Exploring Information Accessibility Policy Best Practices for Coastal Adaptation: Current Realities and Future Visions

1. Introduction

A one-day workshop was held at the Bedford Institute of Oceanography on 17 January 2013. The goal of the workshop was to identify data accessibility policies and best practices that are currently in use in Atlantic Canada, to examine the barriers to enhance the adoption of these best practices, and to define next steps. The agenda for the workshop is included in this report as Appendix 1.

2. Current Data Accessibility Realities in Atlantic Canada

In January 2013, the ACZISC surveyed data providers in Atlantic Canada asking for general information on policies and processes for providing access to data and information. More specific information was requested based upon their answers. The data providing organizations that were surveyed included the four provincial governments, all the federal government departments that are affiliated with the ACZISC, an agency, and a university research project. Table 1 shows the answers obtained by this survey. The table suggests that current realities related to data accessibility in Atlantic Canada are positive as almost all organizations provide some form of internet access and have approval processes supported by policy. Closer examination may show that the transparency of the policy and processes is lacking and that the delivery systems used may not be interoperable. The situation for metadata is more mixed with an apparent lack of access to metadata for some organizations and evolving standards environment.

Table 1: Internet accessibility, process, and policy for data accessibility in Atlantic Canada. The numbers in brackets indicate the answer was related to climate change adaptation data and information. The text of the questions asked of the data providing organizations has been shortened in the table. The wording of the full question would read "Does your organization have…" e.g. "Does your organization have a standard for metadata?" For question 5, the process for approving the release of data was described as routine, proactive or reactive; more than one descriptor was used by some data providing organizations. In the column other answers, "In progress" means the data providing organization is developing the service, standard or process, "NA" means the data providing organization didn't regard the service as applicable to their data and information for a number of reasons including that their data was delivered to the internet by another organization, and "Planned" means that the development of the service, standard or process is planned.

Question	Answer was Yes	Answer was No	Other Answers
1. Internet access to data	11 (5)	1(1)	(In progress 2, NA 3)
2. Internet access to metadata	5	5	
3. Standard for metadata	3	1	Planned 2
4. Process for	4	1	

	maintaining metadata			
5.	Process for approving release of data	8 (5) - Routine 6, Proactive 5, Reactive 4	2	
6.	Policy support for the approval process	6	1	In progress 1

3. Existing and Emerging Best Practices in Atlantic Canada

Three of the Atlantic Provinces (i.e. New Brunswick, Newfoundland and Labrador, and Nova Scotia) maintain relatively sophisticated internet sites allowing for the accessibility of spatial and other data and information. Shown in Figure 1 is a sample map generated by the Province of New Brunswick's GeoNB Map Viewer (http://geonb.snb.ca/geonb). New Brunswick plans to make the climate change adaptation products available through this application. The Province of Prince Edward Island provides a site (http://www.gov.pe.ca/gis/) to download a number of spatial data sets for the province. The Canadian federal government scene is complex with individual departments providing their own data accessibility sites and applications. Two initiatives are bringing this myriad of approaches together, the Open Data Initiative (http://data.gc.ca) and the Federal Geospatial Platform (FGP). The FGP is in the early stages of development. The Research Data Strategy Working Group in Canada issued a report (Research Data Strategy Working Group 2011) to address the "pressing need to deal with Canadian [research] data stewardship." The ACZISC has been working with non-governmental organizations in Atlantic Canada with limited data management capacity to make data and information in their custodianship more visible to the internet and geographically referenced using the COINAtlantic tool set. Some non-governmental organizations in Atlantic Canada that have greater data management capacities have developed very usable internet sites for disseminating the data and information they hold.
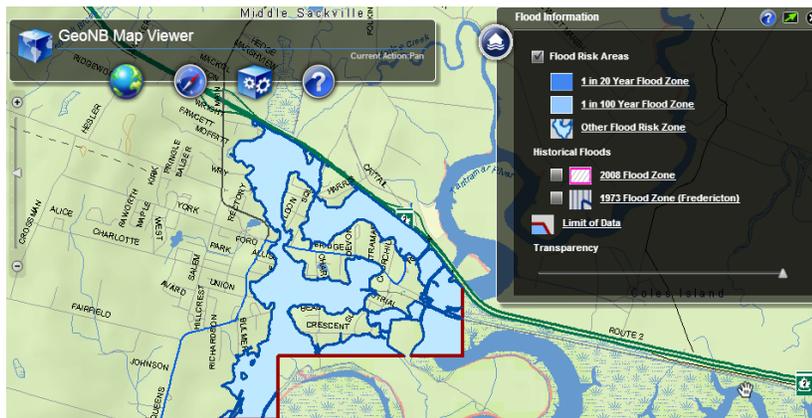
Figure 1: On-line map generated from the GeoNB (New Brunswick) mapping application showing flood risk zones near Sackville, New Brunswick, Canada

4. Presentations

The workshop included three invited presentations to illustrate three different aspects of data accessibility:

1. Data accessibility policy environment as demonstrated by the HRM Open Data Pilot,
2. Integrated solutions to data accessibility as demonstrated by the Federal Geospatial Platform initiative, and
3. Maintaining organizational accountability for data management and data accessibility as demonstrated by the Ocean Tracking Network Report Card.

The full presentations are included in Appendices 2, 3, and 4. Video of the presentations will be available through the ACZISC website coinatlantic.ca

Key points - HRM Open Data Pilot Update

Qingshuang Jiang and Mark Helm from HRM made this presentation.

- Open data is a philosophy and practice requiring that certain data are made available to the public, without restrictions from copyright, patents, or other mechanisms of control for free and in a machine readable format.
- The international open data and open government movement has created expectations in the community and HRM Council for more open access to data. The open data movement also recognizes that open data can be a driver of economic growth (i.e. third party applications development and information to support economic development), and support increased transparency and citizen engagement.
- The Open Data Report to Council was approved by HRM Council in September 2012. The report initiated an Open Data Pilot that encompasses 15 data sets, requires holding an Open Data Application contest, and gathering use statistics for the 15 data sets used in the pilot.
- Recommendations will be made to Council on further Open Data policies and programs.
- The pilot also includes the amendment of the GIS Data Dissemination Policy that restricted dissemination of GIS data and imposed a fee structure, and the development of an Open Data Catalogue.
- If the Open Data Pilot is successful, Open Data Governance, Policy, and Program will be developed in 2014.

Of particular interest from the HRM Open Data Pilot is the approval of the pilot by the most senior decision-making body in the organization (i.e. HRM Regional Council), the amendment of existing Data Dissemination Policies, and the

engagement of the community (both business and civil society) in using the data through an Open Data Application contest.

Key points - Federal Geospatial Platform Initiative

Michael Greskow of Earth Science sector of Natural Resources Canada made the presentation on the Federal Geospatial Platform (FGP) by videoconference from Ottawa.

- Open data will underpin new waves of productivity and generate significant financial value and societal benefits.
- Creating transparency and making data readily accessible and re-usable will be the hallmark of successful governments.
- However:
  - sharing and integration of cross-disciplinary 'trusted' data across the federal family is limited.
  - there is no existing inventory of federal geospatial data assets; and
  - there is an increasing demand for and use of geospatially related data to meet business requirements.
- The Federal Committee on Geomatics and Earth Observations (FCGEO) was established in January 2012 to
  - provide proactive, whole-of-government leadership in geomatics and Earth observations to better support government priorities;
  - collectively enhance the responsiveness, efficiency, and sustainability of the federal geomatics and Earth observations infrastructure; and
  - improve access, sharing, and integration of geospatial data at all levels.
- A priority action for 2012 was to establish a business case for the FGP.
- The FGP is a collaborative effort across 20 departments and agencies to fundamentally change the way we share, use, and manage geospatial assets to support effective program delivery.
- The FGP will include:
  - comprehensive collections of authoritative data;
  - search, discovery, access, and visualization tools that are built once and reused many times;
  - common web-based environment that enables data integration, analysis, and visualization to support informed decision-making; and
  - shared governance and management of geospatial assets and capabilities.

Figure 2 is taken from the presentation and represents through a series of "sliders" the options considered for the FGP architecture in three categories: applications, data, and infrastructure. The Canadian flag on each "slider" represents the current situation. The A, B, and C on each "slider" represent various options for the implementation of the
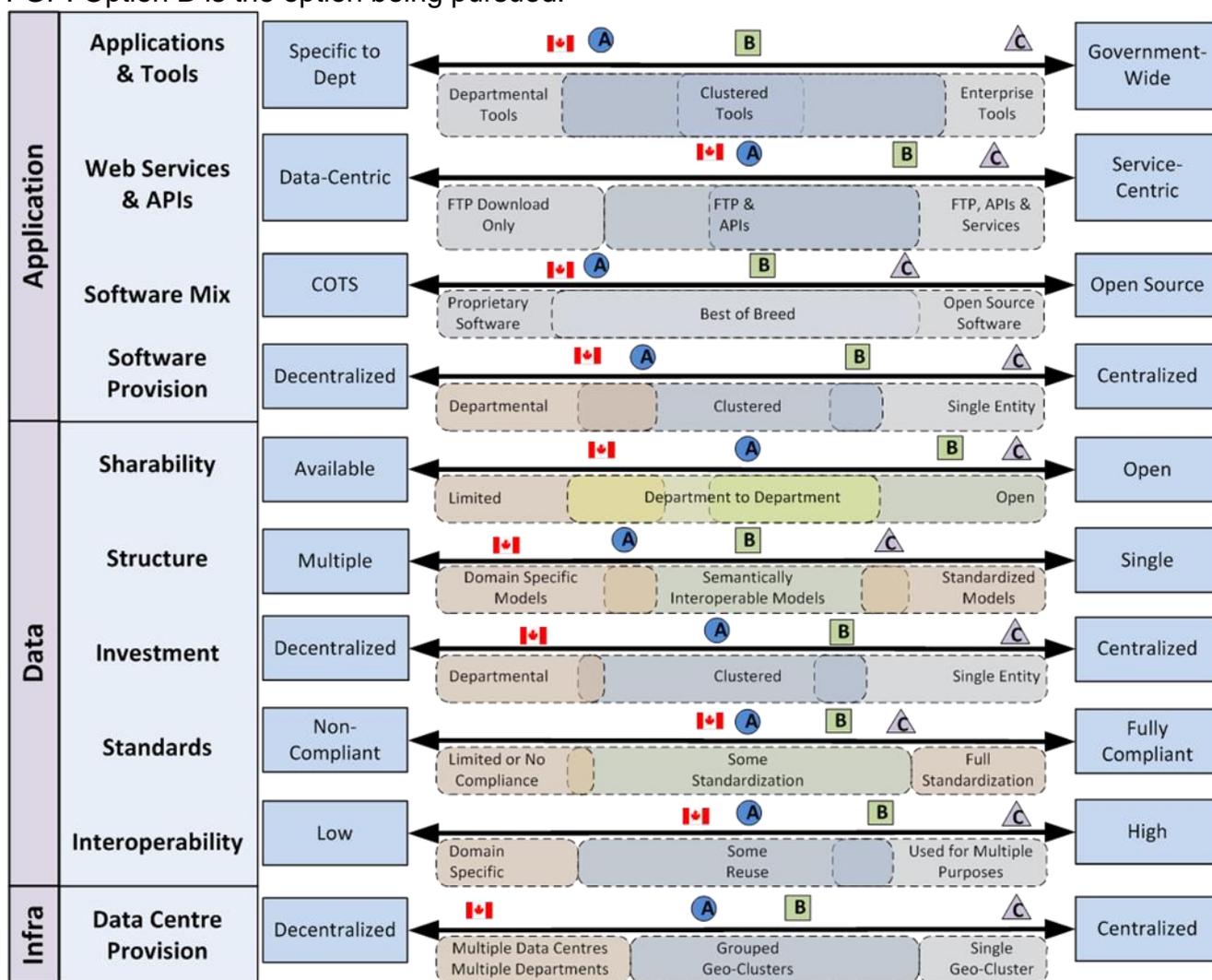
FGP. Option B is the option being pursued.

Figure 2: Federal Geospatial Platform Architecture

Of particular interest are the B options: web services will not be required and shareability of data is largely open. The FGP, if implemented as described, would have a significant positive impact on the accessibility of federal government geospatial data.

Key Points - Ocean Tracking Network Data Accessibility Report Card

Robert Branton a Data Manager for the Ocean Tracking Network (OTN) and a Canadian representative on CODATA made this presentation.

- The OTN report card (see Appendix 2) was used to self-assess its data management and data dissemination policies and processes and to report to funding agencies.

- The Organisation for Economic Co-operation and Development (OECD) endorsed the report Principles and Guidelines for Access to Research Data on 14 December 2006 with the intention of facilitating optimal cost-effective access to digital research data from public funding.
- Principles outlined in the report included:
    - openness,
    - transparency,
    - legal conformity,
    - protection of intellectual property,
    - interoperability,
    - quality, and
    - sustainability.
- Robert Branton demonstrated in his presentation a report card assessing the compliance of the OTN with the OECD principles guidelines finding. Most principles were complied with; some had a mix of full and partial compliance; some a mix of partial and non-compliance; and a few non-compliant under transparency, "Communicates among data archives and data producing institutions".
- Highlights from the OTN assessment included:
    - Openness - Access on equal terms for the international research community at the lowest possible cost.
        - Since inception, OTN staff has worked with technology services professionals at the Dalhousie computer centre to develop and operate an open source and user-friendly Internet-based system.
        - Early offerings included a web mapping services (WMS) based Google Earth flyover showing all projects and stations. More recently (November 2012) full public access was granted on all discovery metadata (i.e. information about the data) and to station and mystery tag records.
    - Formal Arrangements - Access arrangements should promote explicit, formal institutional practices, such as the development of rules and regulations, regarding the responsibilities of the various parties involved in data-related activities…
        - OTN's public data policy document has been vetted through the national and international partners and is referenced in all collaboration agreements.
        - Data management clause(s) are therefore only included in collaboration agreements in cases where the formal public policy is unworkable.
    - Quality - Research institutions and professional associations should develop appropriate practices with respect to the citations of data and the recording of citations in indexes…

- OTN discovery metadata records include preformed standardized data citations, thus enabling anyone accessing or using OTN data to easily give proper attribution to all of the data providers and to OTN.
- o Security - Specific attention should be devoted to supporting the use of techniques and instruments to guarantee the integrity and security of research data…
  - Project data are stored in controlled access data folders/schemes. The relevant principal investigator and or data managers therefore control access to these folders by other OTN members.
  - With regard to guaranteeing the integrity of a data set, every effort should be made to ensure the completeness of data and absence of errors.
  - OTN and various manufactures have implemented procedures whereby collaborators can authorize manufacturers to provide equipment specifications metadata directly to OTN as part of their routine shipping practices.
- o Sustainability - Taking administrative responsibility for the measures to guarantee permanent access to data that have been determined to require long-term retention…
  - All Unrestricted Data held by OTN will be routinely copied to an International Oceanographic Data Exchange (IODE) / Global Ocean Observing System (GOOS) recognized facility such as the Department of Fisheries and Ocean Canada for long term archiving and reported to international biodiversity facilities such as the Ocean Biogeographic Information System (www.iobis.org) and Global Biodiversity Information Facility (www.gbif.org).

Of particular interest is that a framework for data accessibility policy and processes has been approved at the international level (i.e. OECD). Data providing organizations should assess their compliance with this or other accepted.

5. Visions for data accessibility

Participants were asked to share their vision of the ideal state for data accessibility.

The repeated components of the visions invoked were:

- Open/ Free / Reliable access to authoritative geospatial information.

- Data needs to be useable by following accepted standards (e.g. ISO, OGC), managed for future use and usefulness of data measured.

- Information "that makes sense to the average user" to encourage dialogue between data generators / collectors + end users.

- Improved willingness to share and long term goals for sharing between sectors.

- Improved and sustainable data management that enables institutional memory.

- Adoption of standard operating procedures for the creation and maintenance of metadata that is searchable.

- Proper attribution of authorship and provision of suitable credit for developers.

- Training users on how to use the data set.

- Well managed for future use, for which it was not originally intended.

6. Results of Participant Discussion

A. Where in Atlantic Canada is this vision starting to become a reality (especially for climate change adaptation information)?

- Service New Brunswick provides a robust web mapping application, value-added products, various applications and extensive collection of open source data sets through its GeoNB (see Figure 1 above) website. They intend to release spatial data for climate change adaptation through this infrastructure. GeoNB, unfortunately, does not include Open Geospatial Consortium web mapping services in its suite of data delivery services.

- GeoPEI is an initiative under discussion with parties in Prince Edward Island including the University of Prince Edward Island to develop a GIS centre for the management and dissemination of spatial data relevant to the province.

- The Government of Newfoundland and Labrador has provided web mapping services for its water resource and geoscience information, and plans to provide the coastal characterization information developed under the Atlantic Climate Change Solutions (ACAS) program with Dr. Norm Catto from Memorial University.

- Bob Branton's presentation mentioned the 2011 Canadian Research Data Summit that recommends that publicly funded research data be made openly available, and that data management and data dissemination be made part of future projects funded by government.

- The CanCoast project of the Geological Survey of Canada will provide coarse national scale coastal mapping, and data re-analysis of information that relates to climate change adaptation. The CanCoast model will allow for nested data at

differing scale and a repository for different types of data (e.g. census, ecological).

- The ACZISC has developed COIN Atlantic web-based tools for the non-technical specialist that uses Google searches to find and display spatial information that meets the users search criteria. The ACZISC has also conducted workshops showing smaller organizations how to spatially enable their data.

- The ACAS website which includes Google map, and other maps in PDF, will be available shortly providing access to 100+ maps.

B. Barriers to data accessibility identified by the workshop

- Government policies that are not compatible (i.e. one policy to make everything open and accessible (opendata.gc.ca), and another policy that shuts websites down). The federal government has been taking down datasets to meet new government website standards because they aren't fully accessible.

- Even big projects sometimes do not have a data management policy. Where does the data "go" to maintain accessibility and reuse when these projects end?

- There are no repositories for coastal monitoring data collected by communities; this discourages them from taking the time to collect data that they are not sure if it will used in the future by others.

- Infrastructure for disseminating data varies across provinces preventing interoperability.

- Products produced may not be suitable for end users. How do scientists communicate their data to decision makers? For example, municipalities want risk maps as they will be making decisions on climate change adaptations.

- Interpreted results are needed to support resource decisions, but it is often difficult to access the data the interpretations are based upon.

- It is often difficult to find the history of data use so that it can be easily reused.
- Unrealistic expectations of technical staff. Is the data management expert the best resource to create products for the general public?

- Lack of training and capacity within communities of users.

- Lack of common approaches so things don't work together and capacity is diminished.

- Difficulty finding the data / information you need, if you can't find it, it might as well not exist.

- Lack of coordination, better links are needed between community, developers, government; who do I talk to get the right information?

7. Recommendations

a. Consider policy and process issues related to data accessibility before technical issues;
b. Funding agencies need to require, and recipients of funds need to demonstrate, proper data management and data accessibility processes;
c. Data providing organizations need to place greater emphasis on proper management of data and training in data management;
d. Effective consultation with the ultimate users of data and information is required to define appropriate data and information products;
e. Effective and sustainable infrastructure and repositories need to be established to store and disseminate climate change adaptation data and information to decision-makers and other users;
f. Sufficient metadata needs to be developed for each data and information item to permit effective reuse;
g. Web-based tools based upon open source technologies and ubiquitous search mechanisms (e.g. COINAtlantic tools) should be encouraged;
h. Mechanisms for community participation and partnerships with experts (e.g. citizen science and community value added information) need to be encouraged; and,
i. The ACZISC should monitor and report on progress of data accessibility initiatives in all of its affiliated organizations.

ACZISC MEETING #68

Wednesday and Thursday, 16-17 January 2013
William Ford Auditorium, 1 Challenger Drive,
Bedford Institute of Oceanography, Dartmouth, Nova Scotia

C O I N A T L A N T I C   W O R K S H O P   A G E N D A

DAY 2: 0830 - 1630 hrs, Thursday, 17 January 2013

Exploring Information Accessibility Policy Best Practices for Coastal Adaptation: Current Realities & Future Vision

8:30a.m. – 9:00a.m.	**Registration** Coffee/tea and snacks Name tags and workshop packages distributed	
9:00a.m. – 9:30a.m.	**Formal Introduction** Welcoming Remarks Overview of Workshop Objectives	*Andrew Sherin* *Andrew Sherin*
9:30a.m. – 10:00a.m.	**Collaborative Roundtable Introduction** "What's my vision?"	*Facilitation by the ACZISC Secretariat*
10:00a.m. –10:15a.m.	**Break**	
10:15 a.m.–12:00 p.m.	**Guest Speakers** - 20 minute presentations - 10 minute Q&A and discussion period for each presentation	
10:15a.m. – 10:45a.m.	*Federal Geospatial Platform (via video conference)*	*Prashant Shukle and Yvan Désy, Earth Sciences Sector, NRCan*
10:50a.m. – 11:20a.m.	*HRM Open Data Initiative*	*Qingshuang Jiang, and Mark Helm, HRM*
		Robert Branton, Ocean

11:25a.m. – 11:55a.m.	***Report Cards for Data Accessibility***	*Tracking Network*

12:00p.m. – 1:00p.m.	**Lunch** BIO Cafeteria	
12:30p.m. –1:00p.m.	**CZC2014 Launch** – short presentations, Auditorium	
1:00p.m. – 1:45p.m.	**Current Realities in Data and Information Accessibility**	*Andrew Sherin*
1:45p.m. – 2:45p.m.	**Innovation Activity - In Three groups** 1. What is your vision for data and information accessibility? 2. Where in Atlantic Canada is this vision starting to become a reality (especially for climate change adaptation information)? 3. How can the best practises be more widely adopted for climate change adaptation? 4. What are the barriers for this vision becoming a reality everywhere in Atlantic Canada and how can these barriers be reduced? - 45 minutes for brainstorming - 15 minutes to prepare a five minute presentation "Post-It Fun" Exercise	*Facilitation by:* *ACZISC Secretariat*
2:45p.m. – 3:00p.m.	**Break**	
3:00p.m. – 4:00p.m.	**Presentation of Group Recommendations** - Three 5 minute group presentations - 10 minutes for questions and discussion for each presentation	*Workshop Attendees*
4:00p.m. – 4:30p.m.	**Wrap-up, Closing Remarks** De-brief "Note to self" exercise	*Andrew Sherin,* *Alexi Westcott,* *Adam Fancy*

Appendix 2 OTN Report Card

The 'ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT (OECD) Principles and Guidelines for Access to Research Data from Public Funding' was endorsed by the OECD Council on 14 December 2006 with the intention of facilitating optimal cost-effective access to digital research data from public funding. The full text of this document can be found at: http://www.oecd-ilibrary.org/science-and-technology/oecd-principles-and-guidelines-for-access-to-research-data-from-public-funding_9789264034020-en-fr . Following are relevant points extracted from that document for the purpose of conducting a cursory assessment of Ocean Tracking Network data management infrastructure against the OECD principals and guidelines. Grades given here were provided by _____ on _____.

		Compliance		
		Full	Part	Non
a. Openness	The data system is user-friendly, Internet-based and timely.			
b. Flexibility	Accounts for changes in information technologies, characteristics of each research field and diversity of research systems.			
c. Transparency	Documentation on data and conditions of use are available on Internet.			
	Applies existing data management standards.			
	Communicates among data archives and data producing institutions.			
d. Legal conformity	Effectively deals with trade secrets, intellectual property rights and protection of or endangered species.			
e. Protection of Intellectual property	Delayed and or partial release of data allows primary participants to fully exploit the research data without unnecessarily shutting off access.			
	Facilitates access to restricted data for public research and or other public-interest purposes.			
f. Formal Responsibility	Has rules and regulations, regarding the responsibilities of the various parties involved in data-related activities.			
	Research data sharing arrangements are negotiated at the initial proposal stage.			
	Variations in the origin or type of data are taken into consideration when establishing data access arrangements.			
	Research institutions and government organisations have been identified to ensure formal long-term sustainability of the infrastructure required for data access.			
g. Professionalism	Mutual trust between researchers, and trust between researchers, their institutions and other organizations is encouraged.			
	Initial data-producing researchers / institutions are rewarded with temporary exclusive use of the data.			
	Data issues and technical assistance for essential organization and curation of data are expressly acknowledged and taken into consideration as part of the funding process.			
	There are incentives and development of professional expertise in all areas of research data management.			
h. Interoperability	Attention is given to relevant international data documentation standards and co-operate with international organisations charged with developing new standards.			
	There is explicit mention of standards being employed as well as promotion / adoption of most advanced practices.			
	Works with organisations engaged in setting general information and communication technology standards.			
i. Quality	Develops and employs methods and techniques for the collection, dissemination and accessible archiving of data.			
	Origin of data sources are documented and specified in a verifiable way, readily available to all and incorporated into the metadata accompanying the data.			
	Data sets and copied data sets are linked to the original research materials.			
	Develops and employs appropriate practices with respect to citation of data and recording of citations in indexes.			
j. Security	Uses techniques to guarantee the integrity and security of research data.			
	Uses procedures to ensure the completeness of data and absence of errors.			
	Protects against intentional or unintentional loss, destruction, modification and unauthorized use.			
	Protects from environmental hazards such as heat, dust, electrical surges, magnetism, and electrostatic discharges.			
k. Efficiency	Conducts periodic cost-benefit assessments to ensure that data with the greatest potential utility are preserved and made accessible.			
	Has retention protocols and documentation to reduce unnecessary duplication as well as to provide necessary selectivity.			
	Collaborates with non-academic specialists and engages with data management specialist organizations.			
	Develops reward structures including recognition of data management activities in tenure and promotion review.			
l. Accountability	Periodic evaluation by user groups, responsible institutions and research funding agencies.			
	Determines the extent of reuse of the data and publications generated from the reuse of the data.			
m. Sustainability	Has identified administrative responsibility for the measures to guarantee permanent access to data that have been determined to require long-term retention.			
	Long-term preservation of data was considered at the outset of project including determination of most appropriate			

	archival facilities for the data.			