CALIFORNIA WATER BOARDS
COLLEGE OF WATER INFORMATICS
WATER DATA DIGEST
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May Seminar Series:
Dr. Christine Lee, NASA-JPL, presents
SATELLITE BASED MONITORING OF THE SAN FRANCISCO ESTUARY

The May Seminar Series webinar will feature the National Aeronautics and Space Administration's Jet Propulsion Laboratory (NASA-JPL) scientist, **Christine Lee**. Dr. Lee will talk about leveraging various satellite assets to advance understanding of turbidity and temperature conditions in the San Francisco Estuary and how these conditions impact Delta smelt habitat.

Register here to join us **May 27** at noon.

See the College of Water Informatics **Events** for recordings of past speakers and future events.

DATA BYTES
NEED A SPATIAL JOIN? THEN YES TO GIS!

Often when data are provided about facilities that the Water Boards regulate, we get requests to put it into a geographical information system (GIS). But that complexity is not always needed if the requester simply wants to see the data displayed on a map.

GIS, such as performed by **ESRI's ArcGIS** and the open source **QGIS**, is a powerful tool, but it can also bring a lot of complexity that isn't needed. If your tabular data already includes the columns necessary for querying "geographically" (such as by county or by region), then platforms like Tableau or PowerBI provide an easy means to plot and display the data. These platforms allow you to plot symbols on a map based on the included latitude and longitude, query by columns within your data set, and customize your tooltips with key information.

However, if your tabular dataset doesn't include the spatial attributes (i.e. descriptors assigned based on geographic coverage of the earth, such as zip code or congressional district) for your queries, then you will need to add them by performing a "spatial join" using GIS. Tutorials on performing spatial joins in **ArcGIS** and **QGIS** can be found online. You will need the GIS layer (a file that describes the boundaries of the attribute) of interest, such as a watershed layer, in order to perform the join. The coding languages R and Python also provide methods for spatial queries.

GIS Rockstar, Jeff Kapellas, provided these tips for working with latitude/longitude coordinates. Because California is west of the Greenwich prime meridian ("0 degrees longitude"), longitudinal coordinates will always be negative, between approximately -114 and -125 degrees. Latitude coordinates for California will always be positive, between approximately 32 and 42 degrees. Also, many GIS systems require latitude and longitude coordinates be expressed in "decimal degrees." But what if your coordinates are in degree-minute-seconds? Fortunately, the formula for conversion is quite simple:

Decimal Degrees = Degrees + (Minutes/60) + (Seconds/3600)

Water Board employees can visit the **GIS Wiki** page for information and resources for getting started with ESRI tools. If it turns out that all you want are dots on a map, check out **Tableau** or **Power BI**, both accessible to Water Board employees.

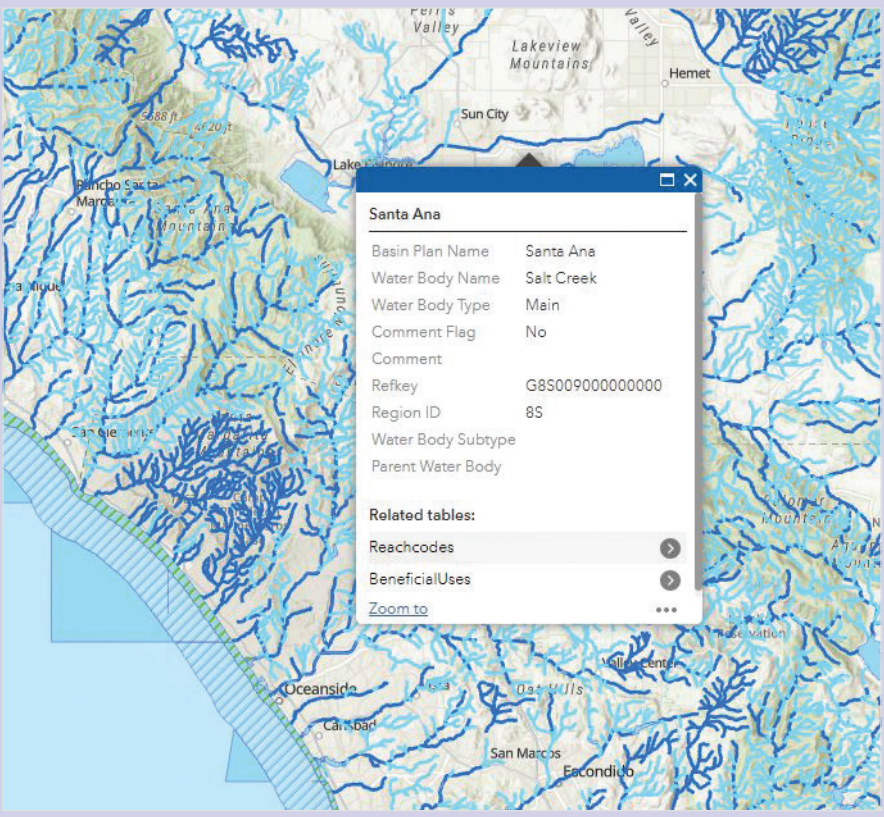

Figure 1: Screen capture of the **Basin Plan Mapping Project Map**, an example of a GIS tool that assigns attributes, such as beneficial uses, to map features.