Planetary Bodies: Mapping STAC Data

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USGS — science for a changing world

The Backstory

Planetary Data
The USGS has vast amounts of planetary data. They process it into ARD (Analysis Ready Data) so it is more accessible to scientists who need it.

Data Discovery Difficult
The ARD was available in a catalog online. But, the data appeared as IDs and long strings of text. The catalog lacked visual context that helps people discover and draw meanful ideas from data.
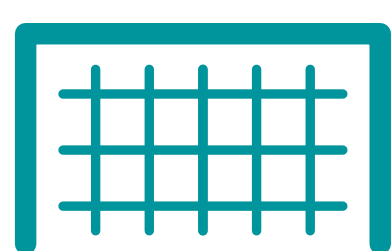
Spatio-Temporal Asset Catalog
The STAC format is a specification for spatial data, including a timestamp. The USGS has collections of data in STAC format.

STAC API
The USGS provides a STAC API, a way for scientists and computer programs to send requests to the USGS's servers and get the data they want.

Goals
The USGS wants to make their data easily accessible and discoverable, As well as a tool so people can learn how to make STAC API requests.

Icons based on FontAwesome, STAC, and Online Web Fonts.
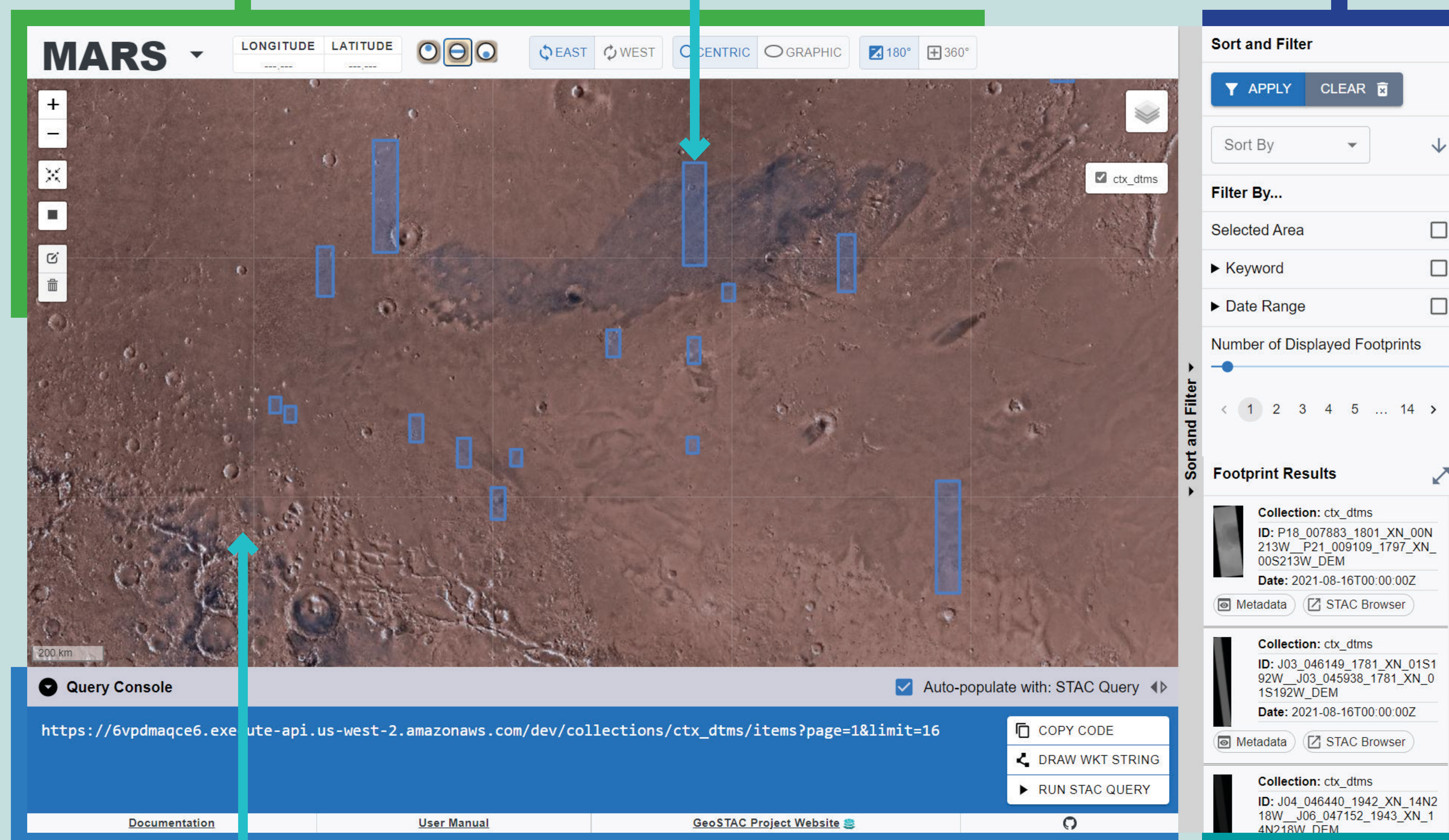
The Web Application

Toolbar
Pick a planet, draw selections, change coodinate systems

Footprints
Outlines of data points shown on the map

Sort and Filter
Narrow down and page through what data is shown

Map
Navigate the surface of a planet or moon

Query Console
View the current query or run custom STAC queries

Results
Lists the currently shown data along with extra info

The Technologies

HTML
CSS
JavaScript

Leaflet
CartoCosmos

React.js
Material UI
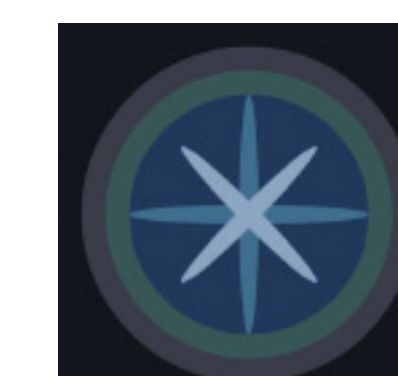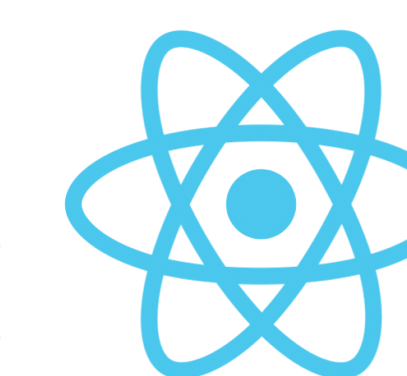
STAC Specification
Babel.js

The Solution

Map
The map element of the web app is made with Leaflet and CartoCosmos. It enables users to navigate around a planet or moon's surface and search for or view "footprints" of spatial data, with visual/locational context.

Sidebar and Console
The sidebar lets users narrow their search. The inputs are reflected in the query console below, as an API command that can be copied and used outside of the web app. The footprints on the map as well as the results list let users further explore the data.

The Future

These features aren't there yet but would be great for version 2.

Shopping Cart
A collection that users could add data to, then download or reopen later could improve the workflow.

Greater Interactivity
Giving users more ways to look at and analyse data without having to leave the web app would increase accessibility.
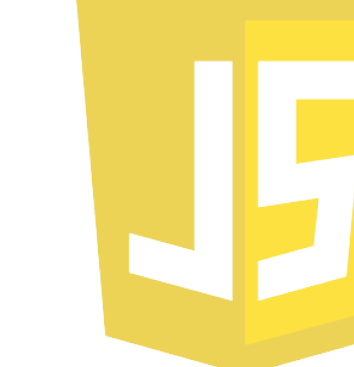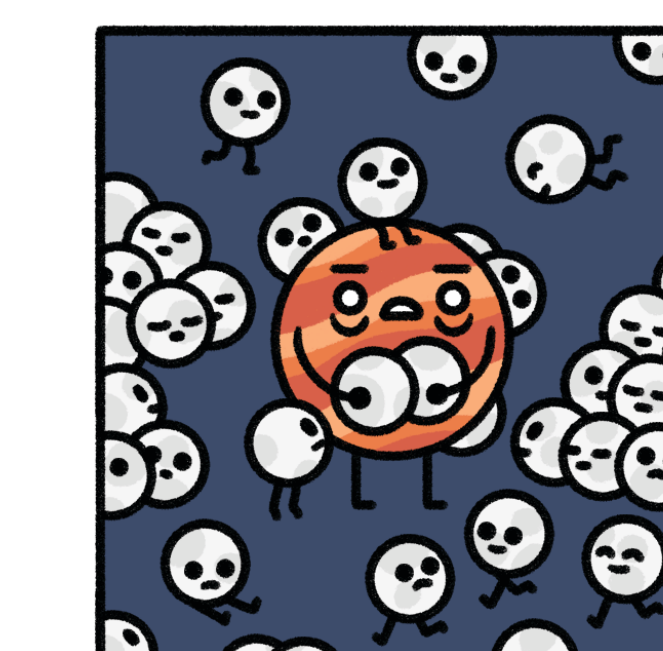
The Memes

All the moons in the GeoSTAC planet menu

Safely Endangered Comic by Chris McCoy, printed with permission.

GEOSTAC
Scan here → to see it in action

Try looking at Europa!

https://geostac.github.io/CartoCosmos-with-STAC/