220	27233	27246	27259	27273	27286
1187.3	27299	27312	27325	27338	27351	27364	27378	27391	27404	27417
1187.4	27430	27443	27456	27470	27483	27496	27509	27522	27535	27549
1187.5	27562	27575	27588	27601	27615	27628	27641	27654	27667	27681
1187.6	27694	27707	27720	27733	27747	27760	27773	27786	27800	27813
1187.7	27826	27839	27853	27866	27879	27892	27906	27919	27932	27946
1187.8	27959	27972	27985	27999	28012	28025	28039	28052	28065	28079
1187.9	28092	28105	28118	28132	28145	28158	28172	28185	28199	28212
1188	28225	28239	28252	28265	28279	28292	28305	28319	28332	28345
1188.1	28359	28372	28386	28399	28412	28426	28439	28453	28466	28479
1188.2	28493	28506	28520	28533	28546	28560	28573	28587	28600	28614

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Table D-7.—Storage capacity at 0.01-foot (hundredths) elevation increments (capacities in acre-feet)

Elevation (feet)	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
1188.3	28627	28641	28654	28667	28681	28694	28708	28721	28735	28748
1188.4	28762	28775	28789	28802	28816	28829	28843	28856	28870	28883
1188.5	28897	28910	28924	28937	28951	28964	28978	28991	29005	29018
1188.6	29032	29045	29059	29072	29086	29099	29113	29126	29140	29154
1188.7	29167	29181	29194	29208	29221	29235	29249	29262	29276	29289
1188.8	29303	29316	29330	29344	29357	29371	29384	29398	29412	29425
1188.9	29439	29453	29466	29480	29493	29507	29521	29534	29548	29562
1189	29575	29589	29603	29616	29630	29644	29657	29671	29685	29698
1189.1	29712	29726	29739	29753	29767	29780	29794	29808	29821	29835
1189.2	29849	29863	29876	29890	29904	29917	29931	29945	29959	29972
1189.3	29986	30000	30014	30027	30041	30055	30069	30082	30096	30110
1189.4	30124	30137	30151	30165	30179	30192	30206	30220	30234	30248
1189.5	30261	30275	30289	30303	30317	30330	30344	30358	30372	30386
1189.6	30400	30413	30427	30441	30455	30469	30483	30496	30510	30524
1189.7	30538	30552	30566	30579	30593	30607	30621	30635	30649	30663
1189.8	30677	30690	30704	30718	30732	30746	30760	30774	30788	30802
1189.9	30816	30829	30843	30857	30871	30885	30899	30913	30927	30941
1190	30955	30969	30983	30997	31011	31025	31039	31052	31066	31080
1190.1	31094	31108	31122	31136	31150	31164	31178	31192	31206	31220
1190.2	31234	31248	31262	31276	31290	31304	31318	31332	31346	31360
1190.3	31374	31388	31402	31416	31430	31444	31458	31472	31486	31501
1190.4	31515	31529	31543	31557	31571	31585	31599	31613	31627	31641
1190.5	31655	31669	31683	31697	31712	31726	31740	31754	31768	31782
1190.6	31796	31810	31824	31838	31852	31867	31881	31895	31909	31923
1190.7	31937	31951	31965	31980	31994	32008	32022	32036	32050	32064
1190.8	32079	32093	32107	32121	32135	32149	32163	32178	32192	32206
1190.9	32220	32234	32249	32263	32277	32291	32305	32319	32334	32348
1191	32362	32376	32390	32405	32419	32433	32447	32462	32476	32490
1191.1	32504	32518	32533	32547	32561	32575	32590	32604	32618	32632
1191.2	32647	32661	32675	32689	32704	32718	32732	32746	32761	32775
1191.3	32789	32803	32818	32832	32846	32861	32875	32889	32903	32918
1191.4	32932	32946	32961	32975	32989	33004	33018	33032	33047	33061
1191.5	33075	33089	33104	33118	33132	33147	33161	33175	33190	33204
1191.6	33219	33233	33247	33262	33276	33290	33305	33319	33333	33348
1191.7	33362	33376	33391	33405	33420	33434	33448	33463	33477	33492
1191.8	33506	33520	33535	33549	33564	33578	33592	33607	33621	33636
1191.9	33650	33664	33679	33693	33708	33722	33737	33751	33765	33780
1192	33794	33809	33823	33838	33852	33867	33881	33896	33910	33924
1192.1	33939	33953	33968	33982	33997	34011	34026	34040	34055	34069
1192.2	34084	34098	34113	34127	34142	34156	34171	34185	34200	34214
1192.3	34229	34243	34258	34272	34287	34301	34316	34331	34345	34360
1192.4	34374	34389	34403	34418	34432	34447	34461	34476	34491	34505
1192.5	34520	34534	34549	34563	34578	34593	34607	34622	34636	34651
1192.6	34666	34680	34695	34709	34724	34739	34753	34768	34782	34797
1192.7	34812	34826	34841	34855	34870	34885	34899	34914	34929	34943
1192.8	34958	34973	34987	35002	35017	35031	35046	35061	35075	35090
1192.9	35105	35119	35134	35149	35163	35178	35193	35207	35222	35237
1193	35251	35266	35281	35296	35310	35325	35340	35354	35369	35384
1193.1	35399	35413	35428	35443	35458	35472	35487	35502	35517	35531
1193.2	35546	35561	35576	35590	35605	35620	35635	35650	35664	35679
1193.3	35694	35709	35724	35738	35753	35768	35783	35798	35812	35827
1193.4	35842	35857	35872	35887	35902	35916	35931	35946	35961	35976
1193.5	35991	36006	36020	36035	36050	36065	36080	36095	36110	36125

Table D-7.—Storage capacity at 0.01-foot (hundredths) elevation increments (capacities in acre-feet)

Elevation (feet)	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
1193.6	36140	36155	36169	36184	36199	36214	36229	36244	36259	36274
1193.7	36289	36304	36319	36334	36349	36364	36379	36394	36409	36424
1193.8	36439	36453	36468	36483	36498	36513	36528	36543	36558	36573
1193.9	36589	36604	36619	36634	36649	36664	36679	36694	36709	36724
1194	36739	36754	36769	36784	36799	36814	36829	36845	36860	36875
1194.1	36890	36905	36920	36935	36951	36966	36981	36996	37011	37026
1194.2	37042	37057	37072	37087	37103	37118	37133	37148	37164	37179
1194.3	37194	37209	37225	37240	37255	37271	37286	37301	37316	37332
1194.4	37347	37362	37378	37393	37408	37424	37439	37454	37470	37485
1194.5	37501	37516	37531	37547	37562	37578	37593	37608	37624	37639
1194.6	37655	37670	37685	37701	37716	37732	37747	37763	37778	37794
1194.7	37809	37825	37840	37856	37871	37886	37902	37917	37933	37948
1194.8	37964	37980	37995	38011	38026	38042	38057	38073	38088	38104
1194.9	38119	38135	38151	38166	38182	38197	38213	38228	38244	38260
1195	38275	38291	38306	38322	38338	38353	38369	38385	38400	38416
1195.1	38431	38447	38463	38478	38494	38510	38525	38541	38557	38572
1195.2	38588	38604	38619	38635	38651	38667	38682	38698	38714	38730
1195.3	38745	38761	38777	38793	38808	38824	38840	38856	38872	38887
1195.4	38903	38919	38935	38951	38967	38982	38998	39014	39030	39046
1195.5	39062	39078	39094	39110	39126	39142	39158	39173	39189	39205
1195.6	39221	39237	39253	39269	39285	39301	39318	39334	39350	39366
1195.7	39382	39398	39414	39430	39446	39462	39478	39495	39511	39527
1195.8	39543	39559	39575	39592	39608	39624	39640	39656	39673	39689
1195.9	39705	39722	39738	39754	39770	39787	39803	39819	39836	39852
1196	39868	39885	39901	39918	39934	39950	39967	39983	40000	40016
1196.1	40032	40049	40065	40082	40098	40115	40131	40147	40164	40180
1196.2	40197	40213	40230	40246	40263	40279	40296	40312	40329	40345
1196.3	40362	40378	40395	40411	40428	40444	40461	40477	40494	40510
1196.4	40527	40543	40560	40577	40593	40610	40626	40643	40659	40676
1196.5	40693	40709	40726	40742	40759	40776	40792	40809	40826	40842
1196.6	40859	40875	40892	40909	40925	40942	40959	40975	40992	41009
1196.7	41025	41042	41059	41075	41092	41109	41126	41142	41159	41176
1196.8	41192	41209	41226	41243	41259	41276	41293	41310	41326	41343
1196.9	41360	41377	41393	41410	41427	41444	41461	41477	41494	41511
1197	41528	41545	41561	41578	41595	41612	41629	41646	41662	41679
1197.1	41696	41713	41730	41747	41764	41781	41797	41814	41831	41848
1197.2	41865	41882	41899	41916	41933	41950	41966	41983	42000	42017
1197.3	42034	42051	42068	42085	42102	42119	42136	42153	42170	42187
1197.4	42204	42221	42238	42255	42272	42289	42306	42323	42340	42357
1197.5	42374	42391	42408	42425	42442	42459	42476	42493	42510	42527
1197.6	42544	42561	42579	42596	42613	42630	42647	42664	42681	42698
1197.7	42715	42732	42750	42767	42784	42801	42818	42835	42852	42870
1197.8	42887	42904	42921	42938	42955	42973	42990	43007	43024	43041
1197.9	43058	43076	43093	43110	43127	43144	43162	43179	43196	43213
1198	43231	43248	43265	43282	43300	43317	43334	43351	43369	43386
1198.1	43403	43420	43438	43455	43472	43490	43507	43524	43542	43559
1198.2	43576	43593	43611	43628	43645	43663	43680	43697	43715	43732
1198.3	43749	43767	43784	43802	43819	43836	43854	43871	43888	43906
1198.4	43923	43941	43958	43975	43993	44010	44028	44045	44063	44080
1198.5	44097	44115	44132	44150	44167	44185	44202	44220	44237	44255
1198.6	44272	44290	44307	44325	44342	44360	44377	44395	44412	44430
1198.7	44447	44465	44482	44500	44517	44535	44552	44570	44588	44605
1198.8	44623	44640	44658	44675	44693	44711	44728	44746	44763	44781

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Table D-7.—Storage capacity at 0.01-foot (hundredths) elevation increments (capacities in acre-feet)

Elevation (feet)	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
1198.9	44799	44816	44834	44852	44869	44887	44905	44922	44940	44958
1199	44975	44993	45011	45028	45046	45064	45081	45099	45117	45134
1199.1	45152	45170	45188	45205	45223	45241	45259	45276	45294	45312
1199.2	45330	45347	45365	45383	45401	45418	45436	45454	45472	45490
1199.3	45508	45525	45543	45561	45579	45597	45614	45632	45650	45668
1199.4	45686	45704	45722	45740	45757	45775	45793	45811	45829	45847
1199.5	45865	45883	45901	45919	45936	45954	45972	45990	46008	46026
1199.6	46044	46062	46080	46098	46116	46134	46152	46170	46188	46206
1199.7	46224	46242	46260	46278	46296	46314	46332	46350	46368	46386
1199.8	46405	46423	46441	46459	46477	46495	46513	46531	46549	46567
1199.9	46585	46604	46622	46640	46658	46676	46694	46712	46731	46749
1200	46767	46785	46803	46821	46840	46858	46876	46894	46912	46931
1200.1	46949	46967	46985	47004	47022	47040	47058	47077	47095	47113
1200.2	47132	47150	47168	47186	47205	47223	47241	47260	47278	47296
1200.3	47315	47333	47351	47370	47388	47406	47425	47443	47461	47480
1200.4	47498	47517	47535	47553	47572	47590	47609	47627	47645	47664
1200.5	47682	47701	47719	47738	47756	47774	47793	47811	47830	47848
1200.6	47867	47885	47904	47922	47941	47959	47978	47996	48015	48033
1200.7	48052	48070	48089	48107	48126	48144	48163	48182	48200	48219
1200.8	48237	48256	48274	48293	48311	48330	48349	48367	48386	48404
1200.9	48423	48442	48460	48479	48498	48516	48535	48553	48572	48591
1201	48609	48628	48647	48665	48684	48703	48722	48740	48759	48778
1201.1	48796	48815	48834	48853	48871	48890	48909	48928	48946	48965
1201.2	48984	49003	49021	49040	49059	49078	49096	49115	49134	49153
1201.3	49171	49190	49209	49228	49247	49265	49284	49303	49322	49340
1201.4	49359	49378	49397	49415	49434	49453	49472	49491	49509	49528
1201.5	49547	49566	49584	49603	49622	49641	49660	49678	49697	49716
1201.6	49735	49754	49772	49791	49810	49829	49847	49866	49885	49904
1201.7	49923	49941	49960	49979	49998	50017	50035	50054	50073	50092
1201.8	50111	50129	50148	50167	50186	50205	50223	50242	50261	50280
1201.9	50299	50317	50336	50355	50374	50393	50411	50430	50449	50468
1202	50487	—	—	—	—	—	—	—	—	—