



Competitive Analysis

Understanding weather data for
improved Mars 2020 rover operations

YOMNA HAWAS | TYLER LA | JOHN SYKES | ANGELA YUNG

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Overview

For our competitive analysis we were interested in assessing a variety of tools related to collaboration, communication, mapping, and data visualization. While our goal is to design a tool to allow scientists to better understand weather on Mars, collaboration is an essential part of successful rover operations. In our competitive analysis, we aimed to assess how well certain features were implemented within tools to inform us about potential features we might like to include in our own tool. We also aimed to discover the gaps in previous tools in order to improve upon them.

Reflection

The competitive analysis helps our team explore existing tools in various domains, assess their pros and cons, and draw insights on how we might utilize existing features for our own design. For each criteria (transparency, customization, sharability, comparability, and annotation), there's at least one tool that does a great job at mastering the interaction design, which could potentially serve as reference point for our team when it comes to the ideation process.

Next step

1. Continue with data synthesis to derive insights.
1. Develop a feature inventory.
2. Based on the insights, prioritize which features to be included in the final design concept.

Competitors

Rover planning

1. ASTTRO

Mapping

2. JMars
3. Access Mars
4. Google Earth Pro

Weather-related

5. NOAA
6. Windy
7. NullSchool

Data visualization

8. Tableau
9. Pudding.cool

Collaboration

10. Slack
11. zipBoard
12. JIRA
13. GitHub

Translational

14. War Room
15. No Man's Sky
16. Bartending

Assessment Criteria

Our criteria for the competitive assessment was chosen based on early findings from our interviews. We kept our criteria broad enough to be applicable to the wide category of products we'd be reviewing. To ensure consistency in our competitive analysis, we defined what every criteria meant to us. For additional consistency, we decided on a group of MVP features that we thought could be important for us to have for our final design solution and we used them to have a more quantitative approach to our competitive assessment.

Transparency

Users can understand how processed data or visualisations tie back to raw data

- Show time retrieved
- Show data format
- Show data source
- Access to raw data
- Provide data context

Customization

Users can personalize their experience to meet their personal needs

- Escape & integrate
- Data manipulation
- In-app customization
- Code customization
- 3D
- Search

Sharability

Users are can share universally understandable work with each other.

- Import data
- Export data
- Share via URL
- Share WIP

Comparability

Users are able to assess multiple datasets for differences and/or for insights

- Compare data points
- Compare by time
- Compare by source
- Review data trends

Annotation

Users can insert feedback, interpretations, and comments while using the tools.

- Add annotation
- Add interpretation
- Add tag
- View others' annotations

NOTES

For ASTTRO, the MVP criteria are different since it is an in-house JPL tool developed specifically for rover planning purposes.

Methodology

We approached the competitive assessment in a systematic way. To get the overall score for each criteria, we followed 3 steps. The first step is to assess the individual MVP features for each criteria. The second step is to give an overall score for the criteria based on the MVP features. The third step is to visualize the criteria on a 'spider chart'

Step 1: Assess the MVP features

For each MVP feature, we provide a rating of 0, 1, or 2. A percentage will be computed accordingly.

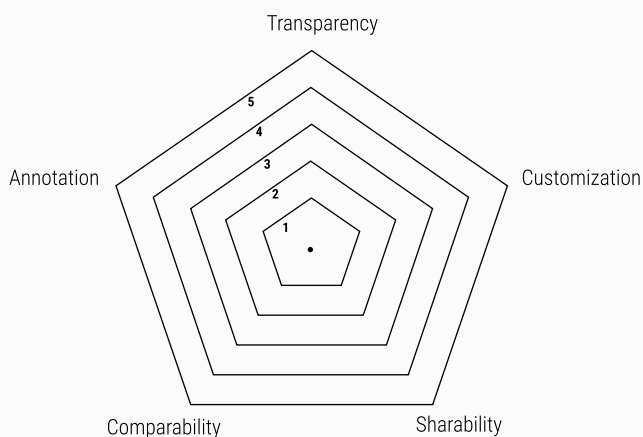
- ✓ 0 = The feature is NOT available
- ✓ 1 = The feature is available
- ✗ 2 = The feature is available & is being done in an effective way

Step 2: Assign the overall score

Based on the percentage of the MVP features, an overall score is computed.

- NA = Not Applicable (score =0)
- 0 - 20% = Severe (score =1)
- 21 - 40% = Not good (score =2)
- 41 - 60% = Average (score =3)
- 61 - 80% = Good (score =4)
- 81 - 100+% = Excellent (score =5)

Step 3: Visualize the overall score



Design Recommendations

1

Provide collaborative experiences

Users should be able to have shared synchronous experiences when collaborating. A way to enhance collaboration is allowing users the ability to share their work with each other. Most JPL scientists use web-based tools when processing and analyzing weather data.

Design implication:

The tool we are building should be able to accommodate JPL existing tools.

Competitor reference:

Tableau does a great job at providing users the ability to publish their work via a server or online. Users can share their WIP by using a custom URL.

2

Add context to data when possible

Metadata plays an important role in providing additional contexts to data. A data point should have relevant metadata, tags, comments, and annotations so that users can interpret the dataset with a common ground. It could be enhanced if users can interact with the visualization, hovering over a data point to view more information.

Design implication:

The tool we are building should have thorough annotation capabilities and it should be interactive.

Competitor reference:

zipBoard has great annotation capabilities. Tableau, JMARS, and Windy has good hovering interaction with the dataset.

Design Recommendations

3

Trace back to raw data

When conducting data analysis or exploring a dataset, scientists prefer to have access to the raw data so that they can conduct a variety of analysis and manipulate different visual presentations.

Design implication:

The tool we are building should allow users the ability to trace back to the original format of the data.

Competitor reference:

Tableau and WCT do a good at giving users access to the imported dataset. In Tableau, users can filter the data right in the tool & with WCT, users can change, add, or delete variables directly on the tool.

4

Enhance customization

Customization can add significant values when analyzing data. Each user has a different need and a preferred method for exploring and manipulating dataset. This also extends to having the capability to adjust the tool bars, layout, customize the codes to accommodate personal needs.

Design implication:

The tool should provide users the flexibility to escape & re-integrate, customize the layout, and see data in various ways.

Competitor reference:

GitHub, Tableau, Google Earth Pro provide users with great customization capabilities to fit their personal usage.

Scoring Matrix

Criteria & MVP Features	ASTRO	JMars	Access Mars	Google Earth	WCT	Windy	NullSchool	Tableau	Pudding.cool	Slack	zipBoard	JIRA	GitHub	War Room	No Man's Sky	Bartending
TRANSPARENCY																
Show time retrieved	na	0	0	0	1	1	0	1	0	1	1	1	1	0	0	1
Show data format	na	0	0	1	1	0	0	1	1	1	1	1	1	0	0	0
Show data source	na	1	1	0	1	1	1	1	1	0	1	1	1	0	0	1
Access to raw data	na	1	1	0	0	0	0	0	1	0	1	0	1	0	0	1
Provide data context	na	0	1	0	0	1	0	0	1	0	1	2	1	1	0	0
Percentage	0%	40%	60%	20%	60%	60%	20%	60%	80%	40%	100%	100%	100%	20%	0%	60%
Score	5	2	3	1	3	3	1	3	4	2	5	5	5	1	1	3
CUSTOMIZATION																
Escape & Integrate	na	0	0	0	1	0	0	1	1	1	1	1	1	na	0	na
Data manipulation	na	1	0	1	1	0	0	1	0	0	0	0	1	na	0	na
In-app customization	na	1	0	1	0	1	0	2	0	0	0	1	1	na	0	na
Code customization	na	0	1	0	0	1	0	1	0	0	0	1	1	na	0	na
3D	na	1	1	2	0	0	1	0	1	0	0	0	0	na	1	na
Search	na	0	0	1	0	0	0	1	1	1	1	1	1	na	0	na
Percentage	0%	50%	17%	83%	33%	33%	17%	100%	50%	33%	33%	67%	83%	0%	17%	0%
Score	1	3	1	5	2	2	1	5	3	2	2	4	5	0	1	0
SHARABILITY																
Import data	na	1	0	1	1	0	0	1	0	1	1	1	1	0	1	1
Export data	na	1	0	1	1	0	0	1	0	1	1	1	1	0	1	1
Share via URL	na	0	0	1	0	1	1	2	1	0	0	1	1	0	0	0
Share WIP	na	0	0	0	0	0	0	1	0	0	1	2	1	1	0	1
Percentage	0%	50%	0%	75%	50%	25%	25%	125%	25%	50%	75%	125%	100%	25%	50%	75%
Score	3	3	1	4	3	2	2	5	2	3	4	5	5	2	3	4
COMPARABILITY																
Compare data points	na	1	na	1	1	1	0	1	0	na	0	1	0	na	1	na
Compare by time	na	0	na	1	1	1	1	0	0	na	0	1	1	na	0	na
Compare by source	na	1	na	0	0	1	0	1	0	na	0	1	0	na	0	na
Review data trends	na	2	na	2	1	1	0	2	0	na	0	0	1	na	0	na
Percentage	0%	100%	0%	100%	75%	100%	25%	100%	0%	0%	0%	75%	50%	0%	25%	0%
Score	2	5	0	5	4	5	2	5	1	0	1	4	3	0	2	0
ANNOTATION																
Add annotation	na	0	0	1	0	1	0	1	0	1	2	2	1	1	1	1
Add interpretation	na	0	0	1	0	1	0	1	0	1	1	1	1	1	0	0
Add tag	na	0	0	0	0	0	0	0	0	0	2	1	1	1	0	0
View others' annotations	na	0	1	0	0	1	0	1	1	1	1	1	1	1	1	1
Percentage	0%	0%	25%	50%	0%	75%	0%	75%	25%	75%	150%	125%	100%	100%	50%	50%
Score	4	1	2	3	1	4	1	4	2	4	5	5	5	5	3	3

The feature is NOT available

The feature is available

The feature is available & is being done in an effective way

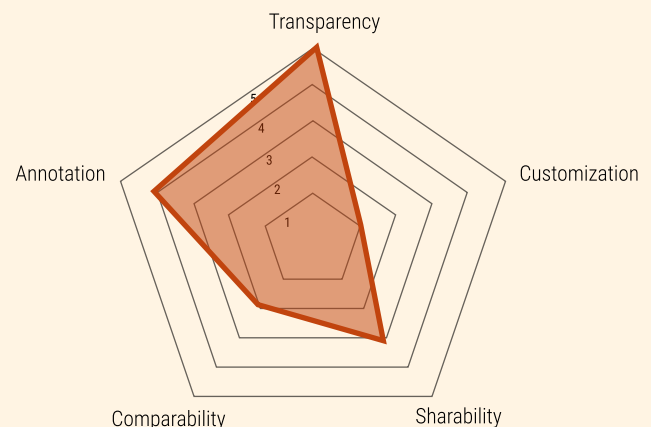
NDA

ASTTRO

ASTTRO is NASA JPL's mission planning tool used by both scientists and rover planners for mission planning activities. Scientists select and annotate specific targets seen on images downloaded from Mars2020 rover along with telemetry and other specialized information. Rover Planners then review the target selection during mission planning activities in order to plan tactical (short-term) science activities while staying within the strategic (long-term) parameters of the mission.

Takeaways

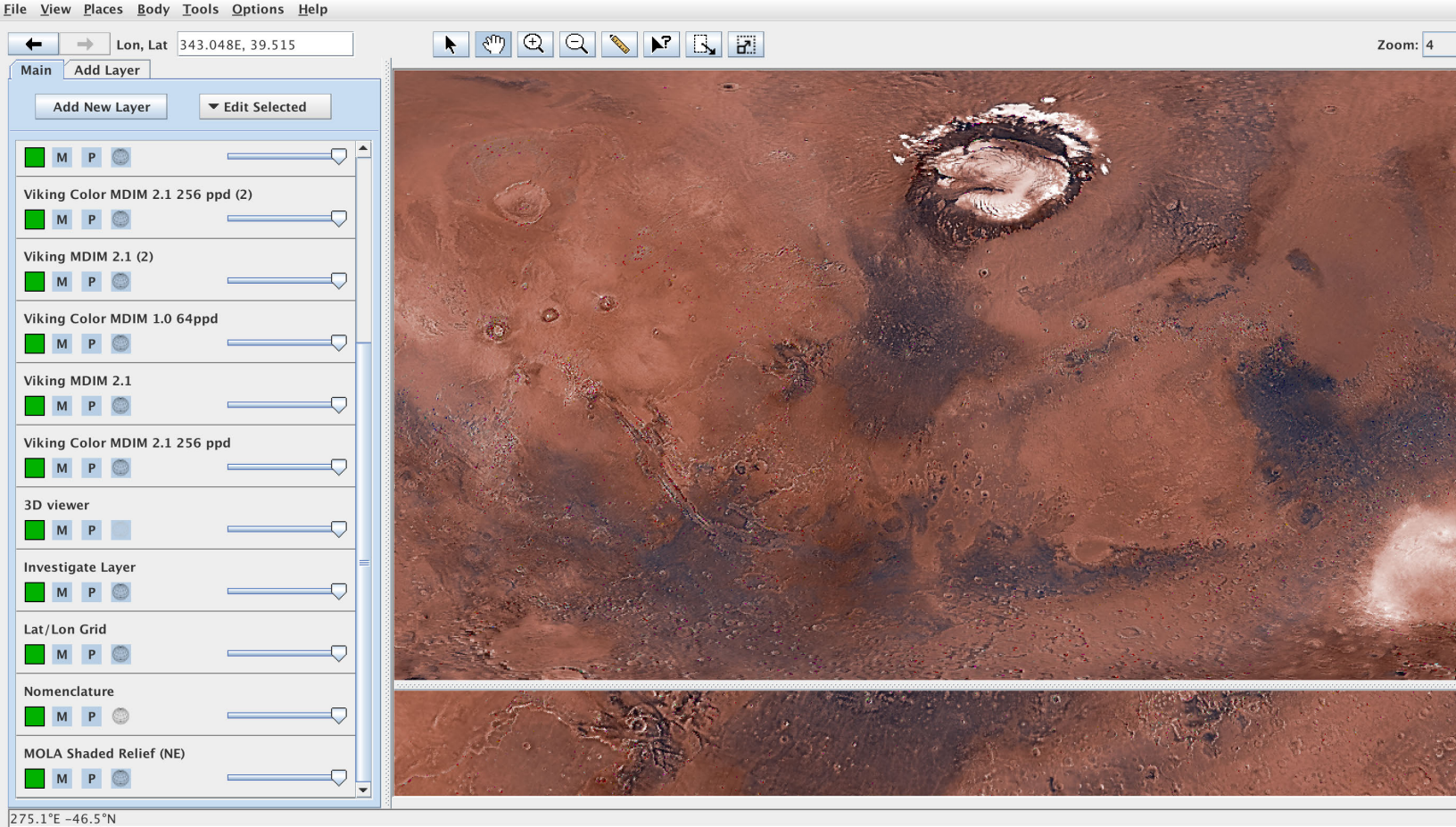
ASTTRO will be the tool NASA JPL users are most familiar with as it has been the tool used on Curiosity and will continue usage into Mars 2020. It is very good at annotation and asynchronous collaboration in general, but it leaves some room for improvement around customization and comparative viewing.





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ASTTRO analysis was taken out due to NDA

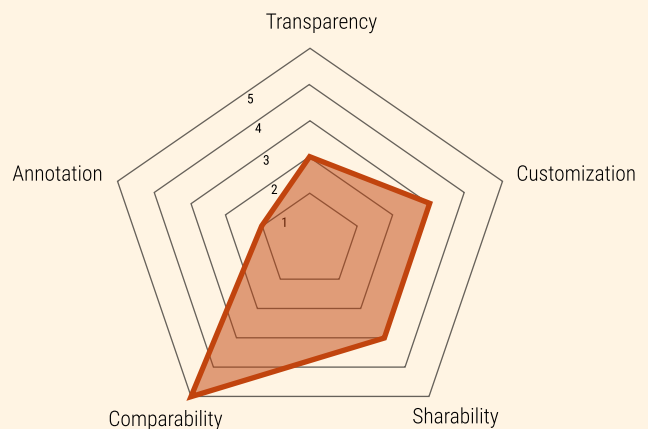


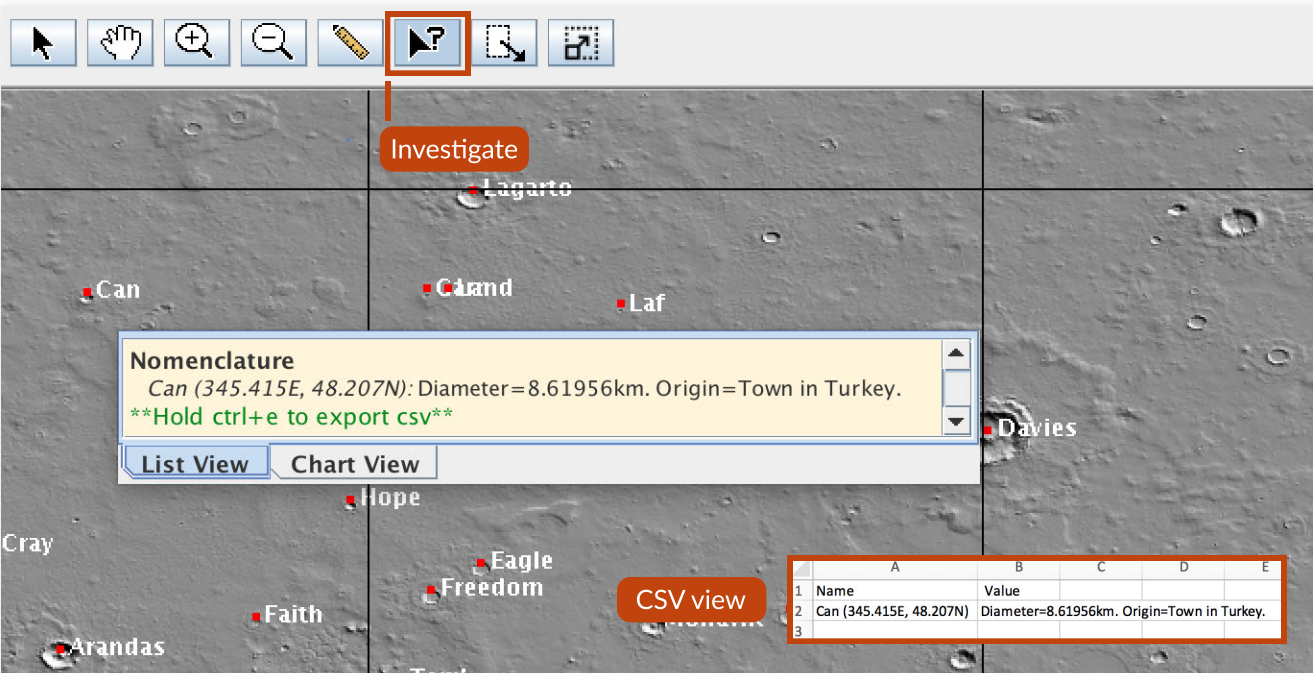
JMARS

JMARS is an acronym that stands for Java Mission-planning and Analysis for Remote Sensing. It is a geospatial information system (GIS) developed by ASU's Mars Space Flight Facility to provide mission planning and data-analysis tools to NASA scientists, instrument team members, students of all ages and the general public.

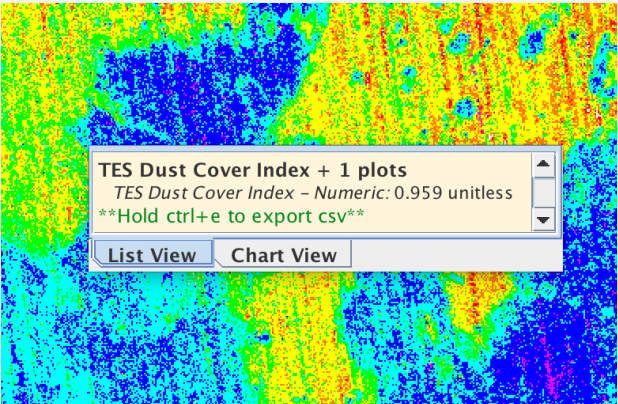
Takeaways

JMARS does a great job at using color to visualize datasets over the terrain. The tool is created for scientists so it carries over NASA data and the language within the organization. It has medium capabilities for collaboration and sharing work. However, the tool doesn't allow users to annotate the data.

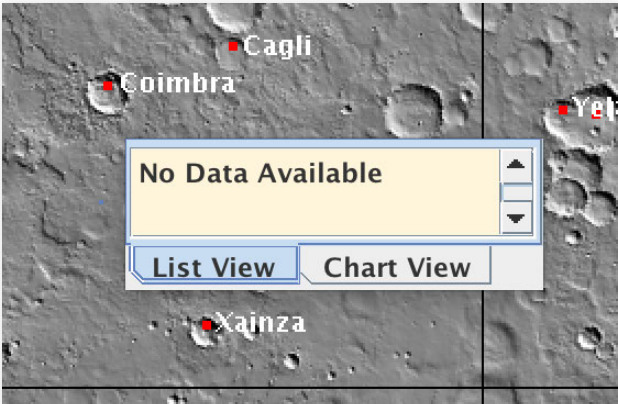




Using the Investigate tool, users can hover a location to view & export attached data



Other data (i.e. dust) are available



Not every location has attached data

SCORE

2

Not Good

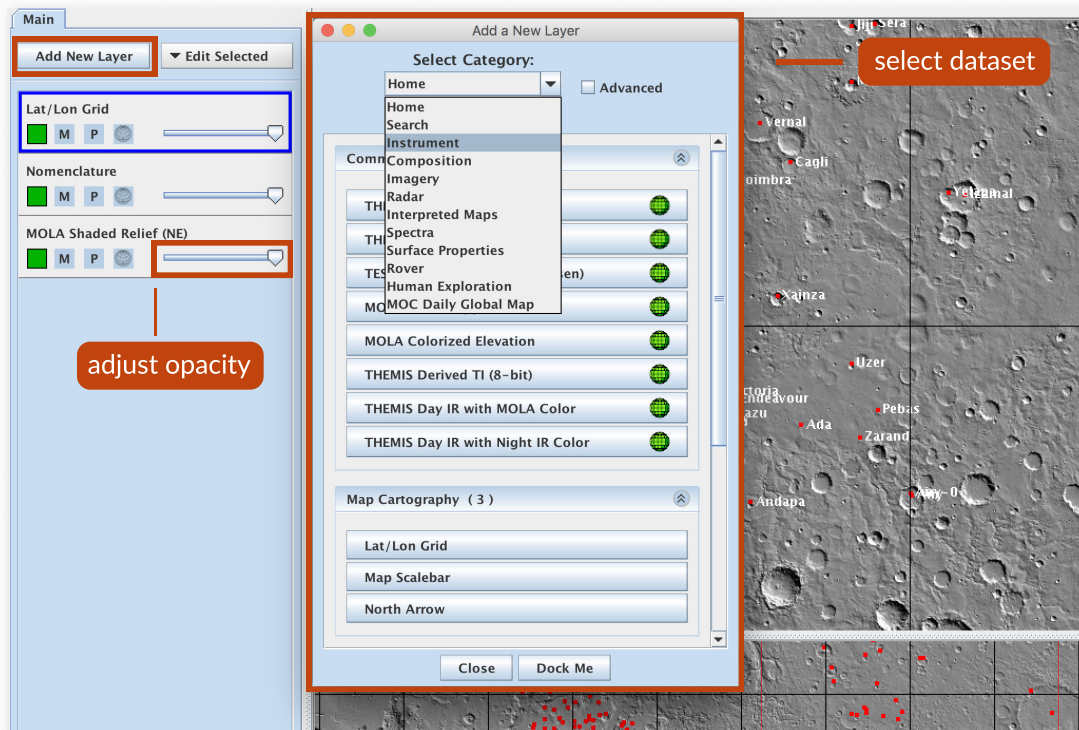
MVP FEATURES

- ✗ Show time retrieved
- ✗ Show data format
- ✓ Show data source
- ✓ Access to raw data
- ✗ Provide data context

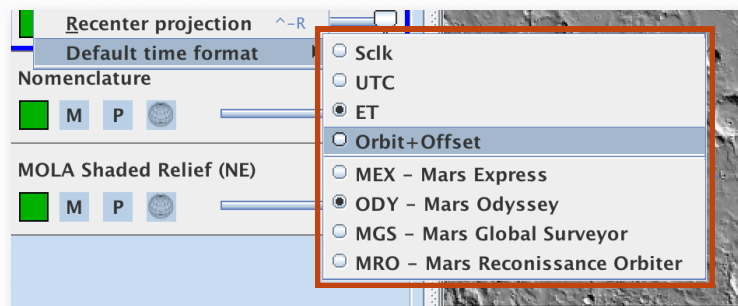
ASSESSMENT

By hovering over the terrain, users can get access to the location's name, coordinates, Instrument data is available. However, there are lots of missing data points, lack of data info, and how it was processed.

JMARS • Customization



Users can add new layers to view different sets of data. Users can stack multiple layers on top of each other by adjusting the opacity of each layer.



Users can change the default time format according to spacecraft

SCORE

3

Average

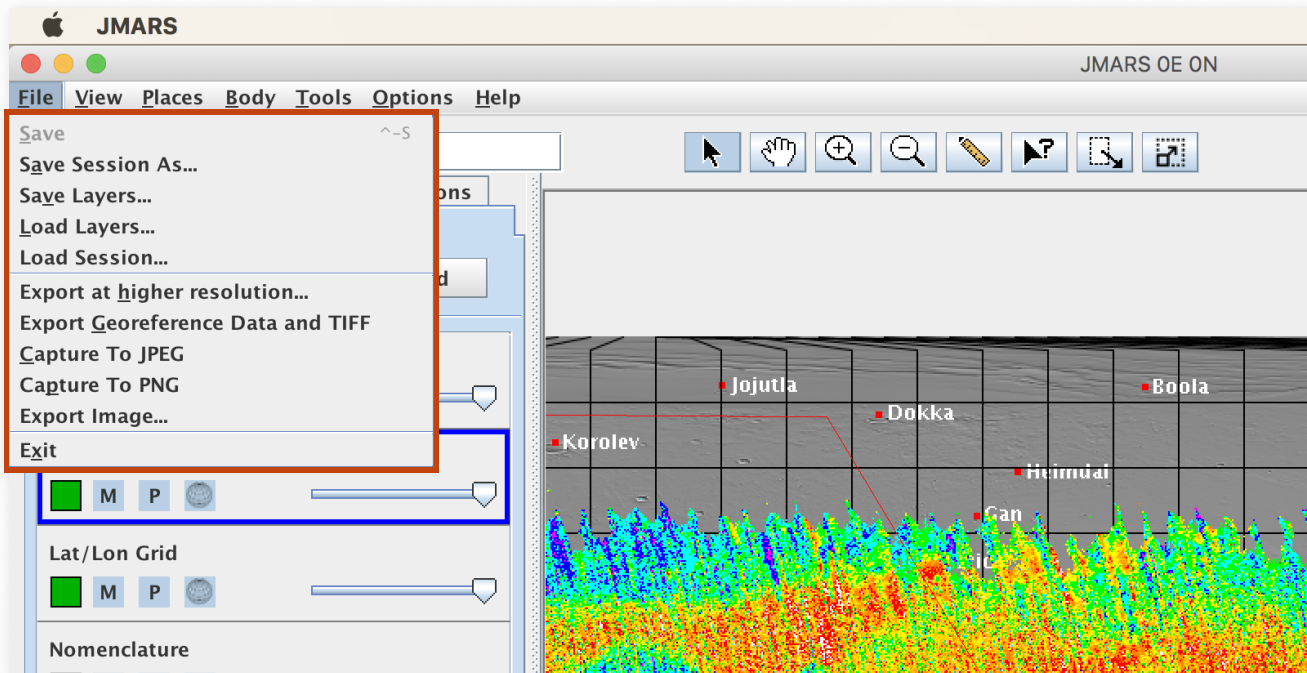
MVP FEATURES

- ✗ Escape & integrate
- ✓ Data manipulation
- ✓ In-app customization
- ✗ Code customization
- ✓ 3D
- ✗ Search

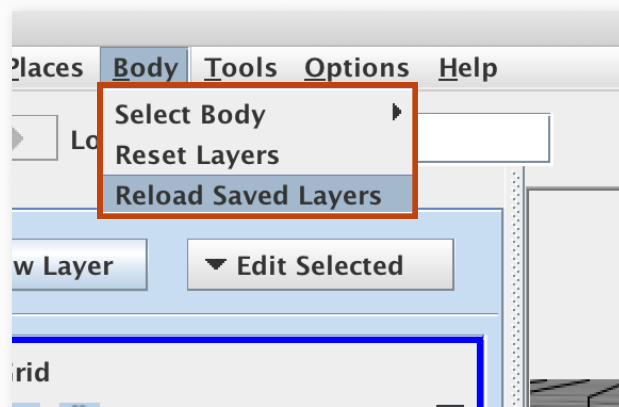
ASSESSMENT

Users can add another layer to the main panel. For each layer, they can select the data source and adjust the opacity. There's no way to transform the data into a format that is usable for another tool. There's no escape route to do independent data analysis. It's hard to find variables since there's no search capability.

JMARS • Sharability



Users have the option to import/export layers in image formats



Users can reload previous work sessions

SCORE

3

Average

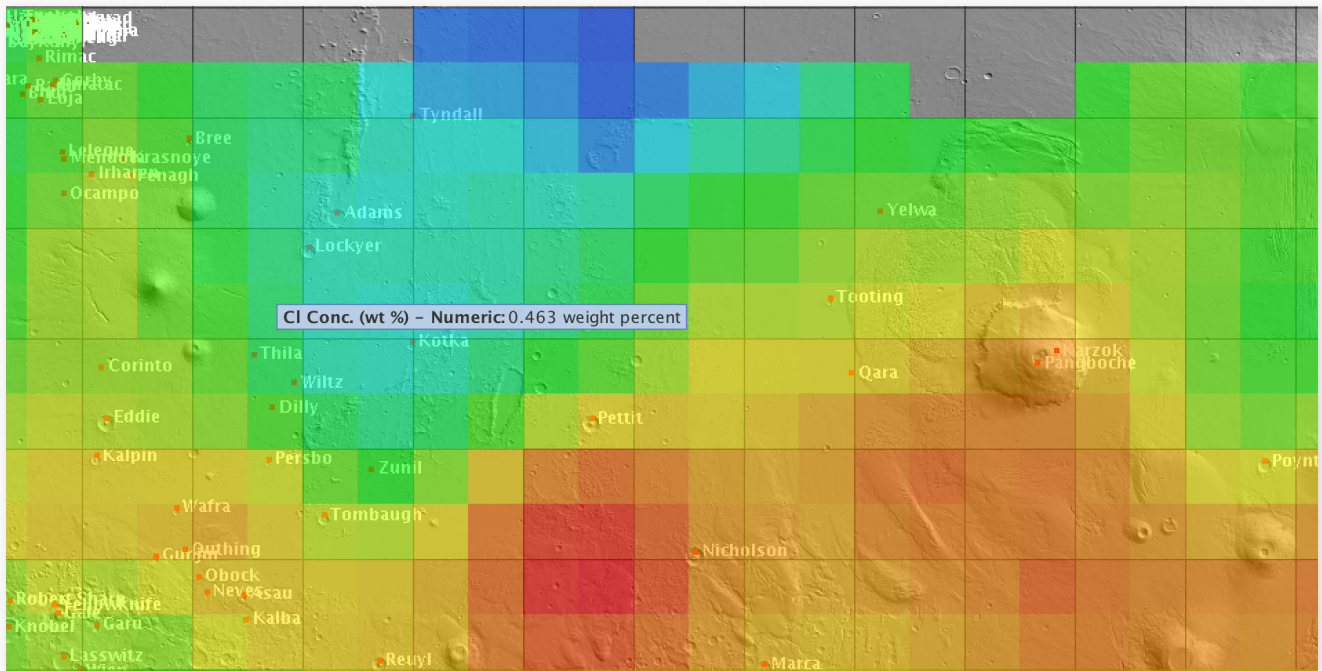
MVP FEATURES

- ✓ Import data
- ✓ Export data
- ✗ Share via URL
- ✗ Share WIP

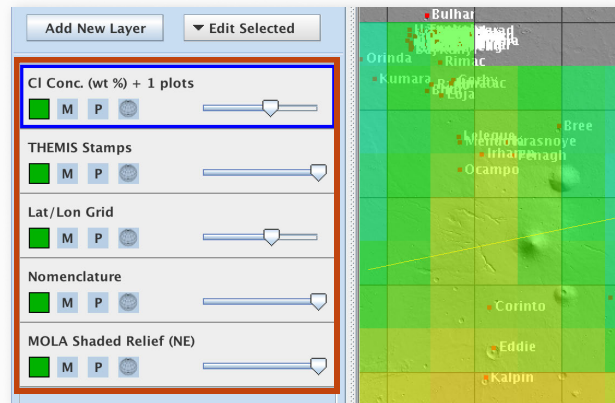
ASSESSMENT

Users have the option to import layers created from another users. They can export the current screen to image formats. While working, they can pause and save the WIP yet they can't share the current status via a web browser; there's no URL for sharing or a quick way to share their work without exporting them to an image.

JMARS • Comparability



Hovering & seeing in colors help compare data in respect to terrain



Users can switch between layers to compare multiple datasets

SCORE

5

Excellent

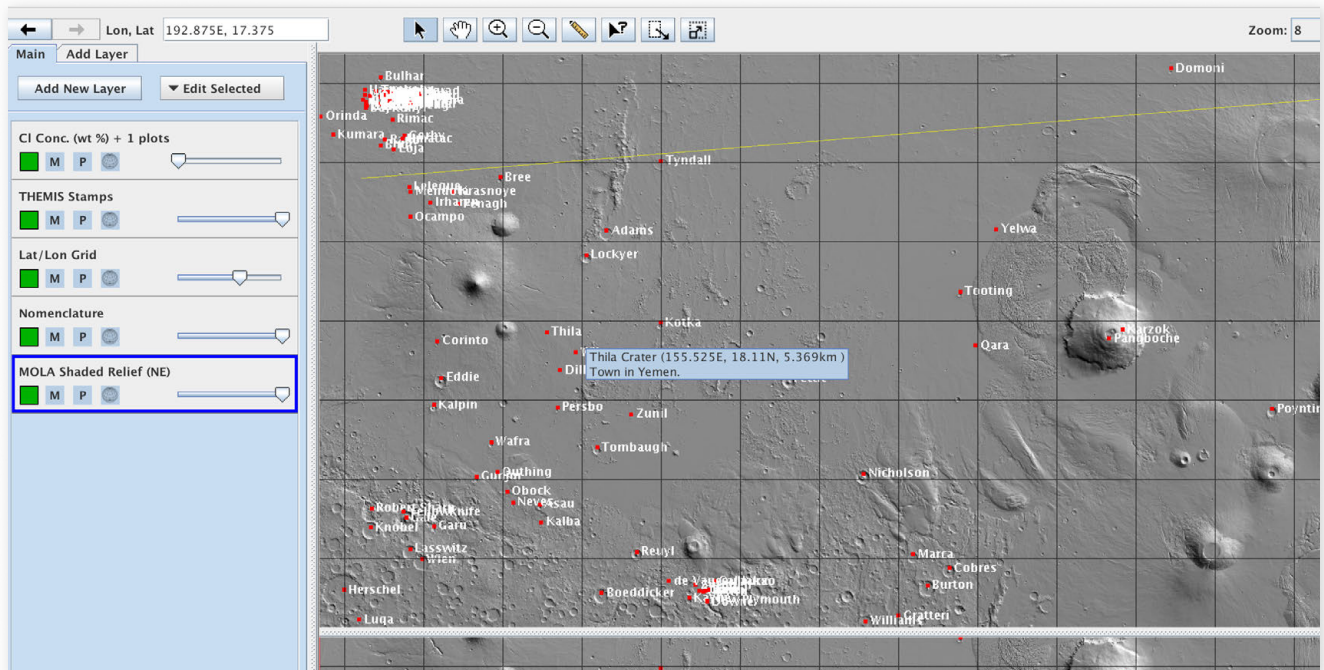
MVP FEATURES

- ✓ Compare data points
- ✗ Compare by time
- ✓ Compare by source
- ✓ Review data trends

ASSESSMENT

Good utilization of color helps users compare and contrast data at a quick glance in respect to terrain. Besides, users can add new layers to the panel and switch between multiple layers efficiently.

JMARS • Annotation



Besides the default coordinates, there's no annotation capability

SCORE

1

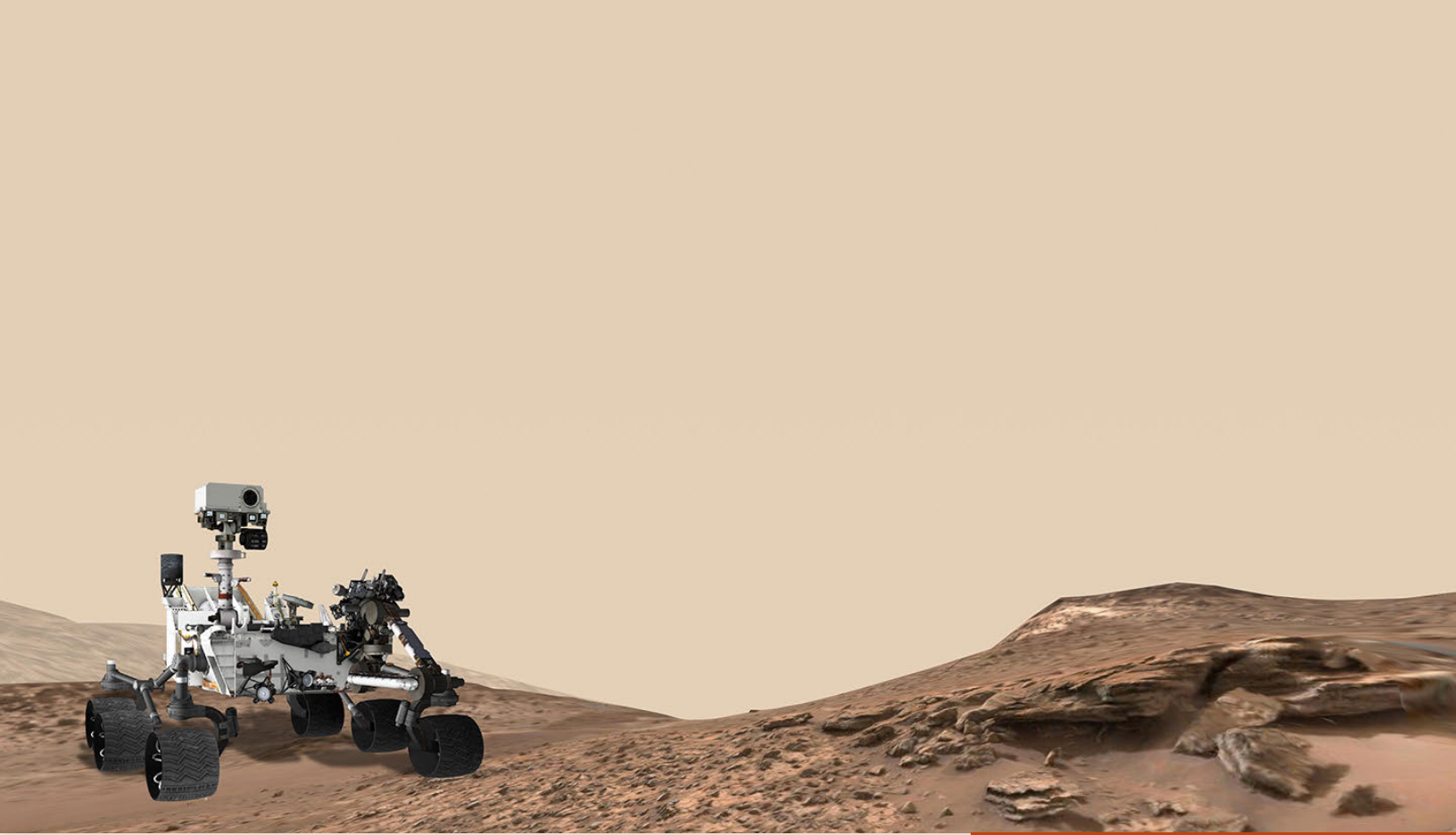
Severe

MVP FEATURES

- ✗ Add annotation
- ✗ Add interpretation
- ✗ Add tag
- ✗ View others' annotations

ASSESSMENT

JMARS currently does not provide users with the ability to annotate the dataset.

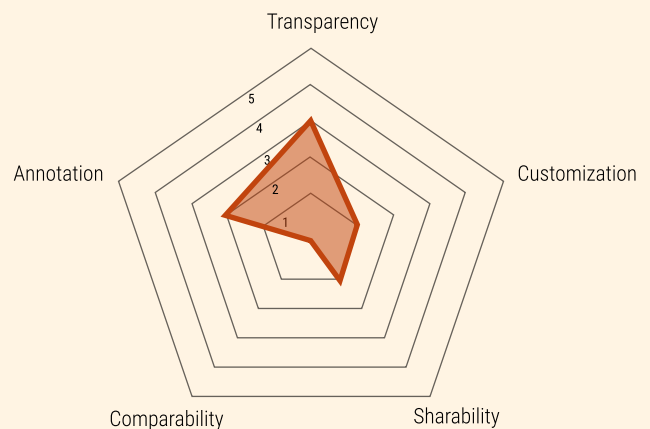


Access Mars

Access Mars is a website that allows users to explore a 3D replica of the Mars surface. This tool was chosen to help us understand how Mars can be realistically visualised and described using map annotations.

Takeaways

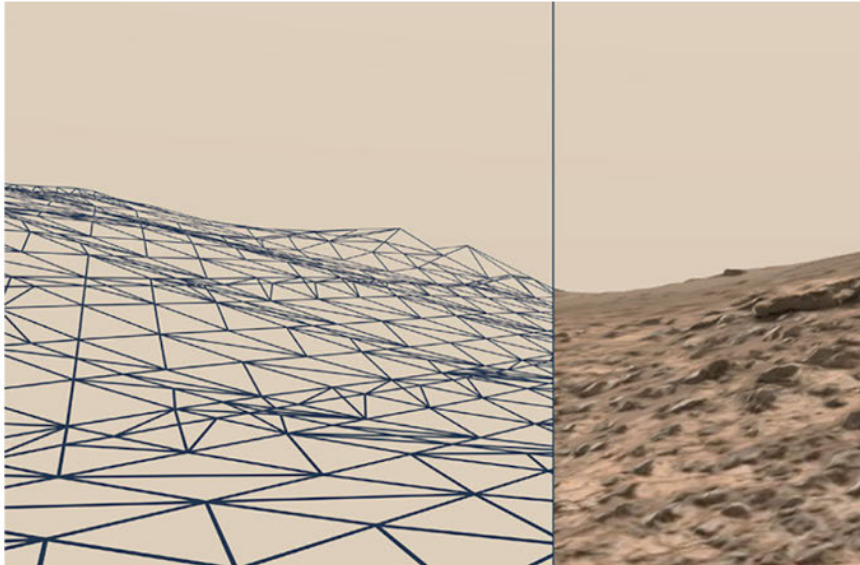
Access Mars does a great job giving context about different locations on Mars in a story-telling manner, which is something that we can incorporate into our own project. However, since this website is for the general public, it is very high level and simple and includes very little information about Mars.



Access Mars • Transparency

STEP 04

Using metadata from the time, location, and direction the images were taken, scientists can tile the terrain data into a composite piece of terrain.



Explaining how images are transformed into a 3D map

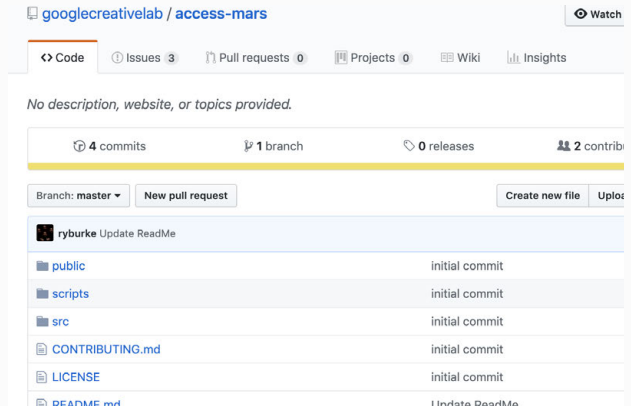
Technologies

Access Mars is built with [A-Frame](#), [Three.js](#), and [glTF](#) with [Draco](#) r

Our fork of Three.js implements a progressive JPEG decoding scheme. We load low-resolution textures initially, then high-resolution textures. The textures closest to the user are updated first.

These high-resolution textures are loaded using the progressive decoder without disrupting the render thread. An empty texture of the correct size begins. This avoids the usual stutter experienced when allocating memory. Decoded in 32x32 blocks of pixels at a time, and this data is sent to the [texSubImage2D](#) function, only the relevant 32x32 portion of the texture is updated. A [WebWorker](#) which uses an [emscripten](#) version of [libjpeg](#) to decode the images.

Detailing how the application was built



Source code on GitHub

SCORE

3

Average

MVP FEATURES

- ✗ Show time retrieved
- ✗ Show data format
- ✓ Show data source
- ✓ Access to raw data
- ✓ Provide data context

ASSESSMENT

The website gives a high-level explanation of how the 3D Mars surface was modeled using images from the rover. For the more tech savy users, the website links to the source code on GitHub where users can see exactly how Access Mars was built.

Access Mars • Customization

The screenshot shows the GitHub repository page for 'ryburke Update ReadMe'. At the top, there are tabs for Code, Issues (3), Pull requests (0), Projects (0), Wiki, and Insights. Below the tabs, a message states 'No description, website, or topics provided.' The repository statistics show 4 commits, 1 branch, 0 releases, 2 contributors, and the Apache-2.0 license. The main content area displays a list of files and folders: public, scripts, src, CONTRIBUTING.md, LICENSE, README.md, package-lock.json, and package.json. Each item is accompanied by its commit history and the time since the last commit (all 2 years ago).

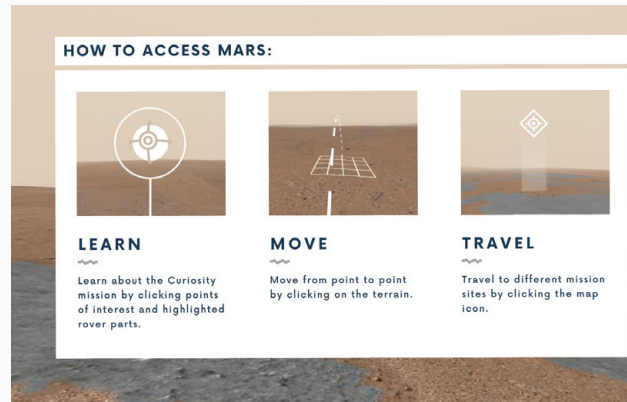
Source code on GitHub

Building

Install node and browserify if y

Running `npm run start` will s

Limited instructions on how to use code



Default experience which can't be customized

SCORE

1

Severe

MVP FEATURES

- ✗ Escape & integrate
- ✗ Data manipulation
- ✗ In-app customization
- ✓ Code customization
- ✗ 3D
- ✗ Search

ASSESSMENT

Users aren't able to directly customize their experience. However, the code is open-source and can be fiddled with to create a personalized experience.



Images can only be shared through browser image copying feature or screenshots

1

Severe

- ✗ Import data
- ✗ Export data
- ✗ Share via URL
- ✗ Share WIP

Users can only share their experience by taking screenshots or using the browser's built-in image copying functionality.

N/A

SCORE

0

Severe

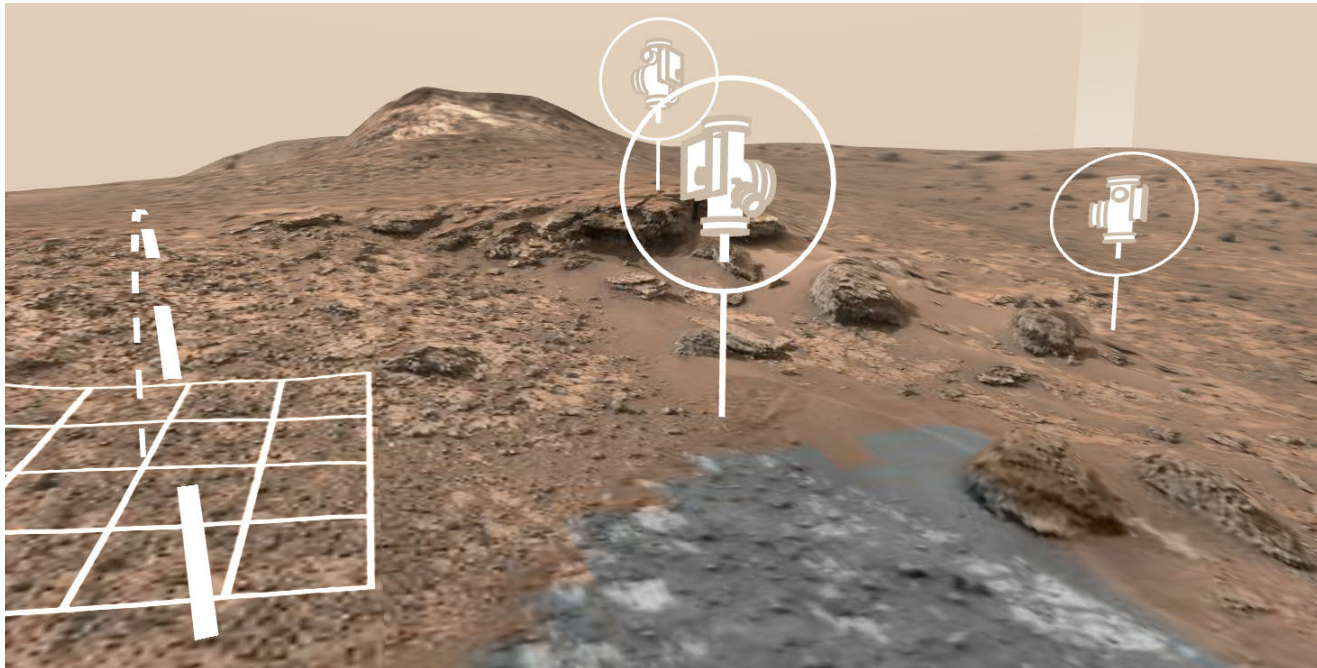
MVP FEATURES

- ✖ Compare data points
- ✖ Compare by time
- ✖ Compare by source
- ✖ Review data trends

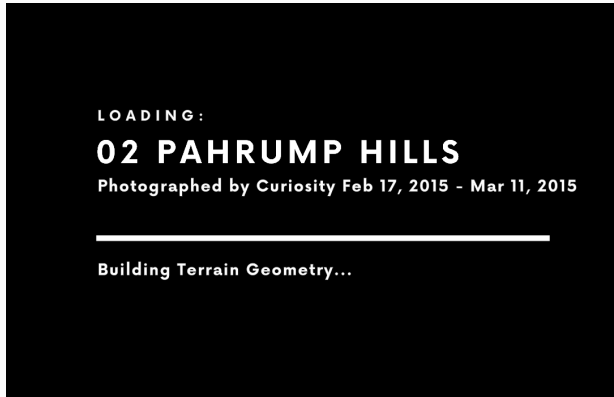
ASSESSMENT

Not Applicable

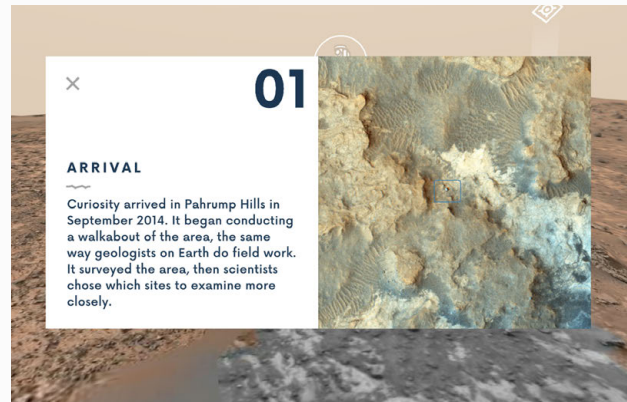
Access Mars • Annotation



Built-in annotation markers



Additional context provided when viewing an annotation



Example of the built-in annotations

SCORE

2

Not Good

MVP FEATURES

- ✗ Add annotation
- ✗ Add interpretation
- ✗ Add tag
- ✓ View others' annotations

ASSESSMENT

There are built in annotations on the tool. However, users aren't able to add their own feedback or experience to the annotations.

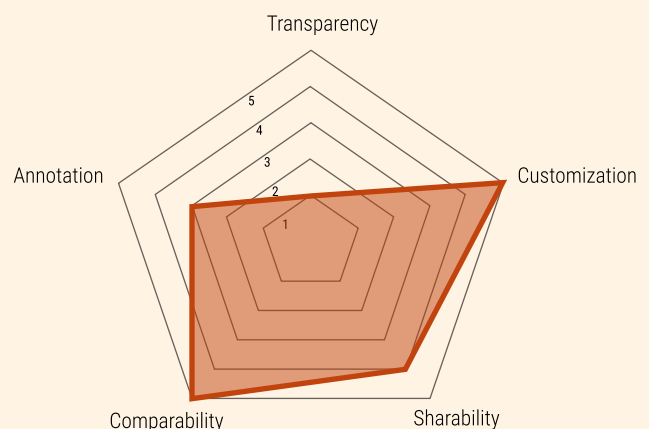


Google Earth Pro

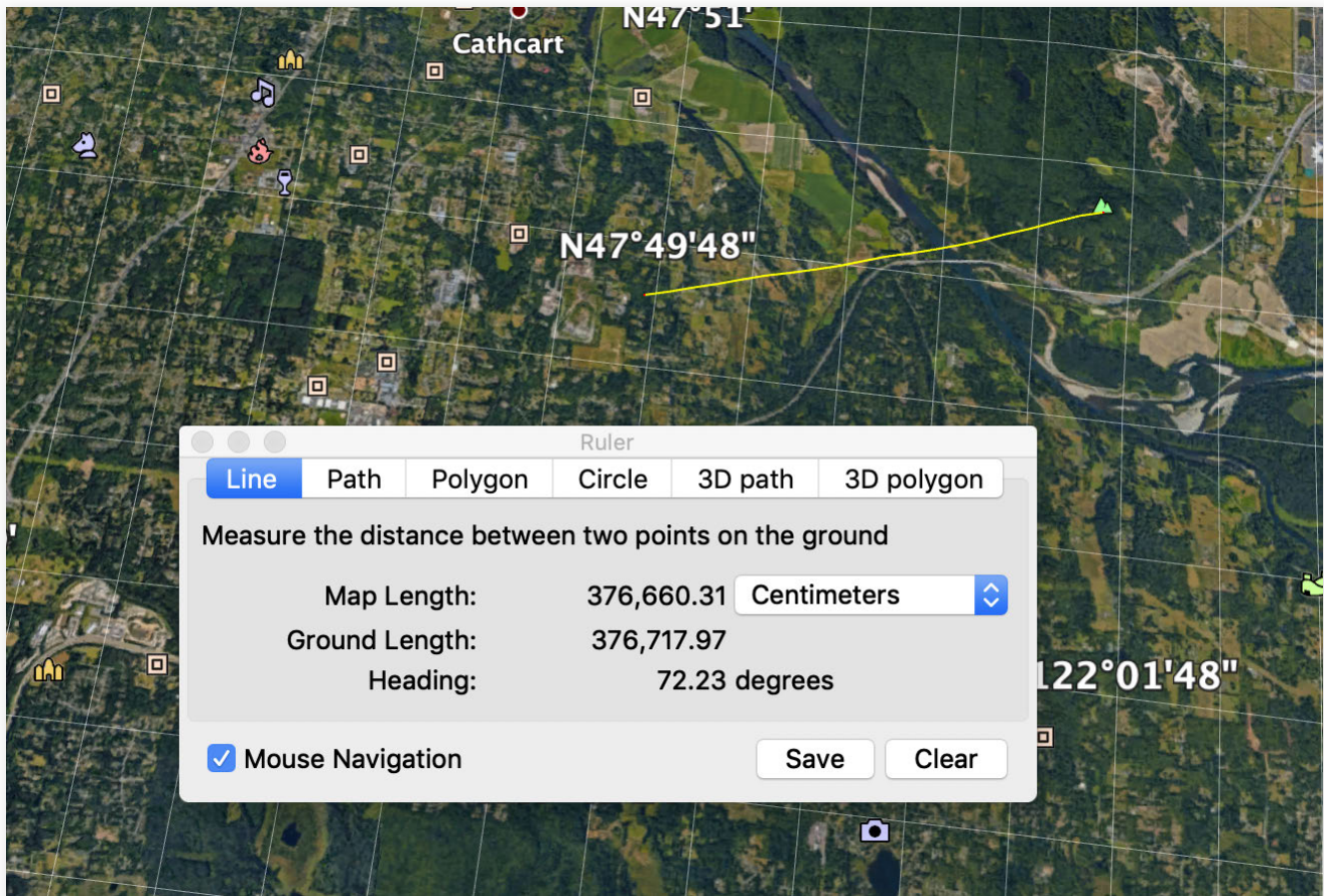
Using satellite images, aerial photography and GIS data, google earth creates a 3D visualization of earth. Users are able to manipulate the globe in order to explore cities and landscapes. Google also offers similar versions of this for the Moon and Mars terrain.

Takeaways

Google Earth Pro allows for a customized view of maps and has features for comparing maps through overlays and adding annotations to marked locations. It is not a collaborative tool and is very limited in transparency due to Google restrictions. Google Earth Pro is a comprehensive mapping tool, obtaining data from various sources for accuracy.



Google Earth • Transparency



Information provided when using the ruler tool

SCORE

1

Severe

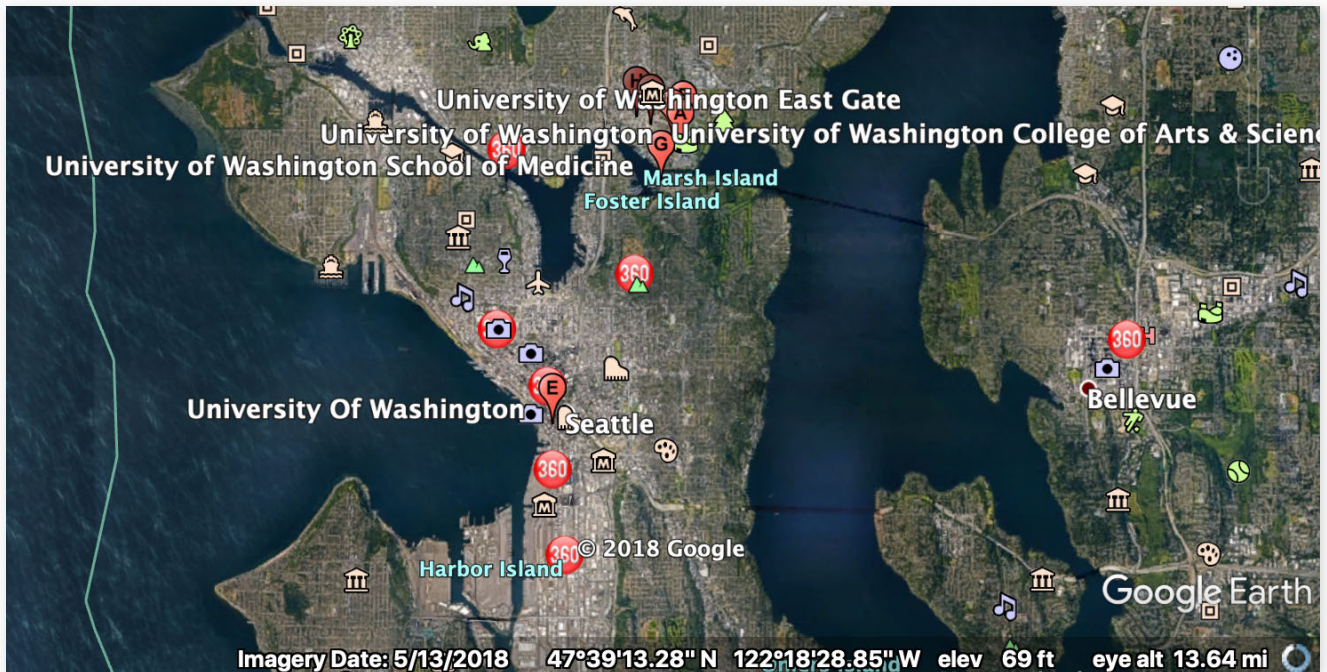
MVP FEATURES

- ✗ Show time retrieved
- ✓ Show data format
- ✗ Show data source
- ✗ Access to raw data
- ✗ Provide data context

ASSESSMENT

Transparency of the application is limited. The application does not inherently have any raw data to show as google protects their data against being copied. If a user manipulates the maps or create overlays, the only way to export is through images.

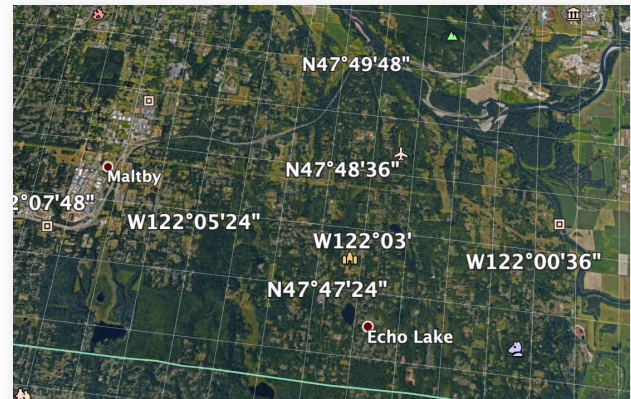
Google Earth • Customization



Google Earth shows 3D maps with important landmarks denoted



Google Earth Street View



Add a grid to your map

SCORE

5

Excellent

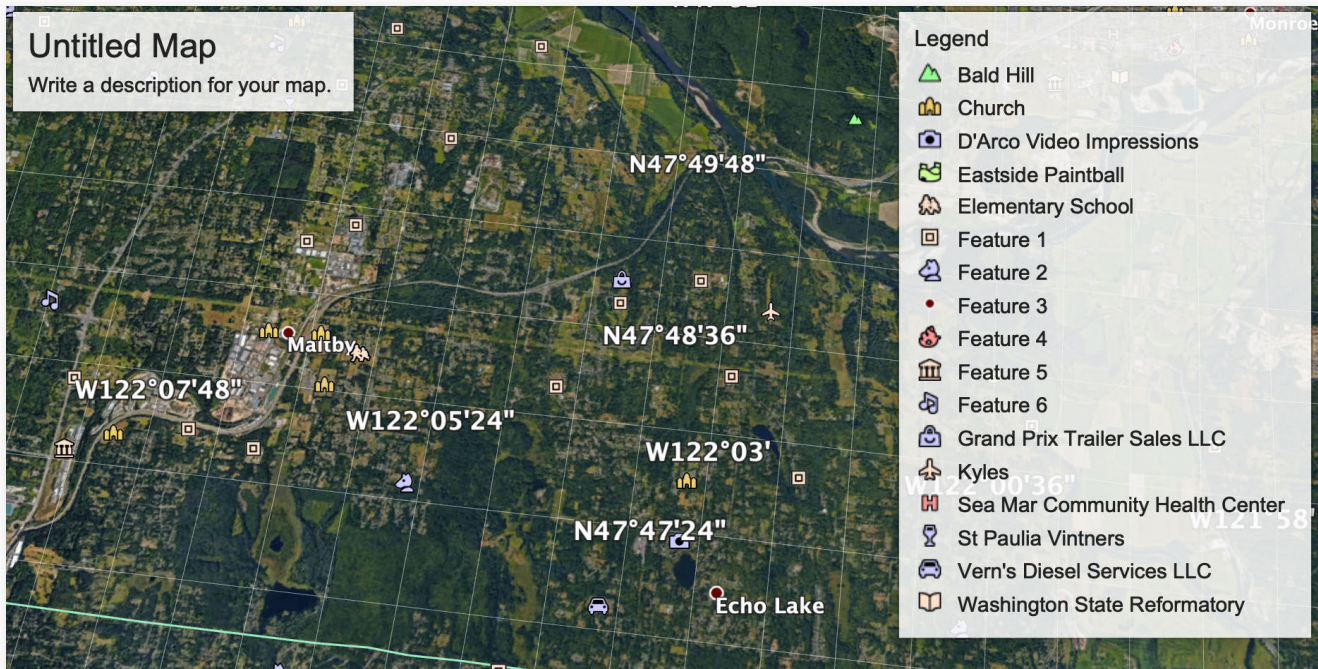
MVP FEATURES

- ✗ Escape & integrate
- ✓ Data manipulation
- ✓ In-app customization
- ✗ Code customization
- ✓ 3D
- ✓ Search

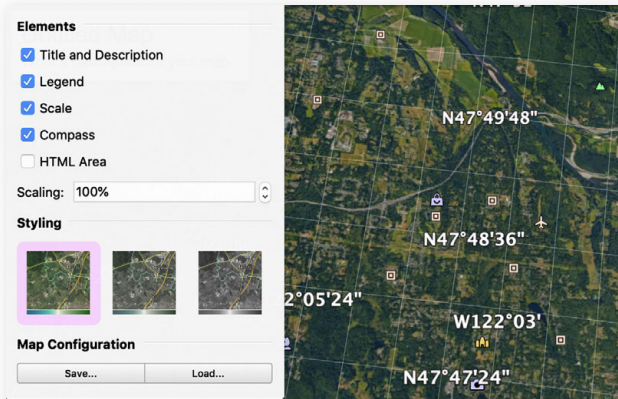
ASSESSMENT

This application is somewhat customizable. You are able to change your view to either 3D and street view and add a grid and scale for context but your options for data export are limited.

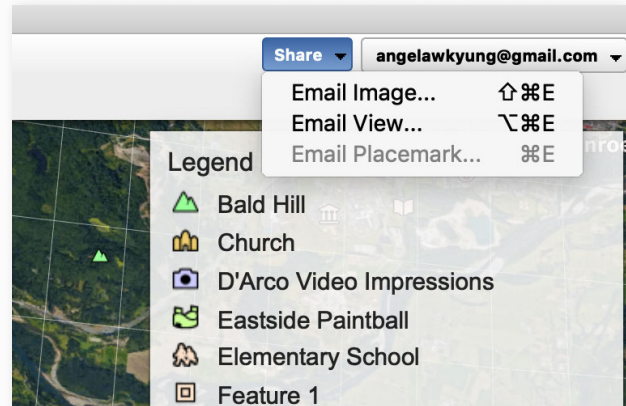
Google Earth • Sharability



Google Earth allow for map sharing through downloading. Add descriptions and landmarks for others to reference.



Customize what you want to share on your map.



Users are given the option to email an image, a placemark, or a view of the map.

SCORE

4

Good

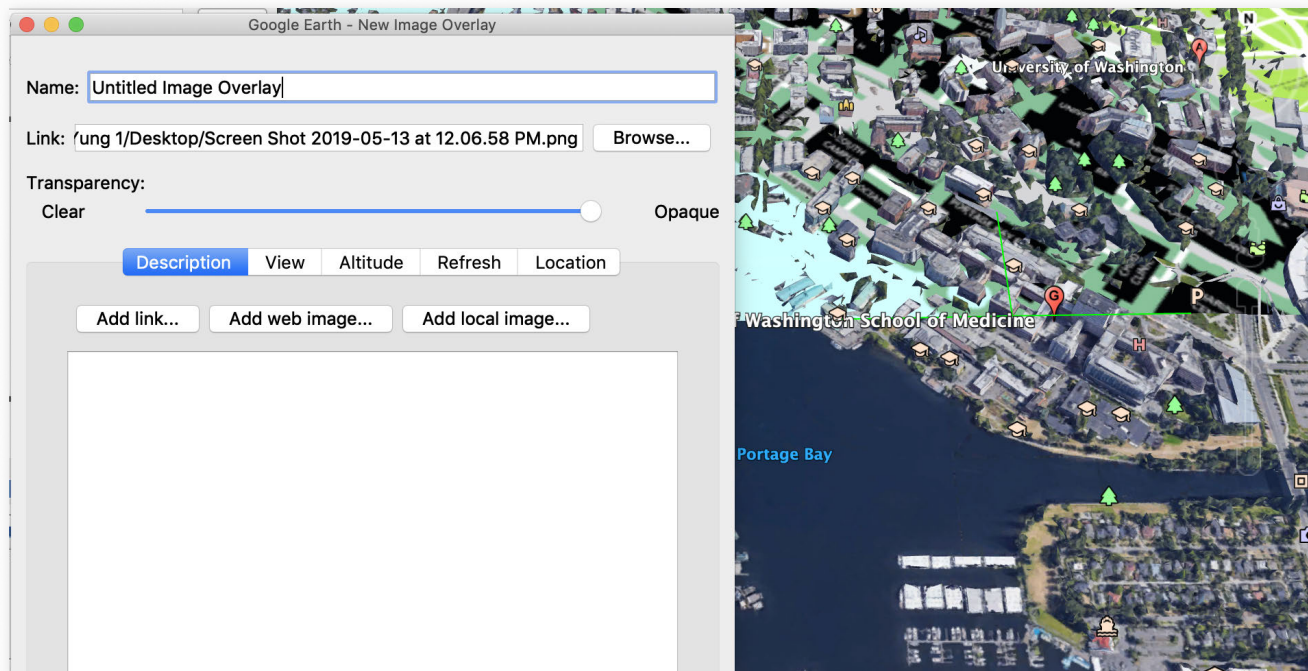
MVP FEATURES

- ✓ Import data
- ✓ Export data
- ✓ Share via URL
- ✗ Share WIP

ASSESSMENT

Users can download and share certain maps with other users. This type of visualization does not allow for users to view other user's output in their preferred method of visualization. The best way of sharing a map is by downloading it as an image.

Google Earth • Comparability



Import a map or image to overlay Google Earth.



Compare present day maps to previous versions using the historical slider.



Use the sunlight slider to compare maps during different times of day.

SCORE

5

Excellent

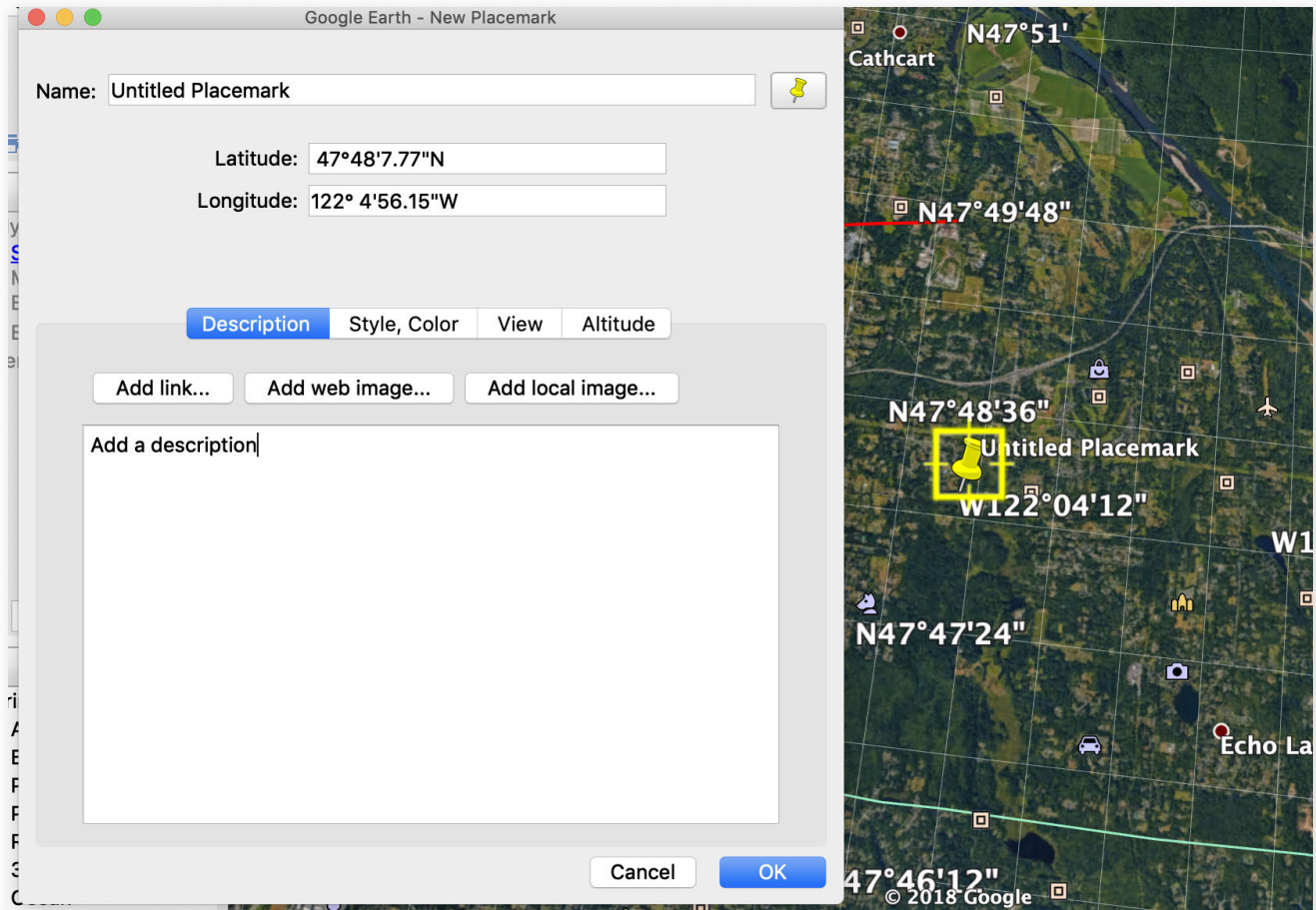
MVP FEATURES

- ✓ Compare data points
- ✓ Compare by time
- ✗ Compare by source
- ✓ Review data trends

ASSESSMENT

Users can compare different data sets by overlaying images on a map area or by using the time/sunlight sliding feature. Aside from these features there are not many other options for comparing data within the application.

Google Earth • Annotation



Create a placemark and add an annotation

SCORE

3

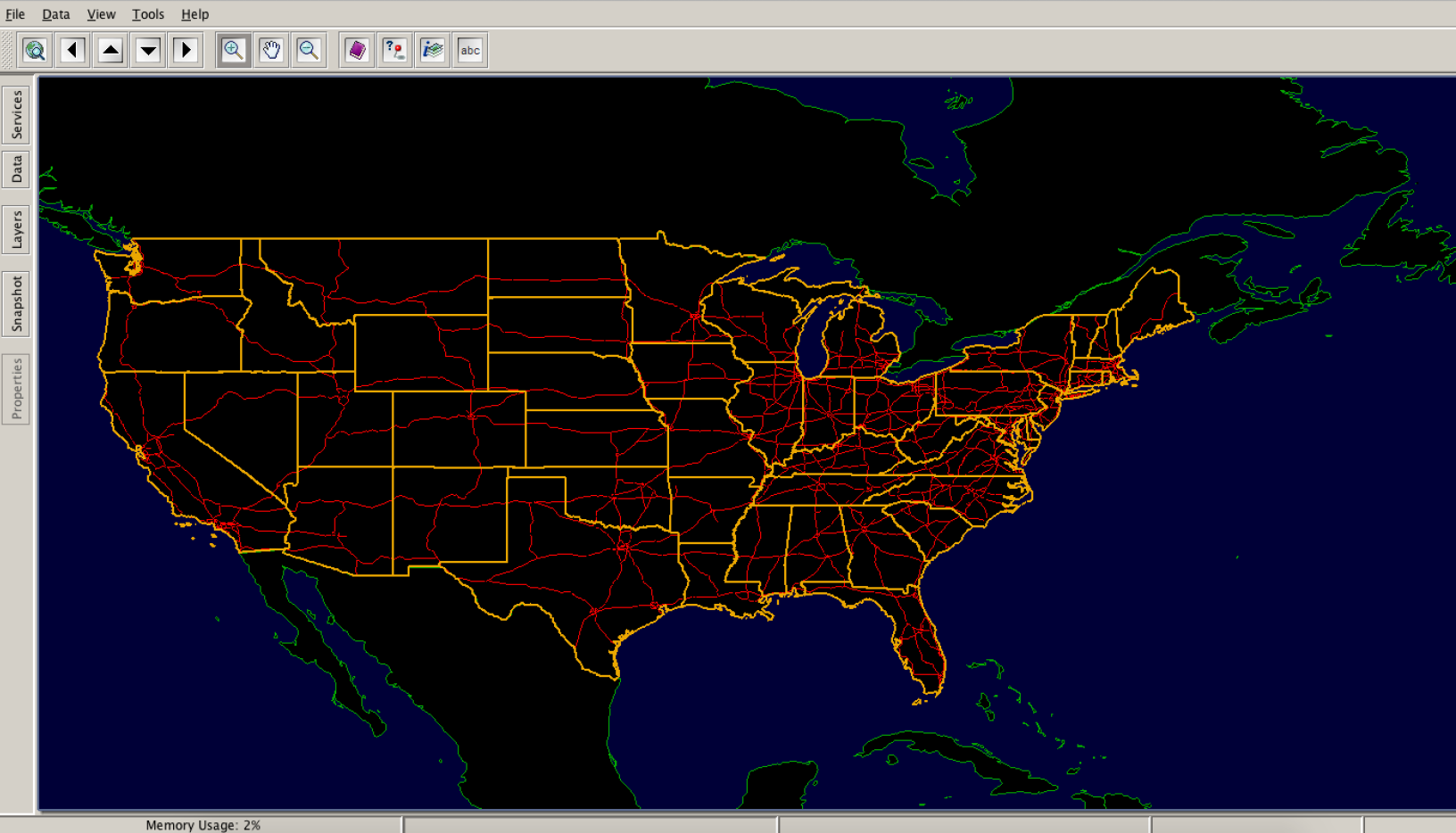
Average

MVP FEATURES

- ✓ Add annotation
- ✓ Add interpretation
- ✗ Add tag
- ✗ View others' annotations

ASSESSMENT

Users are able to write their own feedback or notes on a specific pin but there is no way for other users to see these notes. Users of different accounts are not able to share annotations as collaboration is not a feature of google earth pro.

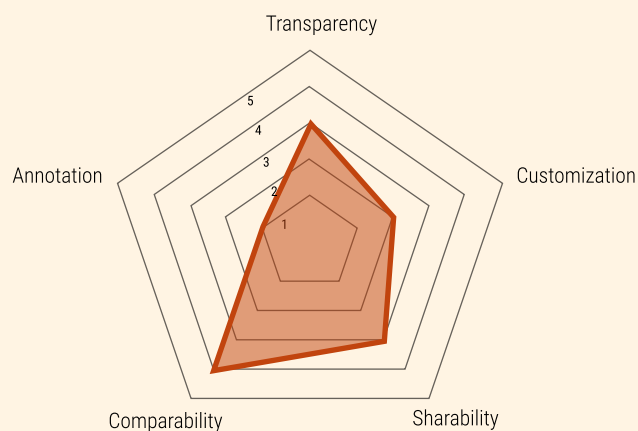


NOAA Weather and Climate Toolkit (WCT)

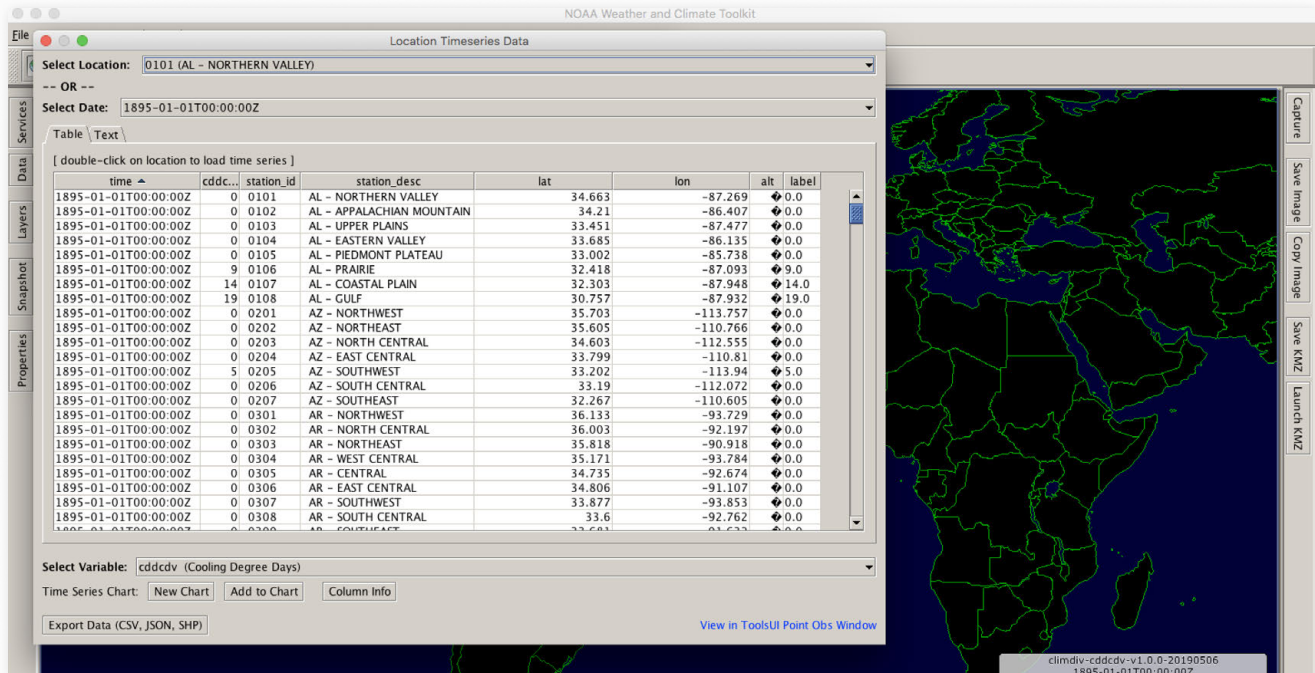
WCT is free, platform independent software distributed from NOAA's National Centers for Environmental Information (NCEI). The WCT allows the visualization and data export of weather and climate data, including Radar, Satellite and Model data.

Takeaways

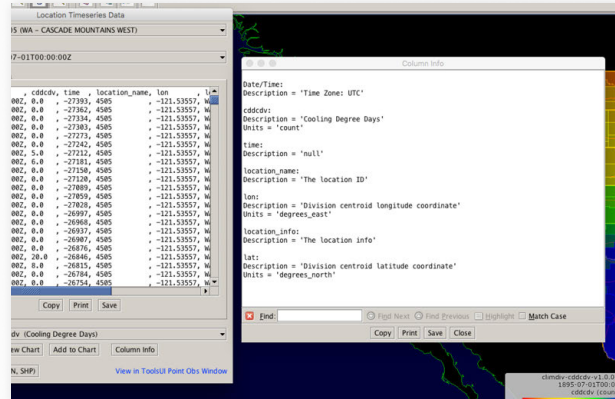
WCT seems to be a legacy tool for analyzing weather data. WCT provides users with basic visualization and the ability to capture image of the screen. The tool is cluttered by pop-up menus and a lack of customization.



WCT • Transparency



Data information depends on how the raw data was processed



Details of data (i.e. ID, tags) can be found

SCORE

3

Average

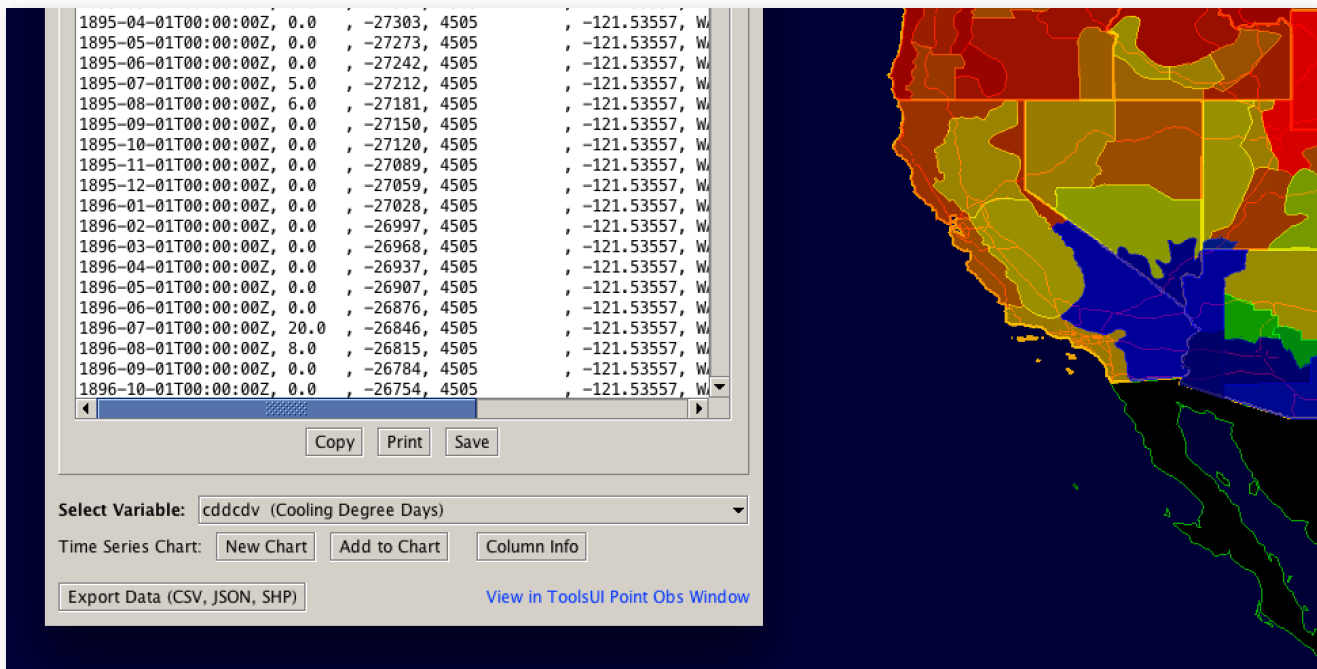
MVP FEATURES

- ✓ Show time retrieved
- ✓ Show data format
- ✓ Show data source
- ✗ Access to raw data
- ✗ Provide data context

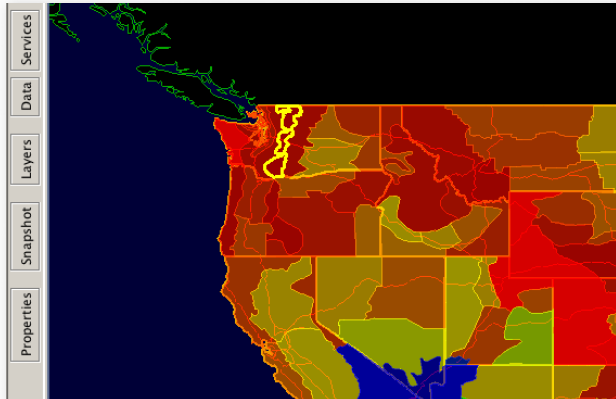
ASSESSMENT

WCT loads csv files into the tool for data exploration. Information of data mostly depends on how it was structured before the import. While using the tool, users can have direct manipulation, changing raw data variables on the go. However, there's no access to the original data file.

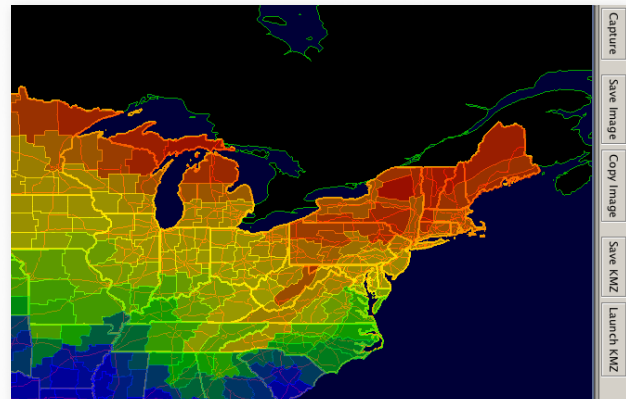
WCT • Customization



Data manipulation and escape route is available



Tool box



Tool box

SCORE

2

Not good

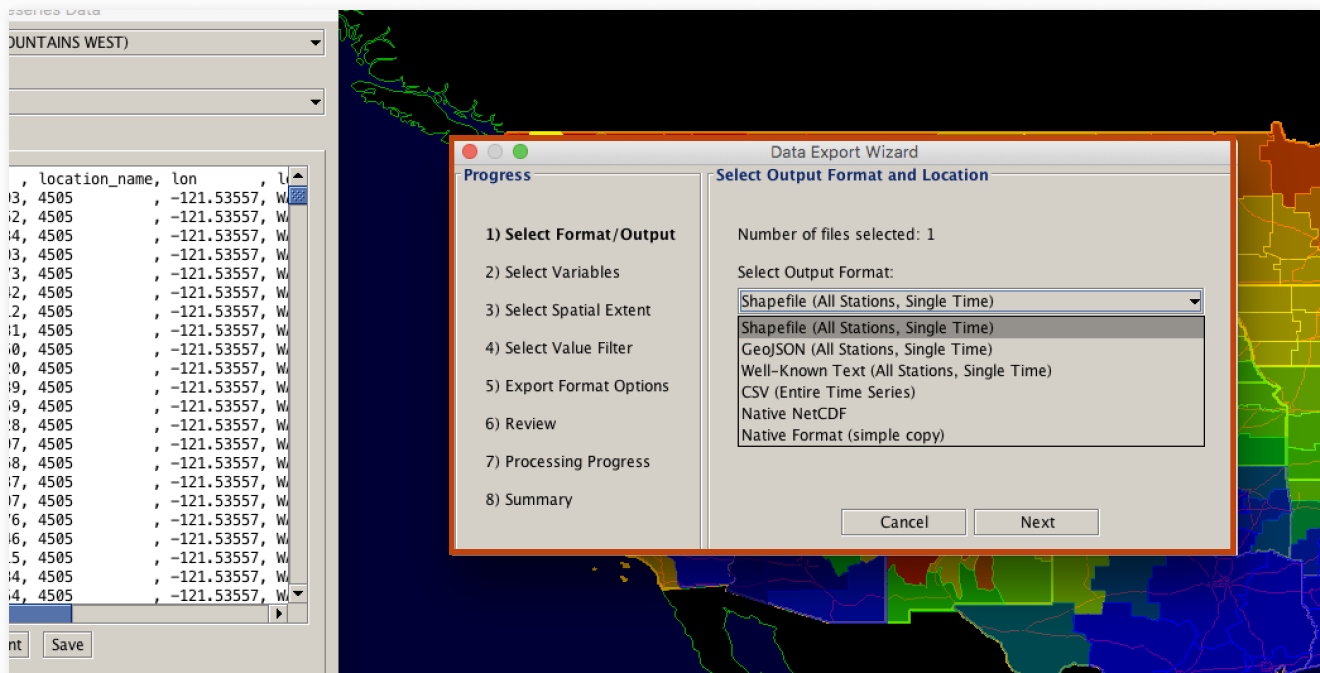
MVP FEATURES

- ✓ Escape & integrate
- ✓ Data manipulation
- ✗ In-app customization
- ✗ Code customization
- ✗ 3D
- ✗ Search

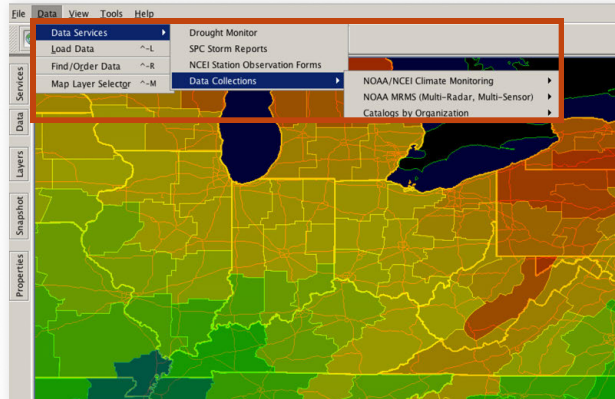
ASSESSMENT

WCT doesn't provide users with much customization. The tool comes with 2 default side bars with simple features for capturing image. Adding tools for the analysis results in opening multiple pop-up windows which decreases visibility.

WCT • Sharability



Export data



Datasets can be directly imported from WCT server

SCORE

3

Average

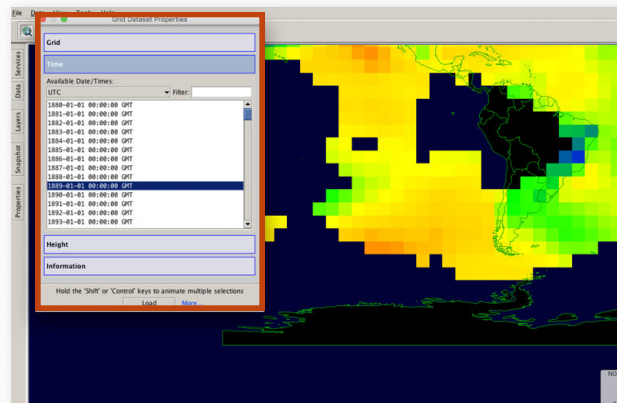
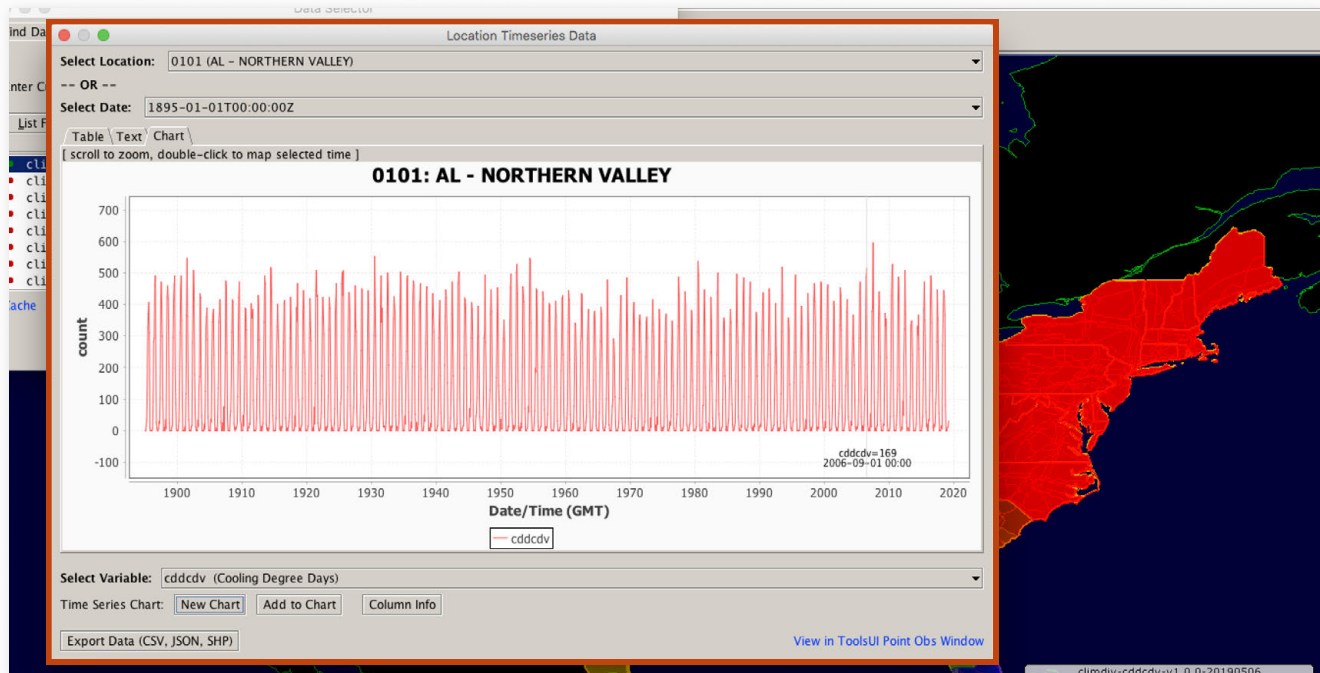
MVP FEATURES

- ✓ Import data
- ✓ Export data
- ✗ Share via URL
- ✗ Share WIP

ASSESSMENT

Users can export data with different output formats. Data can be imported directly from the server. However, there's no way to collaborate on the same dataset or to share WIP with one another.

WCT • Comparability



Compare data based on time retrieved

SCORE

4

Good

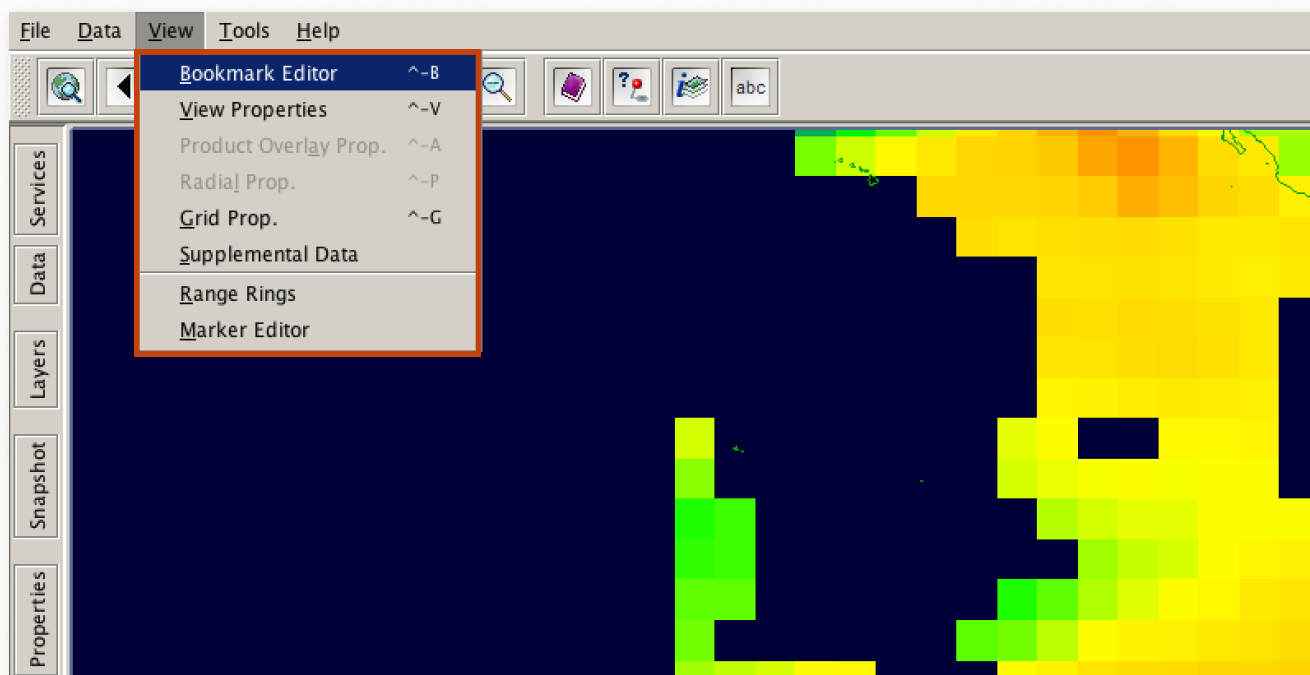
MVP FEATURES

- ✓ Compare data points
- ✓ Compare by time
- ✗ Compare by source
- ✓ Review data trends

ASSESSMENT

Users can view data trend or choose a particular data point and explore in details. However, the visualization is static and doesn't have many options.

WCT • Annotation



Users can only bookmark without leaving comments or annotations

SCORE

1

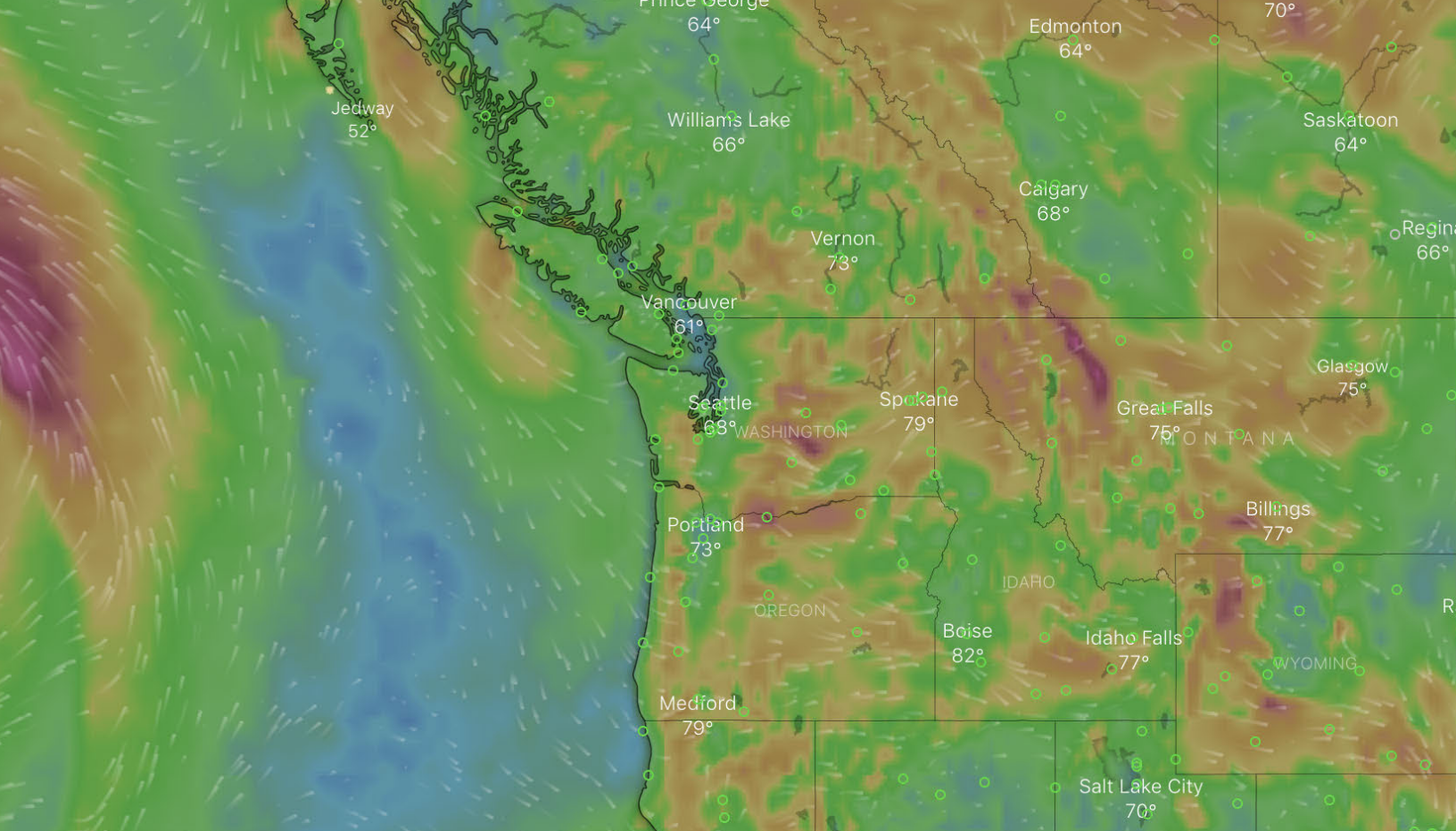
Severe

MVP FEATURES

- ✗ Add annotation
- ✗ Add interpretation
- ✗ Add tag
- ✗ View others' annotations

ASSESSMENT

WCT doesn't have annotation capability.

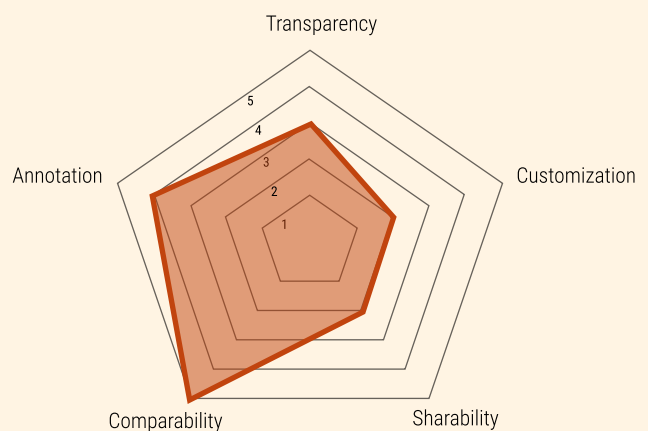


Windy

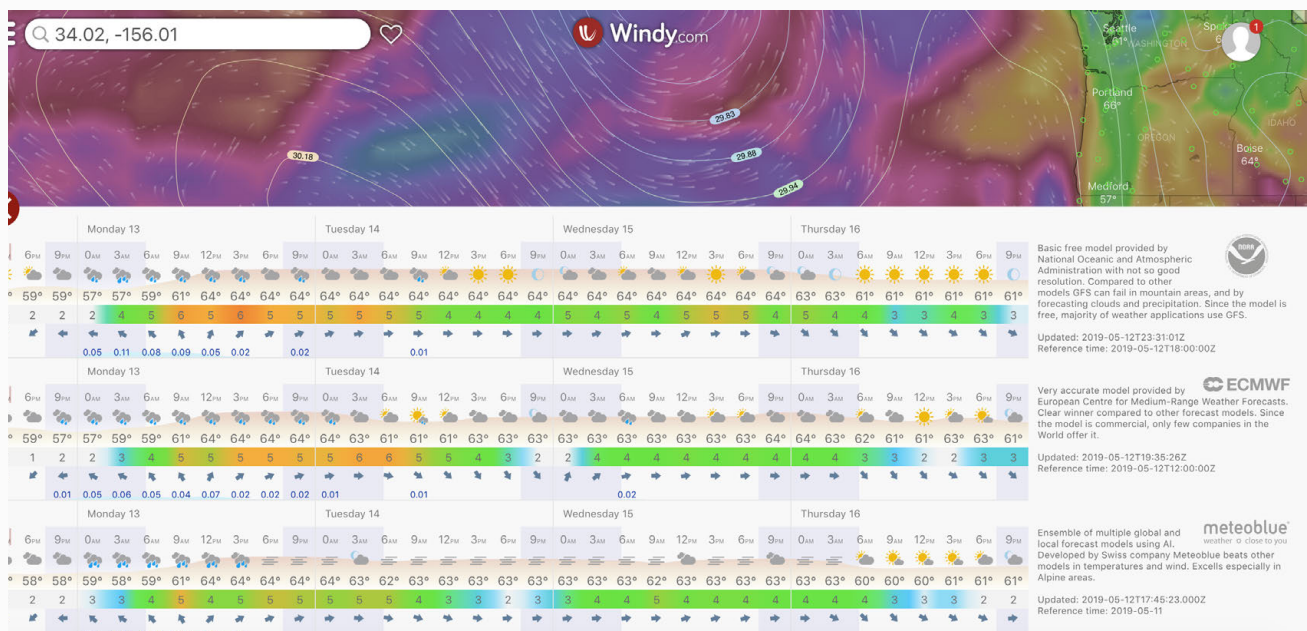
Windy is a weather forecast visualization tool that allows users to visualize and forecast weather in any given location. This tool was recommended to us by a scientist at NASA because of its success in visualizing a lot of information.

Takeaways

Windy has very powerful customization features, which allow the user to visualize weather variables in a flexible manner, which is something that we can incorporate into our own project. Although the site offers custom user drawn annotations, these can still be improved to allow for text annotations and for better searchability of annotations.



Windy • Transparency



Data from multiple weather forecasting models

Forecast model: ECMWF 9km
Update interval: 12 - 13 hrs
Provider: **ECMWF**
Reference time: 2019-05-12T00:00:00Z

Updated 11h ago
Next update expected at:
1:34 PM, in 1h 43m 58s

Visibility
Visibility is a measure of the distance at which an object or light can be clearly discerned. Meteorological visibility refers to transparency of air; in dark, meteorological visibility is still the same as in daylight for the same air.

ECMWF 9km
Very accurate model provided by the European Centre for Medium-Range

Information about data sources and their update dates

windycom / API

Code Issues Pull requests Projects Wiki Insights

Windy API, or Windy Leaflet Plugin, let you put animated weather map into your website and enjoy rich ecosystem of L
<https://api4.windy.com>

weather leaflet leaflets windguru

39 commits 3 branches 0 releases 4 contrib

Branch: master New pull request Create new file Upload files Find File Clone

Marek Dorda Update readme.md Latest commit 8c4d

assets	commit before merge
bcast	Leaflet 1.4 finally here
boat-tracker	Leaflet 1.4 finally here
hello-world	Leaflet 1.4 finally here
metrics	Leaflet 1.4 finally here
navigation	Leaflet 1.4 finally here

Widget's source code on GitHub

SCORE

3

Average

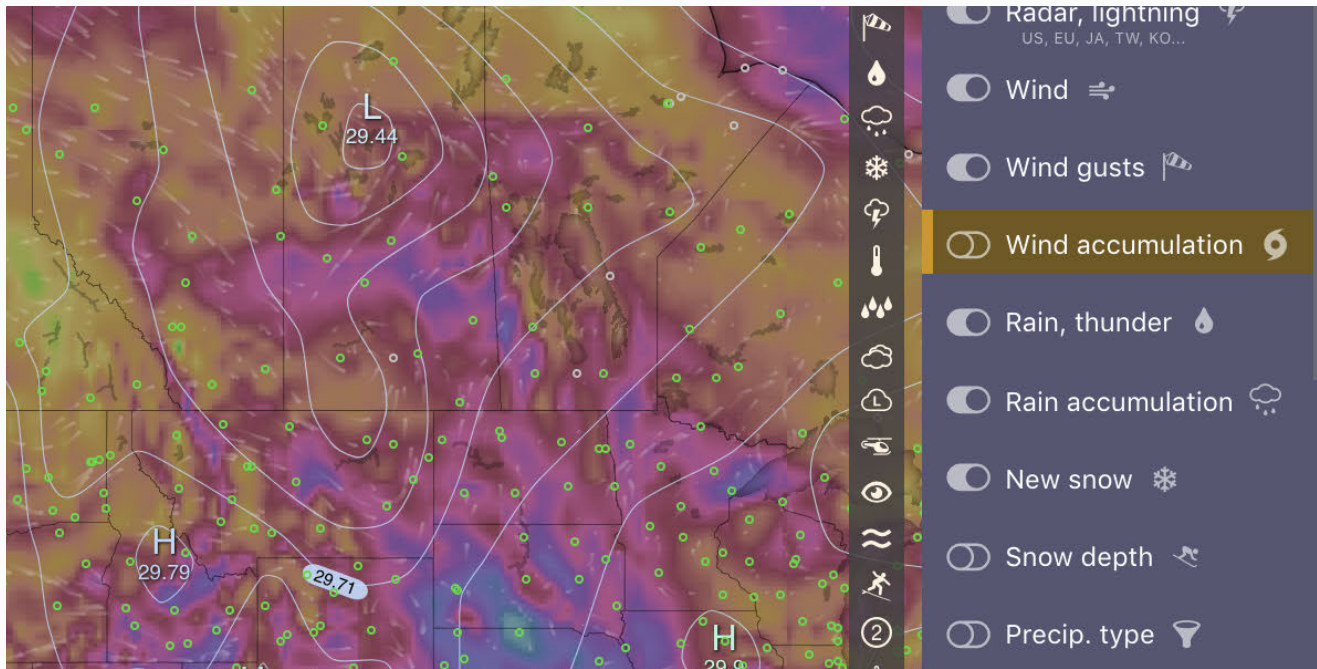
MVP FEATURES

- ✓ Show time retrieved
- ✗ Show data format
- ✓ Show data source
- ✗ Access to raw data
- ✓ Provide data context

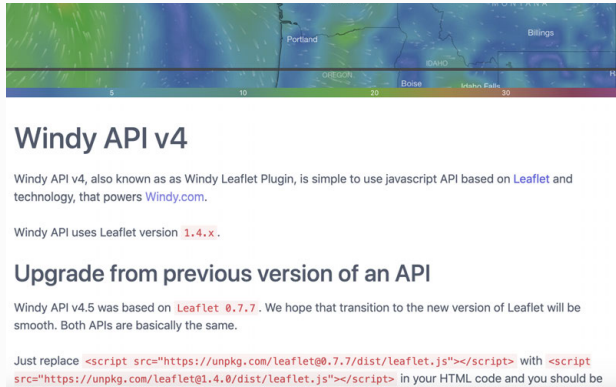
ASSESSMENT

Users can see the different models being used to forecast weather information and when data was last updated. Windy also offers its users widgets with the code available on GitHub.

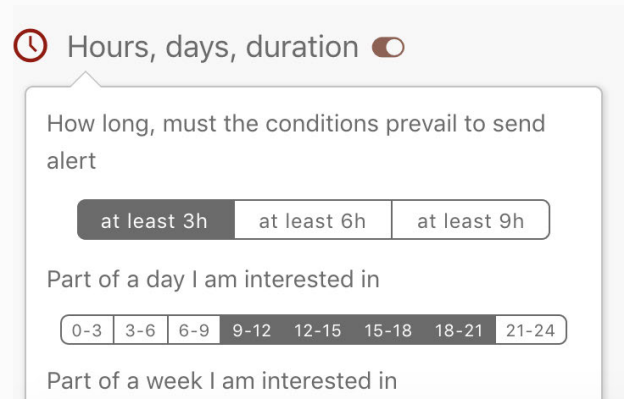
Windy • Customization



Website offers a wide range of layers to help users visualize weather



Users can use Windy's API to customize the data to their own needs



Users can customize the alerts that they receive from Windy

SCORE

2

Not good

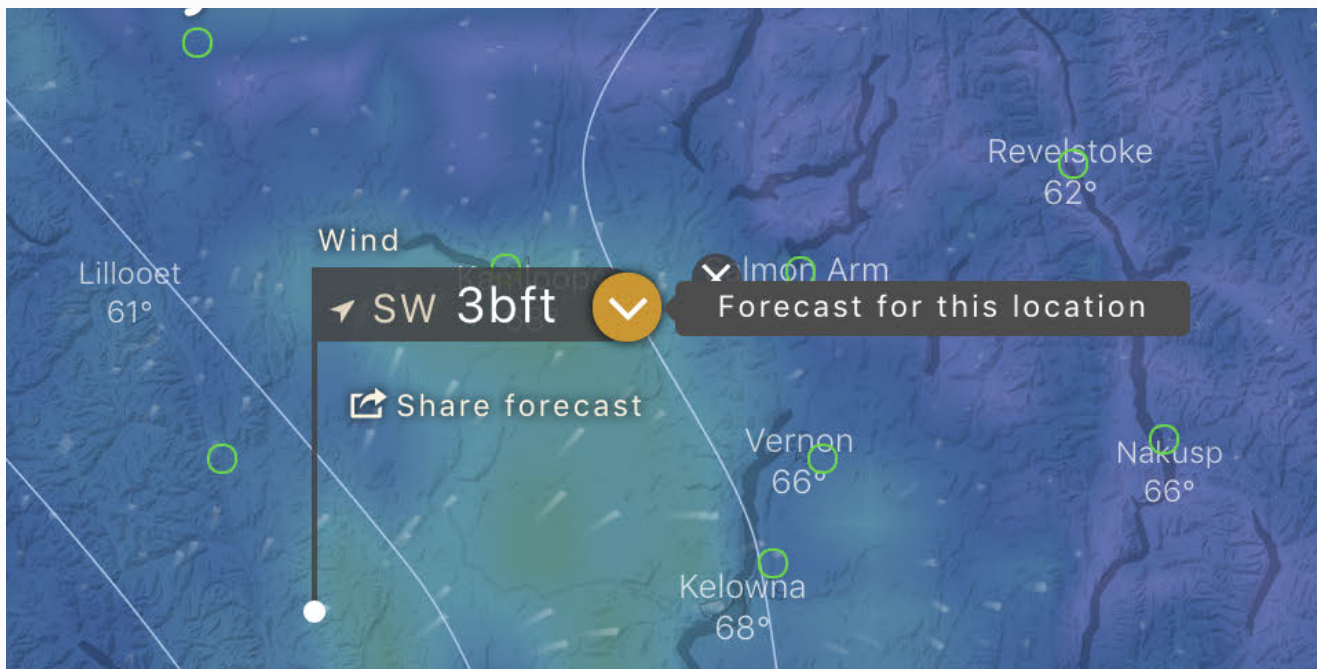
MVP FEATURES

- ✗ Escape & integrate
- ✗ Data manipulation
- ✓ In-app customization
- ✓ Code customization
- ✗ 3D
- ✗ Search

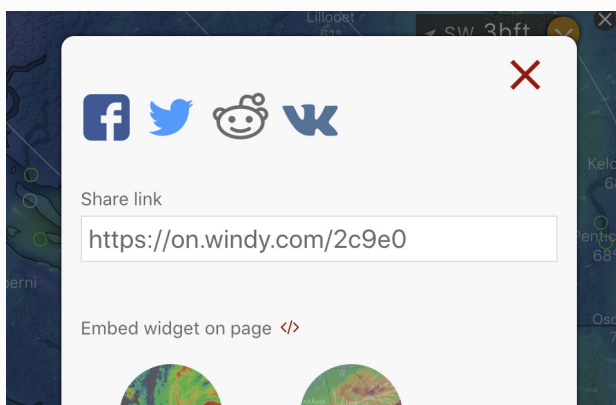
ASSESSMENT

Users can customize elements of their experience, such as color scales and measurement units. They can also save specific places and get notified of changes through fully customized alerts.

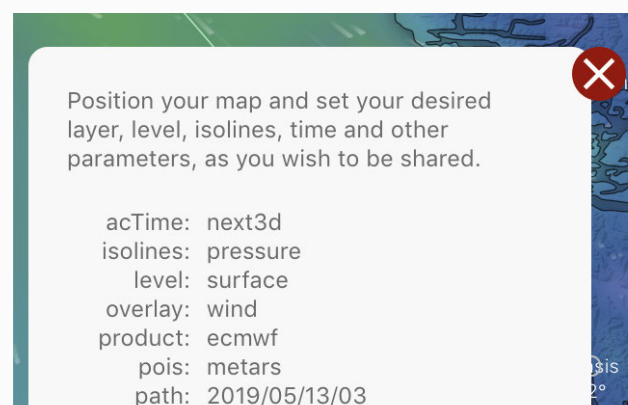
Windy • Shareability



Users can mark areas on the map and share them.



Users share their visualizations using URLs



Windy prompts users to adjust their view to the way they want it to be shared

SCORE

2

Not Good

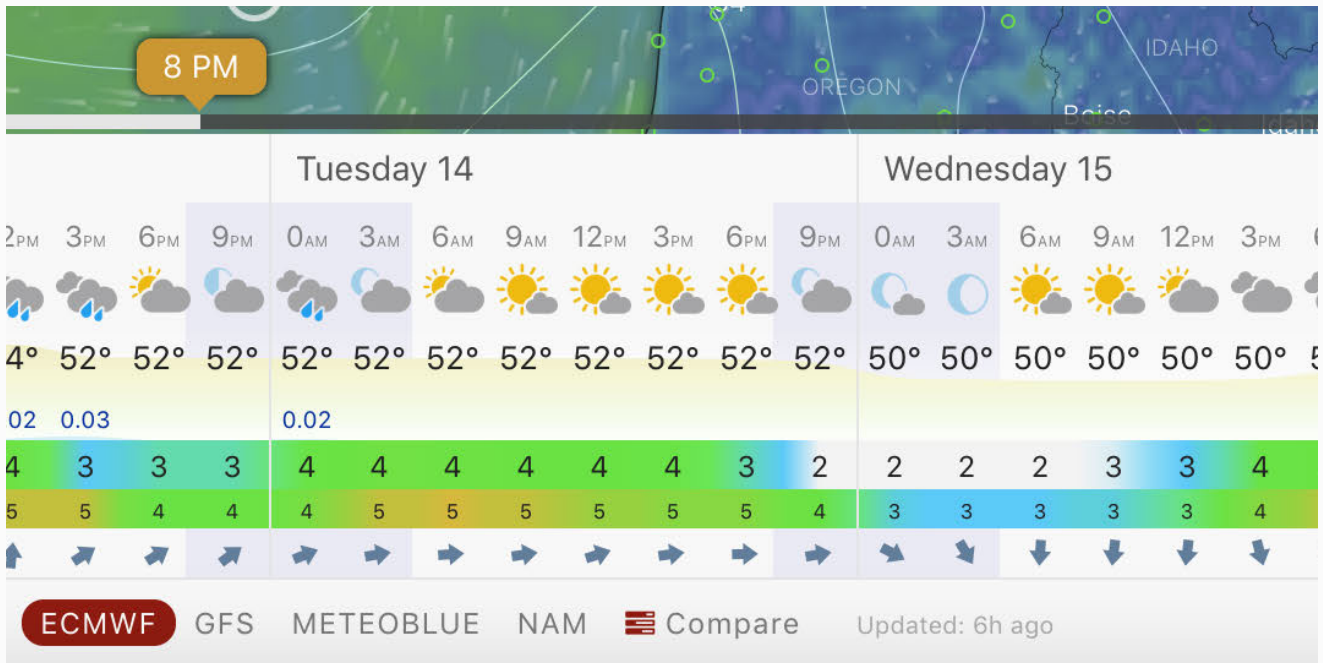
MVP FEATURES

- ✗ Import data
- ✗ Export data
- ✓ Share via URL
- ✗ Share WIP

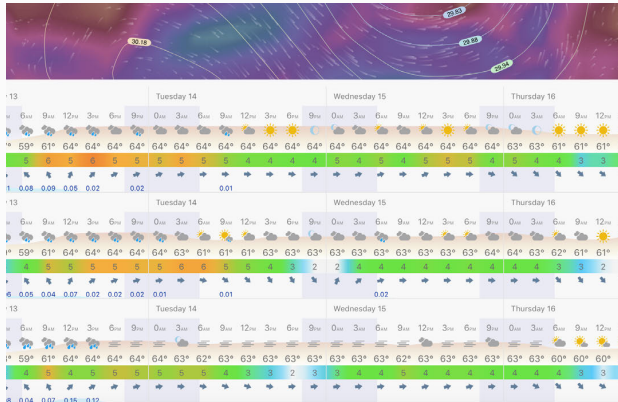
ASSESSMENT

Users can share their annotations through a URL. The shared view will sometimes slightly varies from the original view, for example it will open the same visualization but at a different zoom level.

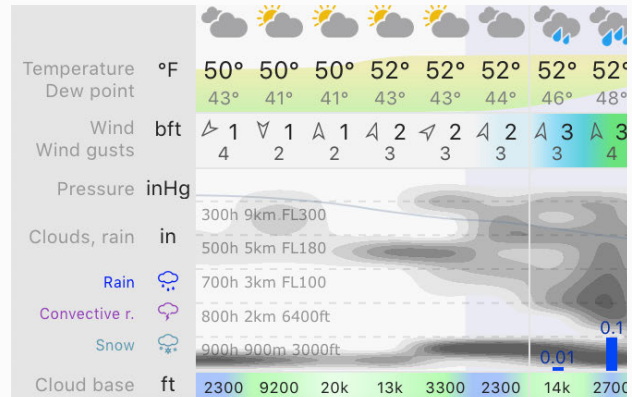
Windy • Comparability



Comparing daily weather changes



Comparing weather data from multiple sources



Comparing multiple weather variables over time

SCORE

5

Excellent

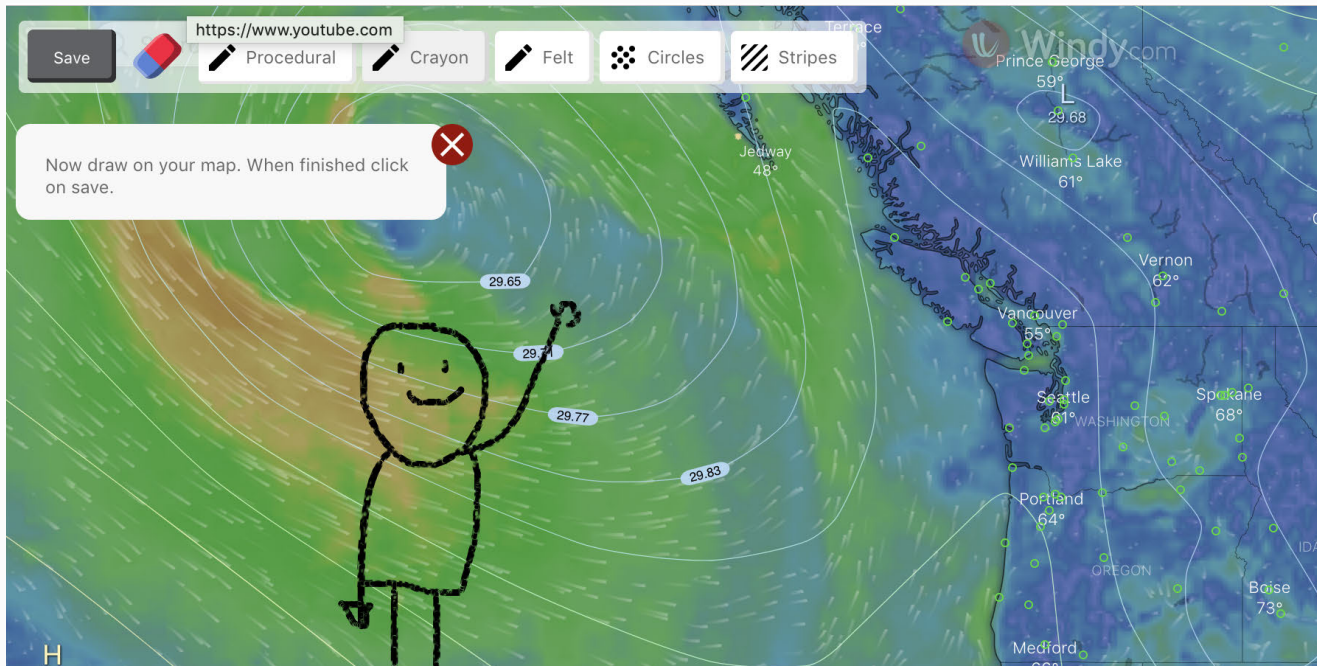
MVP FEATURES

- ✓ Compare data points
- ✓ Compare by time
- ✓ Compare by source
- ✓ Review data trends

ASSESSMENT

Users can compare daily weather progress. They can compare a group of weather variables at once, but don't have control over which variables to show/hide. They can also compare data from multiple data sources.

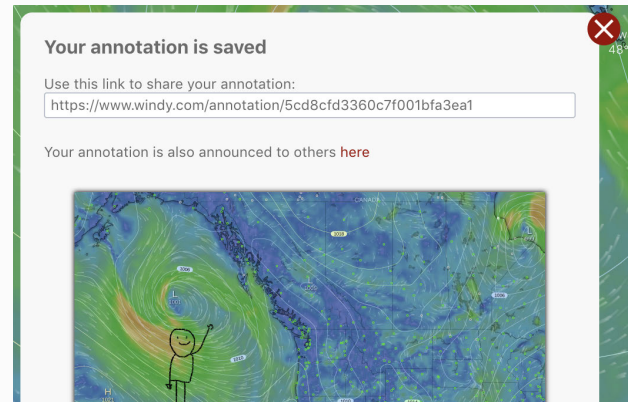
Windy • Annotation



Users can annotate on the map using different drawing tools

- Distance & planning
- Embed widget on page
- Articles
- Annotate the map
- Create video or animated GIF

The annotation feature is only discoverable in the side menu which is hidden by default



Annotations can be shared through links and are shared to all users on the forum

SCORE

4

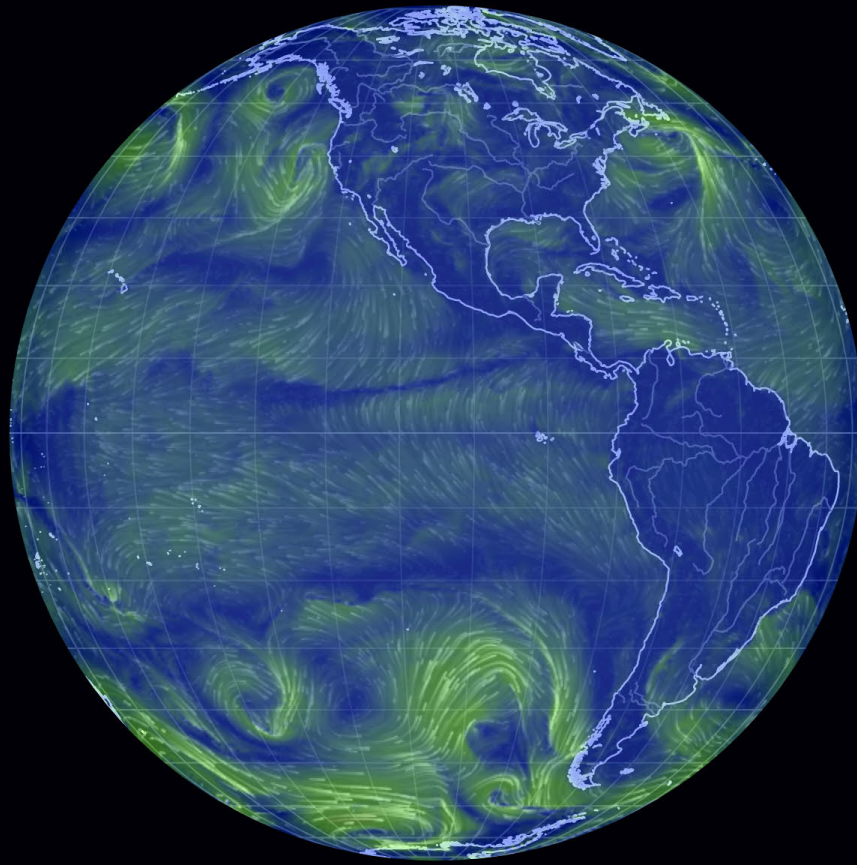
Good

MVP FEATURES

- ✓ Add annotation
- ✓ Add interpretation
- ✗ Add tag
- ✓ View others' annotations

ASSESSMENT

Users can draw on the map but can't input text to the annotation or respond to someone else's annotation. Additionally, users can't access their old annotations unless they have the annotation link saved.

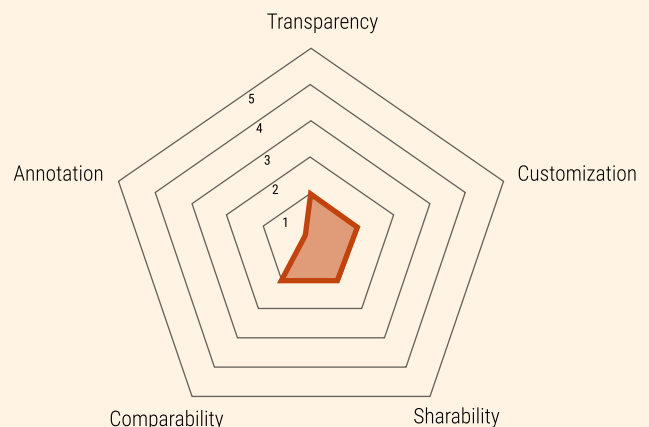


NullSchool

NullSchool Global Weather Visualization Tool utilizes data from multiple government agencies to run a comprehensive interactive tool that allows a user to see current weather patterns and predictions on a global or local scale. Each data set is updated every few days, with some variance depending on the source. Nullschool offers multiple predictive model views for forecasting. These models all have slightly different methodologies so there is variance, however this variance is often valued by researchers as it allows them to validate findings across multiple models rather than rely on any one prediction.

Takeaways

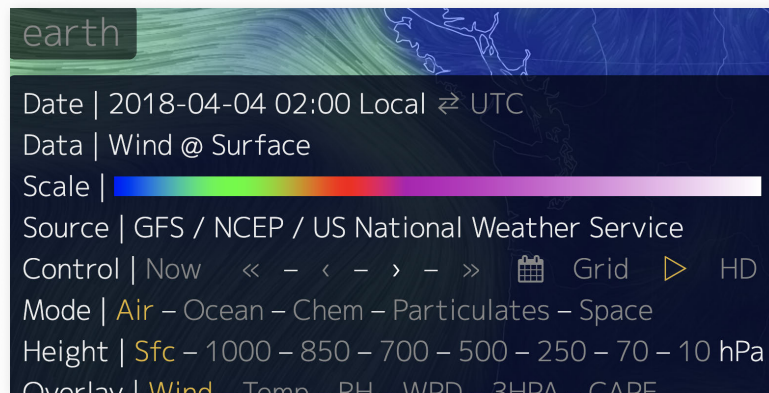
NullSchool combines robust data visualizations with a straightforward interface meant for education and amateur meteorologists. The site gives great examples of how weather data visualizations can be done with a minimal amount of variables. It does not offer good exploration or customization options though as it focuses on only data visualization



NullSchool • Transparency

Free Version of Source Modules	github.com/cambecc/earth D3.js node.js
Weather Data	GFS (Global Forecast System) EMC / NCEP / NWS / NOAA
Ocean Currents Data	OSCAR Earth & Space Research
Sea Surface Temperature	RTGSST (Real Time Global Sea Surface Temperature) MMAB / EMC / NCEP / NWS / NOAA
Ocean Waves	WAVEWATCH III MMAB / EMC / NCEP / NWS / NOAA
Aerosols and Chemistry	GEOS-5 (Goddard Earth Observing System) GMAO / NASA CAMS (Copernicus Atmosphere Monitoring System) Copernicus / European Commission + ECMWF
Aurora	OVATION SWPC / NCEP / NWS / NOAA
GRIB/NetCDF Decoder	Processing script written by Stephanie Hamilton
Geographic Data	UCAR/Unidata THREDDS Natural Earth

Source code and data from NullSchool About page



Display of active source data within tool

SCORE

1

Good

MVP FEATURES

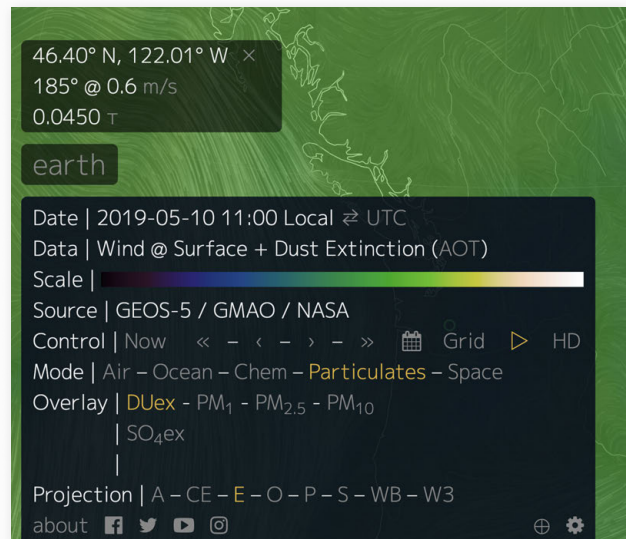
- ✗ Show time retrieved
- ✗ Show data format
- ✓ Show data source
- ✗ Access to raw data
- ✗ Provide data context

ASSESSMENT

The tool cites where the data is coming from and which models are being used on each visualization. A github repository is shared which gives you the tools to entirely recreate each model for verification purposes. However, the forecasts are handled by resource intensive supercomputers running complex predictive algorithms so a full recreation of the models would be difficult.

Overlay Options

- Wind Currents with optional overlays of Temperature
- Relative Humidity at various altitudes
- Precipitation at various altitudes
- Total precipitable water at various altitudes
- Cloud water at various altitudes
- Mean sea level pressure at various altitudes
- Wind Chill / Heat Index
- Ocean Currents and Wave Height with surface temp
- Chemical Makeup of Atmosphere
- Surface Carbon Monoxide levels
- Surface Carbon Dioxide levels
- Surface Sulfur Dioxide levels
- Wind overlayed with Atmospheric Particulate tracking
- Dust Extinction levels (Aerosol Optical Thickness)
- Sulfate Extinction (Aerosol Optical Thickness)
- Wind Current overlay on particulates
- Aurora Predictions
- Custom View Modes



Selection of custom data overlays

SCORE

1

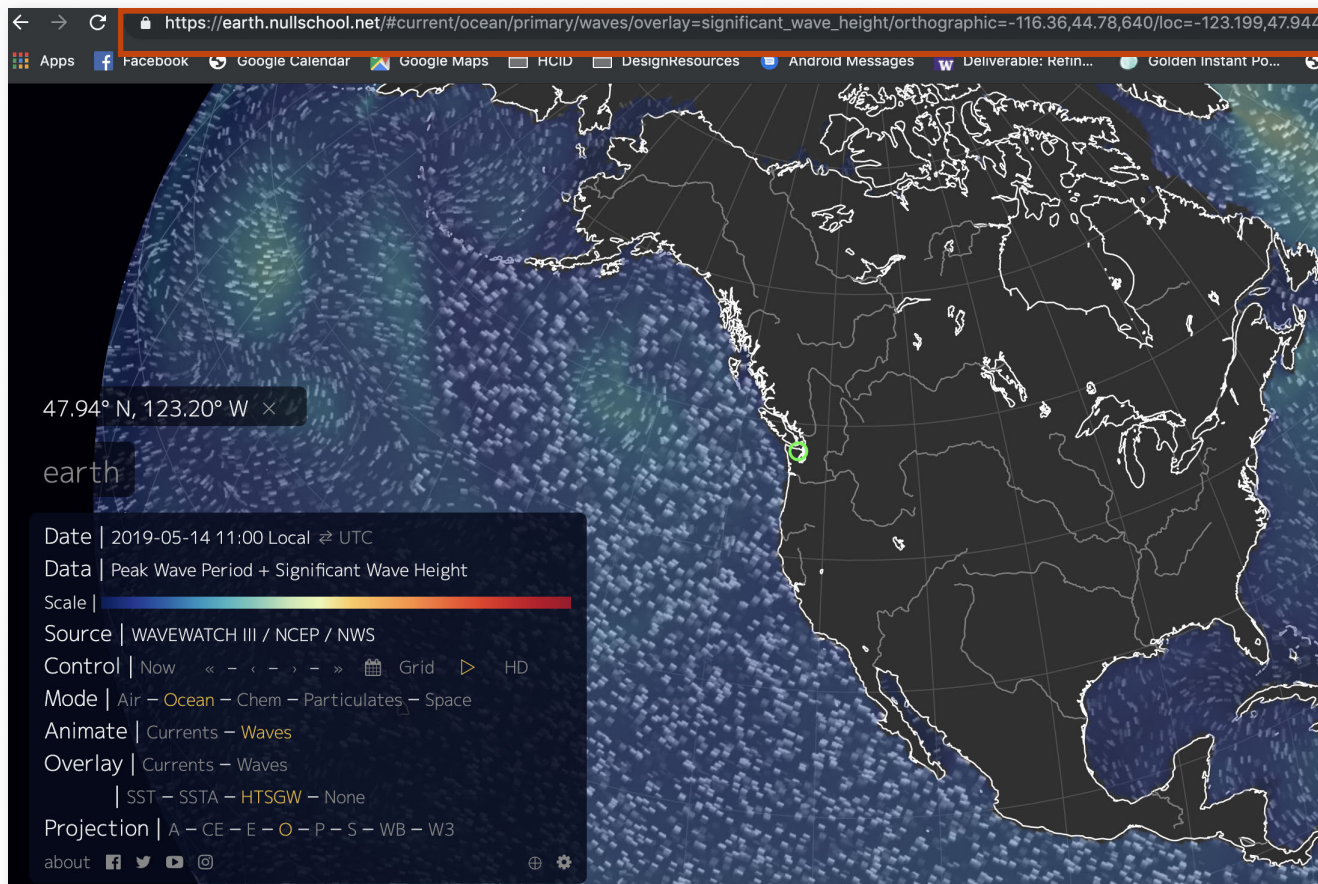
Severe

MVP FEATURES

- ✗ Escape & Integrate
- ✗ Data manipulation
- ✗ In-app customization
- ✗ Code customization
- ✓ 3D
- ✗ Search

ASSESSMENT

Multiple options for different types of atmospheric observations and longitude/latitude selection which can then be quickly recovered via URL.



Specified views are sharable via copy and pasting the URL

SCORE

1

Severe

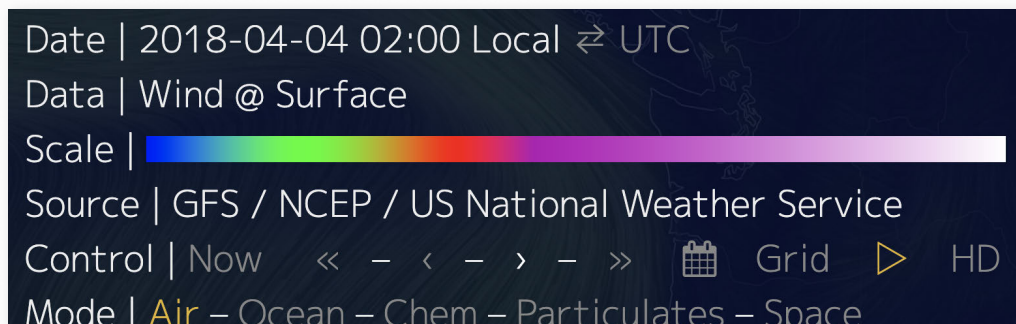
MVP FEATURES

- ✗ Import data
- ✗ Export data
- ✓ Share via URL
- ✗ Share WIP

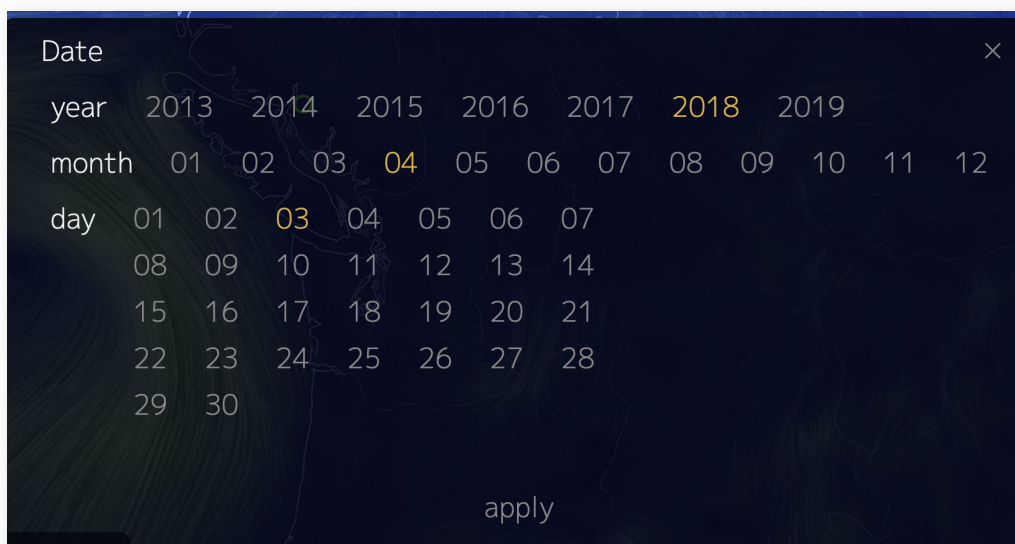
ASSESSMENT

NullSchool does not support any type of sharing features other than manual screenshots and an dynamic URL. While the URL sharing capability is not as explicit as some other options, it does provide a powerful way to share a view of a specific map for the purposes of discussion.

NullSchool • Comparability



The calendar tool is accessed via the main data screen



Calendar view allows quick scrolling through past data and future predictions to see weather events form and dissipate over time

SCORE

1

Severe

MVP FEATURES

- ✗ Compare data points
- ✓ Compare by time
- ✗ Compare by source
- ✗ Review data trends

ASSESSMENT

NullSchool does not offer comparative datasets when viewing different visualizations, however it does offer the ability to quickly move forward and backward in time within a single visualization. This allows the user to get a better understanding for the context of a phenomena and how it formed as well as what its predicted to do in the near-future.

N/A

SCORE

0

Not Applicable

MVP FEATURES

ASSESSMENT

There are no ways to annotate or track other's usage of the tool. Any use of this that I've seen has been done through a screen recording and voice overlay.

Changing the way you think about data

THE TABLEAU PLATFORM

SEE IT IN ACTION



Tableau

Tableau is a data visualization and business intelligence software. Using drag-and-drop analytics, the tool enables customers to perform data analysis, explore datasets, and share insights on the server or online. Evaluating Tableau would help our team leverage existing features to help scientists explore datasets and collaborate with each other.

Takeaways

Tableau provides users with multiple data manipulation features that are helpful in exploring and mining data for insights. The plethora of features also comes with a steep learning curve. Tableau works best with processed data and not with raw data; data files need to be cleaned up prior to the exploration.

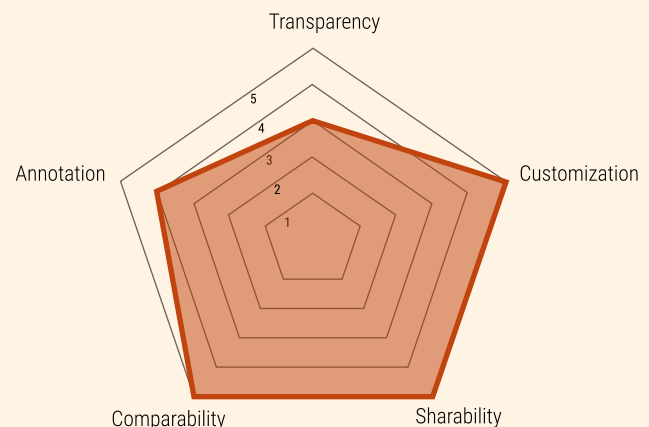
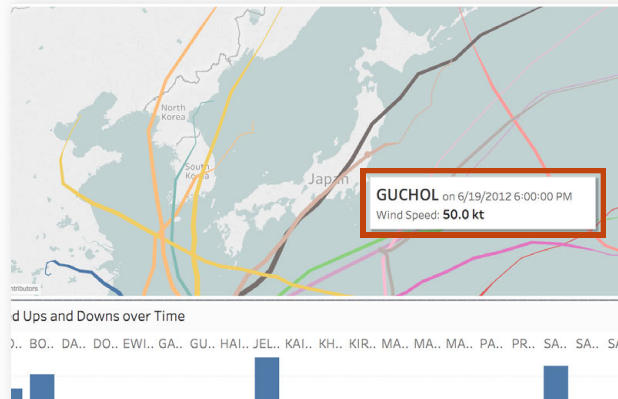


Tableau • Transparency

Basin	Date	Latitude	Longitude	Pressure (mb)	Storm Name	Wind speed (kt)	Number of Records
West Pacific	3/22/2010 11:00:00 ...	7.2000	142.200	null	OMAIS	35	1
West Pacific	3/22/2010 5:00:00 PM	7.9000	142.600	null	OMAIS	35	1
West Pacific	3/22/2010 11:00:00 ...	8.4000	141.900	null	OMAIS	35	1
West Pacific	3/23/2010 5:00:00 AM	9.1000	140.400	null	OMAIS	35	1
West Pacific	3/23/2010 11:00:00 ...	9.7000	139.500	null	OMAIS	35	1
West Pacific	3/23/2010 5:00:00 PM	10.2000	138.700	null	OMAIS	35	1
West Pacific	3/23/2010 11:00:00 ...	10.7500	137.900	null	OMAIS	35	1
West Pacific	3/24/2010 5:00:00 AM	11.0500	136.800	null	OMAIS	35	1
West Pacific	3/24/2010 11:00:00 ...	11.2500	135.400	null	OMAIS	35	1
West Pacific	3/24/2010 5:00:00 PM	11.9500	134.500	null	OMAIS	35	1

Users can get access to raw data on the tool with data format.



Hovering over a data point to reveal its details

SCORE

3

Average

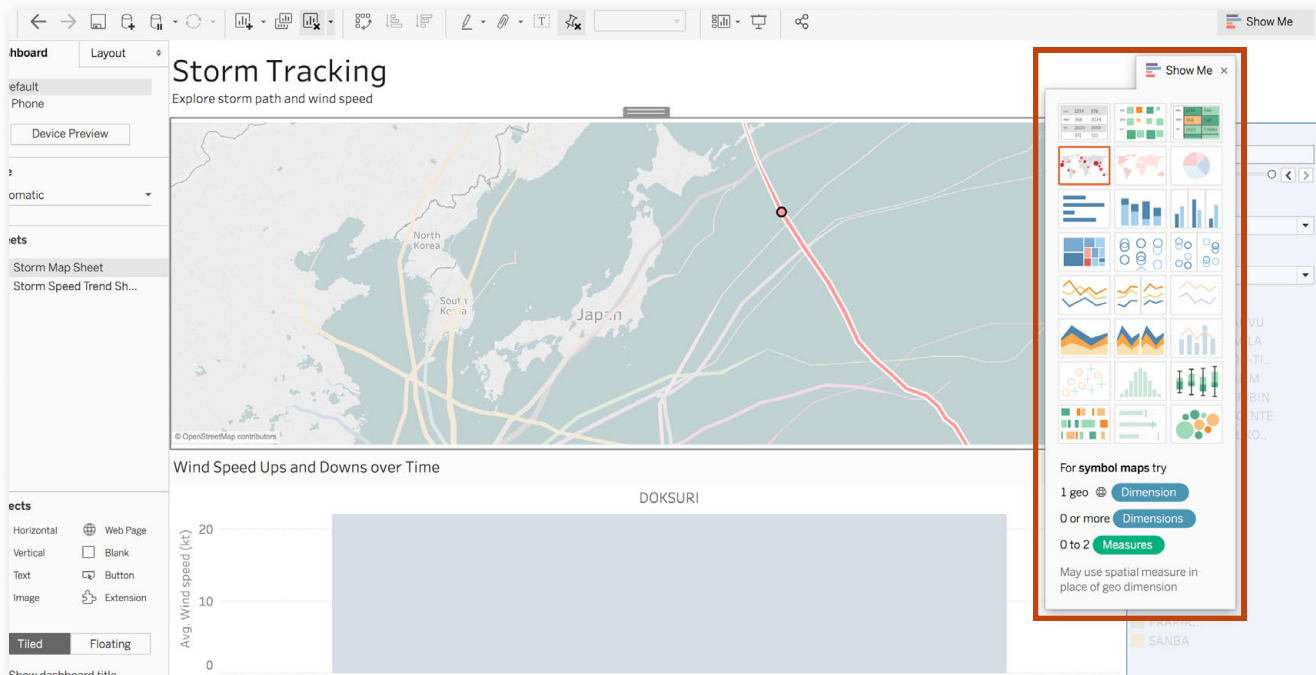
MVP FEATURES

- ✓ Show time retrieved
- ✓ Show data format
- ✓ Show data source
- ✗ Access to raw data
- ✗ Provide data context

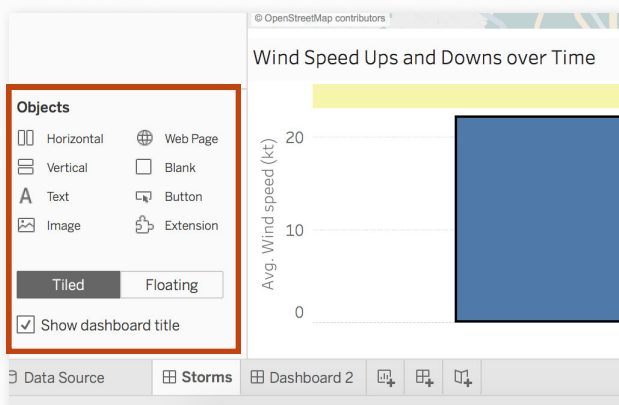
ASSESSMENT

Tableau provides access to imported data right on the tool. Typically, raw data needs to be cleaned up before imported into the tool. On the visualization, when hovering over a particular area, more information of the data is revealed & can be traced back to the original data point.

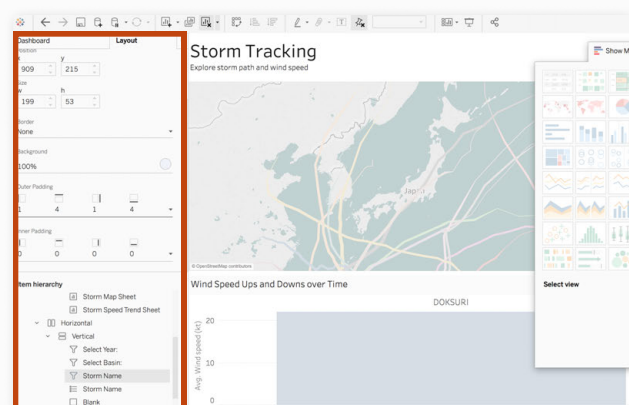
Tableau • Customization



Users get access to various graph and chart types



Layout customization



Layout customization

SCORE

5

Excellent

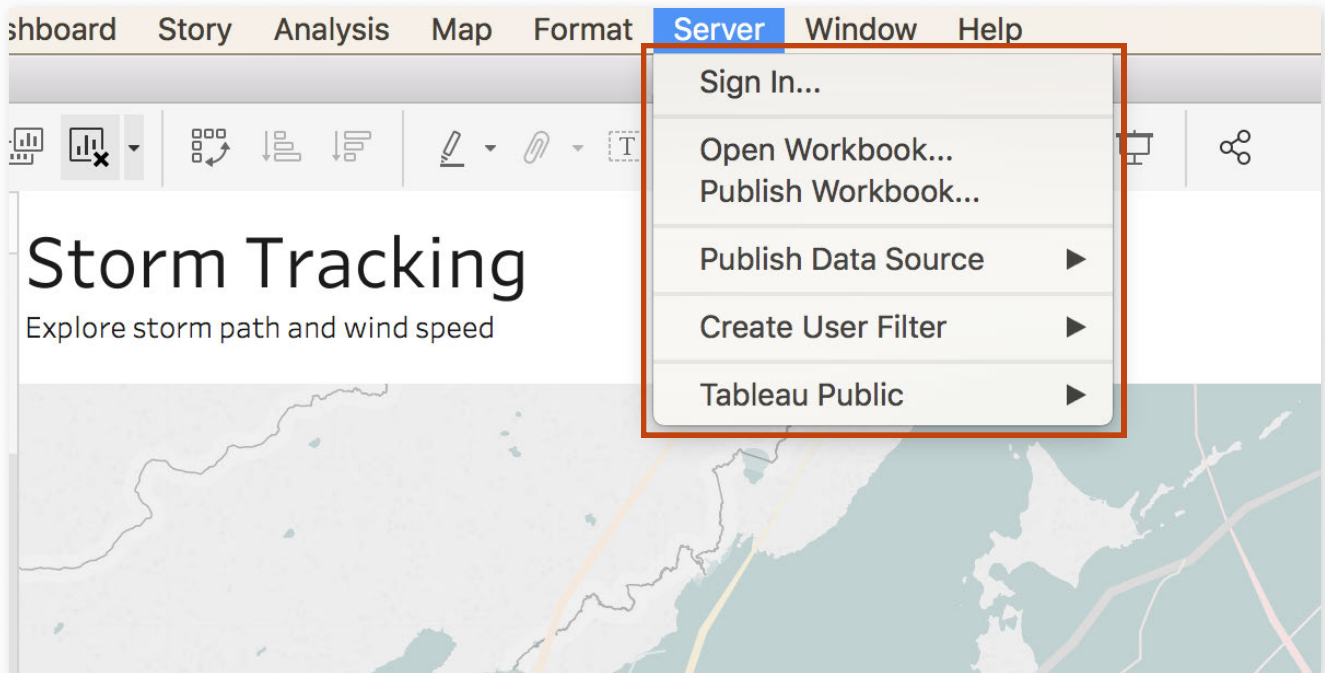
MVP FEATURES

- ✓ Escape & integrate
- ✓ Data manipulation
- ✓ In-app customization
- ✓ Code customization
- ✗ 3D
- ✓ Search

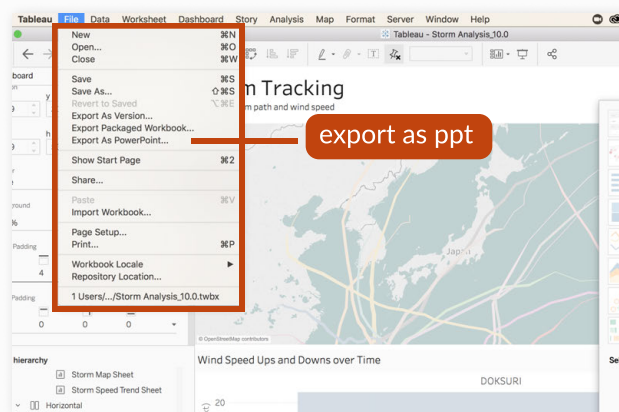
ASSESSMENT

For each Dashboard, Tableau provides users with a variety of graphs and charts as default options. Users can further customize each visualization layout. For each dataset, users can export the raw data, make changes, and integrate it back into the tool.

Tableau • Sharability



Visualization can be published via a web browser



Export visualizations as ppt

SCORE

5

Average

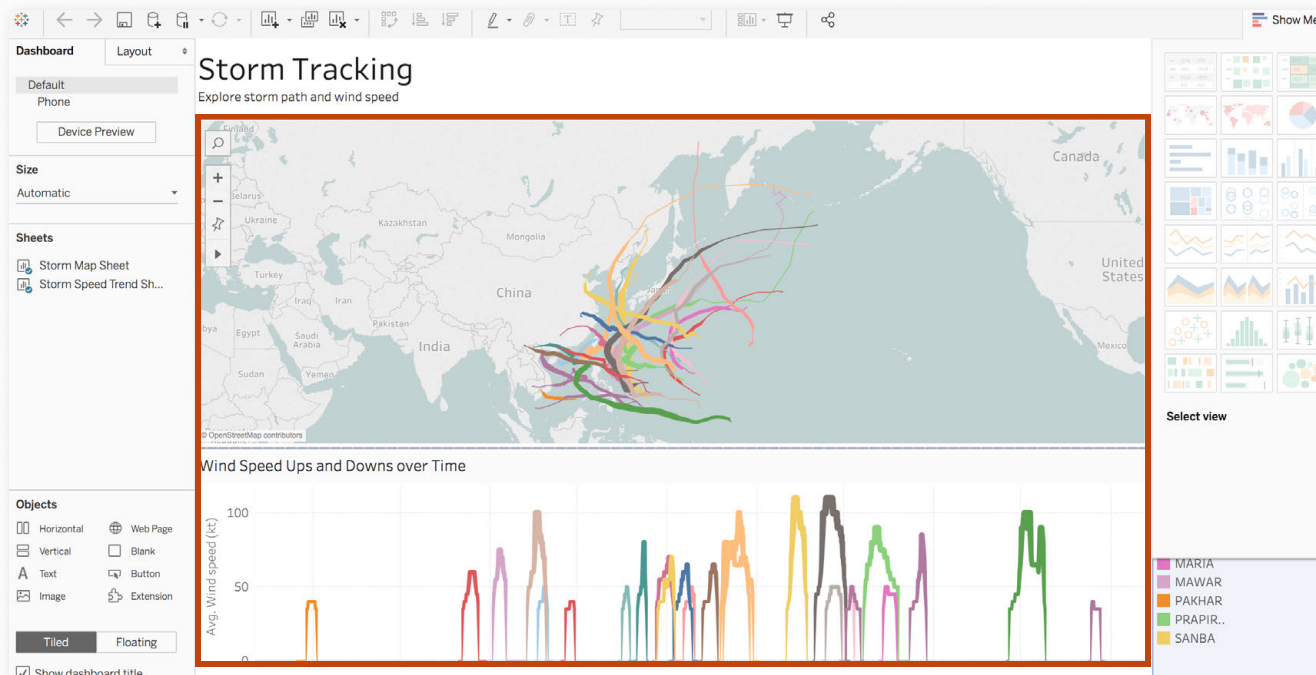
MVP FEATURES

- ✓ Import data
- ✓ Export data
- ✓ Share via URL
- ✓ Share WIP

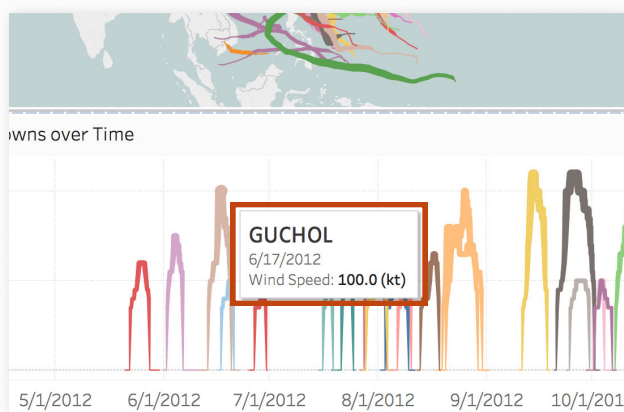
ASSESSMENT

With an account with Tableau, users can publish WIP or complete visualizations to a web browser. Tableau provides users with a URL to share with others. Besides, users also have the option to export visualization as a power point file.

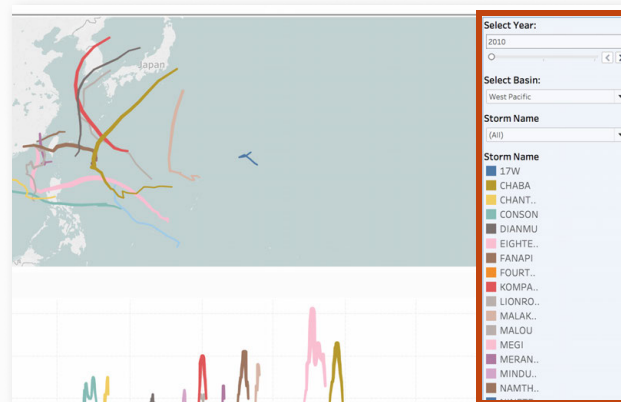
Tableau • Comparability



Data variables can be compared overtime based on specified criteria



Max/min data points can be shown



Data can further be drilled down by category

SCORE

5

Excellent

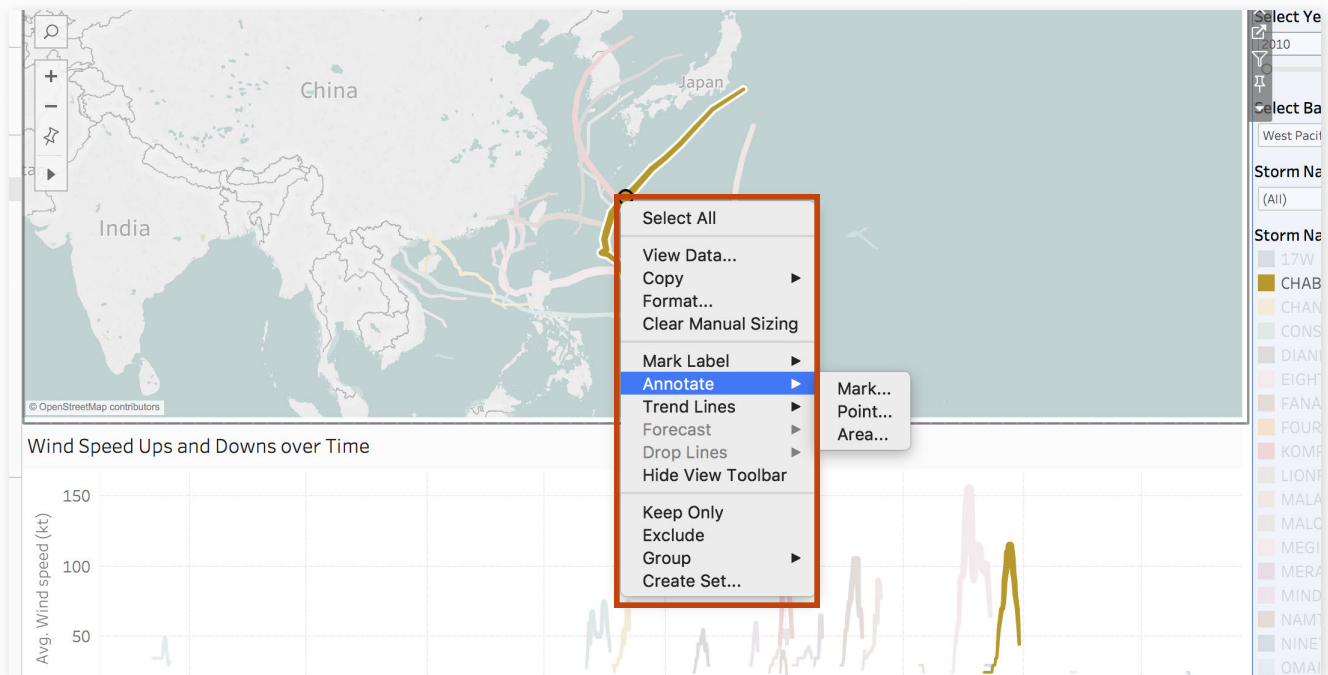
MVP FEATURES

- ✓ Compare data points
- ✗ Compare by time
- ✓ Compare by source
- ✓ Review data trends

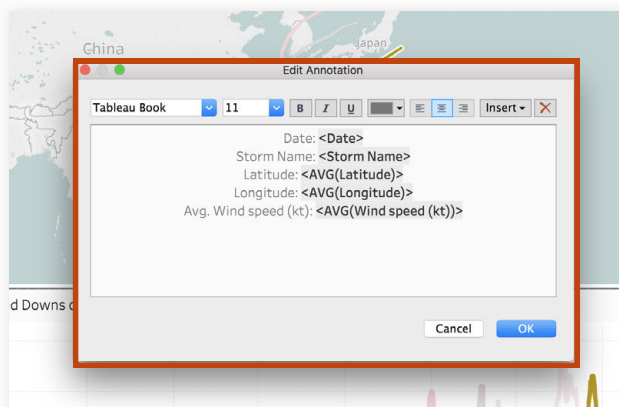
ASSESSMENT

Users can compare multiple datasets or compare the variables within a dataset. Tableau auto generate a data trend based on data input. For each set, users can compare and contrast data at a deeper level by applying filters or select specific variables.

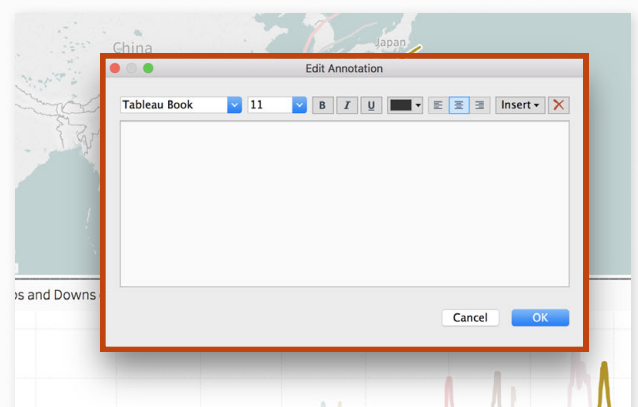
Tableau • Annotation



Users have 3 options for annotations



Annotation can be customized



Text-box annotation

SCORE

4

Good

MVP FEATURES

- ✓ Add annotation
- ✓ Add interpretation
- ✗ Add tag
- ✓ View others' annotations

ASSESSMENT

Users have 3 options to add annotation to the dataset. The structure of annotation can be customized based on the dataset & other team members can view the annotations. However, annotation in Tableau doesn't go beyond just adding metadata and textboxes. There's a need to tag colleague and the decision-making process.



is a digital publication that explains ideas debated in culture with visual essays.

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WHAT'S NEW



The Rise of Hyphenated Last Names in Pro Sports

Since the 1990s names that arch over jerseys have become more common.

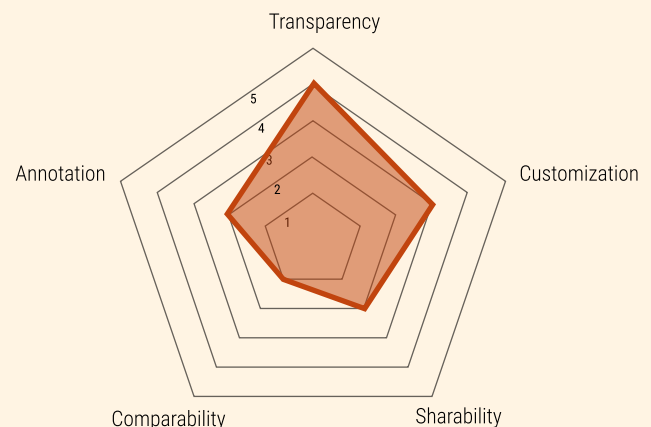
By JAN DIEHM

Pudding.cool

The Pudding is a platform that offers virtual essays. Each essay shows a visualization of datasets in an interactive way coupled with primary research. The goal of virtual essays is to provide an accessible information in a transparent way.

Takeaways

The Pudding offers virtual essays with interactive visualization to better consumption of content. While it is a transparent platform, it lacks sharing, comparing and annotation capabilities that are necessary for a customized and collaborative environment. This is a good format for data consumption but not data manipulation.



Pudding • Transparency

METHODS

The covers were downloaded from [The Vogue Archive](#) (paywall, but most public libraries have memberships) . Only covers from January 2000 through December 2018 were used, since earlier covers were scanned and had inconsistent color quality.

The covers were fed into a [script](#) that identified the faces of models and cropped the images down to size. The script produced many [false positives](#), which were identified and removed by hand, along with the faces of male models.

For each face, several k-means clustering models were fit. The clustering models varied in terms of which features were used (some combination of the `rgb` and `hsl` color values) as well as how many clusters were formed (two or three). Since the style of the covers varied so differently, [different clustering models](#) did a good job at identifying the skin. The script filtered out just the pixels that were determined by the computer model to contain skin, and calculated and stored the median `rgb` color, as well as the corresponding lightness value. Two people double checked that the clustering models were outputting valid results that visually made sense based on the input photos, and the results of all of the valid clustering models were averaged together.

Each article ends with a section detailing the methods used in creation.

The covers were fed into a [script](#) that identified the faces of models and cropped the images down to size. The script produced many [false positives](#), which were identified and removed by hand, along with the faces of male models.

Many of the articles contain links to github or spreadsheets used to analyze data

SCORE

4

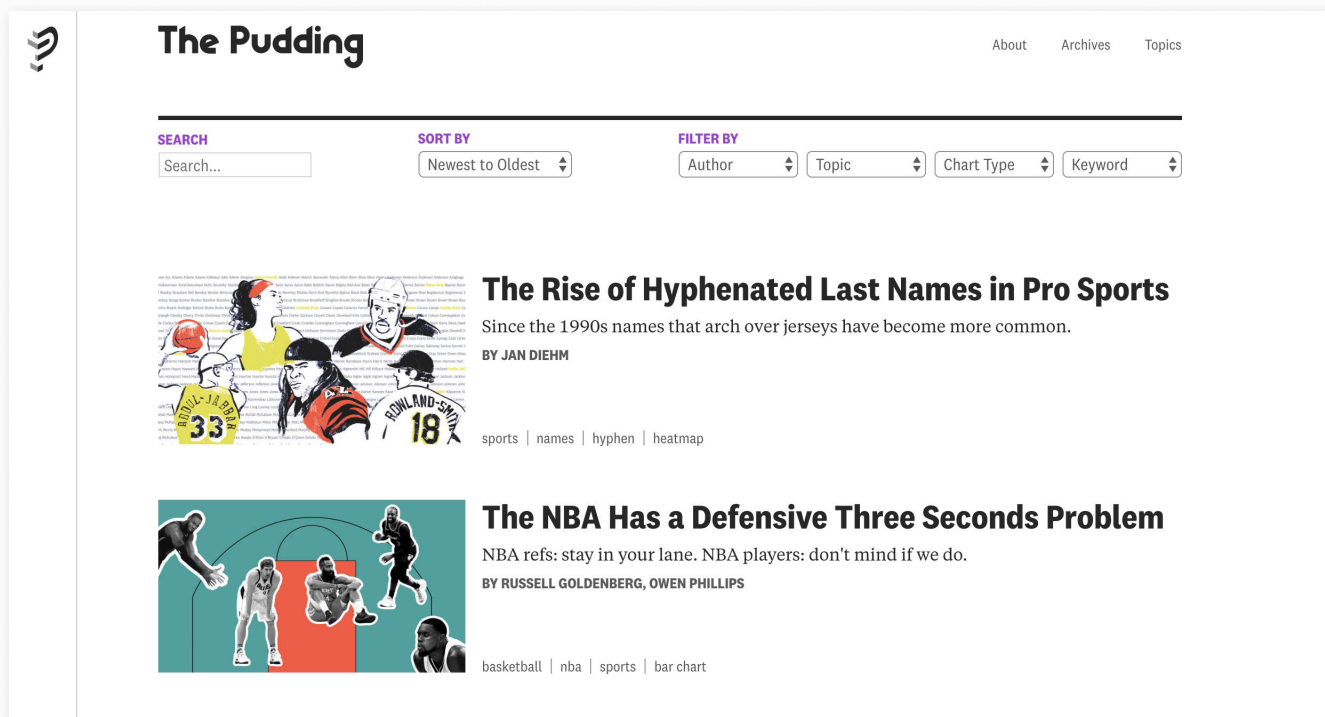
Good

MVP FEATURES

- ✗ Show time retrieved
- ✓ Show data format
- ✗ Show data source
- ✗ Access to raw data
- ✗ Provide data context

ASSESSMENT

Pudding.cool does a good job of making sure their data sources are transparent and allowing others to view their datasets and their analysis process. This is an important part of the platform's push for insuring trust in their readers.



Search customization for ease of finding content

SCORE

3

Average

MVP FEATURES

- ✓ Escape & integrate
- ✗ Data manipulation
- ✗ In-app customization
- ✗ Code customization
- ✓ 3D
- ✓ Search

ASSESSMENT

There is little to no customizability available on this website. This platform intended not for customizing, but instead for data consumption and engaging readers with interactive data visualizations.

pudding • Sharability

Was this your jam? **Preach.**

👍 Like 610


🐦 Tweet




Share articles with facebook and twitter

Data collection for The Pudding exploration

1 commit 1 branch 0 releases 1 contributor

Branch: master New pull request Find File Clone or download

 malaikahanda uploaded notebooks Latest commit 70924bd on Apr 4

 get_faces.ipynb	uploaded notebooks	a month ago
 get_skin.ipynb	uploaded notebooks	a month ago
 make_csv.ipynb	uploaded notebooks	a month ago

GitHub links allow for another form of sharing

SCORE

2

Not Good

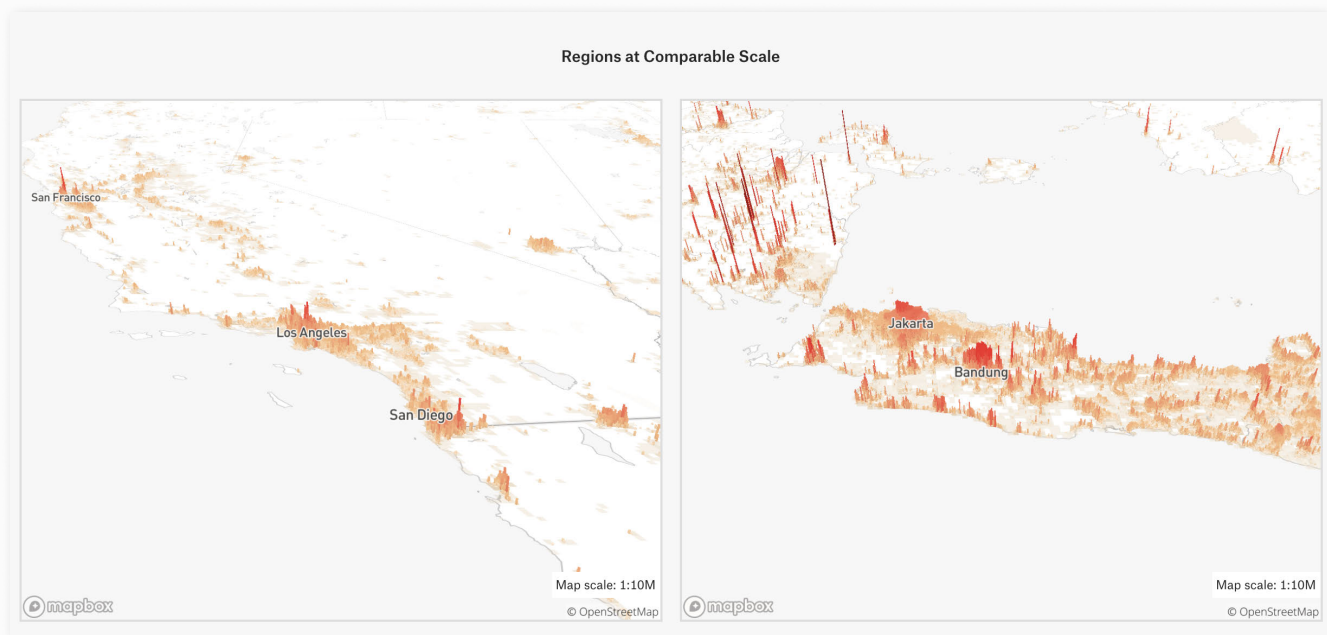
MVP FEATURES

- ✗ Import data
- ✗ Export data
- ✓ Share via URL
- ✗ Share WIP

ASSESSMENT

In most cases, the data source and a github link are provided, so users are able to share their work with others but I wouldn't say it is a feature of this platform but more a feature of other platforms that it utilizes.

Pudding • Comparability



Comparisons will always be observed from a consumer level.

SCORE

1

Severe

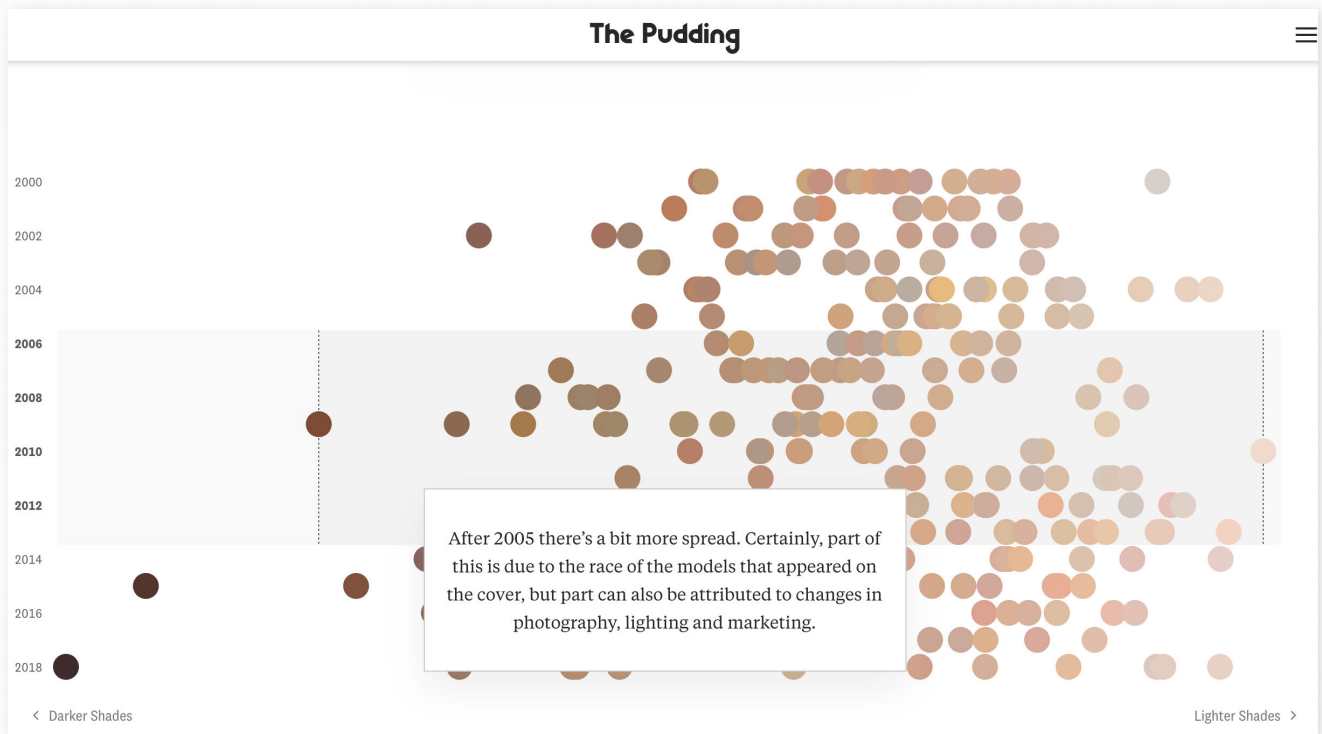
MVP FEATURES

- ✗ Compare data points
- ✗ Compare by time
- ✗ Compare by source
- ✗ Review data trends

ASSESSMENT

There is no option to compare data sets aside from what is crafted within one virtual essay.

Pudding • Annotation



Annotations are embedded into virtual essays to better convey the authors points

SCORE

2

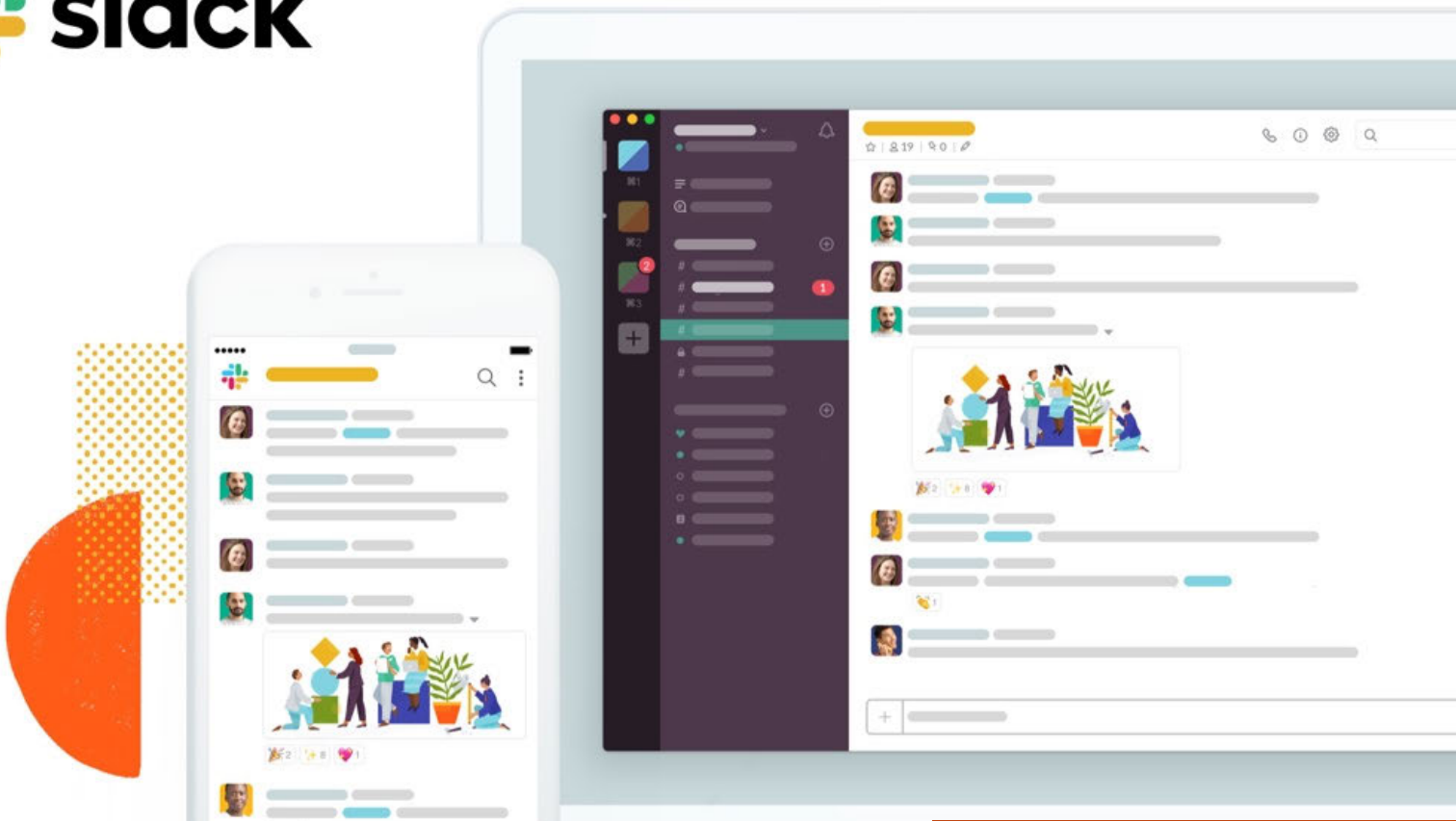
Not good

MVP FEATURES

- ✗ Add annotation
- ✗ Add interpretation
- ✗ Add tag
- ✓ View others' annotations

ASSESSMENT

Unlike some platforms like Medium where users can leave comments, there are no annotation features on this platform.

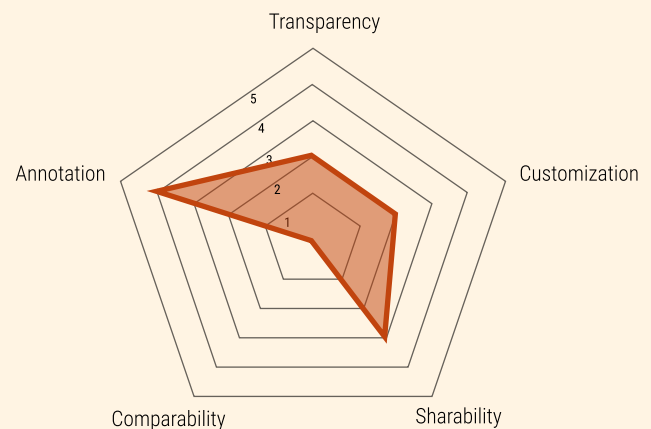


Slack

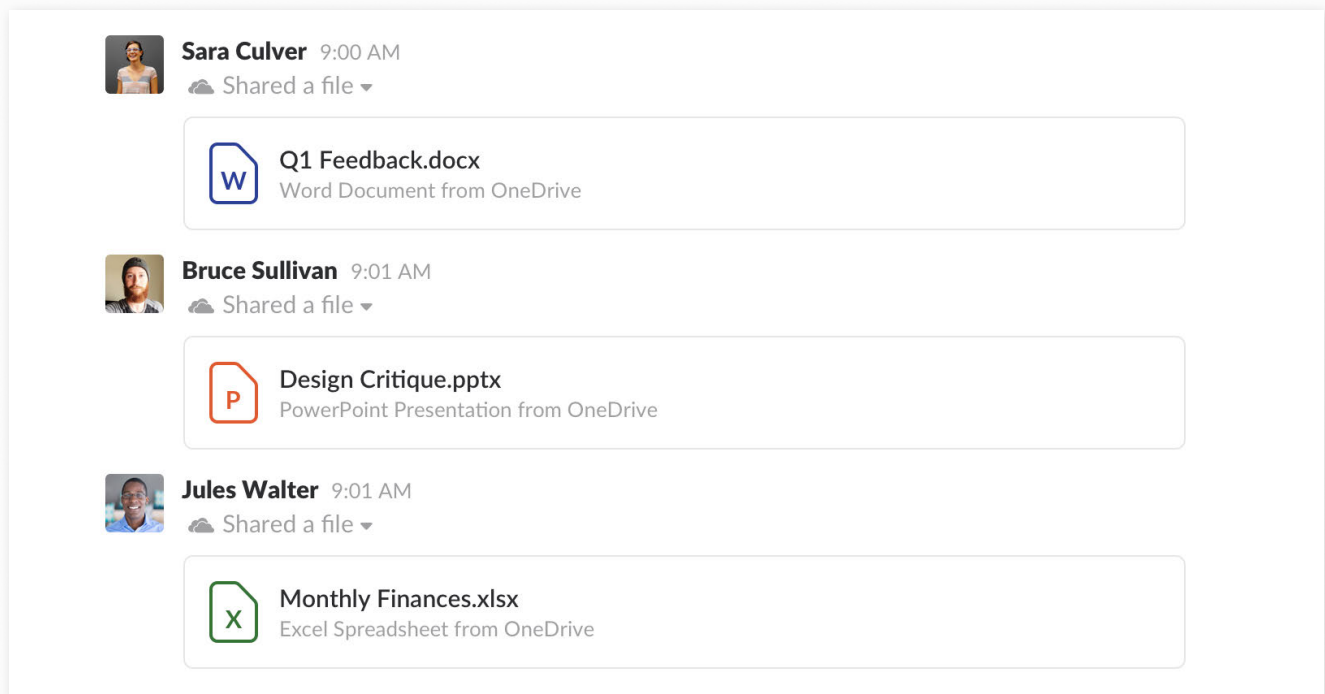
Slack allows for communication within a workplace or organization through messaging and voice or video chats. Users are able to share files within channels which are then saved to the channel. Messages are shown in a chronological order for ease of organization.

Takeaways

Slack is a good communication tool allowing for screen sharing a video chatting for users in disparate locations. In terms of working with data, it is lacking in its ability to be collaborative as you are not able to work on files within Slack.



Slack • Transparency



Slack allows for exchange of files but users' access to data is limited to what other users decide to share

SCORE

2

Not Good

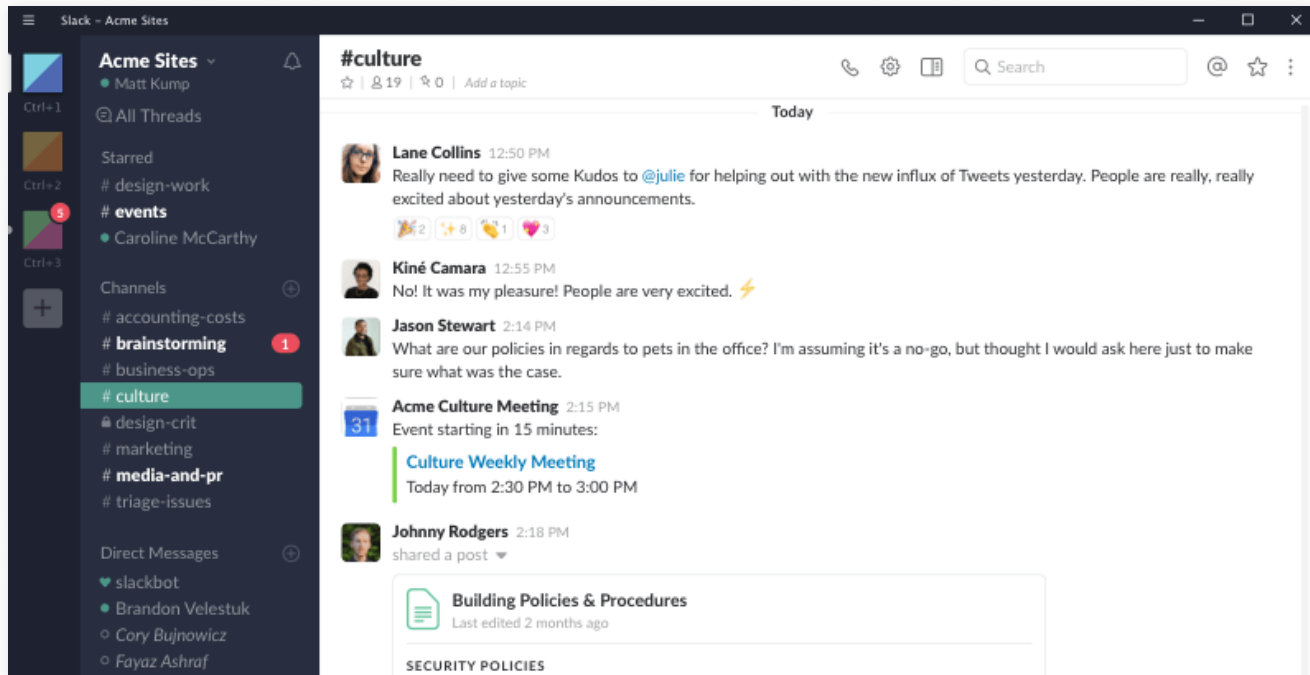
MVP FEATURES

- ✓ Show time retrieved
- ✓ Show data format
- ✗ Show data source
- ✗ Access to raw data
- ✗ Provide data context

ASSESSMENT

When it comes to data, transparency is not a consideration for Slack. Users upload data files to a channel or private message. Files uploaded to slack can be downloaded and any changes to the data must occur outside of this platform.

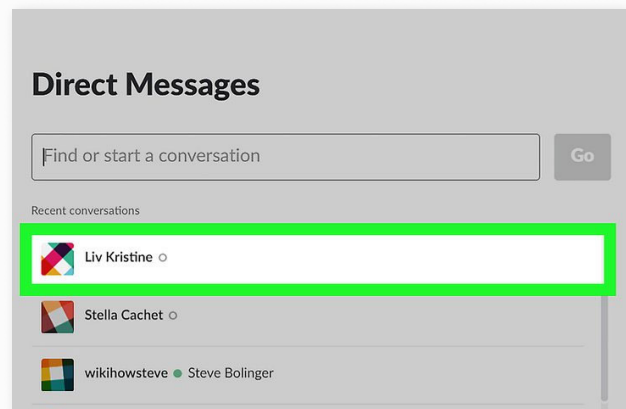
Slack • Customization



Select channels to join or create your own public or private channel



Video and voice call options



Direct message other users for more conversations outside of your channels

SCORE

2

Not Good

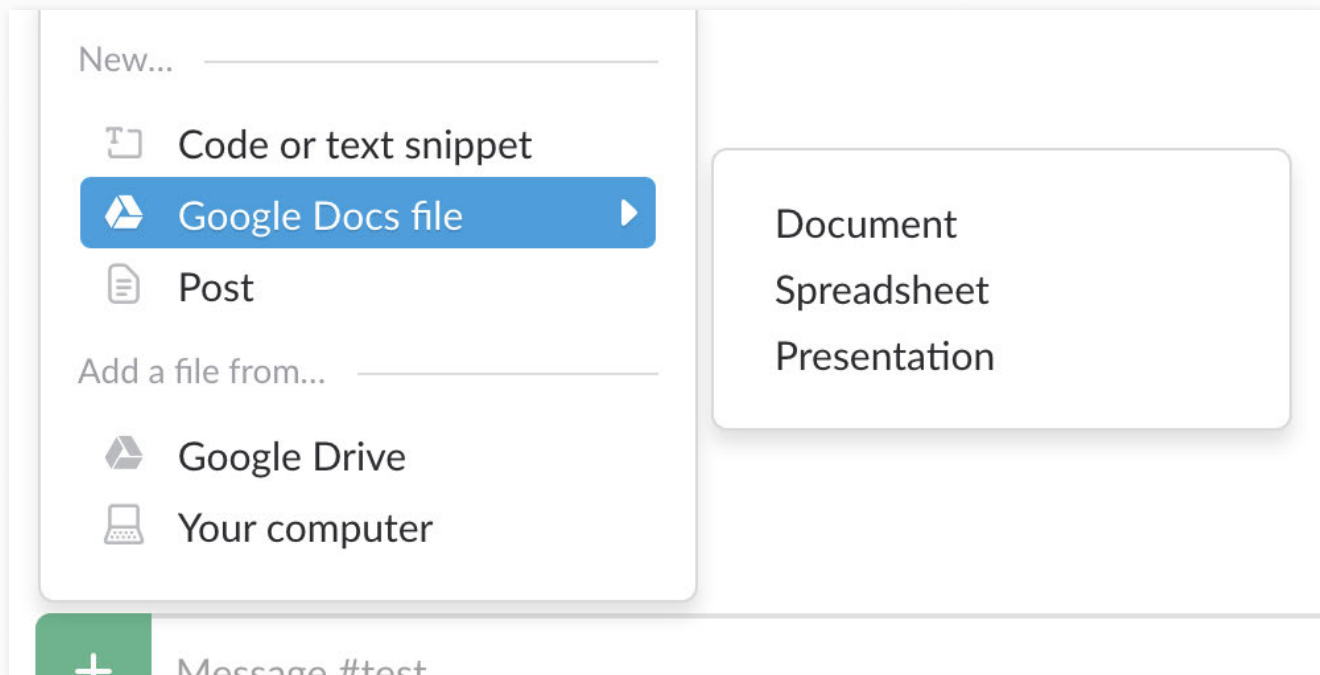
MVP FEATURES

- ✓ Escape & integrate
- ✗ Data manipulation
- ✗ In-app customization
- ✗ Code customization
- ✗ 3D
- ✓ Search

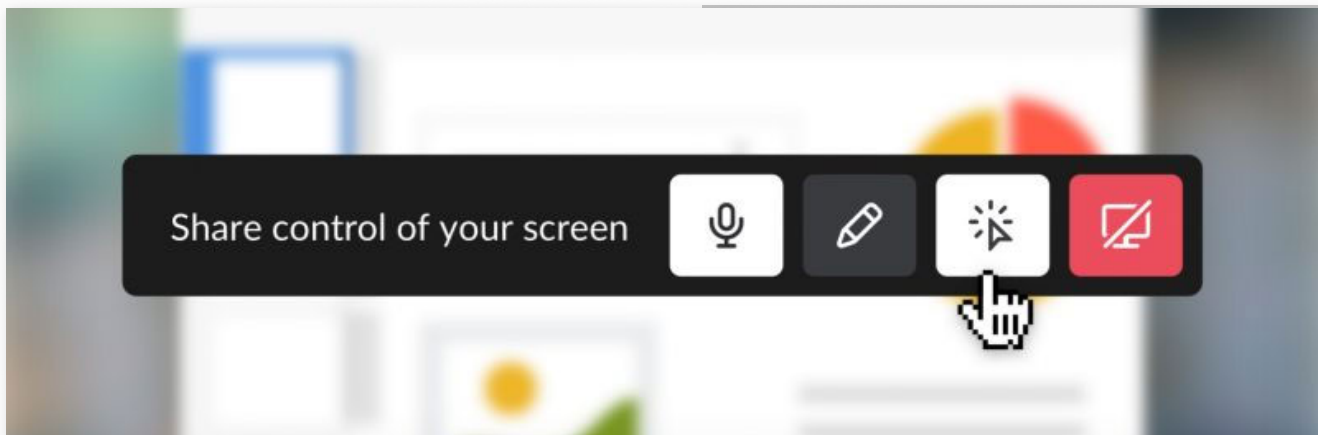
ASSESSMENT

In terms of collaboration, the settings you can customize are related to privacy of a channel and your notifications. You have the option of using slack with messaging, phone or video chats and screen sharing.

Slack • Sharability



Quick uploads of files from your google drive or device



Share your screen and allow others to point and draw on your screen

SCORE

3

Average

MVP FEATURES

- ✓ Import data
- ✓ Export data
- ✗ Share via URL
- ✗ Share WIP

ASSESSMENT

Slack allows for easy uploading of files into a channel or a direct message. During a screen share, users are able to make temporary marks on a user's screen. However users are not able to collaborate on documents or files at the same time.

Slack • Comparability

N/A

SCORE

0

N/A

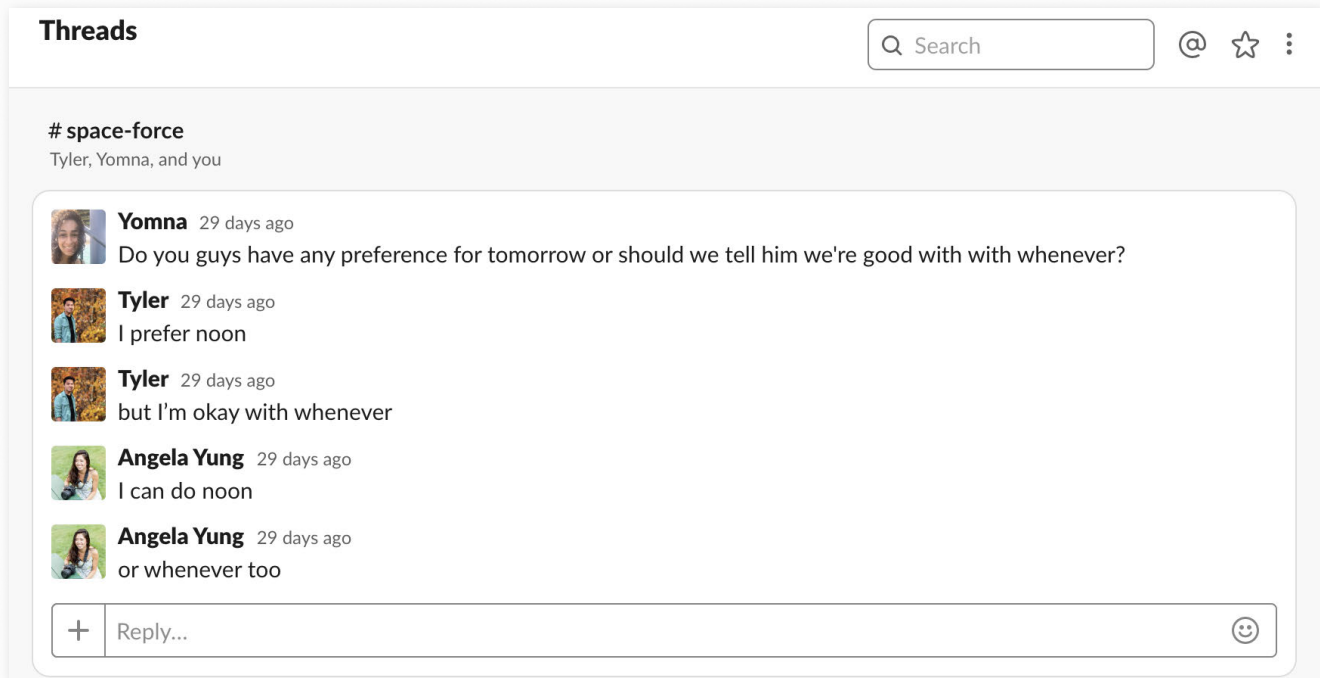
MVP FEATURES

- ✕ Compare data points
- ✕ Compare by time
- ✕ Compare by source
- ✕ Review data trends

ASSESSMENT

N/A

Slack • Annotation



Start threads to respond to specific conversations

SCORE

4

Good

MVP FEATURES

- ✓ Add annotation
- ✓ Add interpretation
- ✗ Add tag
- ✓ View others' annotations

ASSESSMENT

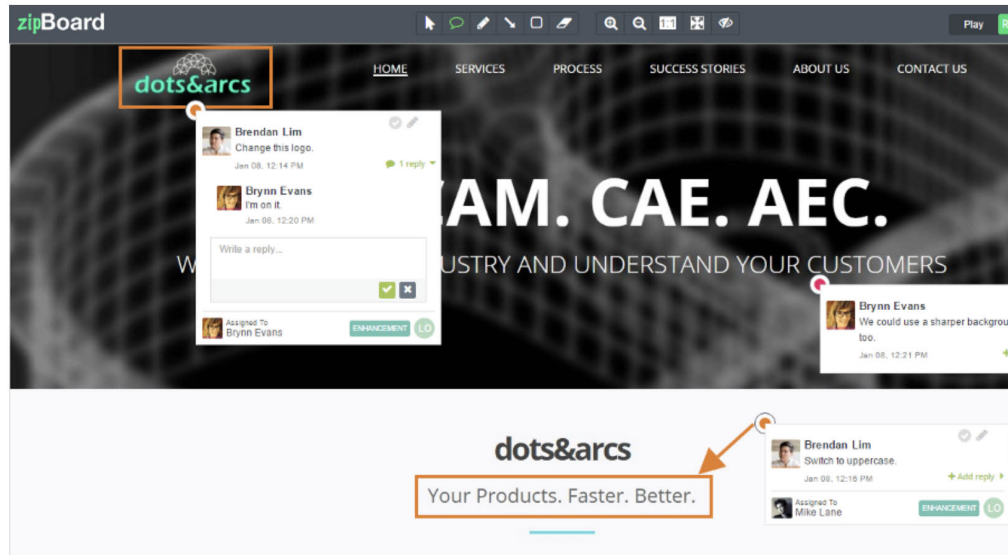
Slack does not allow for annotations on documents or files, however, it allows for reactions to comments and starting threads within a channel which act as annotations within a particular conversation.



zipBoard for eLearning

Whether working with a rapid authoring tool or a custom learning solution, zipBoard makes it easy to track tasks, capture issues, and exchange feedback across instructional designers, project managers, subject matter experts and clients. Instructional design collaboration and eLearning reviews are a breeze on zipBoard.

[Learn More](#)

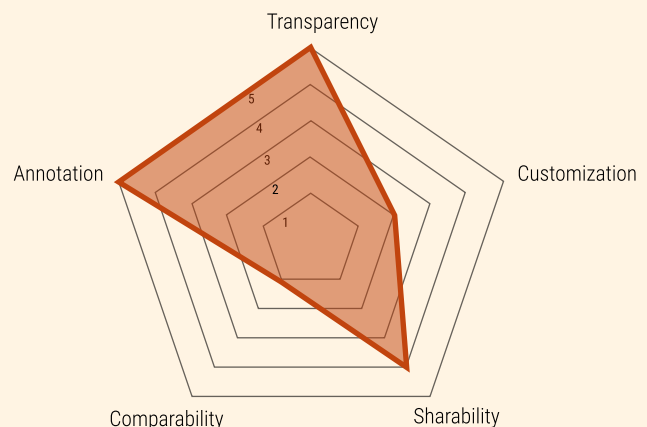


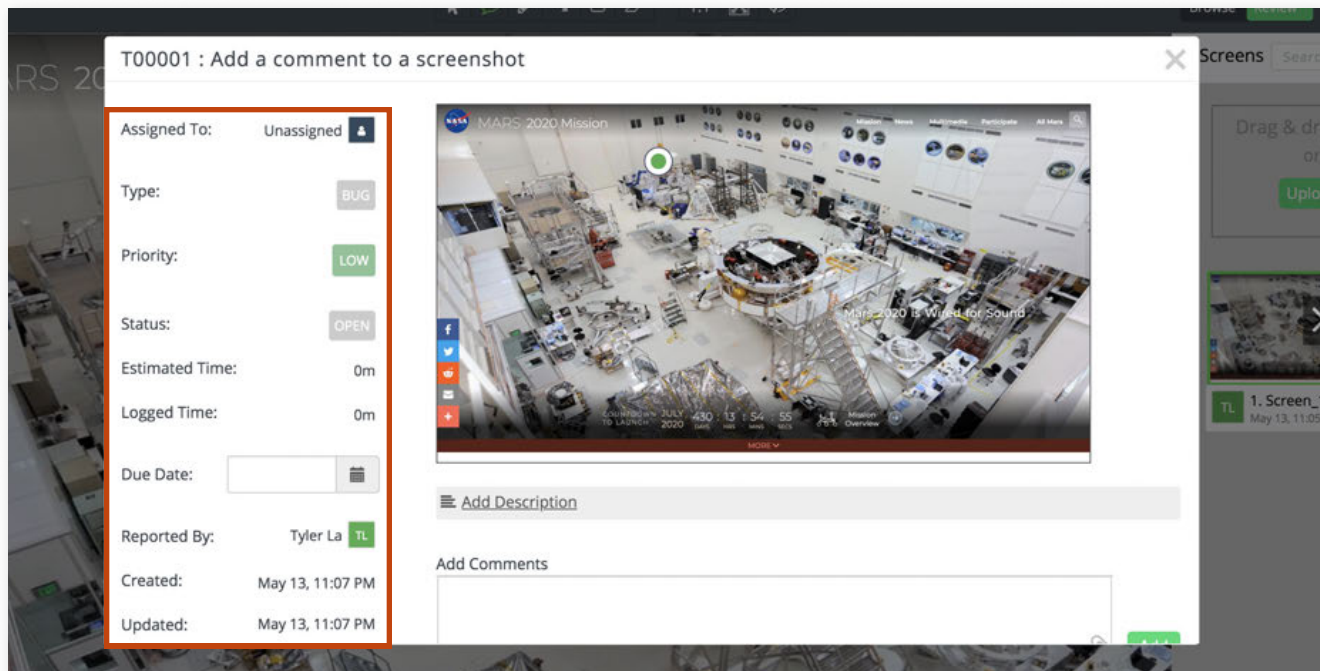
zipBoard

zipBoard is a collaboration tool for designers, developers, and project managers. It is an 'online whiteboard' where multiple users can take notes, comment, give feedback, and annotate with one another. zipBoard is relevant to our research since scientists need to annotate weather information and rover targets to collaborate with other scientists and engineers.

Takeaways

zipBoard's annotation capability is straightforward and easy to use. The tool allows users to utilize annotation beyond just adding text boxes. By allowing users to attach files, assign teammates, and add comments, zipBoard helps integrate context into each data point. However, the tool doesn't have any other features besides annotation.





Metadata is available

SCORE

5

Excellent

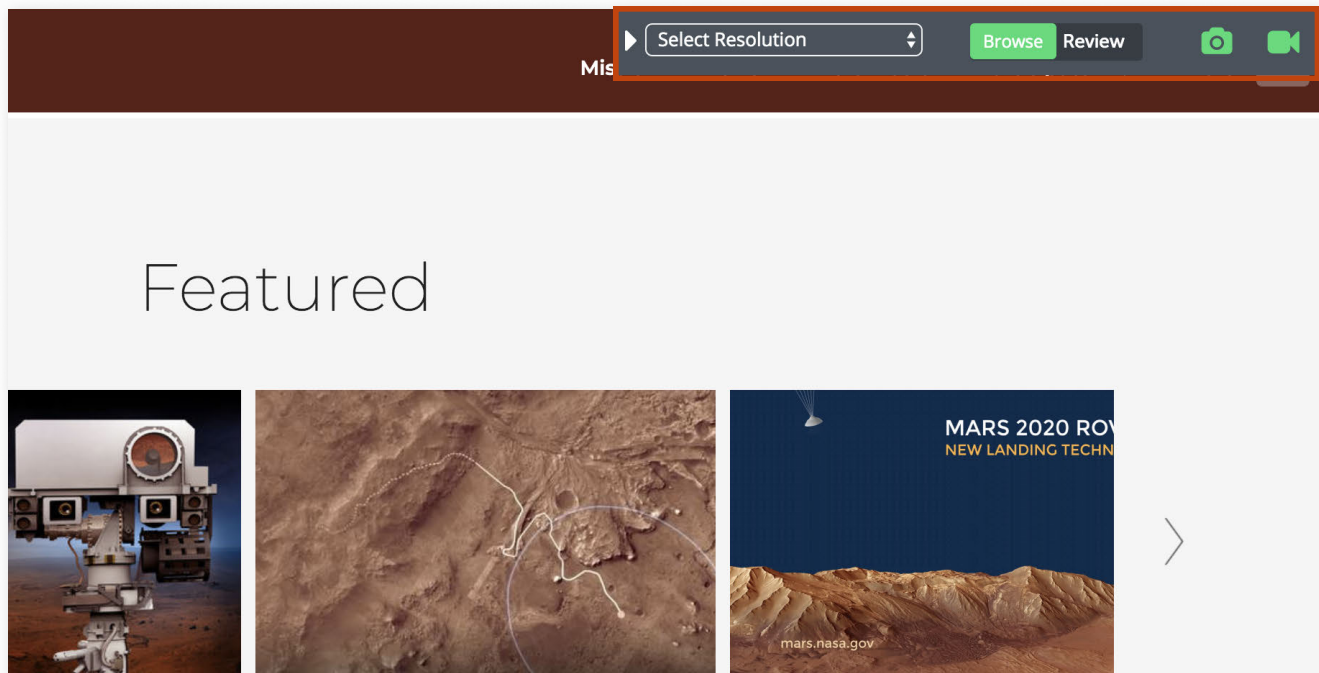
MVP FEATURES

- ✓ Show time retrieved
- ✓ Show data format
- ✓ Show data source
- ✓ Access to raw data
- ✓ Provide data context

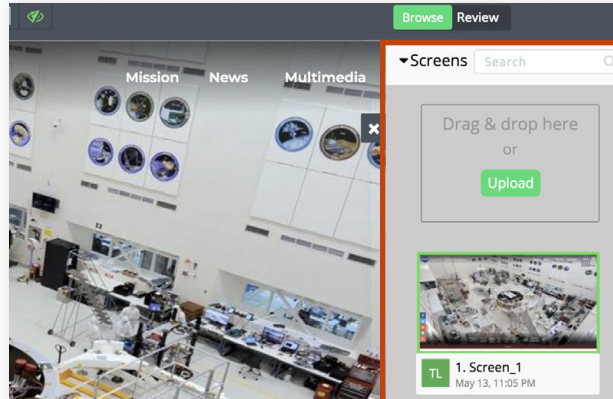
ASSESSMENT

zipBoard shows users the screenshot, date retrieved, data type along with the source of raw data. Since the tool allows users to attach a file to an annotation, data context can be tagged along with the annotation.

zipBoard • Customization



Users can toggle back and forth between original and annotated views



Search capability

SCORE

2

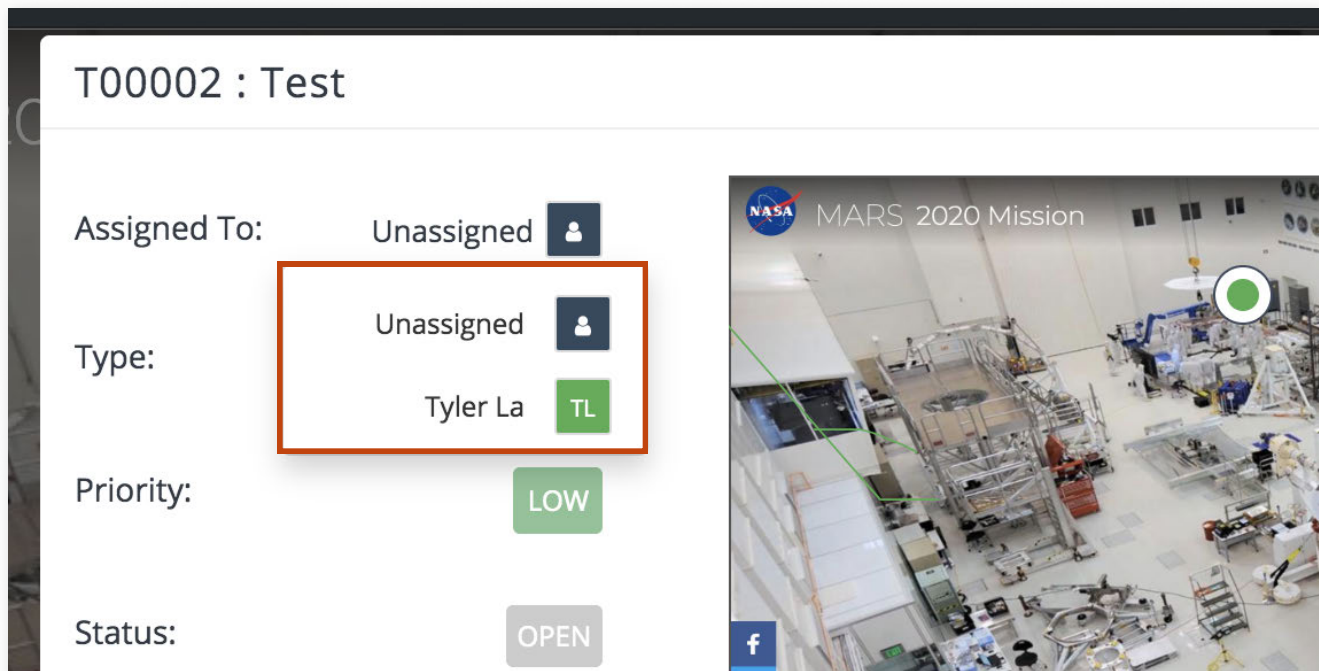
Not good

MVP FEATURES

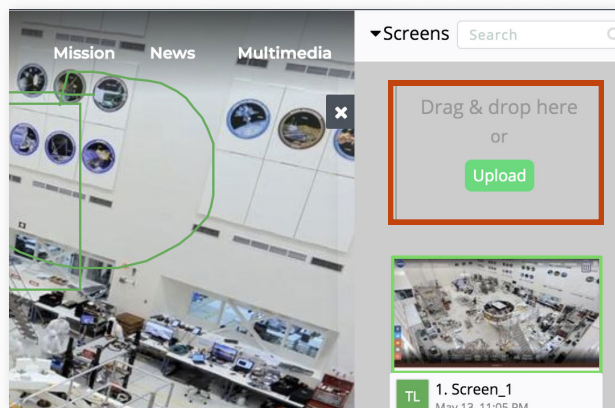
- ✓ Escape & integrate
- ✗ Data manipulation
- ✗ In-app customization
- ✗ Code customization
- ✗ 3D
- ✓ Search

ASSESSMENT

With zipBoard, the workflow for switching back and forth between original (raw data) and annotated (processed data) is quick. Users can search for specific task and screenshot. However, the tool stops at annotation and doesn't enable in depth data analysis capability.



WIP can only be shared with others yet there's no URL generation



Import/export

SCORE

4

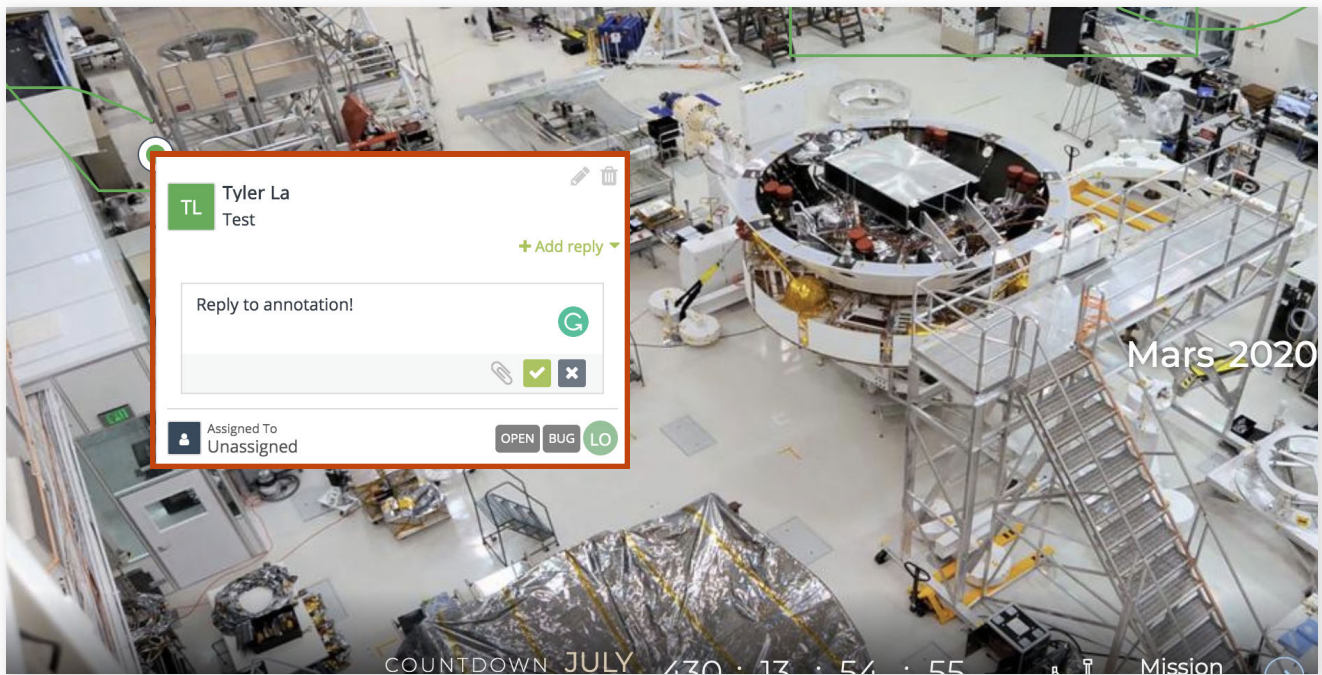
Good

MVP FEATURES

- ✓ Import data
- ✓ Export data
- ✗ Share via URL
- ✓ Share WIP

ASSESSMENT

Users can import/export work as an image. Collaboration can only happen with the entire team is using zipBoard; there's no URL generation that allows for quick access to WIP.



Users can reply and attach files to an annotation created by another person

SCORE

1

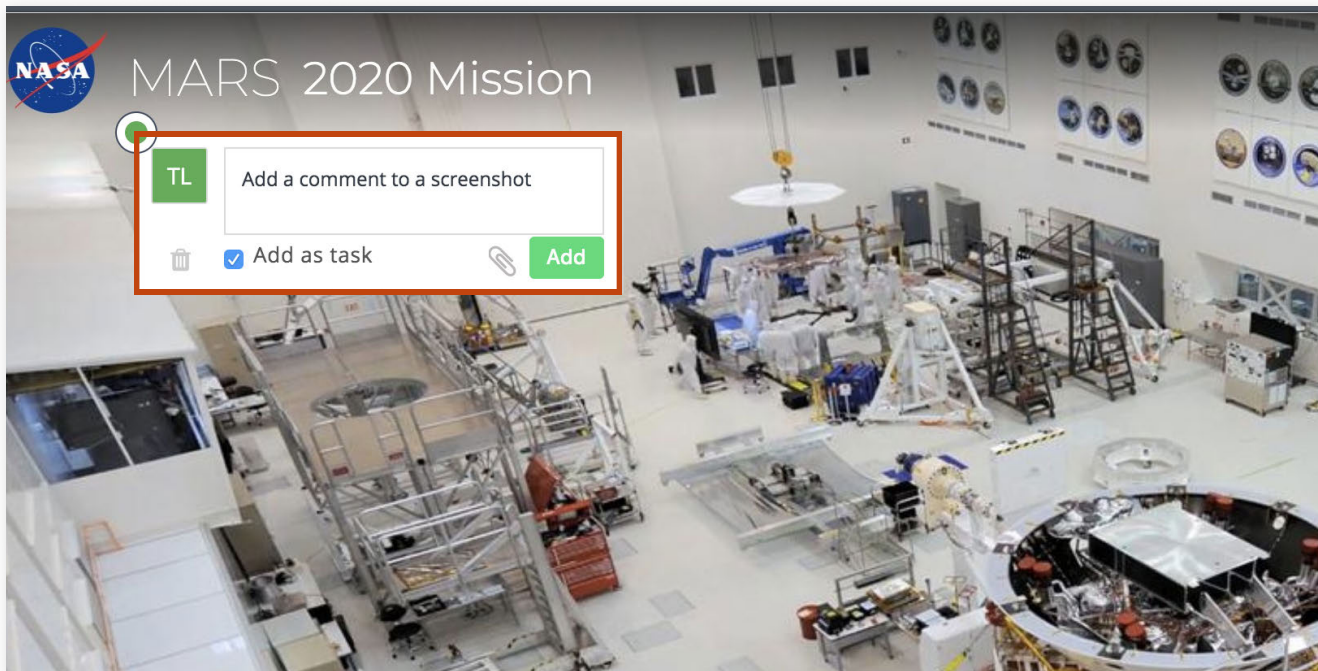
Severe

MVP FEATURES

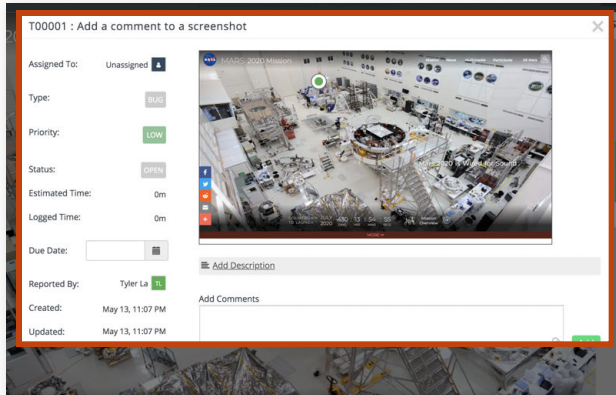
- ✗ Compare data points
- ✗ Compare by time
- ✗ Compare by source
- ✗ Review data trends

ASSESSMENT

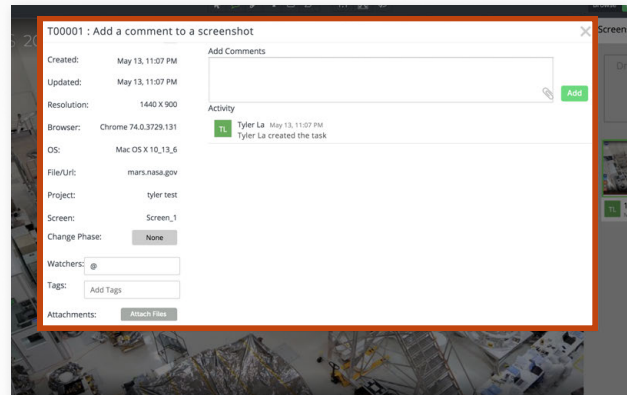
N/A. For each annotation, users can compare notes and reply to each other. However, data analysis is irrelevant for zipBoard.



Users can annotate on a web browser



Customizing annotation - step 1



Customizing annotation - step 2

SCORE

5

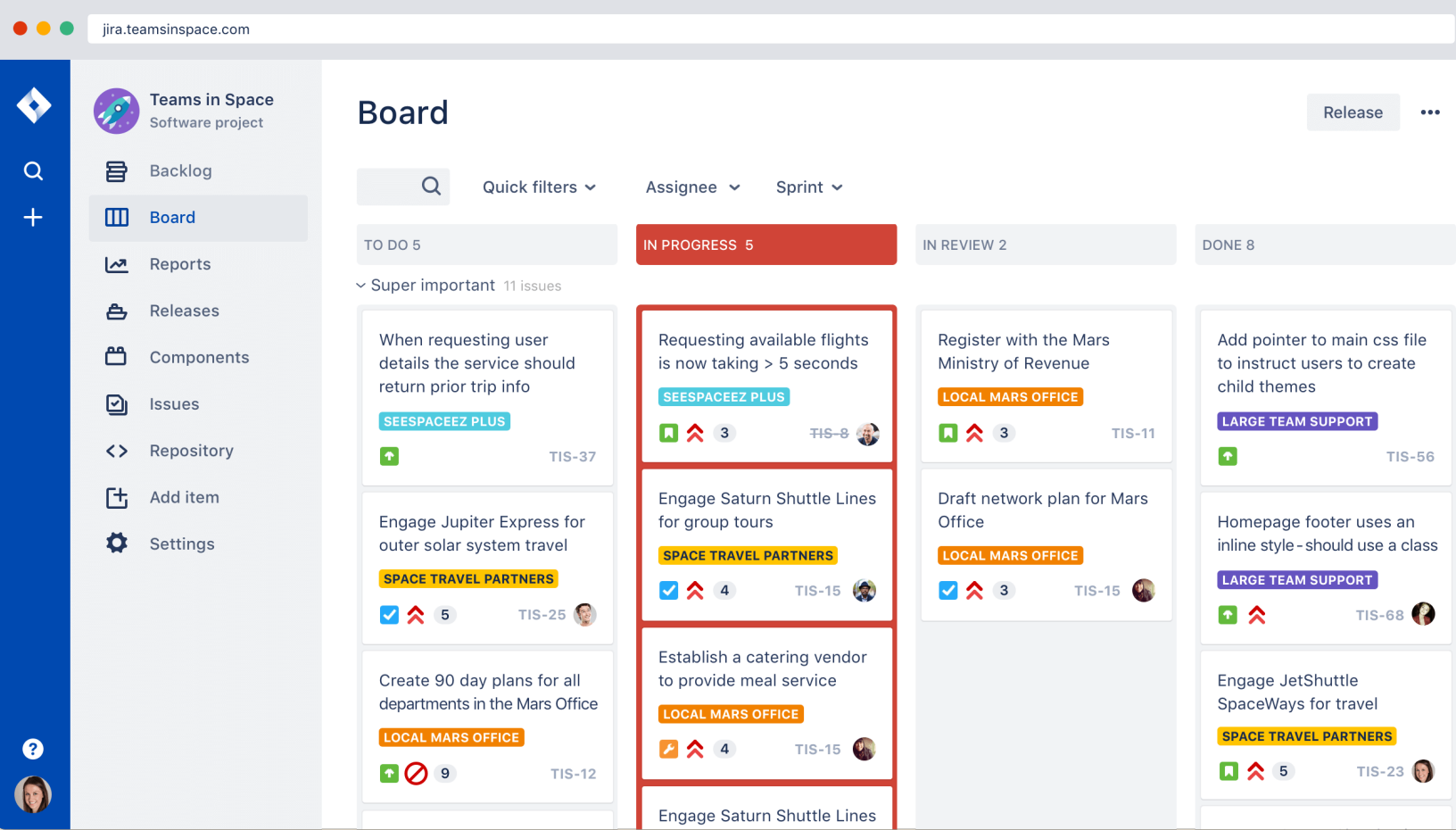
Excellent

MVP FEATURES

- ✓ Add annotation
- ✓ Add interpretation
- ✓ Add tag
- ✓ View others' annotations

ASSESSMENT

Annotation in zipBoard goes beyond just adding a text box, users can customize, collaborate, and add additional notes if needed.

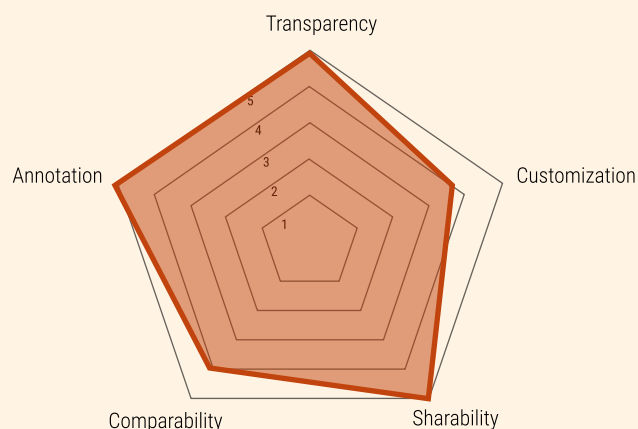


JIRA

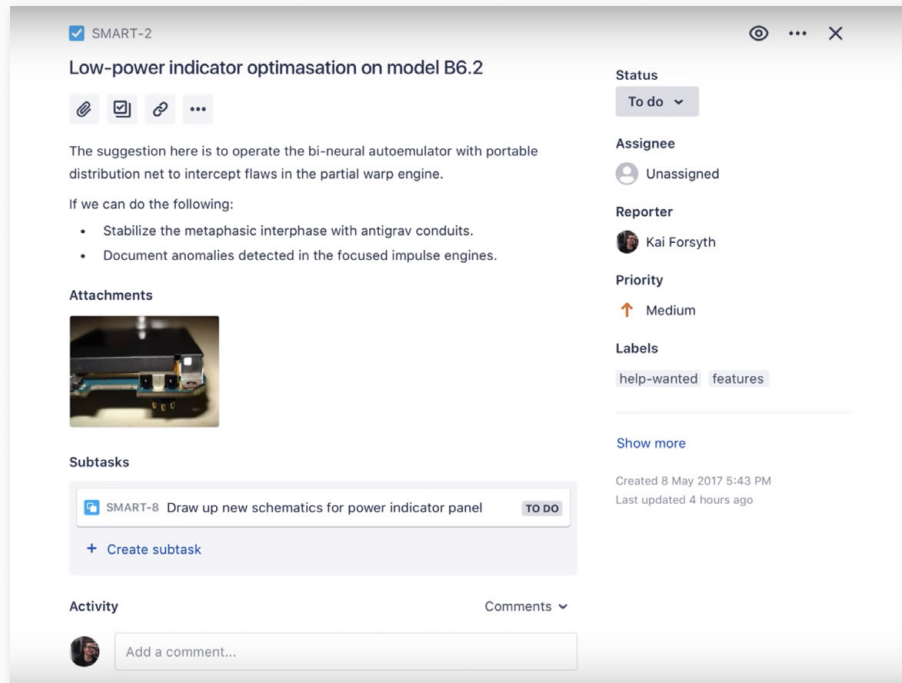
JIRA is project management software used for development and bug tracking. It supports prioritization, roadmaps, ticketing, commenting, and integration with other tools such as google docs and github. It's meant to provide a single source of truth for project management purposes, acting as a hub for all parts of the product cycle.

Takeaways

JIRA is the tool to beat for asynchronous collaboration. It handles almost all categories very well, and allows for robust commentary and tracking of roadmaps over time. It may be too detailed for the scope of our project, but its rich with ideas for us to consider. One area we may be able to improve upon is its comparison view, which is geared more towards developers than planning.



JIRA • Transparency



Example of a ticket in JIRA and the visibility of involved parties

Page History				
Compare selected versions				
Version	Published	Changed By	Comment	Actions
<input type="checkbox"/> CURRENT (v. 4)	Jan 31, 2018 10:16	Emma McRae	Final changes	
<input type="checkbox"/> v. 3	Jan 31, 2018 10:11	Emad Abdi Emma McRae		Restore Delete
<input type="checkbox"/> v. 2	Jan 31, 2018 10:08	Emad Abdi		Restore Delete
<input type="checkbox"/> v. 1	Jan 31, 2018 10:08	Cassie Owens		Restore Delete
Return to Page Information				

All changes are logged in JIRA, allowing for change history to be reviewed

SCORE

5

Excellent

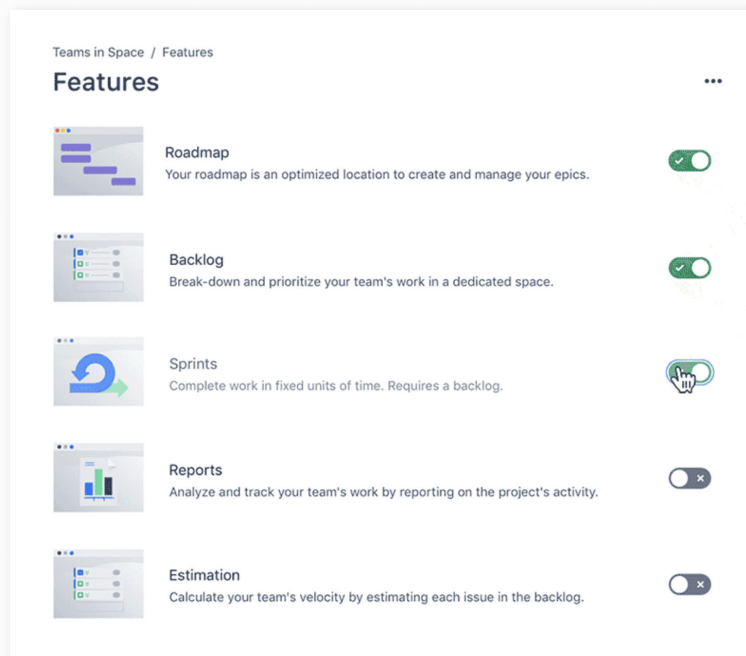
MVP FEATURES

- ✓ Show time retrieved
- ✓ Show data format
- ✓ Show data source
- ✓ Access to raw data
- ✓ Provide Data Context




ASSESSMENT

JIRA offers users the ability to organize the flow of information across the organization. One important aspect of this is allowing teams visibility into whatever other teams are working on and any dependencies someone is experiencing. There is no anonymity in JIRA, so any change, comment, or update done in JIRA is tracked back to a account owner.

JIRA • Customization



JIRA administrators can toggle features on and off as needed for their organization

Field	Operator	Value
 p	 project	 project = p
parent	=	Pipeline (POP)
priority	!=	Pomodoro Support Issues (PSP)
project	is not	Pomodoro Web Client (PWC)

Example of JQL (JIRA Query Language)

SCORE

4

Good

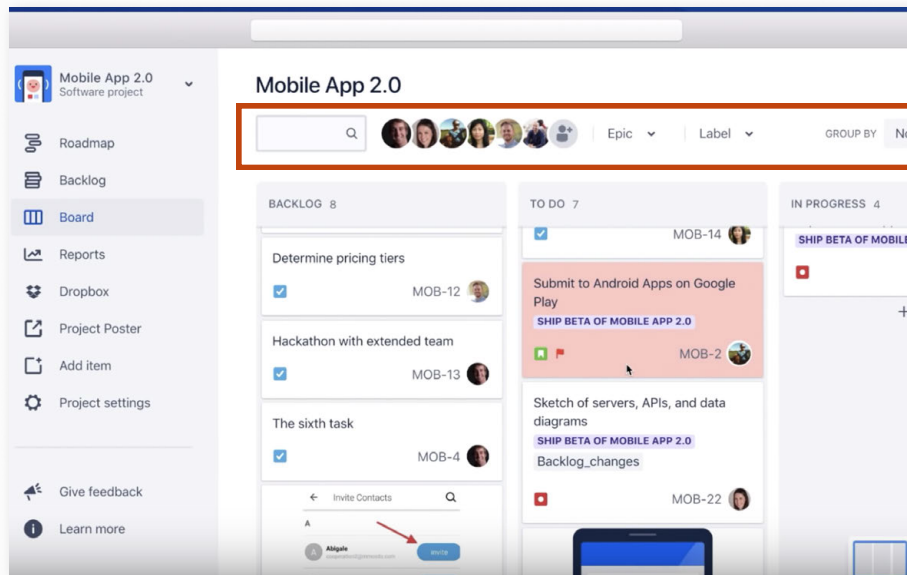
MVP FEATURES

- ✓ Escape & Integrate
- ✗ Data manipulation
- ✓ In-app customization
- ✓ Code customization
- ✗ 3D
- ✓ Search

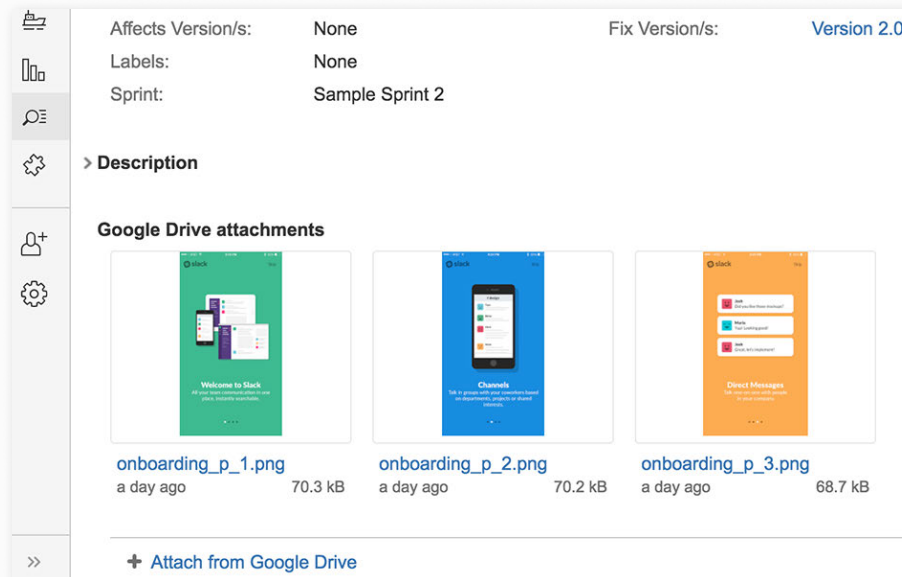
ASSESSMENT

JIRA is highly customizable, allowing both administrators and users to have differing levels of control over the tool. In addition to filters, features, and UI elements, you can customize URLs, naming conventions, and types of projects. JIRA supports multiple types of workflows, but also allows users to modify 'classic' versions of those workflows.

JIRA • Sharability



JIRA features are innately social, allowing large team to collaborate on complex projects



Third-party integrations like Google Drive allow for further collaboration

SCORE

5

Excellent

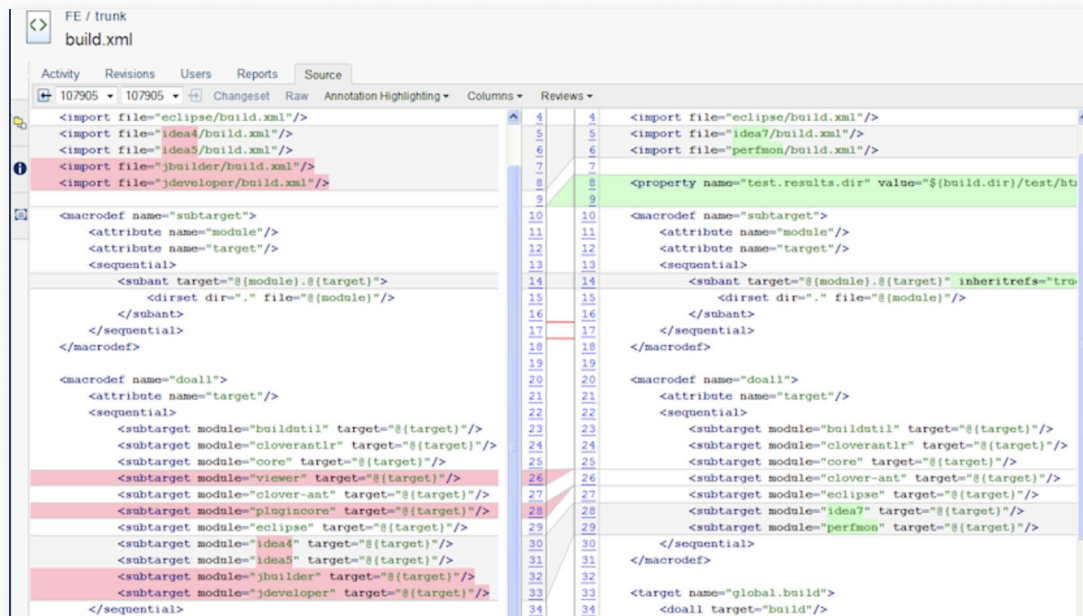
MVP FEATURES

- ✓ Import data
- ✓ Export data
- ✓ Share via URL
- ✓ Share WIP

ASSESSMENT

JIRA's focus is on its ability to connect teams with each other and with other tools. Each user is able opt-in to tracking an issue or be assigned to do so. This tracking capability also allows users to integrate with other software like GitHub to make sure that there is a single source of truth for each ticket, avoiding duplicate workflows or confusing files.

JIRA • Comparability



Comparison view of code versions with color-coded annotation of changes

SCORE

4

Average

MVP FEATURES

- ✓ Compare data points
- ✓ Compare by time
- ✓ Compare by source
- ✗ Review data trends

ASSESSMENT

JIRA supports comparisons views for developers, allowing them to see the differences in code releases for quick code review and assessment of past vs. present. The view is also color coded to denote different types of changes like code additions, comment changes, or subtractions.

JIRA • Annotation

Issues ▾ Boards ▾ Create

ISD-5
Support ticket

Edit Comment Assign More ▾ Resolve this issue Respond to customer Admin ▾

Details

Type:	Service Request	Status:	WAITING FOR SUPP... (View Workflow)
Priority:	Medium	Resolution:	Unresolved
Component/s:	None		
Labels:	None		

Description

111111

Attachments

Drop files to attach, or [browse](#).

Activity

All Comments Work Log History Activity

backbone added a comment - 07/Dec/16 11:53 AM edited INTERNAL

Internal comment from 2nd level support.

Click to add comment

JIRA annotations include commenting for context , attachments, priority, and status

SCORE

5

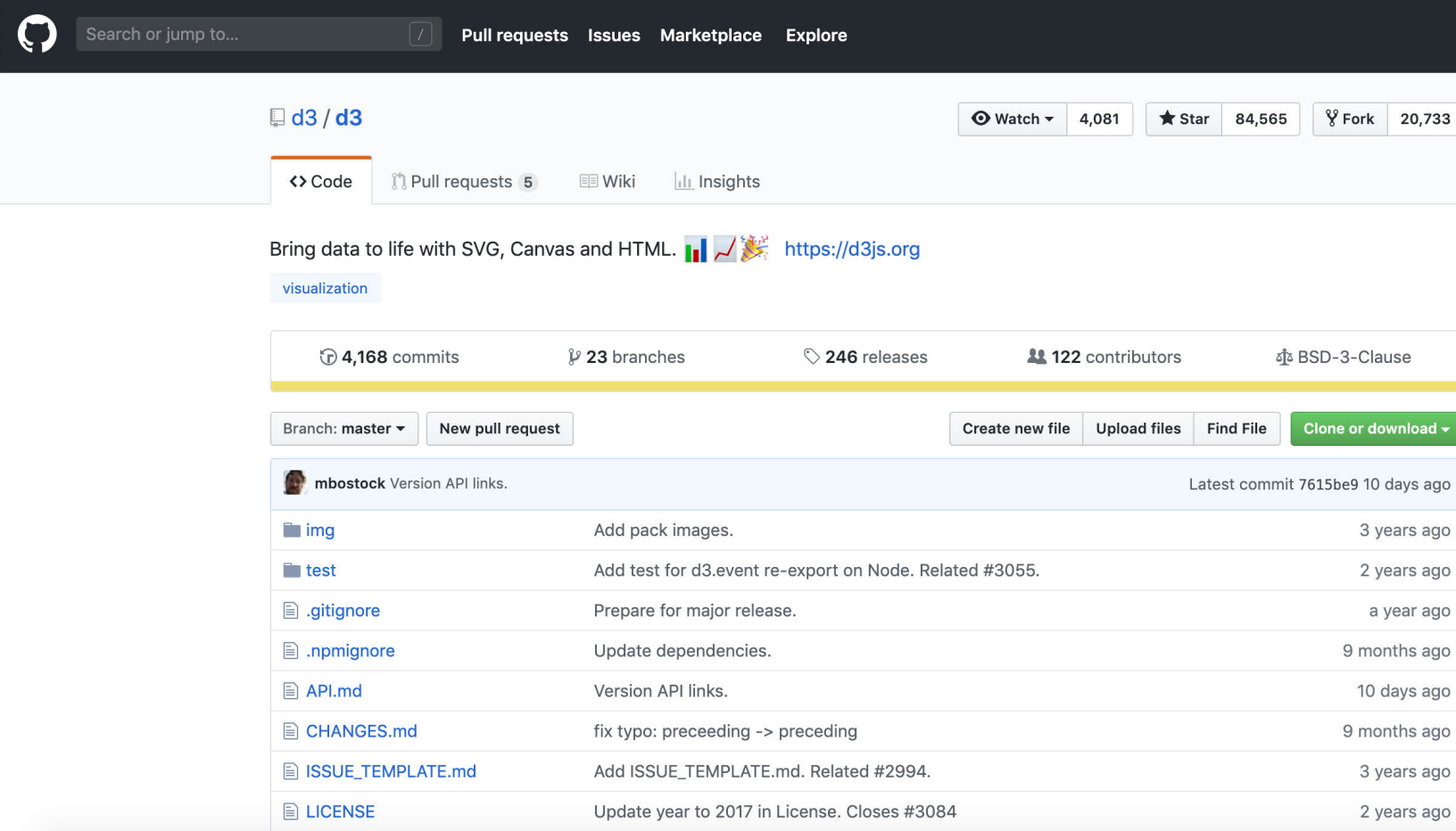
Good

MVP FEATURES

- ✓ Add annotation
- ✓ Add interpretation
- ✓ Add tag
- ✓ View others' annotations

ASSESSMENT

JIRA supports robust annotation, allowing users to comment on issues or add additional context in a multitude of ways, including adding supporting files, metadata, or links to related projects or folders. It also allows users to track progress and context over time, aiding in post-mortem assesment.

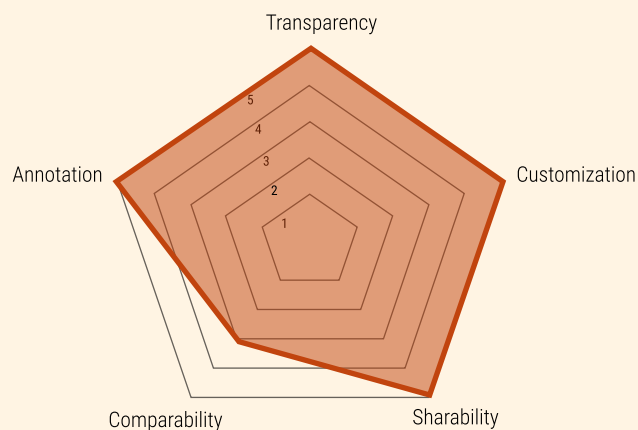


GitHub

GitHub is a repository hosting service that provides a web-based graphical interface, access control and several collaboration features, such as a wikis and basic task management tools for projects. We chose GitHub because of its collaboration capabilities that are centered around code comparison and in-app code review.

Takeaways

GitHub's strong collaborative and transparent nature helps teams produce work quickly and effectively, which is exactly what our stakeholders need to do. One of the problems with GitHub is its steep learning curve, which makes it intimidating to a less technical user.

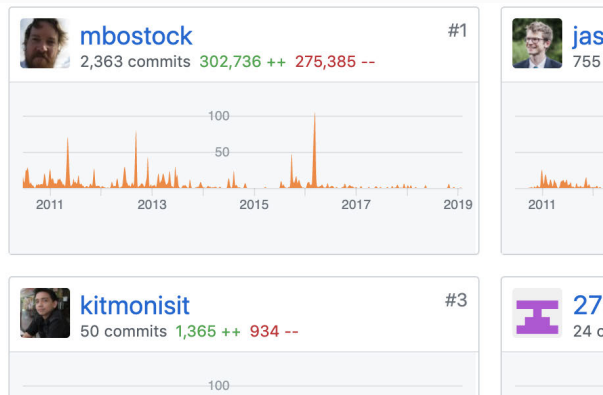


GitHub • Transparency

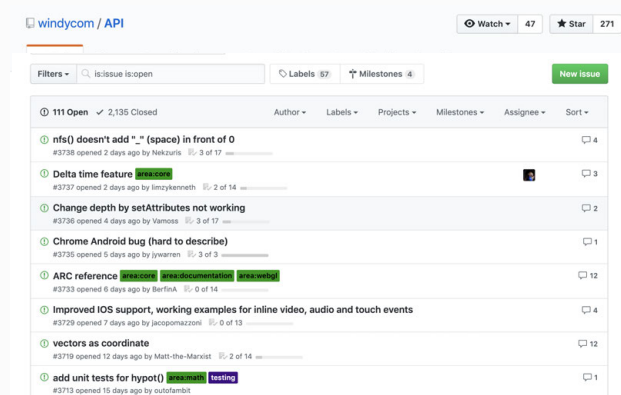
+8 -5 ■■■■ app/assets/stylesheets/head.scss

1		1
2	- min-height: 40px;	2 + display: sticky;
3	- padding: 10px;	3 + top: 0;
4	- font-size: 16px;	4 + z-index: 29;
5	- left: -4px;	5 + width: 24px;
6	- width: 25px;	6 + min-height: 48px;
7		7 + padding: 15px;

Seeing the exact changes that were made to a project



Viewing the contributors to projects



Issues reported for every project

SCORE

5

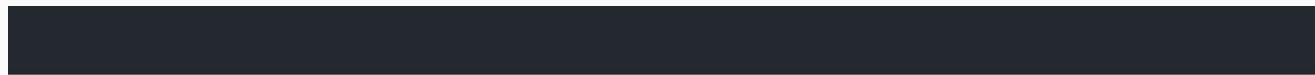
Excellent

MVP FEATURES

- ✓ Show time retrieved
- ✓ Show data format
- ✓ Show data source
- ✓ Access to raw data
- ✓ Provide data context

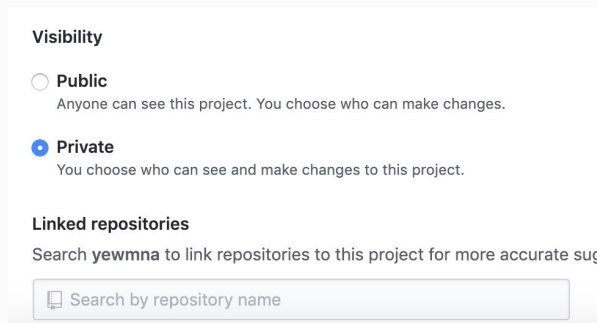
ASSESSMENT

Users can see the exact changes that are made to projects with context such as who made the changes and when. Additionally, users can see contribution levels and report issues that become visible for everyone.

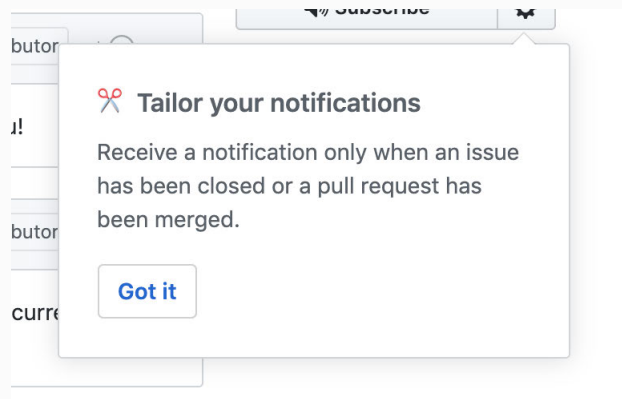


e, mobile first projects on the web.

Forking a repository allows for free experimentation without affecting the original project.



Customizing aspects of repository



Customizing alerts about repositories

SCORE

5

Excellent

MVP FEATURES

- ✓ Escape & integrate
- ✓ Data manipulation
- ✓ In-app customization
- ✓ Code customization
- ✗ 3D
- ✓ Search

ASSESSMENT

Github;s forking feature lets users build upon any existing project without affecting the original version. Users can also customize some aspects of their own projects and can tailor the notifications they receive about project changes.

All public repositories can be accessed by all site users

Any repository has a link that can be shared

Sharing and pointing out specific lines within a file

SCORE

5

Excellent

MVP FEATURES


- ✓ Import data
- ✓ Export data
- ✓ Share via URL
- ✓ Share WIP

ASSESSMENT

Public projects are shared to all users and users can find repositories by searching for specific keywords. Users can import files or share repositories using its unique URL. They can also share a specific part of the code by adding the lines to the file's URL.

GitHub • Comparability

Commits on May 07, 2019

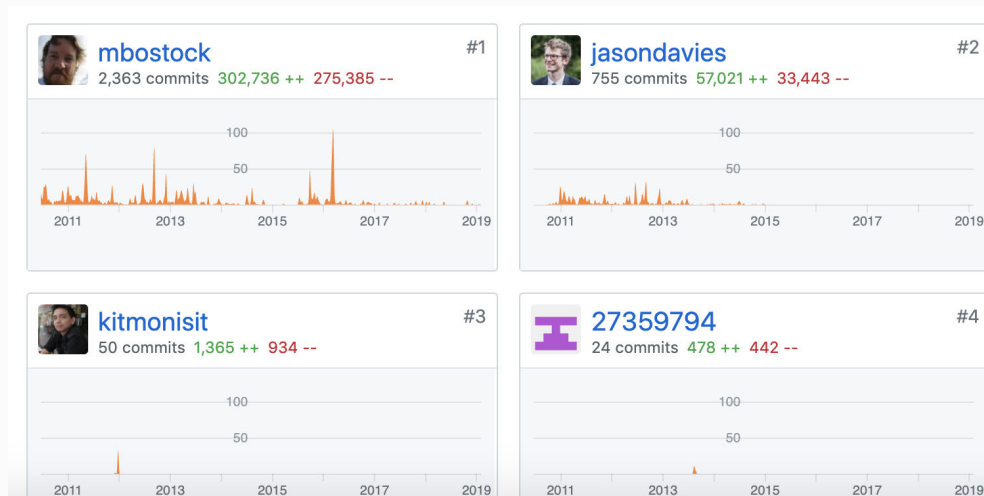
 outofambit this is may summary

Showing 1 changed file with 1 addition and 1 deletion.

```
▼ 2 src/core/shape/2d_primitives.js
```

```
@@ -104,7 +104,7 @@ p5.prototype._normalizeArcAngles = function(  
104 * stop, the arc will be drawn and filled as an open pie segment. If a mode parameter is provided,  
105 * will be filled like an open semi-circle (OPEN) , a closed semi-circle (CHORD), or as a closed p  
106 * origin may be changed with the <a href="#/p5/ellipseMode">ellipseMode()</a> function.<br><br>  
- * The arc is always drawn clockwise from wherever start falls to wherever stop falls on the ellip  
107 + * The arc is always drawn clockwise from wherever start falls to wherever stop falls on the ellip  
108 * Adding or subtracting TWO_PI to either angle does not change where they fall.  
109 * If both start and stop fall at the same place, a full ellipse will be drawn.  
110 *
```

Comparing different versions of the same file



Project contribution over time

SCORE

3

Average

MVP FEATURES

- ✗ Compare data points
- ✓ Compare by time
- ✗ Compare by source
- ✓ Review data trends

ASSESSMENT

Users can compare different versions of the same file and see the exact changes that were made. They can see user contribution over time.

GitHub • Annotation

```
11 + # Grid system
12 + Layouts are built on a 12 column grid.
```



rubyjazzy 1 day ago

Good call, this is more specific!



3



1



Reply..

Commenting on specific parts of code and having discussions.

! Instance specific variables for vertex()

#3651 opened on Mar 27 by Ajayneethikannan 5 of 5

! support suite/test syntax in node tests bug testing

#3641 opened on Mar 24 by outofambit

! Consider Polyfills for consistent DOM API area:dom discussion

#3631 opened on Mar 20 by outofambit

! Improvement for 'loading...' div element when preload is used area:core

#3625 opened on Mar 20 by Ajayneethikannan 5 of 5

! [WIP] unify retained & immediate-mode rendering code

Labeling problems

SCORE

5

Excellent

MVP FEATURES

- ✓ Add annotation
- ✓ Add interpretation
- ✓ Add tag
- ✓ View others' annotations

ASSESSMENT

Users are able to comment on specific parts of code and have discussions about them. Additionally, different problems can be tagged with relevant labels.

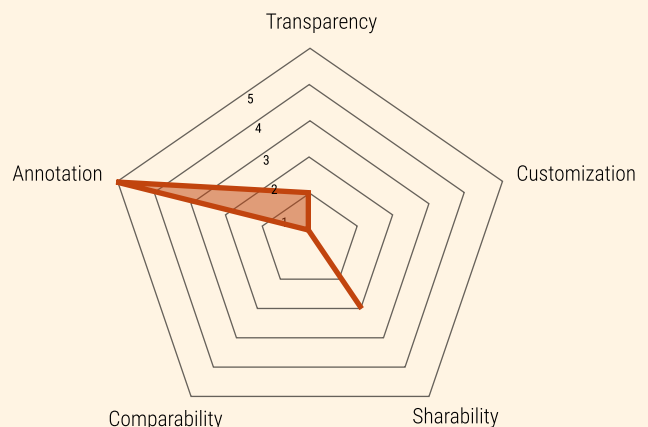


The War Room

The War Room is a project management approach that involves having all the relevant people in one place, for a fluid flow of information. Most mission meetings at NASA occur remotely, so we wanted to investigate this approach to see what positive elements of it we can incorporate into our project.

Takeaways

This approach helps teams make quicker decisions because people communicate in a more effective and fluid manner. We can use this as inspiration on how we can make communication between remote teams similarly effective and fluid. One of the drawbacks of this approach is its scalability with bigger teams.



War Room • Transparency



Data made physically available

SCORE

1

Severe

MVP FEATURES

- ✗ Show time retrieved
- ✗ Show data format
- ✗ Show data source
- ✗ Access to raw data
- ✓ Provide data context

ASSESSMENT

Data and ideas related to a project are physically available to see and discuss. This allows for more transparency between teams.

N/A

SCORE

0

MVP FEATURES

- ✖ Escape & integrate
- ✖ Data manipulation
- ✖ In-app customization
- ✖ Code customization
- ✖ 3D
- ✖ Search

ASSESSMENT

Not Applicable

War Room • Sharability



Sharing data and progress in person

SCORE

2

Not Good

MVP FEATURES

- ✗ Import data
- ✗ Export data
- ✗ Share via URL
- ✓ Share WIP

ASSESSMENT

Team members are encouraged to share data and ideas verbally and in-person which leads to improved understandability.

N/A

SCORE

0

MVP FEATURES

- ✕ Compare data points
- ✕ Compare by time
- ✕ Compare by source
- ✕ Review data trends

ASSESSMENT

Not Applicable

War Room • Annotation



Pointing and discussing



Hand-written and drawn annotations

SCORE

5

Excellent

MVP FEATURES

- ✓ Add annotation
- ✓ Add interpretation
- ✓ Add tag
- ✓ View others' annotations

ASSESSMENT

Pointing at the object of discussion and having a conversation about it, leads to a quicker understanding. Teams may also annotate physical documents to better explain what they're communicating.

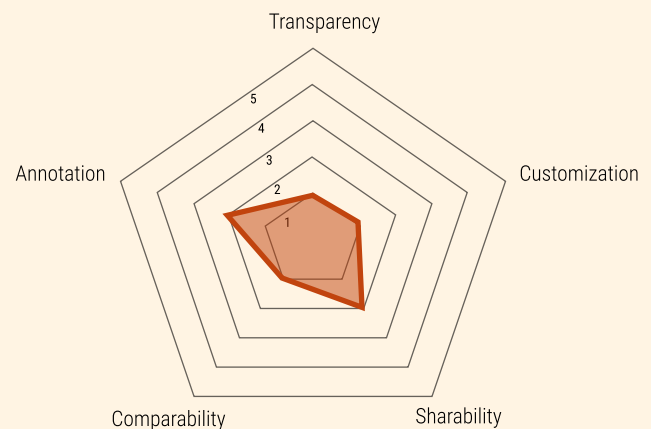


No Man's Sky

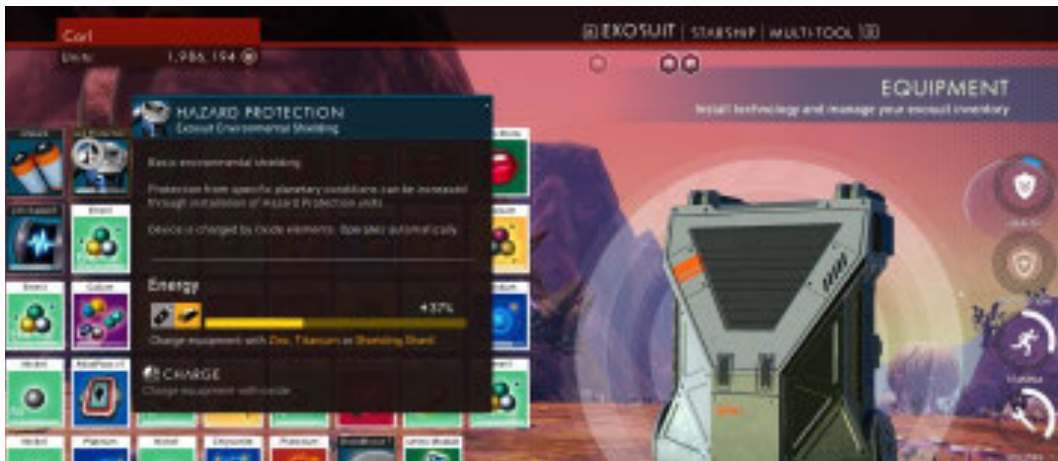
No Man's Sky is an exploration video game created by Hello Games. The premise is you are a spacefaring explorer in a massive galaxy filled with an infinite number of algorithmically generated planets which include their own unique geology, atmospheres, flora, and fauna. All players share a single universe. As you explore a planet, you become aware of its many hazards, which can include atmospheric and weather dangers like radiation, temperature, and acid rain.

Takeaways

While No Man's Sky offers an inspirational look into exploratory space travel and managing weather on unfamiliar planets, it doesn't have much use in the scope of our project. Due to the design of the game, most of the potentially useful features were implemented in minimal ways so as not to strain player cognitive load.



No Man's Sky • Transparency



Equipment information is only viewable in a focus state, there are few ways to scan information



No Man's Sky presents information only when needed, such as weather which only appears when you are in danger

SCORE

1

Severe

MVP FEATURES

- ✗ Show time retrieved
- ✗ Show data format
- ✗ Show data source
- ✗ Access to raw data
- ✗ Provide data context

ASSESSMENT

Transparency is generally kept to a minimum to reduce overloading the player with too much information. You are generally given the information you need to know at any given time for survival, but as the game is primarily about exploration it leaves a lot up to the player to discover on their own.

No Man's Sky • Customization



The focus on exploration has driven No Man's Sky to build out custom filters and lenses for photography.



Character customization options screen in No Man's Sky

SCORE

1

Severe

MVP FEATURES

- ✗ Escape & integrate
- ✗ Data manipulation
- ✗ In-app customization
- ✗ Code customization
- ✓ 3D
- ✗ Search

ASSESSMENT

No Man's Sky offers both cosmetic and functional upgrades and customization for each character. Functional customization centers around avatar capability while cosmetic customization, while minimal, offers the player optional UI tweaks meant to enhance the player experience.

No Man's Sky • Sharability



No Man's Sky features limited cooperative communication options, including voice chat



If you are the first to encounter something in the shared world, you can name it for all future adventurers

SCORE

2

Not Good

MVP FEATURES

- ✓ Import data
- ✓ Export data
- ✗ Share via URL
- ✗ Share WIP

ASSESSMENT

There are chances to interact with other players in game. One of the earliest aspects of this shared universe is that the first person to discover an item or planet is offered naming rights to it which are saved indefinitely for all players encountering it at a later date. Gestures, voice, and text chat options allow users to coordinate and signal to each other about potential dangers.

No Man's Sky • Comparability



Standard to RPGs, there is a comparison view for equipment and inventory upgrades

SCORE

1

Severe

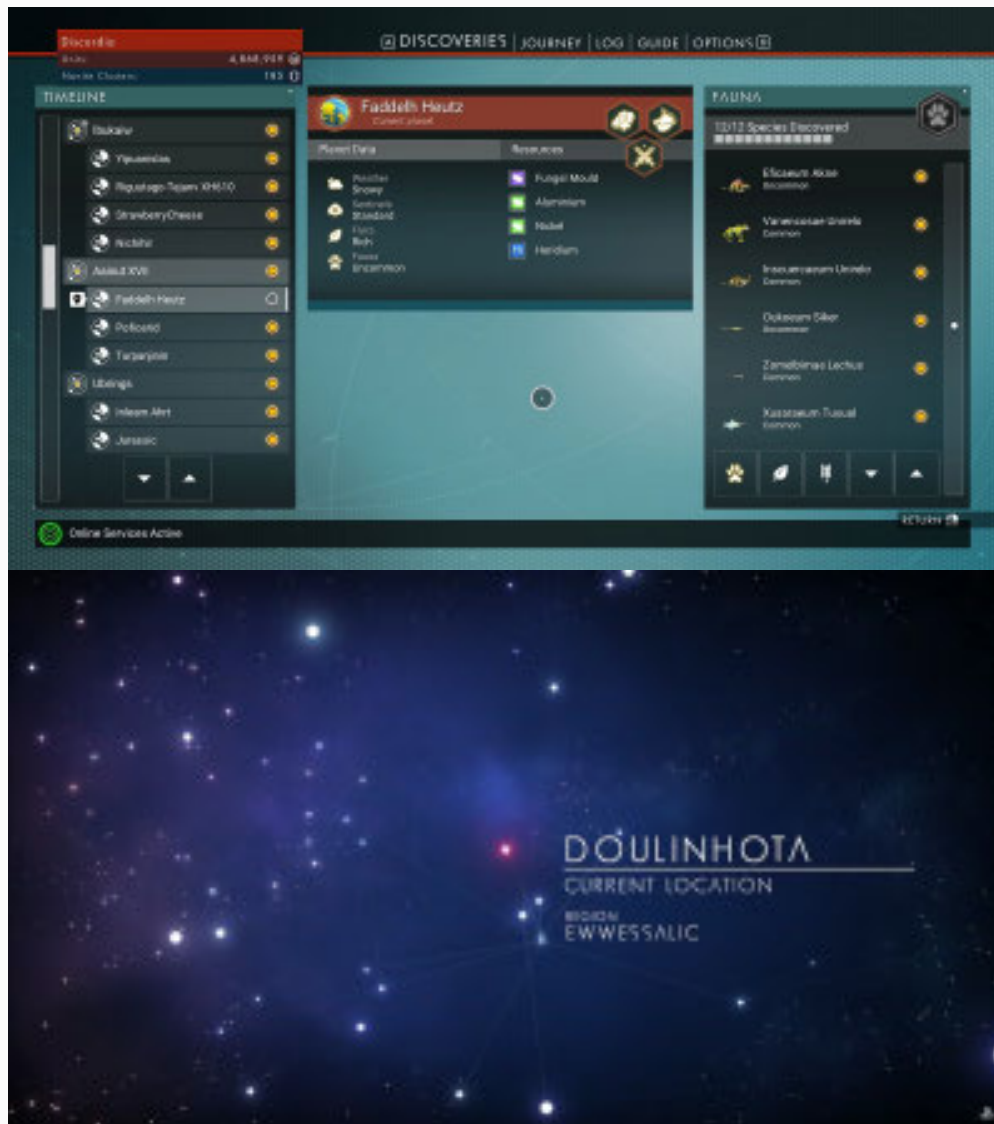
MVP FEATURES

- ✓ Compare data points
- ✗ Compare by time
- ✗ Compare by source
- ✗ Review data trends

ASSESSMENT

No Man's Sky offers little in the way of comparison sets outside of equipment screens. Inventory and tool comparisons allow players to determine which item is more relevant for their needs. This extends to ships, armor, and weapons/tools as these are the most often compared items.

No Man's Sky • Annotation



After you name a discovery, its available for all future players to encounter

SCORE

2

Not Good

MVP FEATURES

- ✓ Add annotation
- ✗ Add interpretation
- ✗ Add tag
- ✓ View others' annotations

ASSESSMENT

No Man's Sky offers automated annotation through discoveries. As a planet, animal, or plant is discovered for the first time by a player, it is logged into a central database. Going forward any player encountering that same asset will see annotated information about the original explorer and their chosen taxonomy.

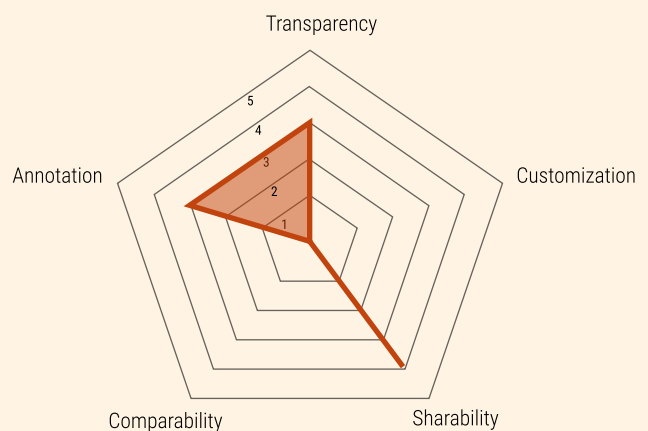


Bartending

Bartenders work in a collaborative and time sensitive environment to meet the needs of customers. The job requires a balance of making sure each individual is doing their part and making sure the resources are stocked. It also requires organization to ensure the bartenders get their orders correct.

Takeaways

Shared workload is done well in a bartending context due to the collaborative nature of the job. Being face to face makes this collaboration more natural. Data analysis and customization are not relevant to the job.



Bartending • Transparency



Paper trail to ensure trust during transactions

SCORE

3

Average

MVP FEATURES

- ✓ Show time retrieved
- ✗ Show data format
- ✓ Show data source
- ✓ Access to raw data
- ✗ Provide data context

ASSESSMENT

The nature of bartending is commerce, therefore there should always be a paper trail. Customers will receive a bill before expected payment. Transparency on the business side depends slightly on the honesty of the bartenders.

Bartending • Customization

N/A

SCORE

0

N/A

MVP FEATURES

- ✕ Escape & integrate
- ✕ Data manipulation
- ✕ In-app customization
- ✕ Code customization
- ✕ 3D
- ✕ Search

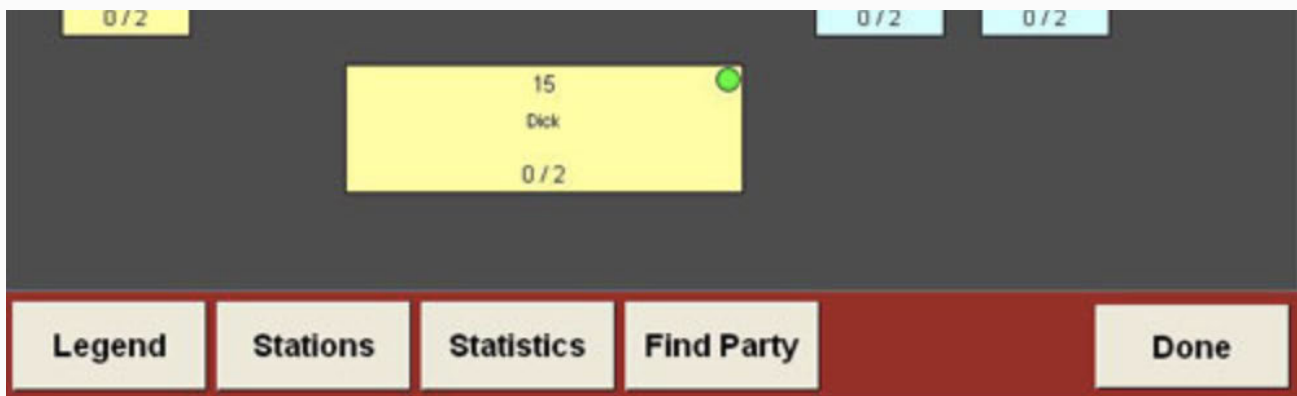
ASSESSMENT

N/A

Bartending • Sharability



Tickets placed near drinks for better communication



Example computer system UI for tracking tables

SCORE

4

Good

MVP FEATURES

- ✓ Import data
- ✓ Export data
- ✗ Share via URL
- ✓ Share WIP

ASSESSMENT

The ability to share your workload is essential to this kind of environment. Often times bartenders will place a ticket over or under a drink so that others are able to run an order to a table. Bartenders also utilize a computer to be able to view orders.

N/A

SCORE

0

N/A

MVP FEATURES

- ✖ Compare data points
- ✖ Compare by time
- ✖ Compare by source
- ✖ Review data trends

ASSESSMENT

N/A

Bartending • Annotation



Working in the same physical space allows for communication through face to face conversations

SCORE

3

Average

MVP FEATURES

- ✓ Add annotation
- ✗ Add interpretation
- ✗ Add tag
- ✓ View others' annotations

ASSESSMENT

Users are able to write their own feedback or notes on a specific pin but there is no way for other users to see these notes. Users of different accounts are not able to share annotations as collaboration is not a feature of google earth pro.