

GeoSTAC

Design Review I



Team Members

Amy Stamile (Lead)

Zachary Kaufman

Jacob Cain

Gavin Nelson

Mentor

Melissa Rose

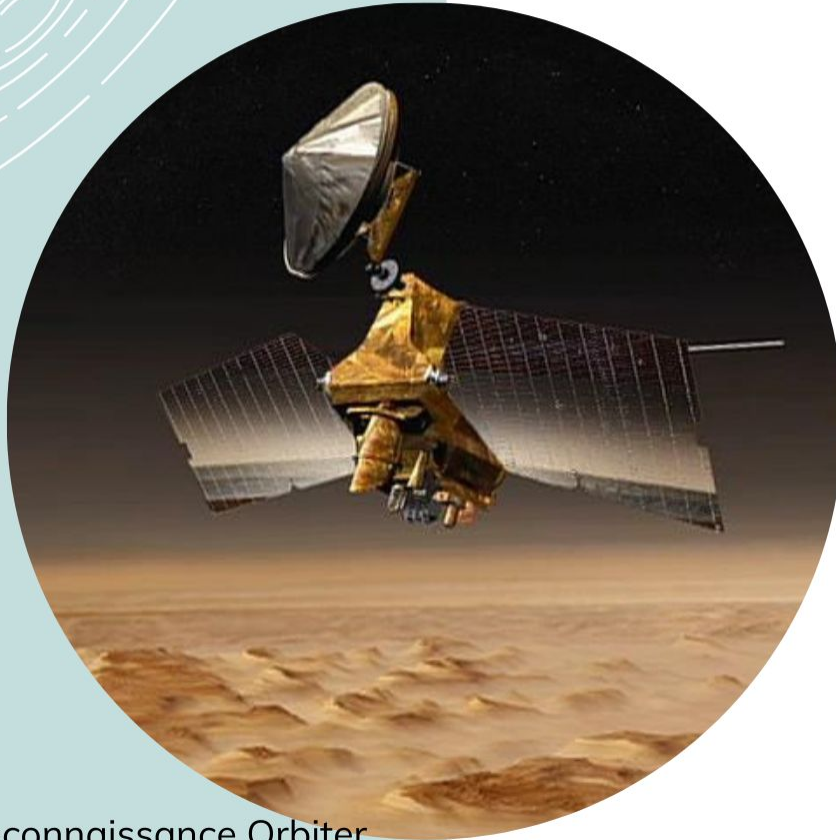
Client

United States Geological Survey (USGS)

Astrogeology Science Center

Big Picture

- Explored about 4% of the visible Universe
- Increase space exploration
- Maps of Planets



Mars Reconnaissance Orbiter
mars.nasa.gov

Clients



Trent Hare - Cartographer

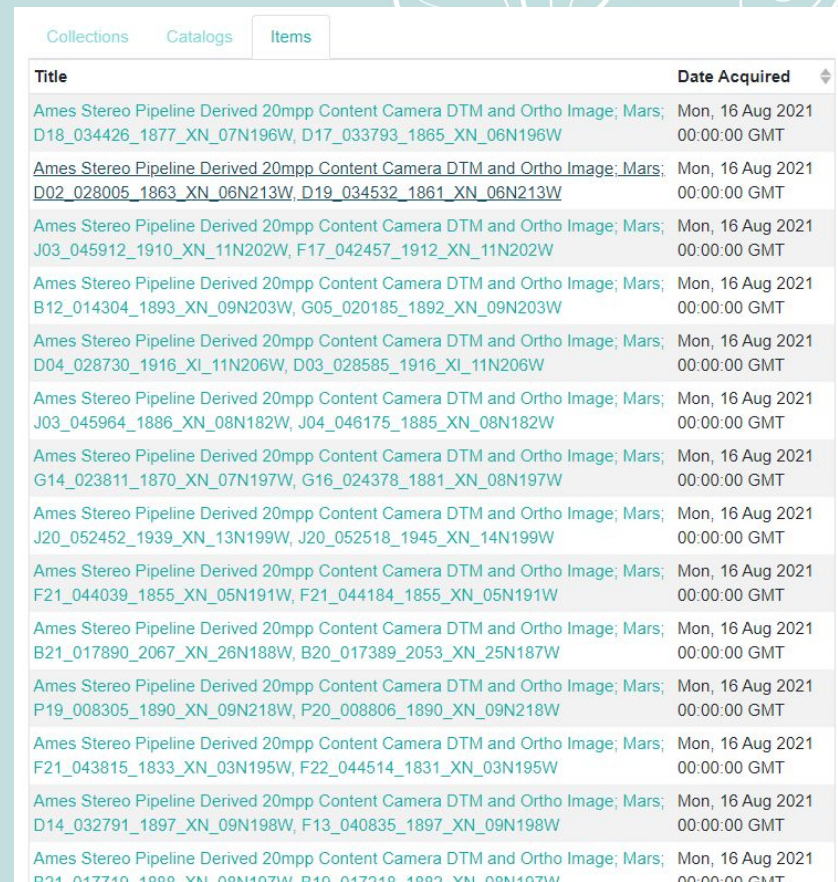


Dr. Jay Laura - Software Lead

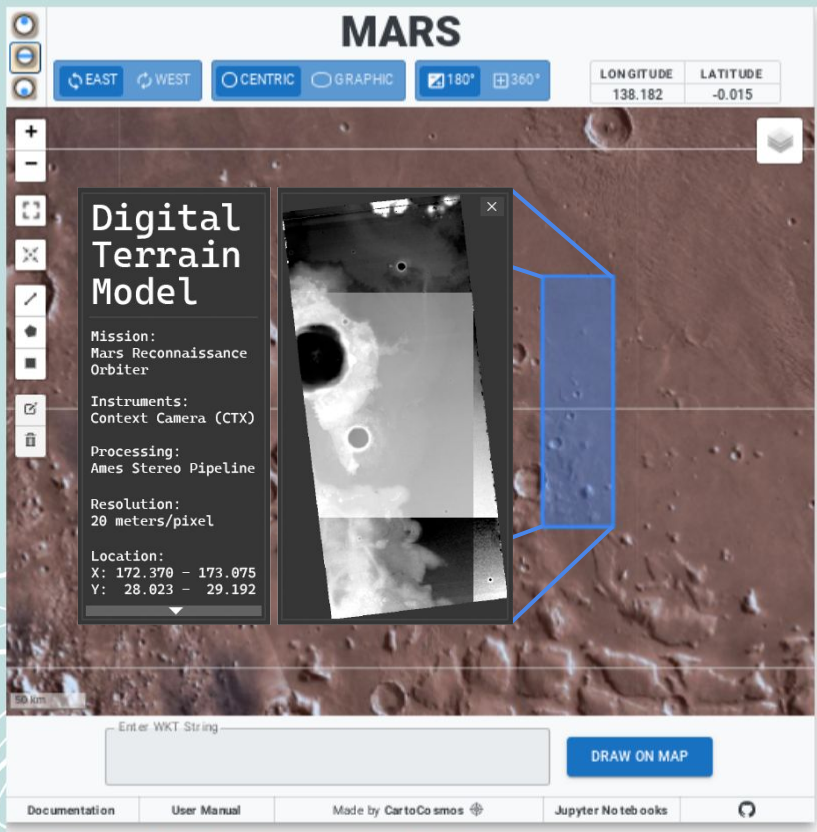


Problem

- Collection of Analysis Ready Data (ARD)
- Difficult to access
- No context



Title	Date Acquired
Ames Stereo Pipeline Derived 20mpp Content Camera DTM and Ortho Image; Mars; D18_034426_1877_XN_07N196W, D17_033793_1865_XN_06N196W	Mon, 16 Aug 2021 00:00:00 GMT
Ames Stereo Pipeline Derived 20mpp Content Camera DTM and Ortho Image; Mars; D02_028005_1863_XN_06N213W, D19_034532_1861_XN_06N213W	Mon, 16 Aug 2021 00:00:00 GMT
Ames Stereo Pipeline Derived 20mpp Content Camera DTM and Ortho Image; Mars; J03_045912_1910_XN_11N202W, F17_042457_1912_XN_11N202W	Mon, 16 Aug 2021 00:00:00 GMT
Ames Stereo Pipeline Derived 20mpp Content Camera DTM and Ortho Image; Mars; B12_014304_1893_XN_09N203W, G05_020185_1892_XN_09N203W	Mon, 16 Aug 2021 00:00:00 GMT
Ames Stereo Pipeline Derived 20mpp Content Camera DTM and Ortho Image; Mars; D04_028730_1916_XI_11N206W, D03_028585_1916_XI_11N206W	Mon, 16 Aug 2021 00:00:00 GMT
Ames Stereo Pipeline Derived 20mpp Content Camera DTM and Ortho Image; Mars; J03_045964_1886_XN_08N182W, J04_046175_1885_XN_08N182W	Mon, 16 Aug 2021 00:00:00 GMT
Ames Stereo Pipeline Derived 20mpp Content Camera DTM and Ortho Image; Mars; G14_023811_1870_XN_07N197W, G16_024378_1881_XN_08N197W	Mon, 16 Aug 2021 00:00:00 GMT
Ames Stereo Pipeline Derived 20mpp Content Camera DTM and Ortho Image; Mars; J20_052452_1939_XN_13N199W, J20_052518_1945_XN_14N199W	Mon, 16 Aug 2021 00:00:00 GMT
Ames Stereo Pipeline Derived 20mpp Content Camera DTM and Ortho Image; Mars; F21_044039_1855_XN_05N191W, F21_044184_1855_XN_05N191W	Mon, 16 Aug 2021 00:00:00 GMT
Ames Stereo Pipeline Derived 20mpp Content Camera DTM and Ortho Image; Mars; B21_017890_2067_XN_26N188W, B20_017389_2053_XN_25N187W	Mon, 16 Aug 2021 00:00:00 GMT
Ames Stereo Pipeline Derived 20mpp Content Camera DTM and Ortho Image; Mars; P19_008305_1890_XN_09N218W, P20_008806_1890_XN_09N218W	Mon, 16 Aug 2021 00:00:00 GMT
Ames Stereo Pipeline Derived 20mpp Content Camera DTM and Ortho Image; Mars; F21_043815_1833_XN_03N195W, F22_044514_1831_XN_03N195W	Mon, 16 Aug 2021 00:00:00 GMT
Ames Stereo Pipeline Derived 20mpp Content Camera DTM and Ortho Image; Mars; D14_032791_1897_XN_09N198W, F13_040835_1897_XN_09N198W	Mon, 16 Aug 2021 00:00:00 GMT
Ames Stereo Pipeline Derived 20mpp Content Camera DTM and Ortho Image; Mars; B21_017719_1888_XN_08N197W, B19_017218_1882_XN_08N197W	Mon, 16 Aug 2021 00:00:00 GMT



Solution

- Show on map (CartoCosmos)
- Navigate to find data
- Show data with locational context

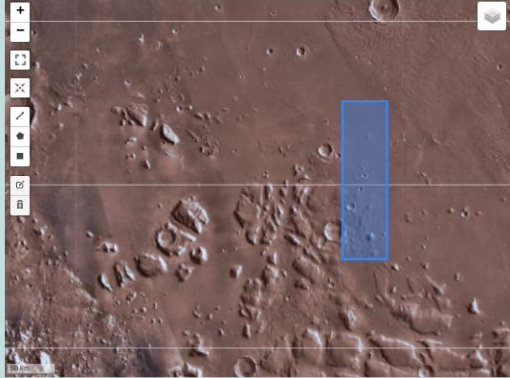
Domain Level Requirements

- View an overlay of image footprints within the CartoCosmos webmap.
- Query search for the loaded footprints.
- Display Cloud Optimized GeoTIFF images when selecting a footprint.



Functional Requirements

Display image footprints



CartoCosmos with a polygon.

Render GeoTIFF images



GeoRaster Layer for Leaflet Plugin Example

Query search functionality

OBJECTID	1
WARD	8
NAME	Ward 8
REP_NAME	
WEB_URL	
REP_PHONE	
REP_EMAIL	
REP_OFFICE	Pennsylvania Ave, Suite 400, NW 20004
WARD_ID	8
LABEL	Ward 8
AREASQMI	11.937871
SHAPE_Leng	28714.069432

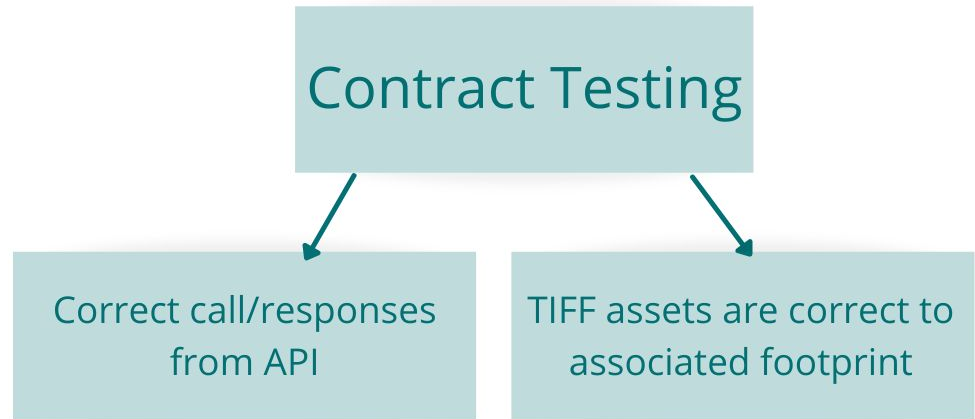
Example of Leaflet GeoJSON results

Performance Requirements

User Testing

- Searching
- Area selection
- Displaying images

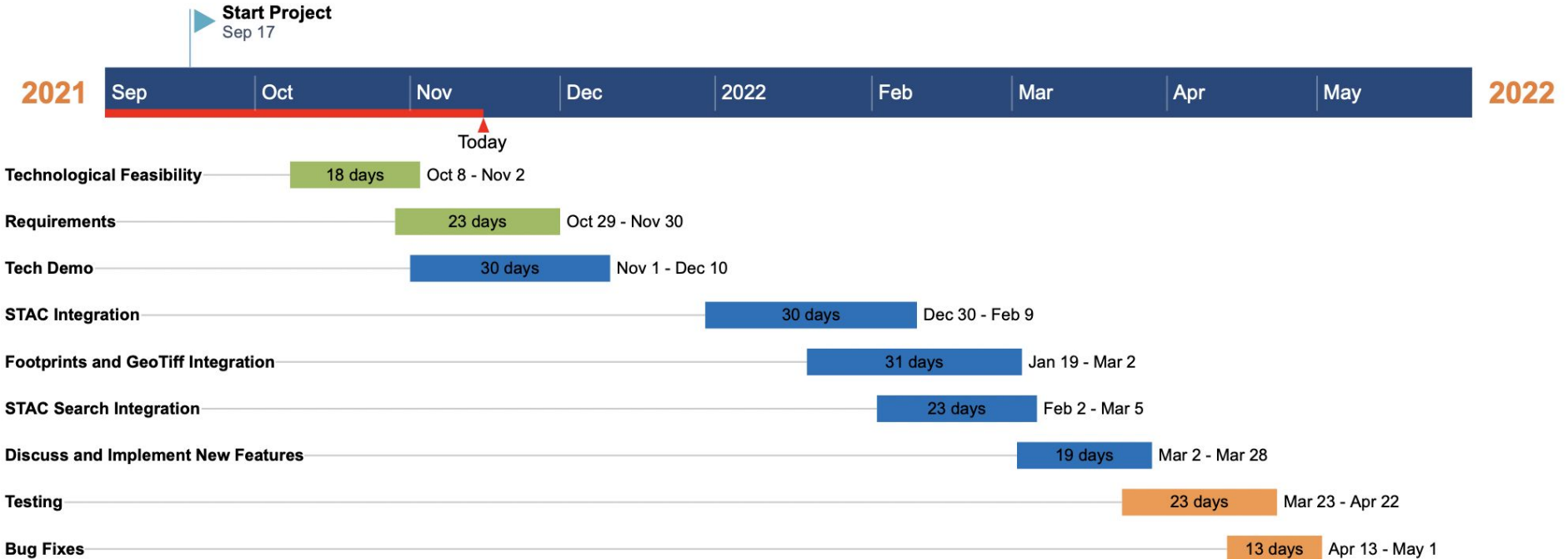
Data Accuracy



Risks & Challenges

Risk	Likelihood	Severity	Solution
Amazon Web Service (AWS) STAC Catalog loading time	Moderate	Moderate	Provide output to the user
CartoCosmos code base	Low to Moderate	Moderate	Work on a forked branch of existing repository

Project Plan & Schedule



Conclusion

