Overview of the Demand QA/QC GIS Preprocessing Method

Background

This Geographic Information System (GIS) workflow document was created to help users evaluate location discrepancies of water rights points of diversion (PODs) located in the Electronic Water Rights Information Management System (eWRIMS). Please refer to the GIS Pre Processing Procedures Part 1 and GIS Pre Processing Procedures Part 2 for detailed, step-by-step guides for completing the GIS preprocessing workflow.

Currently, the physical location and other spatial information for PODs listed in eWRIMS is determined almost entirely by the latitude and longitude coordinates reported by stakeholders. However, many historical POD locations were submitted to the Water Boards using a variety of other coordinate systems including the Public Land Surveying System (PLSS), CA Sate Plane Coordinate System (SPCS), and Universal Transverse Mercator (UTM) coordinates. These data were converted to decimal degree latitude and longitude values over time, using over 6 different manual and automated methods.

In the current eWRIMS database, PLSS, watershed, and other spatial fields are now automatically derived from a single source of original spatial data: the latitude and longitude. It is unclear which spatial records were kept during the shift from legacy systems (Water Rights Information Management System or WRIMS and its predecessors) and which were derived using the current methods.

The POD use limitation documentation from the WRIMS to eWRIMS transition project states, "Because of source data irregularities, some POD locations may be inaccurate by as much as half the width of a PLSS section."

The fact that only a single piece of original spatial information is entered into eWRIMS makes it nearly impossible to verify if POD locations were entered correctly aside from manually opening each water right document. Because POD locations may be shifted by half the width of a PLSS section, Division staff ran a spatial comparison between the PLSS sections and the Lat/Long listed in each eWRIMS POD record and found location discrepancies for over 1660 PODs statewide.

Workflow Overview

- Part I of the GIS procedures guides the user through the steps of comparing the POD latitude/ longitude and PLSS sections statewide using Esri's ArcGIS Pro software. This would need to be done periodically assuming eWRIMS data is constantly being updated by Division staff.

- Part II of the GIS procedures uses the product layers created in step one to run a regional analysis on an Area of Interest (AOI) (e.g., watershed). Once an AOI has been established, the workflow guides the analyst through a series of steps to identify and correct erroneous POD locations, resulting in a more accurate POD dataset for the AOI.

- Several spatial case scenarios are outlined in the workflow to help the analyst parse through and manually correct erroneous PODs.

- Once the erroneous POD locations are corrected for the AOI, the user can follow additional steps to the QA/QC workflow to quantify the amount of water available at each POD location. In this step, the POD points are linked to their underlying NHD stream catchments and assigned a gauge adjusted mean annual flow volume value (cubic feet) from the NHDPlus HR EROMMA table. This flow volume is only being used as a quick proxy for the amount of surface water available at each POD location. A more robust method should be adopted in the future.

- In the case where stakeholders have multiple PODs associated with their water right, a summary statistic tool is used to assign the POD with the maximum volume of water available as that water right's representative POD.