



# *The Empires of the Future are the Empires of the Mind: Defining the role of libraries in the Open Science landscape*

Conclusions

Citizen  
Science

e-Infrastructure

RDM

Open  
Access

Scope

**UCL**

**SKS**  
Science | Knowledge | Services

# Content

- The scope of Open Science
- Open Access
- Research Data Management
- e-Infrastructure
- Citizen Science
- Conclusions

# The Three Major Shifts of Open Science

- How scientists collaborate to create knowledge  
*RDM, EOSC, ERA, ERIC*
- How scientists find meaning in knowledge  
*The International HapMap Project*
- A change in the relationship Science - Society  
*OA, Citizen Science, Open Days, Pop Science*



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The scope of Open Science  
*Open Access*  
*Research Data Management*  
*e-Infrastructure*  
*Citizen Science*  
*Conclusions*



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## What is Open Science?

Open Science is the movement to make scientific research, data and dissemination accessible at all levels of an enquiring society

[fosteropenscience.eu/foster-taxonomy/open-science](https://fosteropenscience.eu/foster-taxonomy/open-science)

# Open Science

a paradigm shift in the modus operandi of research and science impacting the entire scientific process

## RESEARCH CYCLE

Conceptualization

Data Gathering

Analysis

Review

Publication

## CHARACTERISTICS

Citizen Science

Open Code

Pre-print

Open Access

Alternative Reputation Systems

Collaborative Bibliographies

Science Blogs

Open Annotation

Open Data

Open Lab Books / Workflows

Data Intensive



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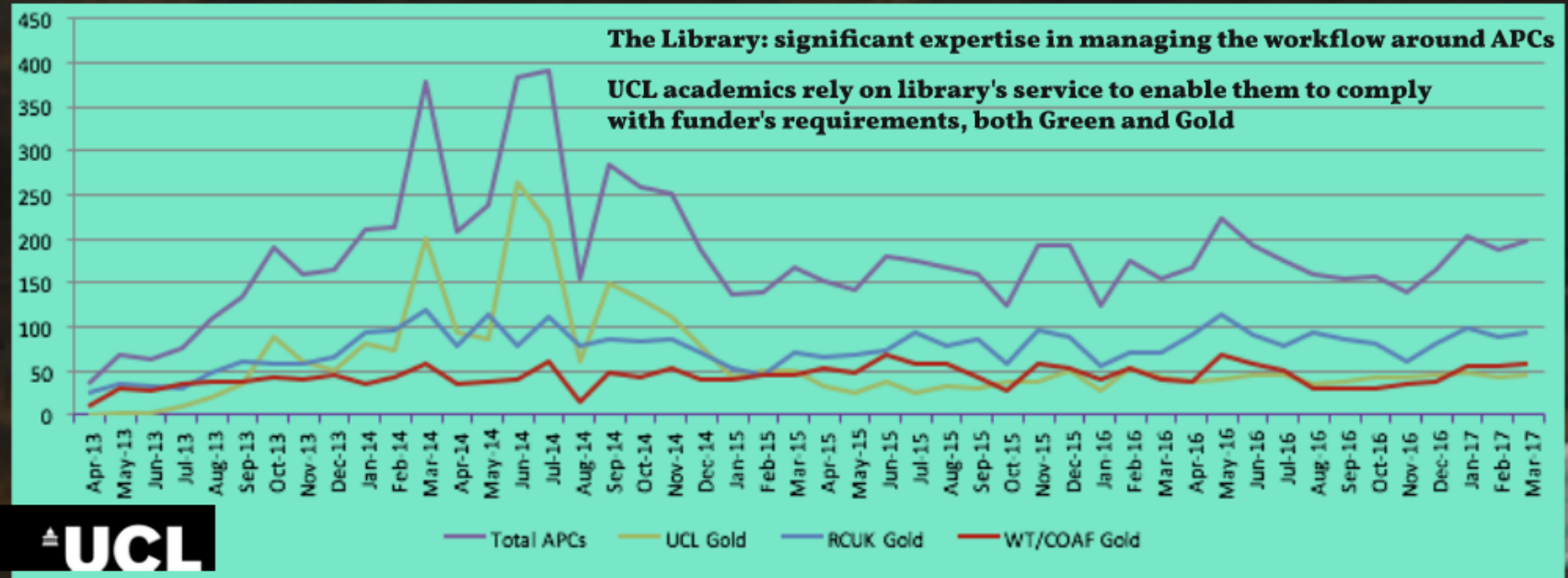


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## Gold APC payments (to March 2017)

8,661 APCs paid since April 2013

RCUK – 3,641 COAF/WT – 2,103 UCL GOLD – 2,917



UCL Press

The UK's first fully Open Access University Press



23 months. 33 books.  
330,000 downloads.

 **UCLPRESS**  
The UK's first fully open access university press

<http://www.ucl.ac.uk/ucl-press>

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## OA Textbooks



Written by Deepak Kalaskar, Peter E. M. Butler, and Shadi Ghali from The Royal Free Hospital, London. The textbook offers a comprehensive overview of reconstructive plastic surgery for introductory plastic surgery and surgical science courses. June 2016

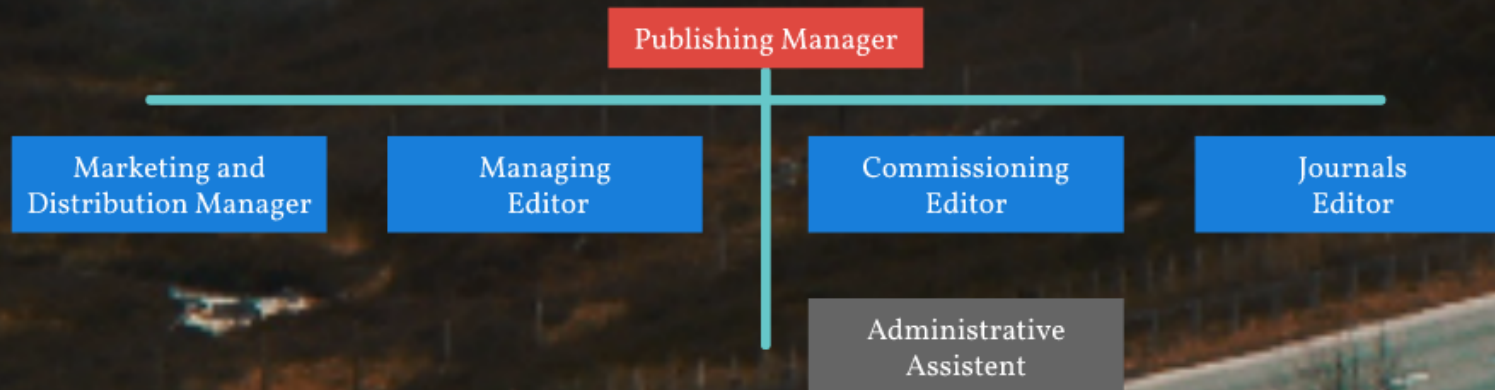


# UCL Publishing model



- OA business model
- Sales via Print on Demand
- Enhanced digital interface
- Books peer reviewed before publication

- Textbook activity
- Journal programme
- Publishing services offered to other universities





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# LEARN

- 5 partners
  - UCL (University College London) – lead partner
  - University of Barcelona
  - University of Vienna
  - LIBER
  - ECLAC – UN Commission for Latin America and the Caribbean
- Started in June 2015; it ran for 24 months
- €497,000 budget
- 100% funded

[www.learn-rdm.eu](http://www.learn-rdm.eu)



*Wilkins Building, UCL, 1826*

## LEARN Deliverables

- Model Research Data Management Policy
- Toolkit to support implementation
- Self-assessment survey
- KPIs to measure levels of success at institutional level
- Executive Briefing (in six languages)
- 20 Recommendations on Best Practice in RDM

*All Deliverables at: <http://learn-rdm.eu/en/dissemination>*

# The LEARN Toolkit of Best Practice Case Studies

**23 chapters of Best Practice Case Studies in 8 sections**

- Policy and Leadership
- Advocacy
- Subject approaches
- Open Data
- Research Data Infrastructure
- Costs
- Roles, Responsibilities, Skills
- Tool development



<http://learn-rdm.eu/en/dissemination>



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# European Open Science Cloud

- EU High Level Expert Group Report
- Launched on 11 October 2016
- Issues considered:
  - Infrastructures
  - Skills development
  - Reward and Recognition
  - Roles and responsibilities
  - Governance & Standards
  - Funding opportunities
- Available here:
  - <http://ec.europa.eu/research/openscience/index.cfm?pg=open-science-cloud>

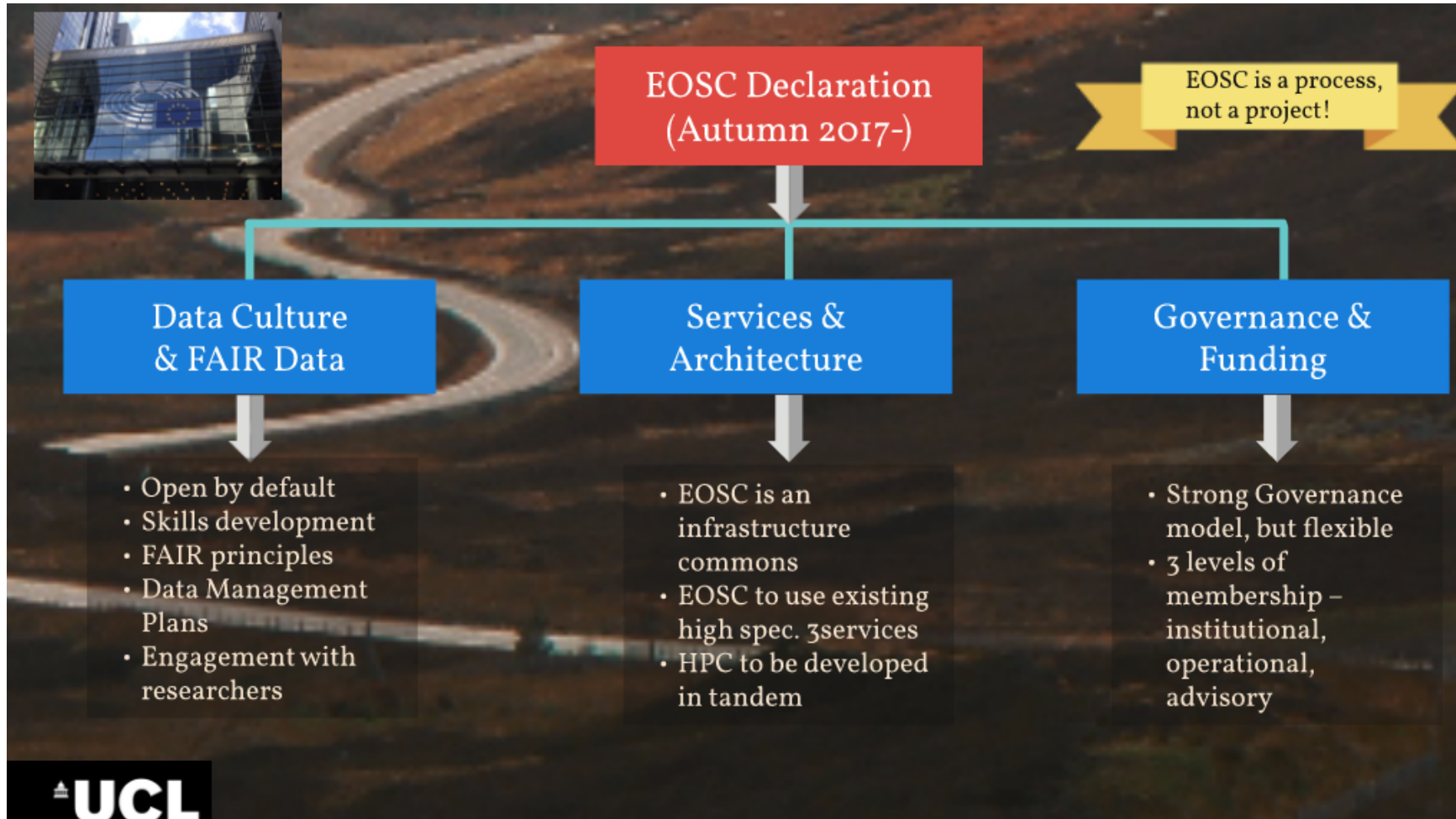


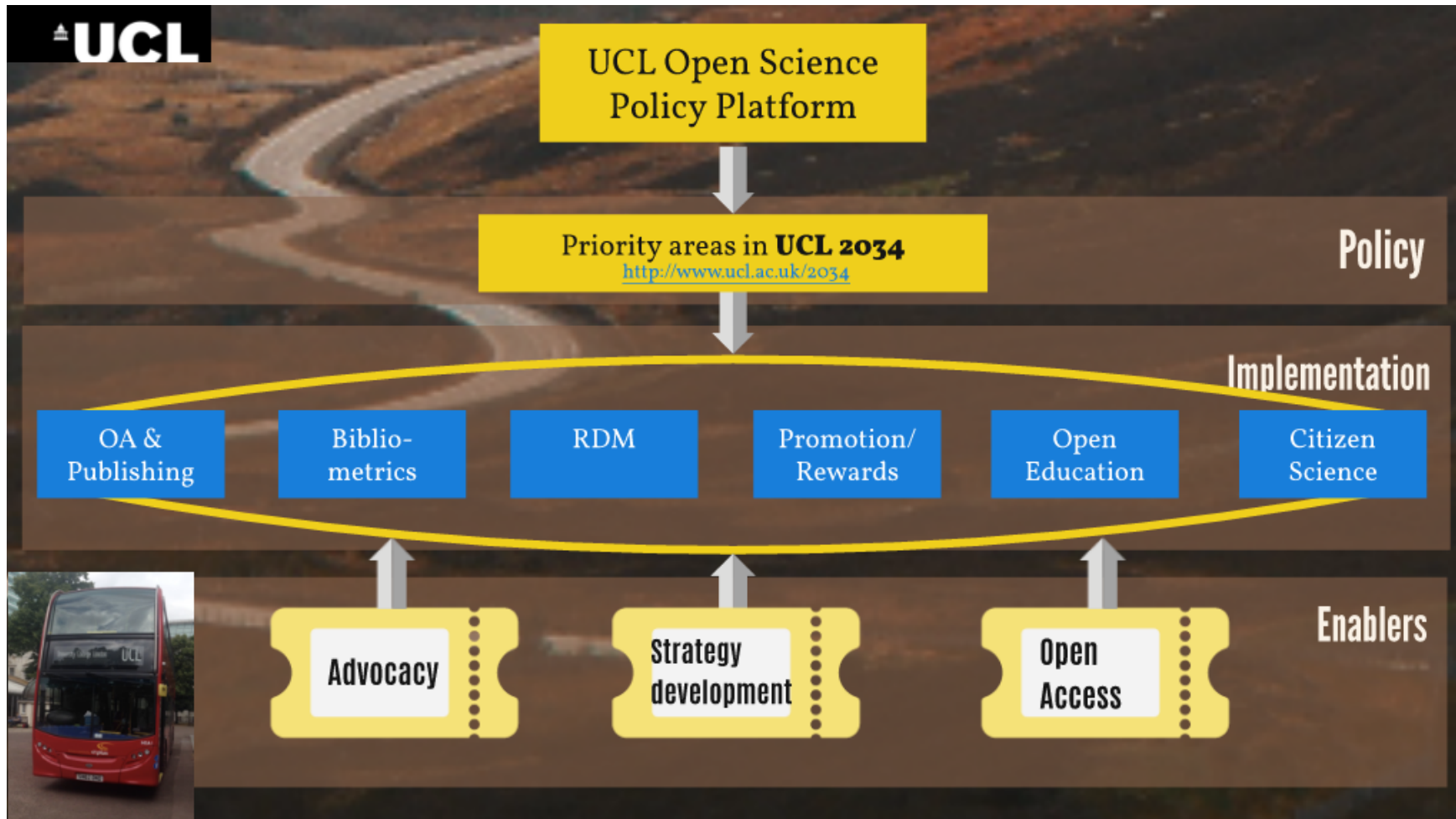
# European Open Science Cloud

- **Headline points:**
  - Build on existing infrastructure and expertise
  - Devise Rules of Engagement
  - EU contribution to FAIR data and Open Science
  - Build links to regional Cloud(s) around the globe
  - Develop expertise
    - Half a million 'core data scientists' in Europe
    - 5% of total research spend should be on data stewardship



*King's Cross Station, London*







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## Citizen Science: Definition

Citizen Science refers to the general public engagement in scientific research activities when citizens actively contribute to science either with their intellectual effort or surrounding knowledge or with their tools and resources

- 2014 EC White Paper on Citizen Science for Europe

Science isn't just something scientists do. It is something in which every single one of us has a stake.

- Professor Ian Chubb, former Chief Scientist of Australia

# Citizen Science: Perspectives and Outcomes

## Perspectives:

- Science
- Education and Engagement
- Project Management

## Outcomes:

- Scientific
- Individual
- Community
- Organizational

# Citizen Science: Components At A Glance

Determine a suitable research idea

Form a team:

*(ideally: scientist+educator+librarian+evaluator)*

Develop, test, and refine:

*(protocols, data forms, educational support materials, marketing and communication package)*

Recruit citizens:

*(and include them in a retention programme)*

Train citizens:

*(and keep records of their training certificates)*

Event(s) development:

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Build FAIR Data:

*(accept, edit, make it FAIR and display data)*

Analyze and interpret data:

*(inform citizens about research methods and the use of their data)*

Disseminate results:

*(use both academic and pop-science standards)*

Measure outcomes:

*(perspectives: scientific, educational and engagement, event management)*

After event actions:

*(equally important with any from above. Ask us!)*

# Citizen Science: Examples

... it's not only about bugs, birds and stars (although we love them) ...

## MATHEMATICS

- 1938, The Math Tables Project (Work Projects Administration, NYC)
- 2016, CrowdMath (MIT PIMES and AoPS)

## PUBLIC HEALTH

- 2005, Malariaccontrol (Swiss Tropical and Public Health Institute + Citizen Cyberlab of CERN, UNITAR and UniGE)

## NEUROSCIENCE

- 2012, Eyewire (Wired Differently, Inc, Seung Lab / Princeton University, Max Planck Institute for Medical Research)

## GOVERNANCE

- 2015, Open Seventeen (ONE, The Governance Lab at New York University, SciFabric, Citizen Cyberlab)

# Citizen Science: Examples

... it's **LOOK AT THIS!** ... (although we love them) ...

## MA **European Illegal Parking (a project of SciStarter)**

• 1938, The Math Tables Project (Work Projects Administration, NYC)

• **The information you provide will help us collect**

PU **enough data to build an European Illegal Parking**

• 2005, Malariacontrol (Swiss Tropical and Public Health Institute + Citizen Cyberlab of CERN, UNITAR and UniGE)

NE **Ranking. Hopefully, this ranking will raise awareness**

• 2012, Eyewire (Wired Differently, Inc, Seung Lab + Princeton University, Max Planck Institute for Medical Research)

GO **to the problem in Europe and thus pressure the**

• 2013, OpenStreetMap (ONE, the Governance Lab at New York University, SciFabric, Citizen Cyberlab)

**national and local institutions to pursue more effective**

**measures to tackle the problem.**



# Citizen Science: Roles for Libraries

Build skills for engaging in citizen science projects

Support (be part of) your organisation's toolkit for developing citizen science projects

Build collections of protocols, data forms and educational materials

Contribute to FAIR data. Develop collections of FAIR data

Offer infrastructure (IT, spaces)

Contribute to evaluation process

Communicate collections and support both scholarly and pop science processes

Participate in recruiting and retention process. Assist volunteers to participate

Participate in marketing activities

Promote a positive attitude towards citizen science

# Citizen Science: part of European strategies

## **LIBER Strategy 2018-2022: HUB FOR DIGITAL SKILLS & SERVICES**

LIBER wants to increase the role of libraries in supporting citizen science. It proposes to do this by:

- Ensuring that Citizen Science enthusiasts are informed about library support for this field
- Making an overview of Citizen Science actions in Europe available to LIBER members
- Organising a Citizen Science workshop where members can discuss the most valuable actions

## **European Council:**

- Promote the creation of appropriate tools as well as standards for interoperability, metadata, citations, anonymization and accessibility.
- Promote the design and definition of sustainability models for Citizen Science projects with long-term commitment for infrastructures and data repositories

## **LERU:**

- Recognise citizen science as an evolving set of research methods, as well as its societal and educational benefits
- Consider creating, where viable, a single point of contact for citizen science within the institution, to advise scientists and ensure liaison with national and regional citizen science initiatives

# Citizen Science: Roles for Libraries, A Survey

The aim is twofold:

1. To picture the current involvement of libraries in citizen science
2. To receive ideas about suitable roles for libraries in citizen science initiatives

- Over 130 invitations were sent
- 8 answers

**You are kindly invited:**

**<http://knowledge.services/citizenscience>**

# Citizen Science: Acknowledgements

links are available at:  
[knowledge.services/citizenscience](http://knowledge.services/citizenscience)

- BONEY, R. Citizen Science: A Developing Tool for Expanding Science Knowledge and Scientific Literacy (2009)
- NIELSEN, M. Reinventing Discovery (2011)
- EC Green Paper on Citizen Science (2014)
- LERU: Citizen Science at Universities: Trends, Guidelines and Recommendations (2016)
- University of Zurich: Citizen Science: New Ways for Research (2016)
- The Australian Guide to Running a BioBlitz (2015)

**Please revisit this presentation:**  
**<http://knowledge.services/presentations>**



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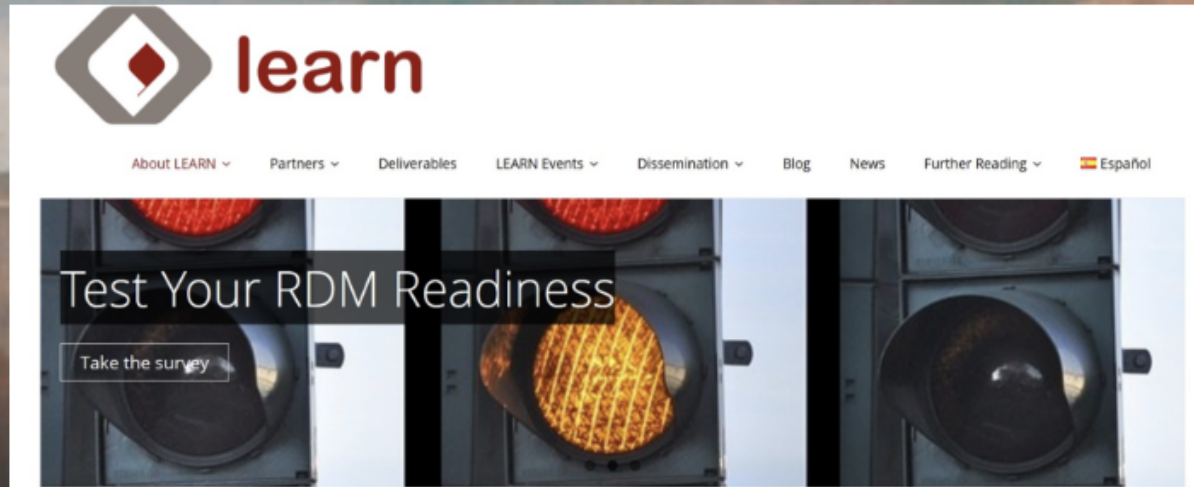
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# Challenges for libraries in Open Science

## 4-step test for libraries to engage in Open Science

1. Offer leadership across the university in open science approaches
2. Identify infrastructure needed to deliver change
3. Engage in skills development for staff
4. Ensure that your advocacy leads to innovation

# LEARN Survey



**Take the survey**

<http://learn-rdm.eu/en/rdm-readiness-survey/>

# Focus on Open Science

*a series of workshops, in partnership with LIBER, e-Infrastructure Plus Austria, EISZ Hungary and CTK Ljubljana*

Nov. 20th, Vienna: <https://knowledge.services/events/2017-vienna/>

Nov. 22nd, Budapest: <https://knowledge.services/events/2017-budapest/>

Nov. 24th, Ljubljana: <https://knowledge.services/events/2017-ljubljana/>

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**knowledge.services/presentations**

**Thanks for listening!**  
**Happy to answer any questions**

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