

**Notes from Geospatial/GIS Meetup
November 12, 2025**

Zoom

Attendees: Janet Reyes, facilitator

Via Zoom: Bhumi Shah, Cristina Gomez-Vidal, Etienne Ortega, Gary Qin, Luis Barrios, Mark Long, Ray Uzwysyn, Surya Arian, Suryaa Charan Shivakumar, ThankGod Micheal, Wallace Gara

Announcements

This meeting was recorded; video is available [here](#). The passcode to view is FH85s+v3

The University of Redlands is holding [GeoWeek](#) November 17-20. The lecture on the evening of November 19 will be virtual as well as in person.

[Register](#) to attend [UC GIS Week](#), a virtual event being held November 18-20 that will feature presentations, lightning talks and more by UC faculty, students, staff and alumni (including four **[update: five]** Highlanders). Also, you may check out the virtual map gallery and participate in a weeklong [mapathon](#) event. No experience is necessary.

Students may be especially interested in stopping by the [City of Riverside's GIS Day](#) on November 19, as there will be opportunities to learn about internships with the City.

Those who are interested in maps and in Ken Burns' upcoming documentary **"The American Revolution"** may want to join the [livestream event](#) on November 18 with Esri's Charlie Frye, who helped create the maps featured in the series.

Esri's support for the classic version of Story Maps is coming to an end, probably in February 2026. If this impacts some of your content, join the ArcGIS StoryMaps Live event on December 3 on ["Remaking your classic stories in ArcGIS StoryMaps."](#) UCR affiliates can expect to see messaging from ITS on this topic in the weeks ahead.

Students interested in submitting a StoryMap or presenting a lightning talk at the [LA Geospatial Summit](#) in February 2026 can share their abstract with Janet before December 5.

Submissions for the [2025 ArcGIS StoryMaps Competition](#) are due by December 12. Topic areas being sought are people, infrastructure, or environment.

Students interested in applying for [an internship with Esri in 2026](#) should submit their application by December 31.

Janet is still seeking presenters for meetups in January and February 2026.

Shared links

NYC planning maps update:

<https://www.route-fifty.com/digital-government/2025/11/voters-approve-digitized-new-york-city-map-a-mid-affordable-housing-push/409434/>

Presentation

Gary Qin, a PhD candidate in Evolution, Ecology, and Organismal Biology at UCR, presented on **Using QGIS in freshwater health assessment of the Santa Ana River Watershed**. The presentation was based on the work covered in Chapter 2 of his dissertation, which focuses on assessing trade-offs between freshwater ecosystem health and ecosystem service delivery in the Santa Ana River Watershed, which is the largest watershed in Southern California. The main stem of the river originates in the San Bernardino Mountains and flows into the Pacific Ocean in Huntington Beach. More than 6 million people live in the watershed.

Gary adapted the [Freshwater Health Index](#) to conduct a baseline assessment of freshwater health in the watershed. In this model, stakeholders implement changes to the watershed that impact ecosystem vitality, which in turn has impacts on the types of ecosystem services (e.g. drinking water, flood control) that benefit the stakeholders. The FHI scores watersheds based on quantitative indicators in three components: ecosystem vitality (including water quality and quantity), ecosystem services (including water supply reliability), and governance & stakeholders (regulations and processes for water management).

Gary is self-taught in GIS, and through his own investigations collected geospatial data sources from various agencies and entities.

One factor Gary calculated for his assessment was the **deviation from natural flow**. It's assumed that the greater the deviation (usually to generate more consistent flows that benefit humans), the higher the negative impacts on the freshwater system. The overall watershed score was 24 (out of 100), attributable to the two dams on the river and extensive flood control and channelization efforts. The deviation increases from moderate in the upper watershed to very pronounced downstream.

Gary also calculated a value for **groundwater storage depletion**, based on the ratio of groundwater wells with a statistically significant downward trend compared to the total number of wells. The overall score of 76 points to successes in the management of groundwater recharge. Groundwater is an important source of potable water for agricultural and urban usage.

Bank modification measures the lateral connectivity between the river and its floodplain, which is an indicator for changes to instream processes and habitats. Gary used channel substrate (concrete vs. soft bottom), determined from interpreting aerial imagery, as a proxy for connectivity. The bank modification score was 89, with the few channels that feature concrete substrate being found mostly in the middle watershed. Soft bottom substrate benefits groundwater recharge as well as fish and riparian vegetation habitats.

Land cover naturalness was calculated by assigning values to Southern California Association of Government's 2016 land use/land cover raster data based on naturalness, using perviousness as a proxy

for naturalness. The overall score was 83, thanks in large part to the natural state of the upper watershed (mountains) and the acreage of agriculture, parks, and golf courses in the lower reaches.

Finally, the value the watershed provides in terms of recreation and cultural heritage is represented by the score for **conservation & cultural heritage sites**. The extent of parks, land trusts, and other preserved lands had been mapped in a shapefile from the [California Protected Areas Database](#). Gary found that about 45% of the watershed is protected. This scales well with the state's [30 by 30](#) initiative, resulting in an overall score of 78.

Accounting for these and other scores, the watershed's composite score for ecosystem vitality was 40; the ecosystem services composite score was 79. This indicates that sufficient ecosystem service delivery comes at a cost to long-term ecological resilience. A more balanced approach to management is recommended.

This study can be used in follow-up assessments to monitor trends and rectify negative impacts. It will also assist in understanding the impacts of climate change on the freshwater health of this semiarid watershed.

Discussion

Mark asked how the existence of GIS changed or shaped the analyses Gary was able to do, and how much did the visualizations themselves contribute to drawing meaning from the results. Gary replied that much of the work would not have been possible (or at least realistic to accomplish) without GIS, or if attempted, the methods used would have been inferior. The overlay capabilities of GIS lets the user see the relationship between different features. In answer to the second part of the question, Gary estimated that seeing the maps really contributed to his understanding of the results in about a quarter of the factors calculated. The maps were helpful to include in the paper he submitted for publication to illustrate the outcomes without having to provide lengthy text to describe them.

Gary also mentioned that it helps the water managers for different parts of the watershed to see with maps how conditions in one part impact, or are impacted by, other subunits.

Janet asked Gary to comment on his journey with GIS; were there any notable pain points? Gary learned to use QGIS by trial and error. He started with the vision of what he wanted each map to look like, and figured out piece by piece how to make it a reality, sometimes using online searches or videos to fill in his knowledge gaps.