

Policy Framework and Roadmap for Open Access, Open Research Data and Open Science

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Abstract. Overview of the growth of policies and a critical appraisal of the issues affecting open access, open data and open science policies. Example policies and a roadmap for open access, open research data and open science are included.

“Putting research results in the public sphere makes science better and strengthens our knowledge-based economy. The European taxpayer should not have to pay twice for publicly funded research. That is why we have made open access to publications the default setting for Horizon 2020, the EU research & innovation funding programme.” (Máire Geoghegan-Quinn, European Commissioner for Research, Innovation & Science)

A study funded by the European Commission (EC) suggests that open access is reaching the tipping point, with around 50% of scientific papers published in 2011 now available for free: “The tipping point for open access (more than 50% of the papers available for free) has been reached in several countries, including Brazil, Croatia, Estonia, Lithuania, Macedonia, Switzerland, the Netherlands, the US, as well as in biomedical research, biology, and mathematics and statistics.”¹

This study has also examined open access policies at funding agencies and concluded that the majority of 48 major science funders considered both open access publications in journals and self-archiving in open access repositories. And more than 75% accepted embargo periods of between six to 12 months.²

ROARMAP: Registry of Open Access Repositories Mandatory Archiving Policies³ lists 220 institutional open access mandates, 44 sub-institutional open access mandates, nine multi-institutional open access mandates, 90 funder open access mandates and 115 open access thesis mandates.

¹ Eric Archambault, Didier Amyot, Philippe Deschamps, Aurore Nicol, Lise Rebout & Guillaume Roberge: Proportion of Open Access Peer-Reviewed Papers at the European and World Levels—2004-2011 (August 2013) - http://www.science-metrix.com/pdf/SM_EC_OA_Availability_2004-2011.pdf

² Ibid

³ <http://roarmap.eprints.org/>

Open access policies in Europe

Open access policy alignment is still one of the challenges in Europe and globally and EIFL is one of the project partners in “PASTEUR4OA – Open Access Policy Alignment STRategies for European Union Research”⁴ – a 30 months project that supports the aim of encouraging the development of matching policies on open access and open data in the European Union according to the EC’s Recommendation on “Access to and preservation of scientific information” (July 2012) and in view of maximizing alignment with the Horizon 2020 policy on access to the research funded by the EC.

The project started in February 2014 and EIFL coordinates the Eastern European network of Key Node organizations in Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia and Slovenia. The project will help develop and/or reinforce open access strategies and policies at the national level and facilitate their coordination among all Member States. This network (together with other networks in Northern, Southern and Western Europe) will build a network of centres of expertise in Member States that will develop a coordinated and collaborative programme of activities in support of policymaking at the national level under the direction of project partners. Bulgarian Key Node organization is Bulgarian Academy of Sciences.

Another related project is “FOSTER – Facilitate Open Science Training for European Research”⁵ – the 24 months project that

- Supports different stakeholders, especially young researchers, in adopting open access in the context of the European Research Area (ERA) and in complying with the open access policies and rules of participation set out for Horizon 2020;
- Integrates open access principles and practice in the current research workflow by targeting the young researcher training environment;
- Strengthens the institutional training capacity to foster compliance with the open access policies of the ERA and Horizon 2020 (beyond the FOSTER project); and
- Facilitates the adoption, reinforcement and implementation of open access policies from other European funders, in line with the EC’s recommendation, in partnership with PASTEUR4OA project.

FOSTER identifies content that can be reused in the context of the training activities on open access and open data, enhances/repackages/reformats it to be used on the portal to support e-learning, blended learning and self-learning.

The project started in February 2014 and EIFL leads the Training work-package. In February we've announced an open call for ERA countries to host FOSTER training events on open access, open data and open science from June to December 2014. The aim of the call was to support different stakeholders, especially young researchers, in practising open access, open data sharing and open science. 45 training proposals have been submitted from 19 countries. The Project Steering Committee has selected 19 projects from 14 countries (Belgium, Bulgaria, Croatia, Denmark, France, Germa-

⁴ <http://pasteur4oa.eu/>

⁵ <http://www.fosteropenscience.eu/>

ny, Greece, Hungary, the Netherlands, Poland, Portugal, Slovenia, Spain and the UK) for FOSTER co-funding for the events. We hope that with community support we will organize both engaging and instructive events that reach out to diverse disciplinary communities and countries in the European Research Area. Over 70 events will take place between June and December 2014. And this event is one of them.

Open access policies in China and Latin America

The Chinese Academy of Sciences (CAS) and the National Natural Science Foundation of China (NSFC) have both issued new open access policies which will contribute to making research more available. The announcement on the Policies on Open Access to Research Articles from Publicly Funded Research, was made on May 15, during a briefing on the coming Annual Meeting of the Global Research Council to be held in May 26-28, 2014, in Beijing, China.

CAS⁶ will require its researchers and graduate students to deposit the final, peer-reviewed manuscripts of their research articles resulted from any public funding, submitted and consequently published since the issuing of the policy, into the open access repositories of their respective institutes, to be made open access within 12-months of their official publication.

CAS will also encourage researchers to deposit previously published articles into their respective institutional repositories as well. CAS will also support researchers to publish in open access journals with good quality control and affordable APC.

NSFC will require the researchers funded by it to deposit the final, peer-reviewed manuscripts of research articles resulted from its funding, submitted and consequently published since the issuing of the policy, into the NSFC open access repository, to be made open access within 12 months of their official publication in academic journals.

Open access policy discussions were a focus of the EIFL-funded open access advocacy project implemented by the CAS National Science Library in 2013. The project contributed to developing and sharing of good practices of open access in China, including open institutional repository development and services, open access policies implementation, and open access publishing support. EIFL is very pleased with these latest developments, as the original goal of the project was to push forward a national open access agenda and to make a bridge for the international collaboration and communication.

Governments of Argentina, Mexico and Peru have introduced national open access mandates and open access is now required by law in these countries. For more details read a COAR (Confederation of Open Access Repositories) interview: Argentinian Senate passes law requiring Open Access – Interview with Dr. Alejandro Ceccatto, Secretariat of Scientific and Technological Articulation from the Argentinian Ministry of Science, Technology and Innovation (MINCYT)⁷.

⁶ See the Chinese and English versions of the CAS Open Access Policy

⁷ <https://www.coar-repositories.org/news-media/argentinian-senate-passes-law-requiring-open-access/>

Ten years on from the Budapest Open Access Initiative: setting the default to open. Recommendations for the next 10 years

In 2002 the Budapest Open Access Initiative launched a worldwide campaign for open access to all new peer-reviewed research. It didn't invent the idea of open access. On the contrary, it deliberately drew together existing projects to explore how they might "work together to achieve broader, deeper, and faster success." But the BOAI was the first initiative to use the term "open access" for this purpose, the first to articulate a public definition, the first to propose complementary strategies for realizing open access, the first to generalize the call for open access to all disciplines and countries, and the first to be accompanied by significant funding.

In 2012 EIFL attended a meeting to mark the 10th anniversary of the declaration and to discuss what we have learnt over the past ten years and how we can navigate the next ten. Below are some recommendations from BOAI10: Recommendations for the next 10 years that came as a result of this meeting.

"Today we're no longer at the beginning of this worldwide campaign, and not yet at the end. We're solidly in the middle, and draw upon a decade of experience in order to make new recommendations for the next ten years.

We reaffirm the BOAI "statement of principle,...statement of strategy, and... statement of commitment." We reaffirm the aspiration to achieve this "unprecedented public good" and to "accelerate research, enrich education, share the learning of the rich with the poor and the poor with the rich, make this literature as useful as it can be, and lay the foundation for uniting humanity in a common intellectual conversation and quest for knowledge."

We reaffirm our confidence that "the goal is attainable and not merely preferable or utopian." Nothing from the last ten years has made the goal less attainable. On the contrary, open access is well-established and growing in every field. We have more than a decade's worth of practical wisdom on how to implement open access. The technical, economic, and legal feasibility of open access are well-tested and well-documented...

Finally, nothing from the last ten years suggests that the goal is less valuable or worth attaining. On the contrary, the imperative to make knowledge available to everyone who can make use of it, apply it, or build on it is more pressing than ever.

We reaffirm the two primary strategies put forward in the BOAI: open access through repositories (also called "green open access") and open access through journals (also called "gold open access"). Ten years of experience lead us to reaffirm that green and gold open access "are not only direct and effective means to this end, they are within the reach of scholars themselves, immediately, and need not wait on changes brought about by markets or legislation."

Ten years of experience lead us to reaffirm the definition of open access introduced in the original BOAI:

By "open access" to [peer-reviewed research literature], we mean its free availability on the public internet, permitting any users to read, download, copy, distribute, print, search, or link to the full texts of these articles, crawl them for indexing, pass them as data to software, or use them for any other lawful purpose, without financial, legal, or technical barriers other than those inseparable from gaining access to the

internet itself. The only constraint on reproduction and distribution, and the only role for copyright in this domain, should be to give authors control over the integrity of their work and the right to be properly acknowledged and cited.

The problems that previously held up the adoption and implementation of open access are solved, and the solutions are spreading. But until open access spreads further, the problems for which open access is a solution will remain largely unsolved. In this statement, we reaffirm the ends and means of the original BOAI, and recommit ourselves to make progress. But in addition, we specifically set the new goal that within the next ten years, open access will become the default method for distributing new peer-reviewed research in every field and country.

1. On policy

1.1. Every institution of higher education should have a policy assuring that peer-reviewed versions of all future scholarly articles by faculty members are deposited in the institution's designated repository. (See recommendation 3.1 on institutional repositories.)

Deposits should be made as early as possible, ideally at the time of acceptance, and no later than the date of formal publication.

University policies should respect faculty freedom to submit new work to the journals of their choice.

University policies should encourage but not require publication in open access journals, and should help faculty understand the difference between depositing in an open access repository and publishing in an open access journal.

When possible, university policies should be adopted by faculty vote, should require immediate open access, and should welcome repository deposits even when not required (e.g. datasets, conference presentations, books or book chapters, work published before the policy's adoption, and so on).

When publishers will not allow open access on the university's preferred terms, we recommend either of two courses. The policy may require dark or non- open access deposit in the institutional repository until permission for open access can be obtained. Or the policy may grant the institution a nonexclusive right to make future faculty research articles open access through the institutional repository (with or without the option for faculty to waive this grant of rights for any given publication).

1.2. Every institution of higher education offering advanced degrees should have a policy assuring that future theses and dissertations are deposited upon acceptance in the institution's OA open access repository. At the request of students who want to publish their work, or seek a patent on a patentable discovery, policies should grant reasonable delays rather than permanent exemptions.

1.3. Every research funding agency, public or private, should have a policy assuring that peer-reviewed versions of all future scholarly articles reporting funded research are deposited in a suitable repository and made open access as soon as practicable.

Deposits should be made as early as possible, ideally at the time of acceptance, and no later than the date of formal publication.

When publishers will not allow open access on the funder's terms, funder policies should require grantees to seek another publisher.

If funder policies allow embargoes before new work becomes open access, the embargoes should not exceed six months. Policies should allow no embargoes at all for uncopyrightable work.

Funders should treat publication costs as research costs, and should help grantees pay reasonable publication fees at fee-based OA open access journals.

When possible, funder policies should require libre OA open access, preferably under a CC-BY license or equivalent.

A repository is suitable for this purpose when it provides open access, supports interoperability with other repositories, and take steps toward long-term preservation. The funder's choice should be determined by ongoing research into questions such as which choice best fosters the deposit of covered articles, the utility of deposits, the convenience of funders and authors, and incentives for the further growth of open access.

1.4. All university and funder open access policies should require deposit in a suitable open access repository between the date of acceptance and the date of publication. The metadata should be deposited as soon as it is available and should be OA from the moment of deposit. The full-text should be made open access as soon as the repository has permission to make it open access.

1.5. We discourage the use of journal impact factors as surrogates for the quality of journals, articles, or authors. We encourage the development of alternative metrics for impact and quality which are less simplistic, more reliable, and entirely open for use and reuse.

Insofar as universities, funding agencies, and research assessment programs need to measure the impact of individual articles, they should use article-level metrics, not journal-level metrics.

We encourage research on the accuracy of the new metrics. As the research shows them to be useful and trustworthy, we encourage their use by universities (when evaluating faculty for promotion and tenure), funding agencies (when evaluating applicants for funding), research assessment programs (when assessing research impact), and publishers (when promoting their publications).

We encourage the development of materials to explain how journal impact factors have been misused, and how alternative metrics can better serve the purposes for which most institutions have previously used impact factors.

As impact metrics improve, we encourage further study into the question whether open access and open access policies increase research impact.

1.6. Universities with institutional repositories should require deposit in the repository for all research articles to be considered for promotion, tenure, or other forms of internal assessment and review.

Similarly, governments performing research assessment should require deposit in OA open access repositories for all research articles to be reviewed for national assessment purposes.

Neither policy should be construed to limit the review of other sorts of evidence, or to alter the standards of review.

1.7. Publishers who do not provide open access should at least permit it through their formal publishing agreements.

Publishers should refrain from lobbying against governments acting in the public interest, and refrain from lobbying against research institutions acting in the interests of researchers and research. Publishers should disavow lobbying campaigns carried out in their name by their professional or trade associations against the public interest and the interests of researchers and research.

The minority of subscription-based publishers who do not yet allow author-initiated green open access, without payment or embargo, should adopt the majority position.

We remind researchers that they need not work as authors, editors, or referees for publishers who act against their interests.

2. On licensing and reuse

2.1. We recommend CC-BY or an equivalent license as the optimal license for the publication, distribution, use, and reuse of scholarly work.

Open access repositories typically depend on permissions from others, such as authors or publishers, and are rarely in a position to require open licenses. However, policy makers in a position to direct deposits into repositories should require open licenses, preferably CC-BY, when they can.

Open access journals are always in a position to require open licenses, yet most of them do not yet take advantage of the opportunity. We recommend CC-BY for all open access journals.

In developing strategy and setting priorities, we recognize that gratis access is better than priced access, libre access is better than gratis access, and libre under CC-BY or the equivalent is better than libre under more restrictive open licenses. We should achieve what we can when we can. We should not delay achieving gratis in order to achieve libre, and we should not stop with gratis when we can achieve libre.

3. On infrastructure and sustainability

3.1. Every institution of higher education should have an open access repository, participate in a consortium with a consortial open access repository, or arrange to outsource open access repository services.

3.2. Every publishing scholar in every field and country, including those not affiliated with institutions of higher education, should have deposit rights in an open access repository.

This will require more institutional repositories or more disciplinary repositories, or both. It may also require, at least in the short term, more universal repositories or repositories of last resort for scholars who don't have an open access repository in their institution or field. The interface text in these universal repositories should be available in several languages.

3.3. Open access repositories should acquire the means to harvest from and re-deposit to other open access repositories.

Researchers who have reason to deposit into more than one repository should only have to deposit once. When possible, institutional repositories should offer to re-

deposit articles in disciplinary repositories requested by authors (e.g. arXiv, PubMed Central, SSRN), and should harvest or download copies of faculty publications deposited in disciplinary repositories.

3.4. Open access repositories should make download, usage, and citation data available to their authors, and make these data available to the tools computing alternative impact metrics. Journal publishers should do the same, whether or not their journals are open access.

Repositories should share these data with one another in standard formats, making it possible (for example) for authors to learn the total downloads for an article on deposit in multiple repositories. No author and no repository should have interest in blocking re-deposit in an additional repository simply to preserve an accurate measure of traffic.

3.5. Universities and funding agencies should help authors pay reasonable publication fees at fee-based open access journals, and find comparable ways to support or subsidize no-fee open access journals.

In both cases, they should require libre open access under open licenses, preferably CC-BY licenses or the equivalent, as a condition of their financial support.

Supporting peer-reviewed open access journals in these ways should be a top priority for any money saved from the cancellation or conversion of subscription journals.

Supporting peer-reviewed open access journals can be particularly important for journals with a more limited audience, such as journals focusing on national law in smaller countries or journals published in a local language, and for journals where publication fees are inappropriate, such as review journals which solicit review articles from authors.

3.6. When subscription-based or non- open access journals permit any kind of self-archiving, or deposit into open access repositories, they should describe what they permit in precise human-readable and machine-readable terms, under an open standard. These descriptions should include at least the version that may be deposited, the timing of deposits, and the licenses that could be attached to deposited versions.

3.7. Open access repositories should provide tools, already available at no charge, to convert deposits made in PDF format into machine-readable formats such as XML.

3.8. Research institutions, including research funders, should support the development and maintenance of the tools, directories, and resources essential to the progress and sustainability of open access.

The list of essential tools will evolve over time, but includes open access repositories and journals, free and open-source repository software, free and open-source journal management software, tools for text- and data-mining, directories of open access journals and repositories, directories of university and funder policies, providers of open licenses, digital preservation services, current awareness services, services for cross-linking and persistent URLs, and search engines.

Research institutions should also support the establishment of worldwide, open standards for metadata and querying that publishers and repositories could implement to make open access research more discoverable, retrievable, and useful.

3.9. We should improve and apply the tools necessary to harvest the references or bibliographic citations from published literature. The facts about who cited whom are

in the public domain, and should be open access in standard formats for use, reuse, and analysis. This will assist researchers and research institutions in knowing what literature exists, even if they don't have access to it, and in the development of new metrics for access and impact.

We urge all publishers to cooperate with this effort.

We recommend the development of infrastructure where reference data may be deposited by publishers, authors, volunteers, third-party entrepreneurs, or software, and where the reference data may be hosted for open access distribution.

3.10. We should assist in the gathering, organizing, and disseminating of open access metadata in standard formats for all new and old publications, including non-open access publications.

3.11. Scholarly publishers need infrastructure for cross-linking and persistent URLs based on open standards, available at no charge, and supporting linking and attribution at arbitrary levels of granularity, such as paragraph-level, image-level, and assertion-level identification.

3.12. We encourage the further development of open standards for interoperability, and tools to implement those standards in open access journals and repositories.

3.13. We encourage experiments with different methods of post-publication review, and research into their effectiveness.

Open access through repositories, open access through journals, and open access through books are all compatible with every kind of traditional pre-publication peer review, and open access does not presuppose any particular form of peer review. We recommend experiments with post-publication peer review not because it will be superior, although it might, but because it would reduce delays before new work becomes open access and could reduce first-copy costs.

3.14. We encourage experiments with new forms of the scholarly research "article" and "book" in which texts are integrated in useful ways with underlying data, multimedia elements, executable code, related literature, and user commentary.

We encourage experiments to take better advantage of the digital medium, and digital networks, for the benefit of research.

We encourage experiments to take better advantage of the ways in which open access articles remove access barriers for machines, and not just for human readers.

We encourage the use of open standards and formats to foster these uses, and research on their effectiveness.

4. On advocacy and coordination

4.1. We should do more to make publishers, editors, referees and researchers aware of standards of professional conduct for open access publishing, for example on licensing, editorial process, soliciting submissions, disclosing ownership, and the handling of publication fees. Editors, referees and researchers should evaluate opportunities to engage with publishers and journals on the basis of these standards of professional conduct. Where publishers are not meeting these standards we should help them improve as a first step.

As one means for evaluating a new or unknown open access publisher or open access journal, we recommend that researchers consult the Open Access Scholarly Pub-

lishers Association (OASPA) and its code of conduct. Members of the association are screened according to this code. Complaints about OASPA-member publishers and suggestions for improving the code of conduct should be sent to OASPA.

We encourage all open access publishers and open access journals to apply best practices recommended by OASPA or to seek membership in the association, which would entail a review of their practices and an opportunity to amend these where necessary.

4.2. We should develop guidelines to universities and funding agencies considering open access policies, including recommended policy terms, best practices, and answers to frequently asked questions.

4.3. We encourage development of a consolidated resource where it is easy to follow the progress of open access through the most relevant numbers and graphics. Each bit of information should be updated regularly, and its provenance or method of computation clearly indicated.

4.4. The open access community should act in concert more often. Wherever possible, open access organizations and activists should look for ways to coordinate their activities and communications in order to make better use of their resources, minimize duplication of effort, strengthen the message, and demonstrate cohesion.

We should create better mechanisms for communicating and coordinating with one another.

We should reach out to our academic colleagues, to the academic press, and the mainstream non-academic press. The academic and non-academic media are better informed about open access, and more interested in it, than at any time in our history. This is an opportunity for helping to educate all stakeholder groups about open access and new proposals to advance it.

4.5. The worldwide campaign for open access to research articles should work more closely with the worldwide campaigns for open access to books, theses and dissertations, research data, government data, educational resources, and source code.

We should coordinate with kindred efforts less directly concerned with access to research, such as copyright reform, orphan works, digital preservation, digitizing print literature, evidence-based policy-making, the freedom of speech, and the evolution of libraries, publishing, peer review, and social media.

We should look for ways to amplify our separate voices when defending common principles.

4.6. We need to articulate more clearly, with more evidence, and to more stakeholder groups the following truths about open access:

Open access benefits research and researchers, and the lack of open access impedes them.

Open access for publicly-funded research benefits taxpayers and increases the return on their investment in research. It has economic benefits as well as academic or scholarly benefits.

Open access amplifies the social value of research, and open access policies amplify the social value of funding agencies and research institutions.

The costs of open access can be recovered without adding more money to the current system of scholarly communication.

Open access is consistent with copyright law everywhere in the world, and gives both authors and readers more rights than they have under conventional publishing agreements.

Open access is consistent with the highest standards of quality.”⁸

Statement on embargo periods

In May 2014 EIFL has joined other major international associations such as COAR (Confederation of Open Access Repositories, <https://www.coar-repositories.org/>), LIBER (Ligue des Bibliothèques Européennes de Recherche – Association of European Research Libraries, <http://libereurope.eu/>), National Science Library, Chinese Academy of Sciences, OpenAIRE (<http://english.las.cas.cn/>) and SPARC (<http://www.sparc.arl.org/>) calling for immediate open access to research articles ⁹. We consider the use of embargo periods as an acceptable transitional mechanism to help facilitate a wholesale shift towards open access. However, embargo periods dilute the benefits of open access policies and we believe that, if they are adopted, they should be no more than six months for the life and physical sciences, 12 months for social sciences and humanities. We further believe that mechanisms for reducing – or eliminating – embargo periods should be included in any open access policy. Any delay in the open availability of research articles curtails scientific progress and stifles innovation, and places unnecessary constraints in delivering the benefits of research back to the public.

Open research data policies

Below are three good practice open access policy examples from the UK.

Research Councils UK (RCUK) Common Principles on Data Policy

“Making research data available to users is a core part of the Research Councils’ remit and is undertaken in a variety of ways. We are committed to transparency and to a coherent approach across the research base. These RCUK common principles on data policy provide an overarching framework for individual Research Council policies on data policy.

Principles

Publicly funded research data are a public good, produced in the public interest, which should be made openly available with as few restrictions as possible in a timely and responsible manner that does not harm intellectual property.

Institutional and project specific data management policies and plans should be in accordance with relevant standards and community best practice. Data with acknowledged long-term value should be preserved and remain accessible and usable for future research.

⁸ <http://www.budapestopenaccessinitiative.org/boai-10-recommendations>

⁹ <https://www.coar-repositories.org/activities/advocacy-leadership/aligning-repository-networks-across-regions/statement-about-embargo-periods/>

To enable research data to be discoverable and effectively re-used by others, sufficient metadata should be recorded and made openly available to enable other researchers to understand the research and re-use potential of the data. Published results should always include information on how to access the supporting data.

RCUK recognises that there are legal, ethical and commercial constraints on release of research data. To ensure that the research process is not damaged by inappropriate release of data, research organisation policies and practices should ensure that these are considered at all stages in the research process.

To ensure that research teams get appropriate recognition for the effort involved in collecting and analysing data, those who undertake Research Council funded work may be entitled to a limited period of privileged use of the data they have collected to enable them to publish the results of their research. The length of this period varies by research discipline and, where appropriate, is discussed further in the published policies of individual Research Councils.

In order to recognise the intellectual contributions of researchers who generate, preserve and share key research datasets, all users of research data should acknowledge the sources of their data and abide by the terms and conditions under which they are accessed.

It is appropriate to use public funds to support the management and sharing of publicly-funded research data. To maximise the research benefit which can be gained from limited budgets, the mechanisms for these activities should be both efficient and cost-effective in the use of public funds.”¹⁰

University of Oxford Policy on the management of research data and records

1. The University of Oxford seeks to promote the highest standards in the management of research data and records (1) as fundamental to both high quality research (2) and academic integrity.

2. The University recognises that accurate and retrievable research data are an essential component of any research project and necessary to verify and defend, when required, the process and outcomes of research. Research data are valuable to researchers for the duration of their research, and may well have long-term value for research, teaching and for wider exploitation for the public good, by individuals, government, business and other organisations, as a project develops and after research results have been published.

3. The University acknowledges its obligations under research funders’ data-related policy statements (3) and codes of practice to ensure that sound systems are in place to promote best practice, including through clear policy, guidance, supervision, training and support.

4. Researchers (4), departments/faculties, divisions, central administrative units and service providers and, where appropriate, research sponsors and external collaborators, need to work in partnership to implement good practice and meet relevant legislative, research funder and regulatory requirements.

5. Research data and records should be:

¹⁰ <http://www.rcuk.ac.uk/research/datapolicy/>

- Accurate, complete, authentic and reliable;
- Identifiable, retrievable, and available when needed;
- Secure and safe;
- Kept in a manner that is compliant with legal obligations and, where applicable, the requirements of funding bodies and project-specific protocols approved under the University Policy on the Ethical Conduct of Research Involving Human Participants and Personal Data (5)
- Able to be made available to others in line with appropriate ethical, data sharing and open access principles.

6. Research data and records should be retained for as long as they are of continuing value to the researcher and the wider research community, and as long as specified by research funder, patent law, legislative and other regulatory requirements. The minimum retention period for research data and records is three (3) years after publication or public release of the work of the research. In many instances, researchers will resolve to retain research data and records for a longer period than the minimum requirement.

7. Where research is supported by a contract with or a grant to the University that includes specific provisions regarding ownership, retention of and access to data, the provisions of that agreement will take precedence.

8. If research data and records are to be deleted or destroyed, either because the agreed period of retention has expired or for legal or ethical reasons, this should be done so in accordance with all legal, ethical, research funder and collaborator requirements and with particular concern for confidentiality and security.

9. Researchers are responsible for:

- Managing research data and records in accordance with the principles and requirements in 5-8 above;
- Developing and documenting clear procedures for the collection, storage, use, reuse, access and retention or destruction of the research data and records associated with their research. This shall include, where appropriate, defining protocols and responsibilities in a joint or multi-institution collaborative research project. This information should be incorporated, where appropriate, in a research data management plan;
- Planning for the ongoing custodianship (at the University or using third-party services) of their data after the completion of the research or, in the event of their departure or retirement from the University, reaching agreement with the head of department/faculty (or his/her nominee) as to where such data will be located and how this will be stored;
- Ensuring that any requirements in relation to research data and records management placed on their research by funding bodies or regulatory agencies or under the terms of a research contract with the University are also met.

10. The University is responsible for:

- Providing access to services and facilities for the storage, backup, deposit and retention of research data and records that allow researchers to meet their requirements under this policy and those of the funders of their research;
- Providing researchers with access to training, support and advice in research data and records management;
- Providing the necessary resources to those operational units charged with the provision of these services, facilities and training.

The University's Research and Information Sub-Committee, a sub-committee of the University Research Committee, is responsible for guiding the development and updating of this policy.

1. Research data and records are defined as the recorded information (regardless of the form or the media in which they may exist) necessary to support or validate a research project's observations, findings or outputs.
2. Research is defined as per the Frascati manual, i.e. creative work undertaken on a systematic basis in order to increase the stock of knowledge, including knowledge of man, culture and society, and the use of this stock of knowledge to devise new applications.
3. An overview of the major research funders' data policies is available at <http://www.dcc.ac.uk/resources/policy-and-legal/overview-funders-data-policies>. See also the RCUK Common Principles on Data Policy (2011) at <http://www.rcuk.ac.uk/research/Pages/DataPolicy.aspx>
4. Researchers are defined as members of the University including staff and doctoral students, and those who are not members of the University but who are conducting research on University premises or using University facilities.
5. <http://www.admin.ox.ac.uk/curec/policystatement/>

Relationship with existing policies

This policy will operate in conjunction with other University policies such as:

- Academic Integrity in Research (<http://www.admin.ox.ac.uk/personnel/cops/researchintegrity/>)
- Policy on the ethical conduct of research involving human participants and personal data (<http://www.admin.ox.ac.uk/curec/policystatement/>)
- Intellectual property policy (http://www.admin.ox.ac.uk/statutes/790-121.shtml#_Toc28143157)
- Data protection policy (<http://www.admin.ox.ac.uk/dataprotection/policy/>)
- Freedom of Information (<http://www.admin.ox.ac.uk/foi/>)
- Information Security Policy (<http://www.it.ox.ac.uk/infosec/ispolicy/>)

The University of Edinburgh Research Data Management Policy

“This policy for managing research data was approved by the University Court on 16 May, 2011.

The University adopts the following policy on Research Data Management. It is acknowledged that this is an aspirational policy, and that implementation will take some years.

1. Research data will be managed to the highest standards throughout the research data lifecycle as part of the University's commitment to research excellence.
2. Responsibility for research data management through a sound research data management plan during any research project or programme lies primarily with Principal Investigators (Pis).
3. All new research proposals [from date of adoption] must include research data management plans or protocols that explicitly address data capture, management, integrity, confidentiality, retention, sharing and publication.
4. The University will provide training, support, advice and where appropriate guidelines and templates for the research data management and research data management plans.
5. The University will provide mechanisms and services for storage, backup, registration, deposit and retention of research data assets in support of current and future access, during and after completion of research projects.
6. Any data which is retained elsewhere, for example in an international data service or domain repository should be registered with the University.
7. Research data management plans must ensure that research data are available for access and re-use where appropriate and under appropriate safeguards.
8. The legitimate interests of the subjects of research data must be protected.
9. Research data of future historical interest, and all research data that represent records of the University, including data that substantiate research findings, will be offered and assessed for deposit and retention in an appropriate national or international data service or domain repository, or a University repository.
10. Exclusive rights to reuse or publish research data should not be handed over to commercial publishers or agents without retaining the rights to make the data openly available for re-use, unless this is a condition of funding.”¹¹

Open science policy

In 2014 the Finnish Ministry of Education and Culture established Open Science and Research Initiative to incorporate open science and research to the whole research process. This will help to improve the visibility and impact of science and research in the innovation system and society at large; and to foster the research system in Finland towards better competitiveness and higher quality, transparent, collaborative and inspirational research process. This national initiative promotes

open access publications, open research data, open research methods and tools, as well as new skills and support services in open science domain (read the policy document here).

¹¹ <http://www.ed.ac.uk/schools-departments/information-services/about/policies-and-regulations/research-data-policy>

Resources

Open access policies

- Open Access Policy Kit produced by RCAAP (Portugal Open Access Scientific Repository) (<http://projeto.rcaap.pt/index.php/lang-pt/consultar-recursos-de-depoio/remository?func=startdown&id=336>)
- Guide to good practices for university open-access policies by Stuart Shieber and Peter Suber, the Harvard Open Access Project (https://cyber.law.harvard.edu/hoap/Good_practices_for_university_open-access_policies)
- Policy Guidelines for the Development and Promotion of Open Access by Alma Swan, commissioned by UNESCO (<http://www.unesco.org/new/en/communication-and-information/resources/publications-and-communication-materials/publications/full-list/policy-guidelines-for-the-development-and-promotion-of-open-access/>)
- MedOANet Guidelines for Implementing open access policies for research performing and research funding organizations (<http://www.medoanet.eu/news/medoanet-guidelines-implementing-open-access-policies-available-7-languages>)
- Research Publishing Models: A Guide for University Managers (Swan et al.) (http://openuct.uct.ac.za/sites/default/files/media/SCAP_Brief_3_Swan_et_al_Publishing_Models.pdf)
- Guidelines on Open Access to Scientific Publications and Research Data in Horizon 2020 (http://ec.europa.eu/research/participants/data/ref/h2020/grants_manual/hi/oa_pilot/h2020-hi-oa-pilot-guide_en.pdf)
- SHERPA/Juliet: Research funders' Open Access policies (<http://www.sherpa.ac.uk/juliet/index.php?la=en&mode=simple>)
- ROARMAP: Registry of Open Access Repositories Mandatory Archiving Policies (<http://roarmap.eprints.org/>)
- Open Policy Network (<http://openpolicynetwork.org/>)

Open research data

- Digital Curation Centre – a centre of expertise on data curation. Plenty of Briefing papers/resources for data managers (<http://www.dcc.ac.uk/>).
- Implementing an Open Data Policy: A SPARC Primer for Research Funders (<http://www.sparc.arl.org/sites/default/files/sparc-open-data-primer-final.pdf>).
- LERU Roadmap for Research Data (http://www.leru.org/files/publications/AP14_LERU_Roadmap_for_Research_data_final.pdf).
- LIBER's E-Science working group: Ten recommendations for libraries to get started with research data management (2012) (<http://libereurope.eu/wp-content/uploads/The%20research%20data%20group%202012%20v7%20final.pdf>).

- LIBER Case Studies on Research Data Management (<http://libereurope.eu/committee/scholarly-research/research-data-management-case-studies/>).
- MANTRA - an online course designed for researchers or others planning to manage digital data as part of the research process (<http://datalib.edina.ac.uk/mantra/>).
- The Royal Society (2012) Science as an Open Enterprise – Summary Report (https://royalsociety.org/~media/Royal_Society_Content/policy/projects/sape/2012-06-20-SAOE-Summary.pdf); and Final Report (<https://royalsociety.org/policy/projects/science-public-enterprise/Report/>).
- Panton Principles for Open Data in Science (<http://pantonprinciples.org/>).
- Research data management - JISC Quick Guide (<http://www.jisc.ac.uk/guides/research-data-management>).
- Research data management guidance - a set of web pages written as guidance for university researchers on research data management & sharing, published as part of a re-launched University of Edinburgh Information Services website (<http://www.ed.ac.uk/schools-departments/information-services/research-support/data-management/data-management-home>).
- Zenodo - a new simple and innovative service that enables researchers, scientists, projects and institutions to share and showcase multidisciplinary research results (data and publications) that are not part of existing institutional or subject-based repositories (<https://zenodo.org/>).

EC Recommendations on Open Access to and Preservation of Scientific Information

In July 2012 the European Commission issued COMMISSION RECOMMENDATION of 17.7.2012 on access to and preservation of scientific information.¹²

Some major recommendations are listed below.

“Policies on open access to scientific research results should apply to all research that receives public funds. Such policies are expected to improve conditions for conducting research by reducing duplication of efforts and by minimising the time spent searching for information and accessing it. This will speed up scientific progress and make it easier to cooperate across and beyond the EU. Such policies will also respond to calls within the scientific community for greater access to scientific information.”

“Enabling societal actors to interact in the research cycle improves the quality, relevance, acceptability and sustainability of innovation outcomes by integrating society’s expectations, needs, interests and values. Open access is a key feature of Member

¹² http://ec.europa.eu/research/science-society/document_library/pdf_06/recommendation-access-and-preservation-scientific-information_en.pdf

States' policies for responsible research and innovation by making the results of research available to all and by facilitating societal engagement.”

“Businesses will also benefit from wider access to scientific research results. Small and medium-sized enterprises in particular will improve their capacity to innovate. Policies on access to scientific information should therefore also facilitate access to scientific information for private companies.”

“The Internet has fundamentally changed the world of science and research. For instance, research communities have been experimenting with new ways to register, certify, disseminate and preserve scientific publications. Research and funding policies need to adapt to this new environment. It should be recommended to Member States to adapt and develop their policies on open access to scientific publications.”

“Open access to scientific research data enhances data quality, reduces the need for duplication of research, speeds up scientific progress and helps to combat scientific fraud. In its final report ‘Riding the wave: How Europe can gain from the rising tide of scientific data’⁵ in October 2010, the High Level Expert Group on Scientific Data emphasised the critical importance of sharing and preserving reliable data produced during the scientific process. Policy action on access to data is therefore urgent and should be recommended to Member States.”

“Preservation of scientific research results is in the public interest. It has traditionally been under the responsibility of libraries, especially national legal deposit libraries. The volume of research results generated is growing tremendously. Mechanisms, infrastructures and software solutions should be in place to enable long-term preservation of research results in digital form. Sustainable funding for preservation is crucial as curation costs for digitised content are still relatively high. Given the importance of preservation for the future use of research results, the establishment or reinforcement of policies in this area should be recommended to Member States.”

“HEREBY RECOMMENDS THAT MEMBER STATES:

Open access to scientific publications

1. Define clear policies for the dissemination of and open access to scientific publications resulting from publicly funded research. These policies should provide for:

- concrete objectives and indicators to measure progress;
- implementation plans, including the allocation of responsibilities;
- associated financial planning.

Ensure that, as a result of these policies:

- there should be open access to publications resulting from publicly funded research as soon as possible, preferably immediately and in any case no later than six months after the date of publication, and twelve months for social sciences and humanities;
- licensing systems contribute to open access to scientific publications resulting from publicly-funded research in a balanced way, in accordance with and without pre-

dice to the applicable copyright legislation, and encourage researchers to retain their copyright while granting licences to publishers;

- the academic career system supports and rewards researchers who participate in a culture of sharing the results of their research, in particular by ensuring open access to their publications and by developing, encouraging and using new, alternative models of career assessment, metrics and indicators;
- transparency is improved, in particular by informing the public about agreements between public institutions or groups of public institutions and publishers for the supply of scientific information. This should include agreements covering the so-called ‘big deals’, i.e. bundles of print and electronic journal subscriptions offered at discounted price;
- small and medium-sized enterprises and unaffiliated researchers have the widest and cheapest possible access to scientific publications of the results of research that receives public funding.

2. Ensure that research funding institutions responsible for managing public research funding and academic institutions receiving public funding implement the policies by:

- defining institutional policies for the dissemination of and open access to scientific publications; establishing implementation plans at the level of those funding institutions;
- making the necessary funding available for dissemination (including open access), allowing for different channels, including digital e-infrastructures where appropriate, as well as new and experimental methods of scholarly communication;–
- adjusting the recruitment and career evaluation system for researchers and the evaluation system for awarding research grants to researchers so that those who participate in the culture of sharing results of their research are rewarded. Improved systems should take into account research results made available through open access and develop, encourage and use new, alternative models of career assessment, metrics and indicators;
- giving guidance to researchers on how to comply with open access policies, especially on managing their intellectual property rights to ensure open access to their publications;
- conducting joint negotiations with publishers to obtain the best possible terms for access to publications, including use and re-use;
- ensuring that results of research that receives public funding are easily identifiable by appropriate technical means, including through metadata attached to electronic versions of the research output.

Open access to research data

3. Define clear policies for the dissemination of and open access to research data resulting from publicly funded research. These policies should provide for:

- concrete objectives and indicators to measure progress;

- implementation plans, including the allocation of responsibilities (including appropriate licensing);
- associated financial planning.

Ensure that, as a result of these policies:

- research data that result from publicly funded research become publicly accessible, usable and re-usable through digital e-infrastructures. Concerns in particular in relation to privacy, trade secrets, national security, legitimate commercial interests and to intellectual property rights shall be duly taken into account. Any data, know-how and/or information whatever their form or nature which are held by private parties in a joint public/private partnership prior to the research action and have been identified as such shall not fall under such an obligation;
- datasets are made easily identifiable and can be linked to other datasets and publications through appropriate mechanisms, and additional information is provided to enable their proper evaluation and use;
- institutions responsible for managing public research funding and academic institutions that are publicly funded assist in implementing national policy by putting in place mechanisms enabling and rewarding the sharing of research data;
- advanced-degree programmes of new professional profiles in the area of data-handling technologies are promoted and/or implemented.

Preservation and re-use of scientific information

4. Reinforce the preservation of scientific information, by:

- defining and implementing policies, including an allocation of responsibilities for the preservation of scientific information, together with associated financial planning, in order to ensure curation and long-term preservation of research results (primary research data and all other results, including publications);–
- ensuring that an effective system of deposit for electronic scientific information is in place, covering born-digital publications and, where relevant, the related datasets;
- preserving the hardware and software needed to read the information in future, or by migrating the information to new software and hardware environments on a regular basis;
- fostering the conditions for stakeholders to offer value-added services based on the re-use of scientific information.”