

Notes from Geospatial/GIS Meetup

January 13, 2022

via Zoom

Attendees: Janet Reyes, facilitator;

Via Zoom: Amanda Grey, Bart Kats, Canserina Kurnia, Debbie Stocking, Elizabeth Perez, Gary Chao, Heather Constable, Isabelle Swanson, Joseph (Jay) Spencer, Joe Messin, Jorge Aponte-Gomez, Matt Daugherty, Max, Mike Cohen, Sahar Foruzan, Steve Ries

Announcements

This meeting was recorded; video is available [here](#). The access passcode to view is CgluYD%2

Esri's next [GIS in Higher Education Chat](#), at 9:00 am on Tuesday, February 1, 2022 will cover ArcGIS Instant Apps. (Canserina also shared information about this.)

Ideas for updating UCR's [ArcGIS Online home page](#) are welcome. Someone at the meetup might have images that we could use to replace the current cover image.

The [Geospatial/GIS Quarterly](#) has been updated to include information regarding meetups, workshops, and other events in Winter 2022. Links involving redistricting have been added to the current events section.

The UCR Library's [Digital Scholarship meetups](#) this quarter might be of particular interest, since the sessions will center on creating a collaborative map of fruit trees on campus.

Janet will be offering two **workshops in Winter Quarter**. [ArcGIS Pro: Building Skills with Vector Data](#) will be on Thursday, February 3, and [ArcGIS Online Web App Options](#) will be on Wednesday, February 16. Both will start at 2:00 pm.

The UC-wide [Love Data Week](#), February 14-18, will include workshops relating to Leaflet and to using Jupyter Notebooks in ArcGIS Pro.

USC is planning to host the [Los Angeles Geospatial Summit](#) on Friday, February 25.

First-time Attendees

Debbie Stocking, Gary Chao, Heather Constable and **Max** (and possibly one or two more) joined us for the first time. Welcome, and we hope to see you again!

Presentation

Extension Specialist Dr. Matt Daugherty, a faculty member in UCR's Entomology Department, presented on "Using geospatial tools to understand the factors driving insect invasions."

Of the 10 or so exotic arthropods introduced in California each year, only 1 in 5 become invasive. Each stage in a biological invasion involves hurdles for the invader to overcome, so understanding the hurdles and how they are overcome can play a part in creating an effective response to an insect invasion. In the absence of effective barriers, early detection, or management, some exotics end up causing major impacts. Human activities (such as moving harvesting equipment to a new location) often contribute to invader success. Data collected from arrays of traps established by federal, state and local agencies help researchers understand invasion dynamics.

Matt discussed three projects that have used mapping and spatial analysis. The first was the successful eradication of the European grapevine moth. The moth was first noticed in Napa County in 2009 and had notably spread by 2010, when eradication measures began. The last moth was detected in 2014, and it was declared eradicated by 2016. The researchers used data from the traps to help understand why this program was so successful. Spatial autocorrelation with trap count data revealed the likelihood that the moth was dispersing by “hitchhiking” on vehicles and equipment, which justified the use of quarantines to contain the moth’s spread. Since the moths typically don’t fly farther than 50 m, establishing a treatment zone of 500m was an effective measure of containing their natural dispersal. Hot spot analysis showed that the detections were strongly clustered. The researchers also used trap data to perform habitat suitability modeling using bioclimatic, landscape, and anthropogenic variables. It was found that mean temperature, elevation, and anthropogenic effects were strong influences. This information is useful for assessing where risks of future invasion are high.

By contrast, vine mealybug invasions are very difficult to eradicate and require extensive measures just to keep a lid on damage to infested vineyards. Early detection seems to allow for more sustainable management. Matt and his colleagues employed research methods similar to those used in studying the European grapevine moth to help identify areas most at risk for a vine mealybug invasion. They were able to produce a risk map for Napa County, and validated their suitability model with presence/absence data collected from 250 vineyards.

Matt’s final example dealt with Asian citrus psyllid, which are responsible for the fatal huanglongbing disease in citrus trees. The Asian citrus psyllid was first detected in residential trees in San Diego County in 2008, and had spread geographically and to commercial citrus by 2011. Matt’s team wanted to study what influenced the spread of ACP to some commercial groves but not others. To do that, the researchers used a set of statistical models known as survival analysis on data collected from various sources. They looked at farm characteristics as well as landscape effects and neighbor (proximity) effects. They found that large groves with more edges and more perforated shapes are invaded at a higher rate. Proximity to urban areas or invaded groves also increased the probability of invasion, with the latter being more significant as years went by. Management measures taken early on while ACP is confined to urban areas helps contain the spread.

Discussion

Mike asked about what to do if he suspects a citrus tree in his yard has the psyllids. Matt said there is a [hotline](#) for invasive pest reporting.

Bart asked about the red palm weevil that had been in the news. Matt said that the use of pheromones and removal of infested trees played a big part in successfully containing that infestation in Laguna Beach. However, a related pest that has invaded trees in San Diego County has been more difficult to control.

Bart also asked about species that researchers view as potential pests. Matt said he gets asked a lot about murder hornets; habitat suitability modeling indicates Southern California is not a potential habitat for them. Entomologists are keeping an eye on a few species, including South American palm weevil and spotted lanternfly.

Another question was about the product developed by a UCR botanist to treat huanglongbing disease. Matt said his understanding is that the product is in early stages of production in a startup company, but it will be a while before it's on the market.

Janet commented on the influence of the shape of groves on psyllid infestations. Matt said it's because of the preference for conditions that occur on the edges. She also asked about the map platforms used; Matt said the mapping was done with Esri products and with R.

Matt said his team always has projects that involve working with data and/or GIS; undergraduates who are interested in helping should feel free to reach out.

Map sharing

The 30-Day Map Challenge (November): <https://30daymapchallenge.com/>