Southern California Coastal Water Research Project

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Executive Summary:

The Southern California Coastal Wetlands Research Project is an institute whose purpose is to research and understand California’s coastal wetland areas and to determine the impact humans have on the ecosystem. Furthermore, the main objective of this project was to produce a full set of wetland and riparian habitat maps for the south coast watersheds with a base imagery of 2005 or newer.

Project Objectives:

The “Wetlands Project”, the name given at CSUN, was designed with the purpose to portray in the form of a map the distribution of wetland and riparian habitats throughout southern California. I decided to become part of this project because it gave me the opportunity to learn and become familiarized with GIS. It also provided me with basic knowledge of wetland habitats, Hydrogeomorphic Classification and the Cowardin Classification system. The maps created for this project answered three main questions, which were: what is the distribution of wetland and riparian areas, how are recovery efforts impacting acreage and habitat distribution? and are we experiencing a net loss or gain in acreage? After the analysis was done we created landscape profiles that helped interpret and facilitate the answers to the questions asked.

Project Approach:

The Wetlands Project was mapped on a region-by-region basis. There were a total of 10 regions within Southern California.
One of the primary tasks of this project was to digitize the streamflow lines, known as templines, based on the stream network (flowlines). The imagery used was DRG’s (Topographic Maps), color infrared imagery, Bing and Google maps and NAIP imagery. I initially began to add templines were there were missing and eliminate the templines that did not belong. Templines that were 100 meters or shorter had to be excluded unless it was obvious that there was a channel present. Templines also had to be edited in order to match up to the imagery and had to follow hydrologic flow, sometimes the linework did not make sense with the topographic maps hydrologically because we were mapping of the NAIP imagery. Linework that did not match up to the DRG’s or NAIP imagery had to be excluded.
Example of templines

Example of a DRG (Topographic Map)
Aside from creating templines we had to buffer all the templines that were delineated. The buffers had to be 2.5 meters and had to be created for each line that was visible in our region. Secondarily, we had to delineate waterbodies using the CONUSWETPOLY layer (target layer for all polygons). Features that had to be delineated were ponds, lagoons, catch basins, reservoirs, golf course ponds and any other depressional wetland features were found. The buffers created from the line work would also be a part of the CONUSWETPOLY layer. Our third task was to classify all the polygons. We were classifying based on the Cowardin Classification System.

The Hydrogeomorphic Classification (HGM) was also applied to the Wetland’s Project. The HGM attributes provided information on the structure and origin of specific wetlands. The broad categories separate wetlands based on their primary hydrodynamic processes. The categories are fluvial, depressions, slopes/seeps, lake shore/beds and tidal.
Example of polygonal classifications

After all the lines were buffered and all the waterbodies were delineated and classified we had to run a final map checklist on all of our polygons and linework. The final map checklist consisted of pulling out all applicable NHD layers (NHD Flowlines, NHD Waterbody and NHD Points) and overlaying it on the CONUSWETPOLY layer. The next step was to make sure that all the wetland polygons were within our regions boundary and not extending outside our scope. We would then highlight all features and explode them to make sure that every polygon or line was its own feature and was not attached to another polygon or line feature. After running the final map checklist we would then archive our work and wait for it to undergo a QC (quality control), which was done by the supervisor.
FINAL MAP CHECKLIST

1) Turn on NHD layers (NHDFlowline, NHDArea, and NHDBasin) and make sure all hydrology has been pulled out if applicable.

2) Turn on NWI.Wetlands layer and DRG and make sure all hydrology on these collateral datasets has been pulled out if applicable.

3) Make sure wetland polygons extend to/stop at quad boundary (and watershed boundary if applicable).

4) For coastal quads, make sure large kelp beds are delineated using CIR imagery. If you can see additional kelp in true color, then delineate that too.

5) Check for catch basins along the intersection of the urban/wildland interface.

6) Select all features and Explode.

7) Sort attribute column to see if any "null" values exist. You should have an "unknown" value if you have a question.

8) Sort "SHAPE_area" field ascending:
   a) Look for tiny polygons (usually less than "50"). Search for and fix any sliver polygons.
   b) Look for any polygons greater than "80,937" that were classified as Palustrine instead of Lacustrine (Exception: Do NOT change Marine and Estuarine systems or PEM classifications in Lacustrine systems).

9) Make sure all wetlands that have been field checked indicate that fact in the "Comments" field.

10) Make sure a "WetType" field exists, and values populated as necessary.

11) Run TempLines Topology. Should be set to 0.25 m.

12) Run NewWetlands Topology. Should be set to default tolerance (0.002 m).

13) Compact the Geodatabase

14) Run the CSUN Validation Tool.

15) Run the WetType Tool.

16) Run the NWI Validation Tool.

All of this should be repeated before the QC1 AND QC2 processes!
Conclusion:

The Wetland’s Project was a project we took on to help the SCCWRP. I was not involved with the analysis of the project but I did work on the landscape profiles, which basically describes how wetlands, riparian habitat, and flood control infrastructure are distributed across the geographic area of interest. The area of interest can entail watershed, subwatershed, congressional districts, landuse, etc. Landscape profiles provide a foundation for landscape condition from a geospatial perspective and can be helpful in determining the changes in our wetland ecosystems.