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Illustration inspired by the work of Chien Shiung Wu

# Beyond article publishing - support and opportunities for researchers in FAIR data sharing

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Springer Nature

ADVANCING DISCOVERY

# Talk data with Springer Nature at EGU 2020

As part of EGU 2020 online we are hosting an open office hour on Thursday May 7th at 11:00 CEST/ 10:00 BST: https://bit.ly/2SqldVP

Drop in to talk to us about anything in these slides or:

- Publishing in data journals or articles, such as flagship data journal *Scientific Data*
- Sharing data that support your research publications: requirements and best practice
- Data curation (inc. our Research Data Support service), repositories and metadata

We are also participating in the Virtual Data Help Desk throughout the week (tweet #DataHelpDesk) and look forward to hearing from you!

We are working to support FAIR data sharing across Springer Nature

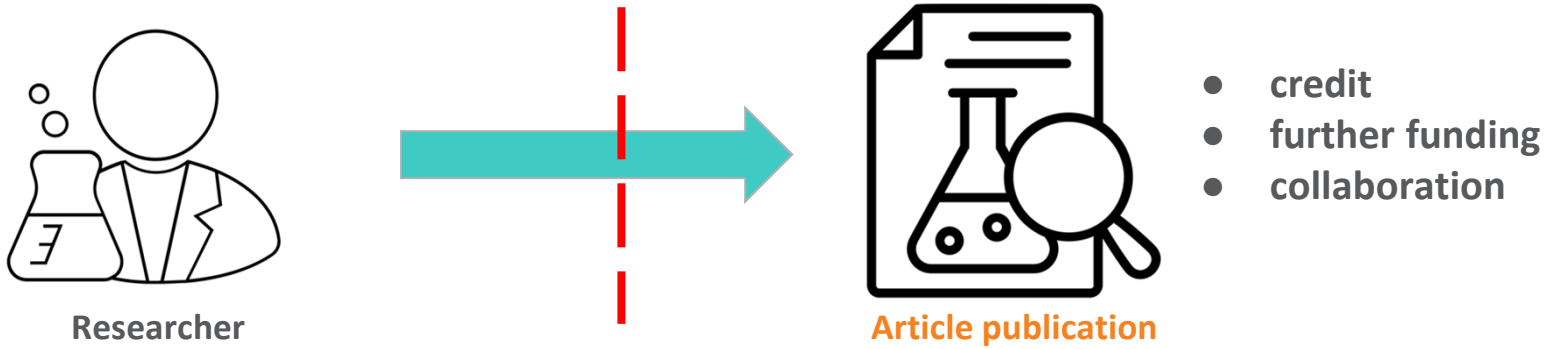
# Some of the ways we support FAIR data sharing in Earth Sciences

- Commitments in Earth Sciences
- Data journals & articles
- Standardised data policies & initiatives
- Support & services

but data sharing in scholarly publishing faces a key challenge

# one challenge to embedding data sharing in publishing

Publishing a research article is an endpoint for a study and a means toward academic recognition, funding and further research.




In this context, data sharing requirements are encountered as a hurdle between the researcher and article publication.

This often results in underlying data being absent from the published work, or simply ‘available on request’.

# data sharing is valuable in itself

We believe that research data are first class research outputs in their own right. Sharing research data is a way to drive research and collaboration as well as a credit mechanism separate to article publication.

Researcher

Data sharing

- credit
- further funding
- collaboration

So the various challenges around sharing data also present opportunities for researchers beyond article publication.

# sharing research data: the opportunities

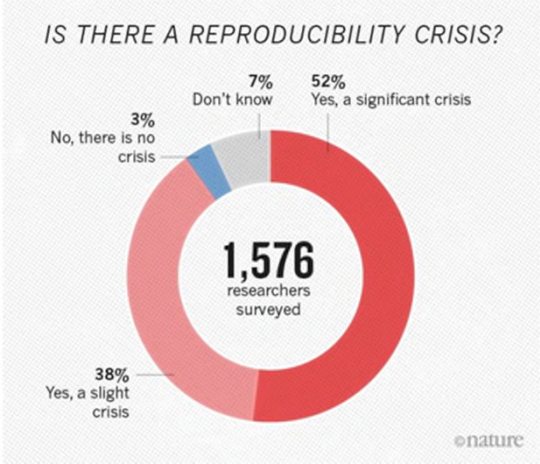
**Societal benefit**

*"We estimate the annual cost of not having FAIR data to a minimum of* ***€10.2bn*** *per year. "*

Cost-benefit analysis for FAIR research data, 2018 report to the European Commission[1]

A *Nature* survey from 2015[2] highlights concern in the research community

**>70% couldn't reproduce the work of others**
**>50% couldn't reproduce their own experiments**



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A recent study of over **half a million articles** found an average **25%** more citations for papers with open data[3]


*Altmetrics present a range of interactions beyond citations alone*

**Credit mechanism**

Data sharing also presents new opportunities for researchers to receive credit for their research outputs

## ✓ Funder data policies

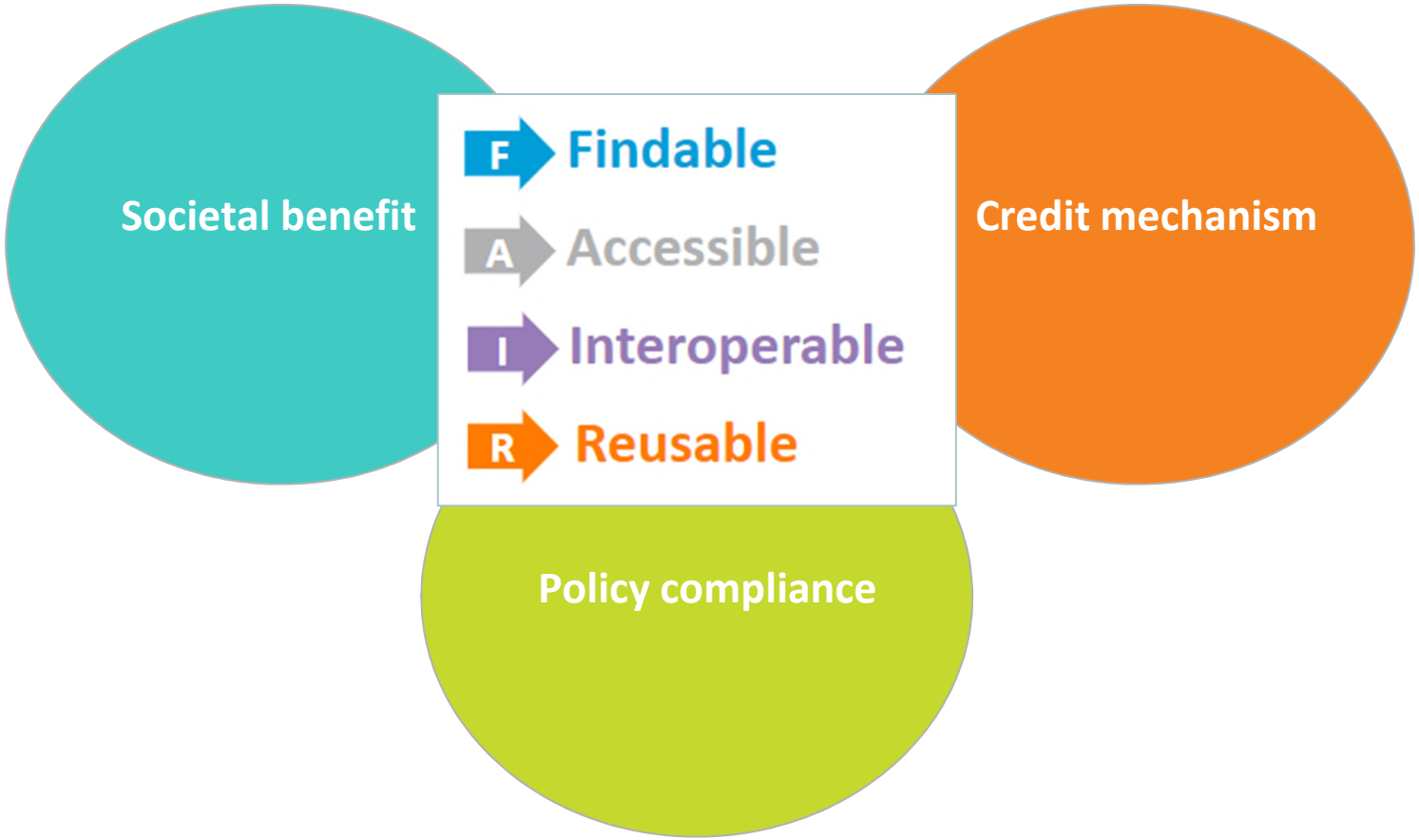
Many major funders have data sharing requirements as a condition of ongoing funding, including UKRI councils, Wellcome, Bill & Melinda Gates Foundation

## ✓ Journal data policies

Publishers increasingly require transparency around data availability, or data sharing, to publish in their journals.

Over **1,600** Springer Nature journals now have data policies

how can publishers support researchers with these opportunities?


Societal benefit
F Findable
A Accessible
I Interoperable
R Reusable
Credit mechanism
Policy compliance

we’re putting FAIR data into practice across our journals, policies and services

# Supporting FAIR data sharing at Springer Nature

## Commitments in Earth Sciences

ENABLING FAIR DATA PROJECT

COPDESS
Coalition for Publishing Data in the Earth and Space Sciences

## Data journals & articles

SCIENTIFIC DATA

there are Springer Nature journals, like Scientific Data, that are glad to publish data articles from the Earth and climate sciences

## Standardised data policies & initiatives

Over **1,600** Springer Nature journals now have data policies, making data requirements easy to follow


## Support & services

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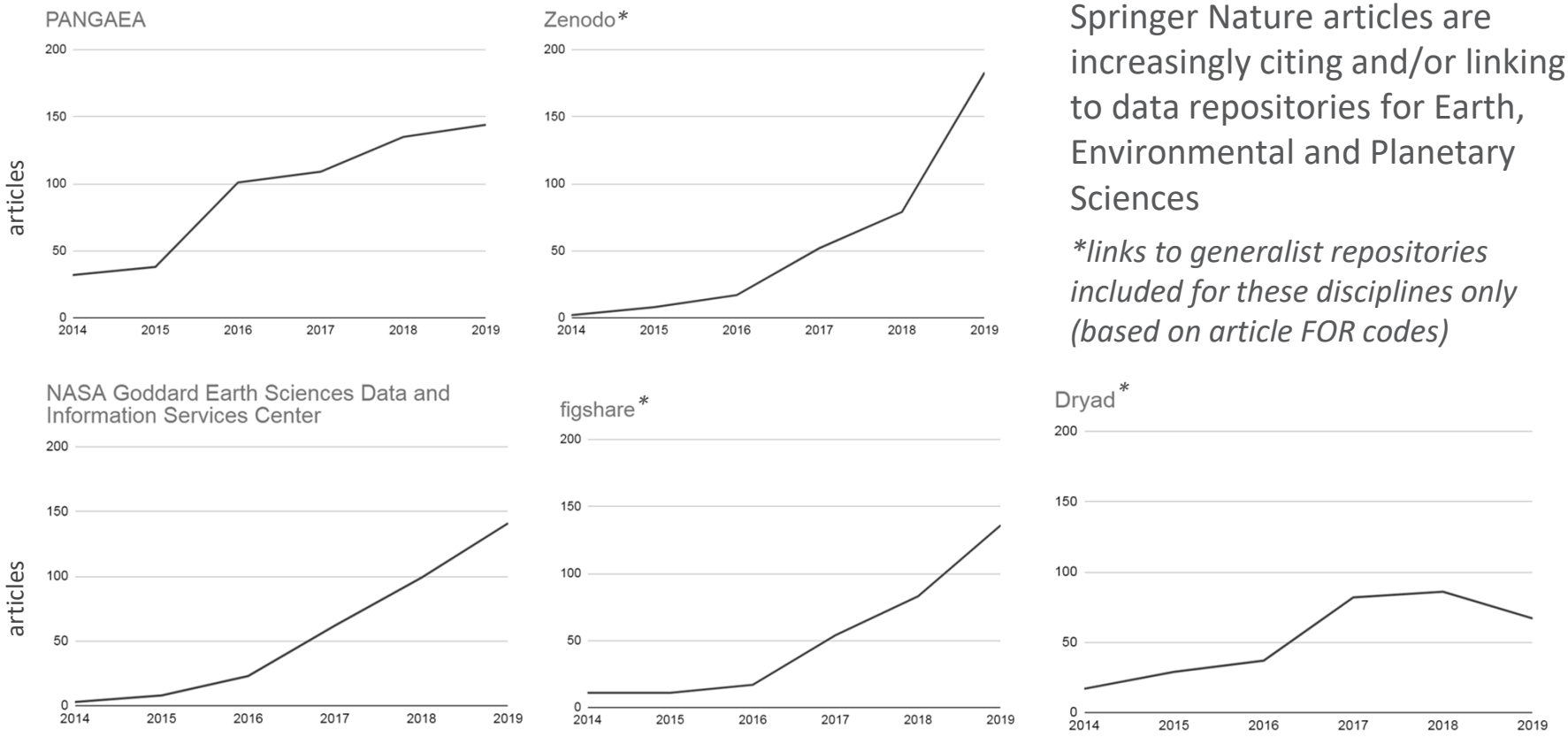
Research Data Support

Helpdesk

Recommended Repositories

and data sharing in Earth Sciences is growing at Springer Nature

# Earth Sciences articles declaring data in repositories




Springer Nature articles are increasingly citing and/or linking to data repositories for Earth, Environmental and Planetary Sciences

**links to generalist repositories included for these disciplines only (based on article FOR codes)*

source: dimensions.ai



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# 1. data sharing through community-led initiatives

# Commitments to data sharing in Earth Sciences

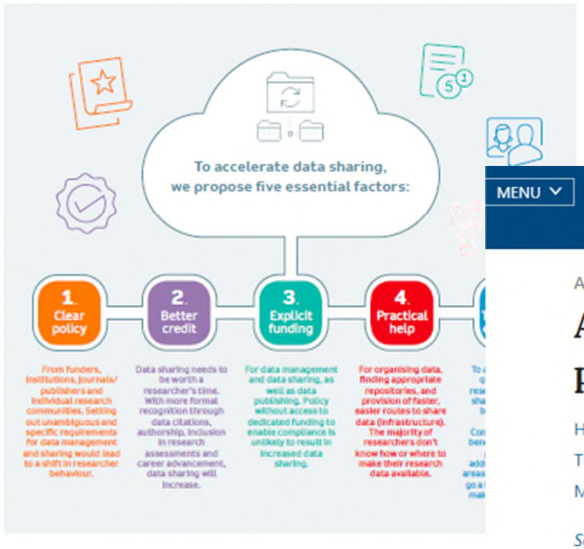
***Nature, Nature Geoscience,*** and ***Scientific Data*** endorse the Enabling FAIR Data initiative in the Earth, space and environmental sciences[6].

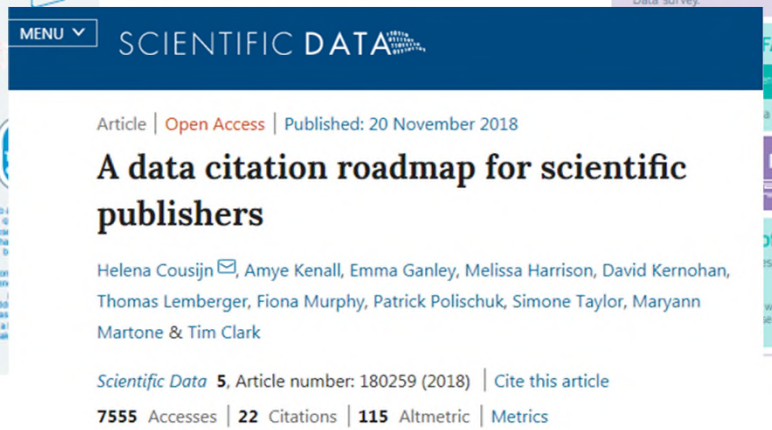

Authors in these fields must make supporting data available to others through community repositories where available, and generalist repositories otherwise.

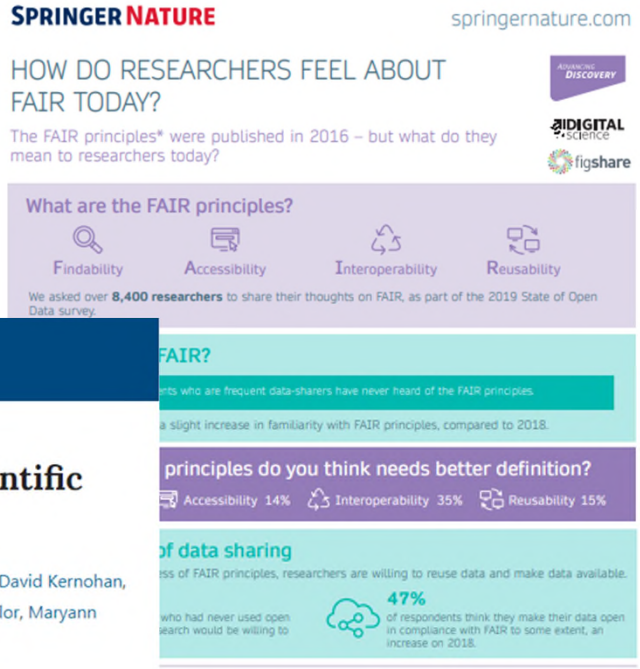
The project aims for:

- easy **discovery, recombination, reuse,** and reliability testing of research data
- generation of **credit** and **recognition** for researchers
- **increased public confidence** in scientific research, and public access to digital research products

# Assessing and outlining practical steps for data sharing across the scientific community

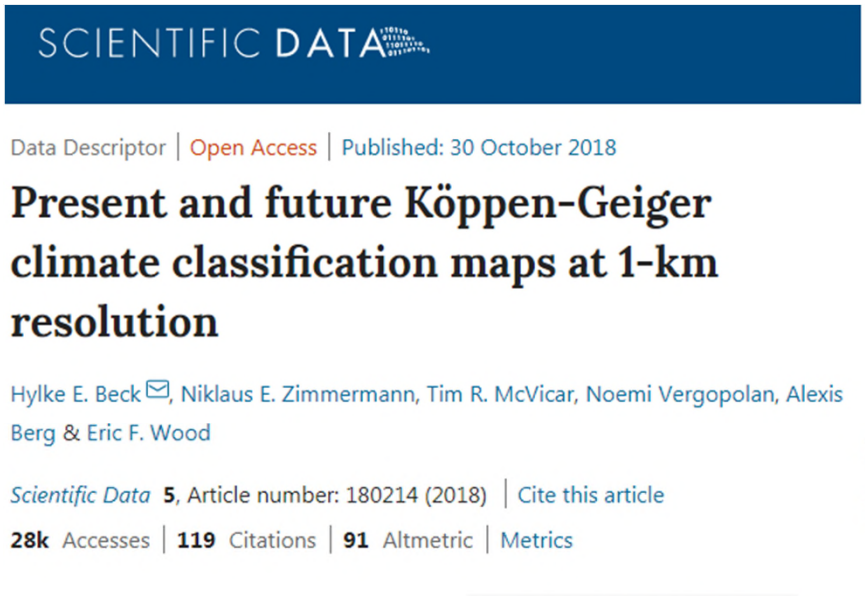


# 2. specialist data publications provide credit and best practice

# Data journals and articles: *Scientific Data*



SCIENTIFIC DATA

Data Descriptor | Open Access | Published: 30 October 2018

**Present and future Köppen-Geiger climate classification maps at 1-km resolution**

Hylke E. Beck, Niklaus E. Zimmermann, Tim R. McVicar, Noemi Vergopolan, Alexis Berg & Eric F. Wood

*Scientific Data* **5**, Article number: 180214 (2018) | Cite this article

**28k** Accesses | **119** Citations | **91** Altmetric | Metrics

- A clear, peer-reviewed description of data, to maximize usage
- Data are hosted in community repositories
- Formal data citation robustly links the data paper to its data records
- Data are previewable in-article when hosted at figshare

**Data Citations**

1 Beck, H. E. *et al. Figshare*
https://doi.org/10.6084/m9.figshare.6396959 (2018)

Explore online: https://doi.org/10.1038/sdata.2018.214

**Present and future Köppen-Geiger climate classification maps at 1-km resolution**

13155 views | 3914 downloads | 1 citations

Version 2 Dataset posted on 16.07.2018, 20:13 by Hylke E. Beck, Niklaus E. Zimmermann, Tim R. McVicar, Noemi Vergopolan, Alexis Berg, Eric F. Wood

New global maps of the Köppen-Geiger climate classification at an unprecedented 1-km resolution for the present day (1980–2016) and for projected future conditions (2071–

# 3. policies to standardise what's expected from researchers

# Standard research data policies at Springer Nature

- Rolling out standard research data policies since 2016.
- More than 1,600 (~65%) Springer Nature journals have one of these policies.
- Approach is practical and pragmatic, enabling researchers to easily understand ‘what’, ‘where’ and ‘how’ of data sharing requirements

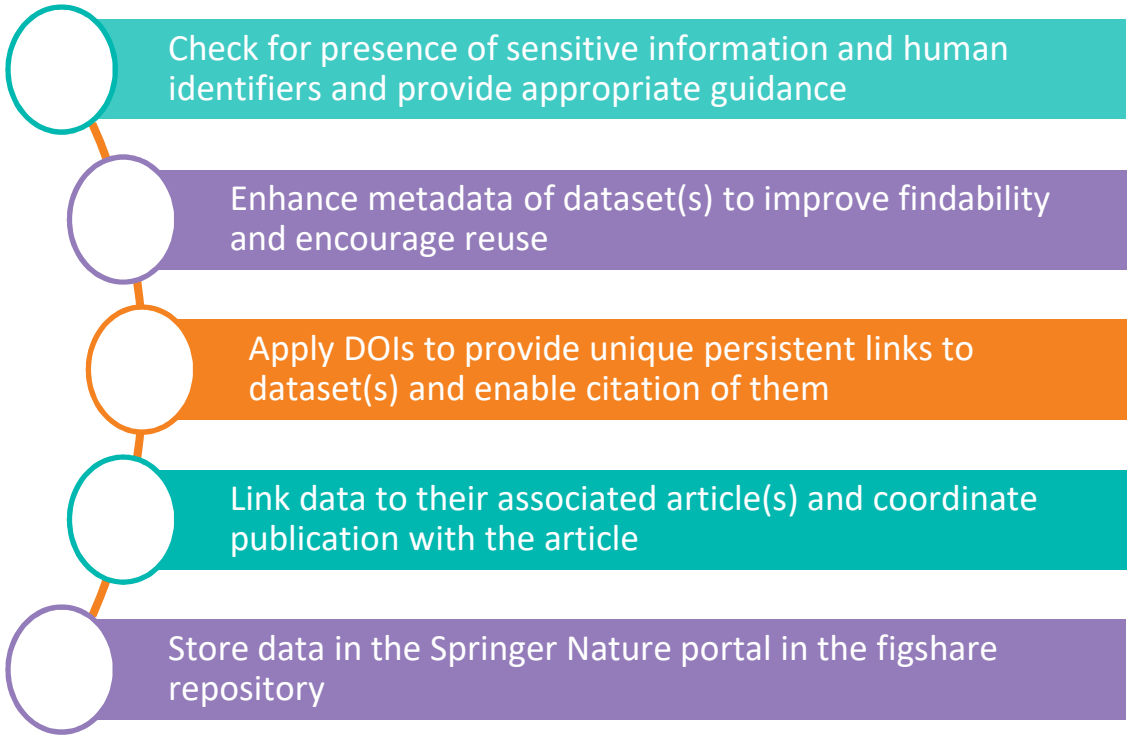
## Policy Types

4. expert support for researchers submitting to our journals

# Research Data Support: hands-on assistance

Researchers submit data for curation and sharing in our Springer Nature figshare repository.

Our curation team perform a series of checks and enhancements, taking on the legwork in curation and providing expert guidance.



# The result: data shared openly, previewable and linked to the research article

**Paper** published in **Nature** (https://doi.org/10.1038/nature23654)

**Dataset** published in the **Springer Nature figshare repository** (https://doi.org/10.6084/m9.figshare.c.3814360)


nature

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NATURE | LETTER

Early members of 'living fossil' lineage imply later origin of modern ray-finned fishes

Sam Giles, Guang-Hui Xu, Thomas J. Near & Matt Friedman

Affiliations | Contributions | Corresponding author

Nature (2017) | doi:10.1038/nature23654

Received 05 December 2016 | Accepted 18 July 2017 | Published online 30 August 2017

PDF | Citation | Rights & permissions | Article metrics

Modern ray-finned fishes (Actinopterygii) comprise half of extant vertebrate species and are widely thought to have originated before or near the end of the Middle Devonian epoch (around 385 million years ago)[1, 2, 3, 4]. Polypterids (bichirs and ropefish) represent the earliest-diverging lineage of living actinopterygians, with almost all Palaeozoic taxa interpreted as more closely related to other extant actinopterygians than to polypterids[5, 6, 7, 8, 9, 10]. By contrast, the earliest material assigned to the polypterid lineage is mid-Cretaceous in age (around 100 million years old)[11], implying a quarter-of-a-billion-year palaeontological gap. Here we show that scanilepiforms, a widely distributed radiation from the Triassic period (around 252–201 million years ago), are stem polypterids. Importantly, these fossils break the long polypterid branch and expose many supposedly primitive features of extant polypterids as reversals. This shifts numerous Palaeozoic ray-fins to the actinopterygian stem, reducing the minimum age for the crown lineage by roughly 45 million years. Recalibration of molecular clocks to exclude phylogenetically reassigned Palaeozoic taxa results in estimates that the actinopterygian crown lineage is about 20–40 million years younger than was indicated by previous molecular analyses[1, 2, 3, 4]. These new dates are broadly consistent with our revised palaeontological timescale and coincident with an interval of conspicuous morphological and taxonomic diversification among ray-fins centred on the Devonian–Carboniferous boundary[12, 13, 14]. A shifting timescale, combined with ambiguity in the relationships of late Palaeozoic actinopterygians, highlights this part of the fossil record as a major frontier in understanding the evolutionary assembly of modern vertebrate diversity.

**Data availability**

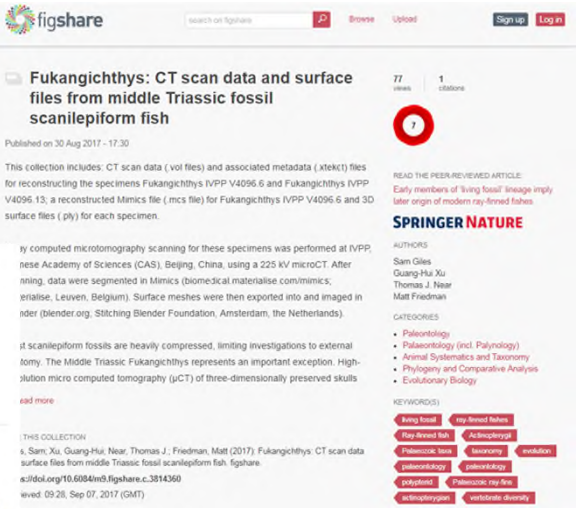
The CT data that support the findings of this study, as well as 3D surface files of described material, are available in figshare[43] with the identifier https://doi.org/10.6084/m9.figshare.c.3814360. All other data files are included in the Supplementary Information.

**References**

Main • Methods • References • Acknowledgements • Author information • Extended data figures and tables • Supplementary information • Comments

1. Hurley, I. A. *et al.* A new time-scale for ray-finned fish evolution. *Proc. R. Soc. Lond. B* **274**, 489–498 (2007)

**Data availability statement** included with the paper


figshare

Fukangichthys: CT scan data and surface files from middle Triassic fossil scanilepiform fish

Published on 30 Aug 2017 - 17:30

This collection includes: CT scan data (.vol files) and associated metadata (.xtekct) files for reconstructing the specimens Fukangichthys IVPP V4096.6 and Fukangichthys IVPP V4096.13; a reconstructed Mimics file (.mcs file) for Fukangichthys IVPP V4096.6 and 3D surface files (.ply) for each specimen.

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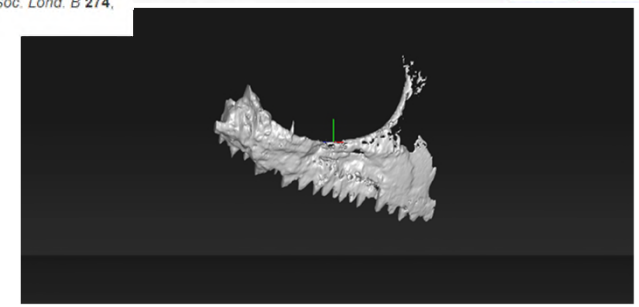

# Guidance in data repositories, policies and sharing

## Free Research Data Helpdesk

Queries are answered within two business days

Run by members of the Springer Nature Data Publishing team

Expertise in data curation and management, archiving and digital preservation, copyright and licensing, Open Access publishing

Always encourage best practices, e.g. the use of community repositories for specific data types

## Recommended Repositories

### Earth, Environmental and Space sciences

- Broad scope Earth & environmental sciences
  - NERC Data Centres
  - NASA Goddard Earth Sciences Data and Information Services Center
  - PANGAEA
- Astronomy & planetary sciences
- Biogeochemistry and Geochemistry
- Climate sciences

A FAIR-led data approach from publishers can help researchers in the Earth and environmental sciences to capitalise on new expectations around data sharing.

Reframing data as a first class research output, equal in stature to research articles, presents researchers with opportunities in generating credit, driving further research and addressing wider social and economic challenges.

References

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3. Colavizza G, Hrynaszkiewicz I, Staden I, Whitaker K, McGillivray B (2020) The citation advantage of linking publications to research data. PLoS ONE 15(4): e0230416. https://doi.org/10.1371/journal.pone.0230416
4. Lucraft, Mithu; Baynes, Grace; Allin, Katie; Hrynaszkiewicz, Iain; Khodiyar, Varsha (2019): Five Essential Factors for Data Sharing. figshare. Journal contribution. https://doi.org/10.6084/m9.figshare.7807949.v2
5. Cousijn, H., Kenall, A., Ganley, E. et al. A data citation roadmap for scientific publishers. Sci Data 5, 180259 (2018). https://doi.org/10.1038/sdata.2018.259
6. https://copdess.org/enabling-fair-data-project/commitment-statement-in-the-earth-space-and-environmental-sciences/

# Thank you

**Scientific Data: http://www.nature.com/sdata/**

**Research Data Support:**
**https://www.springernature.com/gp/authors/research-data/research-data-support**

**Recommended repositories:**
**http://www.springernature.com/gp/group/data-policy/repositories**

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The story behind the image

**Chien Shiung Wu (1912–1997)**

Chien Shiung Wu was a Chinese American experimental physicist best known for conducting The Wu experiment that bears her name. This experiment showed that the conservation of parity was violated by a weak interaction and it was possible to distinguish between a mirrored variation of the world and the mirror image of the current world. This discovery earned Wu the Wolf Prize in Physics in 1978.

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