

CartoCosmos



Team Members:

Kaitlyn Lee, Jacob Kaufman,
Scott Ames, Christopher Moore

Mentor:

Isaac Shaffer

Client:

USGS's Trent Hare and Scott Akins

The Planetary Science Community

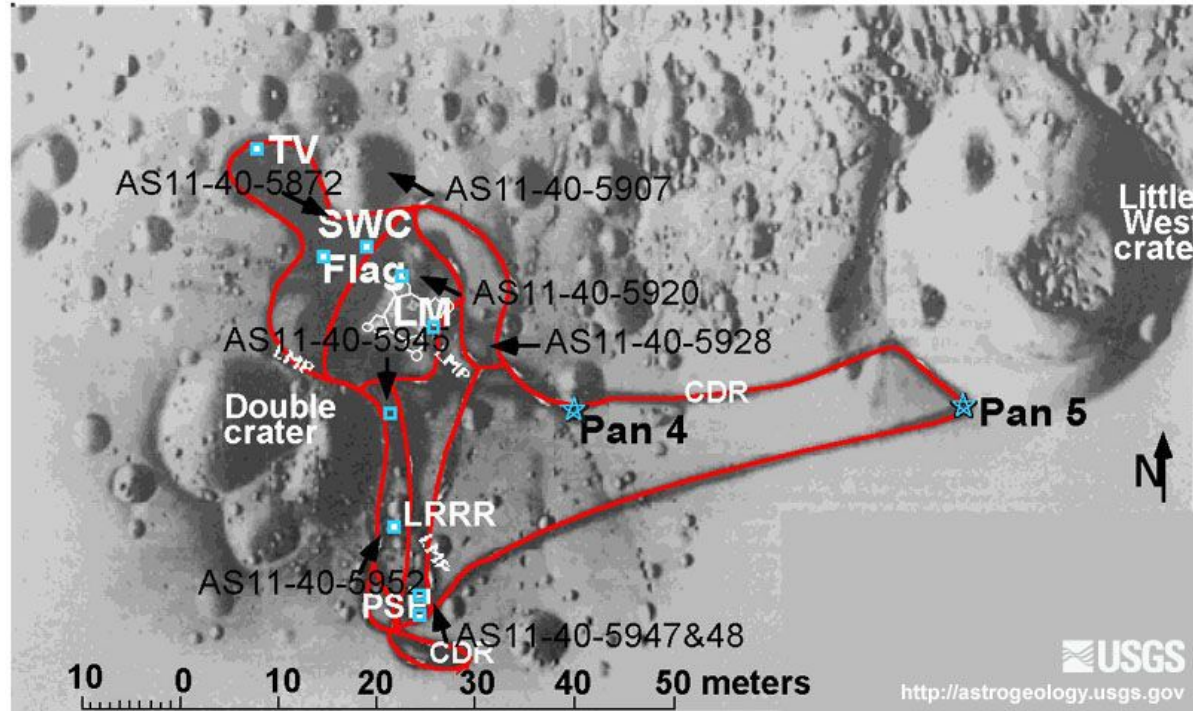


Figure: Map of Landing Site for Apollo 11 Mission

Our Clients



Trent Hare - Cartographer



Scott Akins - IT Specialist



Workflow & Problems

Problems

- Only made for Earth.
- Cannot change lat/lon settings.
- Cannot view body in multiple projections.

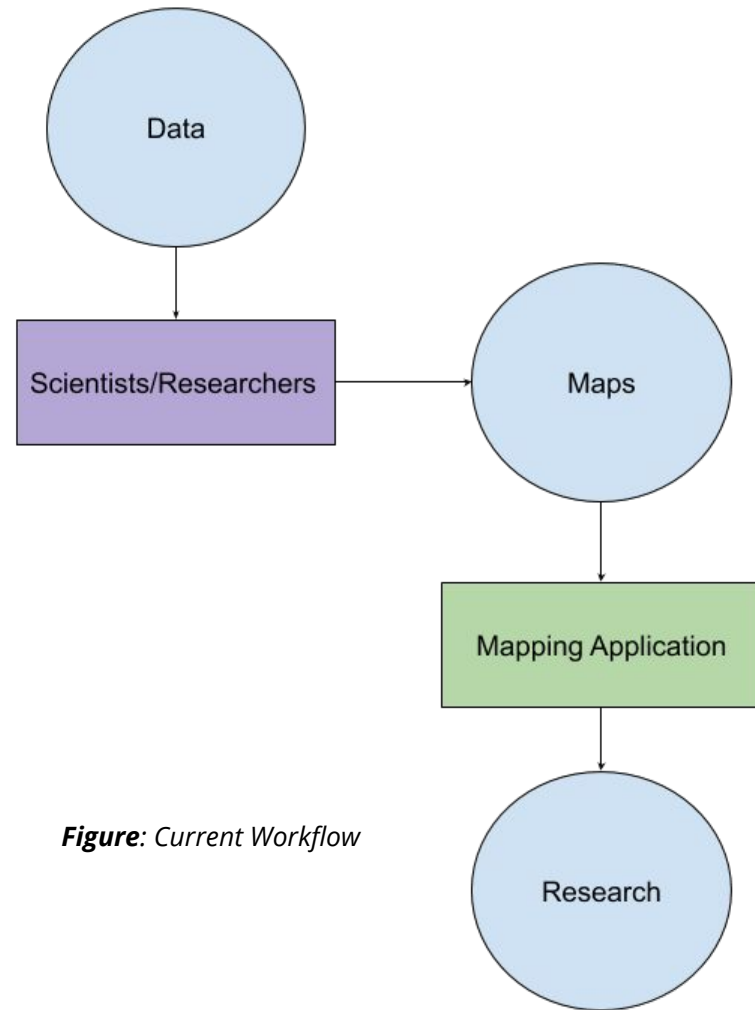


Figure: Current Workflow

Projections

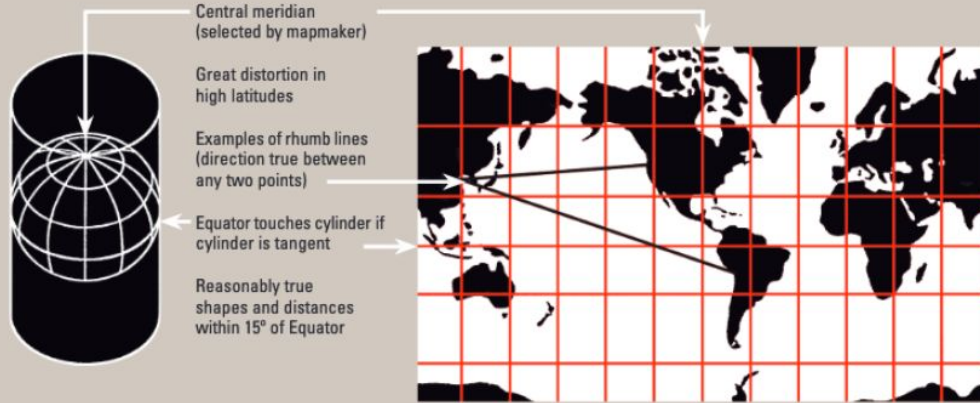


Figure: Cylindrical Projection

<https://store.usgs.gov/assets/mod/storefiles/PDF/16573.pdf>

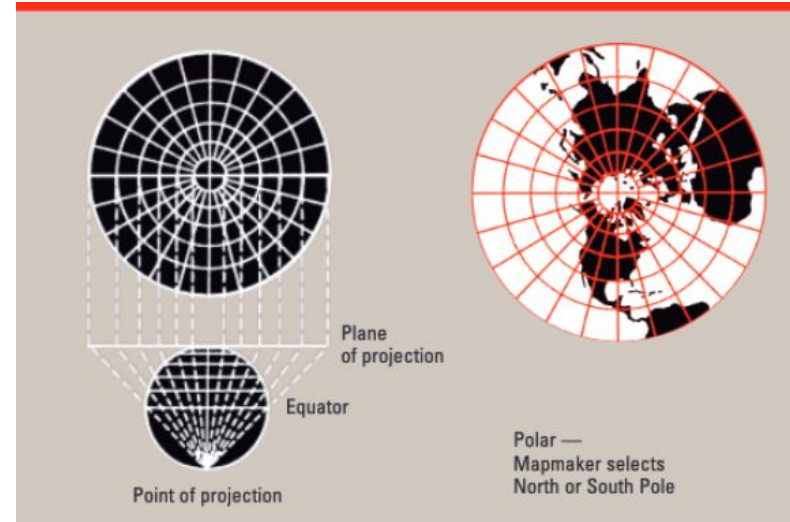


Figure: Polar Stereographic Projection

<https://store.usgs.gov/assets/mod/storefiles/PDF/16573.pdf>

Solution Overview

- Use Leaflet to build a new mapping tool.
- View more bodies, not just Earth.
- Allow swapping Lat/Lon settings.

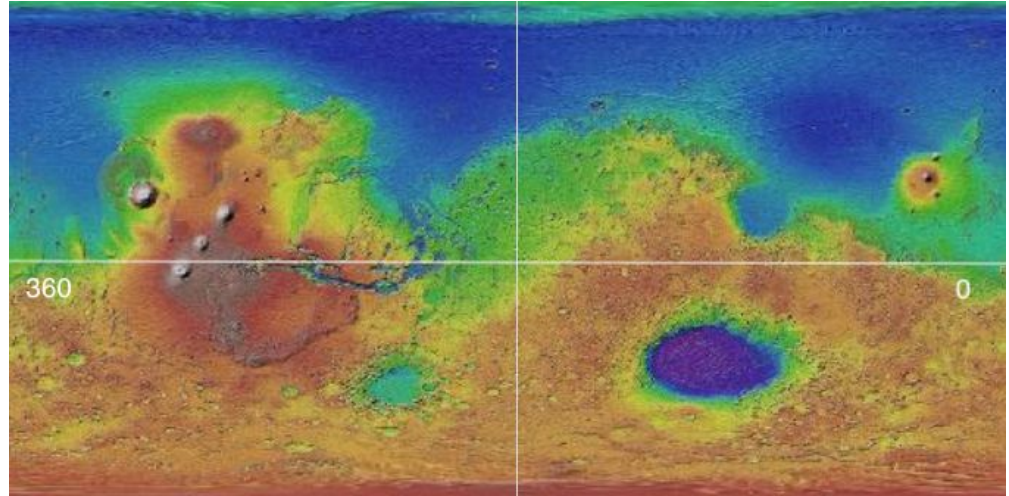


Figure: Lat/lon on Map

Solution Overview

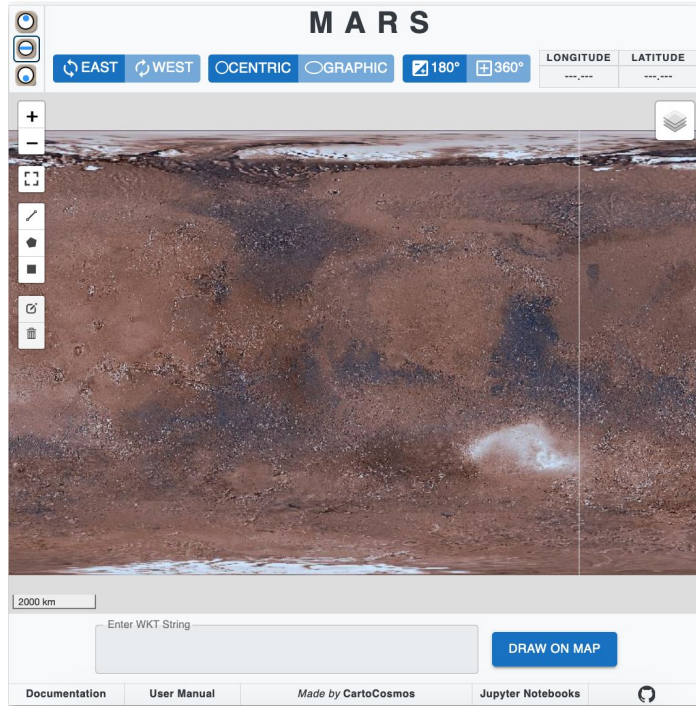


Figure: Cylindrical Projection of Mars

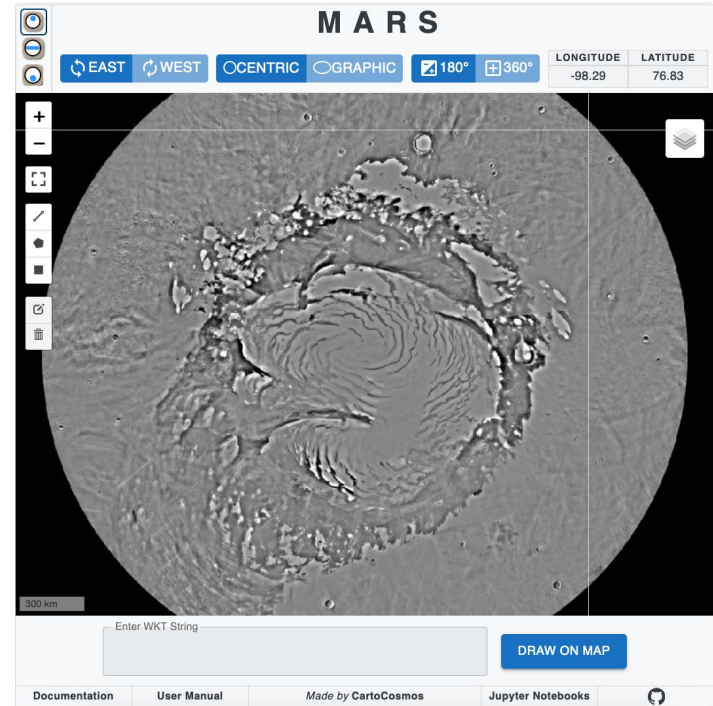
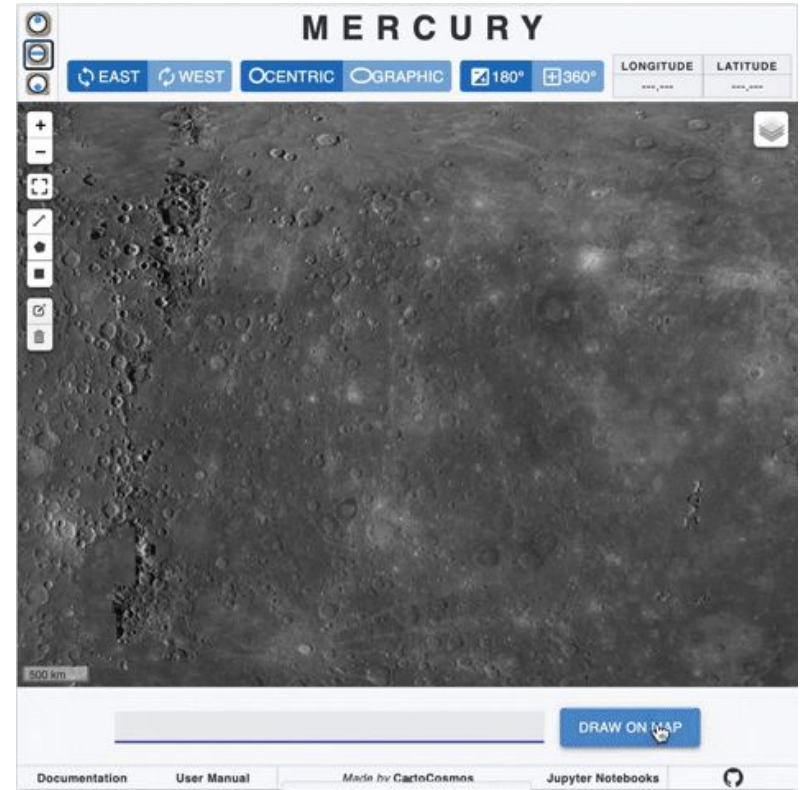


Figure: North Polar Projection of Mars

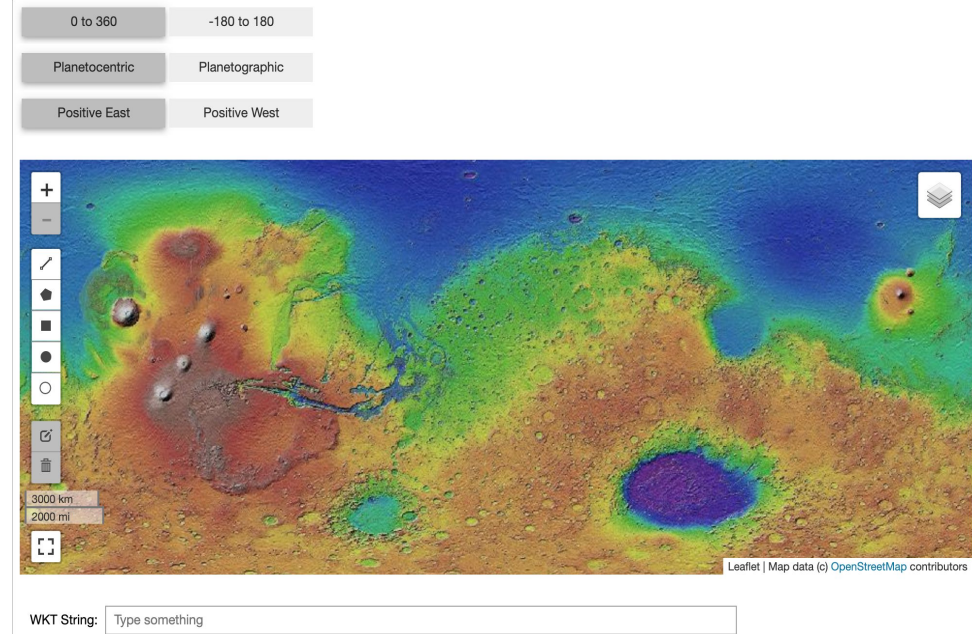
Solution Overview

- Highlight regions of any planetary map
- Users can draw shapes using:
 - On map GUI buttons
 - Well Known Text



Solution Overview:

- Create a mapping tool for Jupyter Notebook
- Follows our implementation for our JavaScript application



Solution Overview:

- Build an autocomplete module
- Directs users to surface feature information pages

as
Asada
Asari
Asau
Ascanius
Asclepi
Asclepi A
Asclepi B
Asclepi C
Asclepi D
Asclepi E

Requirements Refresher

- Leaflet, JavaScript, and Python.
- GUI with all features needed by scientists.
- modular for easy updates.
- compatible with any web browser.

Implementation Overview

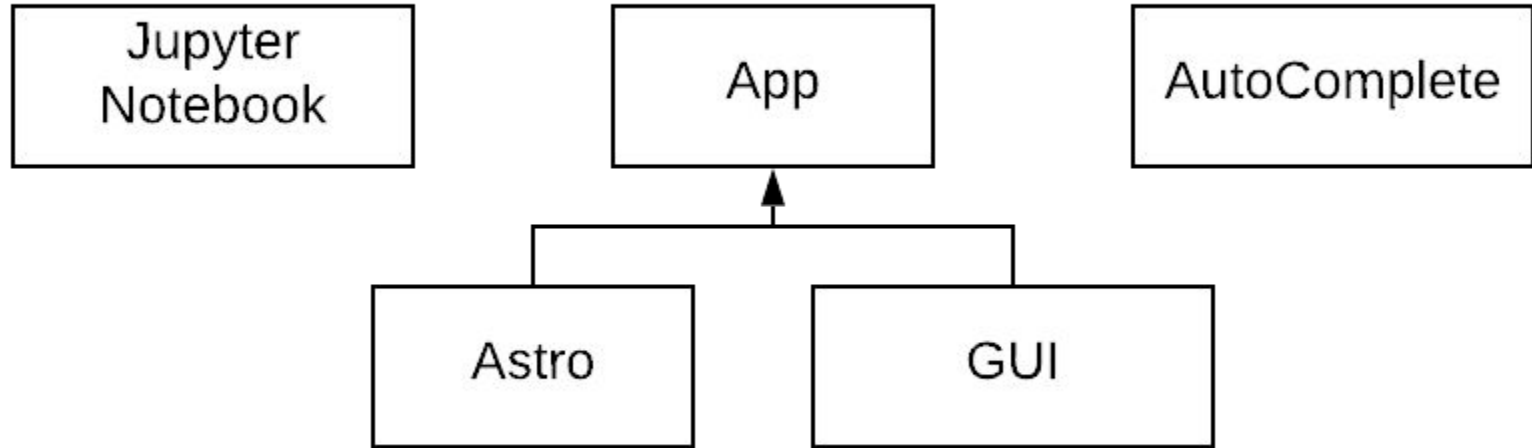


Figure: Overview of Modules

The Astro Package

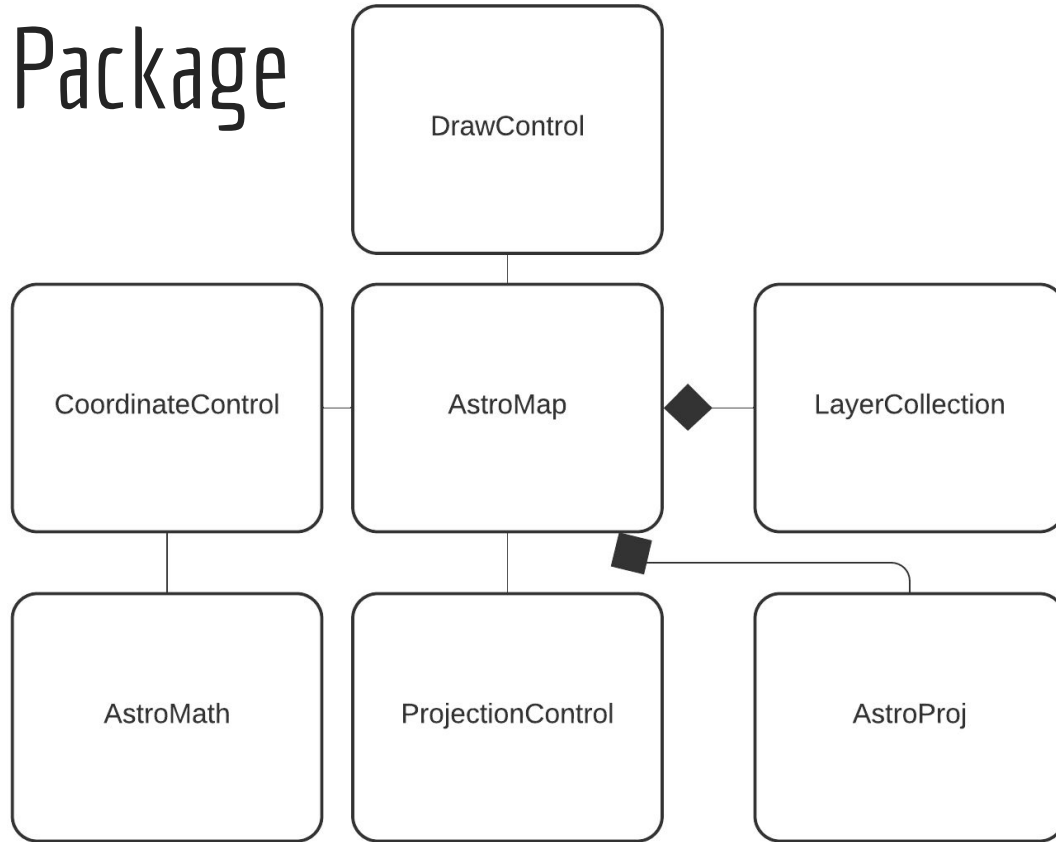


Figure: Overview of the Astro Module

Prototype Demo and Review

Demo Website:

cartocosmos.github.io

Challenges and Resolutions

- Using React (ES6 JavaScript) for the front-end and CommonJS (ES5 JavaScript) for the back-end
 - Refactor the CommonJS code to export its functionality for use by React
- Saving drawn shapes when switching projections
 - Deleted the current layer on map and set it to layer from new projection

Team Schedule



Testing Plan

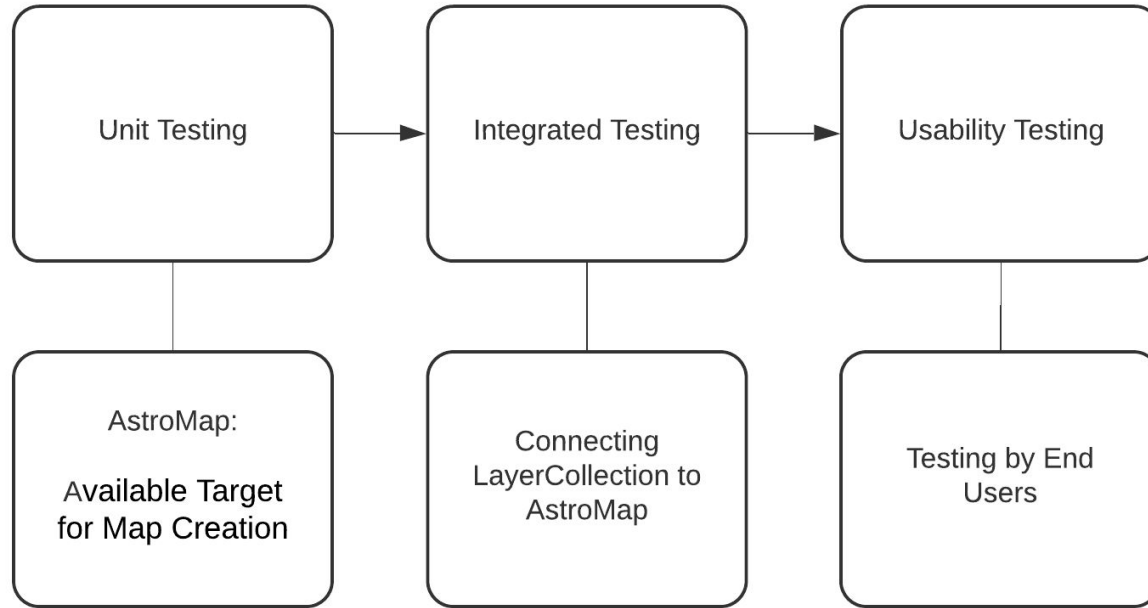


Figure: Overview of Testing Plan

Future Work

- Click on Feature Name on USGS website and show feature on map.
- Getting multiple projections to work in Jupyter.
- Adding fullscreen menu for Leaflet.

Conclusion

- Team CartoCosmos
- Client: USGS
- Problem: USGS needs a new mapping application.
- Solution: A modular Node package using leaflet.
 - AutoComplete search tool
 - Python Implementation
- Alpha-Prototype and stretch goals completed, now testing.

Thanks For Listening

CartoCosmos



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CartoCosmos
Website:

