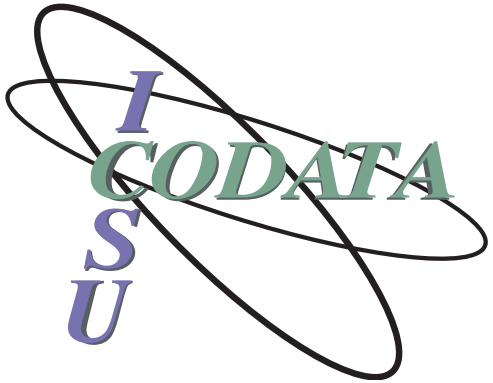
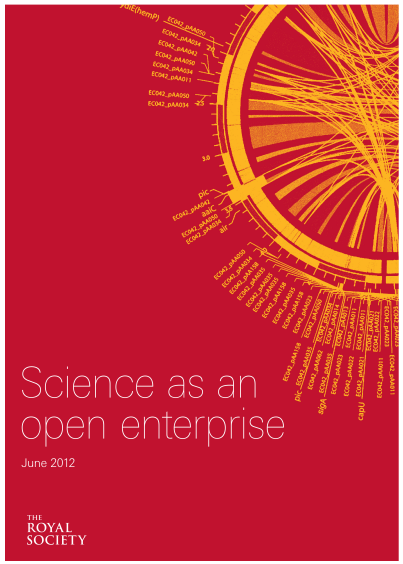


eResearch Australasia 2015: Fuelling the Knowledge Economy
Brisbane, Queensland, Australia
21 October 2015

Responses to the data revolution: CODATA's work on data policy, data science and capacity building

Dr Simon Hodson
Executive Director, CODATA
www.codata.org

Data Revolution:
Science as an Open Enterprise

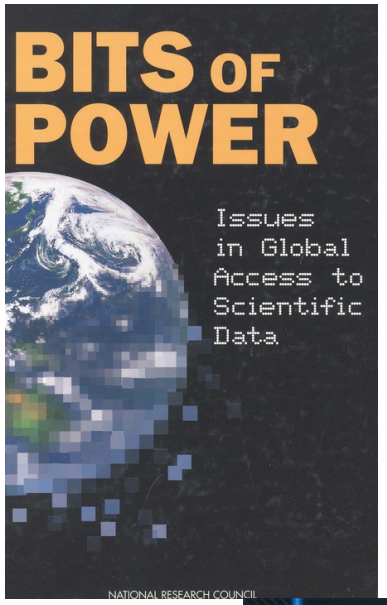


Royal Society Report: Science as an Open Enterprise

CODATA President Geoffrey Boulton, FRS

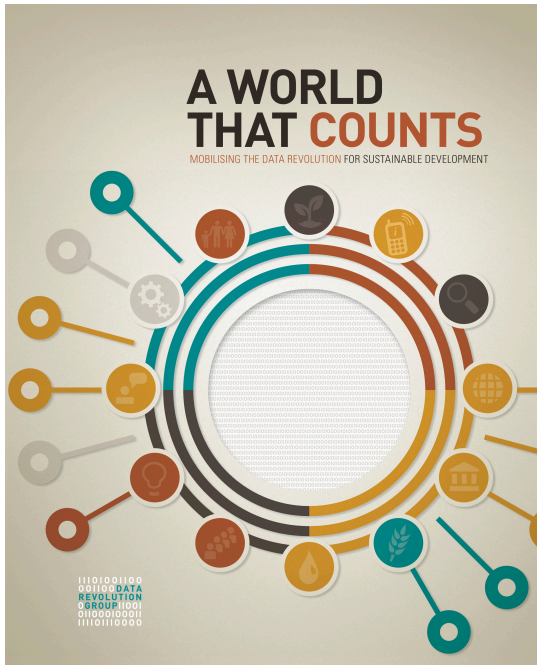
- The digital age has brought a data revolution that presents science with major challenges and opportunities.
- Opportunities because we can gather unprecedented volumes and types of data and analyse them far more quickly.
- **Exploiting these opportunities is the major challenge of international science.**
  - Challenges for data infrastructure, networks and analysis.
  - Fundamental methodological issues for reproducibility and transparency.
  - Challenges and opportunities for science systems, technical and human.
- **Mobilising Big Data requires Open Data!**
- **Data for research should be intelligently open: accessible, assessible, intelligible, useable.**
- **Publications and data should be Open and available concurrently.**
- **Report with very significant impact: G8, H2020**

The Data Revolution and its implications



- Exploiting the data revolution is **the** major priority for international science.
- Implications for the practice of science and how we organise national and international science systems.
- **A global issue, with global implications.**
- **Why is this important?**
- **What is CODATA?**
- **What does CODATA do?**
  - Strategic capacity mobilisation
  - Policy work
  - Data citation
  - Training
  - ‘Data Science’

Data Revolution:
A World that Counts!



- **Creating a world that counts:** Mobilising the Data Revolution for Sustainable Development.
- To meet the new sustainablity goals '*there is an urgent need* ***to mobilise the data revolution for all people and the whole planet in order to monitor progress****, hold governments accountable and foster sustainable development.'*
- *Without immediate action****, gaps between developed and developing countries, between information-rich and information-poor people, and between the private and public sectors will widen****, and risks of harm and abuses of human rights will grow.*
  - Data quality and integrity
  - Data disaggregation (no-one should be invisible)
  - Data timeliness
  - Data transparency and openness
  - Data usability and curation
  - Data protection and privacy
  - Data governance and independence
  - Data resources and capacity
  - Data rights

THIS IS THE REVOLUTION

Indonesia is one of the most social-media dense countries in the world today. Indonesians tweet about a range of topics, including the cost of living. A project by UN Global Pulse, the Indonesian Ministry of National Development Planning and the World Food Programme found public tweets mentioning food prices closely approximate official figures, leading to the development of a technology that extracts daily food prices from public tweets to generate a near real-time food price index. This data mining approach could be adapted to other food items and locations, not just leveraging Twitter but other crowd-sourced and social data sources.

Source: UN Global Pulse (http://www.unglobalpulse.org/nowcasting-food-prices)

Data Revolution: how can we improve … with open data?

- GODAN-ODI Report: improving agriculture, food and nutrition with open data.
- *'Although the amount of data openly available is constantly increasing,* ***there are still challenges related to data management, licensing, interoperability and exploitation. There is a need to evolve policies, practices and ethics around closed, shared, and open data.****'*
- **Enabling more efficient and effective decision making** > lowers cost of accessing information and underpins tools that farmers themselves can use.
- **Fostering innovation to benefit everyone** > an opportunity that must not be missed for creating new businesses and jobs in 'new data-powered innovation ecosystems'.
- **Driving organisational and sector change through transparency** > open data is essential to understanding complex systems, interventions, targets, change.
- **Availability is not enough** > essential that the data be interoperable and machine-readable.
- Problem oriented and solution-based data strategies.
- Develop infrastructure and human capacity.

CODATA Strategy: Mobilising the Data Revolution

CODATA President Geoffrey Boulton, FRS Chair of *Science as an Open Enterprise* Report

Simon Hodson CODATA Executive Director

New CODATA Executive Committee elected at GA in New Delhi, Nov 2014

Mobilising capacity to take advantage of the data revolution is **the** major priority for international science.

CODATA strategy lays out three priorities and a plan that shows we can **deliver benefits** for members on these priorities.

Presents a vision for international promotion and coordination of data ecosystems.

Promote intelligently open data

- **data policies:** supporting implementation of data principles and practice

Adapt to the transformation in research

- **data science:** addressing the frontier issues of data science

Promote data skills, data scientists, data managers

- **research data capacity building** (particularly in LMICs)

What is the International Council of Science?

futureearth
research for global sustainability

ICSU
International Council for Science

- **Mission: to strengthen science for the benefit of society.**
- Brings together National Members (academies) and International Scientific Unions.
- Reports and policy statements on major international scientific issues.
  - Statement on OA to literature and data: http://bit.ly/icsu-OA-statement
  - Critical scientific review of Sustainable Development Goals: http://bit.ly/icsu-SDGs
- Policy for science and science for policy.
- Sponsors coordinating research programmes: Future Earth, Integrated Research on Disaster Risk, Urban Health and Wellbeing.
  - Promotes international and transdisciplinary approaches, to address issues of global importance.

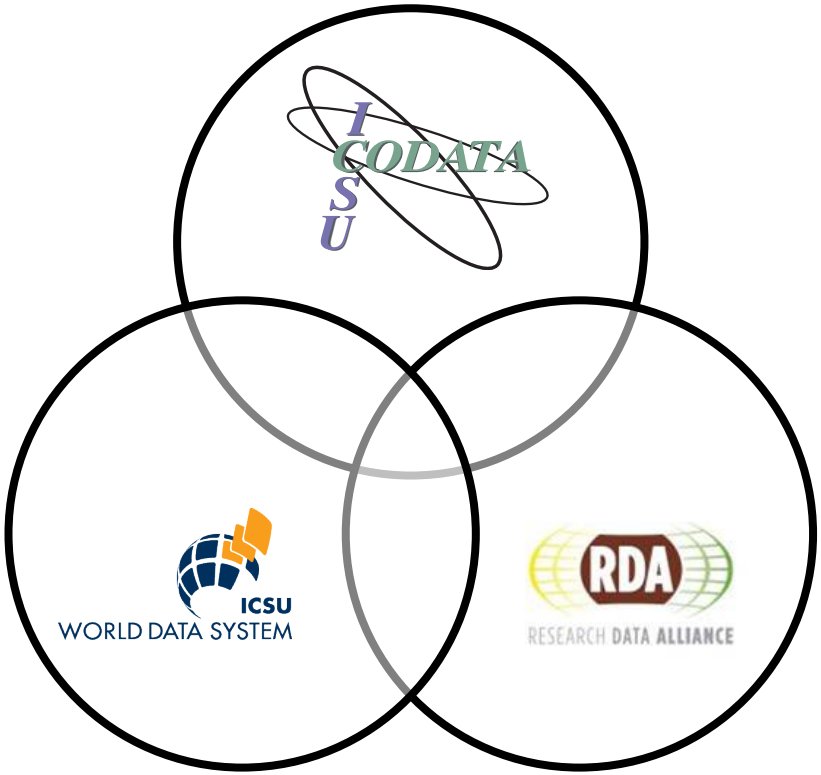
What is CODATA?

TABLE I An abbreviated list of the CODATA recommended values of the fundamental constants of physics and chemistry based on the 2014 adjustment.

Quantity	Symbol	Numerical value	Unit	Relative std. uncert. u_r
speed of light in vacuum	c, c_0	299 792 458	m s^{-1}	exact
magnetic constant	μ_0	$4\pi \times 10^{-7}$	N A^{-2}	
		$= 12.566\,370\,614... \times 10^{-7}$	N A^{-2}	exact
electric constant $1/\mu_0 c^2$	ϵ_0	$8.854\,187\,817... \times 10^{-12}$	F m^{-1}	exact
Newtonian constant of gravitation	G	$6.674\,08(31) \times 10^{-11}$	m^3 kg^{-1} s^{-2}	4.7×10^{-5}
Planck constant	h	$6.626\,070\,040(81) \times 10^{-34}$	J s	1.2×10^{-8}
$h/2\pi$	$\hbar$	$1.054\,571\,800(13) \times 10^{-34}$	J s	1.2×10^{-8}
elementary charge	e	$1.602\,176\,6208(98) \times 10^{-19}$	C	6.1×10^{-9}
magnetic flux quantum $h/2e$	Φ_0	$2.067\,833\,831(13) \times 10^{-15}$	Wb	6.1×10^{-9}
conductance quantum $2e^2/h$	G_0	$7.748\,091\,7310(18) \times 10^{-5}$	S	2.3×10^{-10}
electron mass	m_e	$9.109\,383\,56(11) \times 10^{-31}$	kg	1.2×10^{-8}
proton mass	m_p	$1.672\,621\,898(21) \times 10^{-27}$	kg	1.2×10^{-8}
proton-electron mass ratio	m_p/m_e	1836.152 673 89(17)		9.5×10^{-11}
fine-structure constant $e^2/4\pi\epsilon_0\hbar c$	α	$7.297\,352\,5664(17) \times 10^{-3}$		2.3×10^{-10}
inverse fine-structure constant	α^{-1}	137.035 999 139(31)		2.3×10^{-10}
Rydberg constant $\alpha^2 m_e c/2h$	R_∞	10 973 731.568 508(65)	m^{-1}	5.9×10^{-12}
Avogadro constant	N_A, L	$6.022\,140\,857(74) \times 10^{23}$	mol^{-1}	1.2×10^{-8}
Faraday constant $N_A e$	F	96 485.332 89(59)	C mol^{-1}	6.2×10^{-9}
molar gas constant	R	8.314 4598(48)	J mol^{-1} K^{-1}	5.7×10^{-7}
Boltzmann constant R/N_A	k	$1.380\,648\,52(79) \times 10^{-23}$	J K^{-1}	5.7×10^{-7}
Stefan-Boltzmann constant $(\pi^2/60)k^4/\hbar^3 c^2$	σ	$5.670\,367(13) \times 10^{-8}$	W m^{-2} K^{-4}	2.3×10^{-6}
Non-SI units accepted for use with the SI				
electron volt (e/C) J	eV	$1.602\,176\,6208(98) \times 10^{-19}$	J	6.1×10^{-9}
(unified) atomic mass unit $\frac{1}{12}m(^{12}C)$	u	$1.660\,539\,040(20) \times 10^{-27}$	kg	1.2×10^{-8}

- **Committee on data of the International Council of Science**
- Created in 1966: initial strong focus on quality of reference data in physical sciences.
- CODATA Recommended Values of the Fundamental Physical Constants http://www.codata.org/news/56/62/CODATA-
- Increasing policy perspective and concern with data management, data ecosystem.
- CODATA History: http://www.codata.org/publications/codata-history
- Task and Working Groups, Conference, Workshops and Journal.
- **Promote the study of data in research (data science) as a discipline.**

CODATA and International Collaboration



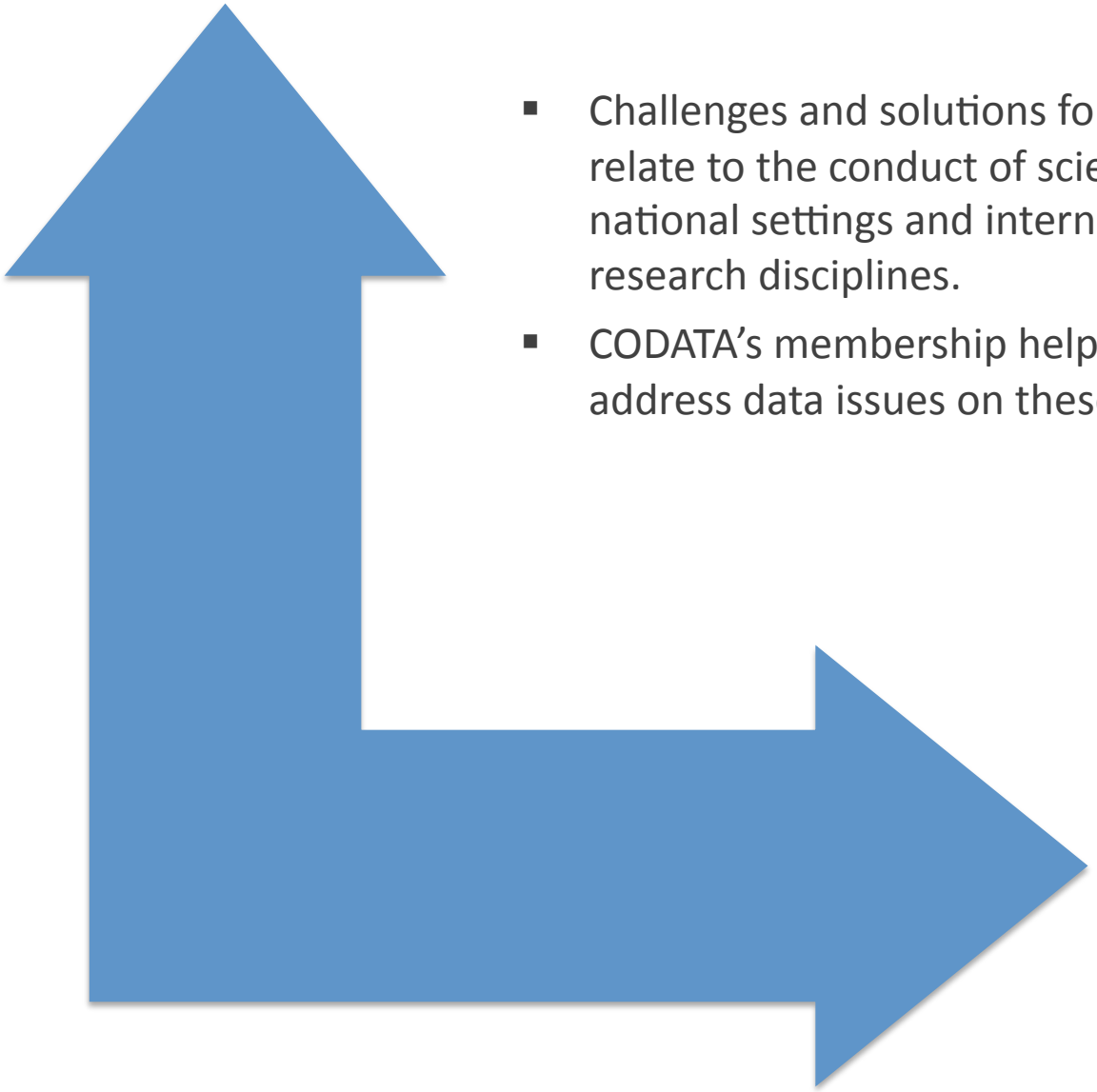
- Collaboration with Research Data Alliance and World Data System.
- A number of joint activities: e.g. joint WGs in Legal Interoperability, Income Streams for Data Repositories etc.
- Clear about areas of core activity
  - RDA: bottom-up community activity to promote interoperability and sharing
  - WDS: development and coordination of international network of trusted repositories
  - CODATA: strategic approach to data policies, data science and data capacity building

Research Data: challenges and stakeholders

National Research Systems

CODATA National Members

National Academies of Science or Data Organisations



- Challenges and solutions for data issues relate to the conduct of science in national settings and international research disciplines.
- CODATA's membership helps us to address data issues on these two axes.

Scientific Disciplines

CODATA International Scientific Union Members

CODATA National Committees

- **What are the benefits of having a CODATA National Committee?**
  - a point of contact and engagement with CODATA;
  - a group to build and coordinate collaboration on CODATA agendas and activities (including data policies and standards, Task Groups, capacity building and training, data issues in developing countries, early career data professionals);
  - an entity to collaborate with other National Committees, bilaterally or in groups;
  - a forum by which national stakeholders (research funders, National Academies, research institutions, data centres, learned societies, research libraries, etc) may raise and advance various agendas particularly those with an international dimension.

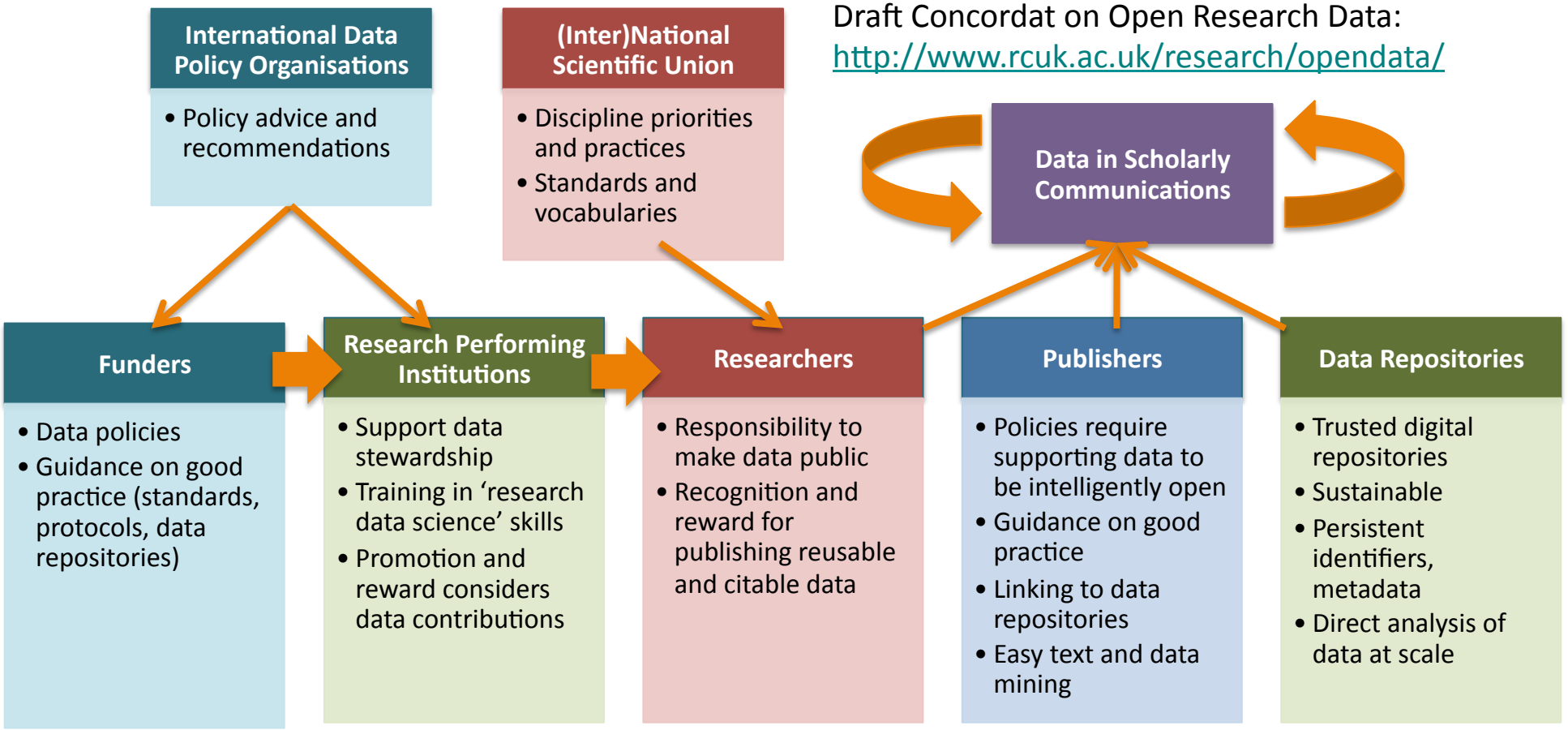
‘Science International’ and Open Science Capacity Building Initiative

- **Science International**: conceived as an annual summit for international science organisations: inc. ICSU, TWAS, IAP, ISSC.
- Provide a unified, international voice for science.
- First edition will be 7-9 Dec 2015, Pretoria, South Africa.
- Coincides with G77 Science Meeting.
- **CODATA leading on the document: Science International Accord on Big Data / Open Data**

- Will launch a broader international **Open Science Capacity Building Initiative**.
- Support from Department of Science and Technology in South Africa.
- Holistic ‘science systems’ approach: policies, procedures, incentives, data infrastructure, scholarly communications, skills and training.
- Research data science summer schools an essential component of this.

What does a healthy Data Ecosystem Look Like?

Analysis used in developing the UK Data Forum Draft Concordat on Open Research Data: http://www.rcuk.ac.uk/research/opendata/

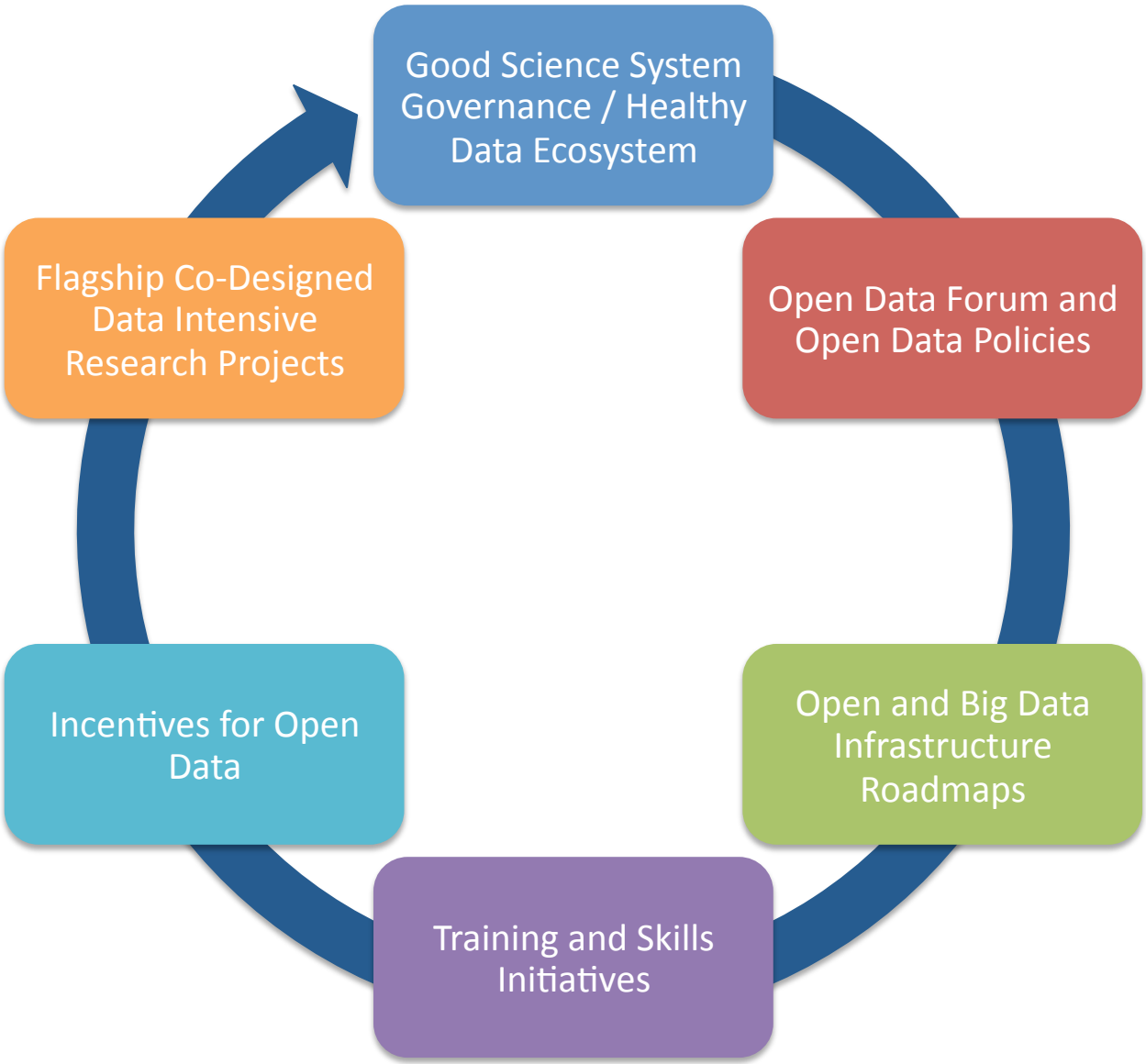


Lens of responsibilities…

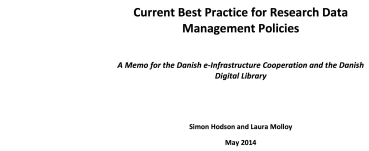
International Shared Data Infastructures

- International components essential to data ecosystem (PIDs, standards, vocabularies, perhaps shared data storage etc.)

Big Data / Open Data Capacity Mobilising Intiative



CODATA and Open Data Policies


Current Best Practice for Research Data Management Policies

A Memo for the Danish e-Infrastructure Cooperation and the Danish Digital Library

Simon Hodson and Laura Molloy

May 2014

Expert Report on data policies for Danish e-Infrastructure Group

Regional Workshops on Data Citation Principles and Practice, South Africa, October


ICT Centre of Excellence and Open Data
Jomo Kenyatta University of Agriculure and Technology


Home | About Us | Open Data | Research and Innovation | Technology Transfer | Contacts Us

ICT Centre of Excellence and Open Data- iCEOD > CODATA Kenya

CODATA Kenya

The main aim of CODATA is to improve the quality, reliability, management and accessibility of data of importance to all fields of science and technology. CODATA has three main priorities as per its strateg entitled "Exploiting the Data Revolution:the CODATA strategy".

1) Data Policy- Supporting implementation of data principles and practices
2) Data Science- Addressing the frontiers of data science and its adaptation to scientific research.
3) Data Education- Capacity building (particularly in low and middle income countries (LMICs)

At the CODATA International Workshop on Open Data for Science and Sustainability in Developing Countries held at JKUAT and at UNESCO in Nairobi, it was agreed that JKUAT, would join CODATA on behalf of Kenya. Later, the CODATA General Assembly held in October, 2014 in India, accepted and welcomed Kenya warmly into the CODATA family.

- **CODATA Data Policy Committee:** key means of delivery.
  - 'The Data Agenda for International Science'
- **Register of Good Practice and Data Policy Assessment Tool**
  - Expert Report on data policies Danish e-Infrastructure Group: http://dx.doi.org/10.5281/zenodo.27872
  - Means of assisting good practice and self-evaluation for national authorities, research institutions and data intensive programmes.
- **Regional Workshops on Data Citation Principles and Practices.**
- **Developing Data Strategies at regional, national and institutional levels.**
  - Collaborating with Polish Science Ministry on Data Policy development
  - Collaborating with CODATA Kenya, JKUAT, on Data Policy development and data strategy.

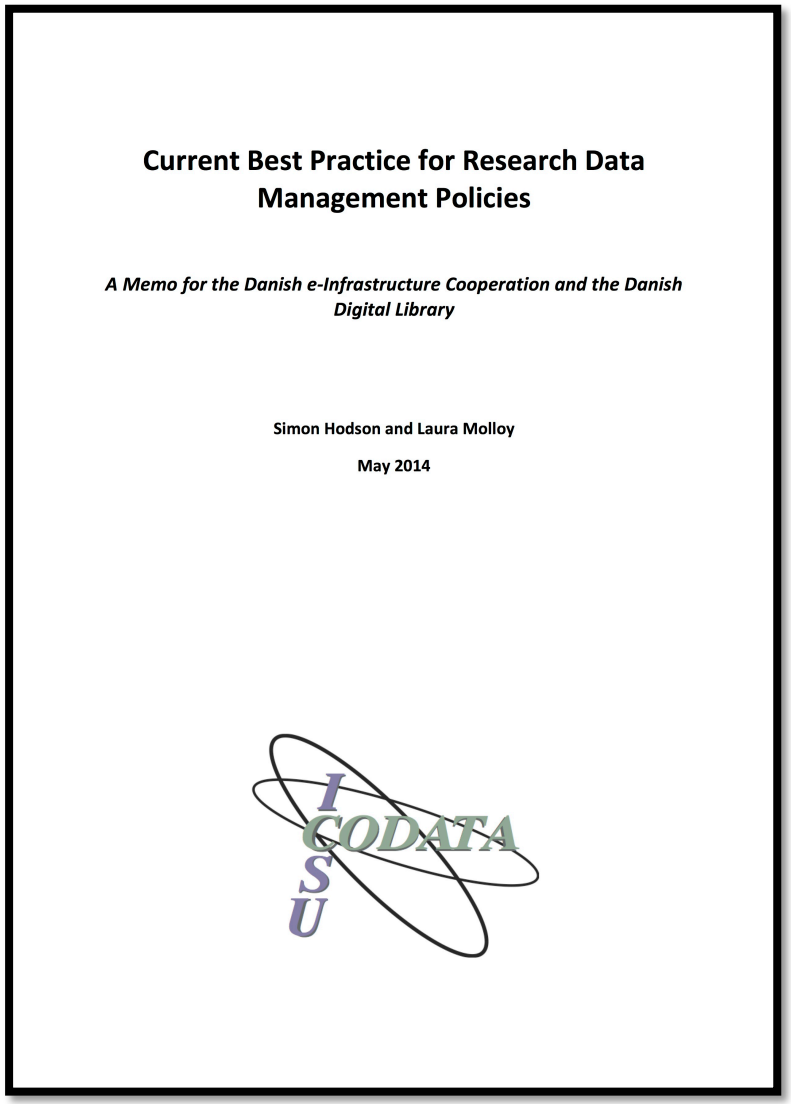
OPEN SCIENCE PLATFORM

International Workshop on Open Data for Science and Sustainability in Developing Countries

- Strong endorsement for the workshop from Kenyan Cabinet Secretary and from local universities and research institutes.
- Cabinet Secretary Dr. Fred Matiang'i: called on CODATA and other international organisations to 'become more visible in education and capacity-building, by developing science and educational programs and activities that focus on data and information' in developing countries.
- Announced data centre to be established at Jomo Kenyatta University of Agriculture and Technology.
- **'JKUAT has now established an ICT Centre of Excellence and Open Data (iCEOD) that was part of the Nairobi-CODATA conference recommendation'**
- Working with CODATA on data management policies and development of iCEOD: http://www.codata.org/membership/national-members/kenya

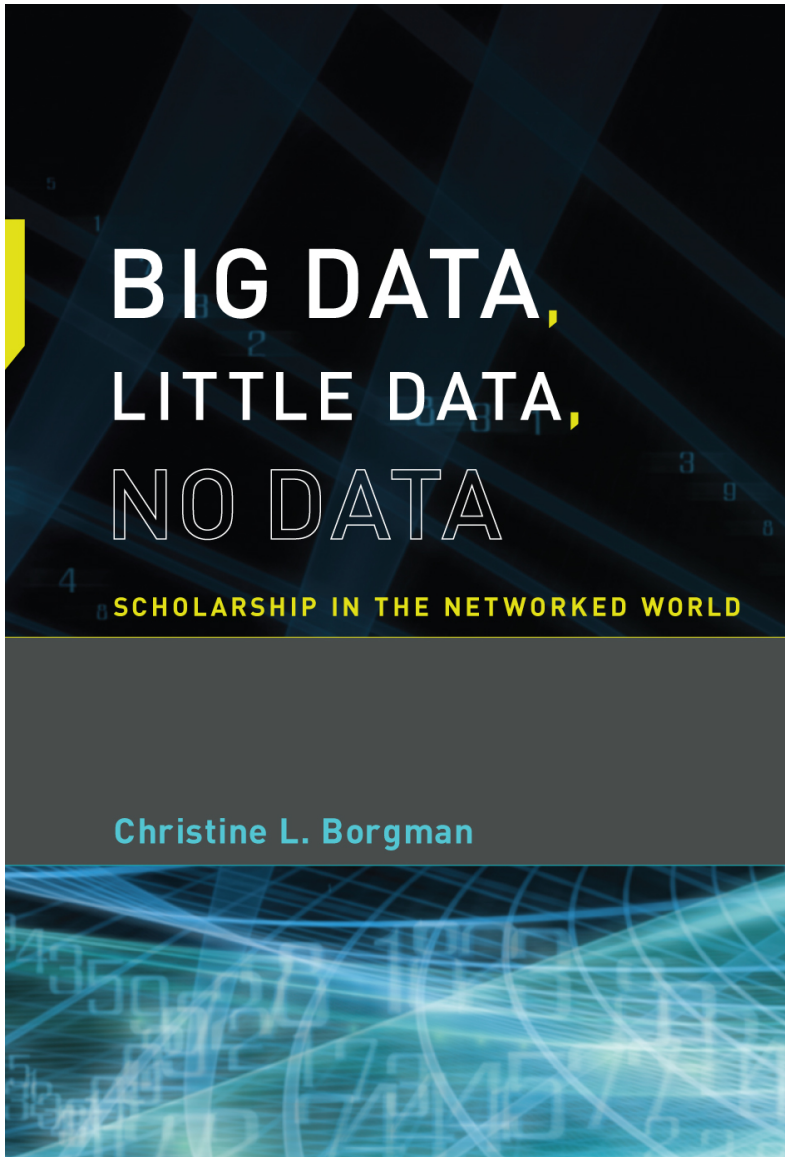
Current Best Practice for Research Data Management Policies

- Expert report commissioned by CODATA member.
- Provides comprehensive summary of best practice in funder data policies.
- Identifies key elements to be addressed:
  1. Summary of policy drivers
  2. Intelligent openness
  3. **Limits of openness**
  4. **Definition of research data**
  5. **Define data in scope**
  6. **Criteria for selection**
  7. Summary of responsibilities
  8. Infrastructure and costs
  9. DMP requirements
  10. Enabling discovery and reuse
  11. Recognition and reward
  12. Reporting requirements, compliance monitoring
- Zenodo: http://dx.doi.org/10.5281/zenodo.27872



Boundaries of Open

- For data created with public funds or where there is a strong demonstrable public interest, **Open should be the default.**
- **Proportionate** exceptions for:
  - Legitimate **commercial** interests (sectoral variation)
  - **Privacy** ('safe data' vs Open data – the anonymisation problem)
  - **Public interest** (e.g. endangered species, archaeological sites)
  - **Safety, security** and dual use (impacts contentious)
- All these boundaries are fuzzy and need to be understood better!
- Should not allow these issues to lead to blanket exemptions: e.g. H2020.
- **There is a need to evolve policies, practices and ethics around closed, shared, and open data.**



Data are representations of observations, objects, or other entities used as evidence of phenomena for the purposes of research or scholarship.

If we look at the range of research conducted, research 'data', sources, evidence are extremely diverse.

When are things research data?

Broad definition where data are the things that underpin research… evidence, sources…

C.L. Borgman (2015). *Big Data, Little Data, No Data: Scholarship in the Networked World*. MIT Press, Preface.

What data are in scope? Criteria for preservation, publication?

- Typology of things that are in scope of research data policies:
  - Data underpinning research conclusions presented the literature *must* be published.
  - Significant data produced by research projects should be made available.

- Major data collection/creation exercises with evident multiple uses (census, Hubble etc).

- Unrepeatable observations, measurements in nature or society? **(preserve and publish)**

- Data created by in vitro experiments that can be reproduced and for which the instruments are being improved **(perhaps very limited reasons for preserving)**

- Data collected for a given purpose (traffic management, customer relations, ships logs) but which could be used for research…

- **Need for collaborative approach (with researchers) to clarifying the criteria to keeping, publishing and discarding data.**

Data Policies: Data Citation

If publications are the stars and planets of the scientific universe, data are the 'dark matter' – influential but largely unobserved in our mapping process

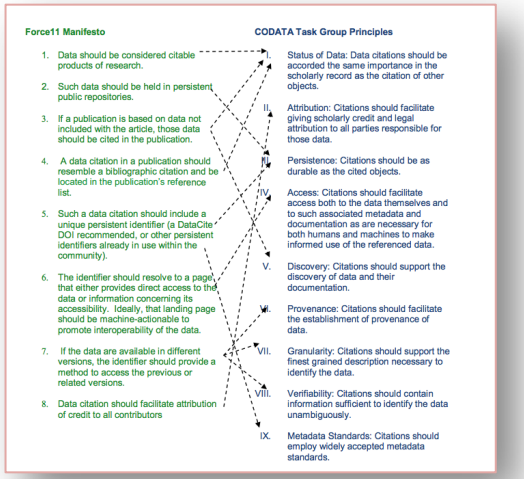
Task Group on Data Citation Principles and Practices

Out of Cite, Out of Mind
http://bit.ly/out_of_cite

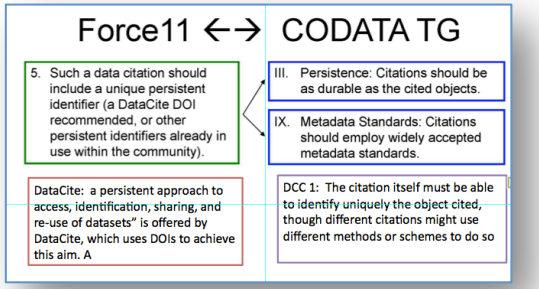
Joint Declaration of Data Citation Principles:
https://www.force11.org/datacitation

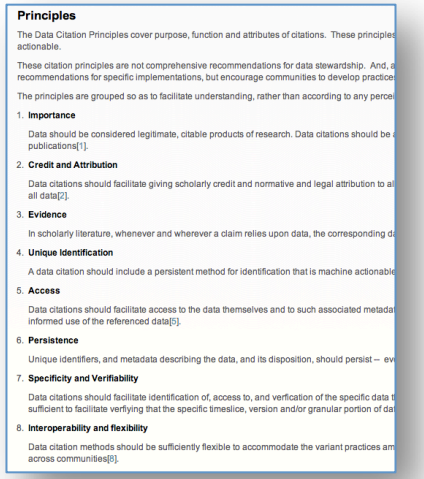
Background and Developments:
http://bit.ly/data_citation_principles

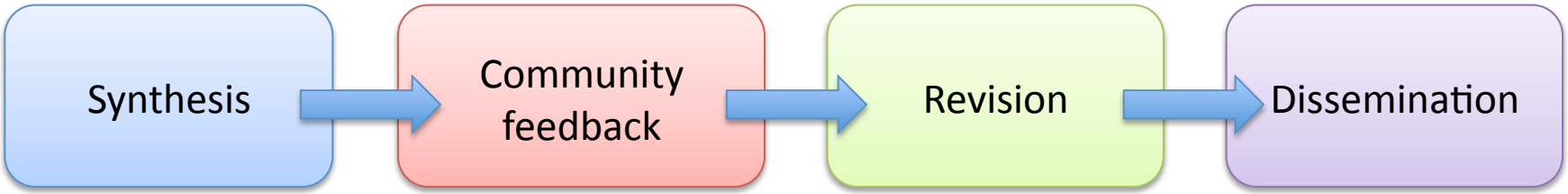
DC1
Data Citation Principles



Process







July-Sept 2013 Nov-Dec 2013 Jan 2014 Now

Data Citation Principles: Open for Endorsement

Joint Declaration of Data Citation Principles (Overview); Slide: Sarah Callaghan

Joint Data Citation Principles

Preamble

Sound, reproducible scholarship rests upon a foundation of robust, accessible data. For this to be so in practice as well as theory, data must be accorded due importance in the practice of scholarship and in the enduring scholarly record. In other words, data should be considered legitimate, citable products of research. Data citation, like the citation of other evidence and sources, is good research practice and is part of the scholarly ecosystem supporting data reuse.

In support of this assertion, and to encourage good practice, we offer a set of guiding principles for data within scholarly literature, another dataset, or any other research object.

The Data Citation Principles cover purpose, function and attributes of citations…

Joint Data Citation Principles

Purpose

1. Importance. Data should be considered legitimate, citable products of research. **Data citations should be accorded the same importance in the scholarly record as citations of other research objects, such as publications.**

2. Credit and attribution. Data citations should facilitate giving scholarly **credit** and normative and legal **attribution** to all contributors to the data, recognizing that a single style or mechanism of attribution may not be applicable to all data.

3. Evidence. In scholarly literature, whenever and wherever a claim relies upon data, the corresponding data should be cited.

Function

4. Unique Identification. A data citation should include a persistent method for identification that is machine-actionable, globally unique, and widely used by a community.

5. Access. Data citations should facilitate access to the data themselves and to such associated metadata, documentation, code, and other materials, as are necessary for both humans and machines to make informed use of the referenced data.

Joint Data Citation Principles

Attributes

6. Persistence. Unique identifiers, and metadata describing the data and its disposition, should persist -- even beyond the lifespan of the data they describe.

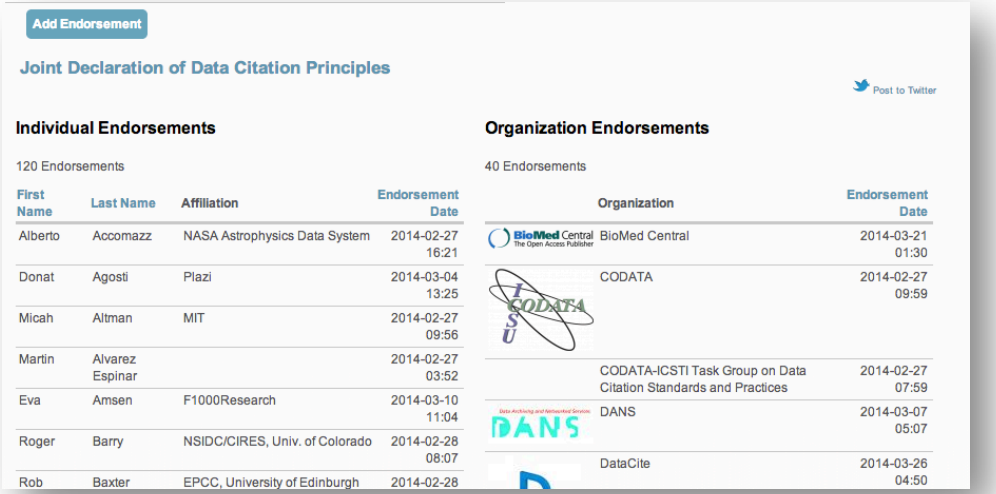
7. Specificity and verifiability. Data citations should facilitate identification of, access to, and verification of the specific data that support a claim. Citations or citation metadata should include information about provenance and fixity sufficient to facilitate verifying that the specific timeslice, version and/or granular portion of data retrieved subsequently is the same as was originally cited.

8. Interoperability and flexibility. Data citation methods should be sufficiently flexible to accommodate the variant practices among communities, but should not differ so much that they compromise interoperability of data citation practices across communities [8].

Endorse the Data Citation Principles

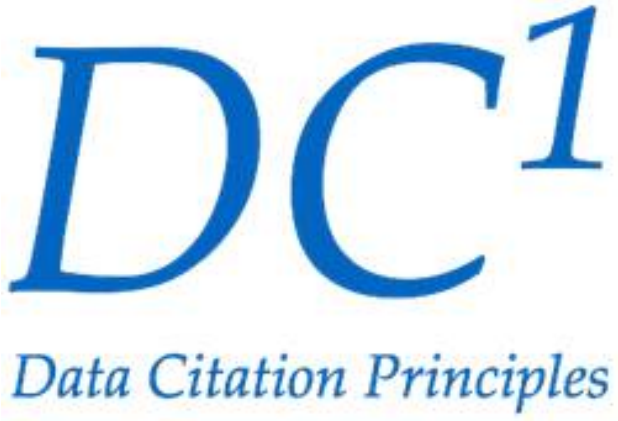
https://www.force11.org/datacitation/endorsements

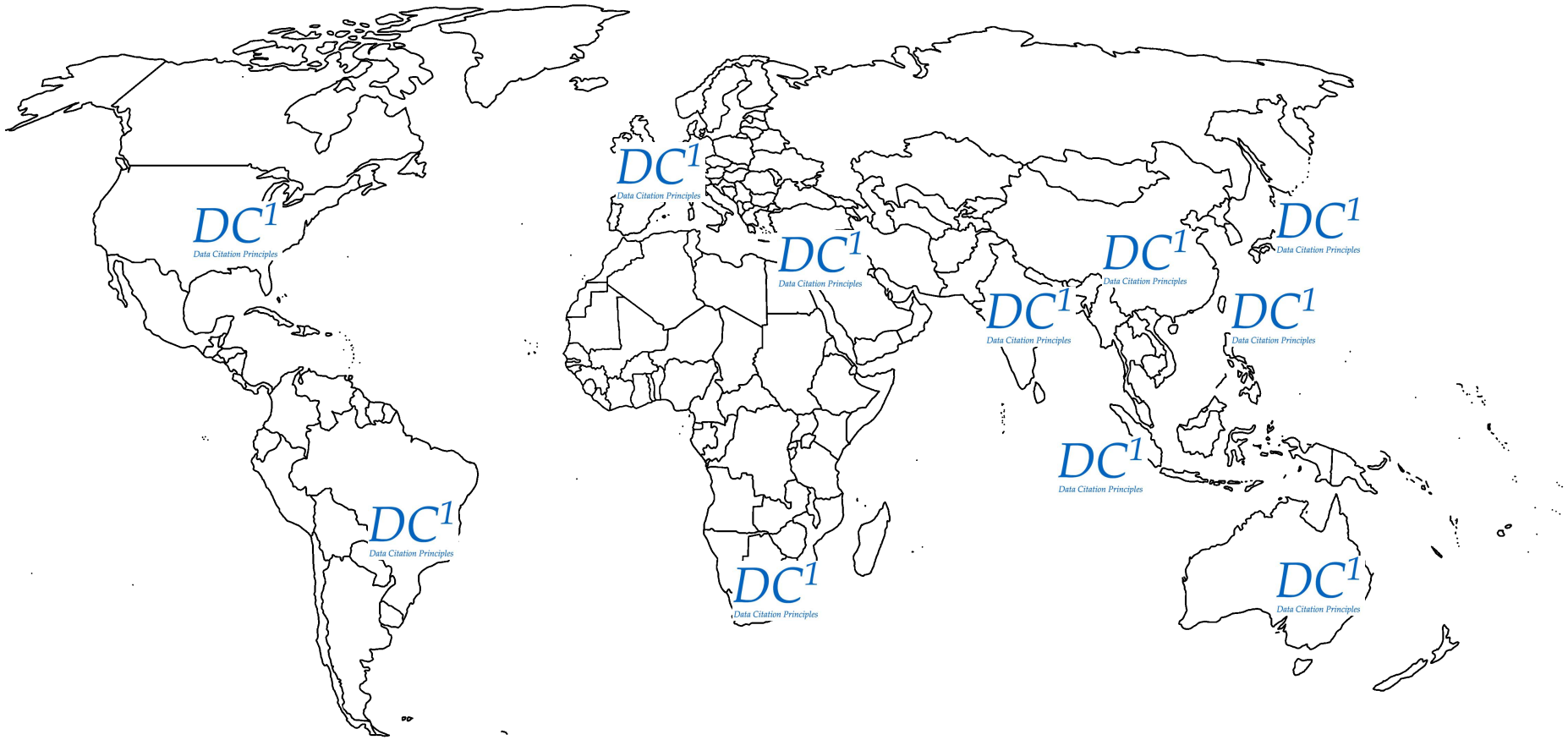
FORCE11
The Future of Research Communications and e-Scholarship



Data Citation: From Principles to Practice

- CODATA Task Group on Data Citation 'Data Citation: From Principles to Practice, A Focus on the Research Policy and Funding Community': http://www.codata.org/task-groups/data-citation-standards-and-practices
- Organising an international series of implementation and adoption workshops.
- **Promote the implementation of data citation principles in the research policy and funding communities throughout the world.**
- **Stakeholders** include: government, funders, research performing institutions, research administrators, research librarians, researchers, learned societies, publishers, data archives, journal editors …
  - What is the policy environment for data citation?
  - What are current attitudes to data citation?
  - What infrastructure currently exists to support data citation?
  - What specific plans for implementation were identified?





DC1

Data Citation Principles

We are taking Data Citation workshops on a world tour!

China… then Australia, Japan, India and South Africa. Plus: USA, Taipei, Korea, Indonesia, Brasil, EC, France, Isreal…

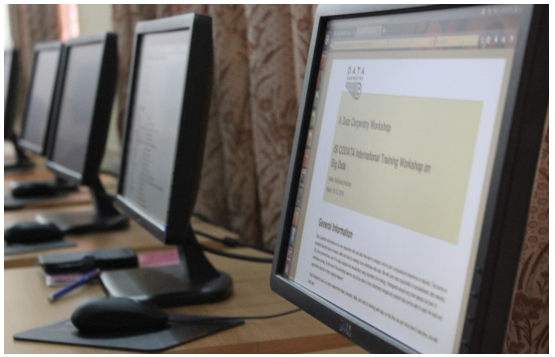
CODATA and Data Science

Capacity Building: Training

CODATA Training in Big Data Science
Beijing, 4-20 June 2014
http://bit.ly/CODATA-China_Training_2104-Call

CODATA ISI Workshop on Big Data, Indian Statistical Institute, Bangalore, 9-20 March 2015
http://drtc1.isibang.ac.in/bdworkshop/

Training Workshop on Open Data, Kenya, Jomo Kenyatta University of Science and Technology, 3-5 August 2014
http://bit.ly/codata-training-jkuat



Research Data Science Summer Schools

CODATA-RDA Research Data Science Science Summer Schools will:

- address a recognised need for Research Data Science skills across disciplines;
- follow an accredited curriculum;
- provide a pathway from a broad introductory course for all researchers (Vanilla) through more advanced and specialised courses (Flavours and Toppings);
- be reproducible: all materials will be online with Open licences;
- be scalable: emphasis will be placed on Training New Teachers (TNT) and building sustainable partnerships;
- **pay particular attention to the needs of young researchers in LMICs.**

Learning Outcomes (Introductory / Vanilla)

Learning Outcomes

1. To understand the importance of data sharing and open science.
2. To understand the importance of annotation and metadata.
3. To have an introductory understanding of developing software for research.
4. To understand how to query and modify an SQL database and the principles behind relational databases.
5. To understand basic principles of statistics, how to deploy machine learning techniques and understand their limitations.
6. To be able to generate simple visualisations of data in an informative fashion.
7. To understand the basic taxonomy of cloud computing.
8. To be able to launch and deploy a Virtual Machine on a Cloud Computing platform.
9. To be able to use a batch submission process.

Research Data Science Summer Schools

First Vanilla School, 1-12 August, ICTP, Trieste

- ICTP providing accommodation and meals for up to 120 students.
- Total 30K euros funding for student travel committed by ICTP, TWAS and CODATA.
- **Priority for students from LMICs.**
- Other sponsors and funders welcome!
- Explore regional schools with TWAS and ICSU regional offices.

software carpentry

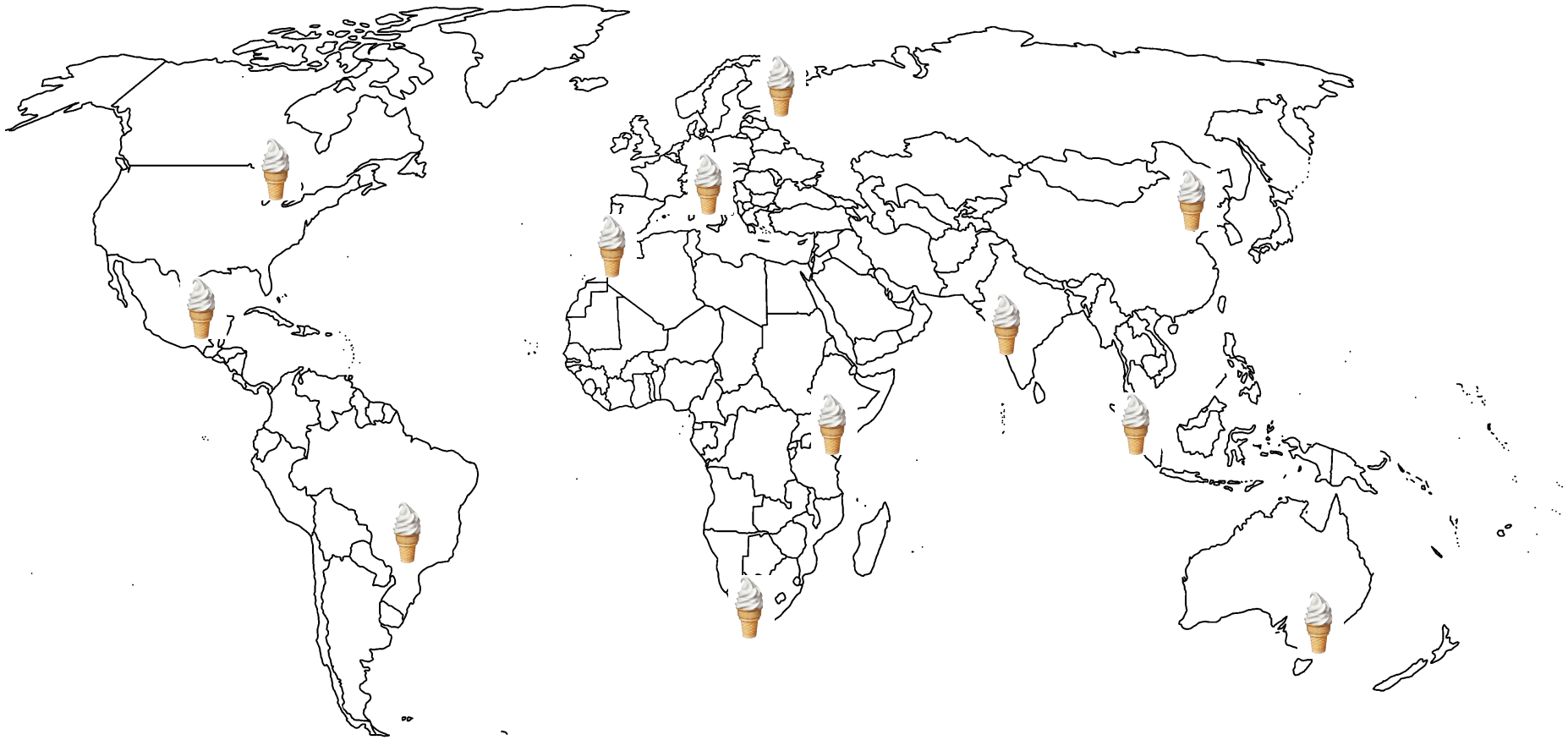
DATA CARPENTRY
MAKING DATA SCIENCE MORE EFFICIENT

DCC

GEO

The Abdus Salam International Centre for Theoretical Physics

twas



We are designing Vanilla for a world tour!

Italy… then South Africa, Mexico, Brasil, USA, Kenya, India, Australia, China, Russia, Indonesia.

What do we mean by data science? What are the pressing issues?

- Strategic mission to address 'frontier issues in data science'.
- What do we mean by 'data science'?
- **Promote the study of data in research (data science) as a discipline.**
- Data science as the systematic study of data in research relates to all areas of scholarly inquiry.
- Contemporary research – particularly when addressing the most significant, transdisciplinary research challenges – increasingly depends on a range of issues relating to data. These issues include the principles and practice of Open Science and research data management and curation, the development of a range of data platforms and infrastructures, the techniques of large scale analysis, statistics, visualisation and modelling techniques, software development and data annotation. The systematic study of these things, of data in research, can usefully be called 'Research Data Science.

- **Key Issues: 1) reproducibility in research; 2) statistical, epistemological and ethical issues in Big Data; 3) coordination of discipline vocabularies (with ISUs); 4) data integration and data strategies for international research programmes (e.g. Urban Health and Wellbeing)**

SciDataCon 2014
International Conference on
Data Sharing and Integration for Global Sustainability

ICSU WORLD DATA SYSTEM

Data Science Journal

- CODATA has relaunched the Data Science Journal with Ubiquity Press.
- New Editor-in-Chief, Sarah Callaghan, data scientist with British Atmospheric Data Centre and expert on many data issues.
- http://datascience.codata.org/
- *Dedicated to the advancement of data science and its application in policies, practices and management as Open Data to ensure that data are used in the most effective and efficient way in promoting knowledge and learning.*

- Ubiquity Press in a publisher with a strong interest in data and software publication and a strong OA ethos.
- Open Scholarship – Researcher Led Publishing.
- Transparent on APC, waivers in case of need.

]u[ubiquity press
open scholarship

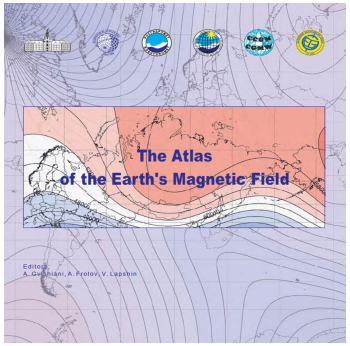
International Data Week 2016

- Jointly organised by CODATA, RDA and WDS.
- Combines 1) two-day research conference, 2) a data forum focusing on policy discussion, 'hacktivism', intersections with open public data and data science, 3) RDA Plenary 8.
- **September or October 2016, USA…**

Organized by:

Challenges in Data Science

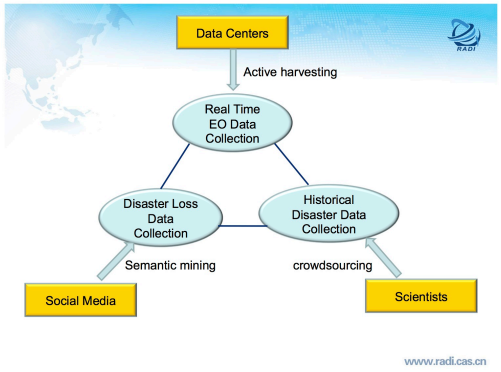
Earth-Space Science Interoperability



Atlas of the Earth's Magnetic Field
http://bit.ly/atlas-magnetic-field

Conferences in Sochi 2016 and St. Petersburg 2017

LOD Global Disaster Data

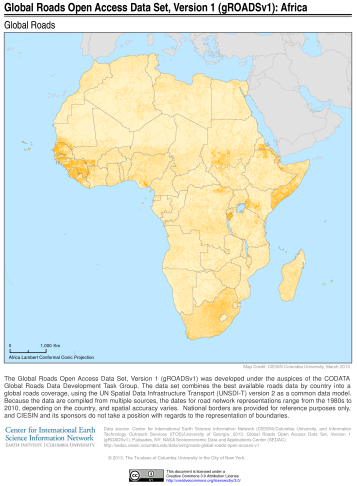


Preparing White Paper on Use of LOD for Disaster Data: http://www.codata.org/task-groups/linked-open-data-for-global-disaster-risk-research

Data at Risk

Memory of the World

Developing 'Principle Guidelines for Data at Risk': http://bit.ly/DAR-guidelines



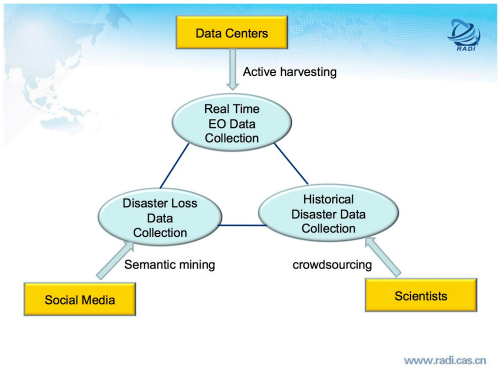
Global Roads Data

Review of Global Roads Data Development Methodologies: http://bit.ly/globalroads-methods

Integrating Geospatial Data on the Web

Coverages and Earth Observation in Linked Data (CEO-LD)

- Funded project led by CODATA.
- UK-China collaboration to implement/validate OGC-W3C standards: http://www.w3.org/2015/ceo-ld/
- Builds on collaborations with RADI, Institute of Remote Sensing and Digital Earth of the Chinese Academy of Sciences and CODATA TG on LOD for Disaster Research.
- Project runs Sept 2015 – May 2016.
- Output will be a draft standard on coverages in Linked Data.



GROUP ON EARTH OBSERVATIONS

Data Strategies for Interdisciplinary, Integrated Research into Smart Cities

Are the data available?

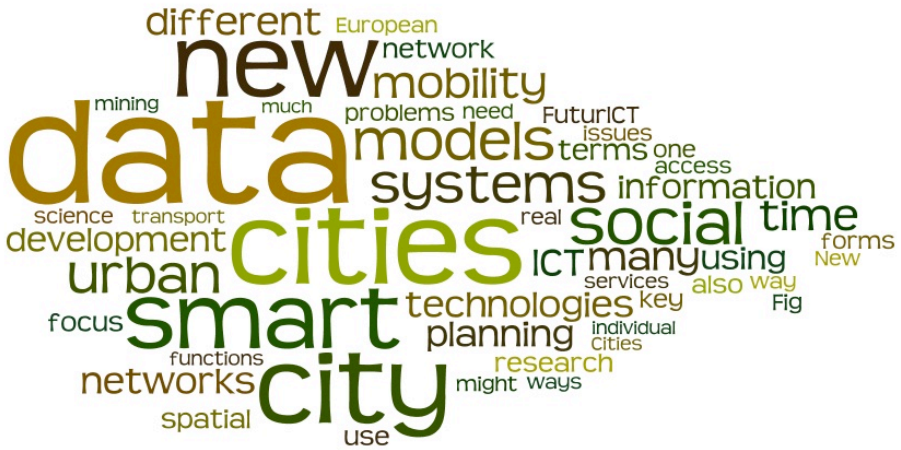
What policies are in place?

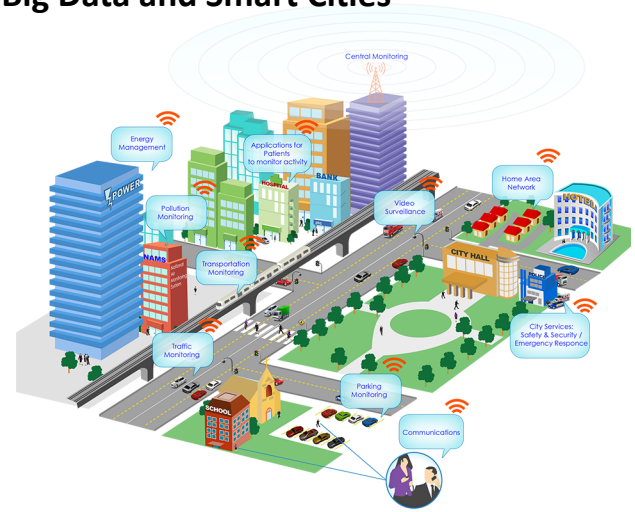
How may the data be integrated, analysed?

What are the ethical implications?

What skills are required?

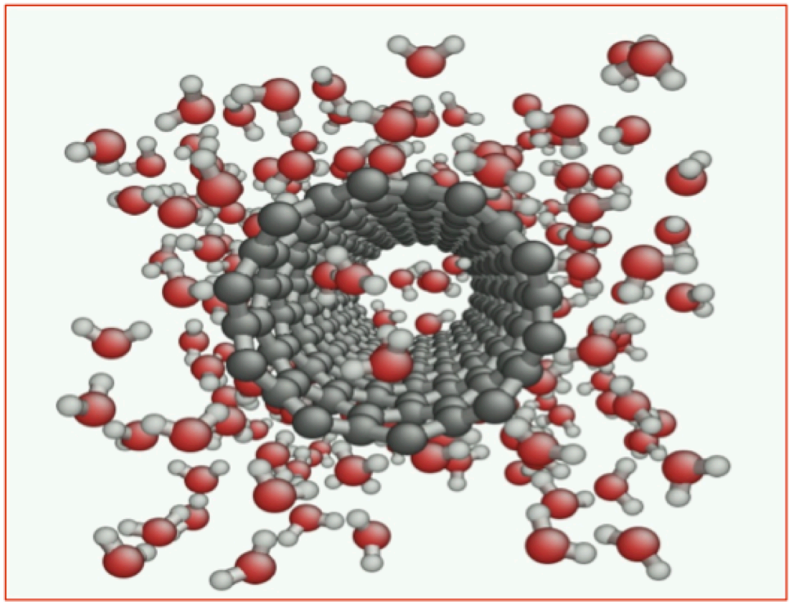
- ISSC World Social Science Fellows Seminar on Big Data in an Urban Context, ICSU Programme on Urban Health and Wellbeing, Xiamen, China, 30 Nov-4 Dec: http://www.codata.org/news/50/62/Call-for-Applications-World-Social-Science-Fellows-Big-Data-in-Urban-Contexts
- **Follow with series of CODATA workshops on Big Data and Smart Cities**





CODATA WG on Description of Nanomaterials

Convene ISUs, International Stakeholders and data experts → Form Working Group → Draft Framework for Description of Nanomaterials → Refine/validate in FP7 Future Nano Needs Project



CODATA-ICSU Workshop:
http://www.codata.info/Nanomaterials/Index-agenda-Nanomaterial.html

CODATA WG on the Description of Nanomaterials:
http://www.codata.org/nanomaterials

Uniform Description System v.01, Feb 2015:
http://dx.doi.org/10.5281/zenodo.20688

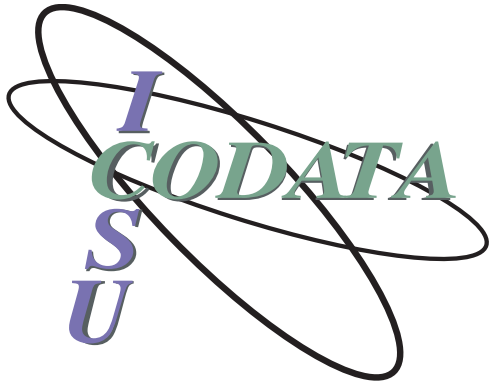
Future Nano Needs Project: http://www.futurenanoneeds.eu/

CODATA Opportunities

- CODATA: a platform for policy development, research into 'data science' and strategic capacity mobilisation.
- Engage with the **Data Science Journal** as a forum for research into data issues.
- Come to **International Data Week** 2016!
- Work with us on the **CODATA-RDA Research Data Science Summer Schools.**
- **Sign up to the Data Citation Principles.**
- Propose a **CODATA Task Group** on a Frontier Data Issue.
- **Forthcoming reports:**
  - CODATA-RDA Legal Interoperability: http://bit.ly/legal-interop-IGs
  - RDA-WDS Income Streams: http://bit.ly/income-streams-draft-P6
  - The Value of Open Data Sharing: White Paper for GEO

DC1 Data Citation Principles

INTERNATIONAL DATA WEEK 2016
WWW.INTERNATIONALDATAWEEK.ORG
Organized by:



ICSU

International Council for Science

Thank you for your attention!

Slide credits: Christine Borgman, Geoffrey Boulton, Sarah Callaghan

Simon Hodson

Executive Director CODATA

www.codata.org

http://lists.codata.org/mailman/listinfo/codata-international_lists.codata.org

Email: simon@codata.org

Twitter: @simonhodson99

Tel (Office): +33 1 45 25 04 96 | Tel (Cell): +33 6 86 30 42 59

CODATA (ICSU Committee on Data for Science and Technology), 5 rue Auguste Vacquerie, 75016 Paris, FRANCE