

Practicing what we preach: Our journey toward open science

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Today CWTS published its [open science policy](#) on its website. This policy, which formally came into effect on September 1 this year, is the outcome of a co-creation process in which many CWTS colleagues participated in a period of one and a half years. In this blog post, we discuss the *why*, the *how*, and the *what* of the CWTS open science policy.

Why did we develop an open science policy?

Over the past decade, CWTS has been involved in a large number of activities in the area of open science, ranging from monitoring of open access publishing and studying of open data practices to the development of open infrastructures and contributions to policy making around open science. However, while open science had become an increasingly important object of study in our work, many of our own research practices were still fairly traditional and not necessarily in line with an open science way of working. This led to a recognition that we needed to reflect more actively on our own research practices: Did we actually practice what we were preaching? And how could we do better? In late 2018, this process resulted in the decision to develop a CWTS open science policy.\

How did we develop our open science policy?

We started by inviting all CWTS colleagues to participate in meetings in which the basics of open science were discussed and in which colleagues were asked to choose the aspects of open science they considered to be most important for CWTS. Four topics were chosen: open access publishing, open research data, open source software, and the relationship between open science and the work of [CWTS BV](#). A number of colleagues then volunteered to prepare a policy around these four aspects of open science. All CWTS colleagues were given the opportunity to provide feedback on the proposed policy.\

The open science policy was formally approved by the CWTS board in June 2020. We then went through a one-year transition period (September 2020-August 2021) in which everyone at CWTS had the opportunity to familiarize themselves with the policy and to start implementing the policy in their work. Several meetings were organized during this transition period to support colleagues in the implementation of the policy. In September 2021, the policy formally entered into force. All research at CWTS is now expected to be carried out in accordance with our open science policy.\

What does our open science policy say?\

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Guiding principles* As a starting point for the CWTS open science policy, we formulated five principles that provide general guidance for the CWTS approach to open science:

1. As open as possible, as closed as necessary
2. Openness is not always easy.

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3. Openness takes time.
4. Openness is a joint responsibility.
5. Openness should not become a straitjacket.\

The first principle recognizes that openness is not always possible or desirable and that there may be good reasons to keep something closed. We will get back to this below in the discussion of open data. The second principle acknowledges that openness may come at a cost, for instance in terms of additional efforts that need to be made. The third principle emphasizes that becoming more open requires a culture change that takes time and will not happen overnight. The fourth principle makes clear that openness needs to be done together. No one can be expected to carry this responsibility on their own. Supervisors for instance have a responsibility to support their PhD candidates in adopting open science practices. Finally, the fifth principle recognizes that openness may sometimes need to be balanced against other important values, which in some cases may justify making exceptions to the open science policy.\

Open access Our open science policy requires all journal articles published by CWTS researchers to be made openly accessible, either in a journal (gold or hybrid open access) or in a repository (green open access). Also, when an article is submitted to a journal, posting the article on a preprint server (e.g., [arXiv](#) or [SocArXiv](#)) is strongly encouraged. Our open science policy encourages publishing in journals that are owned by the scholarly community and that adopt responsible publishing practices, for instance journals that support openness of metadata by participating in initiatives such as [I4OC](#) and [I4OA](#). To support publishing in gold open access journals, CWTS pays article processing charges (APCs) of at most EUR 1200 from its basic funding. For APCs paid from grant funding there is no maximum. The open science policy also encourages open access publishing of conference papers, book chapters, and books, but the policy currently does not mandate this.\

To help CWTS colleagues make their research openly accessible, a toolbox has been created that provides information on the journals most frequently used by CWTS researchers. The toolbox for instance offers information on licenses under which research can be made openly accessible, APCs for open access publishing, and [transformative agreements](#) between the Dutch universities and publishers that may cover the cost of open access publishing.\

Open data Regarding openness of research data, our open science policy states that data should be as open as possible and as closed as necessary. By default, data should be made openly available, but there can be several reasons to keep data closed. For instance, in ethnographic research, data may be co-owned by research participants that do not want the data to be opened. In scientometric research, data may be owned by companies that do not allow the data to be opened.\

CWTS also follows the [data management regulations of Leiden University](#). These regulations specify how data should be managed before, during, and after a research project. Unlike our open science policy, the data management regulations do not indicate whether data should be

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open or closed. Regardless of whether data is open or closed, our open science policy encourages compliance of the data with the [FAIR \(i.e., findable, accessible, interoperable, and reusable\) principles](#).\

Open source Our open science policy distinguishes between two types of software, referred to as type 1 and type 2 software. Type 1 software represents a significant scientific advancement, while type 2 software is instrumental to scientific research but does not itself represent a significant scientific advancement. For Type 1 software, our open science policy requires the source code to be made open. The [open source license](#) (e.g., MIT, GPL, LGPL) can be chosen on a case-by-case basis. Examples of type 1 software developed at CWTS are the [Leiden algorithm](#) for network clustering and the recently released [VOSviewer Online tool](#) for interactive network visualization. Another example is the [igraph package](#) for network analysis, for which [CWTS is one of the contributors](#). An example of type 2 software is the software developed by CWTS for parsing data delivered to our center by data providers such as Clarivate (Web of Science), Digital Science (Dimensions), and Elsevier (Scopus). According to our open science policy, the source code of type 2 software may or may not be made open, depending on what seems best for the sustainability of the software.\

CWTS BV Open science also aims to make research results more accessible for societal stakeholders and to involve these stakeholders in research projects. For CWTS this aspect of open science is for instance reflected in the contributions we make to Horizon projects funded by the European Union and to projects of the [Research on Research Institute \(RoRI\)](#). In addition, [CWTS BV](#), a business unit affiliated with our center, also plays an important role.\

CWTS BV provides services to clients based partly on insights resulting from the research of CWTS. The other way around, projects carried out by CWTS BV also offer important input for the research agenda of CWTS. As an independent legal entity, CWTS BV is not subject to the CWTS open science policy. While openness and transparency are important values in the work of CWTS BV, the confidentiality requested by many clients of CWTS BV often limits the level of openness that can be achieved. For instance, to guarantee confidentiality, many reports of CWTS BV cannot be made openly accessible.\

Next steps

In the coming years, we expect further updates to be made to the CWTS open science policy, partly based on practical experiences in the implementation of the policy and partly based on developments in the broader open science landscape and in the ambitions we have at CWTS to make our research more open. In fact, some CWTS colleagues are already adopting open science practices that go beyond the current requirements of the CWTS open science policy. For instance, some colleagues are systematically posting all their research on preprint servers and some have started to experiment with more open forms of peer review (e.g., online posting of review reports).\

In parallel with these developments, CWTS is also actively exploring the use of open infrastructures for research information. In line with our efforts to promote [openness of](#)

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[bibliographic metadata](#) and of [research information more generally](#), we are for instance working on the institute-wide adoption of [ORCID profiles](#) to keep track of our activities and outputs. Likewise, in our scientometric work, we are making significant efforts to reduce our dependence on proprietary data sources and to optimally benefit from the opportunities offered by open data sources.\

Several CWTS colleagues have also expressed a desire for more formal ways of recognizing the efforts everyone at CWTS is making to adopt open science practices. This issue is currently being addressed as part of an ongoing project aimed at revising the approach we take at CWTS to [recognition and rewards](#).\

We realize that our journey toward more open ways of working has just begun. We look forward to the next steps!

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