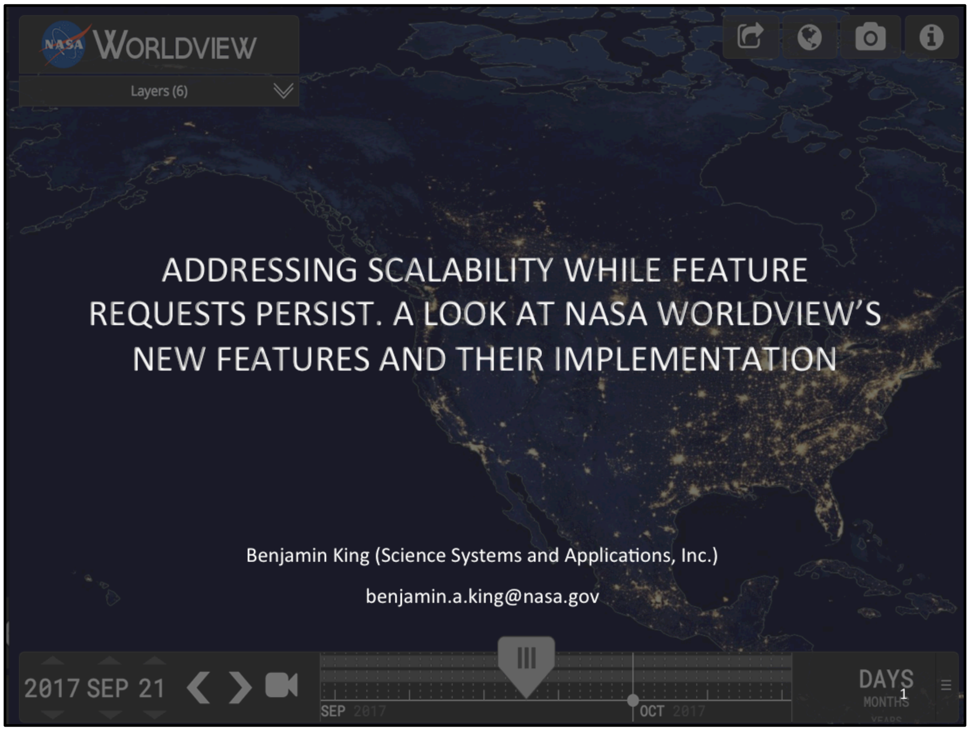


ADDRESSING SCALABILITY WHILE FEATURE REQUESTS PERSIST. A LOOK AT NASA WORLDVIEW'S NEW FEATURES AND THEIR IMPLEMENTATION

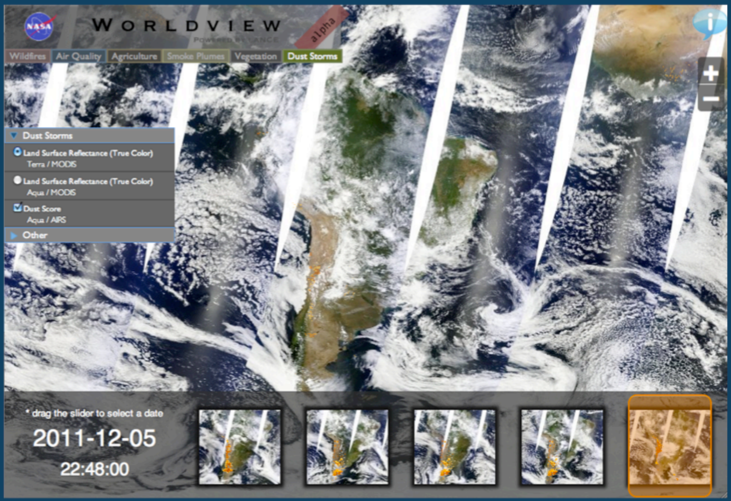
Benjamin King (Science Systems and Applications, Inc.)

benjamin.a.king@nasa.gov

1

Worldview is a web mapping tool used for education, research, and disaster response. We consume 600+ Imagery products and support time-critical application areas such as wildfire management, air quality measurements, and flood monitoring.

WORLDVIEW IN DECEMBER 2011



▼ Dust Storms

● Land Surface Reflectance (True Color)
Terra / MODIS

○ Land Surface Reflectance (True Color)
Aqua / MODIS

☑ Dust Score
Aqua / AIRS

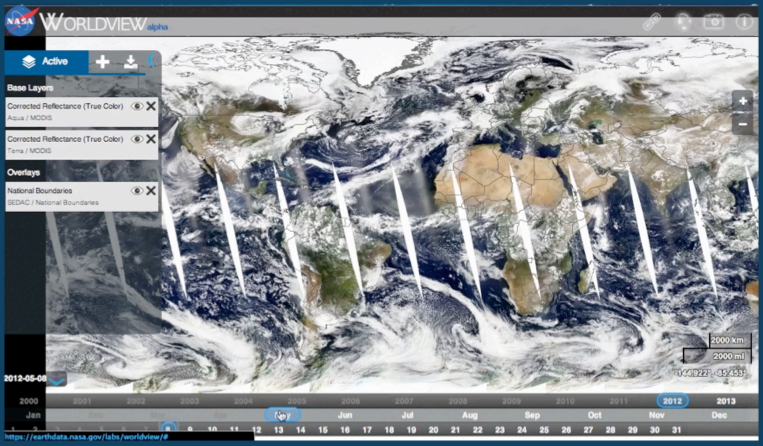
▶ Other

* drag the slider to select a date

2011-12-05
22:48:00

We have come a long way over the past 7 years. Compare this version to current version

WORLDVIEW IN DECEMBER 2013



Base Layers

Corrected Reflectance (True Color)
Aqua / MODIS

Corrected Reflectance (True Color)
Terra / MODIS

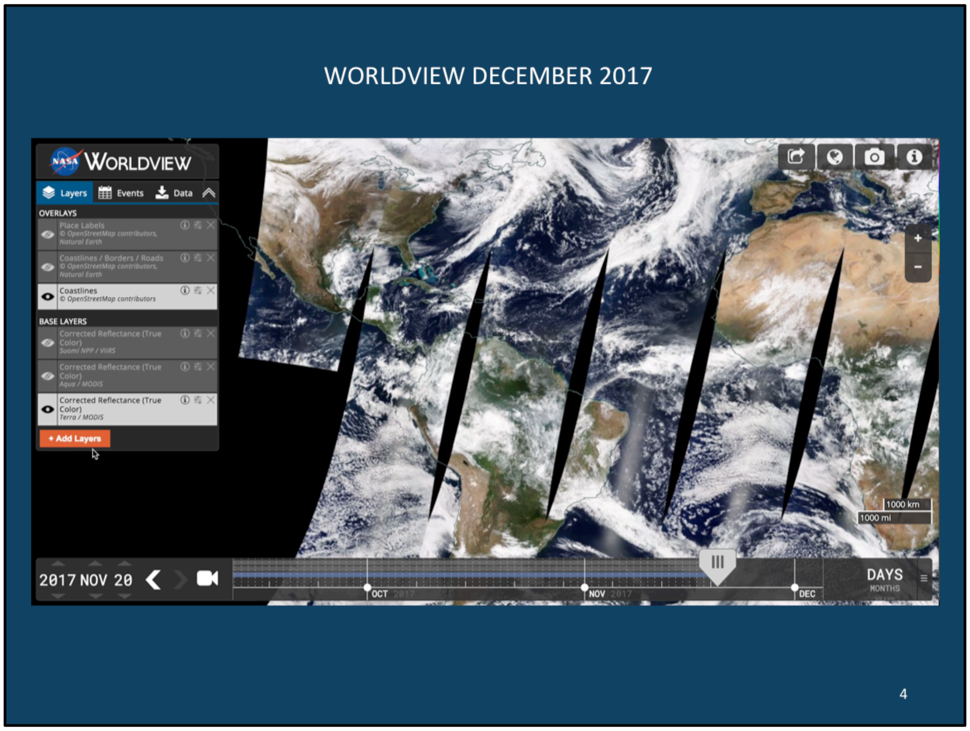
Overlays

National Boundaries
SEDAC / National Boundaries

2012-05-08

https://earthdata.nasa.gov/labs/worldview/#

This is worldview in 2013, two years later. Talk about what has changed between 2011 and 2013 and how this version differs from the current state of Worldview.



WORLDVIEW DECEMBER 2017

NASA WORLDVIEW
Layers
Events
Data
OVERLAYS
Place Labels
© OpenStreetMap contributors, Natural Earth
Coastlines / Borders / Roads
© OpenStreetMap contributors, Natural Earth
Coastlines
© OpenStreetMap contributors
BASE LAYERS
Corrected Reflectance (True Color)
Suomi NPP / VIIRS
Corrected Reflectance (True Color)
Aqua / MODIS
Corrected Reflectance (True Color)
Terra / MODIS
+ Add Layers
2017 NOV 20
OCT 2017
NOV 2017
DEC
DAYS
MONTHS
1000 km
1000 mi

4

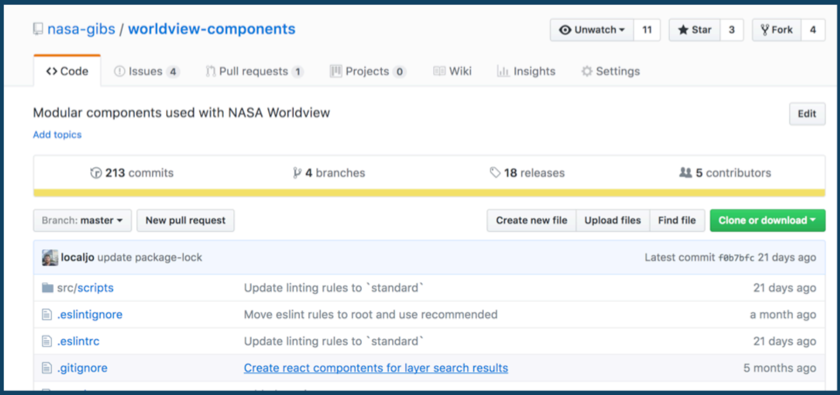
(Video) Give a demo of the current state of Worldview. Discuss issues related to building on top of such a large codebase over a long period of time. Discuss our solutions to these issues. (Detailed example below)

We now have a product picker for browsing through all 600+ layers and an events feature that allows you to browse active events and numerous other features.

When a codebase is maintained for 6+ years by numerous developers, it is going to have it's problems. We have run into the problem of vast amounts of code being put in places in which it was never intended in attempt to get some new functionality to work. Another issue at hand is that things were tightly coupled across different pieces of the application. The team wanted to take a new approach to the structure of the application, but did not have time to break away and focus all our attention on a redo.

As an open source project, a lot of the team's brainstorming relates to getting more contributors on board with the project. Worldview is a mapping application. What good is Worldview code going to be for anyone unless he/she wants to visualize their own WMS (Web Map Service) or WMTS (Web Map Tile Service) imagery (soon to include vector imagery)? The solution decided upon was to make another repository of small components that could be used across many disciplines. What we found while coding with the anticipation of others using our code for their own projects was that we were forced to write decoupled code.

WORLDVIEW COMPONENTS



nasa-gibs / worldview-components

Modular components used with NASA Worldview

213 commits	4 branches	18 releases	5 contributors

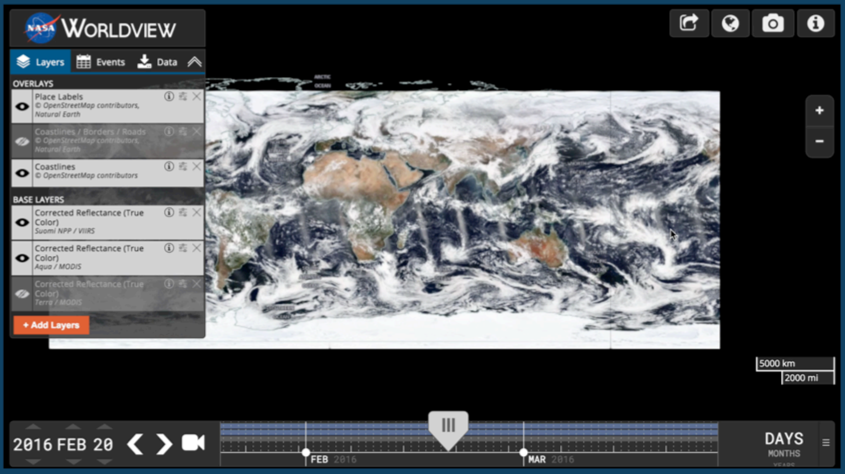
localjo update package-lock — Latest commit f0b7bfc 21 days ago

src/scripts	Update linting rules to `standard`	21 days ago
.eslintignore	Move eslint rules to root and use recommended	a month ago
.eslintrc	Update linting rules to `standard`	21 days ago
.gitignore	Create react compontents for layer search results	5 months ago

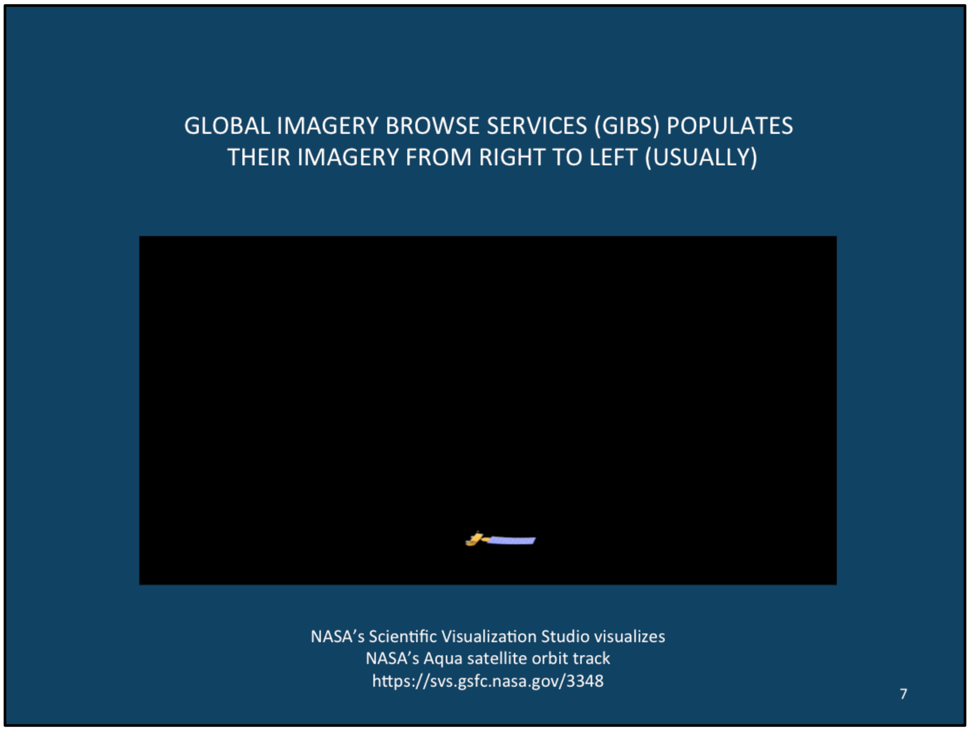
5

Discuss the purpose of the worldview components, which is: getting contributors, creating reusable modules that are non-dependent on the worldview app itself, and using modern development tools.

IMAGERY OVER THE DATELINE


WORLDVIEW
Layers
Events
Data
OVERLAYS
Place Labels
© OpenStreetMap contributors, Natural Earth
Coastlines / Borders / Roads
© OpenStreetMap contributors, Natural Earth
Coastlines
© OpenStreetMap contributors
BASE LAYERS
Corrected Reflectance (True Color)
Suomi NPP / VIIRS
Corrected Reflectance (True Color)
Aqua / MODIS
Corrected Reflectance (True Color)
Terra / MODIS
+ Add Layers
5000 km
2000 mi
2016 FEB 20
FEB 2016
MAR 2016
DAYS
MONTHS

(Video) An example of Worldview’s Imagery Over the Dateline feature being used to show a tropical storm over Fiji.

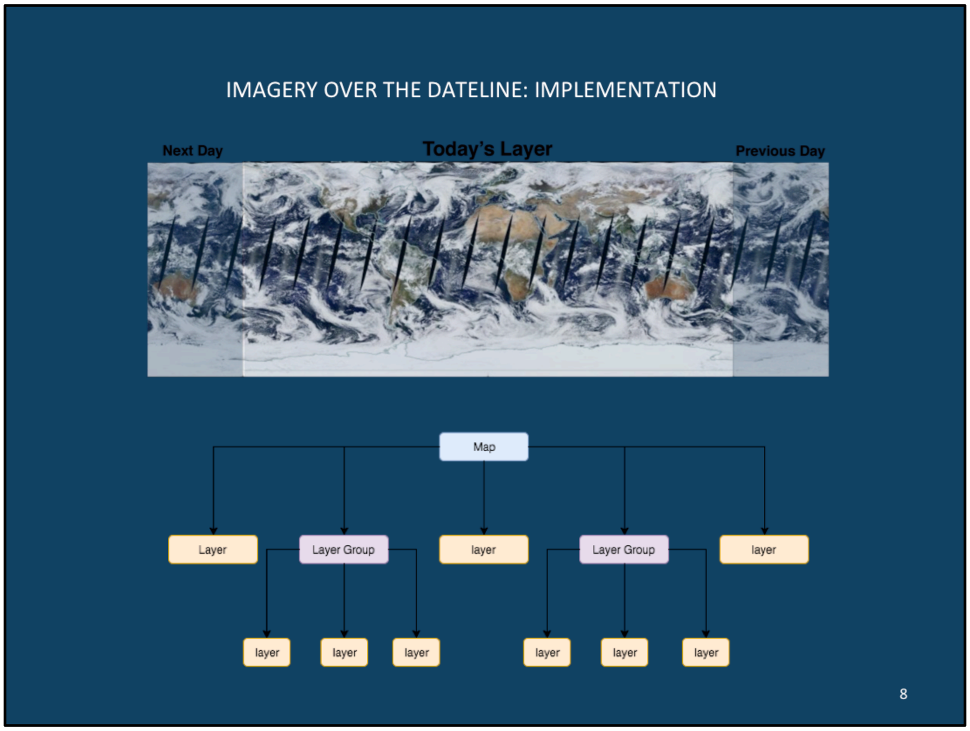


GLOBAL IMAGERY BROWSE SERVICES (GIBS) POPULATES THEIR IMAGERY FROM RIGHT TO LEFT (USUALLY)

NASA’s Scientific Visualization Studio visualizes
NASA’s Aqua satellite orbit track
https://svs.gsfc.nasa.gov/3348

7

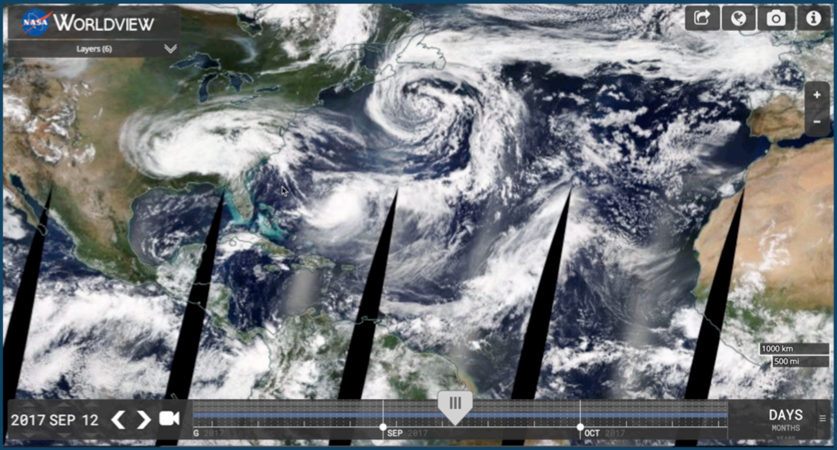
(VIDEO) Use NASA’s Scientific Visualization Studio example to show how orbit tracks affect the way GIBS near real-time imagery is populated. Explain why our implementation is better than simply wrapping imagery.



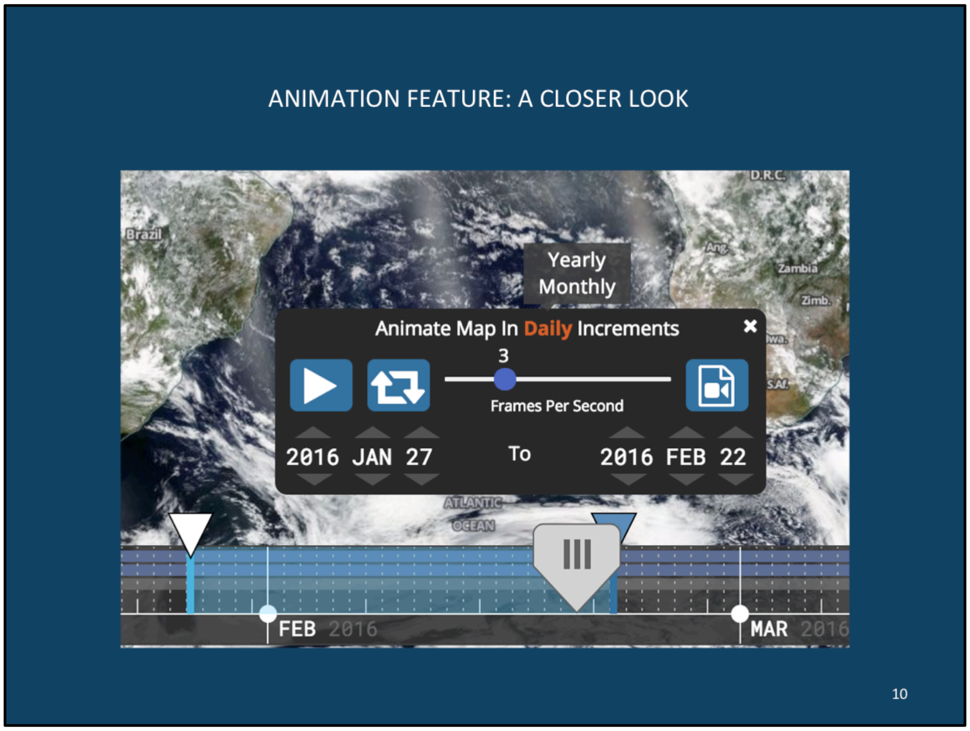
IMAGERY OVER THE DATELINE: IMPLEMENTATION

Explain how imagery over the dateline was implemented using OpenLayers layer groups.

ANIMATION FEATURE



Explain the different capabilities of the animation widget: date selector, frame rate, increments, and creating GIFs.



ANIMATION FEATURE: A CLOSER LOOK

Animate Map In Daily Increments

3

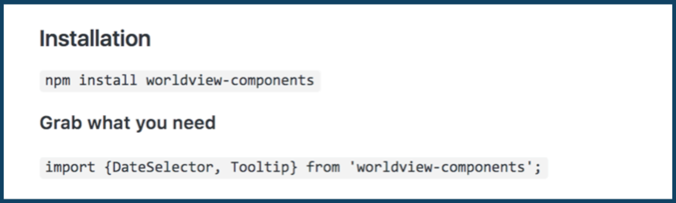
Frames Per Second

2016 JAN 27 To 2016 FEB 22

10

Discuss all the pieces of the animation feature that were able to be isolated into reusable components and discuss precache tiles with promise queues.

HOW TO USE WORLDVIEW COMPONENTS



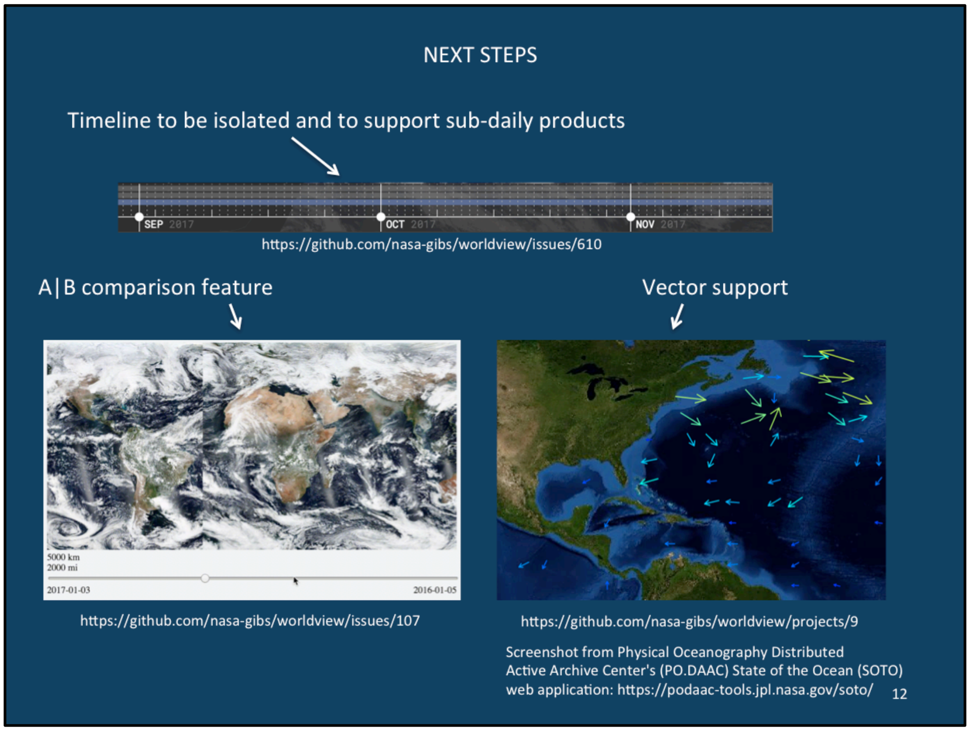
Installation

```
npm install worldview-components
```

Grab what you need

```
import {DateSelector, Tooltip} from 'worldview-components';
```

Explain how anyone could use one of the worldview-components for their own project.



NEXT STEPS

Timeline to be isolated and to support sub-daily products

https://github.com/nasa-gibs/worldview/issues/610

A|B comparison feature

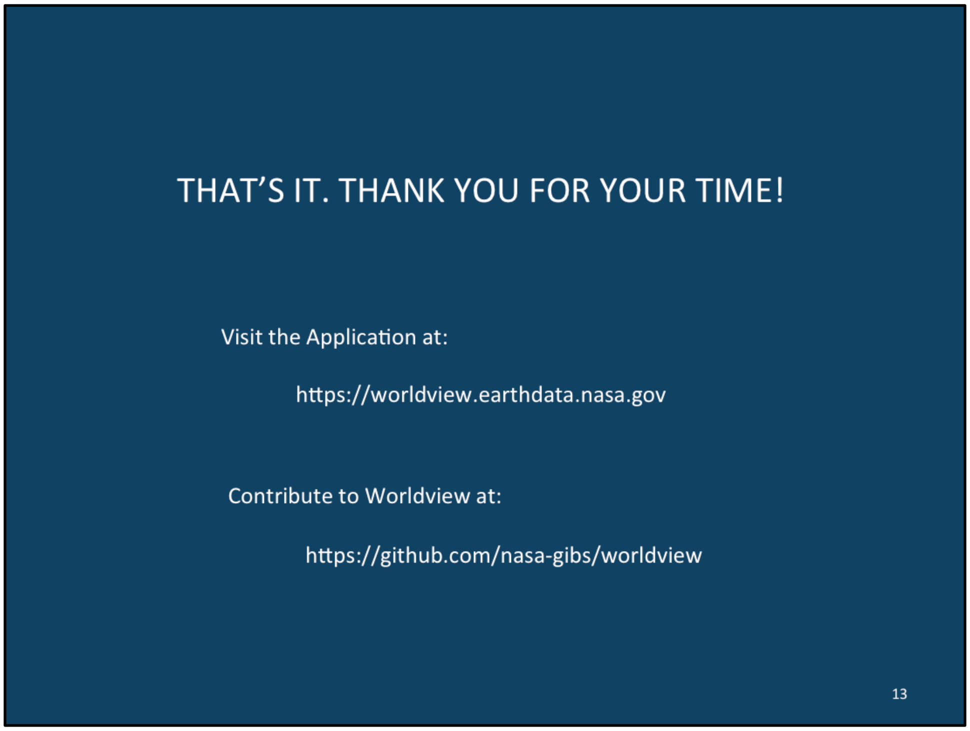
https://github.com/nasa-gibs/worldview/issues/107

Vector support

https://github.com/nasa-gibs/worldview/projects/9

Screenshot from Physical Oceanography Distributed Active Archive Center's (PO.DAAC) State of the Ocean (SOTO) web application: https://podaac-tools.jpl.nasa.gov/soto/

Talk about future features and how we would like contributors



THAT'S IT. THANK YOU FOR YOUR TIME!

Visit the Application at:

https://worldview.earthdata.nasa.gov

Contribute to Worldview at:

https://github.com/nasa-gibs/worldview

GIVE THANKS.