L-Università ta' Malta

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101017454

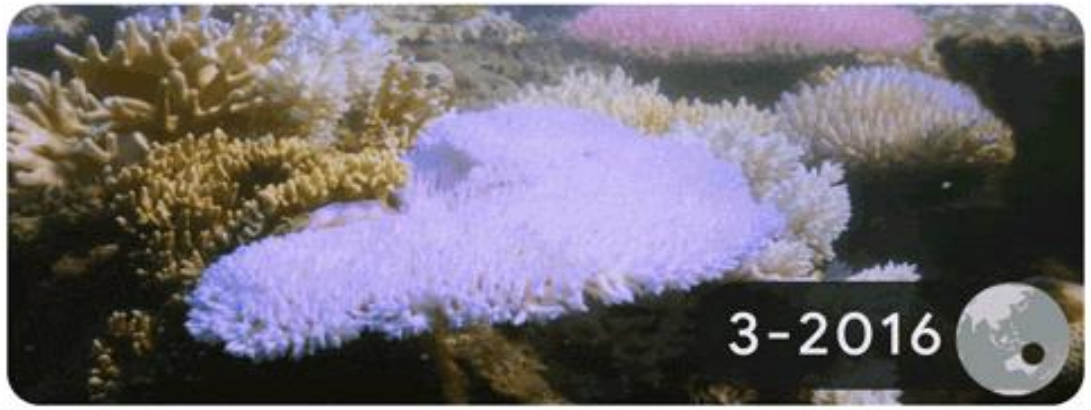
reSEArch-EU

Grasping the breadth and depth of Open Science: is it a new normal?

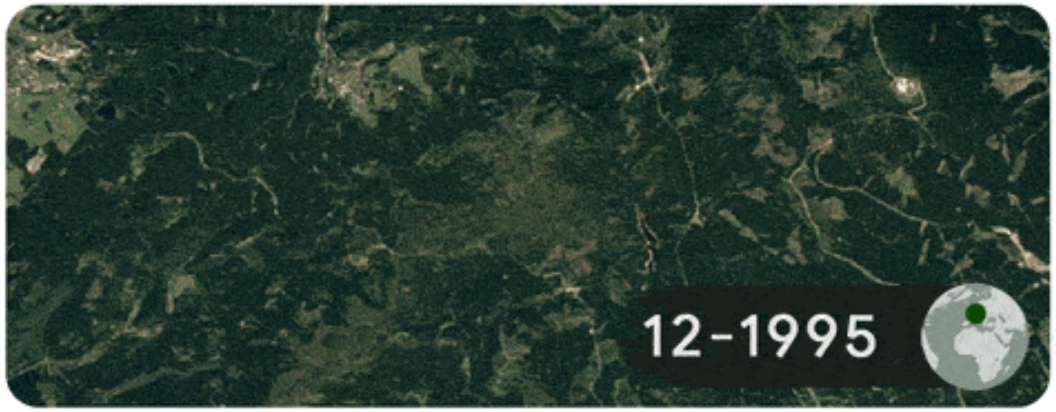
Ritienne Gauci
University of Malta
SEA-EU Open Science Ambassador (OSA)

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101017454

Google Doodle
22/04/2022



Great Barrier Reef | Australia
Coral bleaching on Lizard Island, Australia
Courtesy of The Ocean Agency



Harz Forests | Elend, Germany
Forests destroyed by bark beetle infestation
due to rising temperatures and severe drought
Images taken each December annually from 1995 to 2020

- Engineered by an open spatial software – Google Earth Timelapse Imagery
- Made publicly accessible by an open search engine – Google Chrome
- Supported by third parties providing data
- Available to extract, store, visualise in other fora by using other data sharing tools
- Available for other uses and services – education, awareness, advocacy etc.
- Understandable and universal form of science communication

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Agenda

Definition and Taxonomy
Schools of Thought
FAIR Data Principles
Open Access
Open Data
Business position
Emerging Citizen Science
Open Science in Geography

Credit: Coast Snap (Australia)

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101017454

Definitions

The OECD defines Open Science as: *"to make the primary outputs of **publicly funded** research results – publications and the research data – publicly accessible in digital format with **no or minimal restriction**"* (OECD, 2015:7)

The sharing of '***everything*** *— data, scientific opinions, questions, ideas, folk knowledge, workflows and everything else **as it happens***' (Nielsen, 2009:32)

*"A new approach to the scientific process based **on cooperative work** and new ways of diffusing knowledge by using **digital technologies** and new **collaborative tools***" (European Commission, 2016: 33).

'*Open Science is the **practice of science** in such a way that others can collaborate and contribute, where research data, lab notes and other research processes are freely available, under terms that enable reuse, redistribution and reproduction of the research and its underlying data and methods.*' (https://www.fosteropenscience.eu/)

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101017454

Schools of Thought

Democratic

Pragmatic

Infrastructure

Public

Measurement

By Fecher & Friesike (2013)

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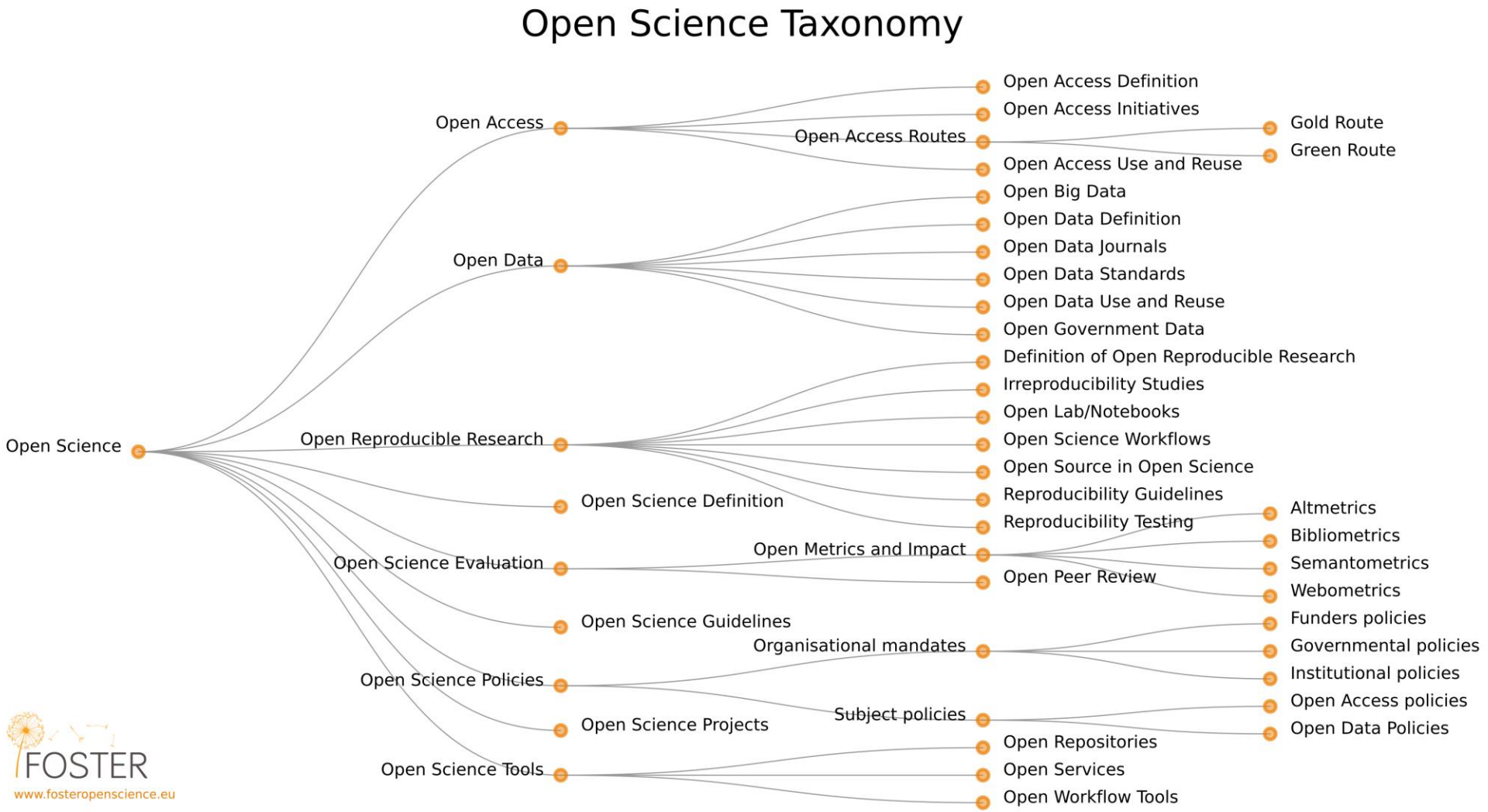
Structure and Taxonomy



FOSTER
www.fosteropenscience.eu

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Future of Open Science (2021)

[Open access, Open data, Open collaboration]

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101017454

Open Data: FAIR data principles (2016)

Open Data are online, free of cost, accessible data that can be used, reused and distributed provided that the data source is attributed and shared alike. (Source: Fosteropenscience.eu)

FINDABLE

Unique identifiers and metadata are used to allow data to be located quickly and efficiently

ACCESSIBLE

Data is open, free and universally available for research discovery efforts

INTER-OPERABLE

A common programming language is used to allow use in a broad range of applications

REUSABLE

All data is clearly described and outlines associated data-use standards

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EC Study of Open Data (2021)

Key findings:

1. A **lack of awareness** among many researchers on the benefits of open data.
2. **Journals and research funders** are the main actors who (can) provide incentives.
3. Simultaneously, they constitute the key building blocks of the current reward system of science that **discourages researchers** to openly share research data. Current initiatives and requirements by funders, journals and academic organisations will contribute to the necessary awareness.
4. There is increasing evidence that sharing research data is not only **beneficial for society** and the economy, but also **for researchers themselves**.
5. One universal barrier is that **it simply takes time** for authors, editors, peer reviewers and editorial support staff to enable it.
6. Other barriers to open data are field-specific, ex concerns about **being outcompeted** (ex Levin et al. 2016), about **misuse of data** and with regard to **privacy issues**.

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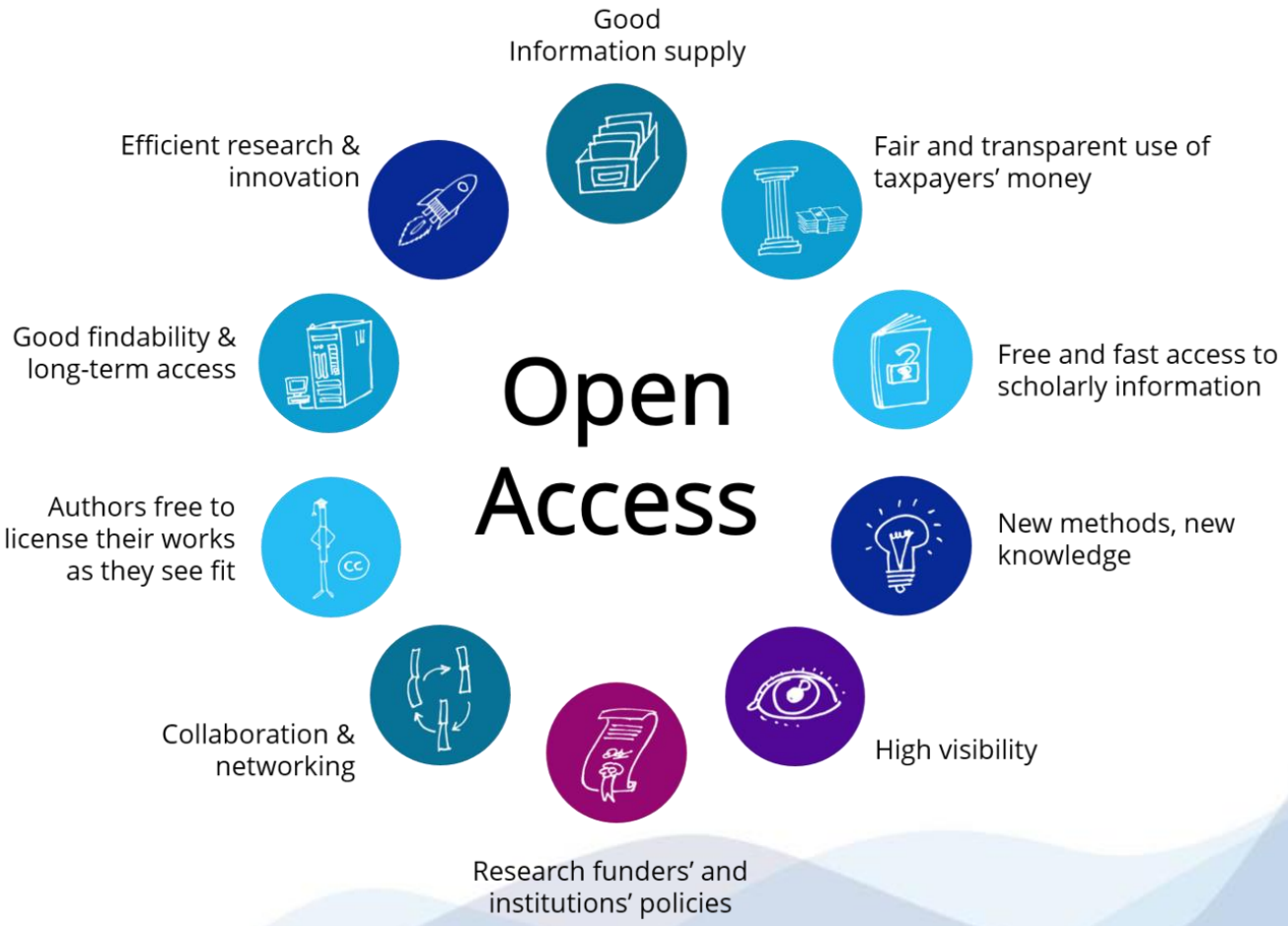
Open Access

Definition

Open Access refers to online, free of cost access to peer reviewed scientific content with limited copyright and licensing restrictions.

Governance

- Budapest Open Access Initiative (2001)
- Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities (2003)
- Finch Report (2013)



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EC Study of Open Access (2021)

Key findings:

1. **More and more** research funders require open access publication of results.
2. The **diversity** of publication routes and the **variety** of funders' and publishers' open access policies create legal and practical uncertainties.
3. **More awareness is needed** both of the technical aspects and of the benefits of publishing this way.
4. Researchers generally regard open access as a positive phenomenon. However, researchers experience several barriers.
5. Traditional recognition and reward systems still consider publishing in **high-impact journals** of great importance.
6. Many research councils are **removing financial disincentives ex.** coverage of article processing charges.
7. Types of infrastructures were developed for **different routes to open access** publishing, including: online platforms of open access journals and publishers; and large institutional and subject repositories.

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Types of Open Access

	GOLD OPEN ACCESS	GREEN OPEN ACCESS
• Access	• Free general access to the final version of the published article. • Access is immediate and permanent	• Free general access to your version of the article. • A temporary delay (embargo period) may be applied.
• Fee	• The fee for open access is paid by the author or on his behalf (for example, supporting research of the fund).	• Authors are not paid for the publication, expenses are covered by subscriptions to libraries.
• Use	• Defined by a user license	• The authors reserve the right to determine the rules for the use of their articles. • All open versions of the article must have a user license.
• Options	• Published in the open access journal • Published in the journal supporting open access to individual articles - a hybrid type	• Articles become freely available after the embargo period in open archives. • Own support of the manuscript by the author.

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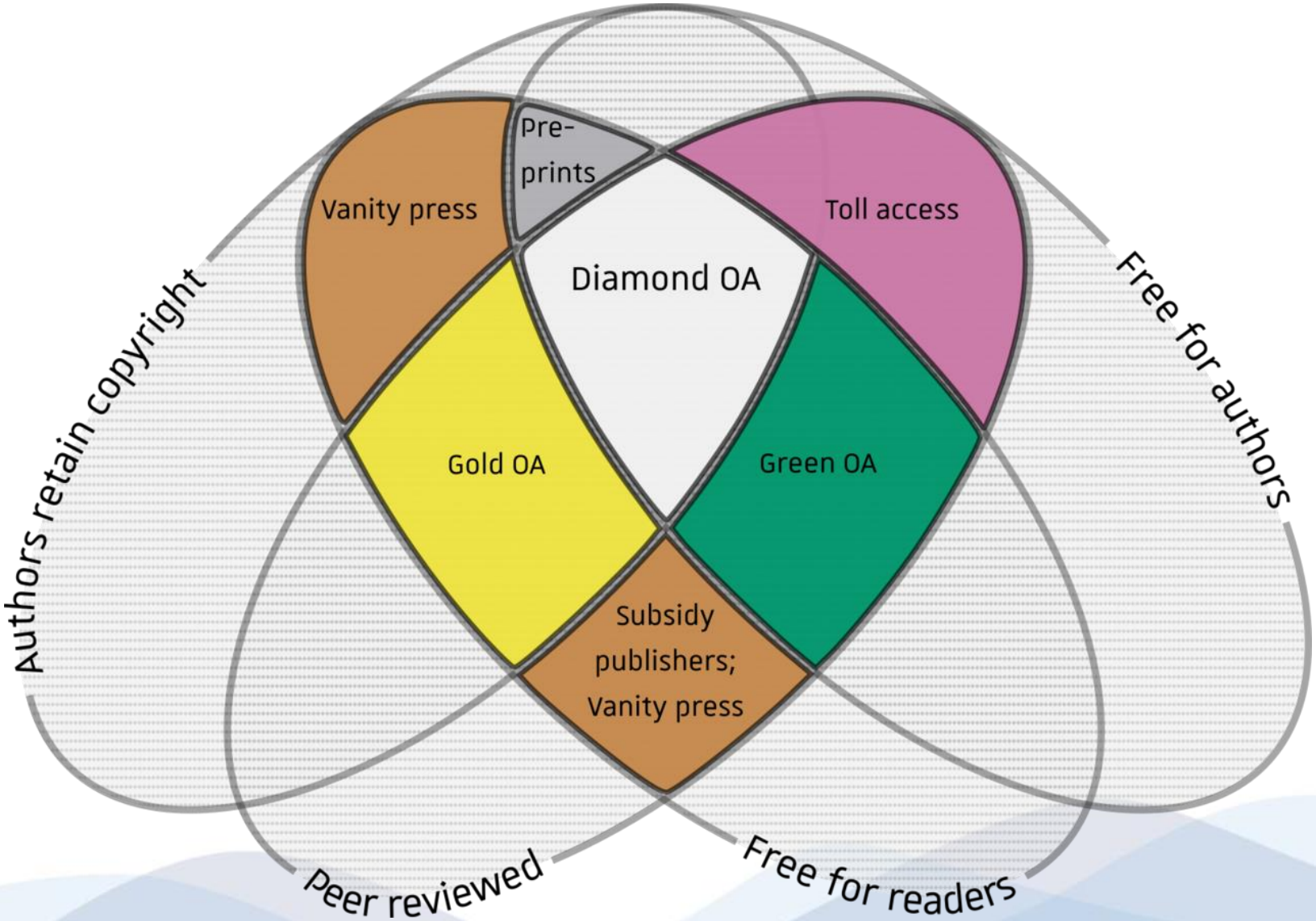

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EU-US-China power relations

China	United States	European Union
University-industry collaboration	Many initiatives to promote open access and open data	Open science policy addresses the openness of research data and results.
High share of private funding	Since 2013, the US requires public online availability of results of publicly funded research within 12 months of publication.	In open access, the European Union is on par with the US.
Chinese researchers prefer gold route access	A relatively high share of open access articles from the US is solely available through	Investment in infrastructure: Open Research Europe (for publications) and the European Open Science Cloud (for research data)
Open access through repositories ('green route') has been mandated	Institutional mandates play a much larger role in the US than in China.	Focuses more on sharing intermediate research results, enabling reuse of data, and rewarding open science practices.
Open data policies are heavily centralised	The country has by far the largest number of data repositories.	
Data must be submitted to government-sanctioned data centres before publication	The number of collaborative initiatives between higher education institutes and private parties in the US is comparable to the averages of the OECD and EU27.	
Still lagging slightly behind the US and the European Union		

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Future of Open Science (2021)

[Open access, Open data, Open collaboration]

Drivers:

1. Giving credit to open science practices (for instance as additional points in research proposal evaluation and/or in researcher career assessment).
2. Evidence of benefits for researchers (team work, cooperation, internationalisation, et cetera).
3. Integration of open science in infrastructures and assisted by tools and services.
4. Increasing awareness of open science practices and benefits.
5. Education and training available on open science practices.
6. Financial incentives by funders for open science practices.
7. Incentives to publish in open access on online platforms.
8. Incentives to reuse research outputs.
9. Adaptation of university curricula (for open science).
10. Engagement with citizen science.
11. Fostering open peer review.

Barriers:

1. Lack of credit or acknowledgement.
2. Concerns about being outcompeted.
3. (Uncertainty about) legal constraints (for instance copyright law, licensing restrictions et cetera).
4. Cost and time of sharing data or of engaging with a broad spectrum of stakeholders.
5. Concerns about misuse of data.
6. Lack of skills (for instance data stewardship).
7. Privacy issues.
8. Uncertainty about socio-economic benefits of open science.

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Open Science: the business position

(Business Europe, 2020)

Key messages

- Acknowledges the huge potential of Open Science.
- OS should not be an end in itself.
- There are no easy criteria allowing for a simple decision for or against the
- use of Open Research Data.
- Regulators should therefore refrain from enforcing a one-size-fits-all approach.
- Building upon the “as open as possible, as closed as necessary” EC 2017 principle.

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Open Science & Citizen Science

- Both Citizen Science and Open Science are emerging movements, mutually dynamic.
- Becoming more significant and layered with more sophisticated understanding of the themes, dynamics and shared characteristics.
- There is not one global Citizen Science community, nor one view to represent, nor one representative body.
- Citizen Science Global Partnership (CSGP)
- Co-founded an Open Science and Citizen Science Community of Practice (CS & OS CoP) under the CSGP.

Geography dimension

What (and why) are geographers debating about?

Emerging Open Tools in Geography

Citizen Science Communication and Education in Geography

© David Cilia

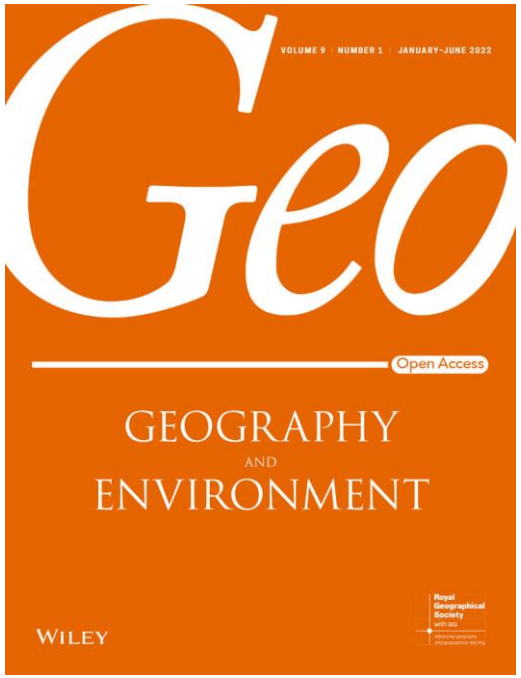
This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101017454

Leonelli et al. (2015) 'Sticks and Carrots' paper

OS leads to
(1) better and more efficient science,
(2) economic growth, in particular for SMEs wishing to capitalise on research findings, and
(3) increased transparency of knowledge production and its outcomes.

The environmental sciences have a long tradition of open ethos, citizen inclusion and global collaborations.

Whether OS is likely to help realise these benefits, however, will depend on the emergence of systemic incentives (hence the carrots!) for scientists to utilise OS in a meaningful manner.



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Pros and Cons

- **Effectively reuse** existing outputs
- Foster the **intelligibility** and **reproducibility** of research findings across disciplinary boundaries
- Makes it possible for researchers to **pick up and continue research** that was started, but never completed, by others
- Encourage the **use of high standards** in research, e.g. careful data production, well tested modelling and robust software

- Increasing transparency in research practices can have **unintended consequences.**
- May be **premature** for ongoing projects that need time to yield clear and widely intelligible results
- Finding ways to decide how sharing and transparency can be organised to be as fruitful as possible is one of the main challenges at present
- Compound researchers' fears of being scooped

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Carrots

- Recognition of sharing practices in credit structures
- Creation of more meaningful incentives for researchers to engage with OS
- Recognition of the role of alternative metrics ('altmetrics') and changing publication cultures
- Adjusting evaluation systems in careers and research grants

Accepted: 14 October 2020

DOI: 10.1111/area.12682

ETHICS IN / OF GEOGRAPHICAL RESEARCH

WILEY AREA Royal Geographical Society with IBG

The values of open data

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[2]Department of Geography, University of Malta, Msida, Malta

Correspondence
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Email: robert.inkpen@port.ac.uk

The values of open data in terms of accessibility, research scrutiny, and data transparency are important ethical values that all scientists should aspire to achieve. As part of the drive for open science in general, the development of open data and, associated with it, open access, are key characteristics. Although these may be the key drivers for open data in science, the potential to inform policies and to support non-academic sectors are also high on the political agenda for geographical science, placing the issue of "open data" firmly within the context of the neoliberalisation of universities and academics. Open data becomes a common resource from which other researchers, business, and government can extract value. This paper addresses the contexts in which open data is being encouraged and identifies concerns that these policies may need to be sensitive to, such as existing and emerging power relations within which data is produced and consumed. Viewing open data in this context illuminates some potential ethical issues that the benign ideal of open data could produce. We explore the importance of viewing research and research outputs within the dimensions of a dynamic set of power relation-

EARTH SURFACE PROCESSES AND LANDFORMS
Earth Surf. Process. Landforms **45**, 5–10 (2020)

Published online 15 December 2019 in Wiley Online Library
(wileyonlinelibrary.com) DOI: 10.1002/esp.4775

Editorial

Editorial 2020 Part II: Data from nowhere?

Stuart N. Lane*
Institute of Earth Surface Dynamics, University of Lausanne, CH1015-Lausanne, Switzerland

Received 20 November 2019; Revised 22 November 2019; Accepted 25 November 2019

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ESPL
Earth Surface Processes and Landforms

ABSTRACT: This short editorial reflects upon and explains ESPL's policy with respect to data sharing. Whilst there are clearly a number of important reasons why data should be shared, notably to support transparency in science and to support the long-term monitoring of geomorphological change, data sharing comes with some concerns. Data sharing cannot become an alternative to field data collection as it produces a scientific understanding of a very particular type. When shared data are combined in extensive analyses we run the serious risks of inter-comparability, bias and incompleteness. Automated harnessing and analysis of any kind of geomorphological data runs the risk of combining data that are not comparable and producing conclusions skewed to the datasets available. Shared data allow for none of the serendipity that comes from being in the field and being confronted by what we see and experience; they might as well be data from nowhere. We must be particularly careful not to reduce the perceived value of field data collection in an academic system that places ever more emphasis on speed and efficiency in scientific knowledge production. It is for these reasons that ESPL's policy on data sharing is to support it and to encourage it, notably through requiring authors to provide a data statement, but we will not insist that data should be published as a condition of manuscript acceptance. © 2019 John Wiley & Sons, Ltd.

KEYWORDS: data; data sharing; publication; fieldwork; extensive analysis; chaotic conception; scientific knowledge production; geomorphology

Introduction

During its November 2019 meeting, the ESPL Editorial Board reflected on its policy with regard to data sharing. The speed with which data have become a new element of academic publishing is quite astonishing and many journals now require the formal publication of data at article submission or before final acceptance. In this short Editorial I reflect on the position taken by ESPL. Our current policy is that an author must make data available to Editors and reviewers upon request; that authors are encouraged to make their data available to others upon request; but not that those data are formally published, component of an academic journal's activities. First, most scientific journals, for some time, have required that authors make their data available to reviewers upon request. The idea is that assessing the data could or even should be an important element of the peer review process. In practice, this rarely happens. In my 12 years as Managing Editor at ESPL I have received one single request from a reviewer to see data during review. By making data sharing a formal part of a publication, reviewers may be encouraged to evaluate data more frequently and this is important. A well-written paper founded on poor or incorrect data in some senses is more problematic than a poorly written paper founded on good data. Peer review of data

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.....Open Government

GeoPlatform.gov

Search

Making Federal Geospatial FAIR

GeoPlatform is making Federal GeoData Findable, Accessible, Interoperable, and Reusable

Search GeoPlatform

Welcome to GeoPlatform.gov

The Geospatial Platform is a cross-agency collaborative effort and Shared Service that embodies the principles and spirit of Open Government, emphasizing government-to-citizen communication, accountability, and transparency. In 2020, GeoPlatform.gov, operating under the authority of the Geospatial Data Act of 2018 , transformed to establish its primary role which will be to discover geospatial data assets with special emphasis as the authorized source for all the official National Geospatial Data Assets (NGDAs) across 18 Data themes as guided by the U.S. Federal Geographic Data Committee (FGDC).

- **Data Services** - The GeoPlatform delivers trusted, nationally consistent, authoritative geographically enriched social, economic, environmental and other data for understanding and decision making.
- **Applications and Tools** - The GeoPlatform provides a suite of applications and tools for integrating, synthesizing, analyzing, problem-solving and visualizing geographically enriched data to accelerate understanding and decision-making.
- **Shared Services** - The GeoPlatform provides shared hosting infrastructure that allows agencies to publish their geospatial data, applications, and tools in a secure cloud-computing environment at a low cost.

Learn More

Current Events and Data Showcase

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Geographic Information System

QGIS (Open Software)

ArcGIS (Esri Licenced Software)

Differences	QGIS	ArcGIS
License	*Available for free*	*Paid license*
Operating system	*Windows, Mac OS, Linux, and Android*	*Windows and Linux*
Versions	*multiple versions at same system*	*One version installation*
Tools	*Some free tools*	*Licensed tools hence paid*
File format accessibility	*Supports all formats*	*Limited file formats*
Source Code	*Open Source*	*Closed Source code*
Processing time	*Less*	*Longer processing time*
Reliability	*More reliable*	*Comparatively less reliable*
Mapping functions	*No advanced mapping functionalities*	*Many advanced mapping functionalities*
Plugins	*Many plugins available*	*No such plugins available*
Guide	*No such good guides*	*Many guides are available*
Data entry	*Text, whole or decimals*	*Can be any- float, integers or texts*
Tools availability	*Offers Plugin Library*	*Offers various tools*
Accessibility	*Desktop accessibility*	*Mobile accessibility*
Data Storage	*Relies on PostGIS*	*File-based shapefiles*
Raster calculator	*Uses algebra along with trigonometry*	*Uses algebra, statistics, zonal tool sets and few more*
Join tables	*Multiple Joins*	*Single joins*
Geodata	*Comparatively less options available*	*More options available for geodata*

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The GIS community responds to the COVID-19 crisis

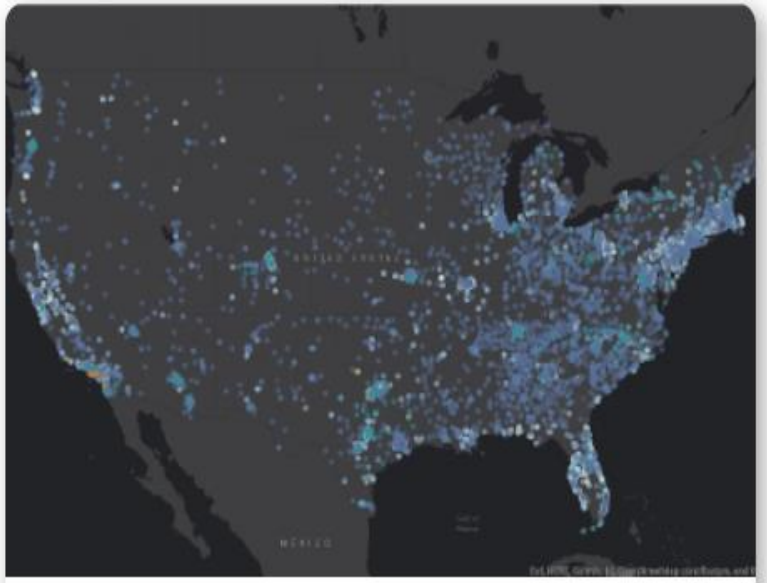
Geospatial professionals across the globe are taking action to help understand COVID-19, manage response to the disease, and slow its spread

By Esri's StoryMaps team

Legions of geographic information systems (GIS) professionals are working day and night to map the pandemic and its many ramifications.

This project has received funding from the European Union's Horizon 2020

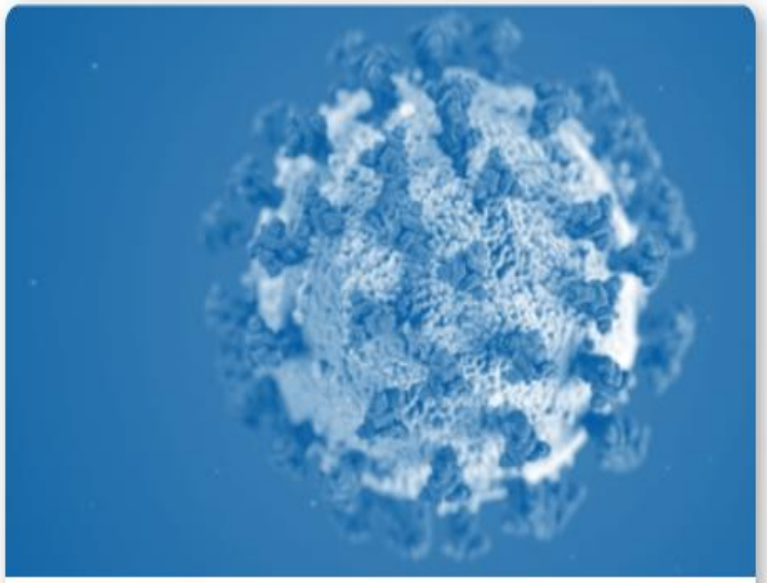
Understand, prepare for, and respond to COVID-19 in your community or organization.



GISCorps COVID-19 Resources

Public apps and data created by GISCorps volunteers in support of the COVID-19 pandemic response.

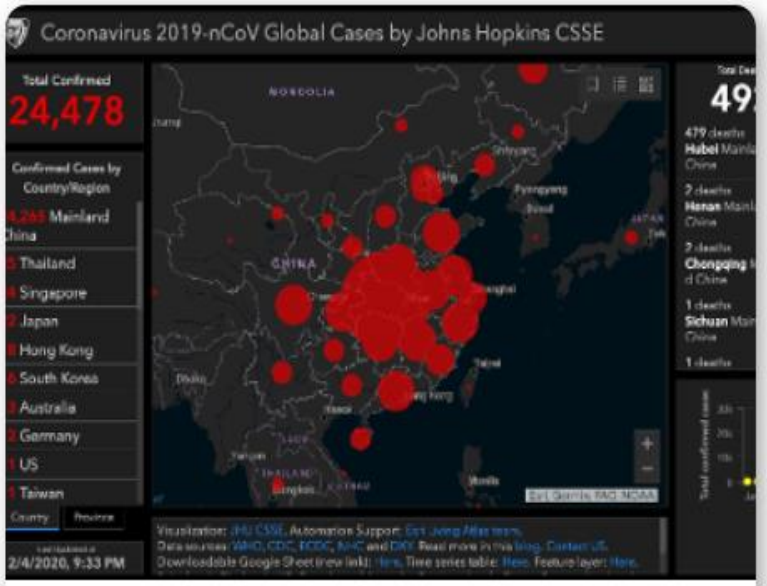
Explore



HHS Protect Public Data Hub

The HHS Coronavirus Response Data Hub shares information from HHS Protect which provides a holistic view of the U.S. healthcare system, includi…

Explore



Coronavirus COVID-19 (2019-nCoV)

This ArcGIS Dashboard created by the CSSE Team at Johns Hopkins contains the most up-to-date coronavirus COVID-19 (2019-nCoV) cases and lat…

Explore

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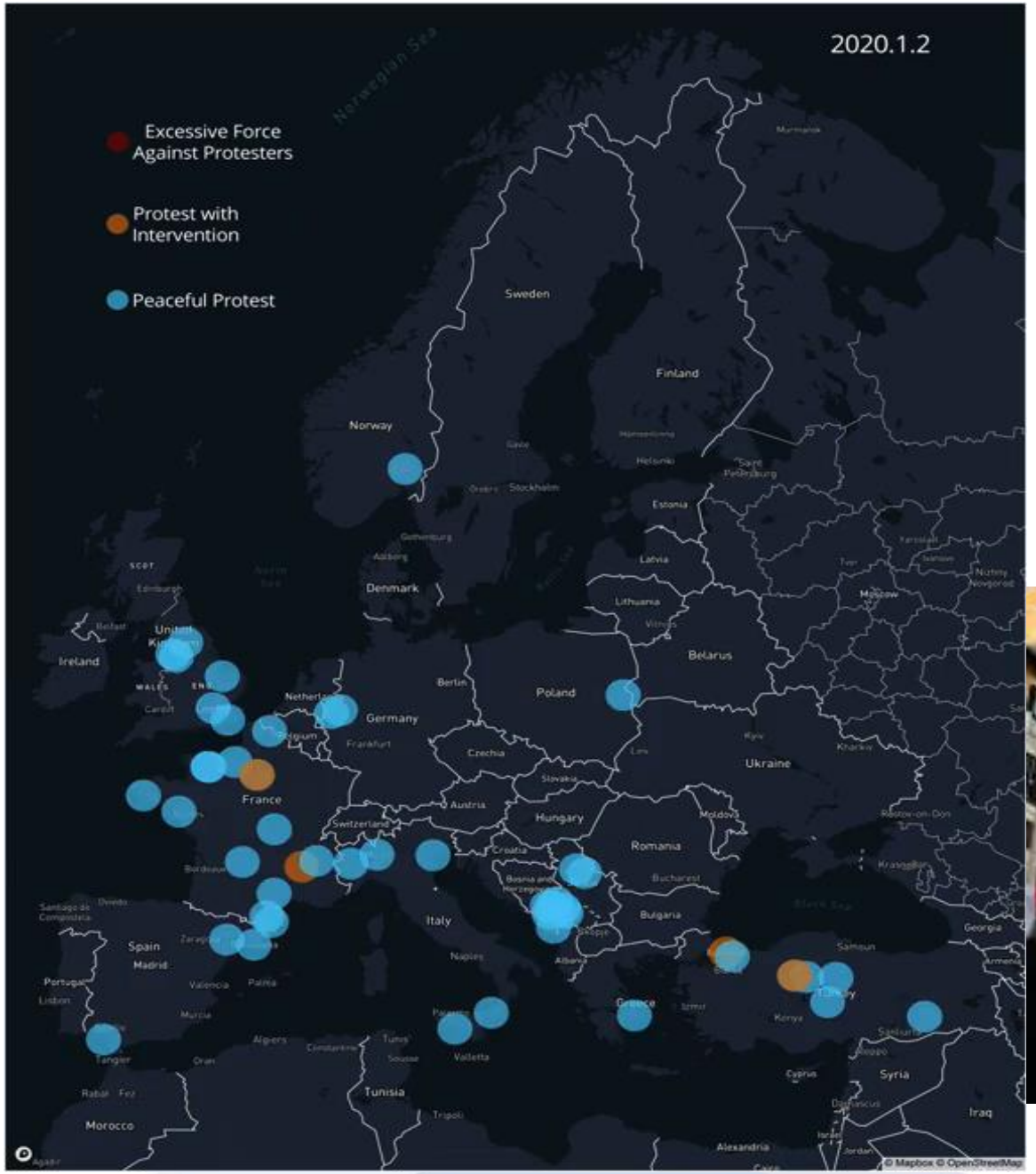
Protests in Europe in 2020 and 2021. Everyone is feeling it.

Source: reddit.com, 24.01.2022



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OPEN GEOGRAPHY EDUCATION

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Geospatial Technology OER eTextbooks

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- Introduction to Geospatial Technology
- Introduction to Geospatial Technology
- Introduction to Remote Sensing
- Open Source GIS
- Cartographic Principles
- Spatial Analysis

OPEN
SCIENCE SCHOOLING

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Royal Geographical Society of London (RGS-IBG)

In 2020 Wiley signed a four year 'read and publish' agreement to many UK universities and research institutions to publish primary research and review articles in Wiley's Open Access or Online Open journals at no cost to the individual.

All four of the Society's journals, Area, Geo: Geography and Environment, The Geographical Journal, and Transactions of the Institute of British Geographers are published by Wiley.

Open access deal for UK researchers in the Society's journals

03 Apr 2020

RGS-IBG NEWS, RESEARCH AND HIGHER EDUCATION

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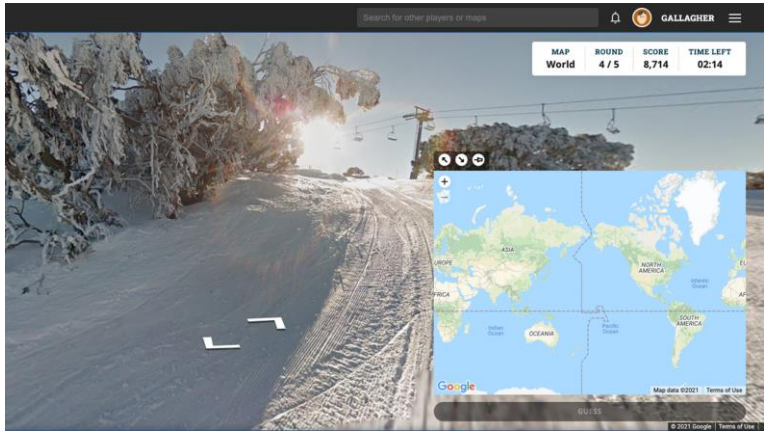
Digital Gaming Revolution: Google Earth, Google Maps, Google Street Views……

GeoGuessr



Durita Dahl Andreassen's from Faaroe Islands

Google Sheep View

JANUARY 21, 2022

Contest #743

Where on Google Earth?

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101017454

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- Wehn et al. 2020 Global Citizen Science perspectives on Open Science.

This projects has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101017454

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Thank you

Questions are welcome!