Summary of rationales and key principles of some important international data policies

Initial draft/outline 30 March, 2020 / S.T.

<reviewer list has been moved to the bottom>

Initially requested input:
a) Add missing data policies and statements of significant importance
b) Highlight important rationales for polar data policies

Possible process towards polar data policies alignment («policy interoperability»):

1. *Identify important reference documents and policies, and current policy drivers*
2. *Identify important objectives*
   - and corresponding gaps in current policies
3. *Identify and formulate core principles*
   - *Legacy*
   - *New*
4. *Add further requirements - global, polar, community specific*

The Antarctic Treaty (treaty text, 1959)
Source: https://www.ats.aq/e/antarctictreaty.html

Motivation:
«... cooperation on the basis of freedom of scientific investigation in Antarctica as applied during the International Geophysical Year accords with the interests of science and the progress of all mankind...»
«In order to promote international cooperation in scientific investigation...»

Principle (Article III 1.c):
«Scientific observations and results from Antarctica shall be exchanged and made freely available.»

Antarctic Treaty Resolution 4 (1998)
Source: https://www.ats.aq/devAS/Meetings/Measure/258

Objective:
«Promote international co-operation in scientific investigation by exchanging, and making freely available, scientific observations and results from Antarctica»

Recommendation:
Establish NADCs; encourage scientists, through (...) development of policies and procedures, to provide in a timely manner appropriate information to their NADCs; give priority consideration as to how the requirement for freedom of access to scientific information is achieved.

SCAR Data Policy (2009/2011)

Source: SCAR Report 39
The SCAR Data Policy is largely modelled on the IPY Data Policy (see below).

Objective:
Fulfil the A.T. Article III 1.c; «maximize the benefit of data gathered under the auspices of SCAR Projects»; «provide a framework for (highly multidisciplinary and disparate) data to be handled in a consistent manner, and to strike a balance between the rights of investigators and the need for widespread access through the free and unrestricted sharing and exchange of both data and metadata»; compatibility with the data principles of ICSU, other relevant international agencies (WMO, IOC/IODE), and the Antarctic Treaty.

Core principles:
Data, including operational data, should be «made available fully, freely, openly, and on the shortest feasible timescale» (but allowing access limitations when legitimate reasons exist); descriptive metadata (AMD), long-term preservation, NADC establishment, data publication, data management planning, acknowledgment of data authors.

«Data management imperatives» (from the SCAR DIMS, SCAR Report No 34, p. 8):
Creation of a sustainable, network-based infrastructure that is capable of meeting the information management challenges that accompany the technological advances at the beginning of 21st Century; interoperable with other existing global infrastructures and initiatives.

IPY Data Policy
Source: http://ppsarctic.nina.no/files/ipy%20data%20policy.pdf

Motivation:
Support the overarching objectives of the IPY; «ensure that data usability is a primary objective for all IPY 2007-2008 scientific projects», «ensure the security, accessibility and free exchange of relevant data that both support current research and leave a lasting legacy.» (A Framework for the International Polar Year 2007-2008, ICSU 2004, p. 19).
Also:

- Link researchers across different fields to address questions and issues lying beyond the scope of individual disciplines
- Strengthen international coordination of research and enhance international collaboration and cooperation
- Leave a legacy of (...) individual data and data systems to support ongoing polar research and monitoring

Core principles:
As for SCAR, and: IPY knowledge and the observations upon which it is built must be effectively managed to ensure the greatest benefit in the future. IPY-generated data should be carefully and thoughtfully collected, used collaboratively, and adequately preserved.

Agreement on Enhancing International Arctic Scientific Cooperation (2017)
Source: https://oaarchive.arctic-council.org/handle/11374/1916

Purpose:
“Increase effectiveness and efficiency in the development of scientific knowledge about the Arctic.”

Principles:
1. Facilitate access to scientific information.
2. Support full and open access to scientific metadata; encourage open access to scientific data and data products and published results with minimum time delay, preferably online and free of charge or at no more than the cost of reproduction and delivery.
3. Adhere to commonly accepted standards, formats, protocols, and reporting.

IASC Data Statement (2013)
Source: https://iasc.info/images/data/IASC_data_statement.pdf

Like the SCAR Data Policy, the IASC Data Statement is largely modelled on the IPY Data Policy.

Objective:
Support the IASC mission, «IASC-endorsed scientific results shall be verifiable and reproducible»; provide a framework for data to be handled in a consistent manner, and to strike a balance between the rights of investigators, the rights of indigenous peoples, and the public; recognize the intellectual effort that goes into producing and maintaining good data.

Core principles:
Largely as for SCAR except requirements specific to Antarctica, plus «ethically open access». «Data shall be professionally preserved and readily accessible as described in data management plans»; fair attribution and use of data; data citation.

SOOS Data Policy (2015)
Source: http://soos.aq/index.php/data/data-policy
The SOOS Data Policy is derived from the SCAR Data Policy.

Motivation:
Make science better, preserve/increase value, respect intellectual property and acknowledge data authors, promote data management.

Core principles:
Largely as for SCAR, plus archival of data in their most granular, usable form.

OECD Principles and Guidelines for Access to Research Data from Public Funding (2006)
Source: http://www.oecd.org/science/inno/38500813.pdf

The OECD Principles and Guidelines were attached to an OECD Recommendation and endorsed by the OECD Council on 14 December 2006. As such they form a standard which the member countries are expected to implement; they are not legally binding but adopted when member governments are prepared to make a political commitment to their implementation ("soft law").

Motivation/objectives (p. 13):
Improve the efficiency and effectiveness of the global science system by promoting «data access and sharing among researchers, research institutions, and national research agencies, while at the same time, recognising and taking into account, the various national laws, research policies and organisational structures of member countries».

Specific objectives (p. 11):

- Promote a culture of openness and sharing of research data among public research communities
- Stimulate the exchange of good practices in data access and sharing;
- Raise awareness about costs and benefits of restrictions and limitations on access to and the sharing of research data from public funding;
- Highlight the need to consider data access and sharing regulations and practices in science policies and programmes;
- Provide a framework of operational principles for research data access arrangements
- Offer recommendations to member countries on how to improve the international research data sharing and distribution environment.

Reasons for improved accessibility (p. 10):

- Good stewardship of the public investment in factual information;
- Creation of strong value chains of innovation;
- Enhancement of value from international co-operation.
- Reinforce open scientific inquiry;
- Encourage diversity of analysis and opinion;
- Promote new research;
- Make possible the testing of new or alternative hypotheses and methods of analysis;
- Support studies on data collection methods and measurement;
- Facilitate the education of new researchers;
- Enable the exploration of topics not envisioned by the initial investigators;
- Permit the creation of new data sets when data from multiple sources are combined.

Core principles:
The OECD document lays out 13 principles: Openness, Flexibility, Transparency, Legal conformity, Protection of intellectual property, Formal responsibility, Professionalism, Interoperability, Quality, Security, Efficiency, Accountability, Sustainability. The leading principle is openness:

«Access on equal terms for the international research community at the lowest possible cost, preferably at no more than the marginal cost of dissemination. Open access to research data from public funding should be easy, timely, user-friendly and preferably Internet-based.»

FAIR principles (2016)
Source: https://www.go-fair.org, https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4792175/

Motivation:
«Facilitate knowledge discovery by assisting humans and machines in their discovery of, access to, integration and analysis of, task-appropriate scientific data and their associated algorithms and workflows»; specific emphasis on enhancing the ability of machines to automatically find and use the data. Based on data as «the key conduit leading to knowledge discovery and innovation, and to subsequent data and knowledge integration and reuse»; and ultimately «extracting maximum benefit from our research investments».

Core principles:
FAIR (Findable, Accessible, Interoperable, Reusable)

CARE principles (2018)

Source: https://www.gida-global.org/care

Motivation:
Connect open data and open science with Indigenous Peoples rights and interests; acknowledge power differentials and historical contexts; create value from Indigenous data in ways that are grounded in Indigenous worldviews and realise opportunities within the knowledge economy.

Core principles:
CARE (Collective benefit, Authority to control, Responsibility, Ethics)

ISC (ICSU) Assessment on Scientific Data and Information (2004)
Source:
https://council.science/wp-content/uploads/2017/05/PAA_Data_and_Information_report.pdf

Objectives:
Employ professional standards and practices in order to properly perform the production, management, and dissemination of scientific data and information, as these have become increasingly critical functions within the scientific research enterprise. Data must be preserved over long periods of time so that the scientific records and observations obtained today will be available for use in research in the future.

ICSU CODATA and GEO have also issued a comprehensive report on «The Value of Open Data Sharing» (2015), prepared for the GEO XII Plenary. See under GEO Data Management Principles below.

Core principles:
The 2004 report offers a comprehensive set of recommendations (56 in total). Among them are full and open access to scientific data (33), interoperability (32), long-term accessibility (38), sound management of IPR (39-40), ensuring data integrity (29-31), professional data and information management (16-21), use of metadata (22-25).

International Science Council CoData

Leads to “Current Best Practice for Research Data Management Policies“:
https://zenodo.org/record/27872#.XsiiVueLmHs

Beijing Declaration (Peter Pulsifer)

https://codata.org/events/science-and-policy-workshops/codata-and-codata-china-high-level-international-meeting-on-open-research-data-policy-and-practice/the-beijing-declaration-on-research-data/

https://zenodo.org/record/3552330#.XvtZxpNKhTY

Note: This appears to be one one of the few general, international statements that recognizes specific valid exceptions to open data #6.?

Immediate Objectives:
- Data management standards support data sharing
- Data sharing is recognized as a professional achievement
- Secondary data users respect the rights of producers and add value to the data they use

Long-term objectives:

- Well-documented data sets are available for secondary analysis
- Capacity to manage and analyse data is strengthened
- Published work and data are linked and archived
- Data sharing is sustainably resourced for the long term

Core principles:
Equitable, Ethical, Efficient

Discoverable, Accessible, Assessable, Intelligible, Reusable, Interoperable to specific quality standards.

ICSU (ISC), IAP, TWAS, ISSC: Open Data in a Big Data World. An international accord. (2015)
Source: Open Data in a Big Data World

"The accord proposes *12 principles* to guide the practice and practitioners of open data, focused on the roles played by scientists, publishers, libraries and other stakeholders, and on technical requirements for open data. It also assesses the "boundaries of openness"."

Motivation:
"'Big data' has emerged as a major opportunity for scientific discovery, while 'open data' will enhance the efficiency, productivity and creativity of the public research enterprise and counteract tendencies towards the privatisation of knowledge. In addition, concurrent open publication of the data underpinning scientific papers can provide the basis of scientific 'self correction'."
Maximising the benefits of big data "will depend on the extent to which there is open access to publicly-funded scientific data".
Other concerns mentioned: add to the stock of knowledge and understanding that are essential to human judgements, innovation and social and personal wellbeing; enhance scientific productivity and creativity, permit data and ideas to flow openly, rapidly and pervasively.

Core principles:
A set of 12 "principles" (of which most are multi-faceted) describing the roles of scientists, universities and research institutes, publishers, funders, libraries, and others, including:

- Make data openly available (scientists)
- Make data that provide evidence for published scientific claims concurrently and publicly available in an intelligently open form (scientists)
- Create a supportive environment for open data, provide incentives, technical support, and training (universities and research institutions)
- Require intelligently open access to the data concurrently with the publication which uses them, and require the full referencing and citation of these data (publishers)
- Regard the costs of open data processes as an intrinsic part of the cost of doing the research (funding agencies)
- Ensure that data are available to those who wish to use them and accessible over the long term (libraries, archives and repositories)
- Open data should be the default position for publicly funded science, with exceptions limited to issues of privacy, safety, security and to commercial use in the public interest
- (When reused) data should be cited with reference to their originator, to their provenance and to a permanent digital identifier
- Both data and metadata should be interoperable to the greatest degree possible

- If research data are not already in the public domain, they should be labelled as reusable by means of a rights waiver or non-restrictive licence that makes it clear that the data may be re-used with no more arduous requirement than that of acknowledging the producer.
- Open data should, as often as possible, be linked with other data based on their content and context in order to maximise their semantic value

UNESCO
Source: UNESCO Recommendation on Open Science,

Background:
In 2019, UNESCO started the development of an international standard-setting instrument on Open Science in the form of a Recommendation on Open Science. A complete draft is available as of May 2021 and expected to be adopted by the member states within the year. UNESCO Recommendations are legal instruments which set principles and norms, which the member states are invited to transpose into national laws and practices.

Motivation:
UNESCO's reasons for providing recommendations on open science are many-faceted and complex. At the core is the importance of science, technology and innovation to respond to the multitude of challenges facing humanity and the planet. UNESCO emphasises that more open, transparent, collaborative and inclusive scientific practices, coupled with more accessible and verifiable scientific knowledge are essential for improving the quality, reproducibility and impact of science and the reliability of the evidence needed for robust decision-making and policy and increased trust in science. The aim is to provide an international framework for open science policy and practice, defining shared values and principles for open science, and identifying concrete measures on open access and open data.

Core principles:
Considering science as a global public good, the UNESCO document provides a comprehensive set of specific recommendations on several aspects of open science. The most relevant of those relating to data management are listed here.

Open research data are defined as data that are available in a timely and user friendly, human- and machine-readable and actionable format, in accordance with principles of good data governance and stewardship, such as the FAIR principles, and supported by regular curation and maintenance.

Under "Definition of Open Science" the Recommendation states that data:
- Should be as open as possible
- Access restrictions are only justifiable on the basis of national security, confidentiality, privacy and respect for subjects of study, legal process and public order, the protection of intellectual property rights, personal information and the protection of human subjects, of sacred and secret indigenous knowledge, and of rare, threatened or endangered species.
- Repositories should adopt interoperable standards and best practices to ensure the content in repositories is discoverable and reusable by humans and machines.
- Building the links with Indigenous Knowledge Systems needs to be done in line with the 2007 United Nations Declaration on the Rights of Indigenous Peoples and the principles for Indigenous Data Governance, such as for example the CARE data principles.

A separate section on “Open Science Core Values and Guiding Principles” defines values and principles that should underpin all open science, including transparency, scrutiny, critique and falsifiability; collaboration, participation and inclusion;

Finally, under “Areas of Action”, the Recommendation encourages member states to endure that that scientific knowledge from publicly funded research, including scientific publications, open research data and open software, is openly licensed or dedicated to the public domain with minimal embargo. Member states are also encouraged to promote non-commercial open science infrastructures and ensure adequate investment in: inter alia:

- Federated and diversified information technology infrastructure, including high performance computing and data storage; internationally interconnected and as interoperable as possible, and following certain core specifications, such as for example the FAIR and CARE principles for data stewardship, and with due care given to persistent identifiers for digital objects, the necessary metadata for their efficient assessment, access, use and re-use, and proper stewardship of data by a trusted global network of data repositories;
- Agreements, concluded in the context of global research communities, which define community practices for data sharing, data formats, metadata standards, ontologies and terminologies, tools and infrastructure;
- Convergence between the various semantic artefacts, particularly vocabularies, taxonomies, ontologies and metadata schema;
- Technology tools that automate the process of searching and analysing linked publications and data;
- Incorporating a core set of data science and data stewardship skills into higher education research skills curriculum;
- Advanced and professional data stewardship to manage and curate data and ensure that the data are FAIR and looked after by trusted institutions or services;
- Evaluation and assessment systems that give value to all relevant research activities and scientific outputs including high quality FAIR data and metadata;
- Developing strategies that facilitate the deposit of data in archives in order to promote their curation and preservation and make them usable and reusable for the appropriate time period.

WDS Data Sharing Principles (2015)
Source: https://www.icsu-wds.org/services/data-sharing-principles

Objective:
Promote universal and equitable access to quality-assured scientific data, data services, products and information, with a view towards long-term data stewardship; foster compliance with agreed-upon data standards and conventions.

Core principles:

«Fully and openly shared», available with minimum time delay and free of charge, preserve authenticity, quality, and integrity of the data, data citation, acknowledgment of data repositories, label «sensitive» or «restricted» only with appropriate justification.

IODE Oceanographic Data Exchange Policy (1999/2003, revised 2019)
Source: https://www.iode.org/index.php?option=com_content&view=article&id=51&Itemid=95
IOC Oceanographic Data Exchange Policy

Motivation:
«The timely, free and unrestricted international exchange of oceanographic data is essential for the efficient acquisition, integration and use of ocean observations gathered by the countries of the world for a wide variety of purposes including the prediction of weather and climate, the operational forecasting of the marine environment, the preservation of life, the mitigation of human-induced changes on the marine and coastal environment, as well as for the advancement of scientific understanding that makes this possible.»

Core principles:
«Timely, free and unrestricted access to all data, associated metadata and products generated under the auspices of IOC programmes», right of Member States and data originators to determine the terms of such exchange, in a manner consistent with international conventions; use data centres linked to the WDS and IODE's NODCs as long-term repositories; non-discriminatory transfer of technology and knowledge.

WMO Resolution 40 (1995)
«WMO policy and practice for the exchange of meteorological and related data and products including guidelines on relationships in commercial meteorological activities»
Source: http://www.wmo.int/pages/prog/hwrp/documents/wmo_827_enCG-XII-Res40.pdf

Motivations (selected):
The fundamental importance, for the provision of meteorological services in all countries, of the exchange of meteorological data and products; the increasing requirement for the global exchange of all types of environmental data; the basic responsibility of Members and their NMSs to provide universal services in support of safety, security and economic benefits, and their dependence on the stable, cooperative international exchange of meteorological and related data and products for discharging their responsibilities.

Core principles:
«WMO commits itself to broadening and enhancing the free and unrestricted international exchange of meteorological and related data and products»

WMO Resolution 25 (1999)
Source: http://www.wmo.int/pages/prog/hwrp/documents/Resolution_25.pdf

Largely a confirmation and limited expansion of Resolution 40.

GEO, GEOSS data sharing principles and data management principles (2015)
Source:
https://www.earthobservations.org/documents/dswg/201504_data_management_principles_long_final.pdf

(Data sharing principles 2005-2015: https://www.earthobservations.org/open_eo_data.php)

Rationale, in general:
In their 2015 report on «The Value of Open Data Sharing» ICSU CODATA and GEO present a wide range of reasons for a transition from restricted to more open data policies for government data. The aim is to underpin GEO's vision of «a future wherein decisions and actions for the benefit of humankind are informed by coordinated, comprehensive and sustained Earth observations and information». The report highlights several major trends «that have made the open and unrestricted uses of public data available through the GEOSS portal essential», and then proceeds to explore in some detail a range of benefits under 5 headlines:

- Broad economic benefits
- Enhancing social welfare
- Growing research and innovation opportunities
- Facilitating education
- Effective governance and policy making

Rationale, data sharing principles (https://www.earthobservations.org/dswg.php):
«The societal benefits arising from Earth observations can only be fully achieved through the sharing of data, information, knowledge, products and services».
«...ensure that data and information of different origin and type are comparable and compatible, facilitating their integration into models and the development of applications to derive decision support tools».

Rationale, data management principles:
Further maximize the value and benefit from data sharing, ensure that data and information of different origin and type are comparable and compatible, facilitating their integration into models and the development of applications to derive decision support tools.

Core data sharing principles:
Data, metadata and products will be shared as Open Data by default, subject to the conditions of registration and attribution when the data are reused.
Where international instruments, national policies or legislation preclude the sharing of data as Open Data, data should be made available with minimal restrictions on use and at no more than the cost of reproduction and distribution.
All shared data, products and metadata will be made available with minimum time delay.

Core data management principles:
The data management principles build on the GEOSS data sharing principles, and details them in 10 individual principles under the headlines Discoverability, Accessibility, Usability, Preservation, and Curation. The data management principles are further explained in a 40 page «Data Management Principles Implementation Guidelines».

AGU Position Statement (in prep.)
Sources:
https://www.agu.org/Share-and-Advocate/Share/Policymakers/Position-Statements-Member-Review
https://www.agu.org/-/media/Files/AGU-Data-Position-Statement-Final-2015.pdf?la=en&hash=FCEA418C259E173ED61C850D80FDDB0F287244EC
https://www.agu.org/Share-and-Advocate/Share/Policymakers/Position-Statements/Position_Data

Rationale:
The AGU Position Statement on Data has been updated frequently. The following expressions of their rationale appear in the 2015 version:

«Earth and space sciences data are a world heritage. Properly documented, credited, and preserved, they will help future scientists understand the Earth, planetary, and heliophysics systems.» «Adherence to this policy will foster scientific advances, yield economic benefits, improve decision-making, enhance public safety and well-being, contribute to national and global security, and lead to a more informed public.» «Publicly funded data are a public good and should be publicly preserved and sustained over time. They should be made as open as ethically possible to maximize scientific, economic, and societal returns.»

Core principles:
Earth and Space Science Data Should Be Credited, Preserved, Open, and Accessible as an Integral Responsibility of Scientists, Data Stewards, and Sponsoring Institutions.
Data (...) must be discoverable, accessible, verifiable, trustworthy, and usable, and those responsible for their acquisition or creation should receive due credit for their contribution to scientific advancement. All players in the science ecosystem—researchers, repositories, publishers, funders, etc.—should work to ensure that relevant scientific evidence is processed, shared, and used ethically, and is available, preserved, documented, and fairly credited. Trustworthy, robust, verifiable, and open science is our responsibility and legacy for future generations.

International Federation of Data Organizations

http://www.ifdo.org/open-accessdata-policies/

Leads to OECD Principles and Guidelines: http://www.oecd.org/science/inno/38500813.pdf

Core principles:
Openness, Flexibility, Transparency, Legal conformity, Protection of intellectual property, Formal responsibility, Professionalism, Interoperability, Quality, Security, Efficiency, Accountability, Sustainability … (Equity?)

Research Data Alliance
https://www.rd-alliance.org/groups/data-policy-standardisation-and-implementation-ig

Leads to "Standardising and Harmonising Research Data Policy in Scholarly Publishing", describing four types of standard data policies for scientific journals. The document comes from an expert working group convened by Springer Nature to audit and identify common features of research data policies of the journals they publish.
Antarctic Data is 'Type 4' – Data sharing, evidence of data sharing and peer review of data required.

See also
https://figshare.com/articles/Developing_a_research_data_policy_framework_for_all_journals_and_publishers/8223365/1

European strategy for data

Source:
https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1593073685620&uri=CELEX%3A52020DC0066

In response to the transformative impact of digital technologies the European Union has developed a "European strategy for data", aiming to promote data-driven a data-driven economy and innovation for citizen benefit. Compliance with the EU's strict data protection rules is underlined. The strategy comprises several elements and measures to "facilitate data sharing across the EU and between sectors to create wealth for society, increase control and trust of both citizens and companies regarding their data"[1]. Two important elements of the strategy are a directive on open data and a new (proposed) Data Governance Act.

EU Open Data Directive

The EU Open Data Directive entered into force on 16 July 2019 and replaces the PSI Directive from 2003. As a directive it is a legal act of the European Union and legally binding to its member states. Article 10 of the Directive relates to research data:

Research data (Article 10)

1. Member States shall support the availability of research data by adopting national policies and relevant actions aiming at making publicly funded research data openly available ('open access policies'), following the principle of 'open by default' and compatible with the FAIR principles. In that context, concerns relating to intellectual property rights, personal data protection and confidentiality, security and legitimate commercial interests, shall be taken into account in accordance with the principle of 'as open as possible, as closed as necessary'. Those open access policies shall be addressed to research performing organisations and research funding organisations.

2. Without prejudice to point (c) of Article 1(2), research data shall be re-usable for commercial or non-commercial purposes in accordance with Chapters III and IV, insofar as they are publicly funded and researchers, research performing organisations or research funding organisations have already made them publicly available through an institutional or subject-based repository. In that context, legitimate commercial interests, knowledge transfer activities and pre-existing intellectual property rights shall be taken into account.

EU: Proposal for a Regulation on European data governance (Data Governance Act)

The proposed (2020) EU Data Governance Act is complementary to the Open Data Directive and concerns data held by public sector bodies that is subject to rights of others. The initiative intends to boost sharing of data generated by public bodies, businesses and citizens, while observing the legal framework for the protection of personal data. One of the stated purposes is to support scientific research.

UK Research and Innovation common principles on data policy (From Helen)

I have copied below the UK Research and Innovation common principles on data policy. These I think give some guidance to what aspects need to be covered in a data policy. The last one is key - there is little point in having a data policy if there are no funds to actually allow anyone to implement it.

- 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.
- 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.
- 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.

[1] European Commission press release 25 Nov 2020

- UKRI 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.

There are a number of declarations/accords on research data rights e.g. Sorbonne declaration (https://www.leru.org/files/Sorbonne-declaration.pdf), open data in a big data world (https://council.science/publications/open-data-in-a-big-data-world/) - is it useful to look at/reference any of these?

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Note: The above links to national and university level policies. During the 30 June session we discussed how we might best "push" international level statements/policies to more local scales where implementation may be more feasible (i.e. a university may have more authority over their staff than an international body).

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Questions

What is it that *we* want? (Objectives and principles)

Interoperable systems –

- Less duplication of effort
- Better synergies (The effect is greater than the sum of its parts)
- Highlighting gaps in knowledge
- Greater impact relative to investment
- Better visibility of information

Observations

Only some mention of reproducibility. In some places it is implied rather than explicit:

- IASC: "IASC-endorsed scientific results shall be verifiable and reproducible"
- OECD: Slight hint at reproducibility, "Make possible the testing of new or alternative hypotheses and methods of analysis", "accountability" and "transparency"
- FAIR: "task-appropriate scientific data and their associated algorithms and workflows"
- WDS: "preserve authenticity" - does this mean reproducibility?
- GEO: "data review and reprocessing", "data traceability"
- IFDO: "Accountability, Sustainability"

There are several descriptions of which data should be made available, which are not necessarily explicit to the user of the policy. *Should all metadata, raw and finalised data be made available? Only finalised, quality-checked data?*

- Antarctic Treaty: “Scientific observations and results”
- SCAR: “data and metadata”
- SOOS: “data in their most granular and usable form”
- IPY: “relevant data”
- OECD: “research data”
- FAIR: “task-appropriate scientific data”
- ISC: “scientific data and information”
- ISC: “scientific records and observations”
- WDS: “quality-assured scientific data”
- IODE: “all data, associated metadata and products”
- WMO: “meteorological and related data and products”
- GEO/GEOSS: “Data, metadata and products “
- AGU: “Earth and Space Science Data”

Other points to consider that are not explicitly mentioned already in this document perhaps?

- which licenses are applicable or recommended?

what is considered an appropriate amount of time to pass before making data openly available?

Reviewed by: (SCADM members write your name here)

Stein T.
Pip waz here.
Frank was here too
Johnathan 👍
Anne Treasure
David Rayner
Marten
Jen Thomas
Helen Peat