

Notes from Geospatial/GIS Meetup

June 15, 2021

via Zoom

Attendees: Janet Reyes, facilitator;
Via Zoom: Amanda Grey, Chandra Reynolds, Emeka Orji, Joseph (Jay) Spencer, Kevin Comerford, Lynn Sweet, Mario Guevara, Nic Barth, Okikiola Michael Alegbeleye, Shanon Langlie, Yuhua Situ

Announcements

This meeting was recorded; video is available [here](#). The access passcode to view is %m!M*17@

Anyone who has a **non-enterprise account in UCR's academic ArcGIS Online** organization is reminded that access to those accounts will end after June 18, 2021 (in theory). To transfer contents of an earlier account to your enterprise account (single sign-on with UCR NetID and password), use the [ArcGIS Online Assistant](#), or contact an administrator to help you change ownership of items. ITS created these [instructions for using the ArcGIS Online Assistant](#).

It is or will soon be time for **renewing ArcGIS desktop licenses**. (you'll see a message pop up when you open a session). The procedure for faculty and staff is different from years past: the sitelicense.ucr.edu link no longer works. Here's the method that worked for Lynn after her license expired recently:

Open R'space

Click on your Authorized Apps tab

Find the Service Link icon (looks like a gold star burst with a blue check mark) and open it

Click on "[Software Request](#)"

I selected ArcGIS and wrote in additional information box "Currently using ArcGIS Desktop 10.7.1 License type: Advanced"

Here is additional information from ITS on [acquiring ArcGIS Desktop](#).

Update: clicking on "Request Services & Software" on [this page](#) will lead you to the same software request form as shown above.

The registration process is fairly easy for the Esri [Education Summit](#) (the mornings of June 21-22), and the [User Conference](#) (July 12-15). Both are free, virtual events. The Education Summit has several sessions focused on higher education; other sessions relate more to K-12.

Janet will offer an [Introduction to Google Earth workshop](#) on Wednesday, August 4 at 2:00 pm. It will take a look at Google Earth, GE Pro, GE Engine, and GE Studio.

The [Geospatial/GIS meetups for summer 2021](#) will be held on Thursday, August 12 and Thursday, September 9. The August meetup will include discussion of takeaways from the User Conference. At present we have no speakers lined up for future meetups - please feel free to volunteer, or to suggest a presenter or a topic to discuss!

Thanks to the Artificial Intelligence for Sustainable Agriculture (AI4SA) grant, UCR affiliates can now **access high-resolution satellite imagery from Planet**, as described in [this article](#). Project PI Elia Scudiero encourages our geospatial community to take advantage of this opportunity. As the article states, “If [P]lanet images could help your project, you’ll need to apply for a user account, but Scudiero says any project will be approved. All that’s required is an active UCR email address. To request access, please visit the [website](#).”

Janet shared that **Bob Johnson**, Geographic Information Specialist with the Center for Conservation Biology, is retiring at the end of June. Bob has been a tremendous supporter of and resource for the UCR geospatial community for several years - we wish him well in his future adventures!

First-time Attendees

Emeka Orji was our only first-time attendee at this meetup. Thanks for joining us, and we hope you’ll return in the future!

Presentation

In response to input from the community, Janet presented information on Google Earth Engine and on mapping-related packages in R. A document with links for unusual GIS applications was also shared.

[Google Earth Engine](#)

Google Earth Engine is a global-scale platform for earth science data and analysis. Because it hosts massive files of satellite imagery and derived datasets, it minimizes a researcher’s need to download and manage data.

This table summarizes the imagery and datasets available in Google Earth Engine:

IMAGERY	DATASETS
Landsat: 1972, 30m, approx. every 2 weeks; includes multispectral and thermal data	Terrain: DEMs, 30m or smaller
Sentinel 1-3 (European): 2014, radar and optical images, ocean, land, and air quality data. Resolution as low as 5m. Every 12 days.	Landcover: global and national (e.g. NLCD)
MODIS: 1999, 16 day, spectroradiometer, 250m – 1km, surface reflectance and derived products (veg indices, snow cover)	Cropland: e.g. USDA NASS Cropland Data Layers
Planet SkySat: 2014-16, 0.8-1.0m or 2m, RGB or multispectral	Other: landforms, burned areas/fire, drought, climate, hydrology, snow cover, ozone
NAIP: 2003-2019, every 3 years since 2009, continental US, 1m, RGB and (recent) nearIR	

Other Google Earth Engine features:

- You can import your own datasets, including shapefiles (vector data); share your data or keep them private.
- It provides a web-based code editor for algorithm development.
- Compute power is backed by Google data centers.
- Any products of your analysis can be downloaded to be used in third-party tools.
- JavaScript API and Python API are available.
- Use cases include:
 - Modeling habitat ranges for at-risk species
 - Malaria risk mapping
 - Assessment of deforestation, desertification, and land use change
 - Assessment of global surface water
- To get access to Earth Engine, fill out the form at signup.earthengine.google.com. You will receive an email titled "Welcome to Google Earth Engine" with instructions for getting started.
 - Users are only allowed one Earth Engine account, associated with one Google account.
 - Jay asked if high school students can have Google Earth Engine accounts.
 - **Update:** Janet didn't find the specific answer, but as noted [here](#), 13 is the minimum age for a Google account.
 - We also discussed that Google Earth Engine might be too complex for high school students to use successfully, and that file sizes of data downloaded from it could be very large. Similar, summarized data found elsewhere might be more appropriate for their use.
- Resources:
 - Help page: <https://developers.google.com/earth-engine/help>
 - Tutorials: <https://developers.google.com/earth-engine/tutorials>
 - Guides: <https://developers.google.com/earth-engine/guides>
 - FAQs: <https://earthengine.google.com/faq/>

Mapping related packages in R

Packages in R contain specific sets of commands that allow you to manipulate data.

To see packages for spatial data: <https://cran.r-project.org/web/views/Spatial.html>

The **prominent** spatial data packages:

→ **sp** (can work with vector and raster data) <https://cran.r-project.org/web/packages/sp/sp.pdf>

→ **sf** (vector only; integrates with [tidyverse](#)) <https://cran.r-project.org/web/packages/sf/sf.pdf> Many commands start with `st_`.

Other commonly used packages for mapping:

- **raster** – extension of **sp** spatial data classes
- **ggplot2** – a system for creating graphics, including maps; part of the tidyverse (load all of tidyverse, or load ggplot2 separately)

- **dplyr** – “provides a set of tools for efficiently manipulating datasets in R” e.g. `arrange()`, `select()`, `summarise()`, `mutate()`, `group_by()`
- **tmap** – generate thematic maps; easier to use than **ggplot2**

For web-mapping:

- **mapview** – create interactive visualizations of spatial data; easier than **mapdeck** or **leaflet**
- **mapdeck** – interactive maps using [mapbox GL](https://mapbox.com/) and deck.gl; suitable for large datasets
- **leaflet** – create dynamic online Leaflet-like maps; most customizable
- **ggmap** – spatial visualization with Google Maps and OpenStreetMaps

To access specific data types:

- **tidycensus** - US Census Bureau data
- **tigris** - Census Bureau cartographic elements
- **mapproj** – among other functions, provides access to GSHHS coastlines

Visualization:

- **viridis** – has color palettes compatible with colorblindness and printing in grayscale
- **RColorBrewer** – color palettes

Lynn shared that the R’Ladies Club had a session on mapping in R a couple of months ago.

<https://rladies.github.io/riverside/events.html> Maybe we can invite the presenter, Tessa Shates in Entomology, to speak at a future meetup.

Unusual GIS applications

[This document](#) contains links to several projects or descriptions of GIS applications regarding: extraterrestrial bodies, digital humanities, below ground mapping, underwater mapping, and the human body.

Map sharing

In the chat, Shanon shared “I’ve also found USA Facts really interesting, in terms of their use of data and visualization”: <https://usafacts.org/visualizations/>

Here are 3 links that Janet shared with the listserv prior to the meetup:

- LEGO World Map: <https://www.lego.com/en-us/product/world-map-31203> (temporarily out of stock)
- Animated map of UFO sightings: <https://www.esri.com/videos/watch?v=IAopNJMbFEI&title=animated-maps-a-century-of-ufo-sightings>
- Geo-coded Art: <http://geocodedart.com/>