The Application for Extracting and Exploring Analysis Ready Samples (AppEEARS)

USFS – NASA Joint Applications Workshop, 30 April – 2 May 2019

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NSIDC National Snow and Ice Data Center
Advancing Knowledge of Earth's frozen regions

CIRES

University of Colorado Boulder

National Snow and Ice Data Center

manages and distributes scientific data

researches the cryosphere and data science

supports data users

supports local and Traditional Knowledge

provides tools for data users

informs the public about the cyrosphere

Affiliations

University of Colorado Boulder

CIRES

Cooperative Institute for Research in Environmental Science

ICSU WORLD DATA SYSTEM

Sponsors

NASA

NSF

NOAA

AppEEARS - Overview

- https://lpdaacsvc.cr.usgs.gov/appeears/
- Earthdata login required
  - https://urs.earthdata.nasa.gov/
- This demo does not require a personal Earthdata login…BUT, you might as well get one because AppEEARS is cool
- #easyanalysis

AppEEARS – Overview

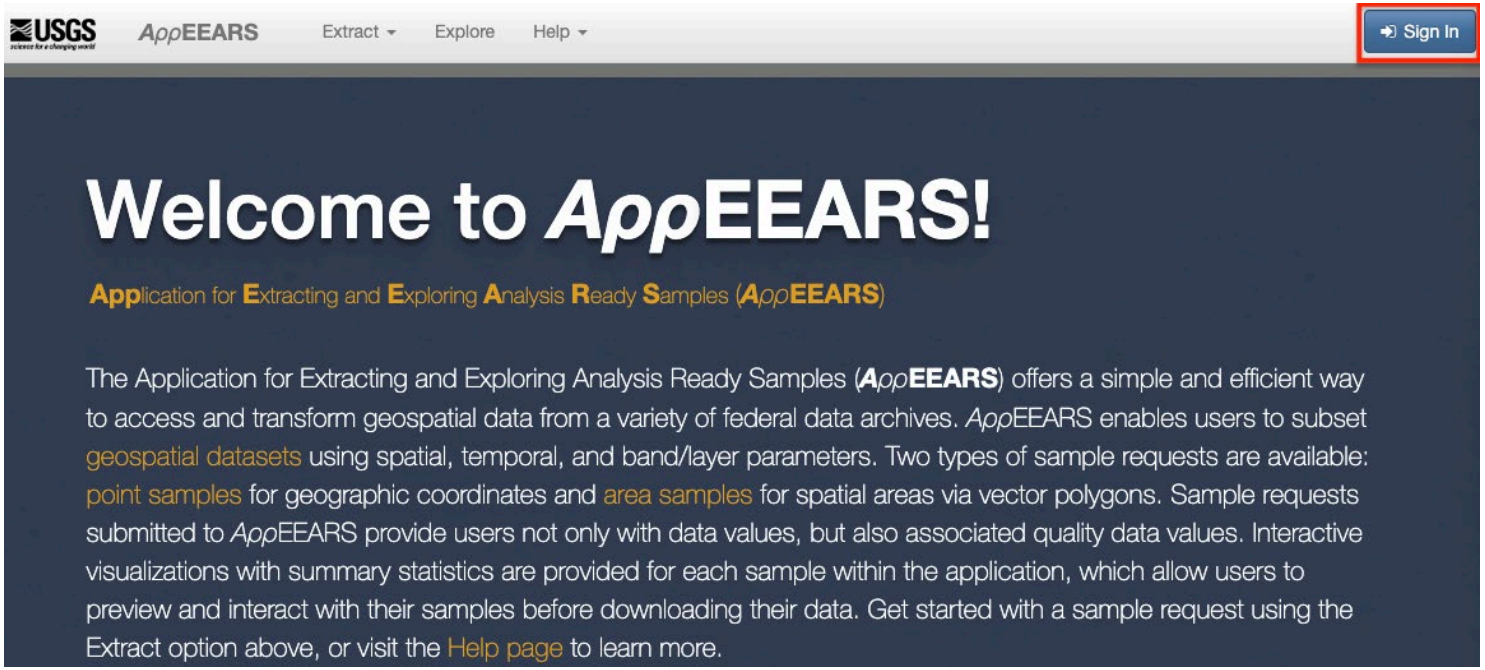
- Analysis ready point and area data samples
- Subset data sets – spatial, temporal, and layer parameters
- Re-format to .csv and GeoTIFF
- Re-project area data samples
- View results with time series graphs and tables, scatter plots, box and whisker plots
- Compare layer parameters
- Size limits
  - 10,000 raster files, 450 GB per request, 7.2 GB per raster

AppEEARS – Available data sets

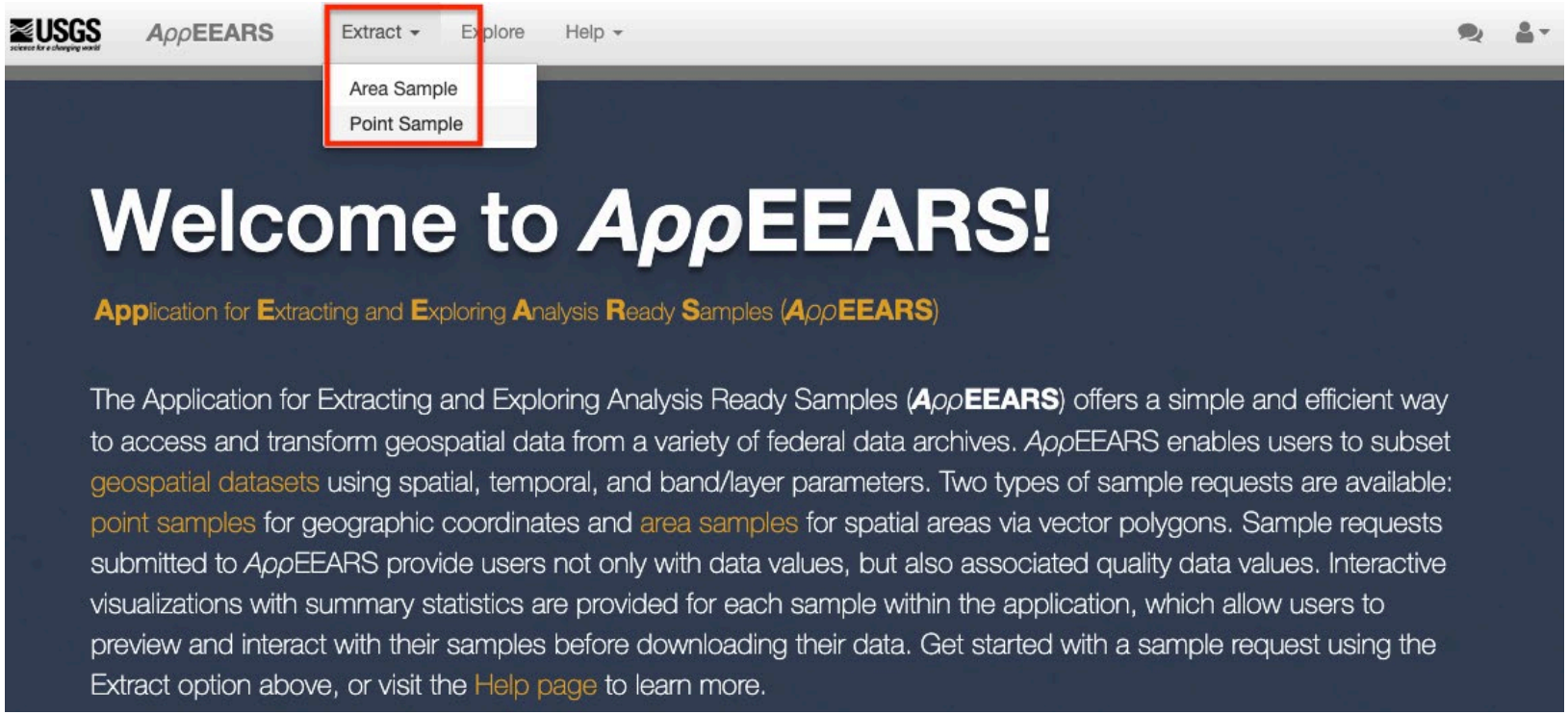
- https://lpdaacsvc.cr.usgs.gov/appeears/products
  - MODIS – NDVI, evapotranspiration, snow cover, et al.
  - SMAP – Soil moisture, freeze thaw, CO2, et al.
  - SRTM – Digital elevation models
  - VIIRS – NDVI, albedo, surface reflectance, et al.
  - WELD – NDVI, reflectance, et al.
  - And more…

AppEEARS – Login

- Login to https://lpdaacsvc.cr.usgs.gov/appeears/
  - Username: usfs_2019
  - Password: UsFs_2019

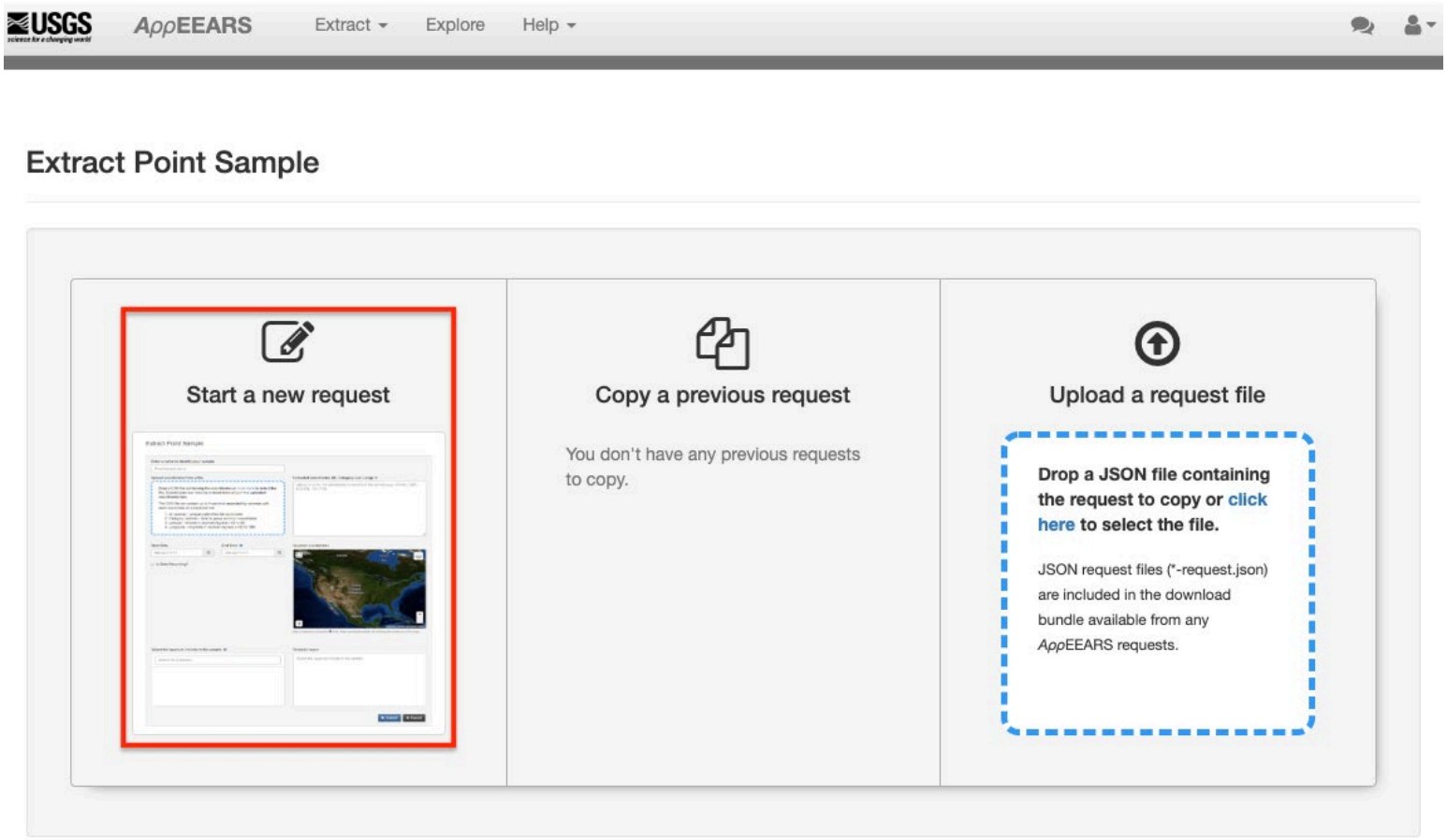


AppEEARS point sample – AM vs. PM SMAP soil moisture in AZ and NM NFs

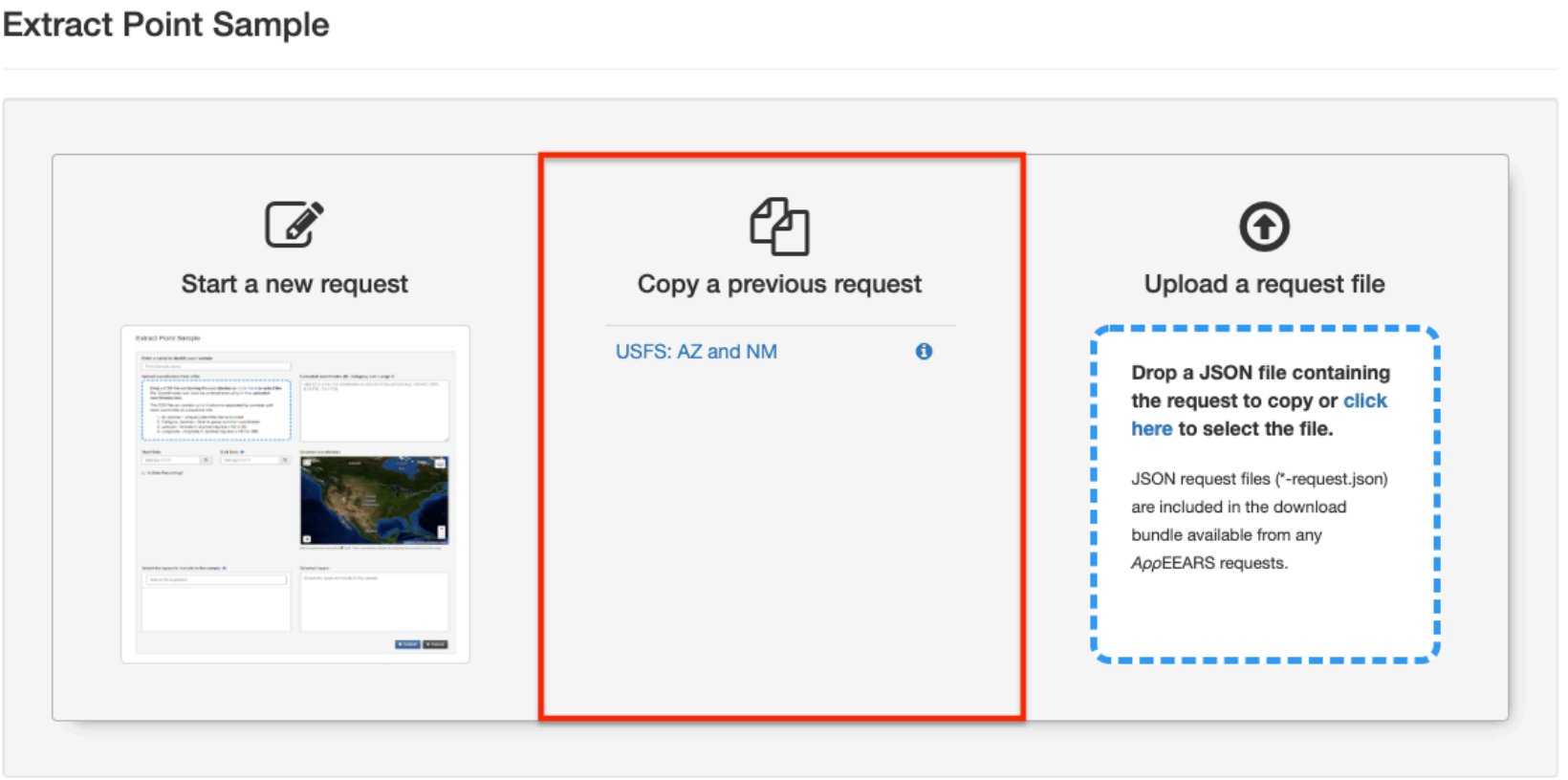


- Extract ➤ Point Sample

AppEEARS point sample– Start a new request

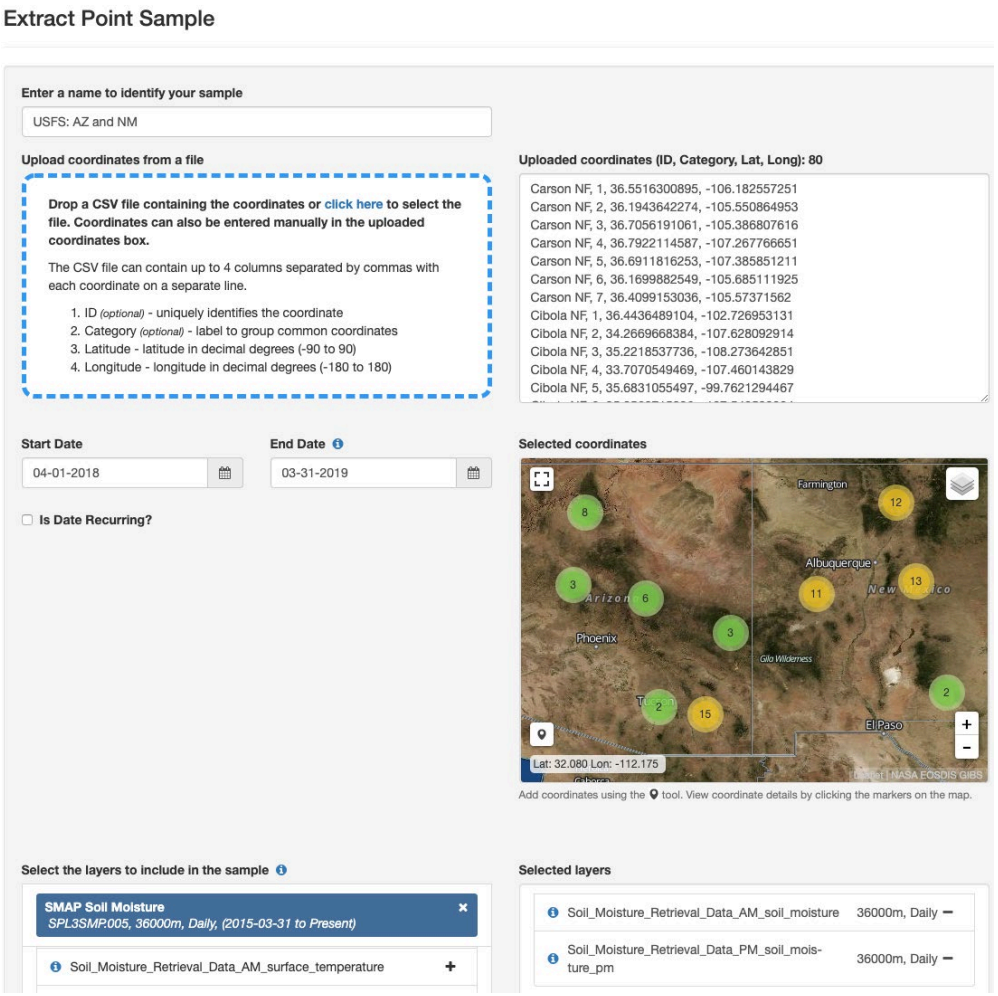


AppEEARS point sample– Copy previous request



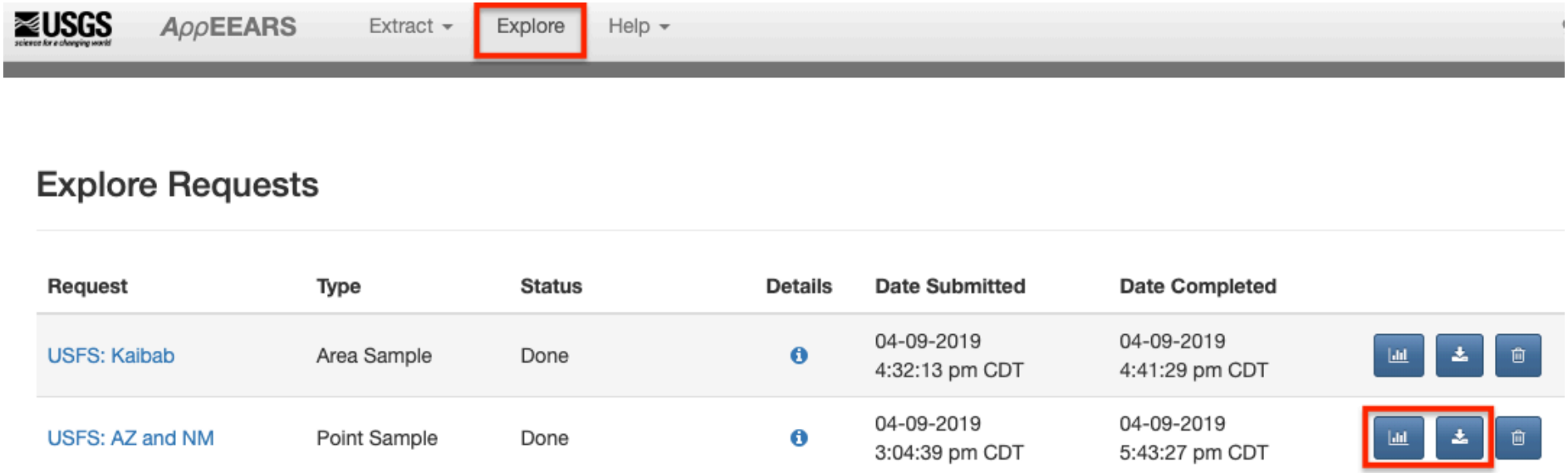
- Copies all details from a previous submission
- Let's look at project details…
- Extract ➤ Point Sample ➤ Copy a previous request ➤ USFS: AZ and NM

AppEEARS point sample – Project details



- Add different products, point locations, and start and end dates
- Do NOT submit if signed in under previous log info

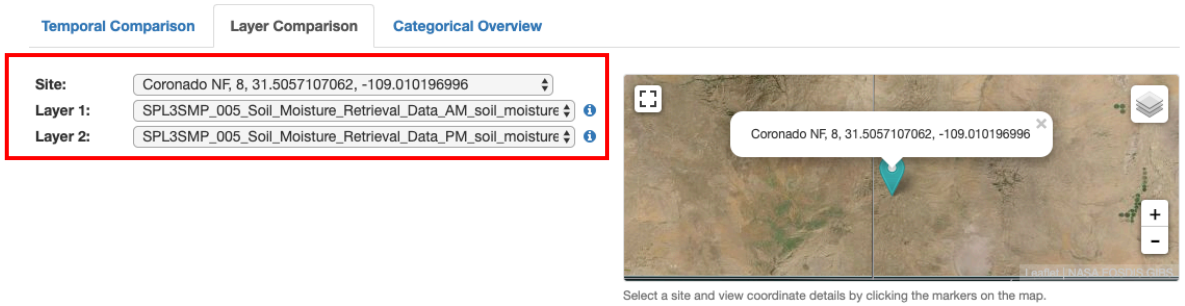
AppEEARS point sample – Order status and download and explore data

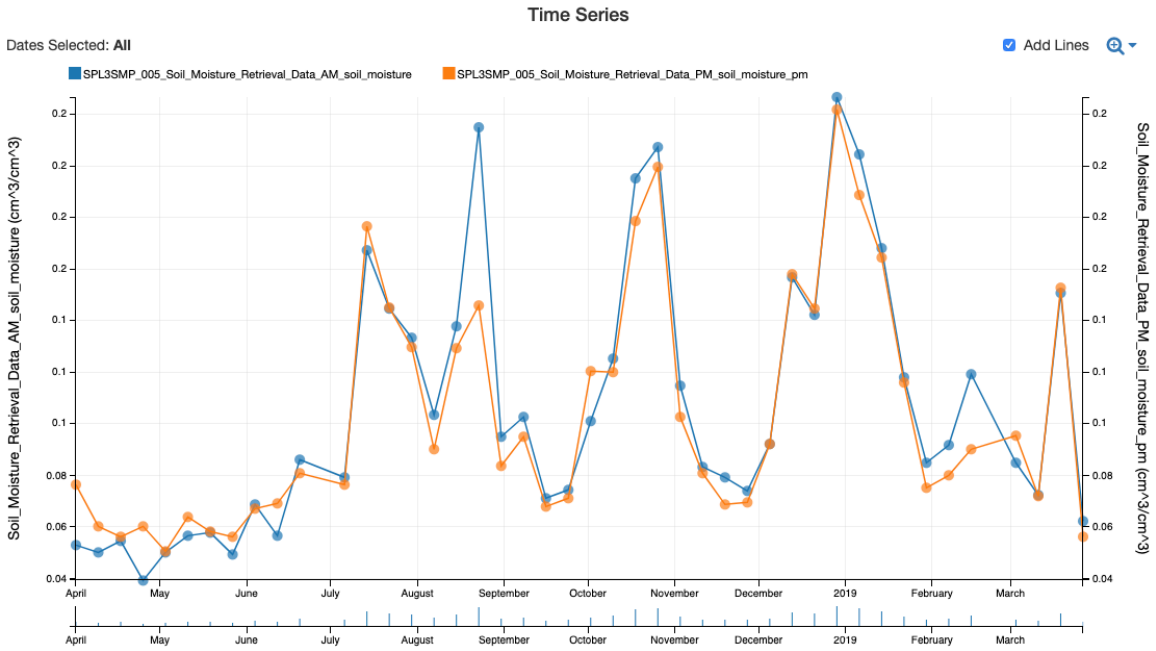


AppEEARS point sample – Temporal comparison

- View study sites and layers parameters on graphs
- Change x-axis to customize temporal coverage on graphs and tables

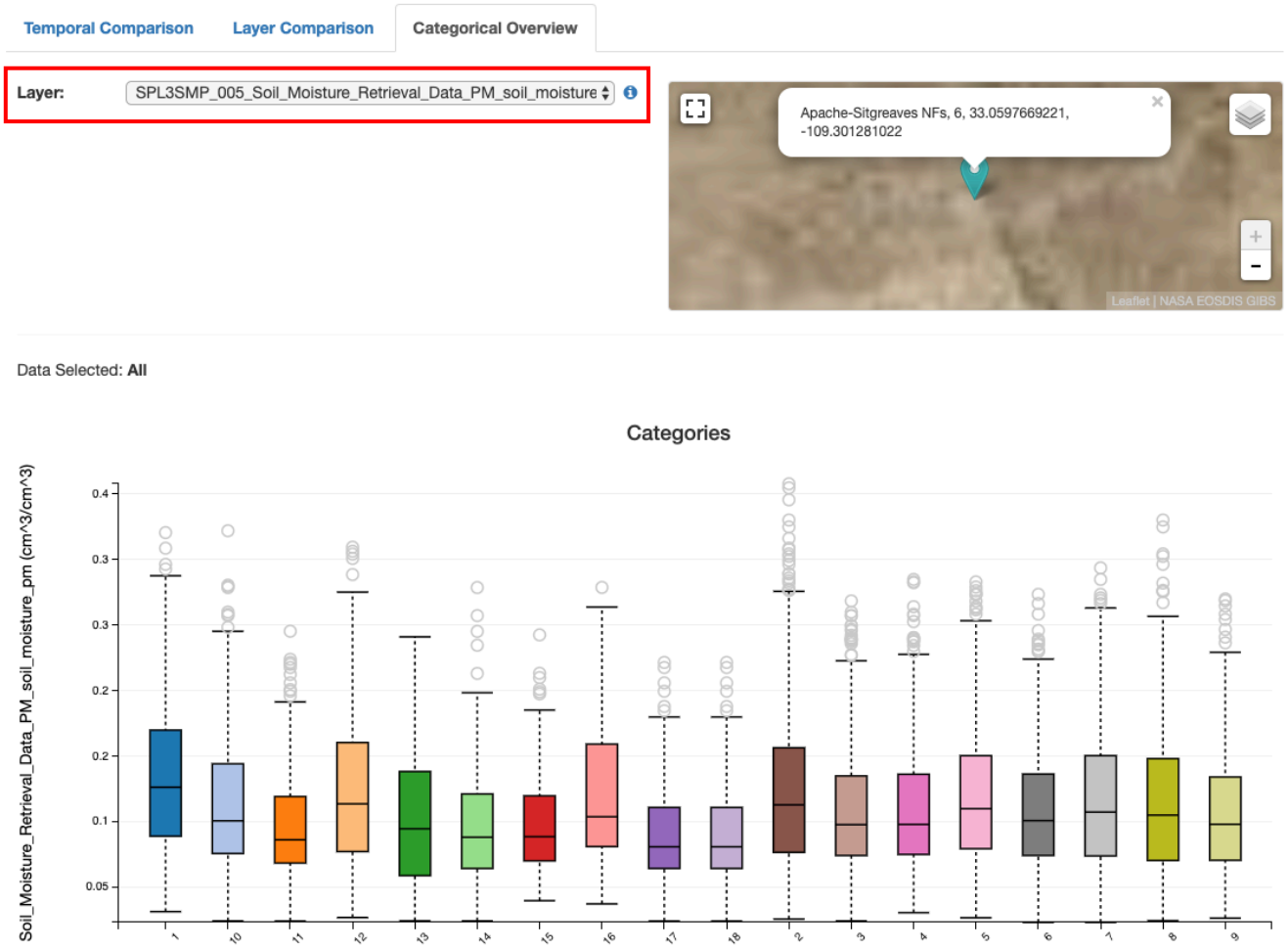
AppEEARS point sample – Layer comparison





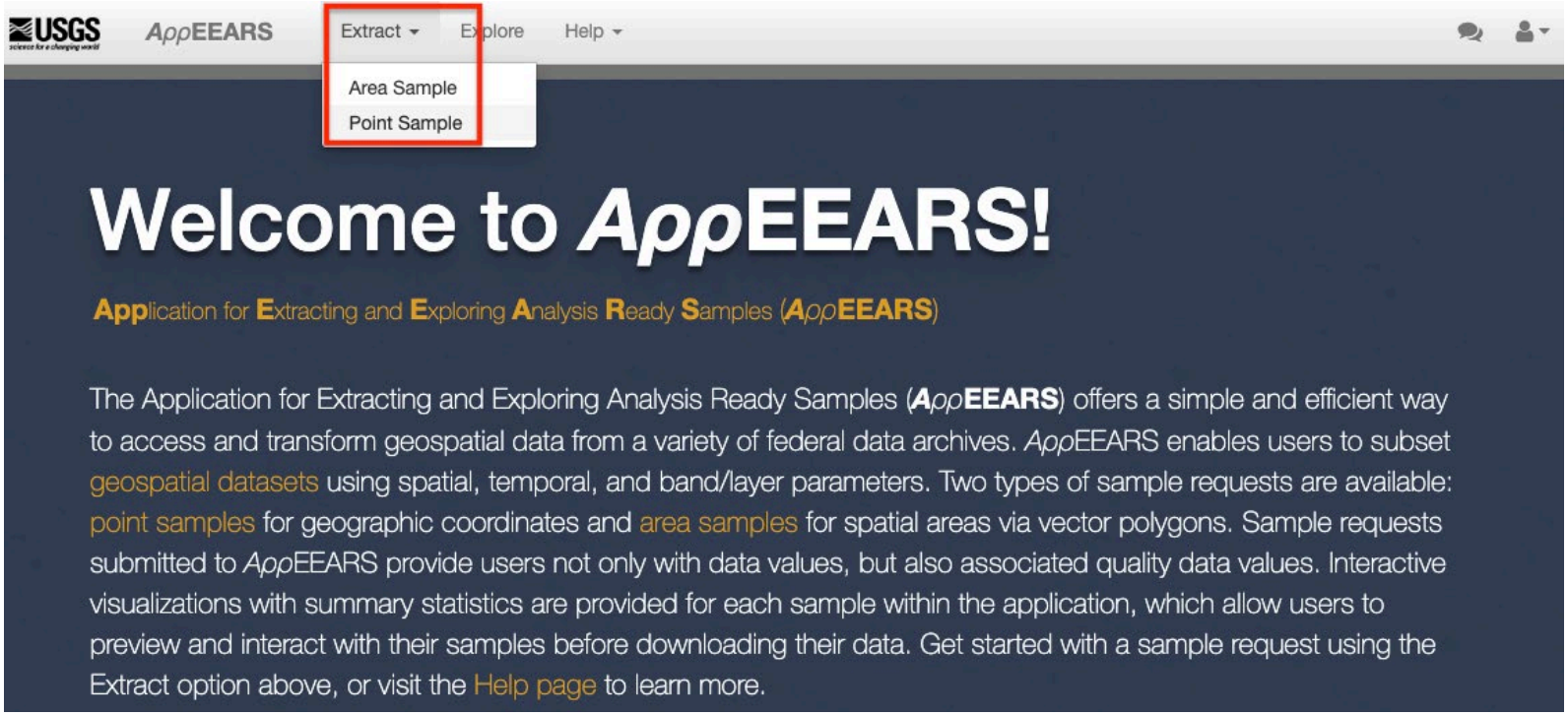
- Compare different layer parameters on the same graph
- Time series, scatter plots, and tables are included
- Adjust x-axis to alter temporal coverage

AppEEARS point sample – Categorical overview



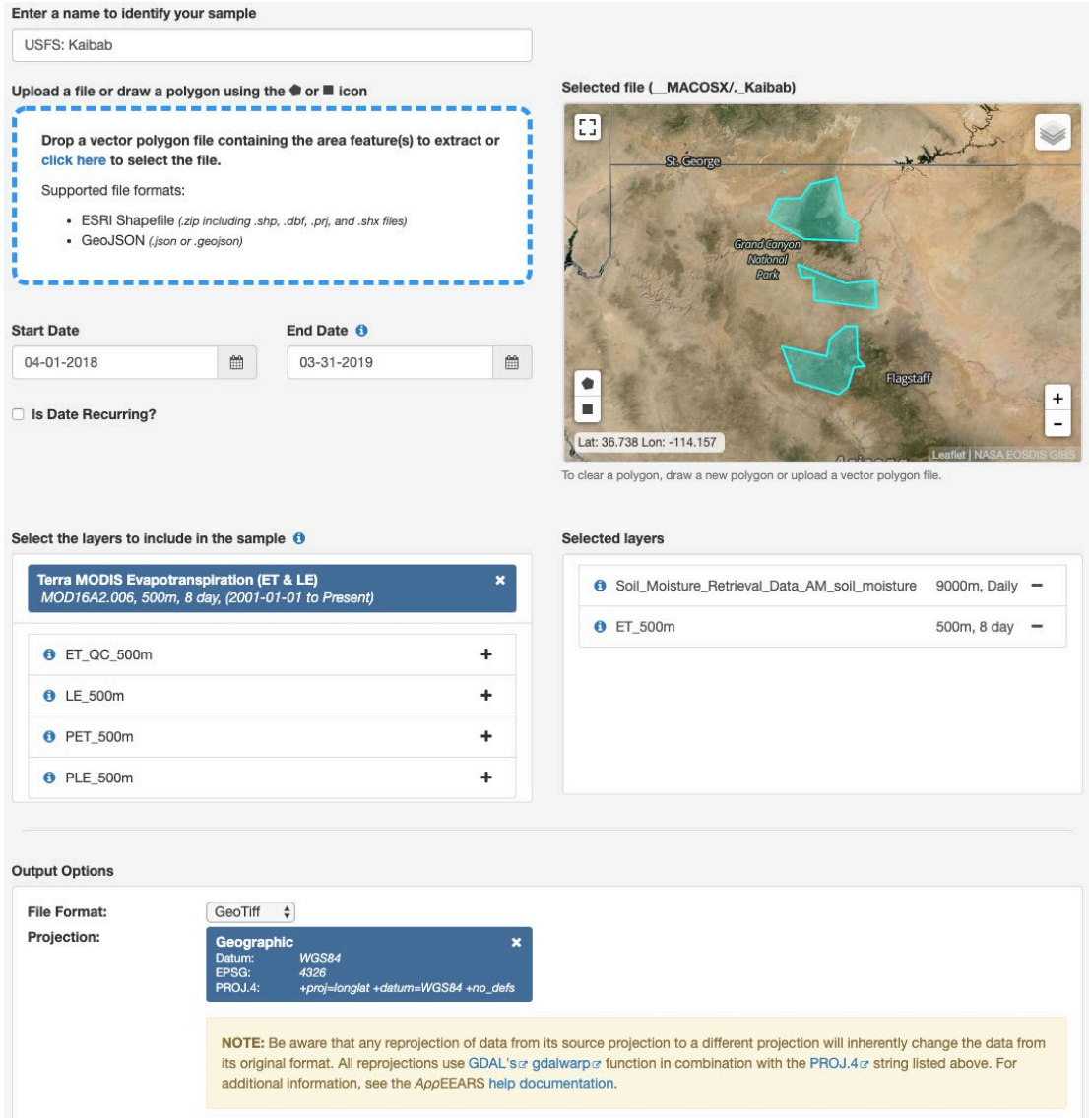
- Explore the distribution of sample data within categories
- Box and whisker plots display total number of samples, median, and interquartile ranges

AppEEARS area sample – Soil moisture and evapotranspiration in Kaibab National Forest



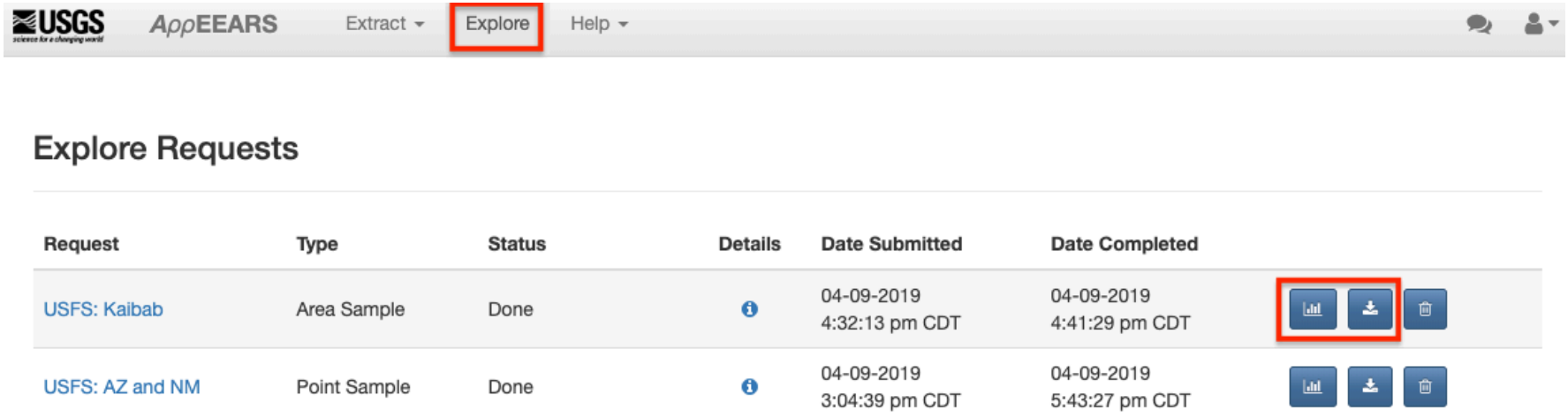
- Extract ➤ Area Sample ➤ Copy previous request ➤ USFS: Kaibab

AppEEARS area sample – project details

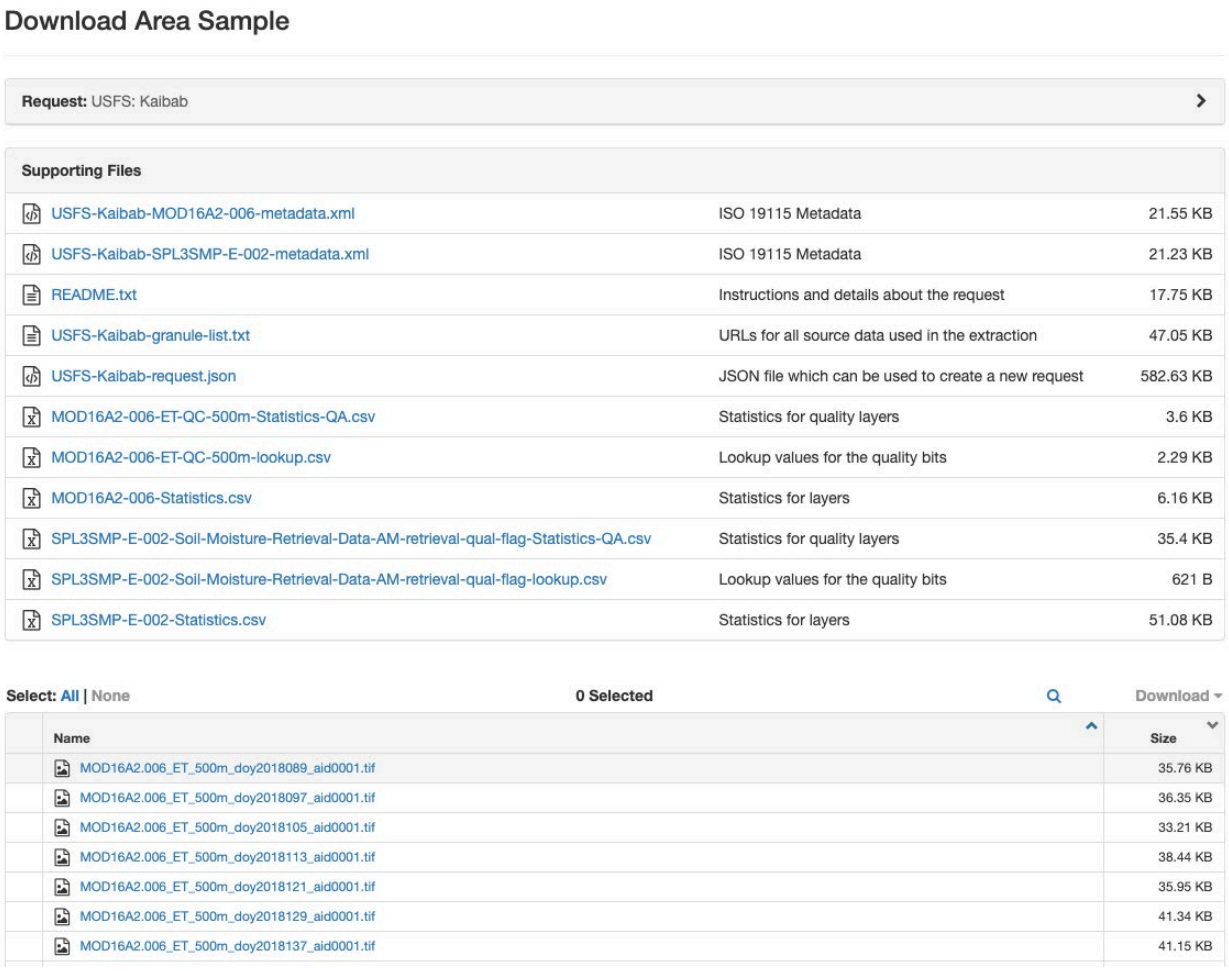


- Do NOT submit the order…i.e. do not get me in trouble

AppEEARS area sample – Order status and download and explore data



AppEEARS area sample – Download data



Download Area Sample

Request: USFS: Kaibab

Supporting Files

USFS-Kaibab-MOD16A2-006-metadata.xml	ISO 19115 Metadata	21.55 KB
USFS-Kaibab-SPL3SMP-E-002-metadata.xml	ISO 19115 Metadata	21.23 KB
README.txt	Instructions and details about the request	17.75 KB
USFS-Kaibab-granule-list.txt	URLs for all source data used in the extraction	47.05 KB
USFS-Kaibab-request.json	JSON file which can be used to create a new request	582.63 KB
MOD16A2-006-ET-QC-500m-Statistics-QA.csv	Statistics for quality layers	3.6 KB
MOD16A2-006-ET-QC-500m-lookup.csv	Lookup values for the quality bits	2.29 KB
MOD16A2-006-Statistics.csv	Statistics for layers	6.16 KB
SPL3SMP-E-002-Soil-Moisture-Retrieval-Data-AM-retrieval-qual-flag-Statistics-QA.csv	Statistics for quality layers	35.4 KB
SPL3SMP-E-002-Soil-Moisture-Retrieval-Data-AM-retrieval-qual-flag-lookup.csv	Lookup values for the quality bits	621 B
SPL3SMP-E-002-Statistics.csv	Statistics for layers	51.08 KB

Select: All | None 0 Selected Download

Name	Size
MOD16A2.006_ET_500m_doy2018089_aid0001.tif	35.76 KB
MOD16A2.006_ET_500m_doy2018097_aid0001.tif	36.35 KB
MOD16A2.006_ET_500m_doy2018105_aid0001.tif	33.21 KB
MOD16A2.006_ET_500m_doy2018113_aid0001.tif	38.44 KB
MOD16A2.006_ET_500m_doy2018121_aid0001.tif	35.95 KB
MOD16A2.006_ET_500m_doy2018129_aid0001.tif	41.34 KB
MOD16A2.006_ET_500m_doy2018137_aid0001.tif	41.15 KB

- .csv files contain all data samples for each science file
- Download individual or all raster files
- .json files can be used to create a new request

AppEEARS area sample – Explore data

- Change layer parameters
- Adjust time scale on x-axis
- Adjust the mix/max of values on the y-axis

Questions or feeback?

- AppEEARS related questions: LPDAAC@usgs.gov
- SMAP related questions: nsidc@nsidc.org