Requst For Proposal: Site Suitability Analysis
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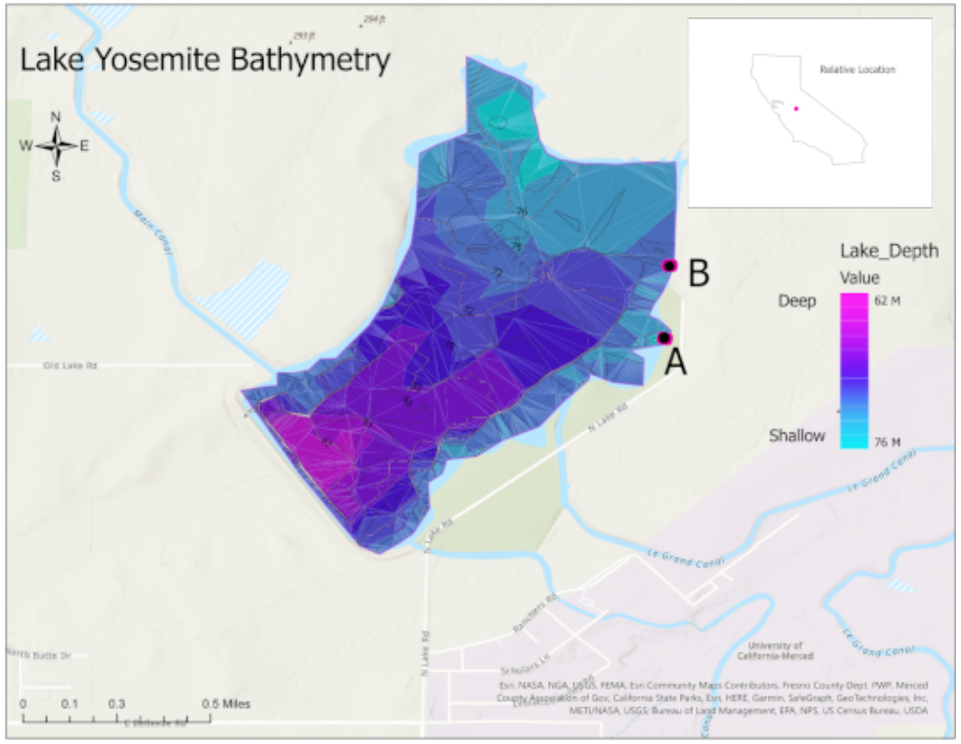
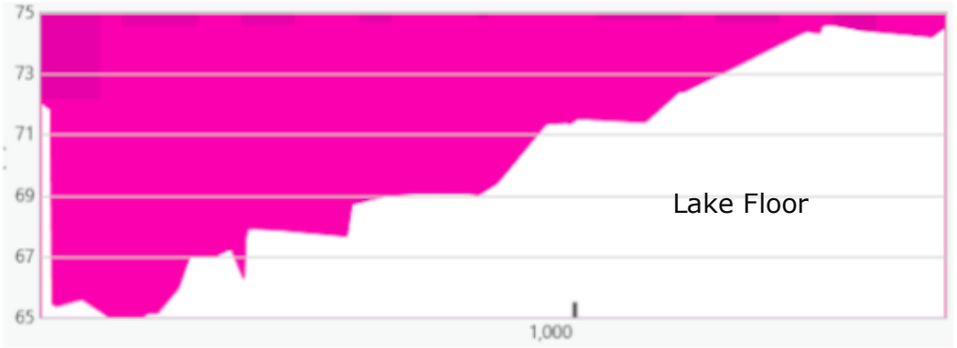
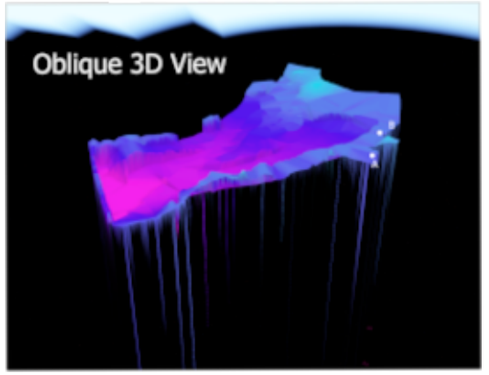
Principal Investigaor: Bobcat Geospatial Inc.
Prepared for: Merced Irrigation District
Delivery Date: December 12, 2022
Data Sources: UCM ENGR 180, ESRI, Merced Vernal Pools and Grassland Reserve



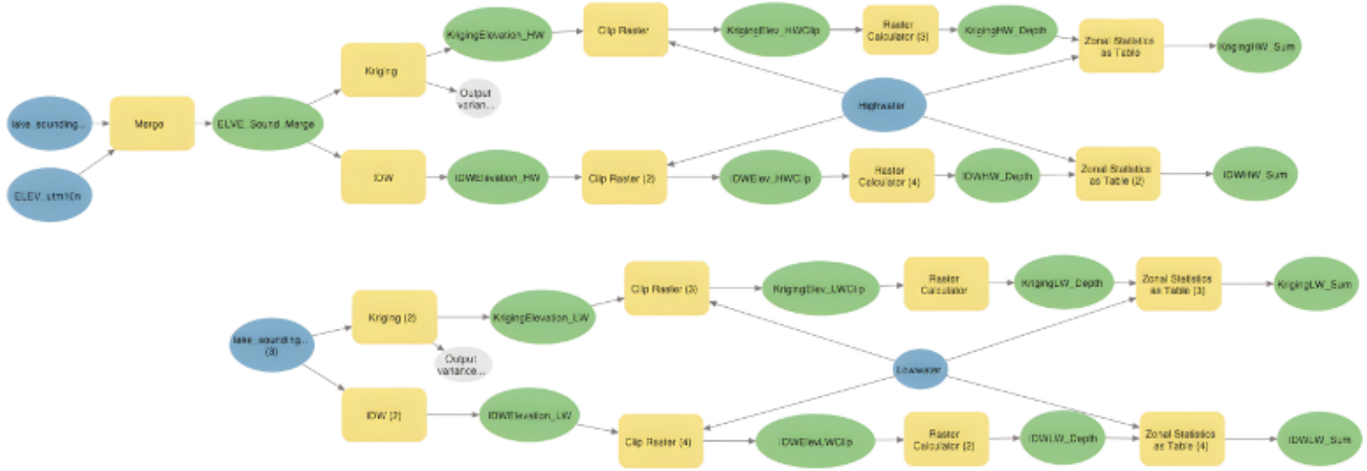
Profile Cross Section

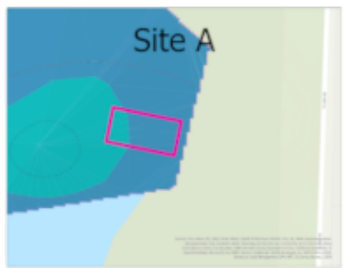




Depth

Model Builder





Source	Average (Acre Feet)	IDW (Acre Feet)	Kriging (Acre Feet)
2014 Low Elevation	6065.3713553	6065.619224	6065.12348671239
2018 High Elevation	7504.88728921	7590.759477	7419.01510142037

Objectives:
The primariy goal of the site suitability analysis is to identify two potential sites to serve as future docking areas. This will be accomplished through the calculation of surface volume using two interpolation methods: Kriging and IDW. The area where this site suitabilty analysis will take place is along the Eastern shore of Lake Yosemite in Merced, California. The lake itself is surrounded by multiple vernal pools along with a road that runs along the south eastern side of the lake itself. The specific criteria that must be met within this site suitabiilty analysis are as follows: Eevation between referenced low and high water years, minimum area of 15 m by 30 m for development, cannot be within 8 meters of a protected vernal pool, within 100 m of an exisitng road.

Methods:
The SONAR and GPS data utilized a traverse Mercator Projection and used the projected coordinate system WGS 1984 UTM Zone 10n which is appropriate to use since Zone 10n covers our specified area of California. The following data was provided by Dr. Joshua Viers and was accessed December 5th, 2022: TIFF data for lowater and highwater years, DEM raster, GPS data, and SONAR data. The vernal pool data was accessed through ArcGIS's online database specifically from the Merced Vernal Pools and Grassland Reserve. All data was stored and accessed through classfiles, a database accessible for UC Merced students. This database allowed for cloud storage which in turn provided ease of access and security.

Results:
As shown by the graph, Sites A and B both fit the criteria as viable docking stations. Due to the usage of buffers in ArcGIS, both sites are within 100 m of the N. Lake Road and both aren't within 8 meters of any vernal pools. And due to the specifications made withing ArcGIS when creating the pink outlines that represent both sites, both of them meet the dimension requirements. Although both sites are along the lakeside in relatively the same area, it is clear that Site A is closer to N Lake Road compared to Site B. This may prove to be an obstacle concerning transport and will also cause an issue as it is in close proximity to neighboring vernal pools.

Discussion and Reccomendations:
Of the two sites, Site B is likely the best option in consideration for the best docking station. Its proximity to the road as well as its general distance from neighboring vernal pools in comparison to Site A makes it a much more viable option. This different can further be viewed through the Site A and Site B closeups provided which will give a depiction of how close each site is to the road. Additionally, the buffers utilized in this site sutiability analysis also provide a great depiction as to how far away each site is from vernal pools and the road itself.