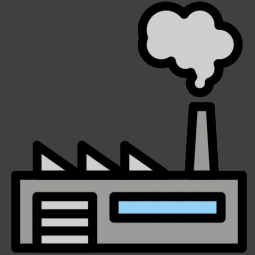


---

*The Turing Way:*  
**Environmental Sustainability  
Collaborators Group**





Inspire and join forces with  
open science communities to  
contextualise open research  
practices for environmental  
data scientists

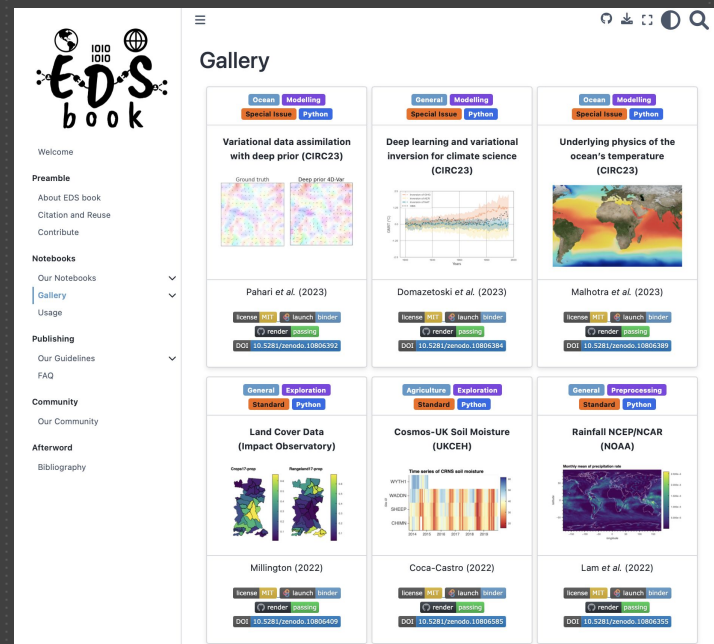
Collaborate with researchers,  
open movements and activists  
working on how minimising the  
environmental impacts of  
data science

Inspired by the Turing Way and validated in the Open Seeds Programme

*We **co-create** computational notebooks to showcase and support the publication of*

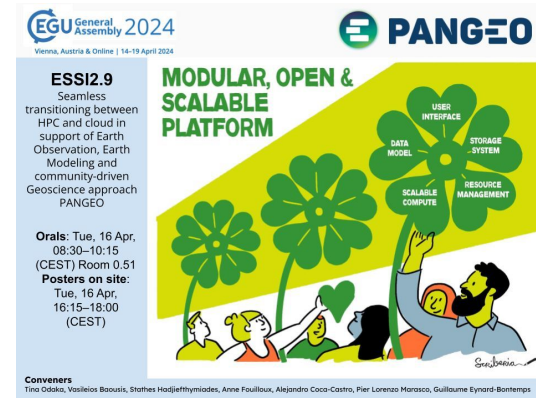
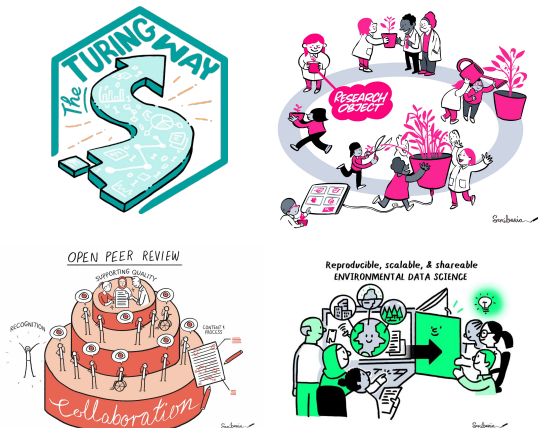
- *Data*
- *Research*
- *Open-source tools*

*for collaborative, reproducible and transparent* **Environmental Data Science**



'EDS book is funded by EPSRC funding for Turing's Environment and Sustainability Grand Challenge'

[www.edsbook.org](http://www.edsbook.org)



New subchapter  
“Research Objects in Action”

Scriberia illustrations

Joint community presence  
(Turing Environment &  
Sustainability GC, Fireside Chat)

24 participants (and 9 reviewers)  
from America, Europe and Asia

EDS book as the core platform  
to submit interactive  
reproduction reports

13 notebooks covering multiple  
topics using Pangeo stack

Sessions at EGU (2022-2024)  
Workshops in FOSS4G & BiDs23



# The Environmental Impact of Digital Research

Subchapter incepted after discussions in TTW issue (Nov 2022) and CW23, and follow-up a speed blog (Aug 2023)

TTW allowed a broader participation from the community via Book Dash (May 2023)

**SOFTWARE SUSTAINABILITY INSTITUTE**

About News, blogs and events Programmes Training Resources Search

Home | News and blogs hub | Tracking the environmental impact of research computing

Bookmark this page

**Tracking the environmental impact of research computing**

Posted by d.barclay on 15 August 2023 - 11:00am

By [James Byrne](#) | SSI fellow  
[James Baker](#) | SSI fellow  
[Sadie Bartholomew](#) | SSI fellow  
[Reina Camacho Toro](#) | SSI fellow  
[Yadira Sanchez](#) | SSI fellow  
[Loïc Lannelongue](#) | SSI fellow  
[Colin Sauze](#) | SSI fellow  
[Camila Rangel Smith](#)  
[Marion Weinzierl](#)  
[Lincoln Colling](#)

Posted on 15 August 2023

Estimated read time: 10 min

Sections in this article  
 Why should we care?

*This blog post is part of our Collaborations Workshop 2023 speed blog series.*

<https://www.software.ac.uk/blog/tracking-environmental-impact-research-computing>

**The TURING WAY**

Welcome

- Guide for Reproducible Research
- Guide for Project Design
- Guide for Communication
- Guide for Collaboration
- Guide for Ethical Research
- Introduction to Research Ethics
- Research Ethics Committees
- Workflows
- Ethical Decisions in Preclinical Research
- Law, Policy and Human Rights
- In Ethics
- Research Ethics for Social Data
- Data Feminism
- Activism for Researchers
- Unionisation
- Whistleblowing
- Cultural change
- The Environmental Impact of Digital Research

## The Environmental Impact of Digital Research

As multiple reports from the United Nations (such as IPCC | [Climate Change 2023: Synthesis Report](#) and WMO | [Global Annual to Decadal Climate Update](#)) have shown, the global climate crisis impacts all of us. From this, reducing carbon emissions has emerged as a means of addressing the climate crisis. For those of us that do computing as part of our day-to-day work, it can form a significant part of our environmental impact, both for us personally and for our organisation(s). In particular, if you or your group does intensive computing, making use of high-performance computers or cloud resources, for example to train intricate models or run complex simulations, the carbon footprint can be sizable.

For this reason, it is important to consider the environmental impact of the computational work you and your colleagues and collaborators do, including having awareness of the possible scale of it in relation to other activities you undertake as part of day-to-day life. With this awareness, it follows that we should all aim to reduce our carbon footprint for our work activities.

This guide helps data and computational scientists to better understand the environmental impacts of their work and projects, as well as providing suggestions for reducing the impact of it.

The topic is not new, it has for example been discussed during [CW23](#).

### Understanding the problem

Most of us are aware of the general context of our planet being subject to climate change that results largely from human influence, and how this poses a great threat to our society. However, in case you are not, and indeed to emphasise this crucial background, we'll summarise this background.

#### Climate change summarised

Human activities, notably the burning of fossil fuels like oil, gas or coal, to generate electricity and to power cars (amongst many other tasks) release greenhouse gases into the atmosphere. These gases, such as carbon dioxide, trap heat in the atmosphere, which in turn raises the temperature of the surface of the Earth.

<https://book.the-turing-way.org/ethical-research/activism/activism-env-impact>

@turingway, CC-BY 4.0, EDS book, DOI:10.5281/zenodo.11084013



# Fireside chat on sustainability and research


**Between computation, climate and culture: perspectives on sustainability and research**  
29 June, 14:00 - 15:30 UTC+1 – [Register on Eventbrite](#)



**Alejandro Coca-Castro**  
Founder  
Environmental Data Science Book



**Carlos Martinez-Ortiz**  
Community Manager  
Netherlands eScience Centre



**Shannon Dosemagen**  
Director  
Open Environmental Data Project



**Claire Buckley**  
Environmental Consultant  
Julie's Bicycle



**Anne Pasek**  
Convener & Co-Founder  
Low Carbon Research Methods



**Loïc Lannelongue**  
Research Associate  
University of Cambridge,  
Green Algorithms initiative



Co-hosted by **The Turing Way**,  
**Environmental Data Science book (EDS book)** and  
**Netherlands eScience Center**

The first tangible knowledge share event of the Turing Way E&S collaborators group

**#environmental-sustainability**  
channel in the Turing Way  
slack workspace



# Resources

#environmental-sustainability



## Fireside Chat

Between computation,  
climate and culture:  
perspectives on  
sustainability and  
research

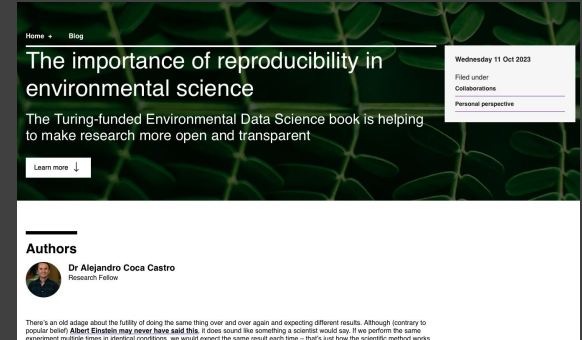
<https://youtu.be/vrkFFswPGOE>



## Sub-chapter

The Environmental  
Impact of Digital  
Research

<https://book.the-turing-way.org/ethical-research/activism/activism-env-impact/> sub-chapter



## Blog post

The importance of reproducibility  
in environmental science

<https://www.turing.ac.uk/blog/importance-reproducibility-environmental-science>