

Notes on surface water build

Chinmay Lohani

Aug 2020

Task

We want to assign surface water to CLUs in California. We use the following pieces of data:

- Shapefiles of CLUs, Planning Areas (PA) and california boundaries from the internet
- 2014 California cropped areas shapefile from the internet.
- Data on yearly allocation to point users and polygon users from Nick Hagerty
- Water users shapefiles from Nick Hagerty

Methodology

Firstly, water is assumed to be disbursed from larger shapes. We have water allocations for point and polygon users from Nick. We assign the polygon users' water allocations to user shapefiles (which have been put together from a possible assortment of sources). For the point users, the idea is to first assign the water to larger shapes since it is unclear as to where exactly does their water get delivered. We can use HUC8s or watershed shapes that tessellate the state of California, but on the suggestion of Nick, we think PAs might be the most reasonable way to do this (since their borders are not aligned with rivers).

Finally, water is allocated to CLUs using the ratio of the area of a CLU that lies in a given shapefile (user shape or PA). So for a CLU with 10 acres of area, of 5 which acres lie in a given user file that has an area of 100 acres 100 acre foot water in a given year will be allocated 5 acre feet. Similarly, for the PAs as well. We add the PA allocation and the user allocation for a given CLU to obtain its total allocation. As an added refinement, we focus only on the cropped area within each of these shapefiles (so we first pre-intersect all of these with the 2014 crop areas to do our allocations).

Other notes

In order to ensure that we capture ‘valid’ intersections, we only count a user shapefile relevant for a given CLU’s allocation if more than half of that CLU’s area lies in that user file. This shouldn’t matter much, and to further verify this, we plot the user shapes and all the CLUs which have some intersection with them. Once we filter down to cropping area, most of the CLU cropped areas lie very snugly inside or outside a given user shape.

Additionally, there is a large amount of code where we tried various ways (geographic/ string matching) to allocate water from various contracts to users (and eventually to CLUs). It could be useful as source code for some steps of getting from raw contract data to spatial allocations.