

# The Most Watched Website in the World

The Evolution of the JHU Global  
Coronavirus Dashboard



JOHNS HOPKINS  
LIBRARIES

Data Services

Reina Murray & Mara Blake | August 6, 2020



## • Introductions and Team

### **Reina Murray**

Geospatial Data Curator &  
Applications Administrator

### **Mara Blake**

Manager of Data Services

### **Center for Systems & Science Engineering**

Dr. Lauren Gardner  
Ensheng Frank Dong  
Hongru Du

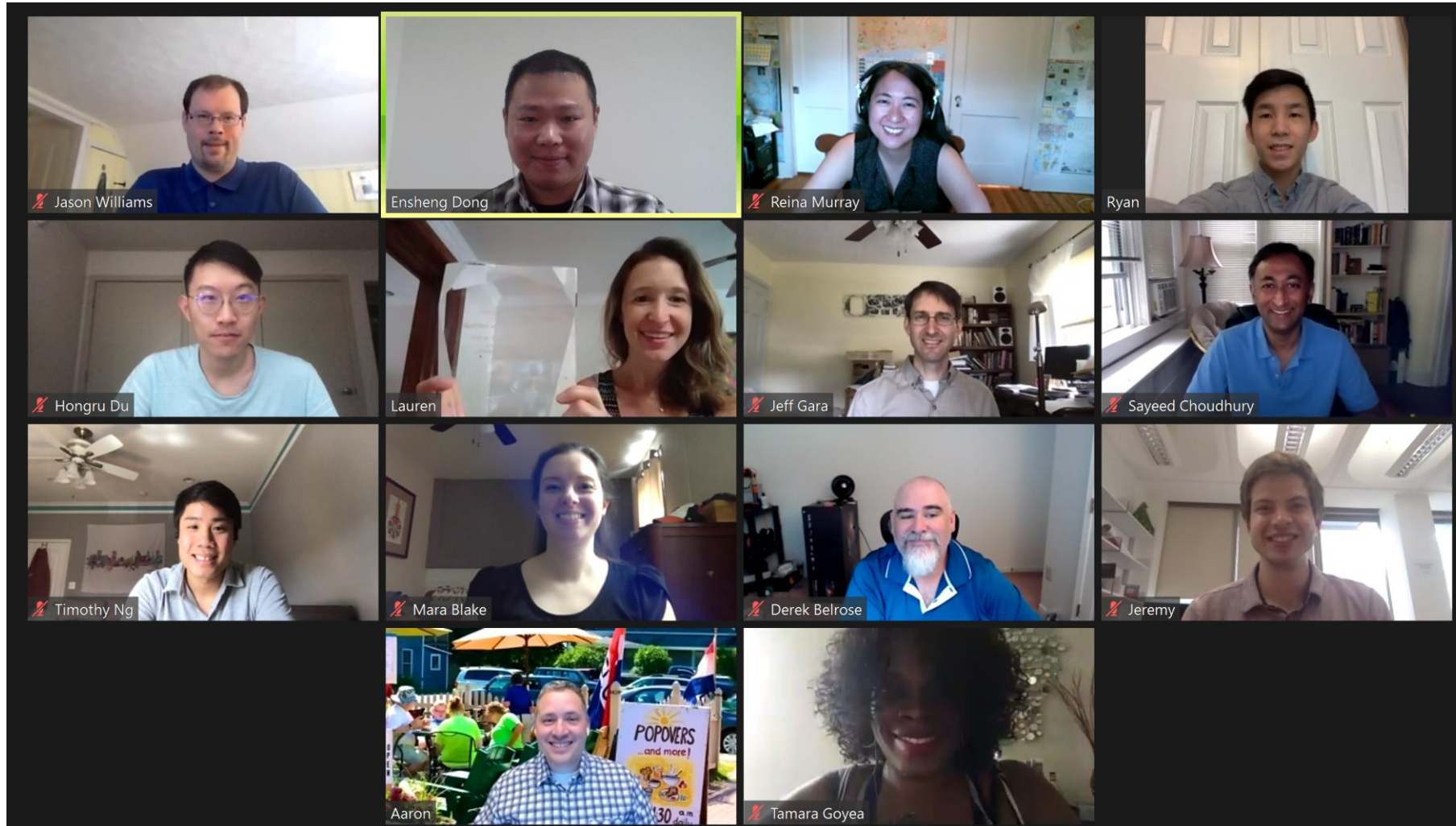
### **Sheridan Libraries**

Sayed Choudhury  
Jason Williams  
Jeffrey Gara  
Derek Belrose

### **Applied Physics Laboratory**

Aaron Katz  
Tamara Goyea  
Ryan Lau  
Timothy Ng  
Jeremy Ratcliff

# • Introductions and Team



# Agenda

- 1. How We Got Here:** the Story and Evolution of the JHU Global COVID-19 Dashboard
- 2. The Balancing Act:** Managing GIS Needs and Services for a Campus in Transition and Beyond
- 3. Looking Ahead:** Trends in Higher Education



# How We Got Here

A large orange arrow pointing to the right, centered on a light beige background. The arrow is filled with a solid orange color and has a white outline. The text "How We Got Here" is written in a bold, white, sans-serif font across the middle of the arrow's shaft.

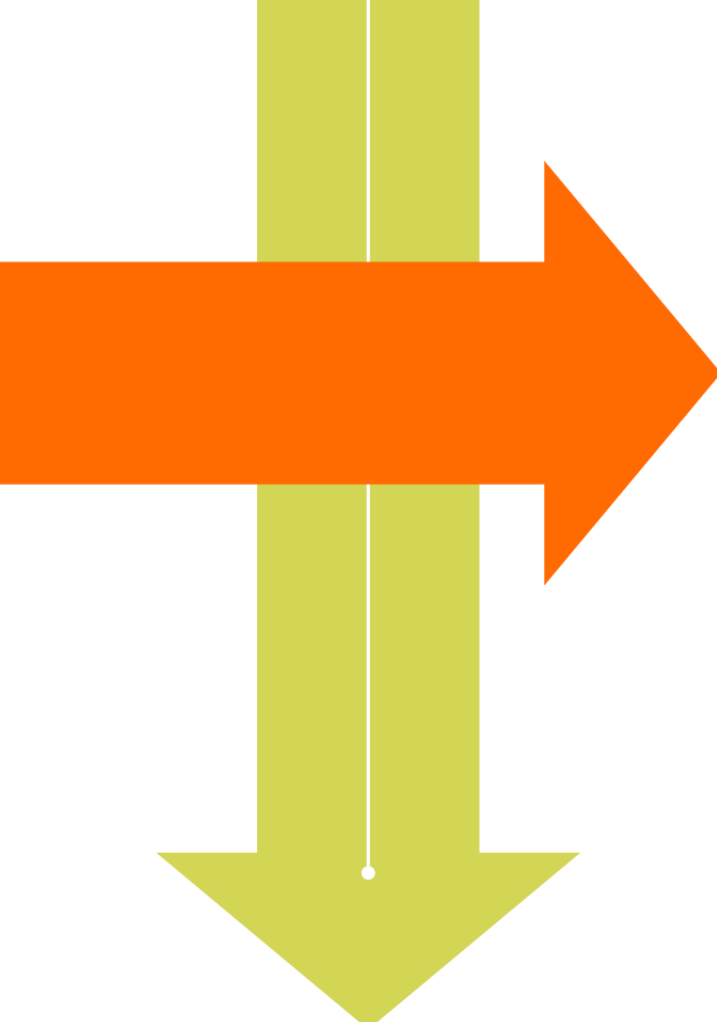


Dr. Lauren Gardner, associate professor of civil and systems engineering at Johns Hopkins University



Ensheng Frank Dong, first-year Ph.D student in civil and systems engineering at Johns Hopkins University

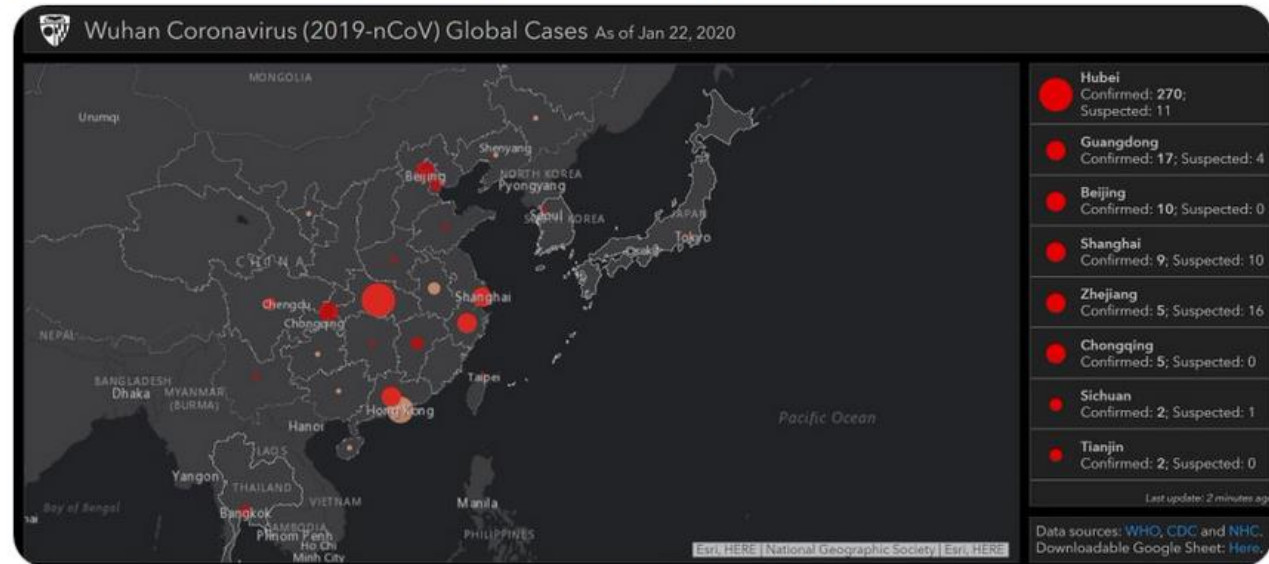




**Lauren Gardner** ✓  
@TexasDownUnder



We are tracking the 2019-nCoV spread in real-time. Cases and locations can be viewed here; data available for download. #nCoV2019 @JHUSystems [gisanddata.maps.arcgis.com/apps/opsdashbo...](https://gisanddata.maps.arcgis.com/apps/opsdashbo...)



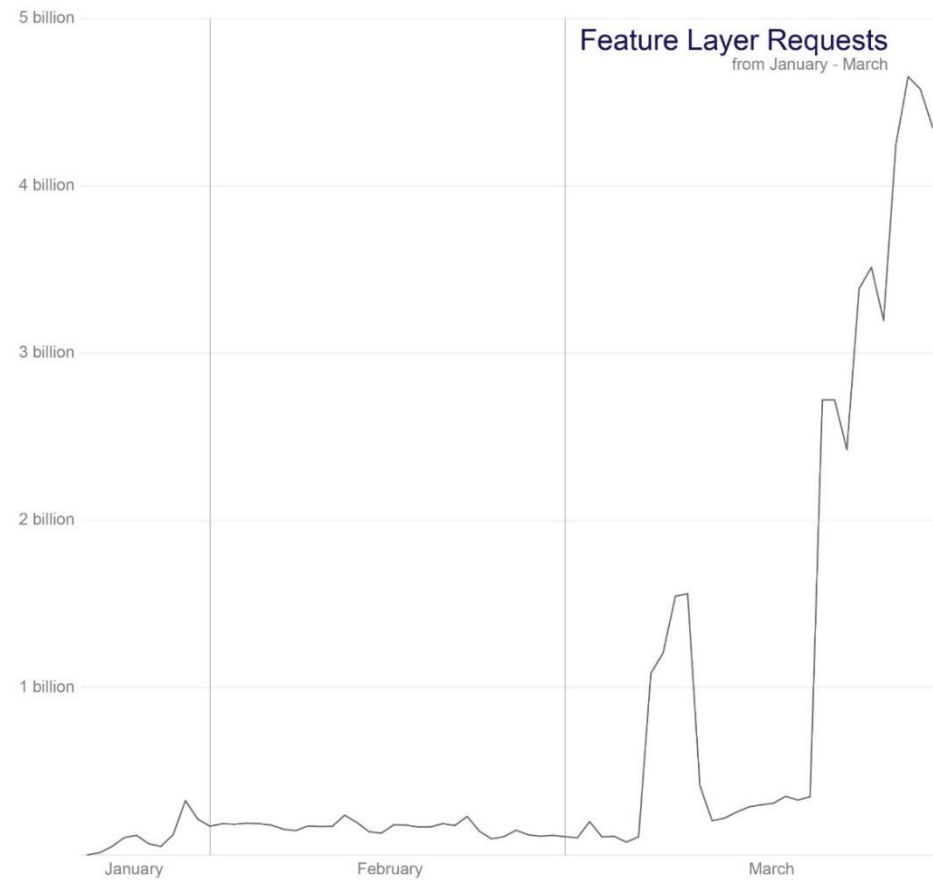
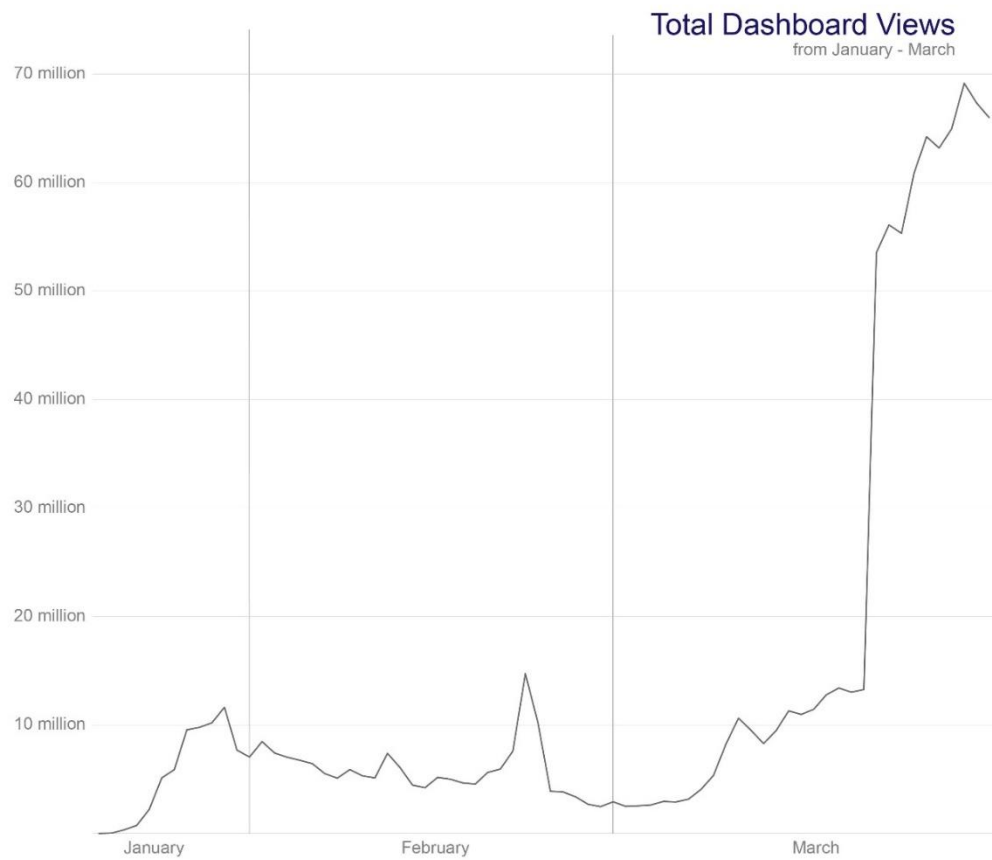
11:04 AM · Jan 22, 2020 · [Twitter Web App](#)

**1.9K** Retweets and comments **2.3K** Likes



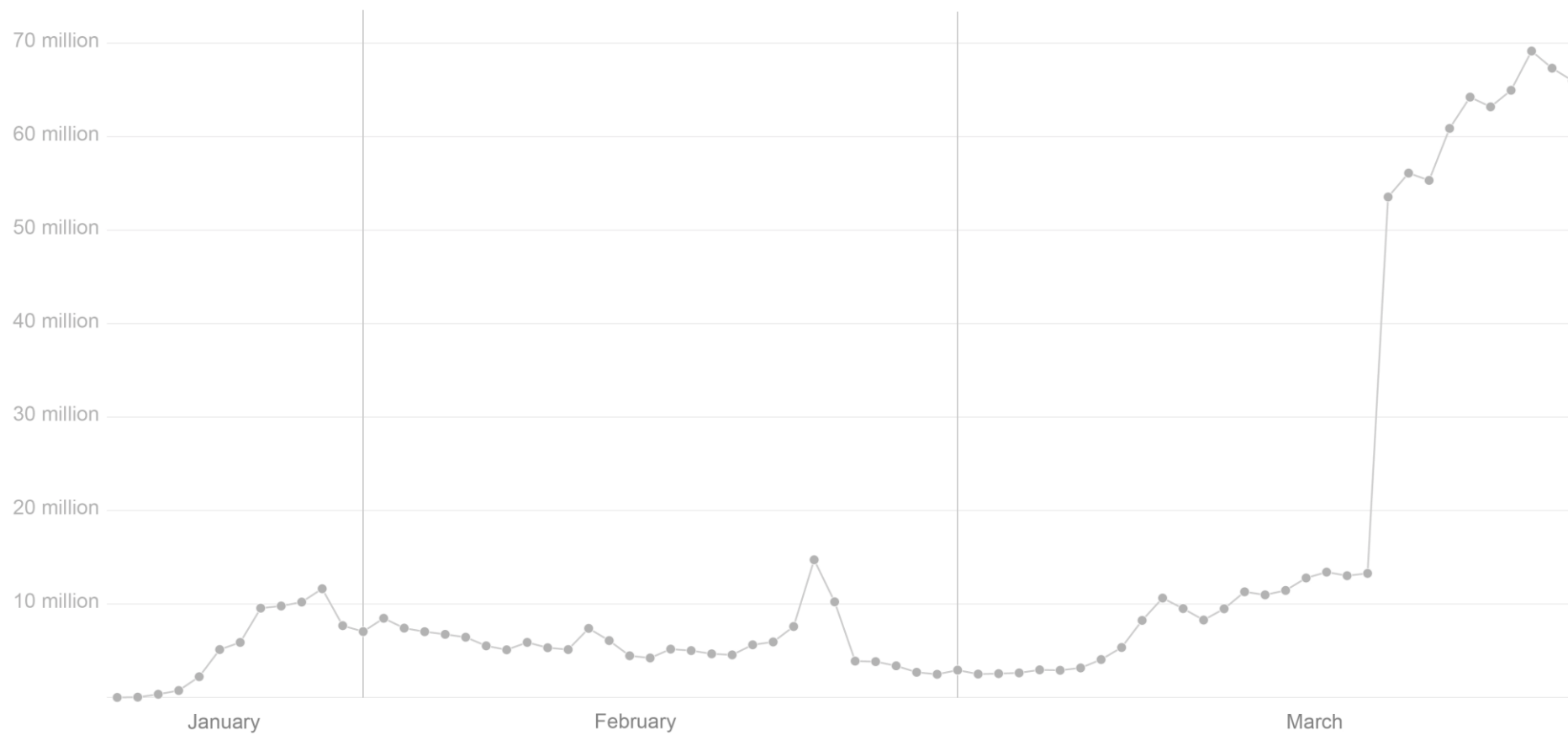
Data Services

# The First Three Months





# Dashboard Views





## **An Evolving Team**

*As the demands for the dashboard and the scope for the project grew, so too did the teams to manage and support it.*





Technical Support

Project Support





Technical Support



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*of* ENGINEERING

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**Center for Systems Science  
and Engineering**

Project Support





## Technical Support



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*of ENGINEERING*



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APPLIED PHYSICS LABORATORY

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**Center for Systems Science  
and Engineering**



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## Project Support





## Technical Support



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*of* ENGINEERING



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SHERIDAN LIBRARIES



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UNIVERSITY

## Project Support





# Technical Support

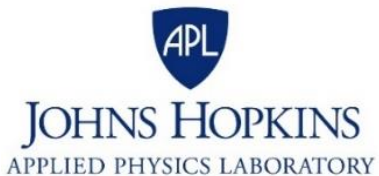
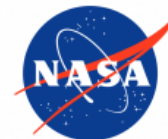


# Project Support



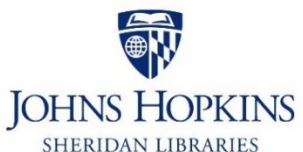


# Technical Support



Center for Systems Science and Engineering

# Project Support



(and more!)

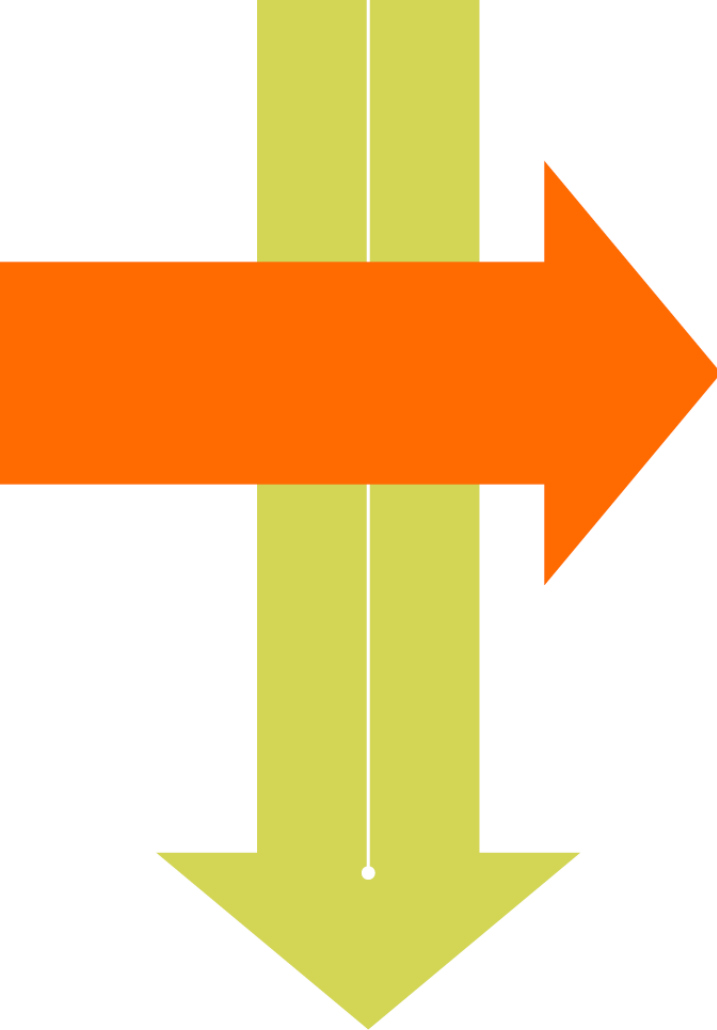


# January




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### COVID-19 Cases US

Overview Data Visualization



The current situation for the COVID-19 virus in the US updated hourly.

Feature Layer by CSSE\_GISandData

Created: Mar 21, 2020 Updated: Jul 28, 2020 View Count: 152,452,318

[Living Atlas](#)

#### Description

This feature layer contains the most up-to-date COVID-19 cases for the US, Canada. Data sources: WHO, CDC, ECDC, NHC, DXY, 1point3acres, Worldometers.info, BNO, state and national government health departments, and local media reports. The China data is automatically updating at least once per hour, and non China data is updating manually. This layer is created and maintained by [the Center for Systems Science and Engineering \(CSSE\)](#) at the Johns Hopkins University. This feature layer is supported by Esri Living Atlas team and JHU Data Services. This layer is opened to the public and free to share. [Contact Johns Hopkins.](#)

#### IMPORTANT NOTICE:

- Fields for Active Cases and Recovered Cases are set to 0 in all locations. John Hopkins has not found a reliable source for this information at the county level but will continue to look and carry the fields.
- Fields for Incident Rate and People Tested are placeholders for when this becomes available at the county level.

#### Details


Source: [Feature Service](#)  
Data Last Updated: Jul 28, 2020, 1:46:44 AM  
Size: 0 kB  
★★★★★

[f](#) [t](#) [s](#)

#### Share

[🔗](#)

#### Owner

 CSSE\_GISandData

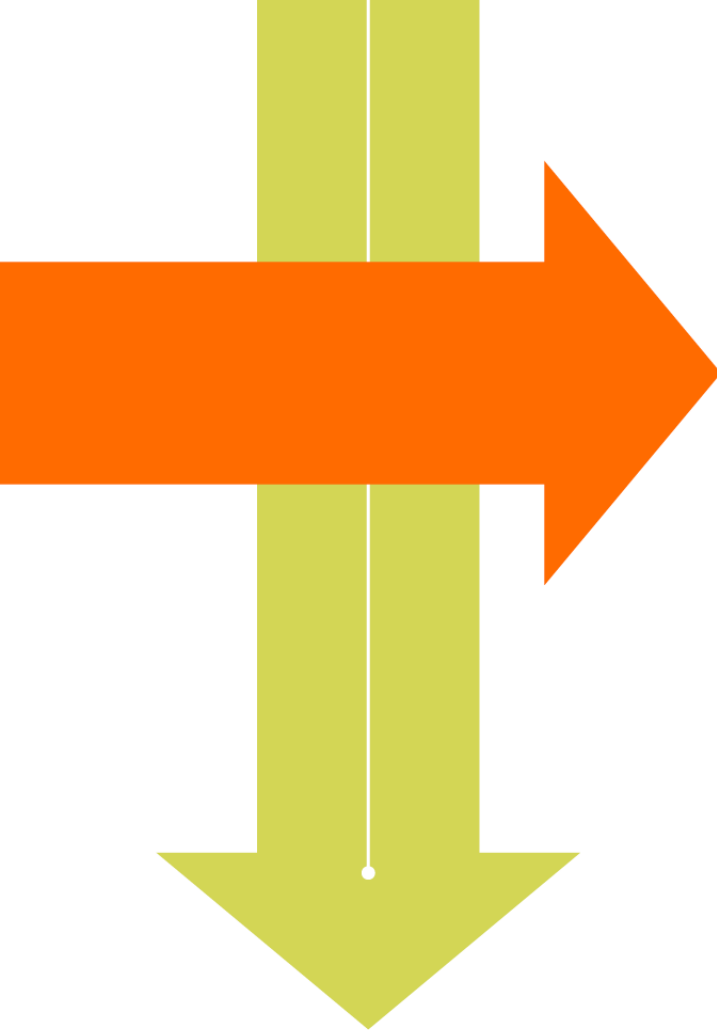
#### Categories

[Open in Map Viewer](#) [Open in Scene Viewer](#) [Open in ArcGIS Desktop](#)



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COVID-19 Cases US

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The current situation for the COVID-19 virus in the US updated hourly.

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Living Atlas

Open in Map Viewer

Open in Scenes Viewer

Open in ArcGIS Desktop

Overview Repositories 1 Projects

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CSSEGISandData

Follow

2.4k followers · 0 following · 0 stars

CSSE at Johns Hopkins University

Baltimore, MD

<https://systems.jhu.edu/>

Organizations

Popular repositories

**COVID-19**

Novel Coronavirus (COVID-19) Cases, provided by JHU CSSE

23.5k stars 14.6k forks

Single sign-on to see contributions for organizations within the Johns Hopkins University enterprise.

1,258 contributions in the last year

	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul
Mon												
Wed												
Fri												

Learn how we count contributions.

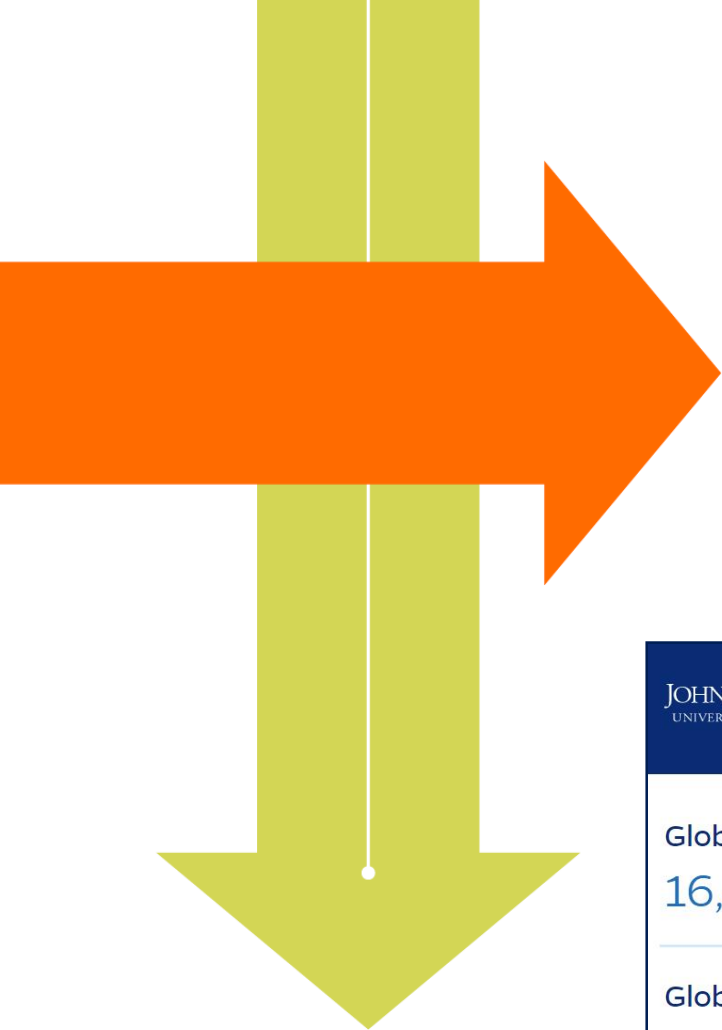
Contribution activity

July 2020

Created 232 commits in 1 repository

CSSEGISandData/COVID-19 232 commits





Data Services

COVID-19 Cases US

Overview Data Visualization

The current situation for the COVID-19 virus in the US updated hourly.

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Center for Systems Science and Engineering

IMPORTANT NOTICE:

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CORONAVIRUS RESOURCE CENTER

Home Tracking Testing Tracing By Region News & Resources About

Global Confirmed  
16,482,592

Global Deaths  
654,103

U.S. Confirmed  
4,290,263

U.S. Deaths  
148,011

Daily New Cases per 100k people. Data shown from 1/22/20 to 7/22/20.

NEW CASES OF COVID-19 IN US STATES

NEW

BY REGION

See the latest data in your region

Explore stats and trends specific to your country or U.S. state

Country or state... >

TESTING TRENDS TOOL

Track trends in COVID-19 cases and tests

NEW

STATE TIMELINE

Impact of opening and closing decisions by state

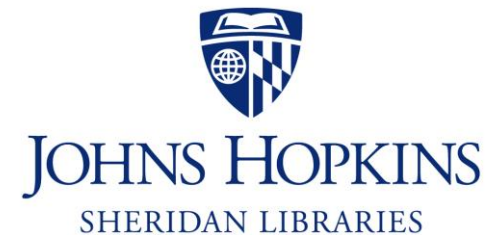
# **Growth, Scalability, and Change**

# The Balancing Act

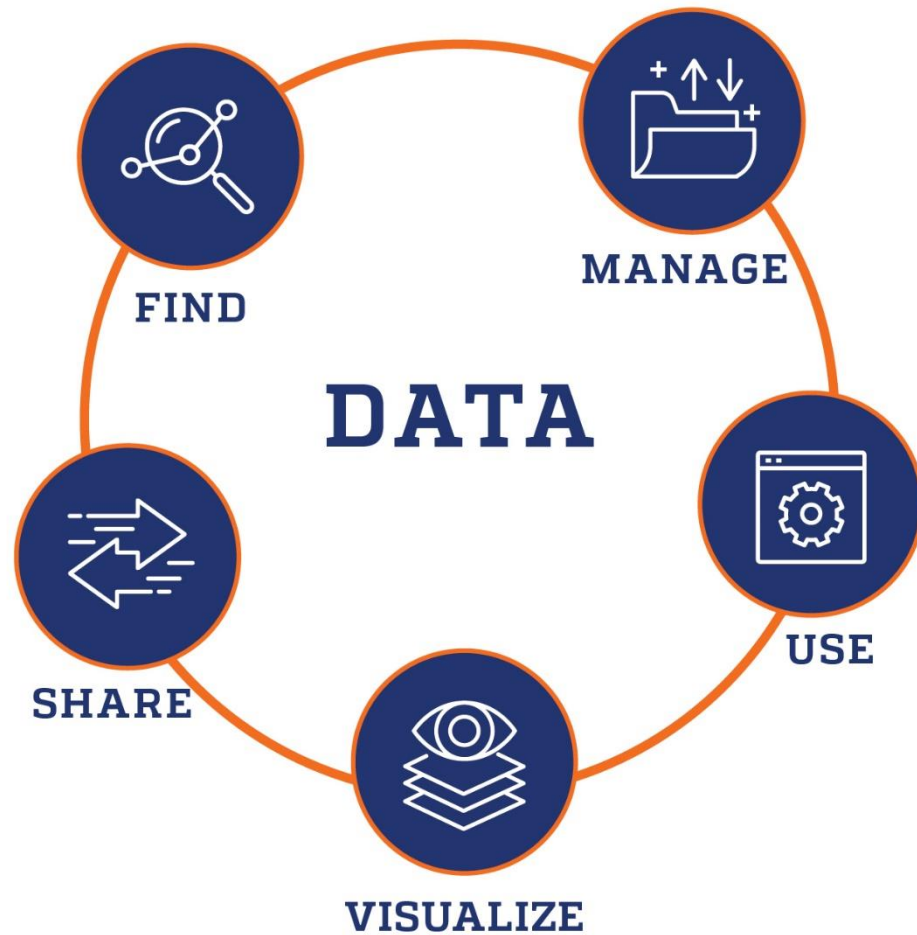
A large, dark blue arrow pointing to the right, centered on a light blue background. The arrow is composed of a horizontal bar and a triangular head. The text "The Balancing Act" is written in white, bold, sans-serif font across the middle of the arrow's shaft.

# JHU Sheridan Libraries

- Libraries and museums serving main campus
- Data Management Directorate
  - Digital Research and Curation Center (DRCC)
  - Library Applications Group
  - Data Services



# JHU Data Services



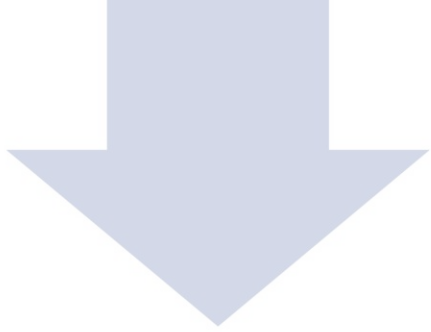


# JHU Data Services



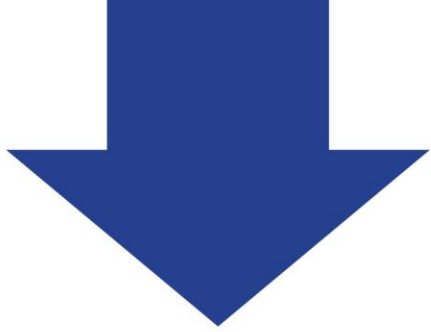
## GIS Services

- Esri Education Site License
- ArcGIS Online Administration
- Consultations
- Workshops and trainings



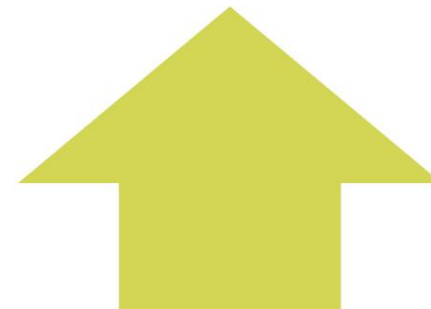
**A Balancing Act**

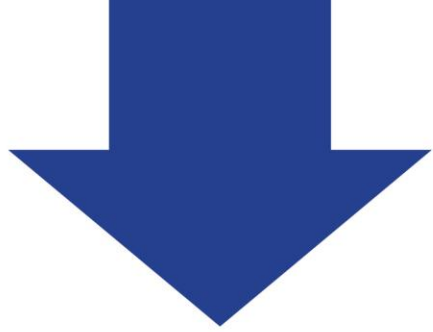




The COVID-19 Global  
Dashboard

Virtual services for  
campus

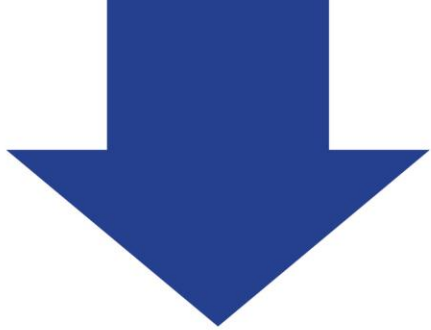




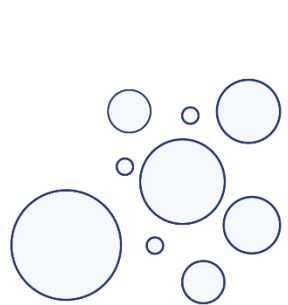
## Supporting the Dashboard:

- 2 months of (almost) 24/7 support
  - Data workflow server set-up and monitoring
  - ESRI license agreement
  - Cyber security review
- Continued efforts supporting the project





# COVID-19 Global Dashboard: General Workflow



Data Sources



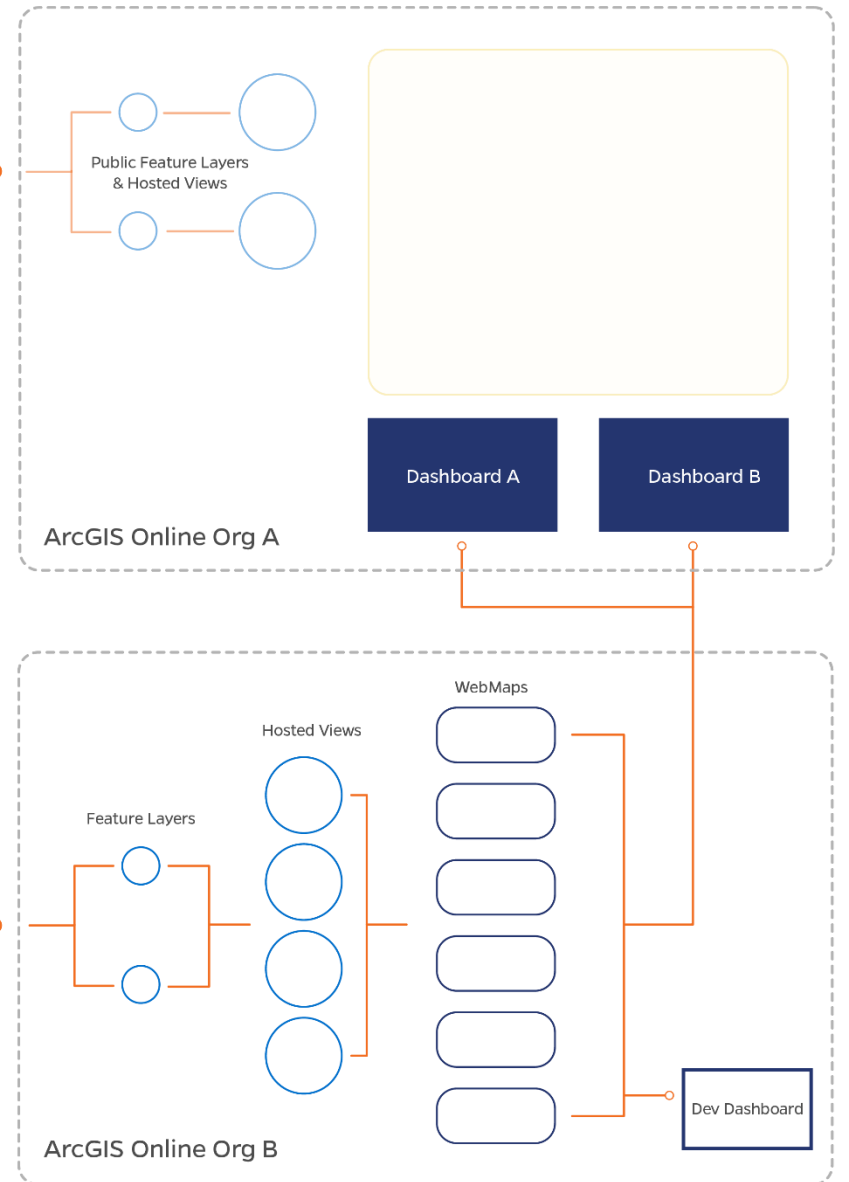
Server: Data Processor



Github Repo

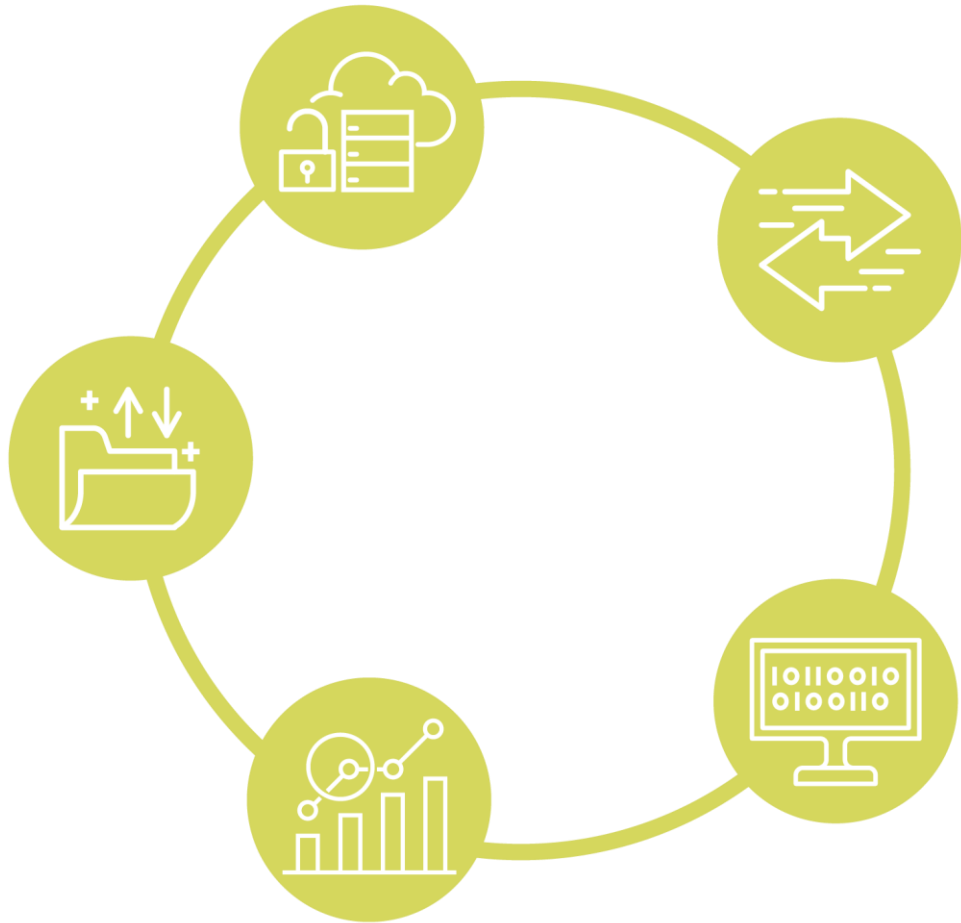


Esri Feed Aggregator



## Transitioning to Remote:

- Modifying service delivery
  - Converting workshops to webinars
  - Switching to video consultations
  - Offering support via chat
- Facilitating remote access to geospatial software
- Manage increased interest in dashboards and GIS overall





**Connection to Library Values  
and Mission**

# **Flexibility, Adaptability, and Iteration**



A large green arrow pointing right, with the text "Looking Ahead" inside it. The arrow is a solid green color and is set against a light green background. The text is white and is centered within the arrow's shaft.

**Looking Ahead**



## Observed Impacts and Rising Trends:



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**Data Services**

# Observed Impacts and Rising Trends:

## Increased Visibility of Geospatial Technology

EDITORS' PICK | 656,007 views | Mar 16, 2020, 11:48am EDT

### Coronavirus Map: How To Track Coronavirus Spread Across The Globe



**Trevor Nace** Senior Contributor  
Science  
[Explore More](#)

**CNN health** Food Fitness Wellness Parenting Vital Signs

### This map tracks the coronavirus in real time

By **Scottie Andrew, CNN**  
Updated 8:56 PM ET, Wed January 29, 2020

### Coronavirus outbreak

### Coronavirus world map: which countries have the most Covid-19 cases and deaths?

Covid-19 has spread around the planet, sending billions of people into lockdown as health services struggle to cope. Find out where the virus has spread, and where it has been most deadly

- [Coronavirus map of the UK](#)
- [Coronavirus map of the US](#)
- [Coronavirus cases in Australia](#)

**Pablo Gutiérrez and Seán Clarke**

Tue 28 Jul 2020 03:56 EDT

### Coronavirus updates

### Mapping the curve: how GIS is helping the Covid-19 response

Written by **Katie Burton** | Published in **Development**

Editorial | [Open Access](#) | [Published: 11 March 2020](#)

Geographical tracking and mapping of coronavirus disease COVID-19/severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) epidemic and associated events around the world: how 21st century GIS technologies are supporting the global fight against outbreaks and epidemics

[Maged N. Kamel Boulos](#) & [Estella M. Geraghty](#)

[International Journal of Health Geographics](#) 19, Article number: 8 (2020) | [Cite this article](#)

106k Accesses | 41 Citations | 321 Altmetric | [Metrics](#)



### COVID-19: Firefighters Turn to Apps, Maps and Dashboards to Communicate and Act

Public Safety  
July 07, 2020



Data Services

# Observed Impacts and Rising Trends:

## Growing Awareness of the Esri Web Ecosystem and Tools




The screenshot displays the Esri COVID-19 dashboard interface. At the top, a navigation bar includes tabs for 'COVID-19', 'Overview', 'Response', 'Business Continuity', 'Reopening', 'Global Map Gallery', and 'Resources'. Below this is a light blue banner with the text 'For urgent GIS help, contact Esri's Disaster Response Program' and a 'Request assistance' button. The main dashboard area features a world map with red markers indicating COVID-19 cases. To the left of the map is a list of 'Confirmed Cases by Country/Region/University' with the following data:

Country/Region/University	Confirmed Cases
US	1,127,251
Spain	226,899
Italy	203,399
France	166,541
United Kingdom	166,148
Germany	141,199
Turkey	117,420
Russia	95,299
Iran	92,023
China	83,982
Brazil	78,162
Canada	53,831
Belgium	47,811
Netherlands	45,000
Peru	33,051
India	33,062
Switzerland	29,491

Other dashboard elements include 'Total Confirmed' (3,187,030), 'Total Deaths' (227,177), and 'Total Test Results in US' (6,026,170). A line graph at the bottom right shows a sharp upward trend in cases. Below the dashboard, a text box reads: 'Johns Hopkins University dashboard. A global view of COVID-19 cases from the Center for Systems Science and Engineering at Johns Hopkins University (JHU). View the JHU dashboard'.

### Global maps and dashboards

Access ready-to-use apps and dashboards that immediately aid better understanding and decision-making about COVID-19.

-  Johns Hopkins University dashboard
-  US Weekly Unemployment Data
-  Global map gallery



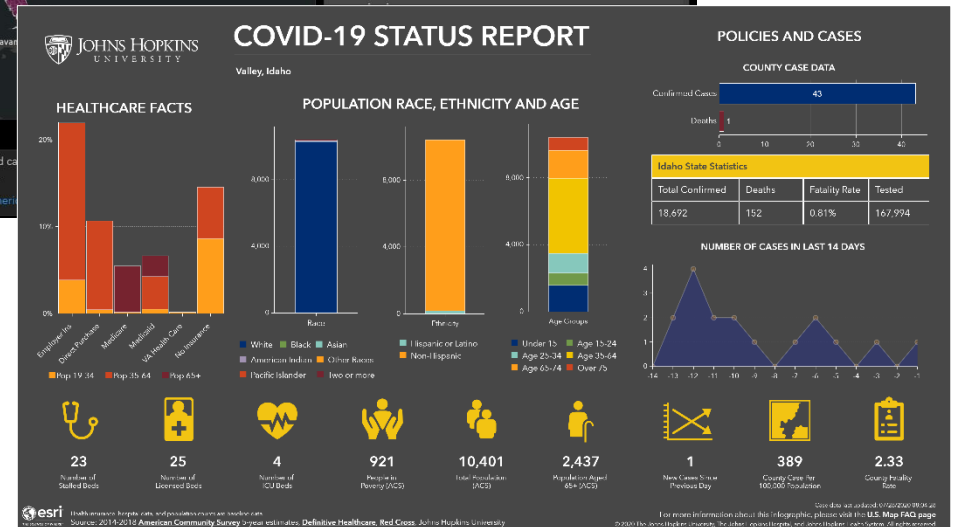
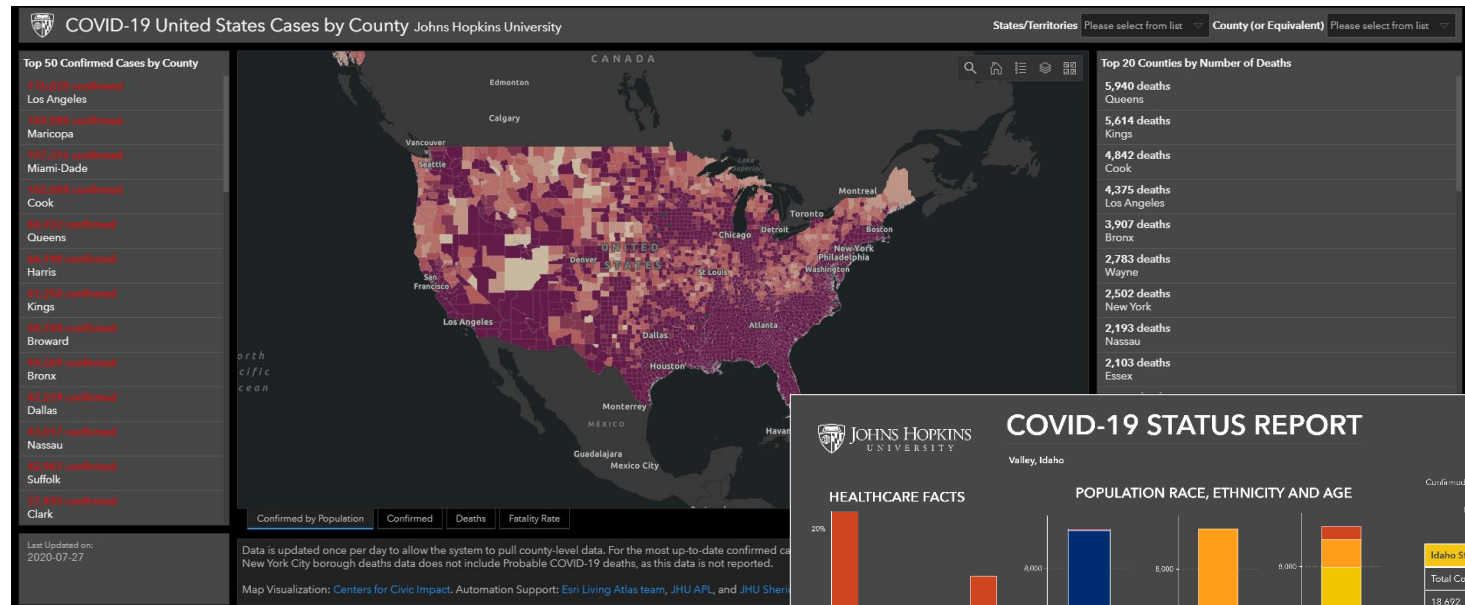
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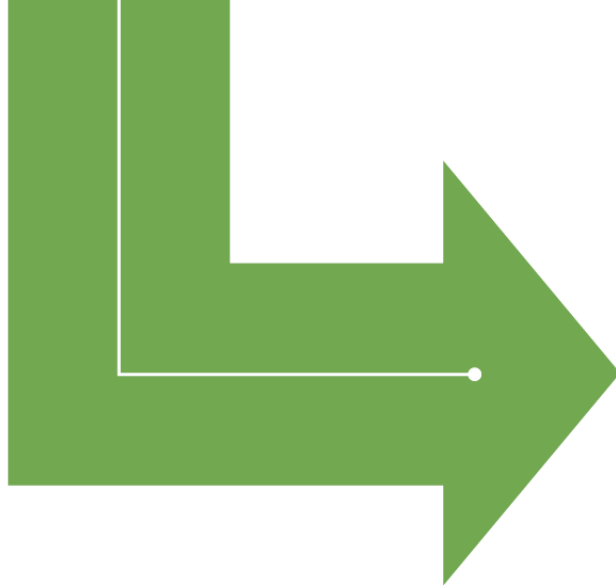


# Observed Impacts and Rising Trends:

## Growing Interest in Using Geospatial Technology for Research Projects



Data Services



# Observed Impacts and Rising Trends:

From Research Project to Public-facing, Public-serving Product

Thank you for visiting us. To see the impact of your engagement, visit our *Dashboard*

Now that the country is emerging from lock-down, and to best prepare for potential pandemic surges in the future, it is important that we continue to track COVID – 19 symptoms. You may participate in the COVID Control Study, even if you do not have symptoms or a thermometer. Download the app below.

Your contribution matters.  
Submit your body temperature.  
Help us defeat COVID-19!



Data Services

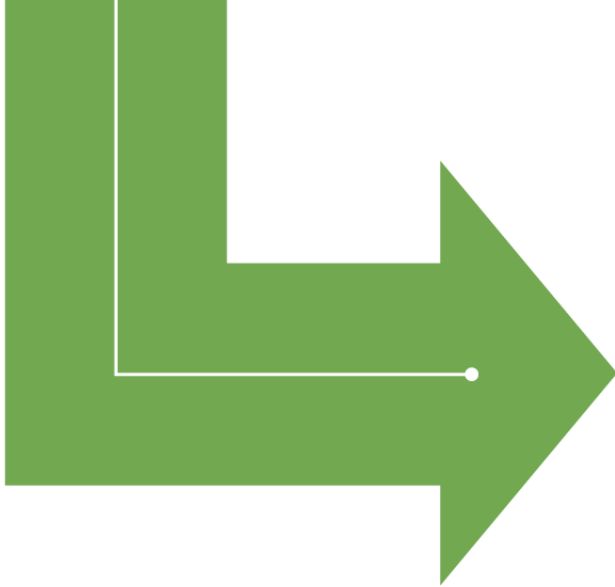
Interest in and use of web GIS  
continues to grow.

This calls for the  
GIS education community  
to carve a path to excellence



We can prepare our community  
through education and training  
in critical skills such as

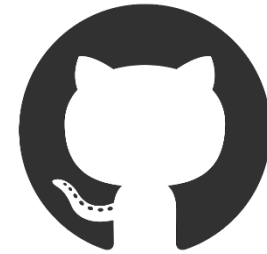
Web GIS  
ArcGIS Online Administration  
Programming  
Project and product management



### ArcGIS Online

Dashboards: **2.7 billion** views

Feature Layers: **178 billion** requests



### Github Repo

Starred **23,400** times

Forked **14,600** times

In past month, 158 files were changed with over 132,000 additions and 14,000 deletions



# Image Credits

- **Slide 3:** Screenshot taken by Ensheng Frank Dong.
- **Slide 6:** Image credit: Will Kirk/Johns Hopkins University.
- **Slide 7:** Gardner, Lauren. [@TexasDownUnder]. (2020, January 22). We are tracking the 2019-nCoV spread in real-time. [Tweet]. Retrieved from <https://twitter.com/TexasDownUnder/status/1220014483516592129>. Screenshot taken by Reina Chano Murray.
- **Slide 8:** Graphs by Reina Chano Murray.
- **Slide 9:** Animation by Reina Chano Murray.
- **Slide 17:** Animation by Reina Chano Murray.
- **Slide 18:** COVID-19 Cases US feature layer item description page. Retrieved from <https://www.arcgis.com/home/item.html?id=628578697fb24d8ea4c32fa0c5ae1843>. Screenshot taken by Reina Chano Murray.
- **Slide 19:** CSSEGISandData Github Profile. Retrieved from <https://github.com/CSSEGISandData>. Screenshot taken by Reina Chano Murray.
- **Slide 20:** Johns Hopkins University. (2020). Coronavirus Resource Center. Retrieved July 28, 2020, from <https://coronavirus.jhu.edu/>. Screenshot taken by Reina Chano Murray.
- **Slide 23:** Image credit: Megumi Shiobara Chano.
- **Slide 29:** Graphic by Reina Chano Murray.
- **Slide 35:** Screenshots taken by Reina Chano Murray.

Nace, Trevor. (2020, March 16). Coronavirus Map: How to Track Coronavirus Spread Across the Globe. Retrieved from <https://www.forbes.com/sites/trevornace/2020/03/16/coronavirus-map-how-to-track-coronavirus-spread-across-the-globe/#39458e86f980>

Burton, Katie. (2020, April 27). Mapping the curve: how GIS is helping the Covid-19 response. Retrieved from <https://geographical.co.uk/people/development/item/3676-how-gis-is-helping-the-covid-19-response>

Andrew, Scottie. (2020, January 29). This map tracks the coronavirus in real time. Retrieved from <https://www.cnn.com/2020/01/29/health/coronavirus-map-real-time-tracking-trnd/index.html>

## Image Credits

Cox, Mike. (2020, July 7). COVID-19: Firefighters Turn to Apps, Maps and Dashboards to Communicate and Act. Retrieved from <https://www.esri.com/about/newsroom/blog/fire-chiefs-use-apps-maps-and-dashboards/>

Gutierrez, Pablo and Sean Clarke. (2020). Coronavirus world map: which countries have the most Covid-19 cases and deaths? Retrieved July 28, 2020 from <https://www.theguardian.com/world/2020/aug/05/coronavirus-world-map-which-countries-have-the-most-covid-19-cases-and-deaths>

Kamel Boulos, M. N., & Geraghty, E. M. (2020). Geographical tracking and mapping of coronavirus disease COVID-19/severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) epidemic and associated events around the world: how 21st century GIS technologies are supporting the global fight against outbreaks and epidemics. *International Journal of Health Geographics*, 19(1). <https://doi.org/10.1186/s12942-020-00202-8>

- **Slide 36:** Esri. (2020). *Coronavirus Disease (COVID-19) Maps, Solutions & Resources*. Esri. Retrieved from <https://www.esri.com/en-us/covid-19/overview>. Animation by Reina Chano Murray.
- **Slide 37:** Centers for Civic Impact. (2020). COVID-19 United States Cases by County. Retrieved July 27, 2020 from <https://coronavirus.jhu.edu/us-map>. Screenshots taken by Reina Chano Murray.
- **Slide 38:** COVID Control – A Johns Hopkins University Study. (2020). Covid Control. Retrieved July 27, 2020 from <https://covidcontrol.jhu.edu/>. Screenshots taken by Reina Chano Murray.