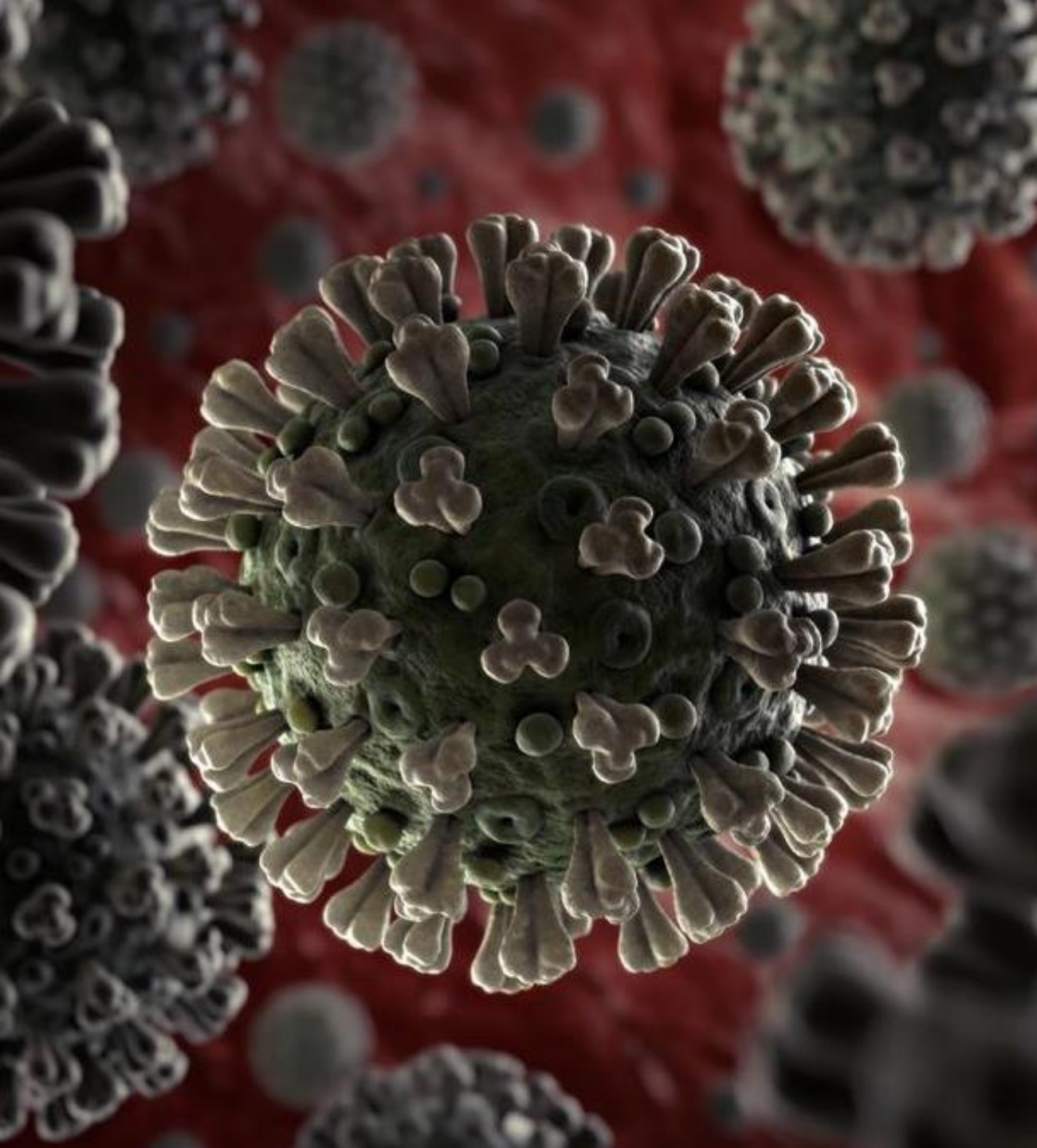


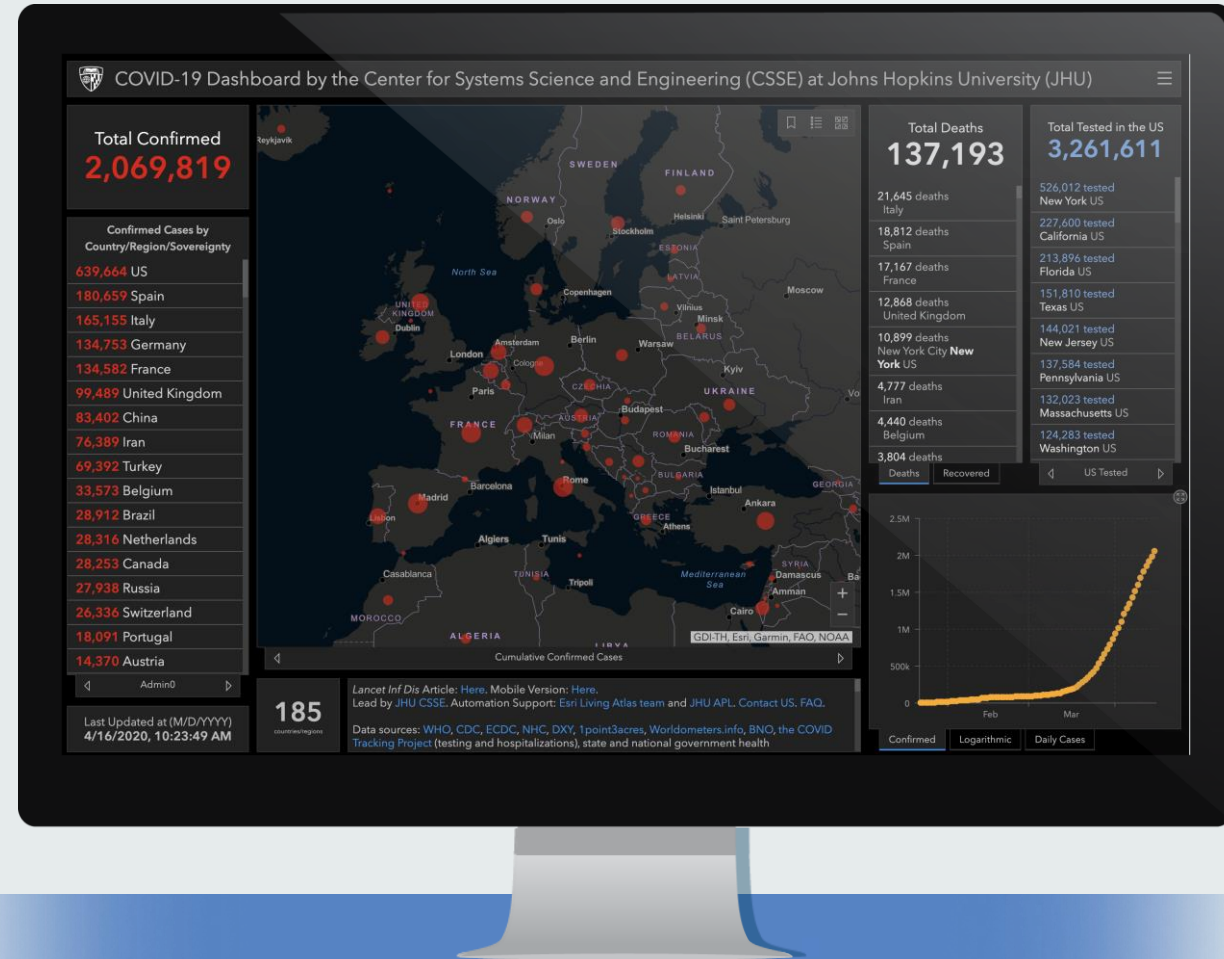


GIS for COVID-19 Response & Recovery

Webcast to EuroSDR BOD
20th May 2020

Nick Land

The Role of GIS



“Place is one of the basic tenets of a field investigation. Both the *who* and the *when* of disease are relative to and often dependent on the ***where***”.

Centers for Disease Control and Prevention (CDC)

GIS

Provides A Framework . . .
. . . And Process



. . . Data Driven & Science Based

GIS

Provides A Framework . . .
. . . And Process

*COVID – 19
Response*



Respond ➡ **Recover** ➡ **Rebuild**

GIS - An Integrated System for Managing COVID-19 Response

5 steps to COVID-19 response

US

As global communities and businesses seek to respond to the COVID-19 pandemic, you can take these five proactive steps to create an instant picture of your organization's risk areas and response capacity.

China

Germany

France

1

Map the cases

Turkey

Map confirmed and active cases, deaths, and recoveries to identify where COVID-19 infections exist and have occurred.

Austria

4

Portugal

Brazil

Israel

Admission

Map your capacity

4/1/2020, 6:43:57 PM

Map facilities, employees or citizens, medical resources, equipment, goods, and services to understand and respond to current and potential impacts of COVID-19.

Model the spread and impact of disease

2

Map the spread

Time-enabled actions spread over time and locations.

3

Map vulnerable populations

COVID-19 disproportionately impacts certain demographics such as the elderly and those with underlying health conditions. Mapping social vulnerability, age, and other factors helps you monitor at-risk areas and regions you

Manage resources and select sites

Communicate with the public

5

Communicate with maps

Use interactive web maps, dashboard apps, and story maps to help rapidly communicate your situation so everyone stays aware.

Integrating All Types of Relevant Data



Integrating All Types of Relevant Data

Tier 1	Tier 2	Tier 3
• “Authoritative” • Government Agencies i.e. “Authorities” • Mandate to provide	• “Reliable” • Well documented, reliable source e.g. Academia • Not necessarily mandated to provide	• Useful “for Reference” • Examples include Crowdsourced information

Delivering Powerful Capabilities Across Organizations



*Building Blocks . . .
For a Responsive System*

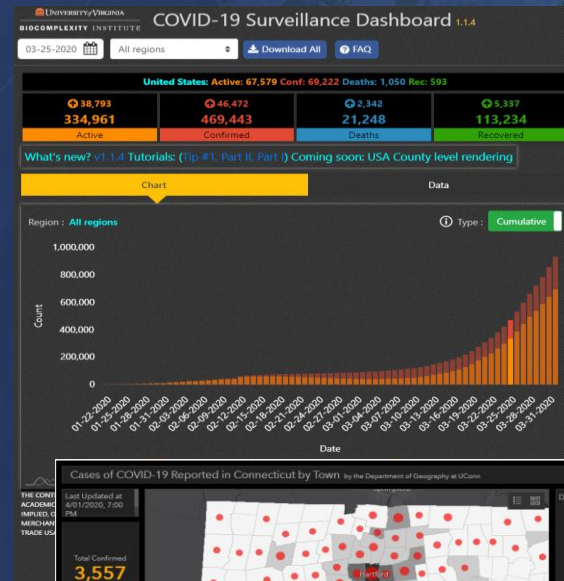
Engaging Key Stakeholders



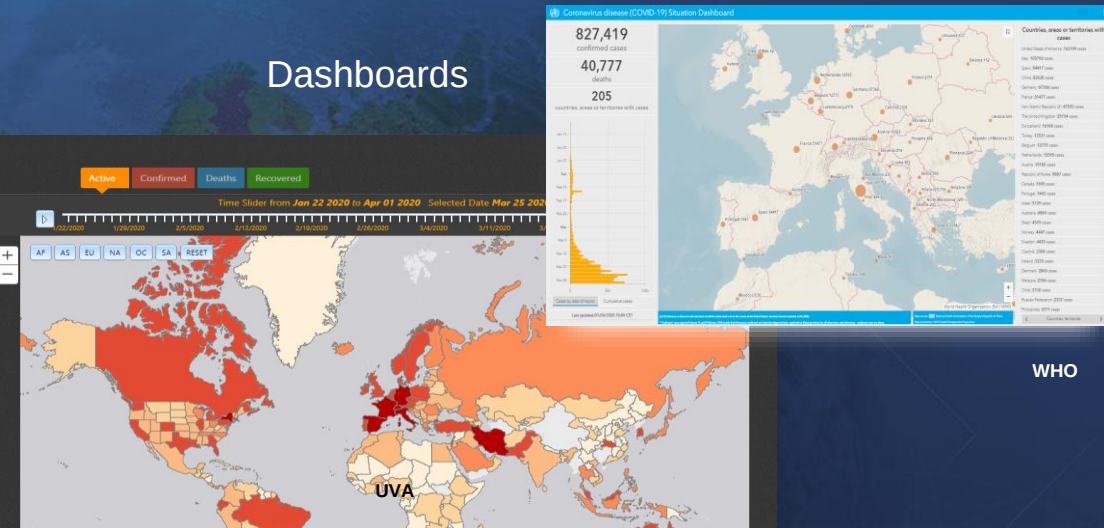
Applications

Providing Situation Awareness

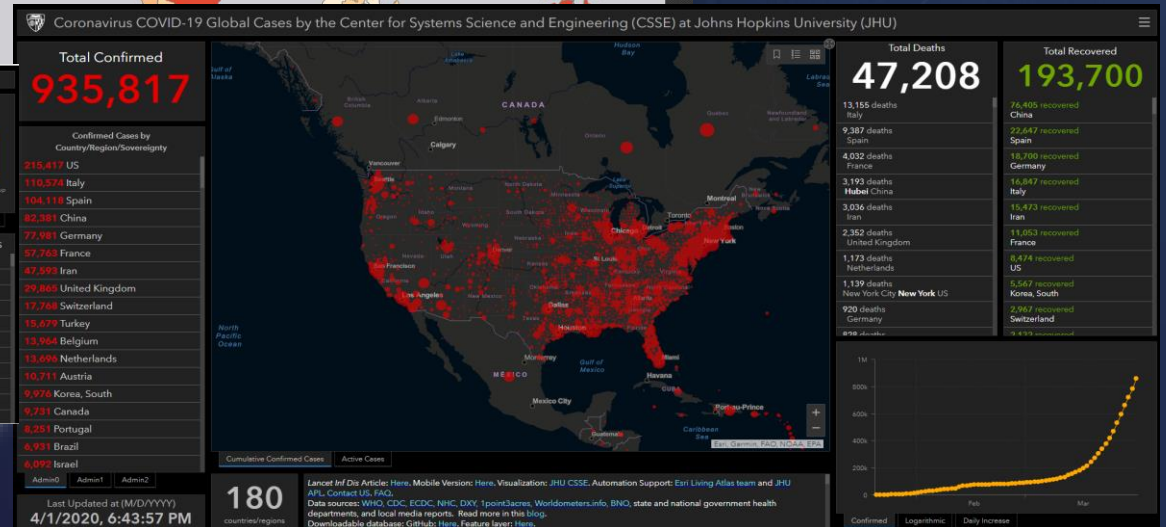
Dashboards



Johns Hopkins
CSSE



WHO





Total Confirmed

4,822,430

Confirmed Cases by
Country/Region/Sovereignty

1,508,957 US

299,941 Russia

255,368 Brazil

247,709 United Kingdom

231,606 Spain

225,886 Italy

180,051 France

177,289 Germany

150,593 Turkey

122,492 Iran

101,261 India

94,933 Peru



Admin0

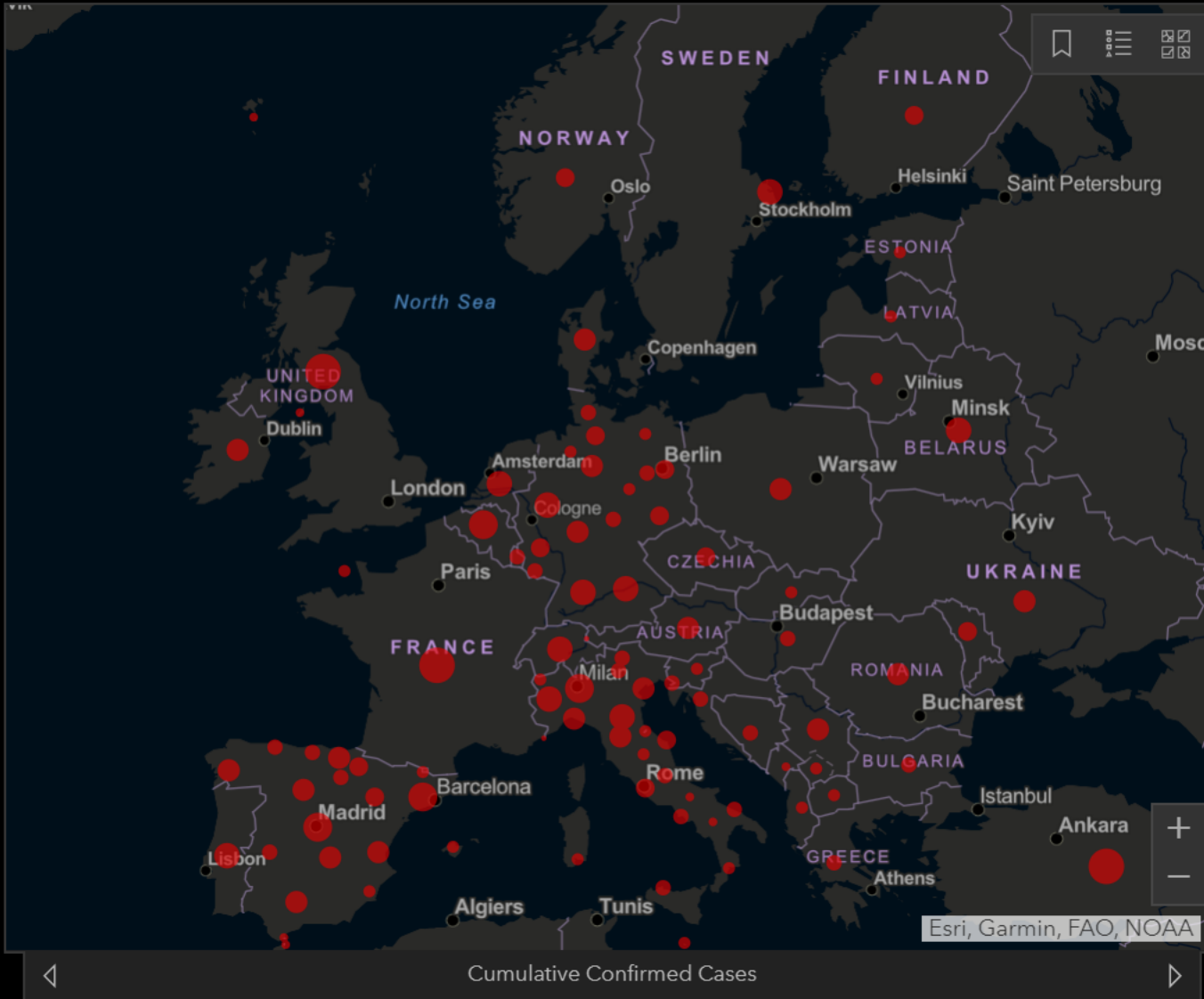


Last Updated at (M/D/YYYY)
5/19/2020 11:32:12 a.m.

188

countries/regions

Lancet Inf Dis Article: [Here](#). Mobile Version: [Here](#).
Lead by JHU CSSE. Automation Support: [Esri Living Atlas team](#) and JHU
APL. [Contact US](#). [FAQ](#). Read more in this [blog](#).



Global Deaths

318,851

90,369 deaths
US

34,876 deaths
United Kingdom

32,007 deaths
Italy

28,242 deaths
France

27,709 deaths
Spain

16,853 deaths
Brazil



Global Deaths



US State Level
Deaths, Recovered

28,339 deaths, 61,681
recovered
New York US

10,439 deaths, 23,496
recovered
New Jersey US

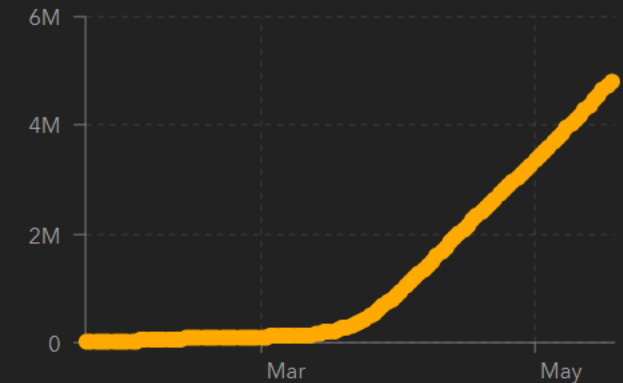
5,862 deaths,
recovered
Massachusetts US

4,915 deaths, 28,234
recovered
Michigan US

4,515 deaths,



US Deaths, ...



Confirmed

Logarithmic

Daily Cases

Auswahl pro Bundesland

(Covid-19-Fälle | Todesfälle)

45,639 2,314 Bayern

36,485 1,525 Nordrhein-Westfalen

34,034 1,653 Baden-Württemberg

11,207 548 Niedersachsen

9,368 442 Hessen

6,520 222 Rheinland-Pfalz

6,478 182 Berlin

5,133 198 Sachsen

5,042 232 Hamburg

3,185 150 Brandenburg

3,002 128 Schleswig-Holstein

2,750 147 Thüringen

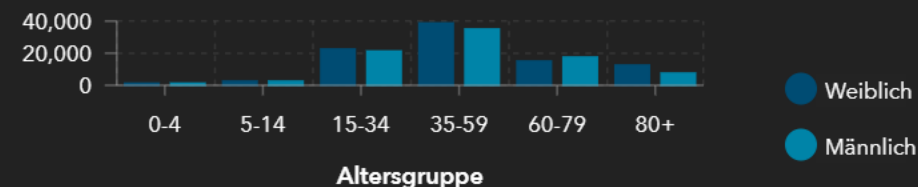
2,699 154 Saarland

1,679 54 Sachsen-Anhalt

COVID-19-Fälle/100.000 Einwohner

COVID-19-Fälle
175,210
aus total 175,210**+ 513**
zum VortagCOVID-19-Todesfälle
8,007
aus total 8,007**+ 72**
zum VortagCovid-19-Genesene
~155,700
von ~155,700**+ ~1,100**
zum VortagKombination, Analyse &
Kommunikation
relevanter Daten zum
Coronavirus[Erkunden Sie den](#)

COVID-19-Fälle nach Altersgruppe und Geschlecht

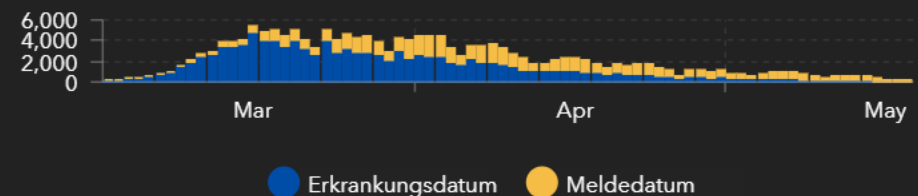


Fälle Altersgruppe

Fälle Altersgruppe/100.000 Einwohner

COVID-19-Fälle/Tag nach Erkrankungsbeginn, ersatzweise
Meldedatum*

(Übermittlungsverzug, siehe Disclaimer)



* Bei Fällen ohne Angaben zum Erkrankungsbeginn (Erkrankungsbeginn unbekannt bzw. Fälle ohne Symptome) wird ersatzweise das Meldedatum verwendet. Die abnehmende Fallzahl über die letzten Tage kann durch den Melde- und Übermittlungsverzug bedingt sein.

Datenstand

19.05.2020, 00:00 Uhr

Applications

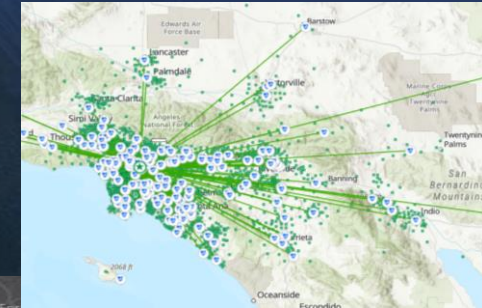
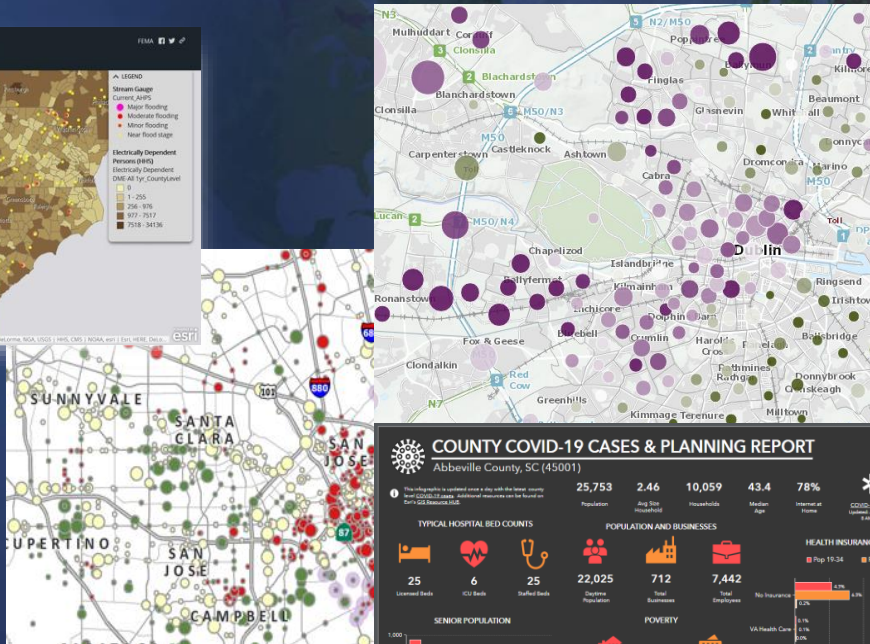
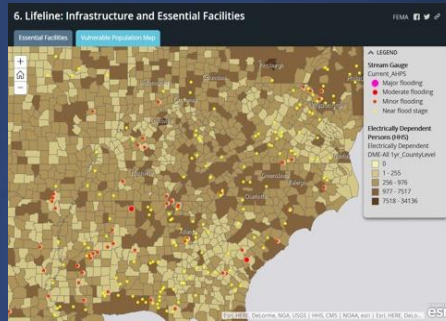
Location & Allocation Analysis

Understanding Vulnerable Populations

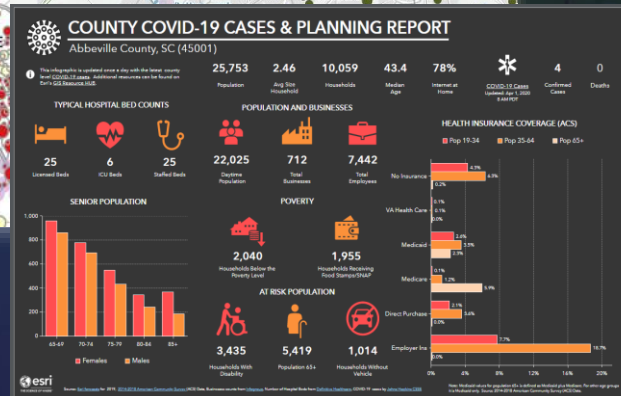
Allocation of Critical Resources

Selecting Centers

Access to Care

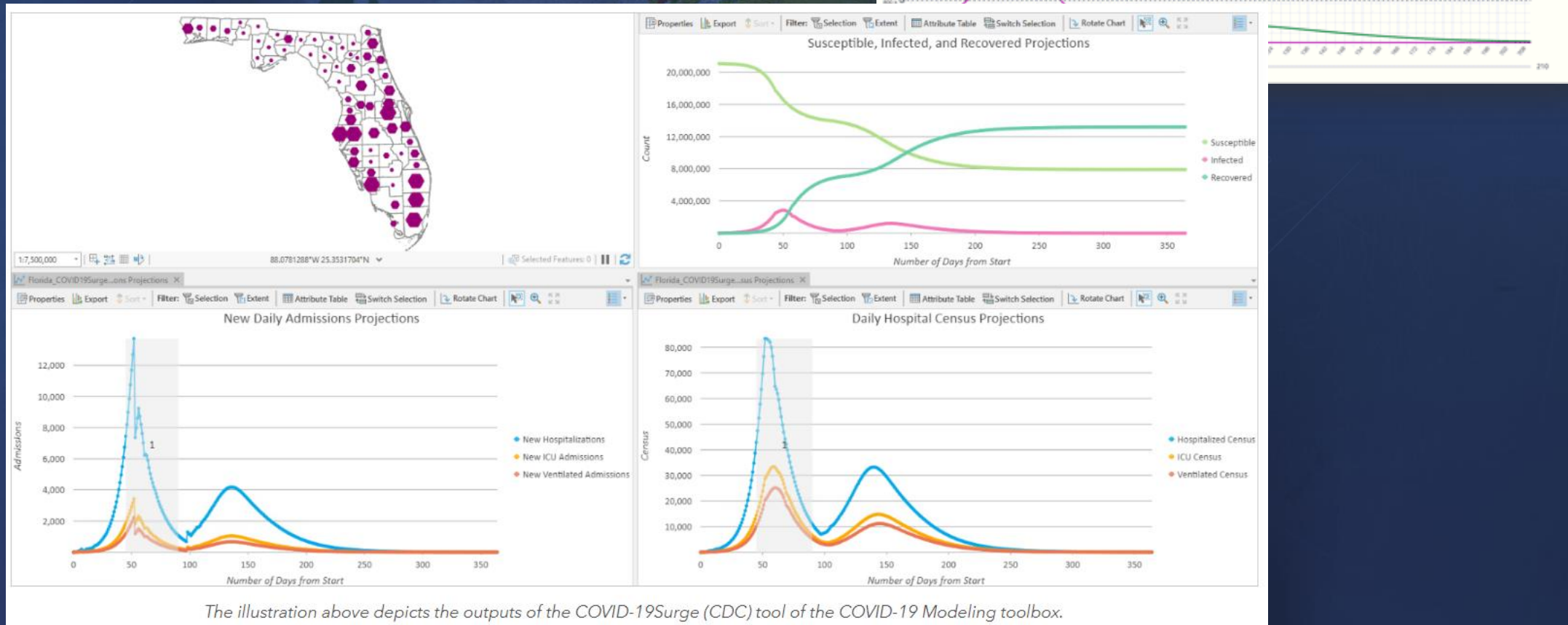


Population Profile



Applications

Predicting Spread and Impacts on Hospitals



High Risk Counties

Wayne, North Carolina
Risk Rating: 10

Richmond, New York
Risk Rating: 10

Duplin, North Carolina
Risk Rating: 10

Accomack, Virginia
Risk Rating: 10

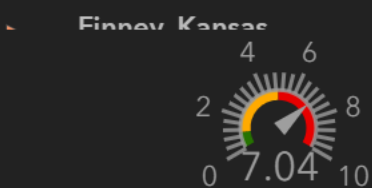
Northampton, Virginia
Risk Rating: 8.71

Nobles, Minnesota
Risk Rating: 6.97

Sussex, Delaware
Risk Rating: 6.48

Ford, Kansas
Risk Rating: 6.48

Suffolk, New York
Risk Rating: 6.41



Average of High Risk Counties

HighMedLow

Population (Low Risk Counties)

254,980,361

Population (Medium Risk)

67,200,271

Population (High Risk Counties)

4,986,802

Hospitals:

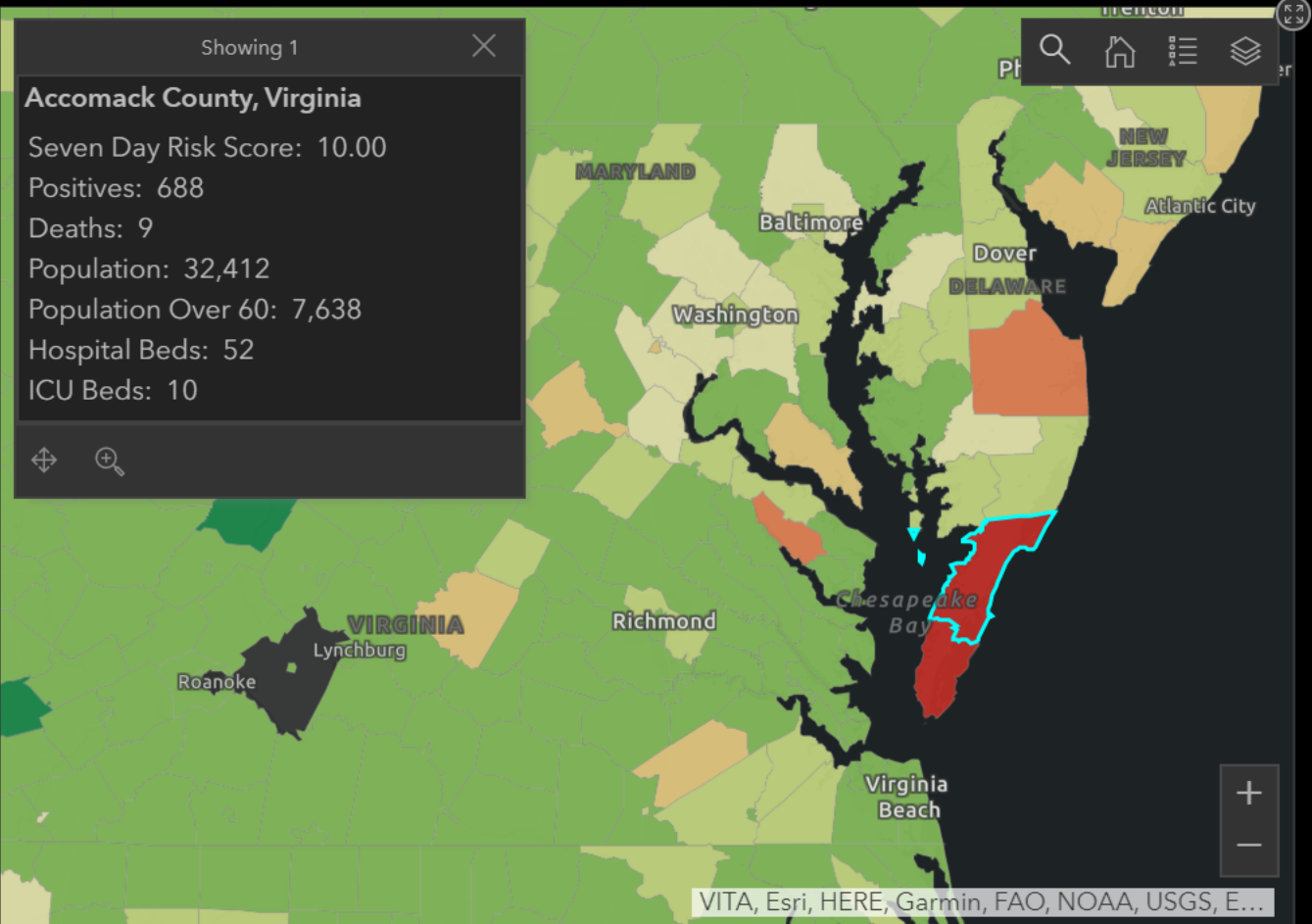
6,547

Beds:

957,204

ICU Beds:

91,633



VITA, Esri, HERE, Garmin, FAO, NOAA, USGS, E...

Confirmed Cases

Cook, Illinois: 63,690

Queens, New York: 59,324

Kings, New York: 52,485

Bronx, New York: 43,158

Nassau, New York: 39,225

Suffolk, New York: 38,224

Los Angeles, California: 37,974

Westchester, New York: 32,323

New York, New York: 25,216

Middlesex, Massachusetts: 19,345

Hudson, New Jersey: 17,574

Bergen, New Jersey: 17,459

Suffolk, Massachusetts: 16,671

Essex, New Jersey: 16,600

Philadelphia, Pennsylvania: 16,340

Miami-Dade, Florida: 15,864

Passaic, New Jersey: 15,278

Union, New Jersey: 14,903

CasesDeathsMedia

Updated: May 18, 2020

Powered by [Geospark Analytics](#)

6 May 2020 - Model updates include the addition of social distancing data

Esri Maps for Public Policy

[Overview](#)
[Explore](#)
[Issues](#)
[Resources](#)




How did unemployment change since last month?

Map 1 of 11

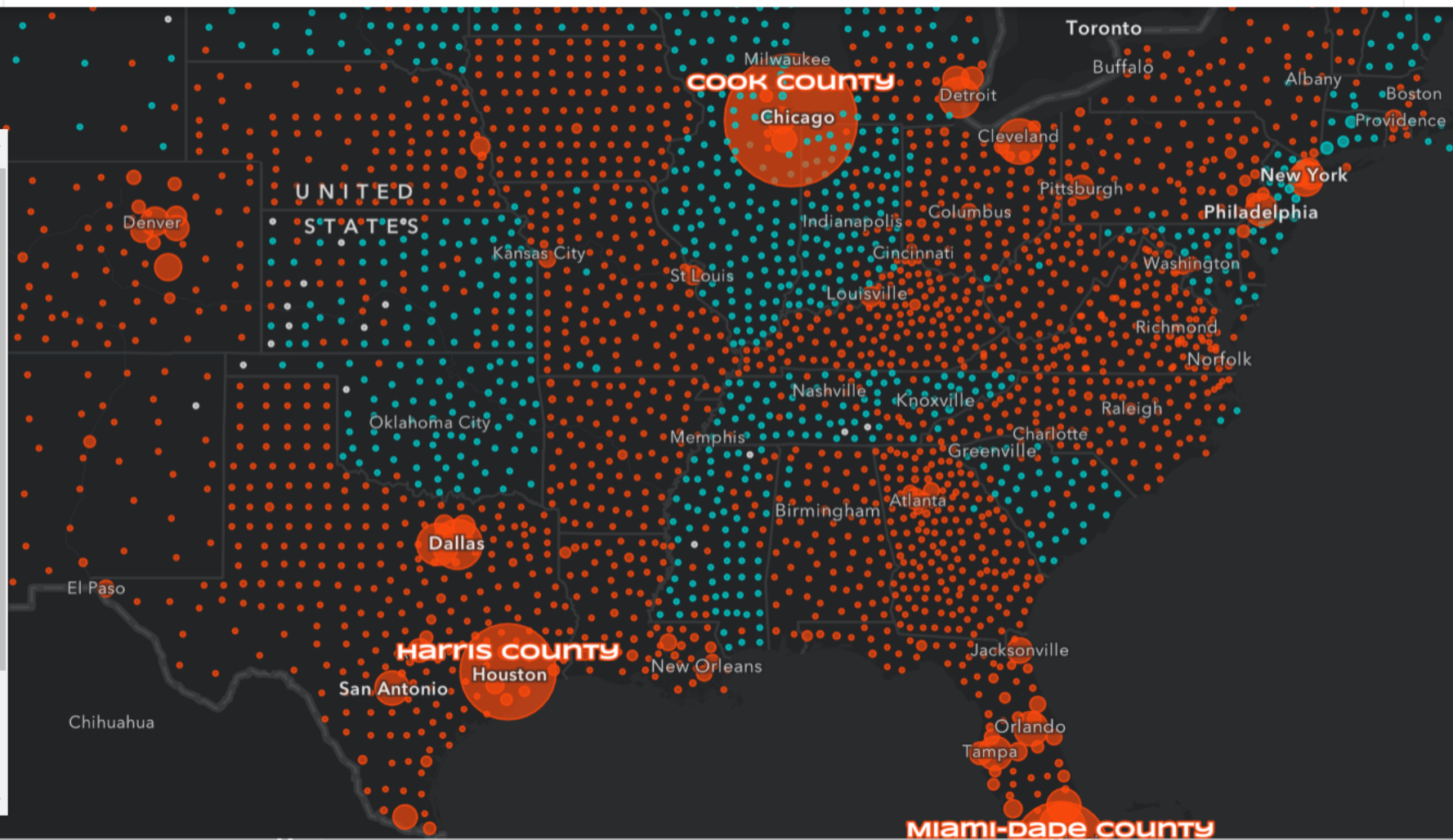
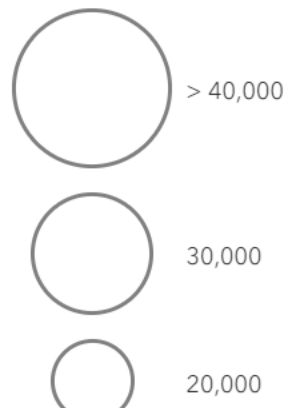

[Share](#)

Unemployment Trend

Was there an increase or decrease in the number of unemployed people?

- Increase
- Decrease
- No Change

Change in the number of unemployed people





🔍 Zoom to

1 of 2



IHME predicted the peak of hospital resource use in Sweden to be in 12 days on **Monday, June 01, 2020.**

[IHME State COVID-19 Chart](#)

Current social distancing assumed until infections minimized and containment implemented.



Applications

Involving the citizen - Crowdsourcing



COVID-19 Tracking Switzerland

The coronavirus COVID-19 is spreading rapidly throughout Europe.

In order to contain the disease, suspected cases must be identified as early as possible. This is the purpose of this campaign.

Whether you are sick or healthy, infected or not, your data can help save lives. By filling out the form below, you are helping us to overcome this crisis together. Ideally, repeat your participation daily ([set up calendar event](#)).

Important: The data is collected anonymously and does not allow identification of individuals.

[Learn more](#) - [Sign up for the mailing list](#)

[Press release Canton of Bern](#)

[To the survey](#)

Deutsch Français Italiano English

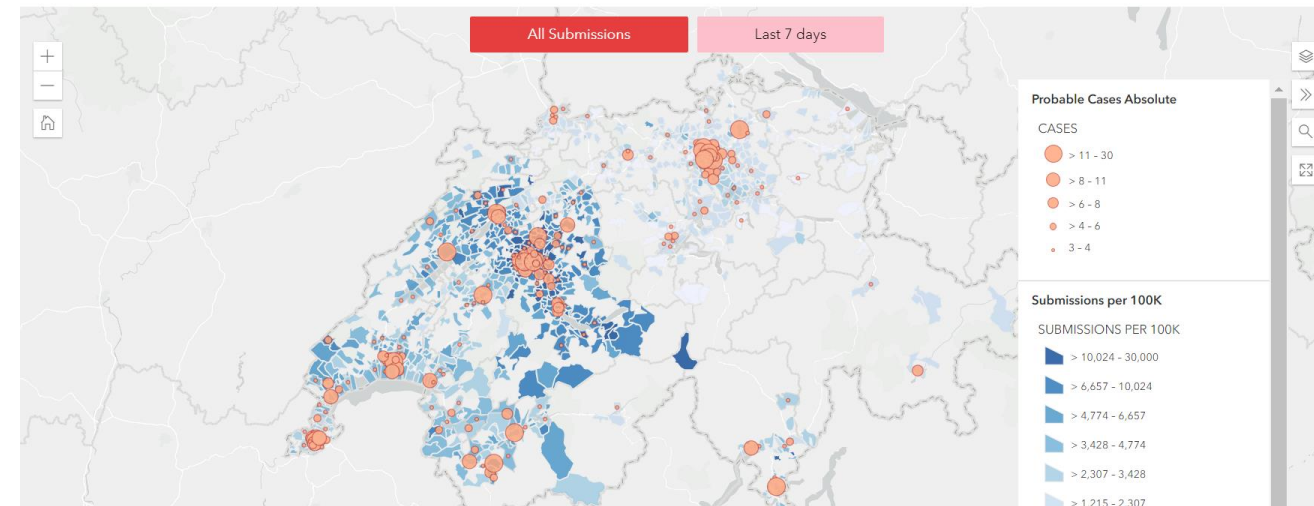
[Home](#) [Map](#) [Blog](#) [FAQ](#)

	Submissions	Suspected cases
Last 24 hours	527	7
Last 7 days	4k	42
Total	267k	2.2k

Map

Statistics

Detailed map



Hubs

Providing Data, Models, Applications, StoryMaps, Resources, News



Mid Ulster Council COVID-19 Response Hub

last updated April 7th, 2020, 14:50

We are monitoring the evolving situation with COVID-19 and are following the advice of the Public Health Agency (PHA). We have created an interactive map, which provides details of all the groups and as More People become affected by COVID-19, lots of local organisations are offering help and support for their communities organisations offering support to the local community during the COVID-19 pandemic.

What Help is there in your area
Use the interactive map below to identify help in your area.
1. Search your address at the top of the map.



COVID-19 GIS Hub España

Es el momento de aplicar la geografía para combatir esta pandemia

¿Dónde están los afectados? ¿Qué zonas son prioritarias? ¿En qué estado están los transportes? ¿Cómo protegemos nuestras infraestructuras críticas?

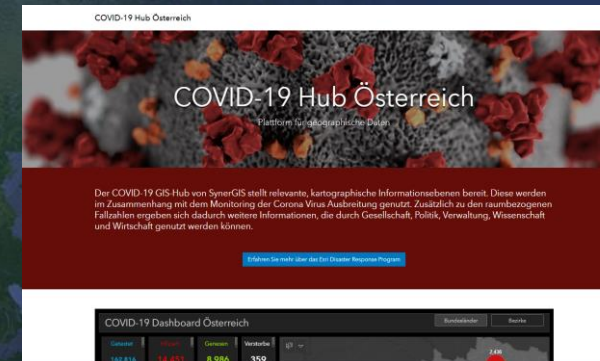
Está donando su tecnología a organizaciones públicas y privadas que lo requieren.
Si tu organización está relacionada con la gestión de la pandemia llámanos y te ayudaremos

Para facilitar el acceso a toda la información que vamos recopilando, hemos habilitado un buscador con todos los recursos, mapas, datos y aplicaciones.

Accede al repositorio completo de datos

Webinar: Te ayudamos a frenar el Cor...
Te ayudamos a frenar el Coronavirus en tu municipio.

Te ayudamos en la gestión de la crisis del Covid-19 en tu municipio



COVID-19 Hub Österreich

Platform for geospatial data

Der COVID-19 GIS-Hub von SynerGIS stellt relevante, kartographische Informationsebenen bereit. Diese werden im Zusammenhang mit dem Monitoring der Corona Virus Ausbreitung genutzt. Zusätzlich zu den raumbezogenen Fallzahlen ergeben sich dadurch weitere Informationen, die durch Gesellschaft, Politik, Verwaltung, Wissenschaft und Wirtschaft genutzt werden können.

Erfahren Sie mehr über den COVID-19 Response-Program

COVID-19 Dashboard Österreich

Geometrie	Fläche	Gesamt	Verstärkt	GT
162,816	16,431	8,966	359	2,46



COVID-19

Hub de partilha de informação útil para visualizar e analisar a evolução da pandemia em Portugal.

Situação em Portugal
(Fonte: DGS - Boletim Diário atualizado às 12h e referente ao dia anterior anterior às 24h)

Casos Confirmados	Casos Suspeitos	Recuperados	Óbitos
18,841	154,727	493	629

Casos em Vigilância	Aguardam Resultado	Casos Internados	Casos no UCI
26,065	3,910	1,302	229

Casos Importados	De Contacto Confirmado	Casos Novos
729	18,112	750



COVID-19 Srbija

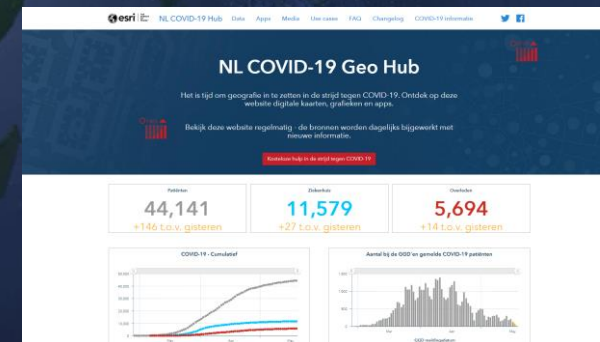
Zvanična stranica Ministarstva zdravlja

COVID-19

Ova GIS platforma omogućava deljenje informacija neophodnih za praćenje epidemiološke situacije i širenja COVID-19 virusa na teritoriji Republike Srbije i delovanje u skladu sa trenutnom situacijom. Pored toga, korisnici platforme mogu pronaći sve relevantne informacije za zemlju u okruženju i druge evropske zemlje koje su zahvaćene virusom COVID-19. Indeks aplikacija za praćenje epidemije izazvane virusom COVID-19 za ceo svet možete pronaći na sledećem linku: <https://covid19.eu/>
Izvor podataka: <https://covid19.eu/>, <https://covid19-data-explorer.com/>, <https://giswebnyja.eu/>

19 prostorna distribucija zaraženih na teritoriji Republike Srbije

COVID-19 prostorna distribucija lica u samoizolaciji na teritoriji Republike Srbije



NL COVID-19 Geo Hub

Het is tijd om geografie in te zetten in de strijd tegen COVID-19. Ontdek op deze website digitale kaarten, grafieken en apps.

Bekijk deze website regelmatig - de bronnen worden dagelijks bijgewerkt met nieuwe informatie.

Bekijk het hub in de app [COVID-19](#)

Statistiek

Positief	Bevestigd	Overleden
44,141	11,579	5,694
+146 t.o.v. gisteren	+27 t.o.v. gisteren	+14 t.o.v. gisteren

COVID-19 - Cumulatief

Aantal bij de GGD'en gemiddeld COVID-19 patiënten



United Nations Department of Economic and Social Affairs Statistics • UN COVID-19 Data Hub

<https://covid-19-data.unstatshub.org/>

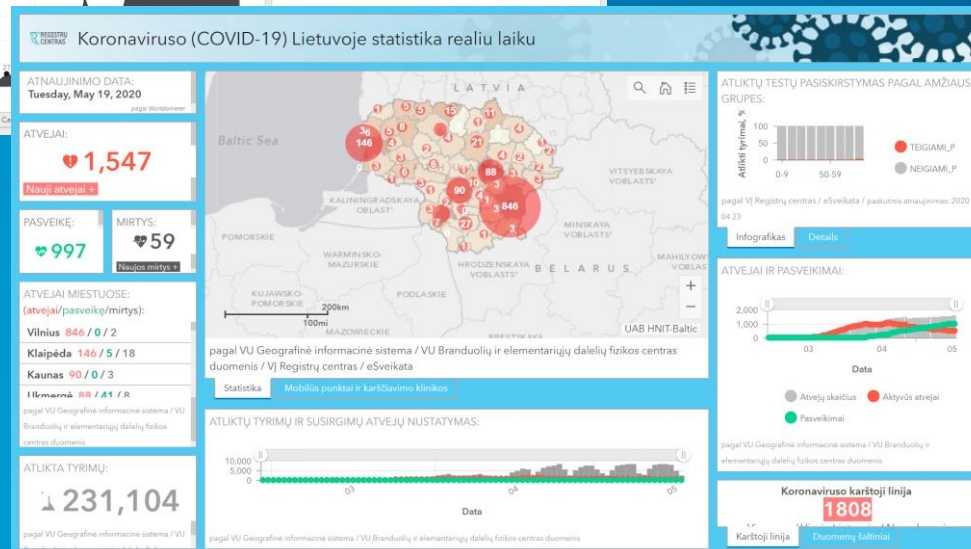
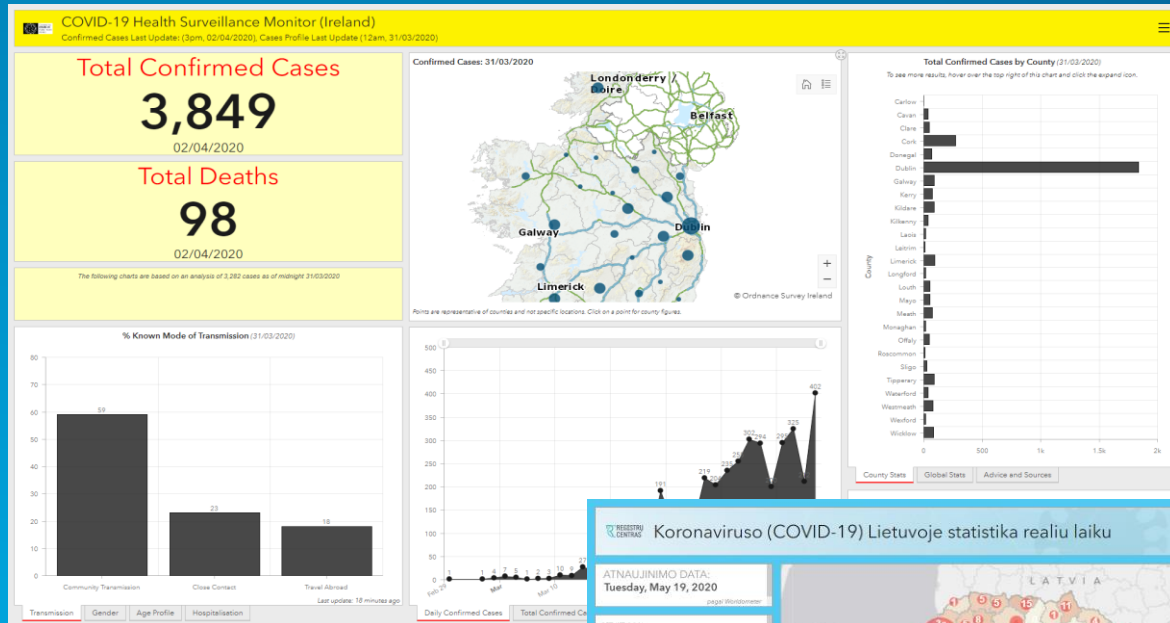
Data

This section makes data relevant to COVID-19 response readily available as geospatial data web services, suitable for the production of maps and other data visualizations and analyses, and easy to download in multiple formats. If your organization is interested in federating authoritative data services through this global COVID-19 data hub, please [contact us](#).



COVID-19 Response – Mapping Agencies

Dashboards, Hubs & Expertise



Authoritative Data



Begraafplaatsen

- Actualiteit: feb 2020
- Bron: Kadaster, Esri Nederland
- Bekijk de kaart
- Raadpleeg de API (REST)



Crematoria

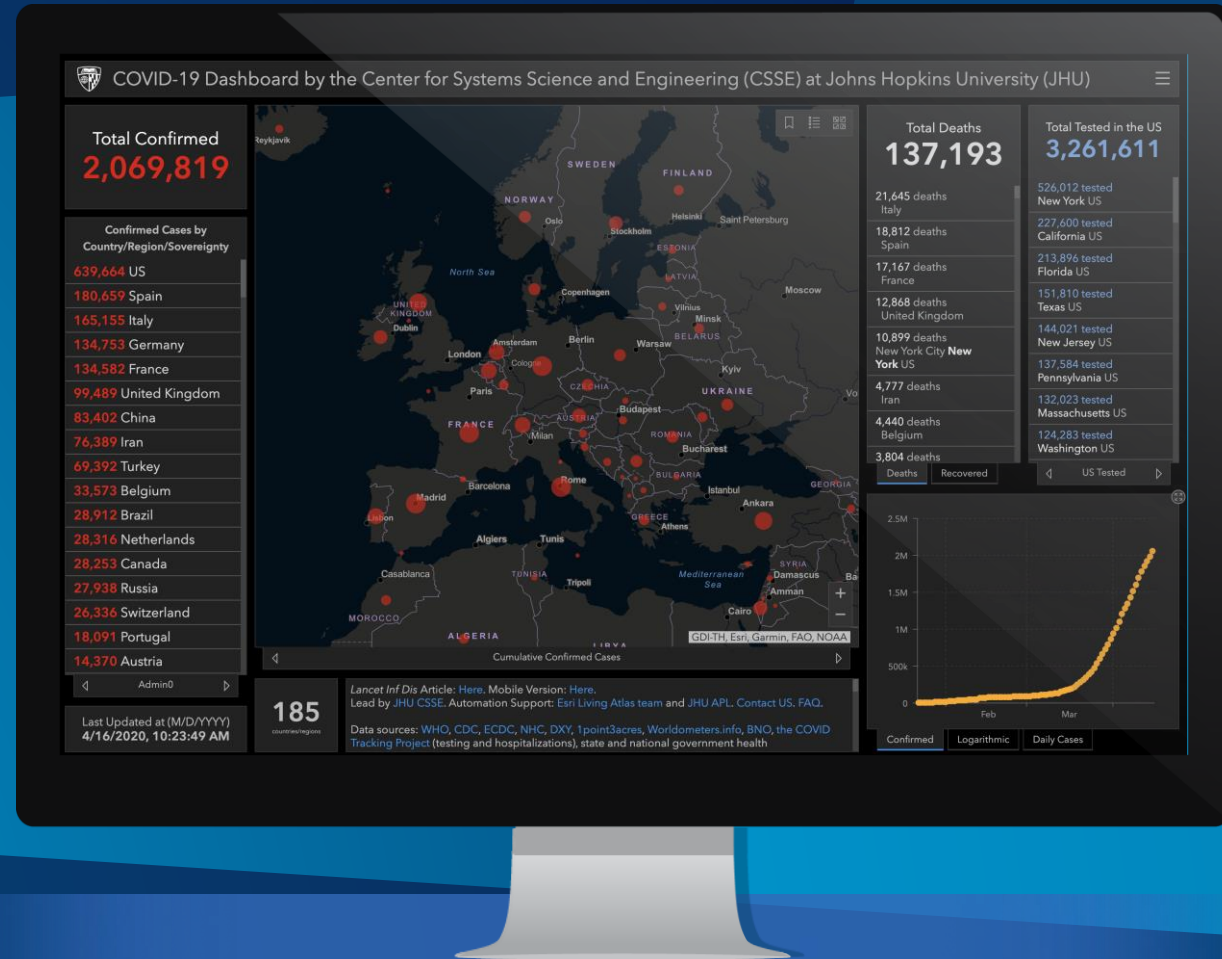
- Actualiteit: feb 2020
- Bron: Kadaster, Uitvaartinformatie.nl
- Bekijk de kaart
- Raadpleeg de API (REST)



Recreatiegebieden / parken

- Actualiteit: april 2020
- Bron: Kadaster, Esri Nederland
- Bekijk de kaart
- Raadpleeg de API (REST)

The Role of Esri



Esri Disaster Response Program

Operations and Collaboration ArcGIS Online Organization

This is the ArcGIS Online Organization for the Esri Disaster Response Program. This is our working site for tactical operations and where we do most of our work for public disaster apps. Please visit our industry page www.esri.com/disaster for more information about the Disaster Response Program. For users who are responding to emergencies and need access to up to date webmaps and data, Join the DRP ArcGIS Online Collaboration [groups](#) to quickly access and download Web Maps and Data into your organizations ArcGIS Online site.



Help when you need it most

When disaster strikes, Esri's [Disaster Response Program](#) (DRP) is there to support you around the clock, 24 x 7. [Request assistance](#) from Esri experts, augment software, explore content, and monitor events online as part of our corporate citizenship. We're there when you need us most.



Join the disaster response GeoNet community

And Follow Esri's DRP on Social Media

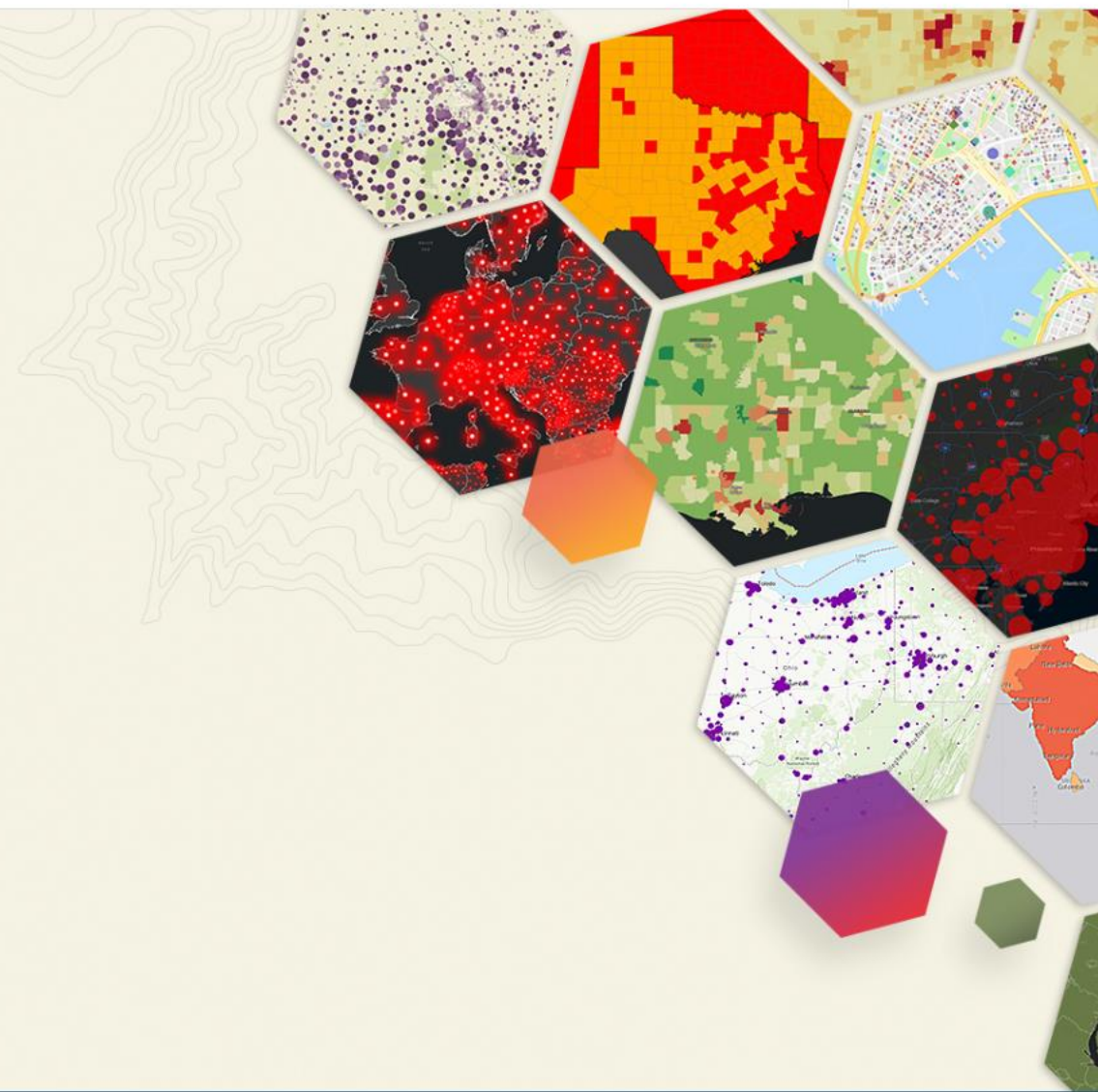


Get Prepared Now. Explore Esri's Solution for Emergency Management Operations.

COVID-19 support for response and recovery

[Get resources](#)

Esri is fully prepared to maintain operations during the coronavirus disease 2019 (COVID-19) pandemic. We have not experienced any significant business impact or interruption. We have a business continuity plan in place across all business units, including technology support and customer service, to ensure resilience. We will continue to fully serve our users, partners, and employees without disruption.



New: [Business Continuity & Recovery Webinar Series](#)

COVID-19 GIS Hub

Get maps, datasets, applications, and more for coronavirus disease 2019 (COVID-19).

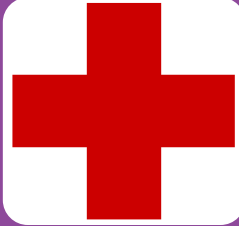
Check back often—these resources will be updated with new information as it becomes available.

[Request GIS assistance](#)

<https://coronavirus-resources.esri.com/>

Understand, prepare for, and respond to COVID-19 in your community or organization.

Current Coronavirus Offerings



Response

- Coronavirus Response Hub Template
- Coronavirus Response Solution
- ICYMI



Business Continuity

- Coronavirus Business Continuity Solution



Education

- Institutions
- Students
- Teachers & Parents K-12

Coronavirus Response Hub Template

[Coronavirus Response Hub Template](#) - includes examples, materials, and configurations to rapidly deploy your own ArcGIS Hub (a framework for a website to visualize and analyze the crisis in the context of your organization's or community's population and assets).



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last updated April 7th, 2020, 14:50

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Ресурси про COVID-19

GIS-Hub COVID-19
Висвітлення ситуації в Україні

COVID-19 - це інфекційне захворювання, спричинене новим коронавірусом. Цей новий вірус і хвороба були невідомі населенню до початку спалаху в місті Ухань, Китай, у грудні 2019 року. На цій сторінці ви знайдете інформацію, карти та ресурси про боротьбу з коронавірусом в Україні.

Підтверджено в Україні	Активних	Загиблих	Одружало
4,161	3,864	116	186

Підтверджено в світі	Померлих	Одружаних
2,088,425	139,419	528,300

Source: Coronavirus COVID-19 Cases



COVID-19 GIS Hub España

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COVID-19

Hub de partilha de informação útil para visualizar e analisar a evolução da pandemia em Portugal

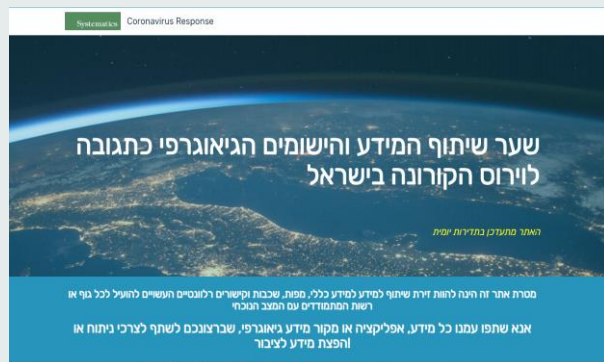
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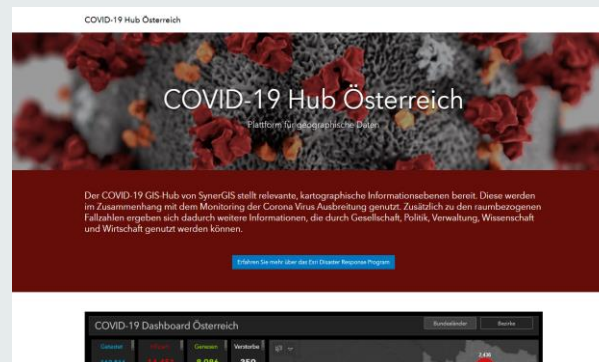


שער שיתוף המידע והישומים הגיאוגרפיים כתגובה לווירוס הקורונה בישראל

האשר מתעדכן בתדירות יומית

בסרת אתר זה הנה לחצו זירת שיתוף למידע כלכלי, מפת, שכבות וקישורים רלוונטיים להעל לכל בני אדם ורשות הממוסדת עם תמיכה חובו

אם שתפו עמנו כל מידע, אפליקציה או מקור מידע גאוגרפי, שברצונכם לשלוח לצרכי ניתוח או להפצת מידע לציבור



COVID-19 Hub Österreich

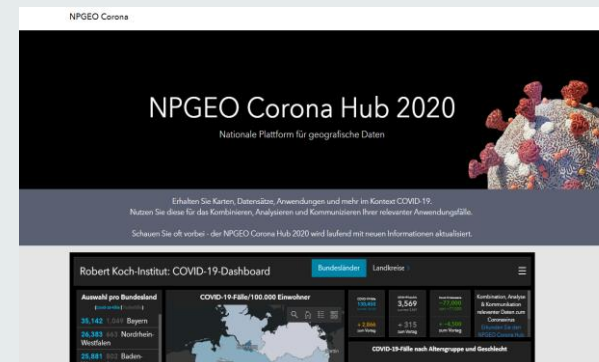
Plattform für geographische Daten

Der COVID-19 GIS-Hub von SynerGIS stellt relevante, kartographische Informationsebenen bereit. Diese werden im Zusammenhang mit dem Monitoring der Corona Virus Ausbreitung genutzt. Zusätzlich zu den raumbezogenen Fallzahlen ergeben sich dadurch weitere Informationen, die durch Gesellschaft, Politik, Verwaltung, Wissenschaft und Wirtschaft genutzt werden können.

Erhalten Sie mehr über den GIS-Hub Österreich

COVID-19 Dashboard Österreich

Landkreis	COVID-19	Geometrie	Werte	U
1	14,874	8,986	359	2.48



NPGeo Corona Hub 2020

Nationale Plattform für geographische Daten

Erhalten Sie Karten, Datensätze, Anwendungen und mehr im Kontext COVID-19.

Nutzen Sie diese für das Kombinieren, Analysieren und Kommunizieren Ihrer relevanten Anwendungsfälle.

Schauen Sie oft vorbei - der NPGeo Corona Hub 2020 wird laufend mit neuen Informationen aktualisiert.

Robert Koch-Institut: COVID-19-Dashboard

Auswahl pro Bundesland

COVID-19-Fälle/100.000 Einwohner

COVID-19-Fälle nach Altersgruppen und Geschlecht



COVID-19 Srbija

Zvanična stranica Ministarstva zdravlja

SDZ Monitoring

COVID-19

Ova GIS platforma omogućava deljenje informacija neophodnih za praćenje epidemiološke situacije i širenja COVID-19 virusa na teritoriji Republike Srbije i delovanje u skladu sa trenutnom situacijom.

Pored toga, korisnici platforme mogu pronaći sve relevantne informacije za zemlje u okruženju i druge evropske zemlje koje su zahvaćene virusom COVID-19.

Indeks aplikacija za praćenje epidemije izazvane virusom COVID-19 za ceo svet možete pronaći na sledećem linku

Izvor podataka: <https://covid19.rs/>, <https://covid19-data.gov.rs/>, <https://giswebhpa.rs/>

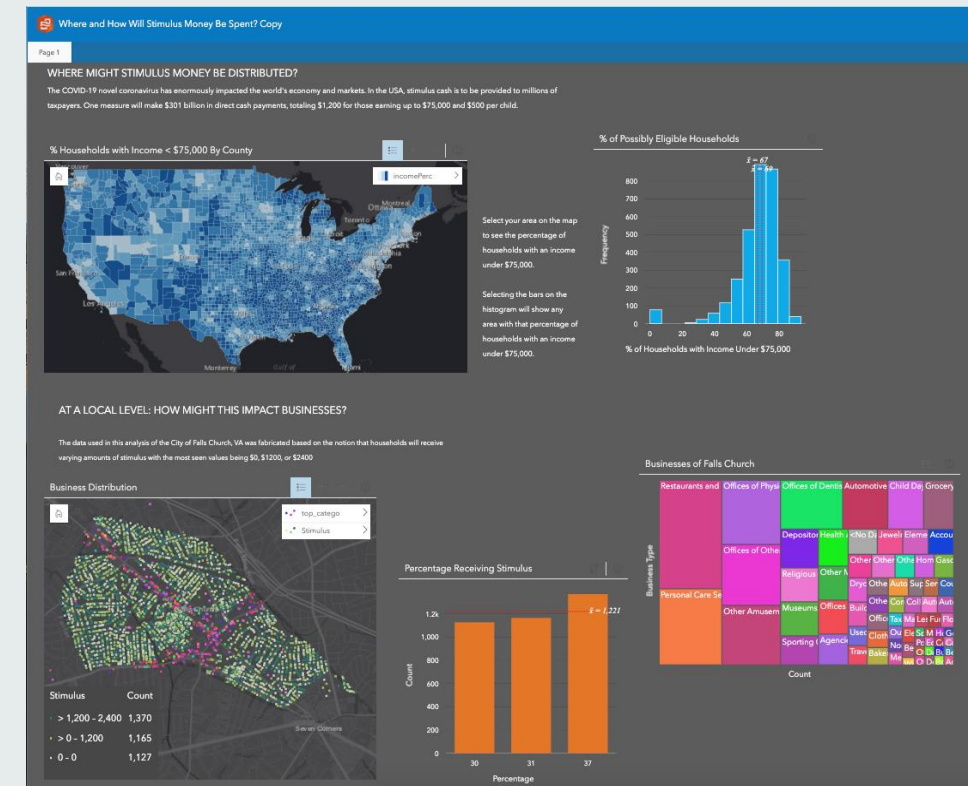
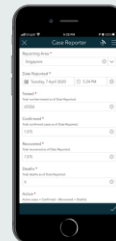
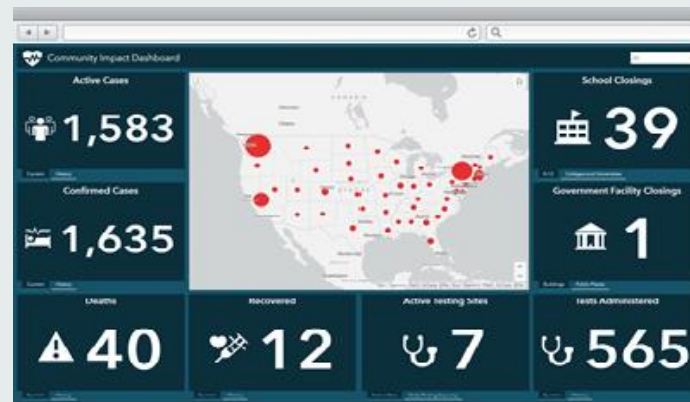
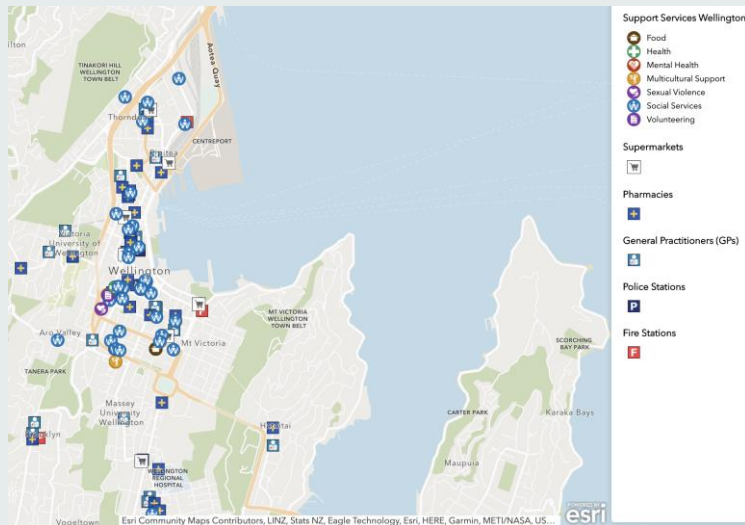
19 prostorna distribucija zaraženih na teritoriji Republike Srbije

COVID-19 prostorna distribucija lica u samoizolaciji na teritoriji Republike Srbije

Coronavirus Response Solution

[Coronavirus Response Solution](#) - maps and apps for Public Health agencies to understand COVID-19 impact and share authoritative information with the community.

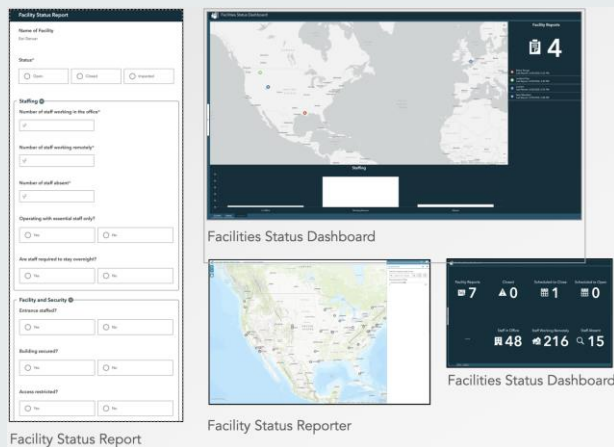
- Monitor coronavirus cases
- Track the impact on public gathering places
- Inventory of testing sites
- Share authoritative information with the public



Coronavirus Business Continuity Solution

Report and Monitor

Status of Your Facilities
Capacity of Your Workforce
Health of Your Employees
(Optional)



Apps for **Facility Status**

Understand and Act

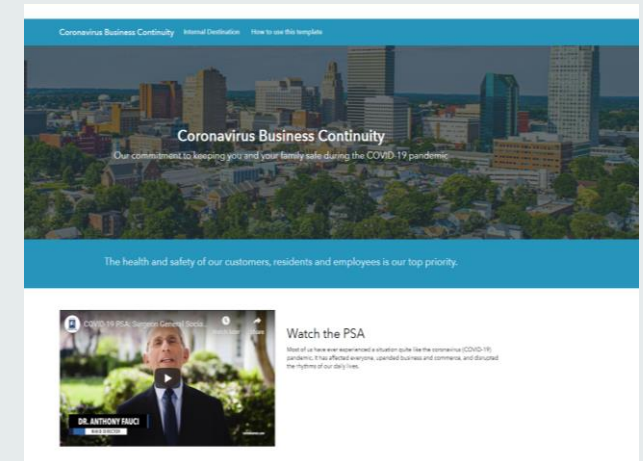
Current Status of Your
Workforce and Facilities



Apps for **Workforce
Capacity**

Communicate

Current Operations
and/or Disruptions to
Customers and
Stakeholders



**Coronavirus Business
Continuity Hub**

<https://solutions.arcgis.com/shared/help/coronavirus-business-continuity/>

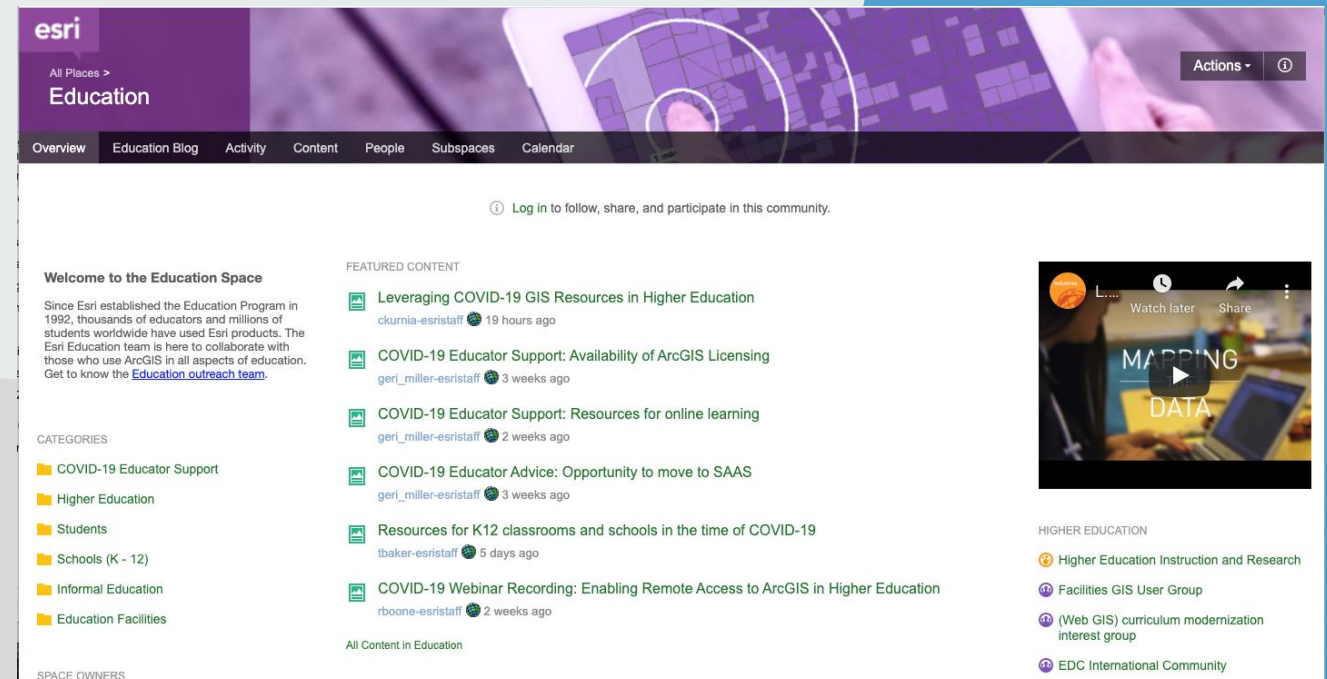
Education

Supporting Institutions (now that Universities are closed)

- All teaching resources / FAQs / webinars are on [GeoNet Education Space](#)
 - Includes assistance to move from physical GIS labs to Virtual Machines
- Licence donations for Higher Education Institutions
- Supporting Students at Home
 - Free Software

Learn ArcGIS Response to COVID-19

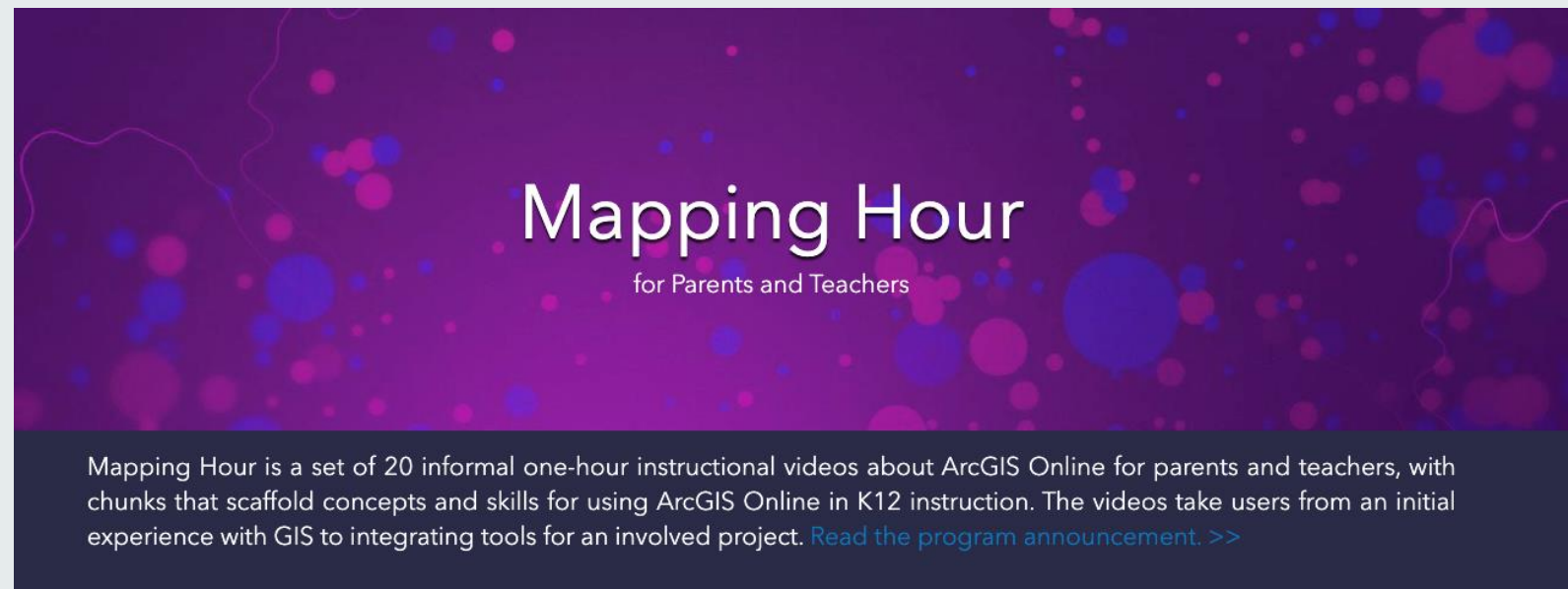
To support Learn users during the COVID-19 outbreak all users who sign up between March 1 and June 30 will have access to their Learn ArcGIS Organizational account through August 31. Please [contact us](#) with any questions.



Education

Supporting K12 Teachers & Parents

- **Content for Teachers** - <https://esriurl.com/k12coronavirus> - focused summary blogs.
- **Content for Parents & Teachers** - <https://esriurl.com/mappinghour> - series of 20 hour-long videos for parents and teachers usable 1-at-a-time or "binge-watchable" include temporary Publisher-level login if needed (for age 18+)
- Also [European content](#)



For More Information & Resources

- Disaster Response Programme (DRP):
<https://www.esri.com/en-us/disaster-response/overview>
- COVID-19 Resources:
<https://www.esri.com/en-us/covid-19/overview>
- COVID-19 Hub:
<https://coronavirus-resources.esri.com/>
- COVID-19 StoryMap:
<https://storymaps.arcgis.com/stories/feaf86dac1584a84978a5e49d62266ca>
- Index of Global COVID-19 Applications:
<https://www.arcgis.com/apps/opstdashboard/index.html#/a9419e61cb6f4521a15baf78be309b35>
- GeoNet Education Space:
 - <https://community.esri.com/community/education/pages/overview>

The GIS Community is Responding

Collaborating and Sharing Approaches, Models, Apps & Data...



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