

**Notes from Geospatial/GIS Meetup  
April 7, 2026**

**Orbach Library, Room 122 and on Zoom**

**Attendees:** Janet Reyes, facilitator

**In person:** Ashish Kulkarni, Audrey Hui, Hannah Velazquez, Mike Cohen, Ray Uzwyshyn

**Via Zoom:** Ahmed Eldawy, Amanda Yepiz, Andrew Haglund, Debbie Stocking, Gerald Winkel, Joseph Messin, Luis Barrios, Lynn Sweet, Mark Long, Roland L, Ryan Bruellman

**Announcements**

This meeting was recorded; video is available [here](#). The passcode to view is ^s8V5Aq. (include the period at the end)

All are encouraged to register for a series of in-person events on Wednesday, April 15 under the title of **GIS at UCR: Esri Innovation & Demo Day**. The morning will feature three [Mapping the Future](#) workshops in Rivera Library, Room 140. Topics include resources, opportunities, faculty research, and GIS careers. Also look for a GIS @ UCR table underneath the Rivera Arches with handouts and swag. At 2:00 pm in the University Theatre, the Chancellor's Distinguished Lecture Series will present [A Conversation with Jack Dangermond](#), the President of Esri.

The [Big Ten GIS Conference](#) is a free, virtual event being held on Friday, April 17.

The [Esri Imagery & Remote Sensing Educators Summit](#) takes place online on April 22-23. Registration is free.

Janet will present two **geospatial workshops** this quarter. [Finding and Using Imagery in a GIS](#) will be held on Zoom on Wednesday, April 29. [From Table to Map](#) will be on Zoom and in Orbach Science Library, Room 122 on Wednesday, May 13. Both workshops take place at 2:00 pm.

**Shared links**

Presentation slides:

[https://1drv.ms/p/c/91c32dc74f2ffb25/IQDZz8xXr0H9SZB0IHDp12FnAaB-LSXx1jKCRk0\\_pAwbmLc](https://1drv.ms/p/c/91c32dc74f2ffb25/IQDZz8xXr0H9SZB0IHDp12FnAaB-LSXx1jKCRk0_pAwbmLc)

**Presentation**

Mike Cohen, a GIS consultant at UCR, presented on **Drones: Technology, Applications, and Impact for College Students**.

Mike began by discussing how a drone stays balanced and moves as intended, touching on the concepts of roll, pitch, and yaw and the forces of flight (lift, drag, thrust, and weight). Drones have sensors and electronic speed controllers that respond instantaneously to variations in the forces. Higher-end drones have the capability to maintain constant elevation over surfaces, including slopes.

Mike displayed his [DJI Air 3](#) drone, which has two cameras: one with a 24 mm wide-angle lens, and one with a 70 mm telephoto lens. The latter provides images with more detail (less amount of ground covered in one image pixel - the term for that concept is ground sample distance (GSD)). His controller lacks a screen but can be connected to an iPhone or iPad. Drone flight can be controlled manually or with pre-programmed flight paths.

The formula for calculating GSD requires knowing sensor width, sensor height, focal length, flight height, and image width/height.

Drone size categories are nano (<0.55 lbs), micro (0.55-55 lbs), and large (> 55 lbs) UAVs. Micro and large drones need to be registered. All recreational drone flyers should take The Recreational UAS Safety Test ([TRUST](#)) online to certify that they understand how to fly a drone safely.

To apply for a drone pilot license, the first step is to acquire an [IACRA](#) number. FAA Part 107 Drone Test practice materials are available. Two books that are helpful for preparing are the [Airman Knowledge Testing Supplement](#) and the [Pilot's Handbook of Aeronautical Knowledge](#).

Drones are being used for detecting and treating stressed crops, capturing 360-degree imagery, delivering packages, inspecting infrastructure, monitoring construction progress, and being configured into patterns with other drones (swarm technology) among other applications. The market for drone skills is on trend to increase rapidly. Obtaining drone piloting certifications and technical skills opens career paths in agriculture, media, logistics, and public safety. Mike advises students to network with other drone users and take advantage of internships to enhance job prospects.

Slide 19 in the presentation includes links to several resources regarding legal regulations and licensing requirements. Drone operators need to be respectful of people and property that might be photographed during a flight. Institutions (such as UCR) provide [safety guidelines](#) for flying drones over their property. Local ordinances regarding drone flight may be stricter than what FAA maps indicate.

[Air Aware](#) Aloft is an airspace map tool that conveys local restrictions applying to drone flight - for instance, within a perimeter of controlled airspace surrounding March ARB. [Flightradar24](#) tracks flights in real time. These and other tools can help a drone pilot with situational awareness, which is key for drone safety.

AI integration with drones includes autonomous navigation, video creation, and blurring license plates in images. Lithium-ion batteries allow for drone flights up to 45 minutes. Drones integrated with IoT devices can maneuver in real time to avoid collisions with aircraft or obstacles.

Mike concluded the presentation by discussing some of the projects he's worked on for the UCR Botanic Gardens, including capturing 360-degree imagery and orthorectified imagery. For the latter, images were captured with 90% overlap. Mike found [Waypoint Map](#) supports 3d mapping for his drone. The resulting imagery can be processed into an orthorectified Tiff file by using [ArcGIS Drone2Map](#). Another software he called out was [PTGui](#), which enables panoramic image stitching of individual images captured by a drone.

Mike demonstrated some of the products created for the Botanic Gardens, including the searchable [interactive virtual tour](#). The splash screen for the tour includes links to a [360-degree view from the West Slope](#), a [Rose Garden video](#), and other visual projects.

After the meetup, a few attendees accompanied Mike to the Bell Tower, where he demonstrated launching and controlling the drone and acquired the following imagery:

[360 degree view](#)

video [looking down from above the Bell Tower](#)

[hyperlapse video looking down](#)

### **Discussion**

**Roland** asked what level of drone equipment is needed for GPS coordinate capture. Most of the higher-level drones these days have the capability to capture latitude/longitude and gimbal angle and record those to a photo.

**Ray** asked about the ranges of costs of drones comparable to what Mike has. The DJI that Mike purchased was around \$2000. Newer models might be \$2500 - \$3000, but it may still be possible to purchase a drone with high-tech features for around \$1500. A lot depends on the specs needed for the intended uses.

An in-person attendee asked if companies tend to contract for drone work or if they use in-house staff. Employers that have frequent or constant need of drones (utilities, public safety, media) are more likely to have in-house staff, while entities with less-frequent needs tend to contract. Mike has found such requests on LinkedIn.

As a follow-up question, **Ray** asked how long it might take students to get enough experience for finding employment as a drone pilot. Mike said San Bernardino Valley College is spinning up a program where students can be ready to take the FAA Part 107 Drone Test at the end of one semester. Even after getting a license, much skill practice is still needed, in addition to becoming familiar with the software that will enable creation of the desired products.

**Janet** mentioned the annual [DroneCamp](#) run in the summer by UC ANR; more information will be shared at the next meetup. Also, an Esri rep informed her that more ArcGIS software related to drones will soon be made available to colleges, including UCR.

### **Contact**

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