

CyAN App: Cyanobacteria Assessment Network Mobile Application



New Tool for the Early Detection of Algal Blooms in U.S. Freshwater Systems

Impact of CyAN

Supporting the environmental management and use of U.S. waters, protecting human health, conserving money and resources using satellite data records.



Schaeffer et al. Eos.
[Article URL](#)



Sentinel-3A Satellite Remote Sensing

Video Source: [European Space Agency](#)

Ocean and Land Colour Instrument (OLCI)

- Revisit: 2-3 day
- Spatial resolution: 300m
- Surface water measures





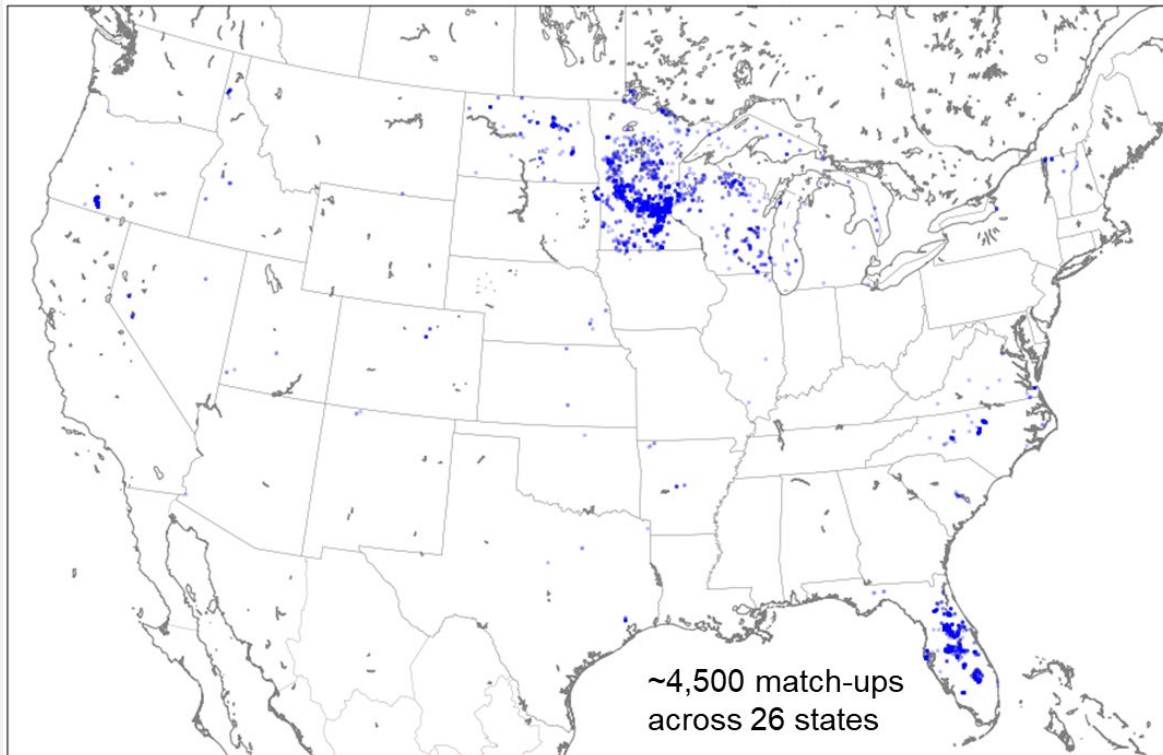
Known Issues with Satellite Remote Sensing

- Mixed pixels, drought/flood dynamics
- Ice and snow
- Provisional data may have errors
- Test QA flags now applied for mixed pixels and snow/ice

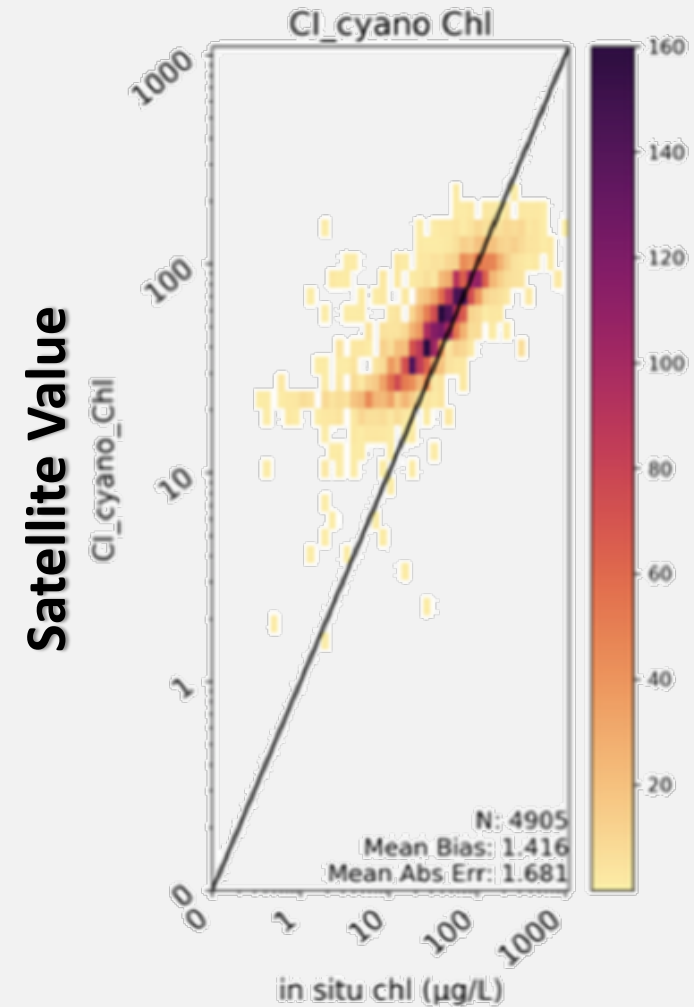


Image Source: NY Times

Initial Chlorophyll Validation



Seegers et al. In Prep.



Bottle Samples



Clark et al. 2015.
Ecological Indicators.

doi.org/10.1016/j.ecolind.2017.04.046

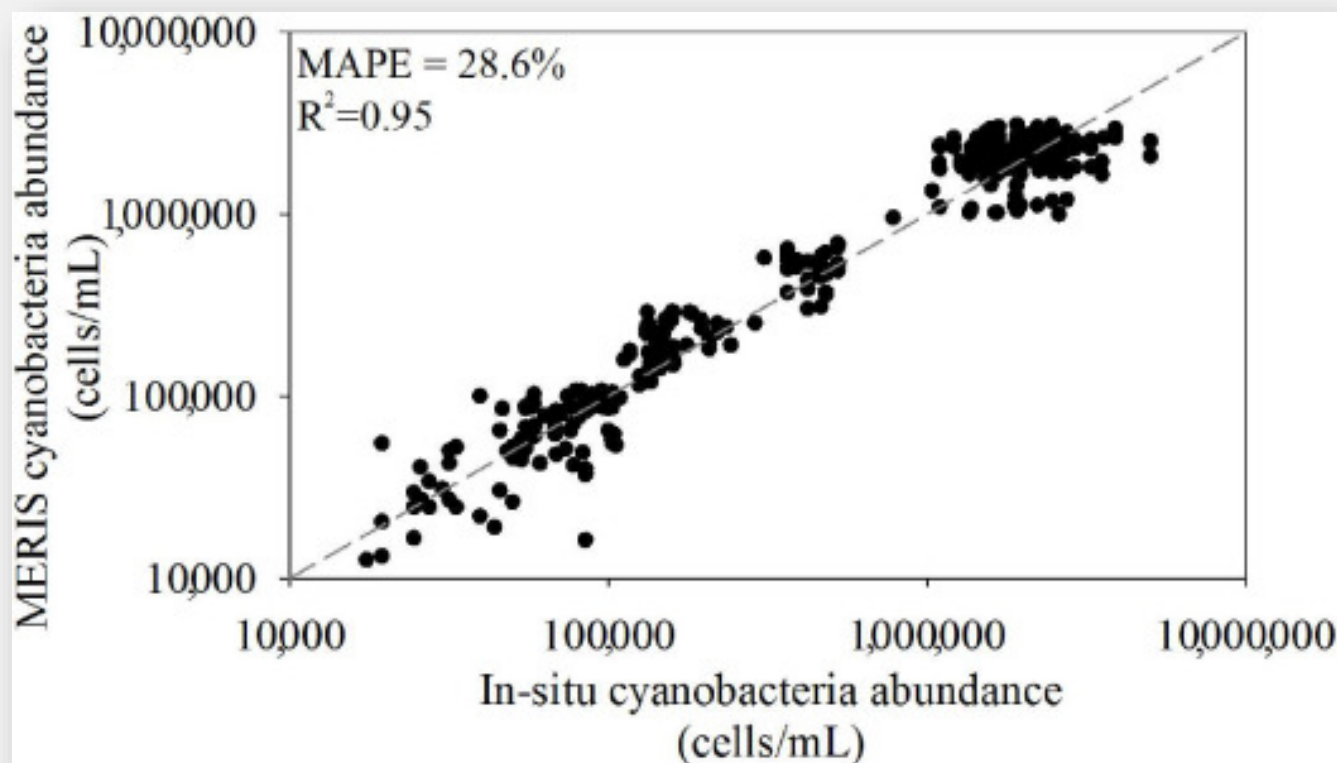


Lunetta et al. 2015.
Remote Sensing of
Environment.

doi.org/10.1016/j.rse.2014.06.008

Initial Cyanobacteria Validation

Satellite Value



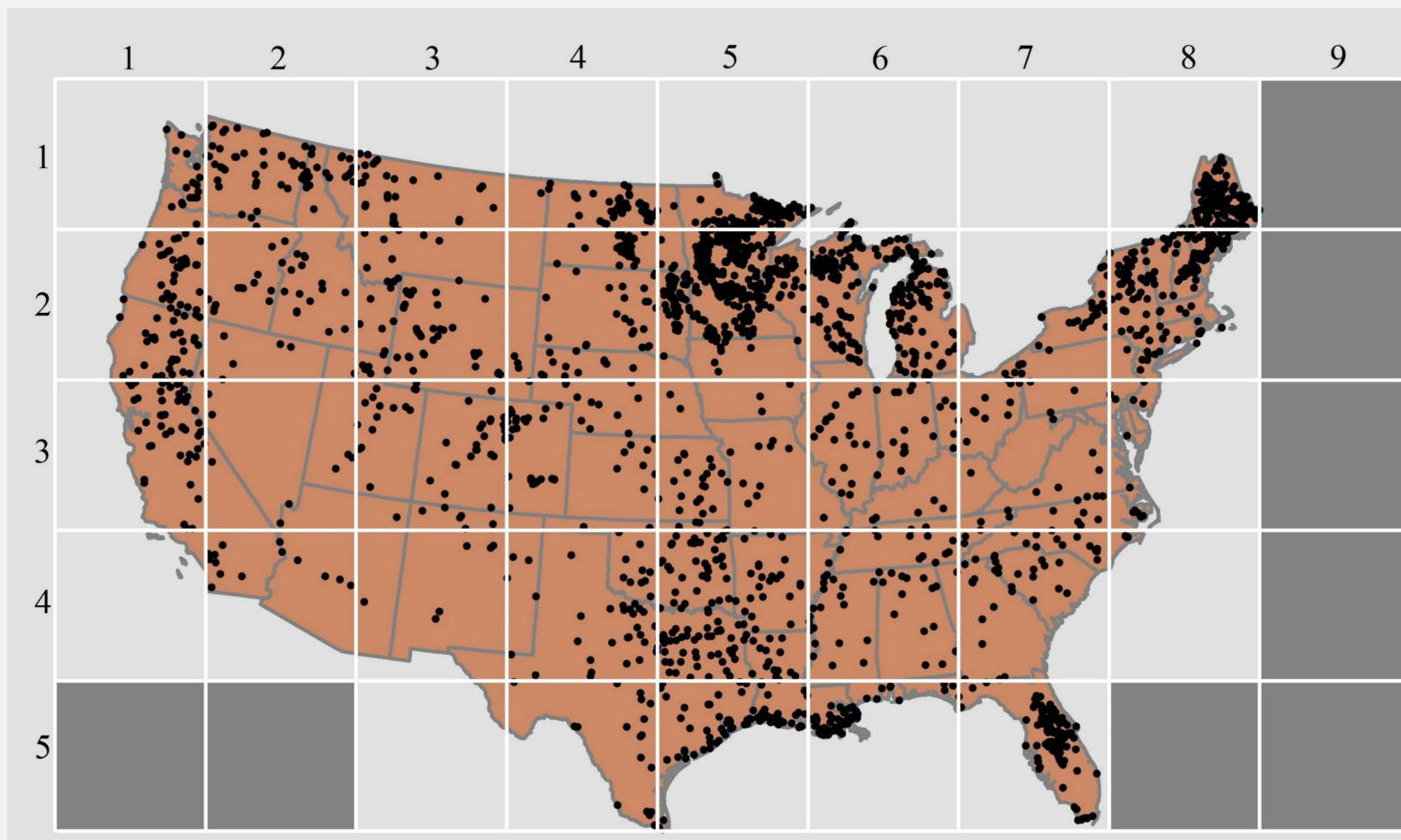
Bottle Samples

Satellite results represent what is seen in the field.



Can I use the CyAN App for My Lake?

The CyAN app provides access to cyanobacterial bloom satellite data for over 2,000 of the largest lakes and reservoirs across the United States.



Schaeffer et al 2018.
Environmental
Modelling & Software.

doi.org/10.1016/j.envsoft.2018.08.015



Weekly Data *Behind the Scenes*

50,000
cell/mL

200,000
cell/mL



Sunday

Monday

Tuesday

Wednesday

Thursday

Friday

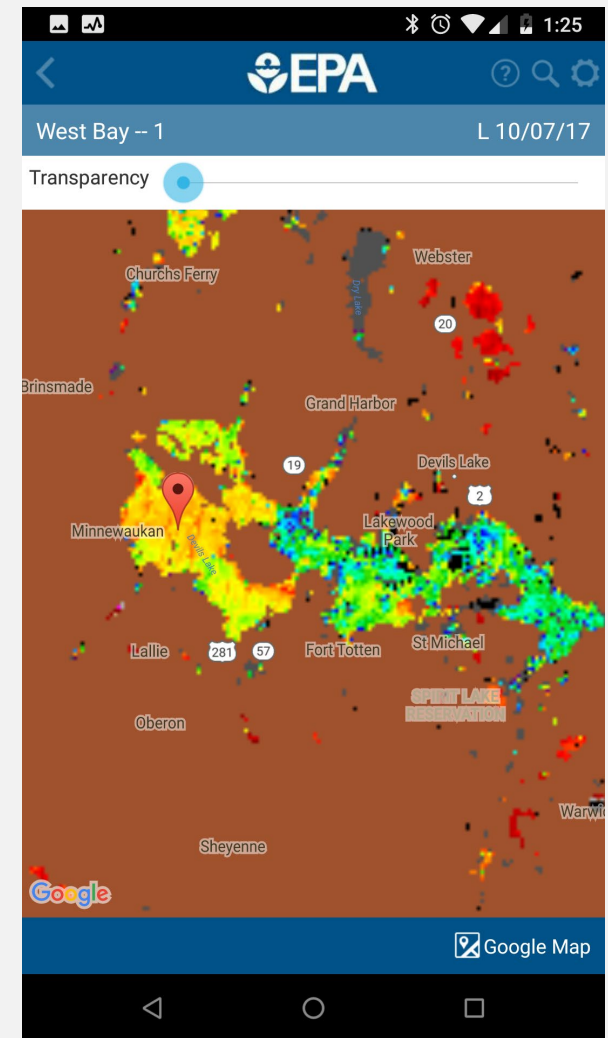
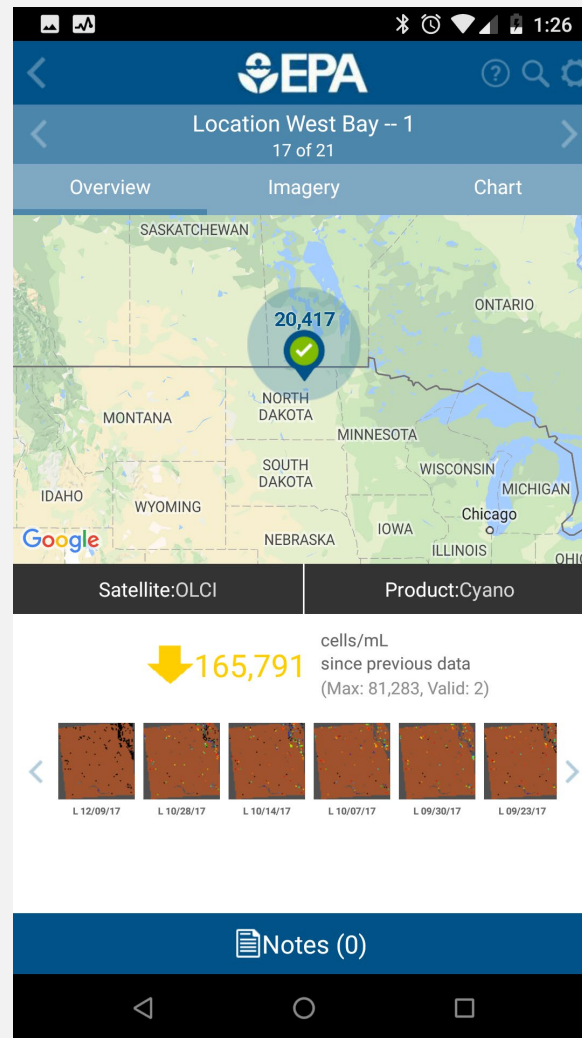
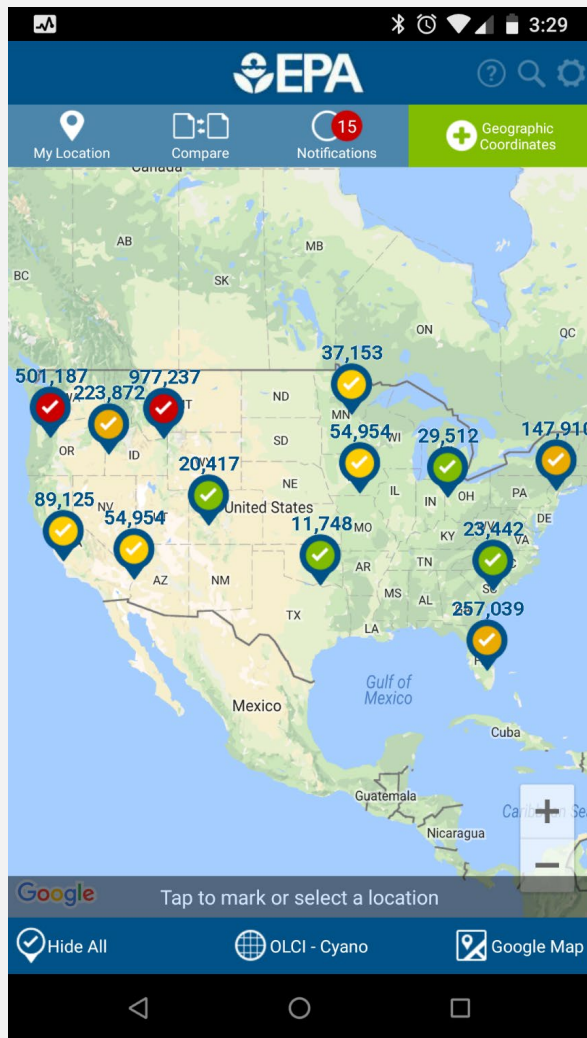
Saturday

Weekly composite



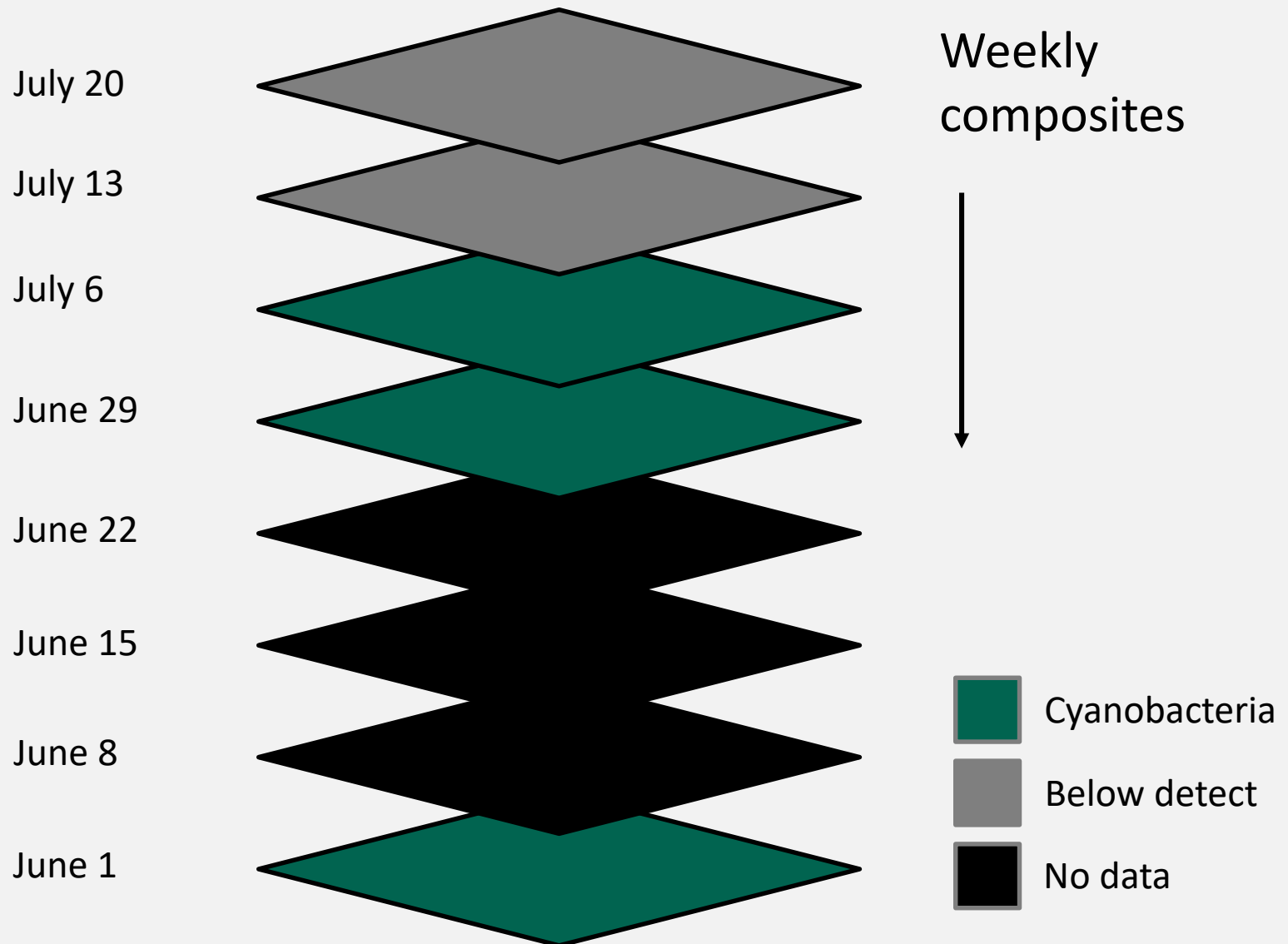
200,000
cell/mL

Mobile App Overview



Is the App Up-to-Date?

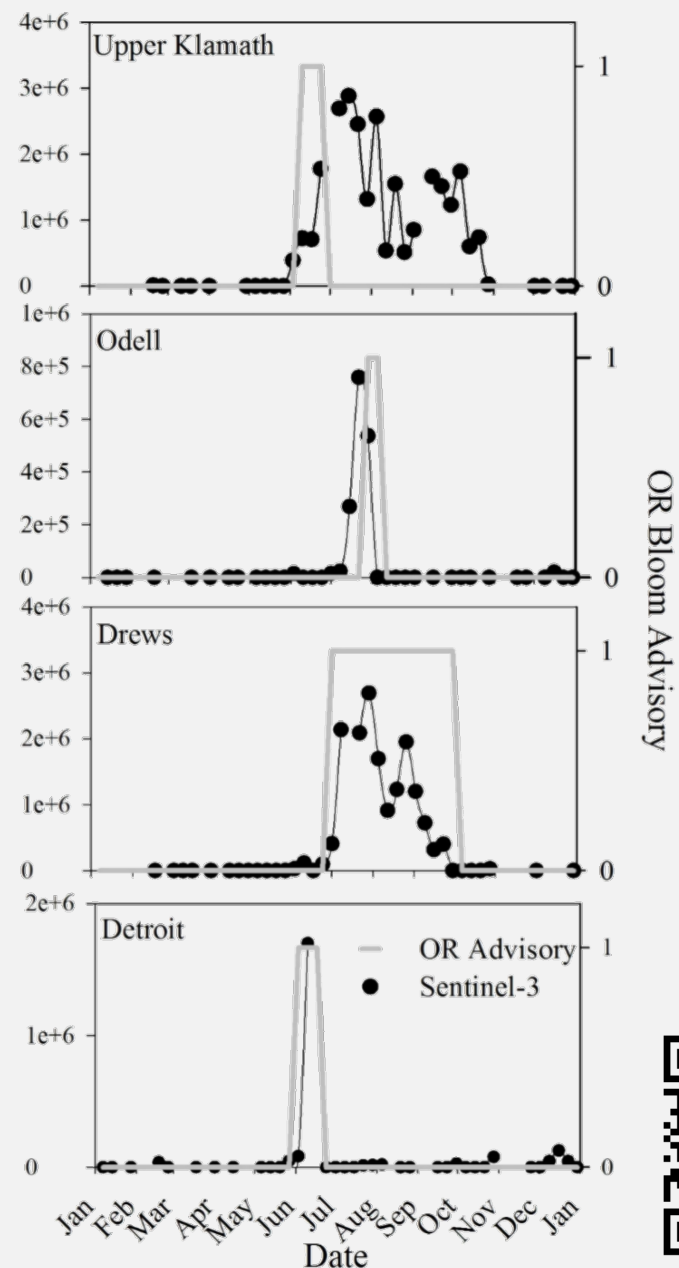
Only reports when cyanobacteria is detected.





Sentinel-3 cyanoHAB

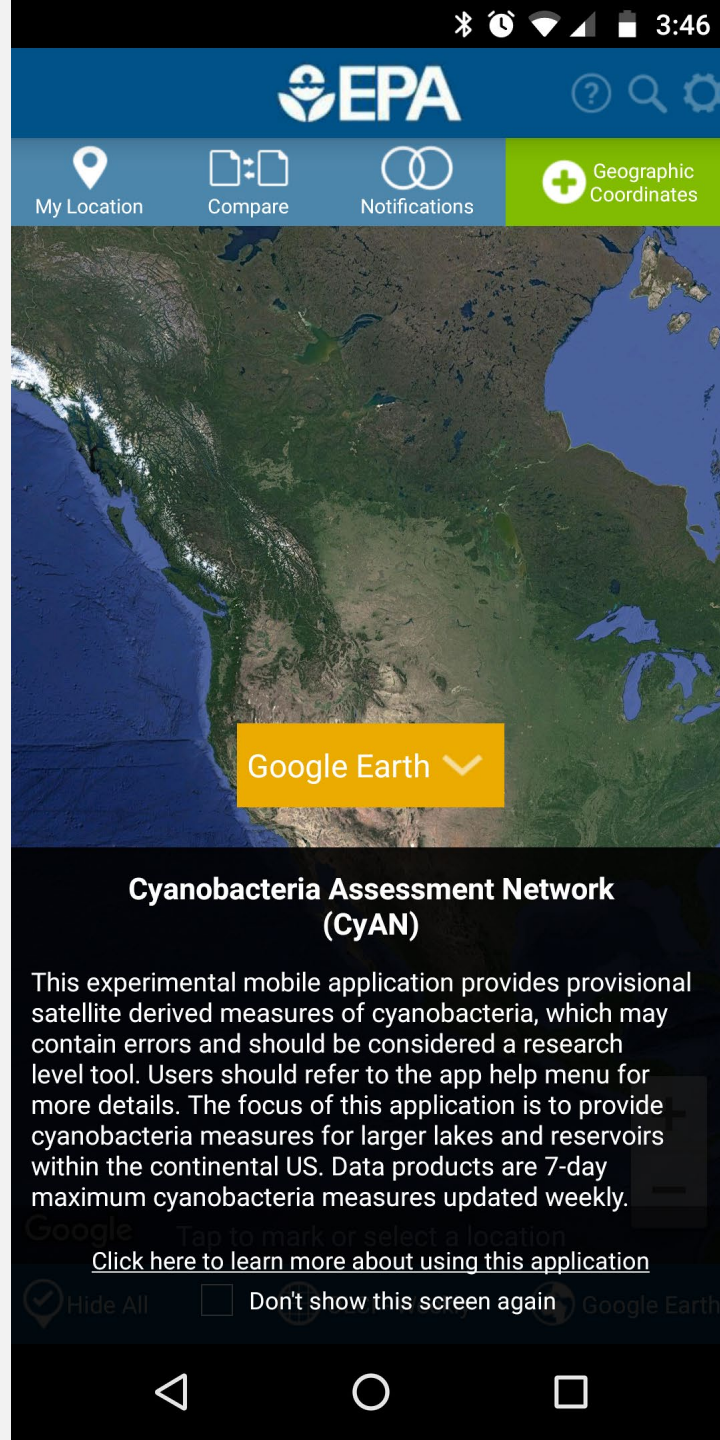
(cells mL⁻¹)

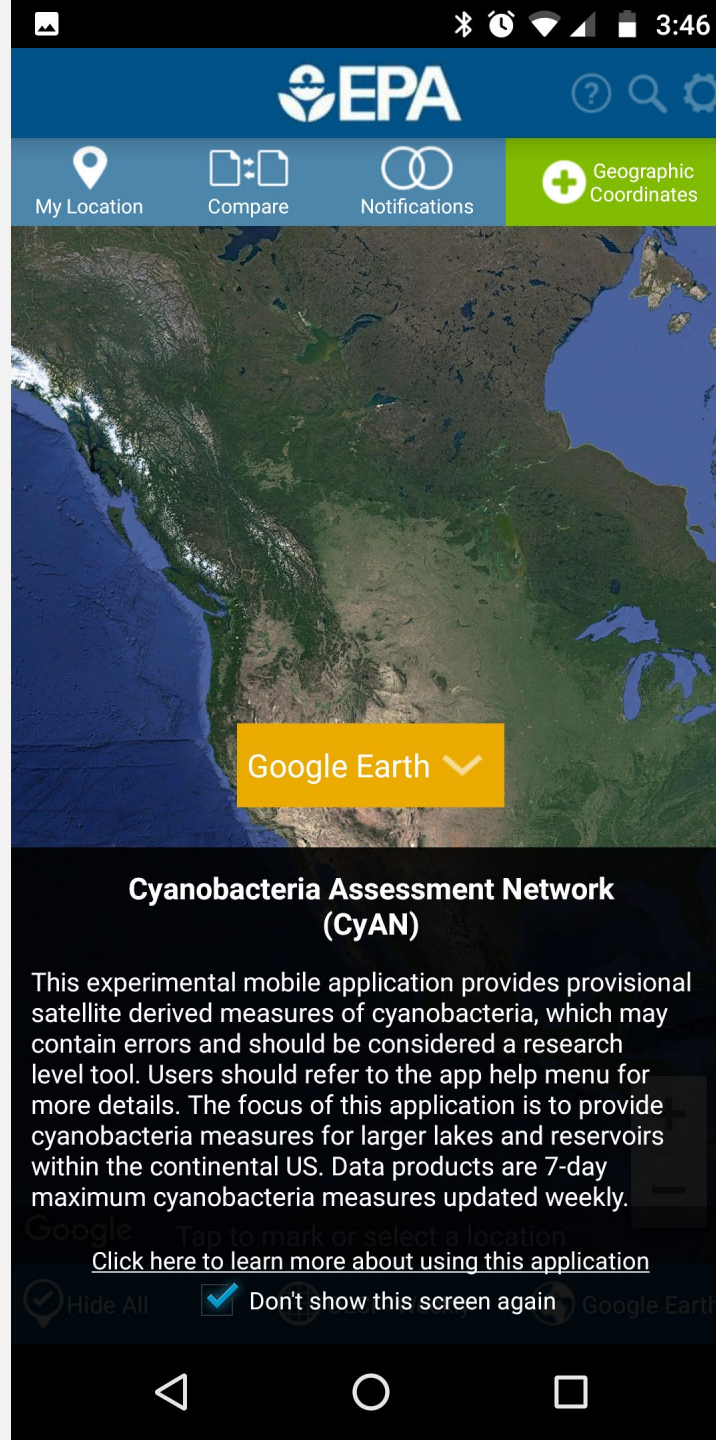


Step-by-Step Training



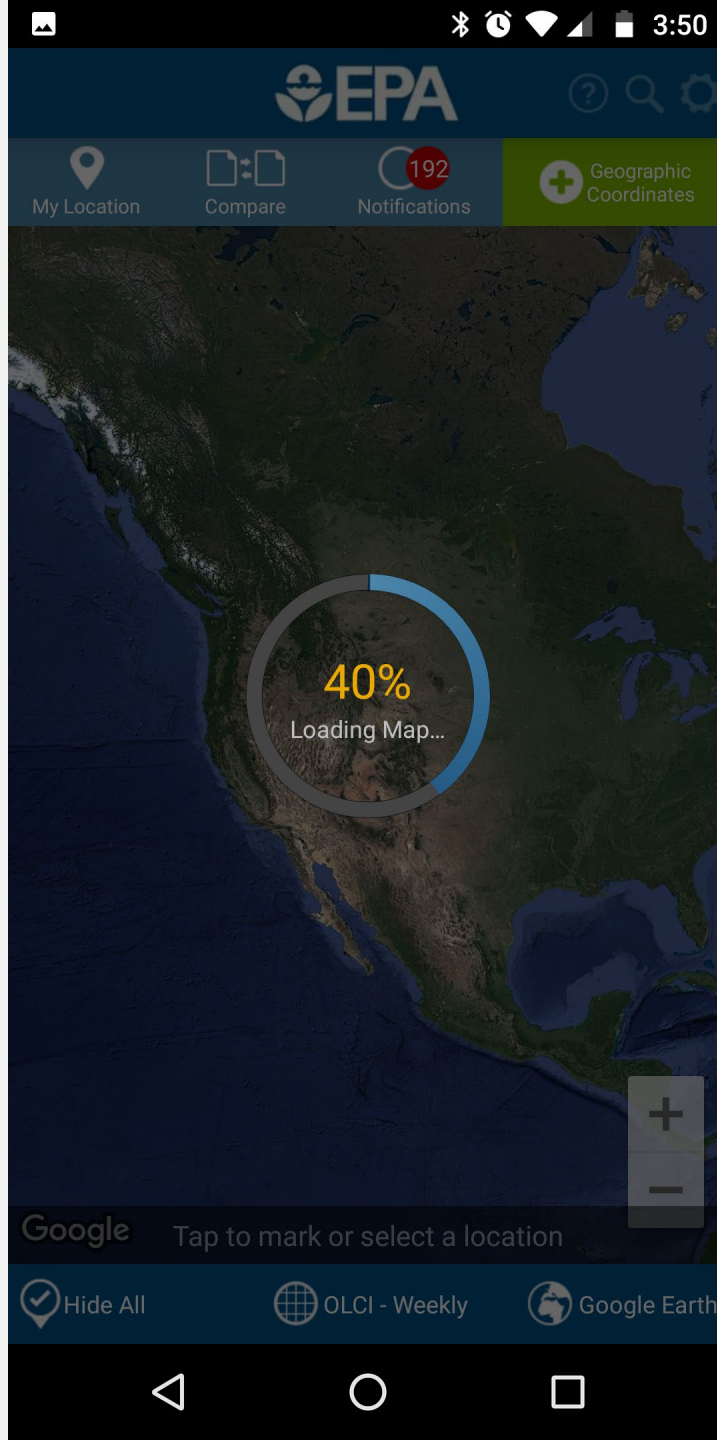
Single point location example

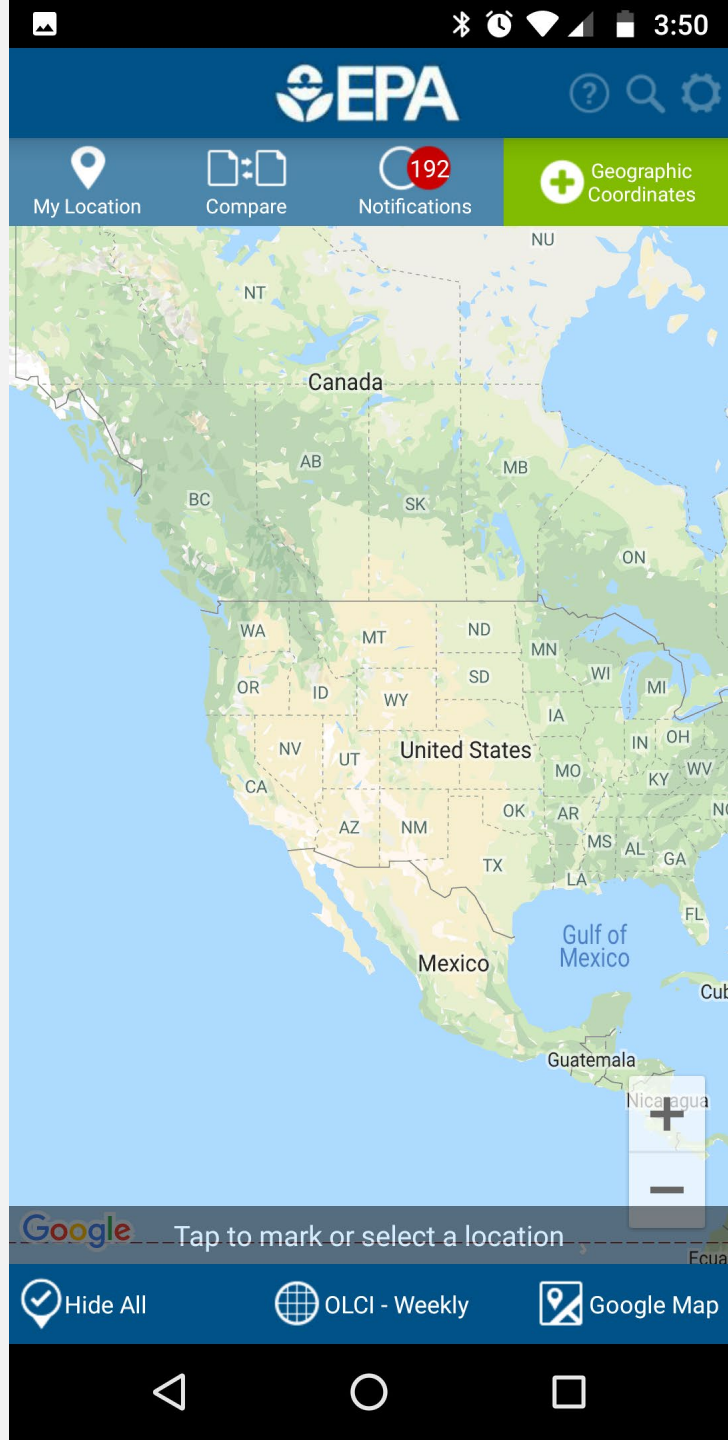


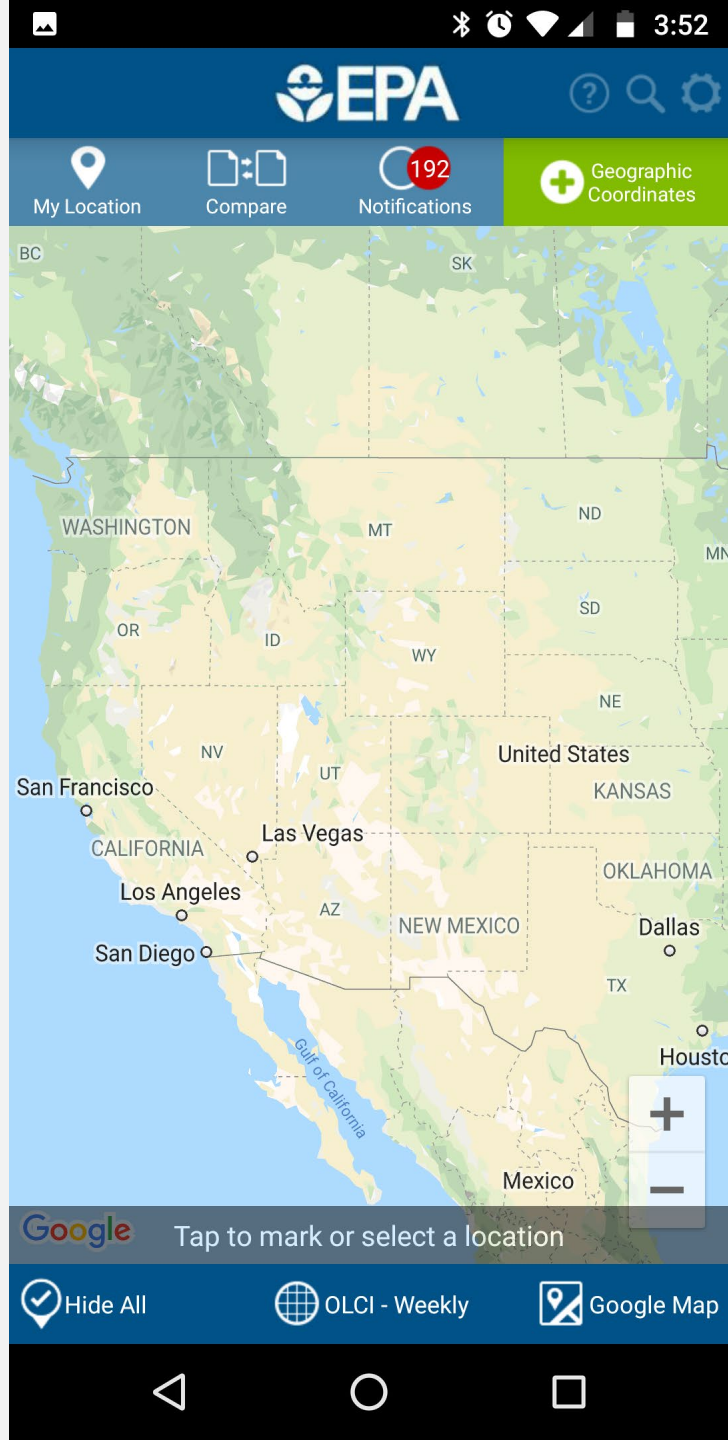


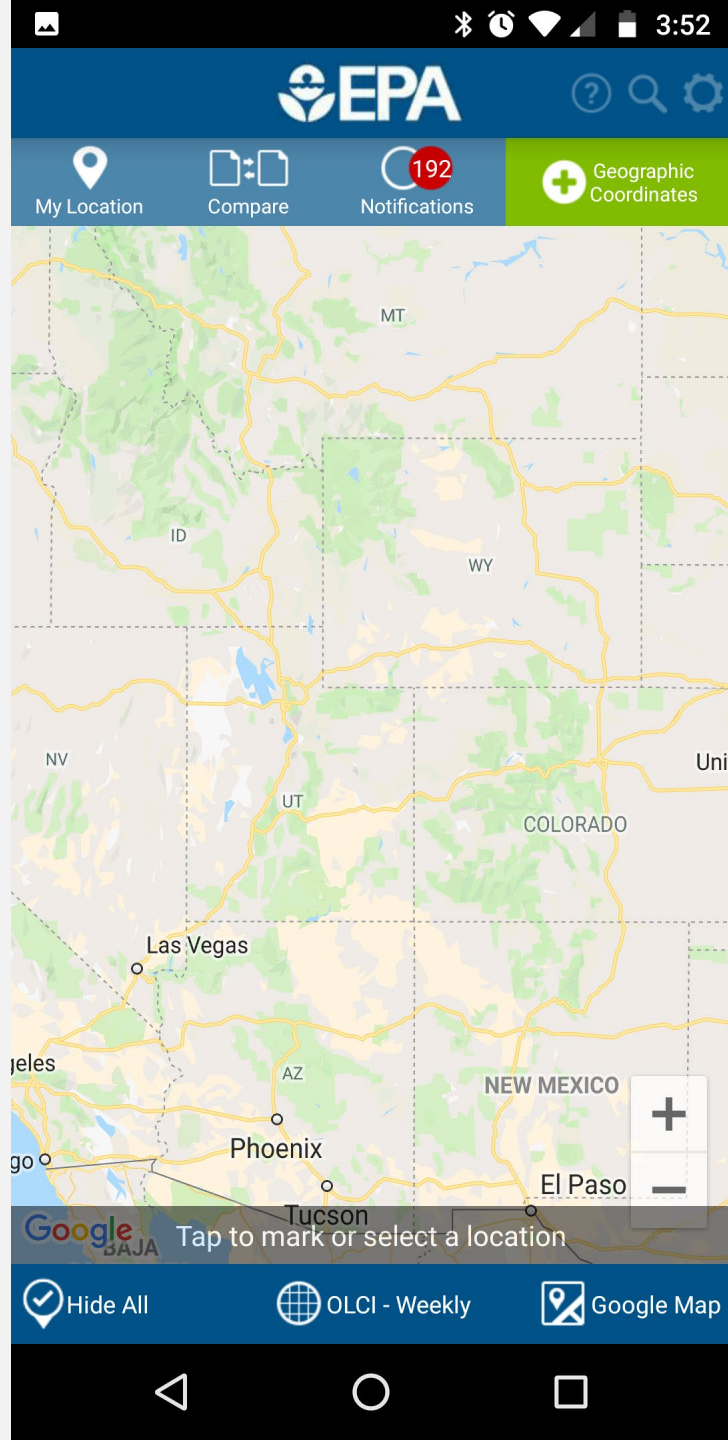








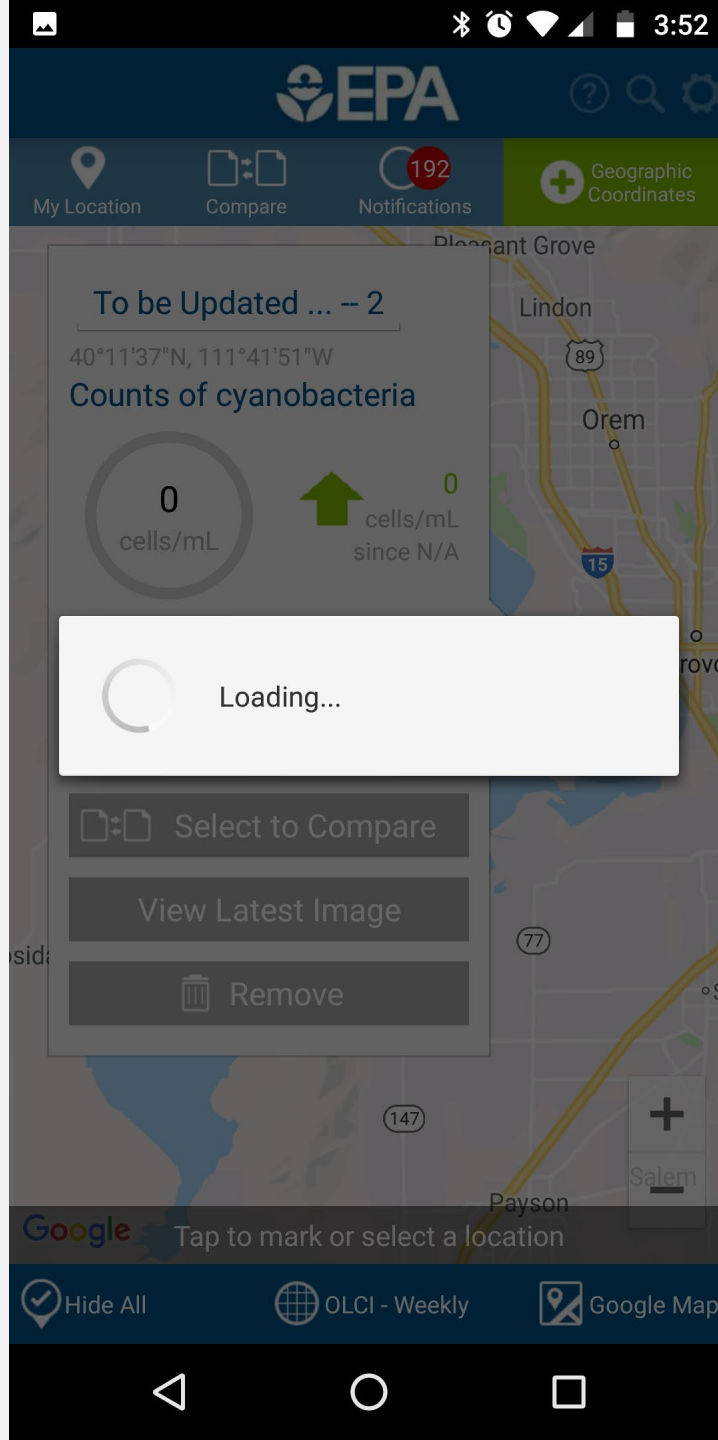


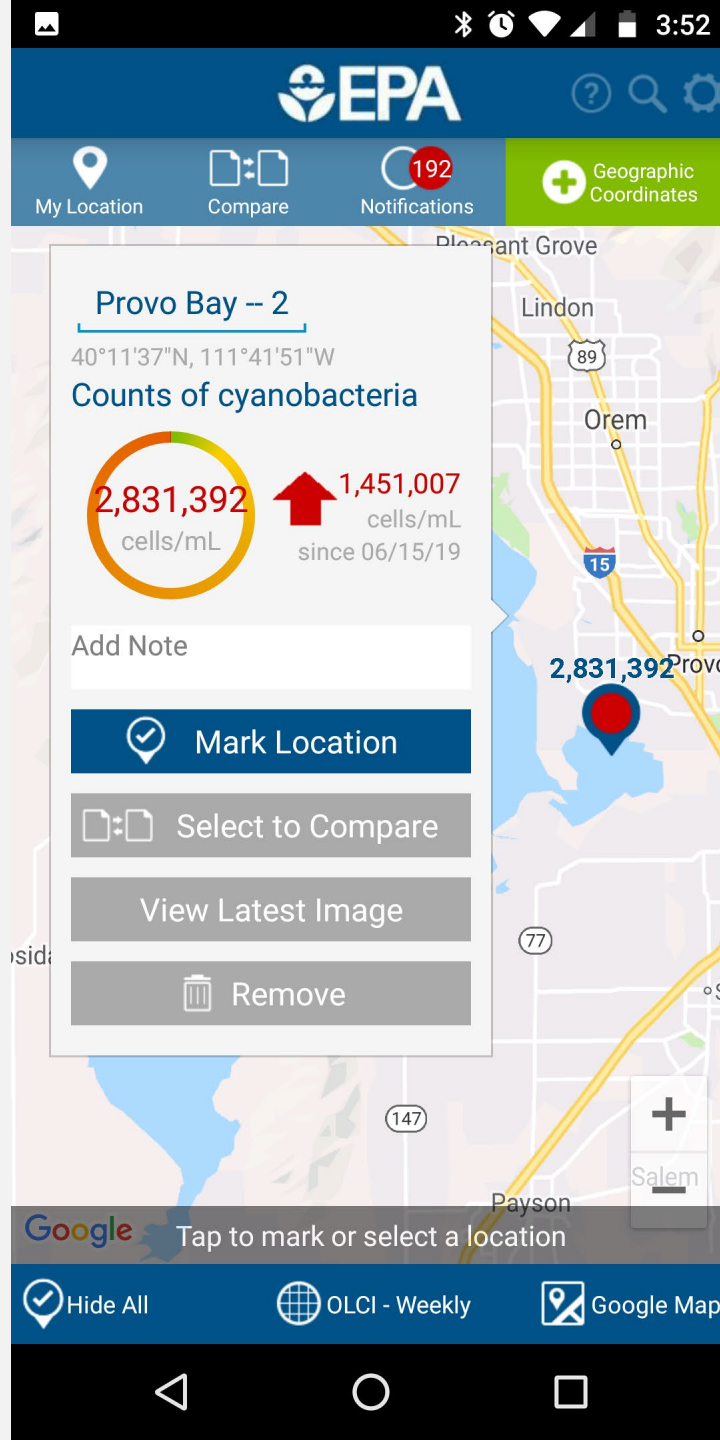


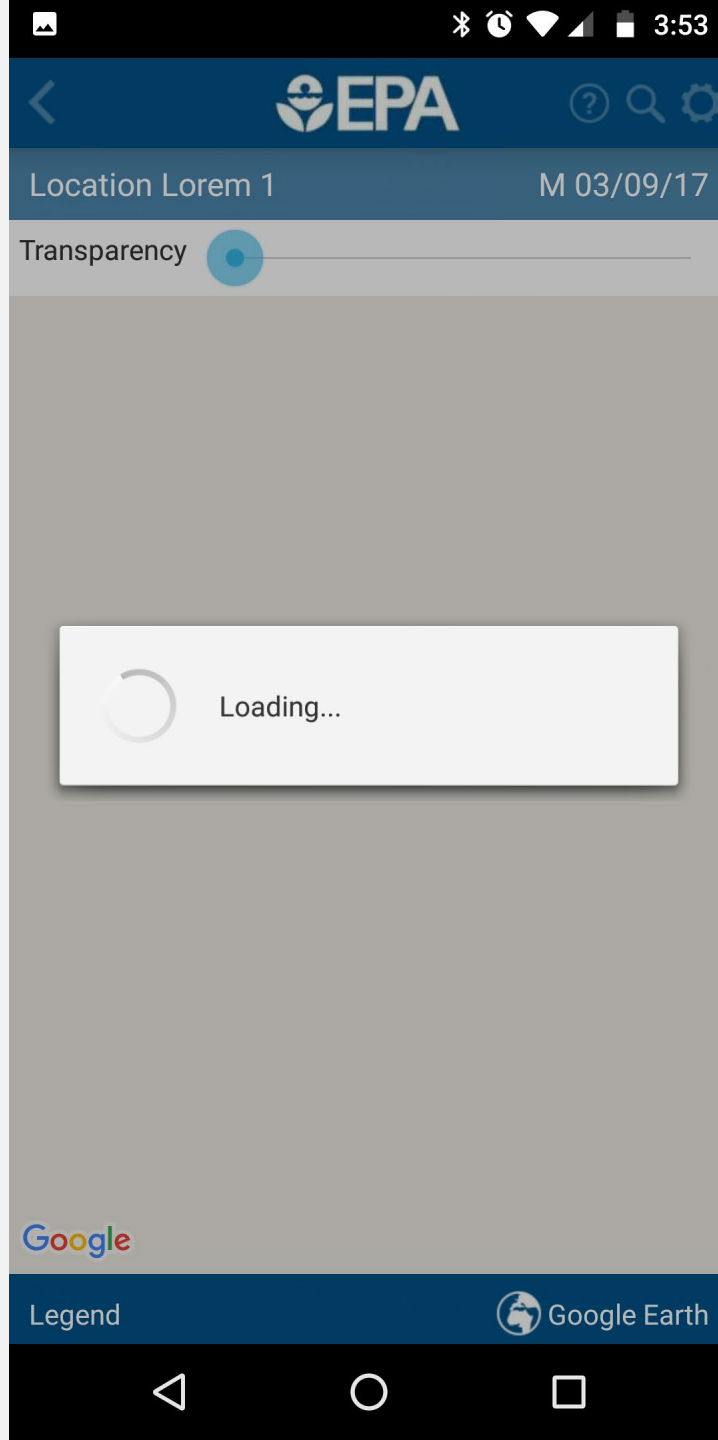


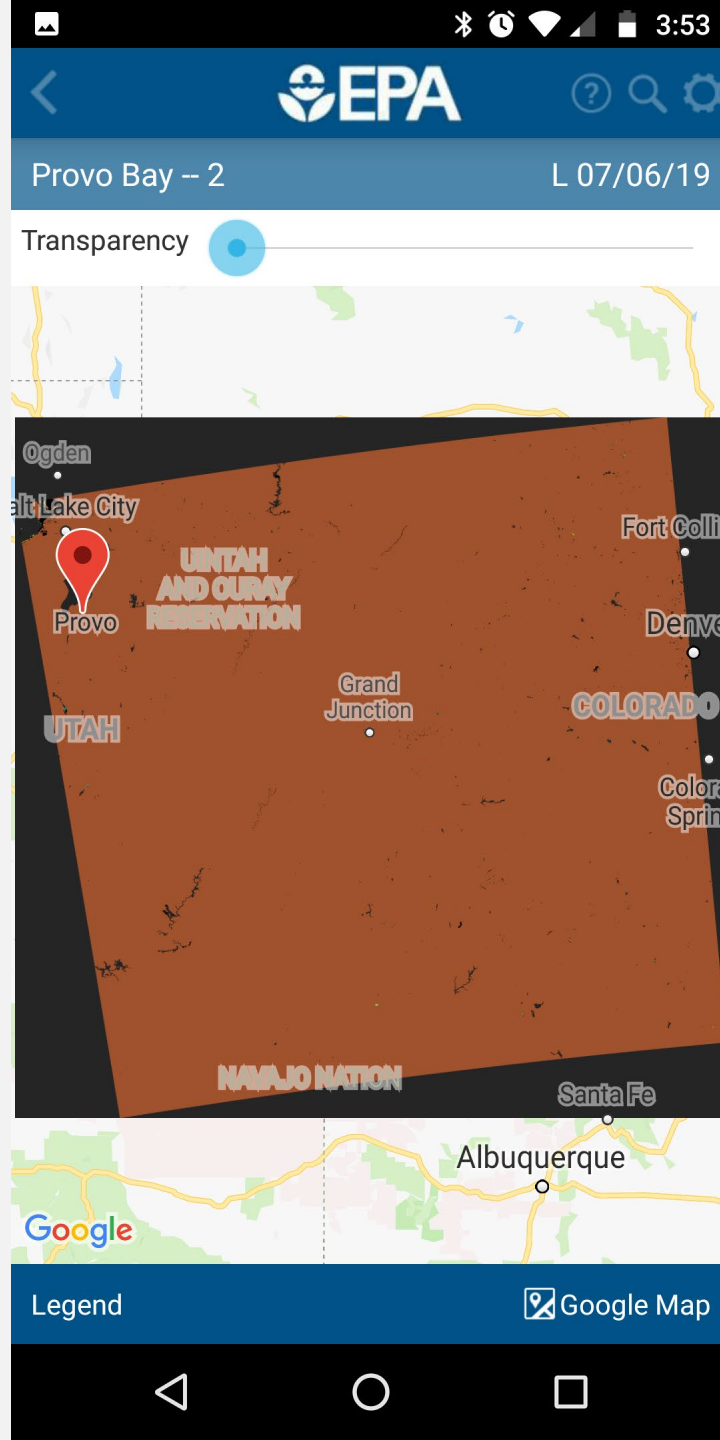


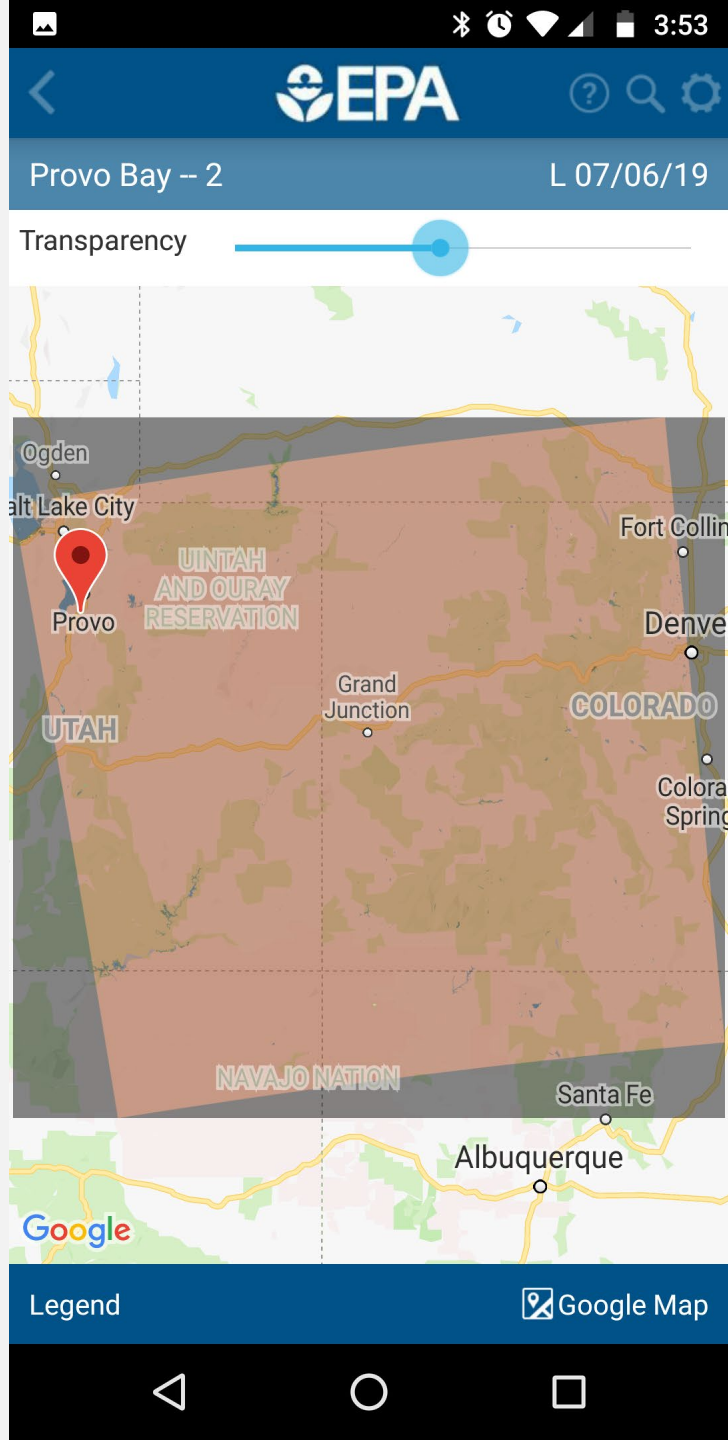


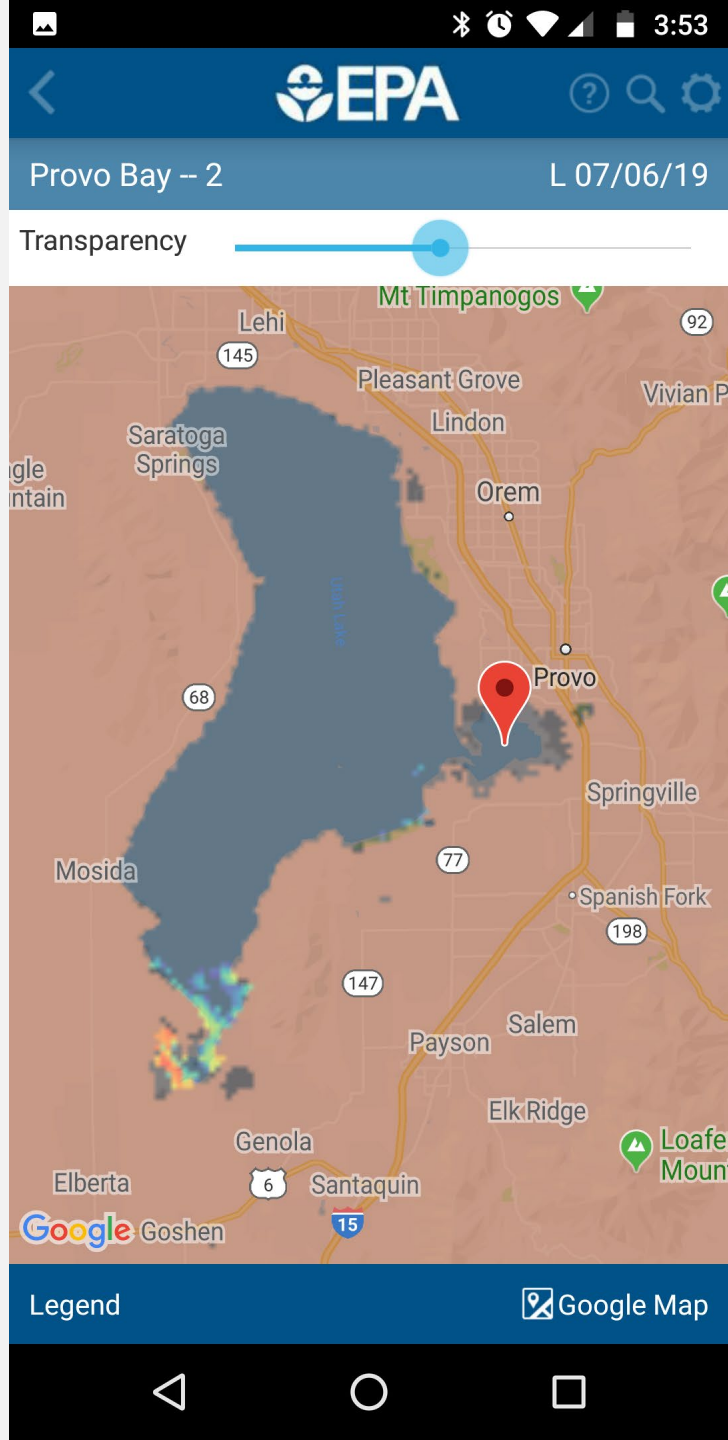


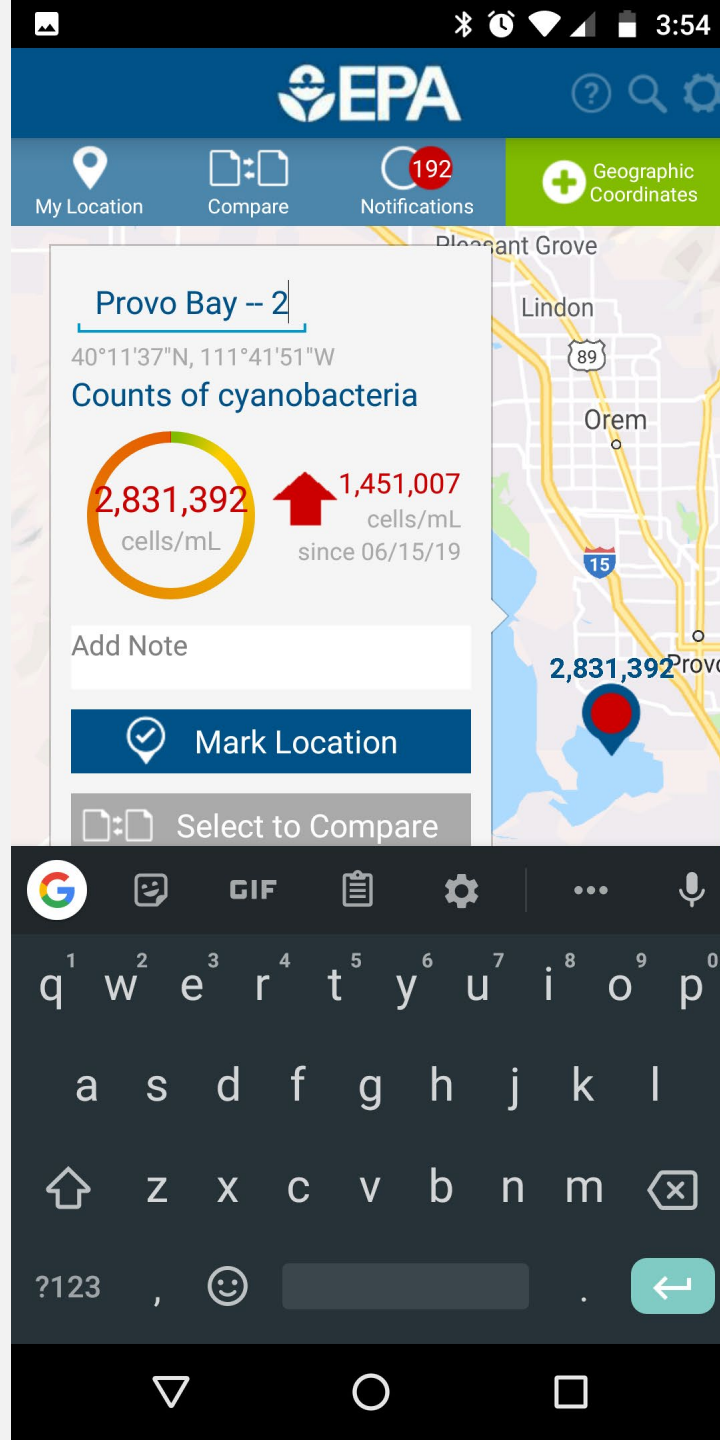


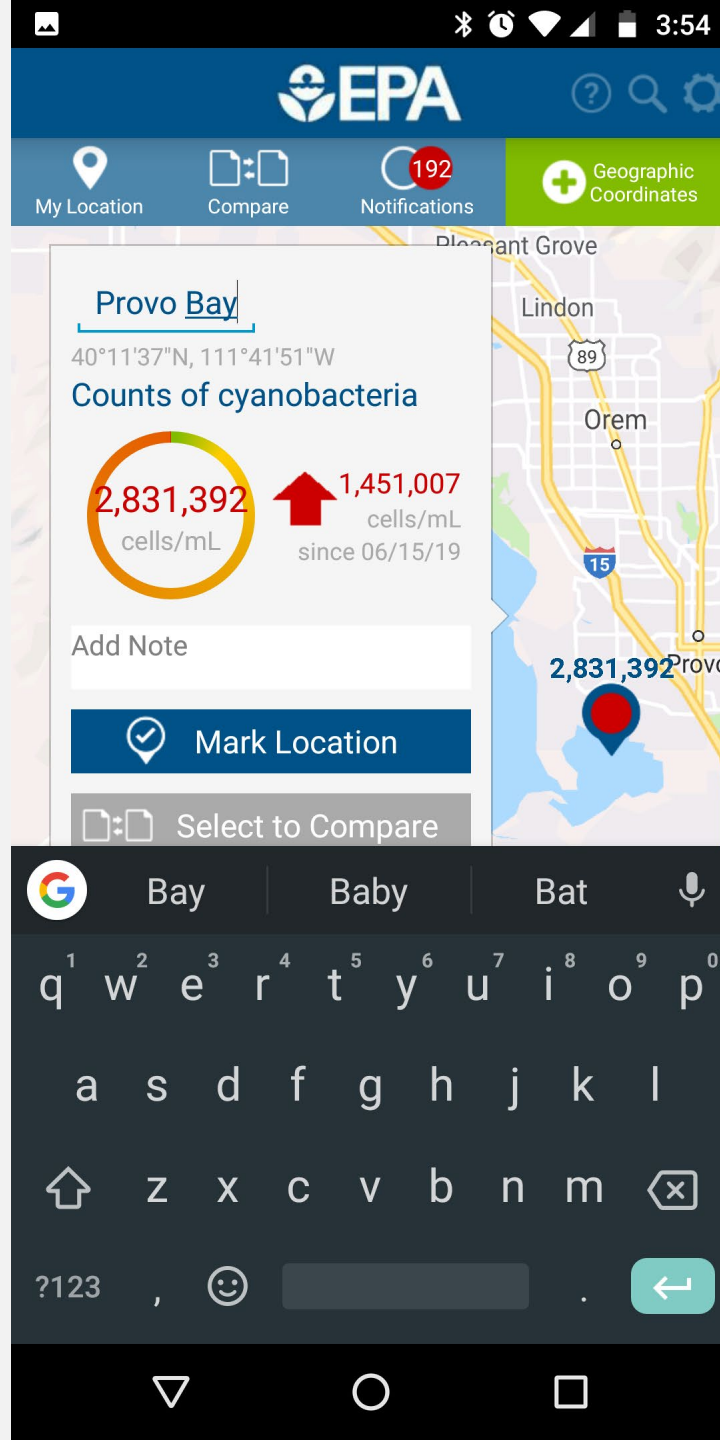
















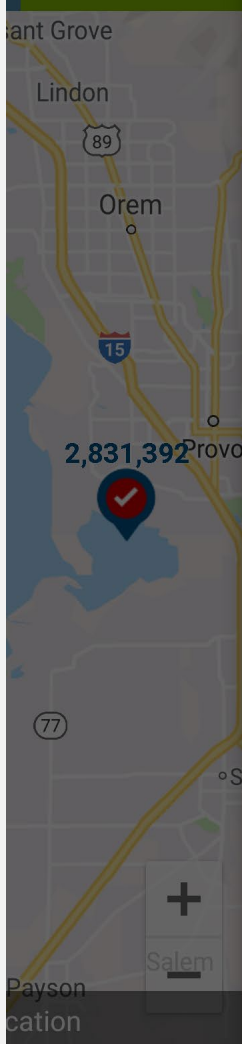





Version: R.1.0.1

Modify Graph Color Configuration

Geographic Coordinates



 Google Map

Low

From 10,000 To 109,000

Medium

From 110,000 To 299,000

High


From 300,000 To 1,000,000




Very High

Higher than 1,001,000

☐ Alert when higher than 1,000,000


Reload Data





Version: R.1.0.1

Modify Graph Color Configuration


Low


From

10,000

To

109,000




Medium


From

110,000

To

299,000




High


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1,000,000



Very High


Higher than

1,001,000




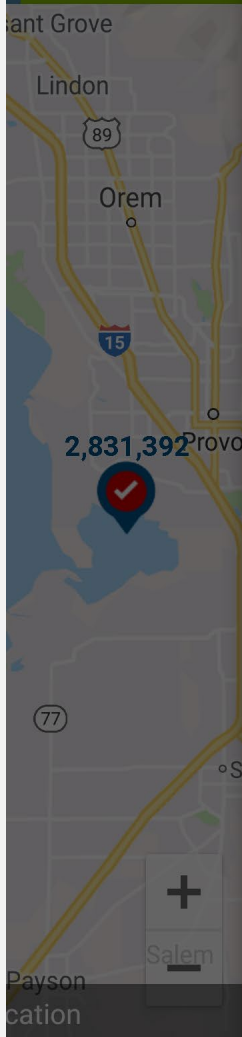
☒ Alert when higher than


1,000,000




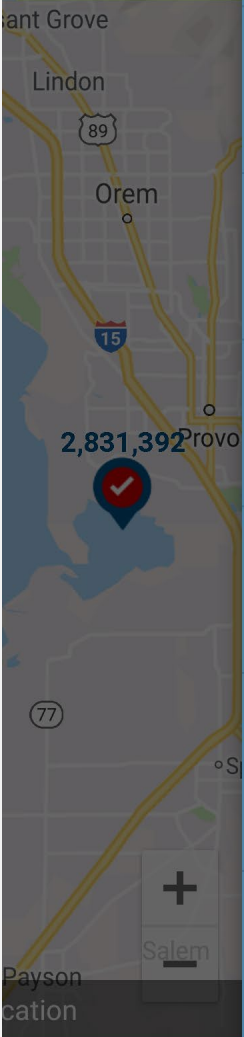
Reload Data


Geographic Coordinates





Google Map




 Geographic Coordinates

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Modify Graph Color Configuration

Low




From


10,000

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299,000



High




From


300,000

To

501,000




Very High




Higher than

502,000

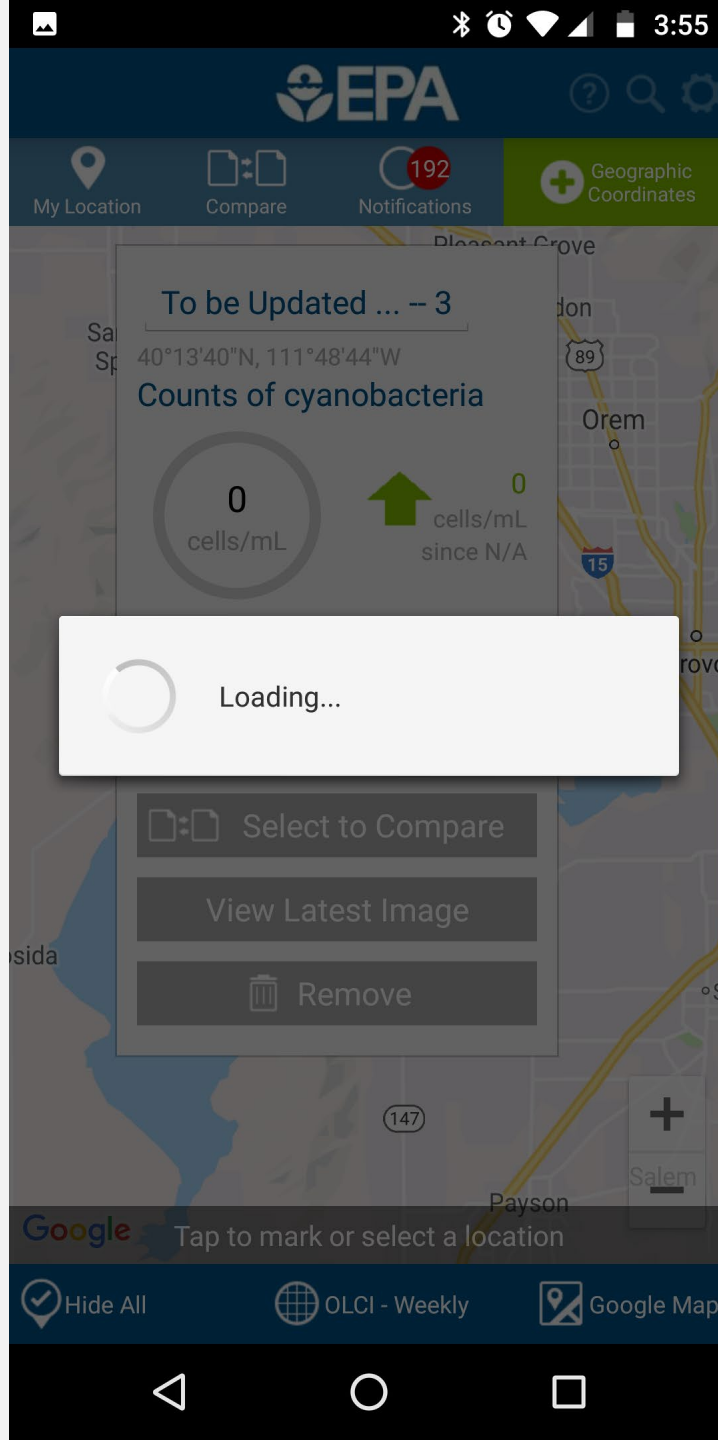


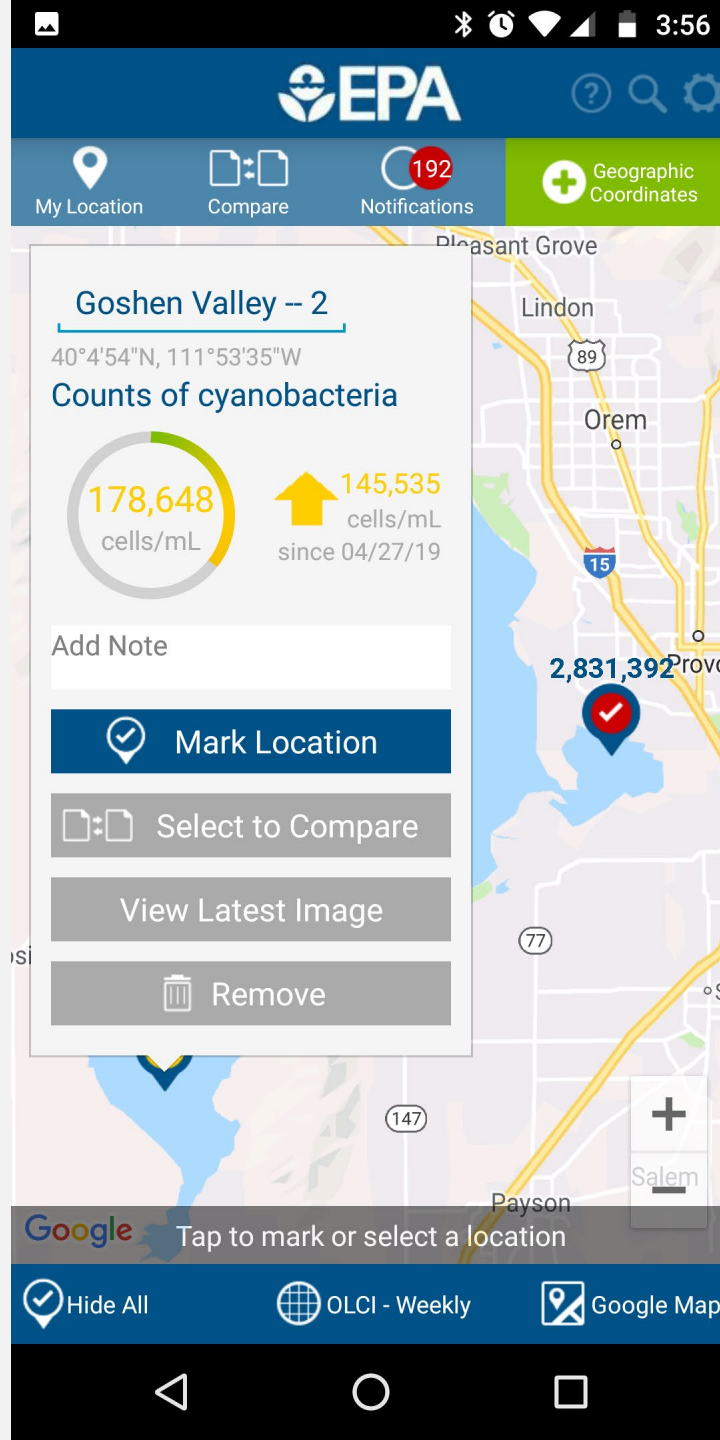
☒ Alert when higher than

1,000,000

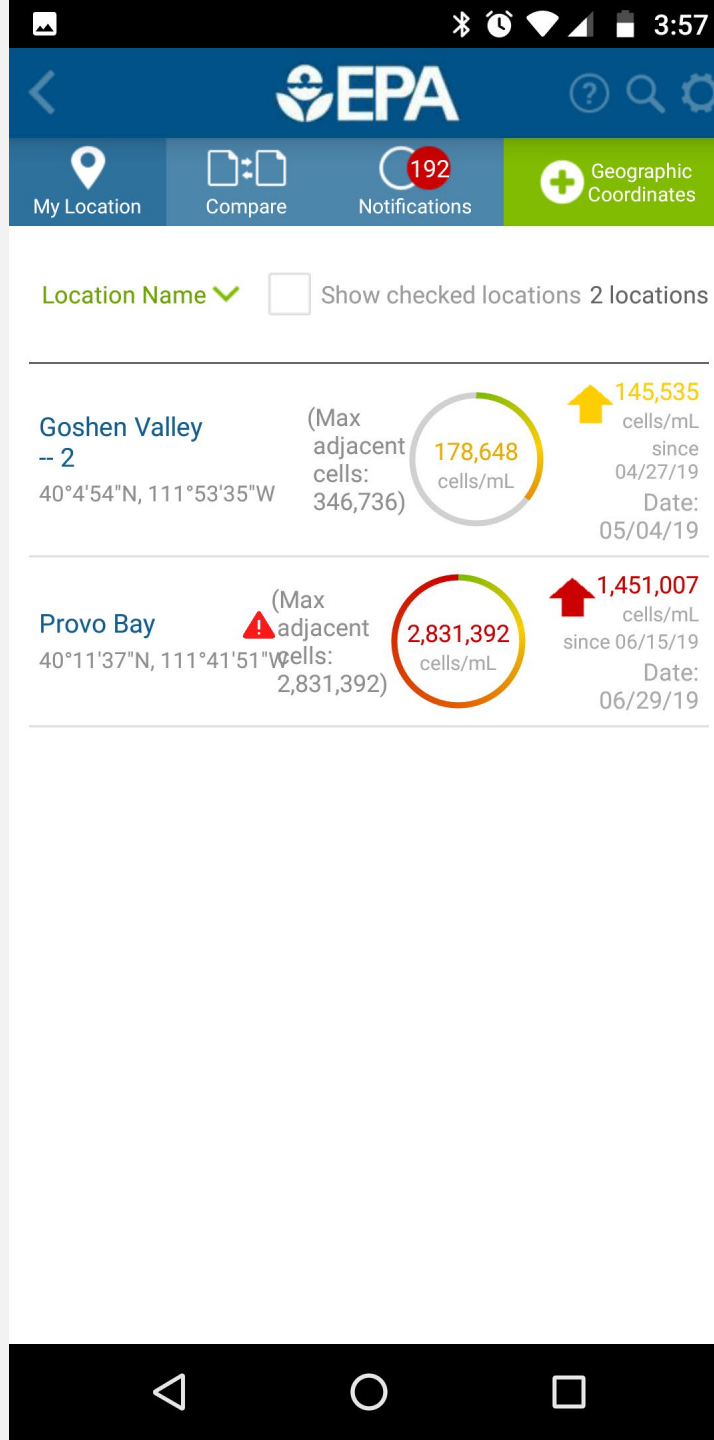


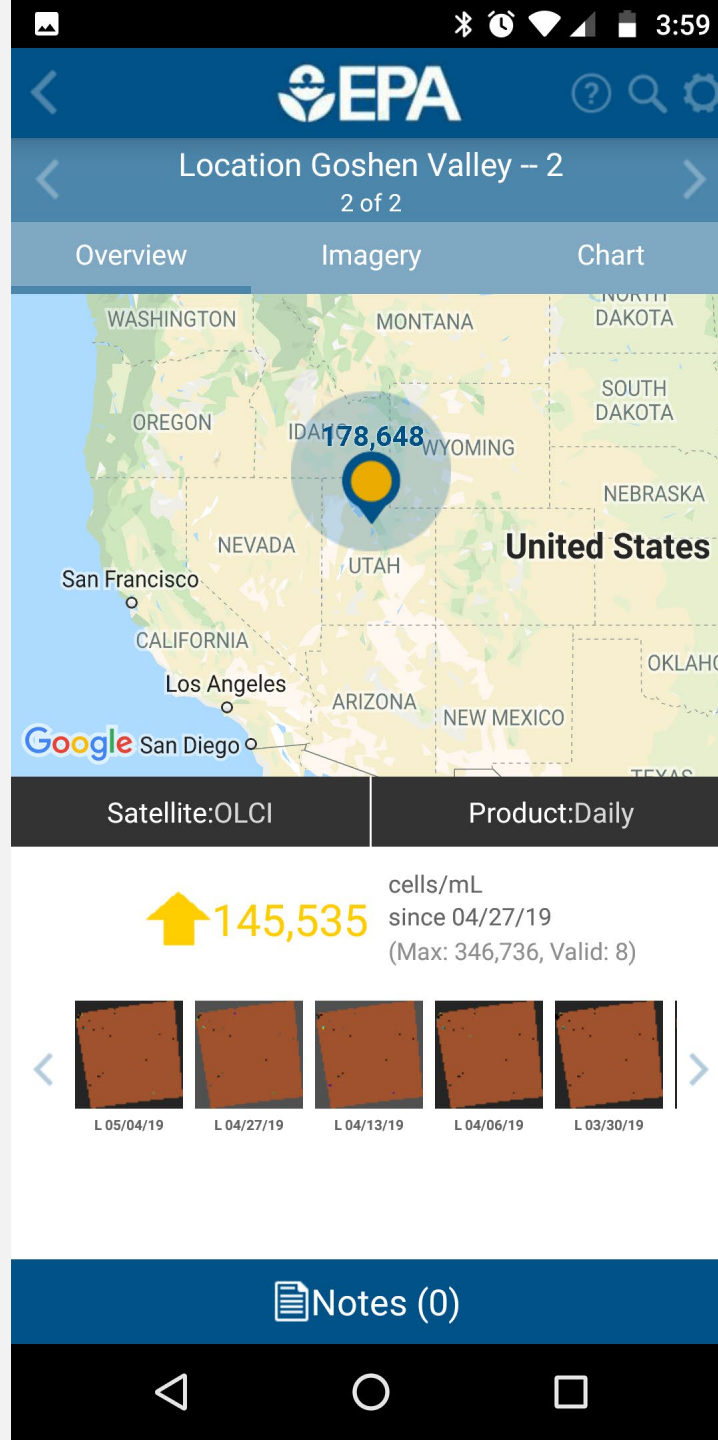
Reload Data

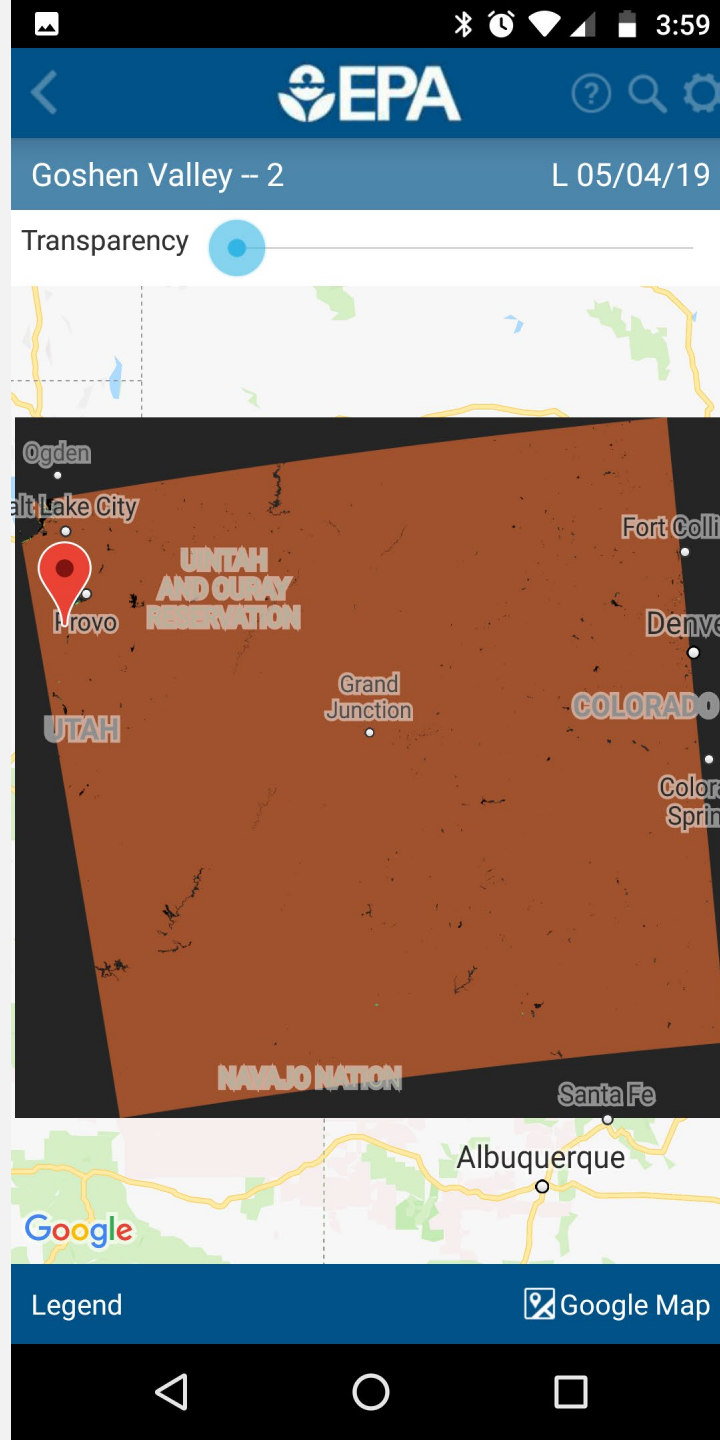


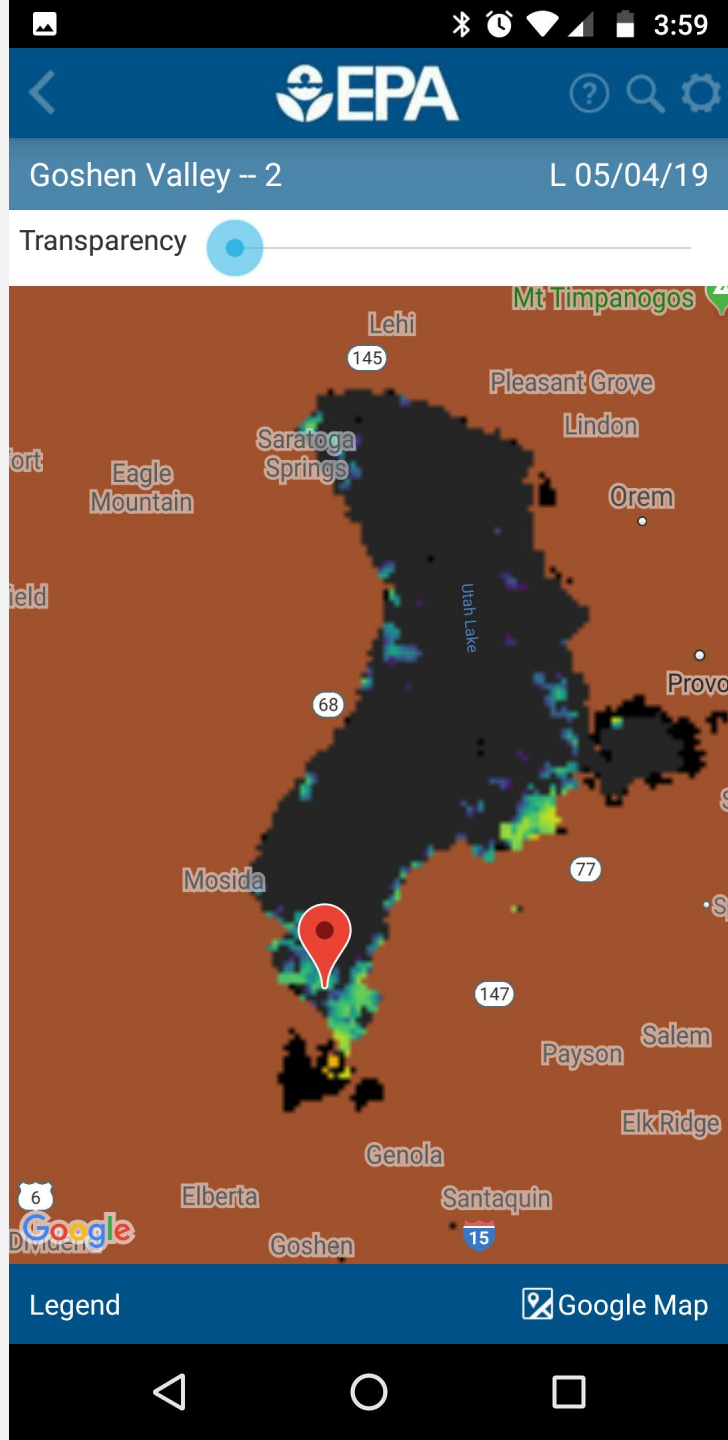


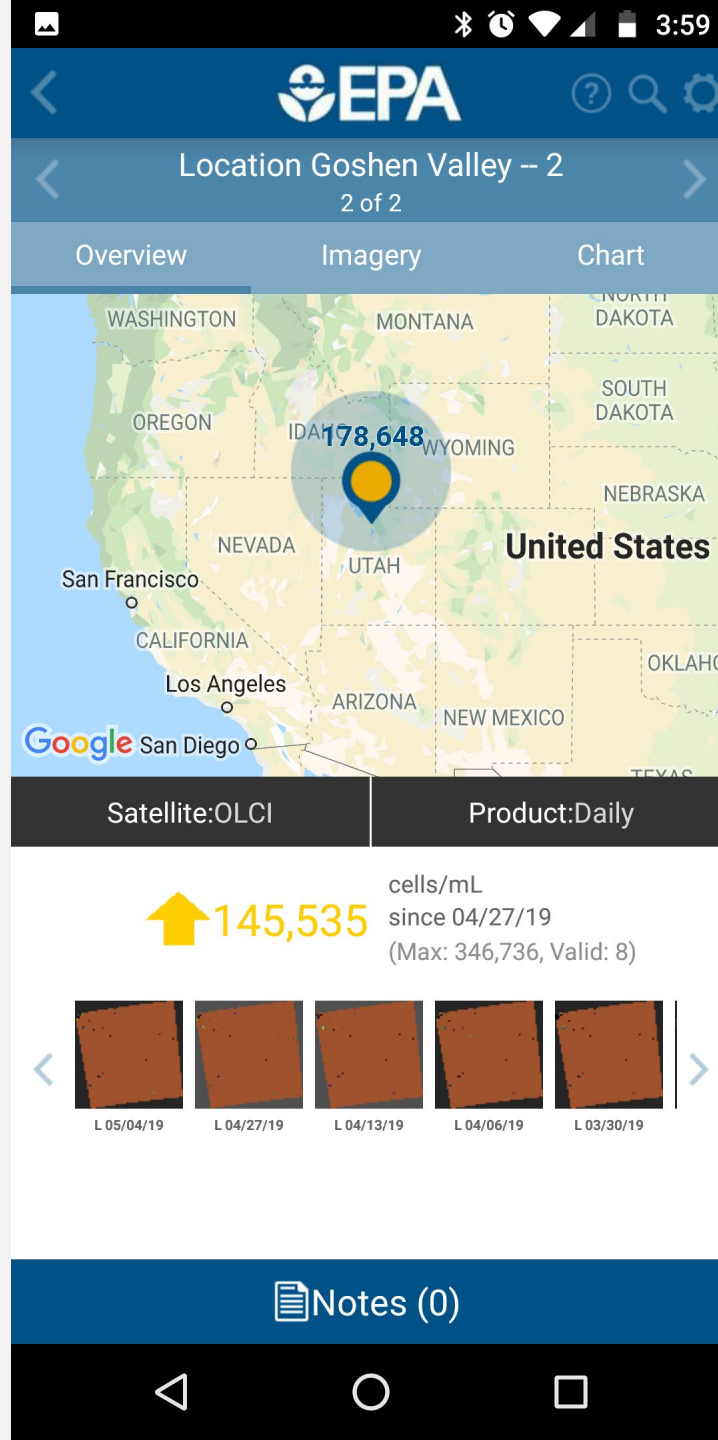


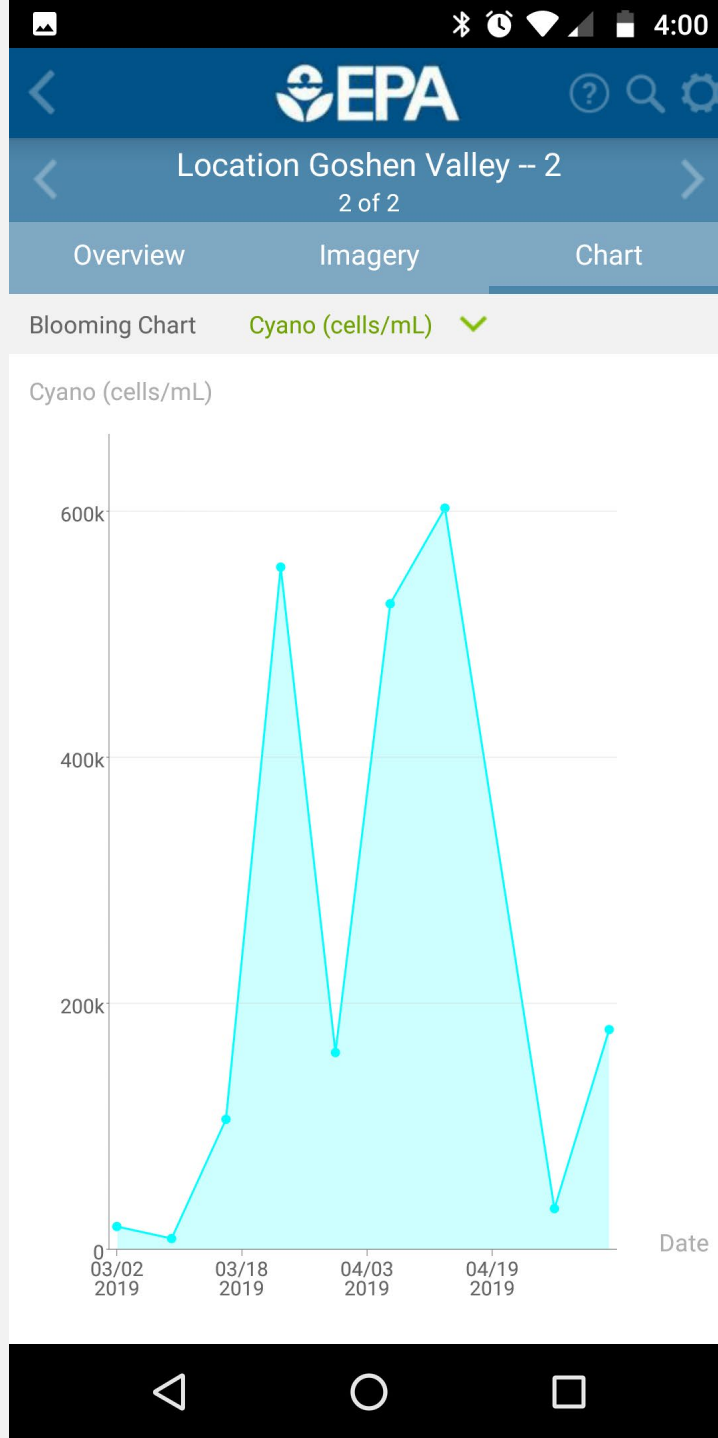



















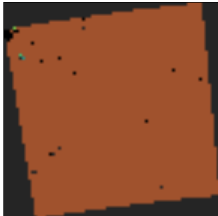
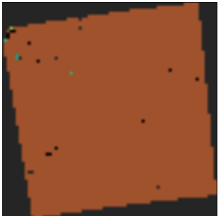
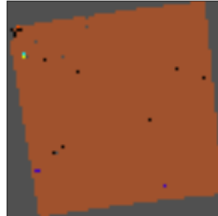
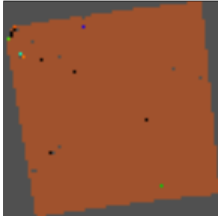






Location Goshen Valley -- 2
2 of 2


Overview Imagery Chart

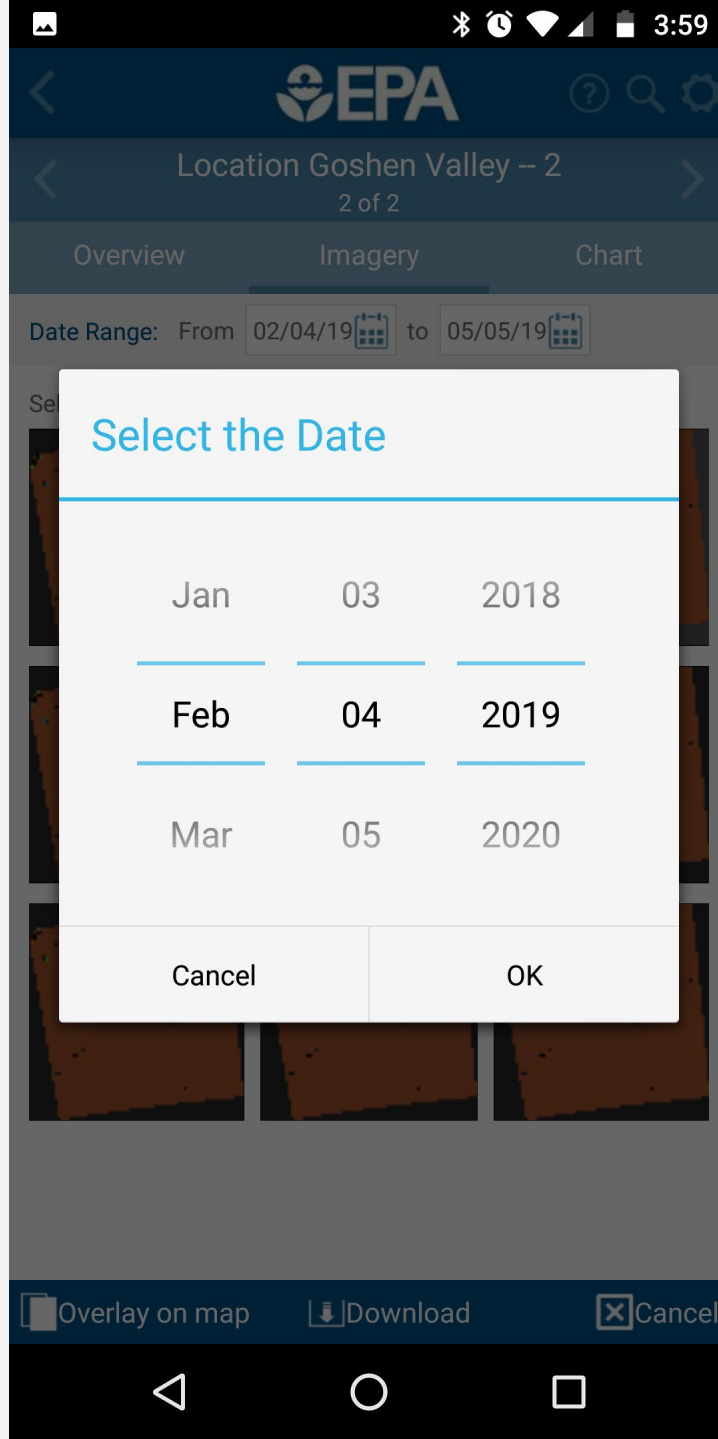
Date Range: From 02/04/19  to 05/05/19 

Selected (0)



 Overlay on map  Download  Cancel




A screenshot of a mobile application interface for the EPA. The app shows a location "Goshen Valley -- 2" (2 of 2) with tabs for Overview, Imagery, and Chart. A date range is set from 02/04/19 to 05/05/19. A "Select the Date" modal is open, displaying a date picker with months (Jan, Feb, Mar), days (03, 04, 05), and years (2018, 2019, 2020). The modal has "Cancel" and "OK" buttons. At the bottom of the app, there are buttons for "Overlay on map", "Download", and "Cancel".

Select the Date

Jan	03	2018
Feb	04	2019
Mar	05	2020



Cancel OK

Overlay on map Download Cancel





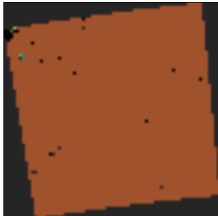

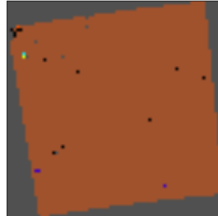
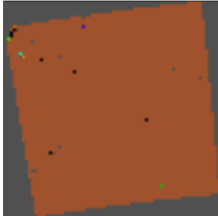






Location Goshen Valley -- 2
2 of 2


Overview Imagery Chart

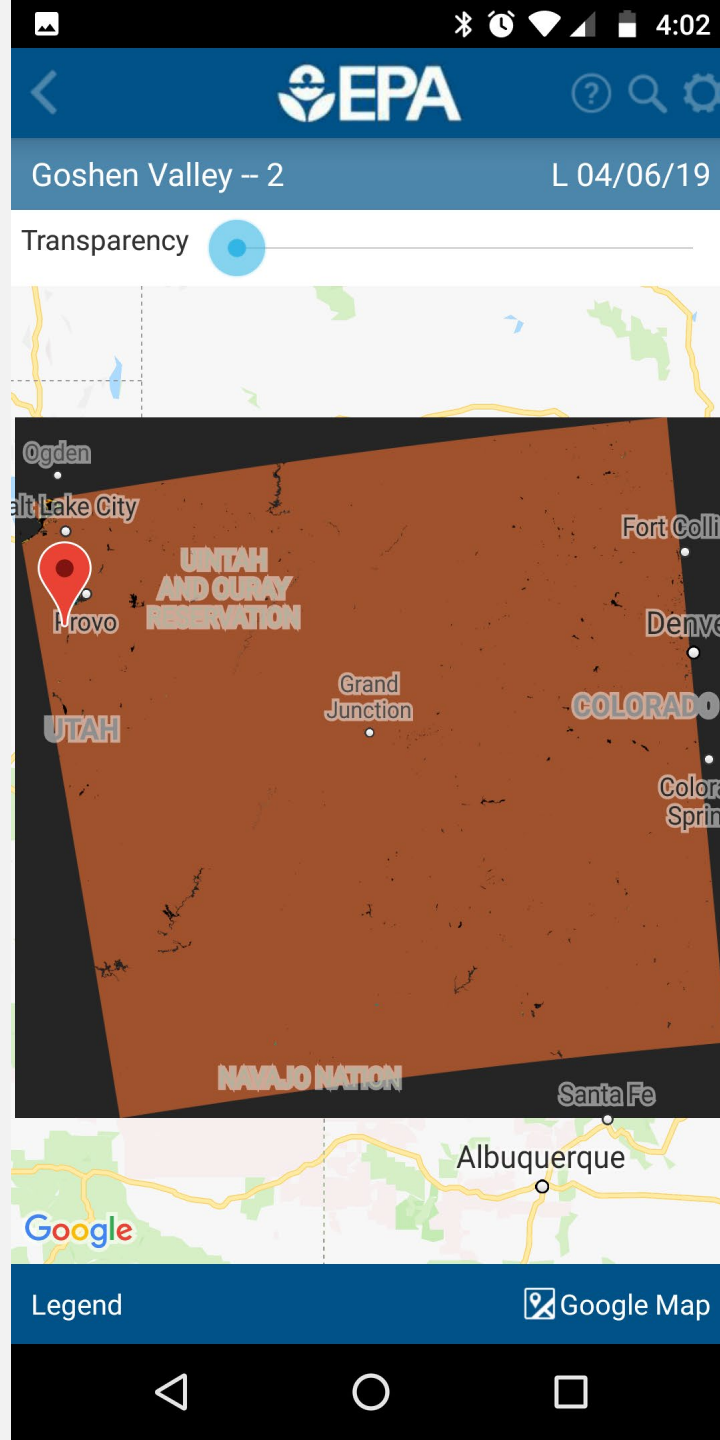
Date Range: From 02/04/19  to 05/05/19 

Selected (1)



 Overlay on map  Download  Cancel





View the country in minutes

