

# CASRAI

Consortia Advancing Standards in Research  
Administration Information

# About Us

# CASRAI Mission

---

simplify & harmonize administrative requirements so that researchers can “reduce & reuse” their information across multiple processes.

# CASRAI Vision

---

a highly productive and operationally efficient ecosystem where researchers spend no more than 20% of their time on administration.

# CASRAI History

---

- Canada (founding 2006)
- United Kingdom (started in 2016)
- Europe (started in 2017)

More Efficiency.  
More Insights.

— — —  
**Simon Kerridge**

CASRAI International Past Chair

**John Donovan**

CASRAI EU Chair

**Kes Morton**

CASRAI Executive Director

What is Research  
Information?  
(aka: 'admin  
data')



# What is RMI?

— — —

**Research Management:** All the diverse *administrative* work (planning, processing, controlling, evaluation and reporting) spanning institutions *and* funders that comprises the underpinning ‘business’ of all research work.

**Research Management Information (RMI):** All the diverse data needed to inform the above.



CASRAI CA

# Past Initiatives

— — —

- **The Admin Burden in Canada (ABC) initiative**

Convened and coordinated by the Canadian chapter of CASRAI, ABC brings together combined leadership from the Canadian Association of Research Administrators (CARA), the Canadian Association of University Business Officers (CAUBO), the Canadian Association for Graduate Studies (CAGS), the Canadian Association of Research Libraries (CARL), the Canadian Association of Research Ethics Boards (CAREB), Polytechnics Canada as well as active researchers.

# Past Initiatives

— — —

## The inventory

The early work completed under the banner of ABC resulted in an extensive inventory of issues that constituted some level of undue administrative burden, together with identification of the key stakeholders and the desired end state for each. The inventory deals with a number of research and research management categories of interest:

- Personnel Recruitment
- Program Design
- Financial Compliance
- Non-Financial Compliance
- Post-Award Management
- Reporting
- Scholarly Communications

The inventory is accessible at [http://docs.casrai.org/Admin\\_Burden\\_in\\_Canada/Issues](http://docs.casrai.org/Admin_Burden_in_Canada/Issues)

# Past Initiatives

— — —

- **ORCID-CA.** The internationally-used Open Researcher and Contributor ID (or “ORCID”) standard utilizes CASRAI standards; the development of the Canadian Consortium was also catalyzed by CASRAI, but is now spun-off, with CRKN taking on the coordinating role. ORCID was established to solve name ambiguity and researcher identification problems by giving individuals a unique numeric identifier that persists over time. Unlike other author identifiers, ORCID is not limited by discipline or by geographic region or to any proprietary publisher or information provider.
- The **CCCV.** A long-standing priority for CASRAI has been to assist in the evolution of the CCCV to assist in improving its usability by researchers and value for research admin.

# Ongoing Initiatives

---

- **Glossaries, taxonomies and templates**
- CASRAI has led the development and maintenance of a **glossary** of “terms” and definitions specific to research administration information, as well as a number of “taxonomies” and “templates” that can be applied to addressing research administration productivity issues. Links to these source documents are at <http://casrai.org/standards>
- **IRiDiuM (International Research Data Management glossary)** - a practical trans-disciplinary reference for individuals, organizations, and working groups concerned with the improvement of research data and data management, and as a meeting place for further discussion and development of terms.
- The **Tri-Council audit and compliance framework**. (in partnership with CAUBO)

# Ongoing Initiatives

---

- **Glossaries, taxonomies and templates**
- CASRAI has led the development and maintenance of a **glossary** of “terms” and definitions specific to research administration information, as well as a number of “taxonomies” and “templates” that can be applied to addressing research administration productivity issues. Links to these source documents are at <http://casrai.org/standards>
- **IRiDiuM (International Research Data Management glossary)** - a practical trans-disciplinary reference for individuals, organizations, and working groups concerned with the improvement of research data and data management, and as a meeting place for further discussion and development of terms.
- The **Tri-Council audit and compliance framework**. (in partnership with CAUBO)

# Existing templates

— — —

- Research Data Management Plan (Ethics Review)
- Open Access APC Report
- Peer Review Services
- Full Academic CV
- Abridged Academic CV
- Research Outputs Report
- Research/Scholarly Services Report



# New initiatives

— — —

**Researcher Survey** CASRAI CA wishes to increase engagement with researchers for the following reasons:

- Reducing administrative burden on researchers is part of the CASRAI mission
- Researchers have a good understanding of this problem and can advise CASRAI on priority issues
- Researchers can help influence institutions and funders to encourage administrative burden reduction

**Research Impacts** To help researchers, research managers and non-academic partners to be more deliberate in thinking about and planning for outcomes and impacts, as well as collecting evidence of impact.

# CASRAI UK

# Some UK lead activities

— — —

**CRedit**

**Working with UKRI on the new UK Funding System (Je-S replacement)**

**Open Access – taxonomy of metadata**

**Research Impact – taxonomy development**

**Notice of Award**

**H-Group**

**ISNI-IA OrgId Advisory Group**

**Snowball Metrics**

**ReConnect UK 18-19<sup>th</sup> June**

1. Origins of the Contributor Roles Taxonomy (CRediT)
2. Adoption & implementation
3. First insights into its value!
4. Where next ...



## University of Kent

## Established problems with authorship: increasingly outdated

1. Authorship criteria doesn't reflect range of contributions ...
2. ... nor supports accountability

# Authorship doesn't (often) reflect contribution ...

## THE AUTHOR LIST: GIVING CREDIT WHERE CREDIT IS DUE

**The first author**  
Senior grad student on the project. Made the figures.

**The third author**  
First year student who actually did the experiments, performed the analysis and wrote the whole paper. Thinks being third author is "fair".

**The second-to-last author**  
Ambitious assistant professor or post-doc who instigated the paper.

Michaels, C., Lee, E. F., Sap, P. S., Nichols, S. T., Oliveira, L., Smith, B. S.

**The second author**  
Grad student in the lab that has nothing to do with this project, but was included because he/she hung around the group meetings (usually for the food).

**The middle authors**  
Author names nobody really reads. Reserved for undergrads and technical staff.

**The last author**  
The head honcho. Hasn't even read the paper but, hey, he got the funding, and his famous name will get the paper accepted.

www.phdcomics.com

JORGE CHAM © 2005

## Article

August 20, 1997

The JAMA Network®

# When Authorship Fails A Proposal to Make Contributors Accountable

Drummond Rennie, MD; Veronica Yank; Linda Emanuel, MD, PhD

» Author Affiliations

JAMA. 1997;278(7):579-585. doi:10.1001/jama.1997.03550070071041

thebmj

Research ▾

Education ▾

News & Views ▾

Campaigns ▾

Archive

## Editorials

### Authorship: time for a paradigm shift?

BMJ 1997 ; 314 doi: <https://doi.org/10.1136/bmj.314.7086.992> (Published 05 April 1997)

Cite this as: BMJ 1997;314:992



## Established problems with authorship: increasingly outdated

1. Authorship criteria doesn't reflect range of contributions ...
2. ... nor supports accountability
3. **Demise of the lone author**

# Demise of the lone author

University of

◉ [Login](#) [Cart](#)

# nature

International weekly journal of science

Search  go [Advanced search](#)

## Access

To read this story in full you will need to login or make a payment (see right).

[nature.com](#) > [Journal home](#) > [Table of Contents](#)

## Essay

Nature 450, 1165 (20 December 2007) | doi:10.1038/4501165a; Published online 19 December 2007

## The demise of the lone author

Mott Greene<sup>1</sup>

1. Mott Greene is John Magee professor of science and values at the University of Puget Sound, Tacoma, Washington, USA.

**As the average number of contributors to individual papers continues to rise, science's credit system is under pressure to evolve.** [Top](#)

Any issue of *Nature* today has nearly the same number of Articles and Letters as one from 1950, but about four times as many authors. The lone author has all but disappeared.

To read this story in full you will need to login or make a payment (see right).

### ARTICLE LINKS

#### SEE ALSO

- [Editor's Summary](#)

### ARTICLE TOOLS

- ✉ [Send to a friend](#)
- 📄 [Export citation](#)
- 🔒 [Rights and permissions](#)
- 📄 [Order commercial reprints](#)

### SEARCH PUBMED FOR

- [Mott Greene](#)

### I want to purchase this article

Price: \$18

In order to purchase this article you must be a registered user.

[Register now](#)

### I want to buy this article via ReadCube

Rent: \$3.99\*

Purchase: \$9.99\*

\*Printing and sharing restrictions apply

[Purchase now](#)

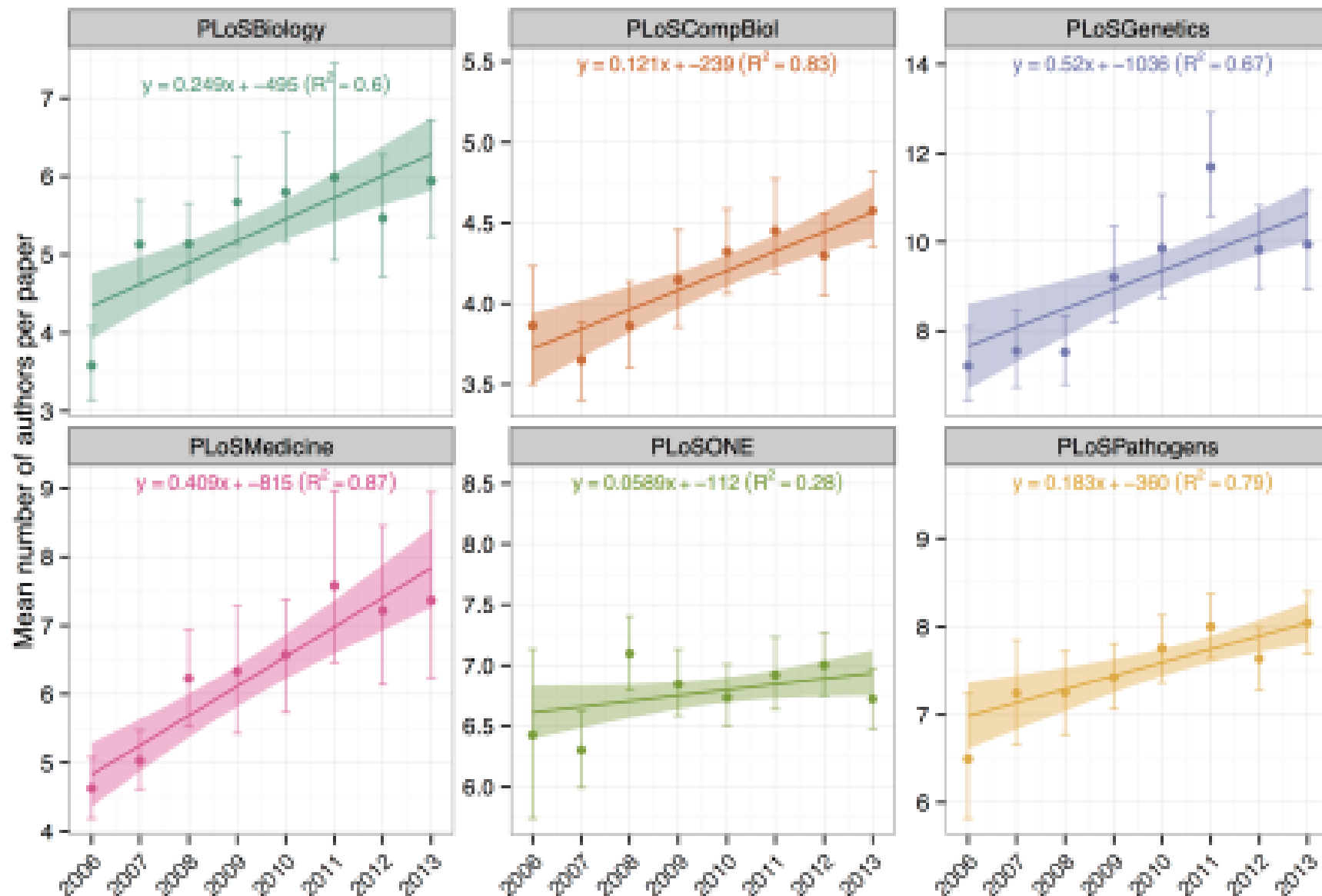
### I want to subscribe to *Nature*

Price: US\$199

This includes a free subscription to *Nature News* together with *Nature Journal*.

[Subscribe now](#)

# Demise of the lone author



## Established problems with authorship: increasingly outdated

1. Authorship criteria doesn't reflect range of contributions ...
2. ... nor supports accountability
3. Demise of the lone author
4. **Team science – lots of 'authors'**

# Extreme team science!

University of

IOPscience

Journals ▾

Books

Login ▾

Journal of Instrumentation

*2,926 authors from  
169 research institutions!*

lookup ▾



Journal of Instrumentation > Volume 3 > August 2008

The ATLAS Collaboration et al 2008 JINST 3 S08003 doi:10.1088/1748-0221/3/08/S08003

## The ATLAS Experiment at the CERN Large Hadron Collider

**OPEN ACCESS** THE CERN LARGE HADRON COLLIDER: ACCELERATOR AND EXPERIMENTS

The ATLAS Collaboration, G Aad<sup>81</sup>, E Abat<sup>18</sup>, J Abdallah<sup>162</sup>, A A Abdelalim<sup>46</sup>, A Abdesselam<sup>116</sup>, O Abdinov<sup>10</sup>, B A Abi<sup>111</sup>, M Abolins<sup>86</sup>, H Abramowicz<sup>150</sup>, E Acerbi<sup>87</sup>, B S Acharya<sup>159</sup>, R Achenbach<sup>55</sup>, M Ackers<sup>20</sup>, D L Adams<sup>23</sup>, F Adamyan<sup>169</sup>, T N Addy<sup>53</sup>, M Aderholz<sup>98</sup>, C Adorisio<sup>35</sup>, P Adragna<sup>72</sup>, M Aharrouche<sup>78</sup>, S P Ahlen<sup>21</sup>, F Ahles<sup>45</sup>, A Ahmad<sup>146</sup>, H Ahmed<sup>2</sup>, G Aielli<sup>133</sup>, P F Åkesson<sup>28</sup>, T P A Åkesson<sup>76</sup>, A V Akimov<sup>93</sup>, S M Alam<sup>1</sup>, J Albert<sup>164</sup>, S Albrand<sup>52</sup>, M Aleksa<sup>28</sup>, I N Aleksandrov<sup>62</sup>, M Aleppo<sup>87</sup>, F Alessandria<sup>87</sup>, C Alexa<sup>24</sup>, G Alexander<sup>150</sup>, T Alexopoulos<sup>9</sup>, G Alimonti<sup>87</sup>, M Aliyev<sup>10</sup>, P P Allport<sup>70</sup>, S E Allwood-Spiers<sup>50</sup>, A Aloisio<sup>101</sup>, J Alonso<sup>14</sup>, R Alves<sup>122</sup>, M G Alvigi<sup>101</sup>, K Amako<sup>63</sup>, P Amaral<sup>28</sup>, S P Amaral<sup>28</sup>, G Ambrosini<sup>16</sup>, G Ambrosio<sup>87</sup>, C Amelung<sup>28</sup>, V V Ammosov<sup>126</sup>, A Amorim<sup>122</sup>, N Amram<sup>150</sup>, C Anastopoulos<sup>151</sup>, B Anderson<sup>74</sup>, K J Anderson<sup>29</sup>, E C Anderssen<sup>14</sup>, A Andreazza<sup>87</sup>, V Andrei<sup>55</sup>, L Andricek<sup>98</sup>, M-L Andrieux<sup>52</sup>, X S Anduaga<sup>67</sup>, F Anghinolfi<sup>28</sup>, A Antonaki<sup>8</sup>, M Antonelli<sup>44</sup>, S Antonelli<sup>19</sup>, R Apsimon<sup>127</sup>, G Arabidze<sup>8</sup>, I Aracena<sup>142</sup>, Y Arai<sup>63</sup>, A T H Arce<sup>14</sup>, J P Archambault<sup>27</sup>, J-F Arguin<sup>14</sup>, E Arik<sup>18</sup>, M Arik<sup>18</sup>, K E Arms<sup>108</sup>, S R Armstrong<sup>23</sup>, M Arnaud<sup>135</sup>, C Arnault<sup>113</sup>, A Artamonov<sup>94</sup>, S Asai<sup>152</sup>, S Ask<sup>79</sup>, B Asman<sup>144</sup>, D Asner<sup>27</sup>, L Asquith<sup>74</sup>, K Assamagan<sup>23</sup>, A Astbury<sup>164</sup>, B Athar<sup>1</sup>, T Atkinson<sup>84</sup>, B Aubert<sup>4</sup>, B Auerbach<sup>168</sup>, E Auge<sup>113</sup>, K Augsten<sup>125</sup>, V M Aulchenko<sup>106</sup>, N Austin<sup>70</sup>, G Avolio<sup>28</sup>, R Avramidou<sup>9</sup>, A Axen<sup>163</sup>, C Ay<sup>51</sup>, G Azuelos<sup>91</sup>, G Baccaglioni<sup>87</sup>, C Bacci<sup>134</sup>, H Bachacou<sup>135</sup>, K Bachas<sup>151</sup>, G Bachy<sup>28</sup>, E Badescu<sup>24</sup>, P Bagnaia<sup>132</sup>, D C Bailey<sup>154</sup>, J T Baines<sup>127</sup>, O K Baker<sup>168</sup>, F Ballester<sup>162</sup>, F Baltasar Dos Santos Pedrosa<sup>28</sup>, E Banas<sup>37</sup>, D Banfi<sup>87</sup>, A Bangert<sup>98</sup>, V Bansal<sup>121</sup>, S P Baranov<sup>93</sup>, S Baranov<sup>5</sup>, A Barashkou<sup>62</sup>, E L Barberio<sup>84</sup>, D Barberis<sup>47</sup>, G Barbier<sup>46</sup>, P Barclay<sup>127</sup>, D Y Bardin<sup>62</sup>, P Bargassa<sup>116</sup>, T Barillari<sup>98</sup>, M Barisonzi<sup>39</sup>, B M Barnett<sup>127</sup>, R M Barnett<sup>14</sup>, S Baron<sup>28</sup>, A Baroncelli<sup>134</sup>, M Barone<sup>44</sup>, A J Barr<sup>116</sup>, F Barreiro<sup>77</sup>, J Barreiro Guimarães da Costa<sup>54</sup>, P Barrillon<sup>113</sup>, A Barriuso Poy<sup>28</sup>, N Barros<sup>122</sup>, V Bartheld<sup>98</sup>, H Bartko<sup>98</sup>, R Bartoldus<sup>142</sup>, S Basiladze<sup>96</sup>, J Bastos<sup>122</sup>, L E Batchelor<sup>127</sup>, R L Bates<sup>50</sup>, J R Batley<sup>26</sup>, S Batraneanu<sup>28</sup>, M Battistin<sup>28</sup>, G Battistoni<sup>87</sup>, V Batusov<sup>62</sup>, F Bauer<sup>135</sup>, B Bauss<sup>78</sup>, D E Baynham<sup>127</sup>, M Bazalova<sup>123</sup>, A Bazan<sup>4</sup>, P H Beauchemin<sup>91</sup>, B Beaugiraud<sup>4</sup>, R B Beccherle<sup>47</sup>, G A Beck<sup>72</sup>, H P Beck<sup>16</sup>, K H Becks<sup>167</sup>, I Bedajane<sup>125</sup>, A J Beddall<sup>18</sup>, A Beddall<sup>18</sup>, P Bednár<sup>143</sup>, V A Bednyakov<sup>62</sup>, C Bee<sup>81</sup>, S Behar Harpaz<sup>149</sup>, G A N Belanger<sup>27</sup>, C Belanger-Champagne<sup>160</sup>, B Belhorma<sup>52</sup>, P J Bell<sup>79</sup>, W H Bell<sup>50</sup>, G Bella<sup>150</sup>, F Bellachia<sup>4</sup>, L Bellagamba<sup>19</sup>, F Bellina<sup>167</sup>, G Bellomo<sup>87</sup>, M Bellomo<sup>117</sup>, O Beltramel<sup>28</sup>, A Belymam<sup>72</sup>, S Ben Ami<sup>149</sup>, M Ben Moshe<sup>150</sup>, O Benary<sup>150</sup>, D Benchekroun<sup>92</sup>, C Benchouk<sup>81</sup>, M Bendel<sup>78</sup>, B H

### Related Articles

1. The integration and engineering of the ATLAS SemiConductor Tracker Barrel
2. Combined performance tests before installation of the ATLAS Semiconductor and Transition Radiation Tracking Detectors
3. Combined performance studies for electrons at the 2004 ATLAS combined test-beam

[More](#)

### Related Review Articles

1. Liquid noble gas detectors for low energy particle physics
2. Comparative analysis of SN1987A antineutrino fluence
3. Particle identification using time of flight

### Share

[Post to CiteUlike](#)

#EARMAConference  
@SimonRKerridge



# Demand to support & incentivise team science



Included recommendations for

## Key Stakeholders



1. Open, transparent, standardized and structured **contribution** information.
2. Open and transparent research information infrastructure which links all **research inputs** and outputs to **individual contributors**
3. Minimise researchers' **administrative burden** and should be interoperable.

<https://acmedsci.ac.uk/policy/policy-projects/team-science>

## Established problems with authorship: increasingly outdated

1. Authorship criteria doesn't reflect range of contributions ...
2. ... nor supports accountability
3. Demise of the lone authors
4. Team science – lots of 'authors'
5. **More information needed to support research/researcher assessment**
6. **Systematic drivers to 'publish' – games & incentives ...**
7. **Recognising & finding expertise**
8. **Space limitations gone away**



COMMENT

Writing

Study  
conception

# Credit where credit is due

Liz Allen, Amy Brand, Jo Scott, Micah Altman and Marjorie Hlava are trialling digital taxonomies to help researchers to identify their contributions to collaborative projects.

Investigation

Formal  
analysis

Research today is rarely a one-person job. Original research papers with a single author are — particularly in the life sciences — a vanishing breed. Partly, the inflation of author numbers on papers has

Through the endorsement of individuals' contributions, researchers can start to move beyond 'authorship' as the dominant measure of esteem. For funding agencies, better information about the contributions of grant applicants would aid the decision-making

journal articles could be classified using a 14-role taxonomy (see "Who did what?"). The survey was sent to 1,200 corresponding authors of work published in PLOS journals, Nature Publishing Group journals, Elsevier journals, Science and eLife. Corresponding authors were asked to indicate the contribu-

*Nature* **508**, 312–313 (17 April 2014) doi:10.1038/508312a



| Term                       | Definition   |
|----------------------------|--|
| Conceptualization          | <i>Ideas; formulation or evolution of overarching research goals and aims.</i>   |
| Methodology                | <i>Development or design of methodology; creation of models.</i>   |
| Software                   | <i>Programming, software development; designing computer programs; implementation of the computer code and supporting algorithms; testing of existing code components.</i>   |
| Validation                 | <i>Verification, whether as a part of the activity or separate, of the overall replication/reproducibility of results/experiments and other research outputs.</i>  |
| Formal Analysis            | <i>Application of statistical, mathematical, computational, or other formal techniques to analyse or synthesize study data.</i>  |
| Investigation              | <i>Conducting a research and investigation process, specifically performing the experiments, or data/evidence collection.</i>  |
| Resources                  | <i>Provision of study materials, reagents, materials, patients, laboratory samples, animals, instrumentation, computing resources, or other analysis tools.</i>  |
| Data Curation              | <i>Management activities to annotate (produce metadata), scrub data and maintain research data (including software code, where it is necessary for interpreting the data itself) for initial use and later re-use.</i> |
| Writing – Original Draft   | <i>Preparation, creation and/or presentation of the published work, specifically writing the initial draft (including substantive translation).</i>  |
| Writing – Review & Editing | <i>Preparation, creation and/or presentation of the published work by those from the original research group, specifically critical review, commentary or revision – including pre- or post-publication stages.</i>    |
| Visualization              | <i>Preparation, creation and/or presentation of the published work, specifically visualization/data presentation.</i>  |
| Supervision                | <i>Oversight and leadership responsibility for the research activity planning and execution, including mentorship external to the core team.</i>   |
| Project Administration     | <i>Management and coordination responsibility for the research activity planning and execution.</i>  |
| Funding Acquisition        | <i>Acquisition of the financial support for the project leading to this publication.</i>   |





# CRedit

CRedit is high-level taxonomy, including 14 roles, that can be used to represent the roles typically played by contributors to scientific scholarly output. The roles describe each contributor's specific contribution to the scholarly output.



## Background

CRedit grew from a practical realization that bibliographic conventions for describing and listing authors on scholarly outputs are increasingly outdated and fail to represent the range of contributions that researchers make to published output.

Furthermore, there is growing interest among researchers, funding agencies, academic institutions, editors, and publishers in increasing both the transparency and accessibility of research contributions.

<https://casrai.org/credit/>

# CRedit implemented across increasing number of outlets

## Publishers

American Association of Petroleum Geologists  
BMJ Open Science  
British Psychological Society  
Cell Press  
Dartmouth Journal Services  
De Gruyter Open  
Duke University Press  
eLife  
Elsevier  
Evidence Based Communications  
F1000 Research  
Geological Society of London  
Health & Medical Publishing Group  
International Centre of Insect Physiology and Ecology  
The Journal of Bone & Joint Surgery  
KAMJE Press  
Lippincott Williams & Wilkins  
MA Healthcare  
MIT Press  
Oman Medical Specialty Board  
Oxford University Press  
Public Library of Science (Plos)  
SAE International  
SLACK Incorporated  
Springer  
Springer Publishing Company  
Wiley VCH  
Wolters Kluwer

Kent

## Integrators

Allen Press/ Peer Track  
Aries Systems/ Editorial Manager  
Coko Foundation/ xPub  
River Valley/ ReView

## Publishing Outlets

Gates Open Research  
HRB Open Research  
Wellcome Open Research



# CRedit taxonomy at PLOS

University of  
**Kent**

Implementation June 2016 – requirement

Author interface:

- Replacement of 5-term contributions list
- Each author must have at least one contribution
- Assigned by corresponding author
- For PLOS Medicine: mapping to ICMJE criteria

Human- **and** machine-readable:

- JATS draft

<https://casrai.org/credit/>

Source: Veronique Kiermer, PLOS 2018



 OPEN ACCESS  PEER-REVIEWED

RESEARCH ARTICLE

# More than 75 percent decline over 27 years in total flying insect biomass in protected areas

Caspar A. Hallmann , Martin Sorg, Eelke Jongejans, Henk Siepel, Nick Hofland, Heinz Schwan, Werner Stenmans, Andreas Müller, Hubert Sumser, Thomas Hörrén, Dave Goulson, Hans de Kroon

Published: October 18, 2017 • <https://doi.org/10.1371/journal.pone.0185809>

 In Library 

827  
Save

20  
Citation

479,490  
View

1,854  
Share

Article


Authors

Metrics

Comments

Related Content



Download PDF 

Print

Share

 Check for updates

Abstract

[Introduction](#)

[Materials and methods](#)

[Results](#)

[Discussion](#)

[Supporting information](#)

[Acknowledgments](#)

## Abstract

Global declines in insects have sparked wide interest among scientists, politicians, and the general public. Loss of insect diversity and abundance is expected to provoke cascading effects on food webs and to jeopardize ecosystem services. Our understanding of the extent and underlying causes of this decline is based on the abundance of single species or taxonomic groups only, rather than changes in insect biomass which is more relevant for ecological functioning. Here, we used a standardized protocol to measure total insect biomass using Malaise traps, deployed over 27 years in 63 nature protection areas in Germany (96 unique

Included in the  
Following Collection

[PLOS ONE 10 Year Anniversary Collection: Editorial Board Favorites](#)



OPEN ACCESS PEER-REVIEWED

RESEARCH ARTICLE

# More than 75 percent decline over 27 years in total flying insect biomass in protected areas

Caspar A. Hallmann, Martin Sorg, Eelke Jongejans, Henk Siepel, Nick Hofland, Heinz Schwan, Werner Stenmans, Andreas Möller, Hubert Sumser, Thomas Hörrén, Dave Goulson, Hans de Kroon

Published: October 18, 2017 • <https://doi.org/10.1371/journal.pone.0185809>

In Library

827  
Save

20  
Citation

479,490  
View

1,854  
Share

Article

Authors

Metrics

Comments

Related Content

Download PDF

Print

Share

Check for updates

Abstract

Introduction

Materials and methods

Results

Discussion

Supporting information

Acknowledgments

## Abstract

Global declines in insects have sparked wide interest among scientists, politicians, and the general public. Loss of insect diversity and abundance is expected to provoke cascading effects on food webs and to jeopardize ecosystem services. Our understanding of the extent and underlying causes of this decline is based on the abundance of single species or taxonomic groups only, rather than changes in insect biomass which is more relevant for ecological functioning. Here, we used a standardized protocol to measure total insect biomass using Malaise traps, deployed over 27 years in 63 nature protection areas in Germany (96 unique

Included in the  
Following Collection

PLOS ONE 10 Year  
Anniversary Collection:  
Editorial Board Favorites

OPEN ACCESS PEER-REVIEWED

RESEARCH ARTICLE

# More than 75 percent decline over 27 years in total flying insect biomass in protected areas

Caspar A. Hallmann, Martin Sorg, Eelke Jongejans, Henk Siepel, Nick Hoffand, Heinz Schwan, Werner Stenmans,

**Roles:** Conceptualization, Formal analysis, Investigation, Methodology, Software, Validation, Visualization, Writing – original draft, Writing – review & editing

c.hallmann@science.ru.nl

**Affiliation:** Radboud University, Institute for Water and Wetland Research, Animal Ecology and Physiology & Experimental Plant Ecology, PO Box 9100, 6500 GL Nijmegen, The Netherlands

<http://orcid.org/0000-0002-4630-0522>

In Library

Comments

Related Content

827  
Save

20  
Citation

479,490  
View

1,854  
Share

Download PDF

Print

Share

Check for updates

Included in the  
Following Collection

PLOS ONE 10 Year  
Anniversary Collection:  
Editorial Board Favorites

Supporting information

Acknowledgments

References

underlying causes of this decline is based on the abundance of single species or taxonomic groups only, rather than changes in insect biomass which is more relevant for ecological functioning. Here, we used a standardized protocol to measure total insect biomass using Malaise traps, deployed over 27 years in 63 nature protection areas in Germany (96 unique location-year combinations) to infer on the status and trend of local exteroforms. Our analysis



OPEN ACCESS PEER-REVIEWED

RESEARCH ARTICLE

# More than 75 percent decline over 27 years in total flying insect biomass in protected areas

Caspar A. Hallmann , Martin Sorg, Eelke Jongejans, Henk Siepel, **Nick Hofland**, Heinz Schwan, Werner Stenmans, Andreas Müller, Hubert Sumser, Thomas Hörrén, Dave Goulson, Ha

Published: October 18, 2017 • <https://doi.org/10.1371/journal.pone.0>

**827**  
Save

**20**  
Citation

**479,490**  
View

**1,854**  
Share

Article

Authors

Metrics

**Roles:** Formal analysis, Resources, Software, Validation

**Affiliation:** Radboud University, Institute for Water and Wetland Research, Animal Ecology and Physiology & Experimental Plant Ecology, PO Box 9100, 6500 GL Nijmegen, The Netherlands

[Download PDF](#)

[Share](#)

**Abstract**

[Introduction](#)

[Materials and methods](#)

[Results](#)

[Discussion](#)

[Supporting information](#)

[Acknowledgments](#)

## Abstract

Global declines in insects have sparked wide interest among scientists, politicians, and the general public. Loss of insect diversity and abundance is expected to provoke cascading effects on food webs and to jeopardize ecosystem services. Our understanding of the extent and underlying causes of this decline is based on the abundance of single species or taxonomic groups only, rather than changes in insect biomass which is more relevant for ecological functioning. Here, we used a standardized protocol to measure total insect biomass using Malaise traps, deployed over 27 years in 63 nature protection areas in Germany (96 unique

Check for updates



**Included in the Following Collection**

[PLOS ONE 10 Year Anniversary Collection: Editorial Board Favorites](#)

# More than 75 percent decline over 27 years in total flying insect biomass in protected areas

Caspar A. Hallmann , Martin Sorg, Eelke Jongejans, Henk Siepel, Nick Hofland, Heinz Schwan, Werner Stenmans, Andreas Müller, Hubert Sumser, Thomas Hörrn, Dave Goulson, Hans de Kroon

Published: October 18, 2017 • <https://doi.org/10.1371/journal.pone.0185809>

 In Library 

827  
Save

20  
Citation

479,487  
View

1,854  
Share


Article

Authors

Metrics

Comments

Related Content

Download PDF 

Print

Share

 Check for updates

## About the Authors

### Caspar A. Hallmann

**Roles:** Conceptualization, Formal analysis, Investigation, Methodology, Software, Validation, Visualization, Writing – original draft, Writing – review & editing

\* E-mail: [c.hallmann@science.ru.nl](mailto:c.hallmann@science.ru.nl)

**Affiliation:** Radboud University, Institute for Water and Wetland Research, Animal Ecology and Physiology & Experimental Plant Ecology, PO Box 9100, 6500 GL Nijmegen, The Netherlands

**ORCID:** <http://orcid.org/0000-0002-4630-0522>

### Martin Sorg

**Roles:** Conceptualization, Data curation, Funding acquisition, Investigation, Methodology, Resources, Writing – review & editing

**Affiliation:** Entomological Society Krefeld e.V., Entomological Collections Krefeld, Marktstrasse 159, 47798 Krefeld, Germany

### Eelke Jongejans

**Roles:** Conceptualization, Funding acquisition, Investigation, Supervision, Writing – review & editing

**Affiliation:** Radboud University, Institute for Water and Wetland Research, Animal Ecology and Physiology & Experimental Plant Ecology, PO Box 9100, 6500 GL Nijmegen, The Netherlands

Included in the  
Following Collection

[PLOS ONE 10 Year Anniversary Collection:](#)  
[Editorial Board Favorites](#)

ADVERTISEMENT



#EARMAConference  
@SimonRKerridge



# CRedit taxonomy at F1000

Implementation across all F1000 Open Research Platforms since 2017

Author interface:

- Within submission process
- Each author must have at least one contribution
- Assigned by corresponding author

Human- **and** machine-readable:

- JATS draft

<https://casrai.org/credit/>

Source: Veronique Kiermer, PLOS 2018

Wellcome Open Research

BROWSE GATEWAYS HOW TO PUBLISH ABOUT BLOG MY ACCOUNT SIGN IN

**W**  
wellcome

## Wellcome Open Research

A new way for Wellcome-funded researchers to rapidly publish any results they think are worth sharing.

**SUBMIT YOUR RESEARCH**

Browse Articles →

04 SEPTEMBER 2017 Safety and effectiveness of mass drug administration to accelerate elimination ...

05 SEPTEMBER 2017 Evaluation of the Luminex xTAG Respiratory Viral Panel FAST v2 assay fo...

05 SEPTEMBER 2017 Geographic-genetic an Plasmodium falciparum

Health Research Board

**COMING SOON**

## HRB Open Research

A platform for HRB-funded researchers to publish their research outputs in an open and accessible way

**STAY UPDATED** **READ MORE IN THIS BLOG →**

**HRB** Health Research Board

MNI Open Research

**COMING SOON**

## MNI Open Research

Tanenbaum Open Science Institute

A platform for rapid, author-led publication and open peer review of any research conducted at the Montreal Neurological Institute and Hospital.

**STAY UPDATED** **READ MORE IN THIS BLOG →**

**neuro**  
INSTITUTE OF NEUROLOGICAL SCIENCES  
RESEARCH, TEACHING, CLINICAL CARE

Powered by F1000

**COMING SOON**

## AMRC Open Research

A platform for rapid author-led publication and open peer review of research funded by AMRC member charities

**STAY UPDATED** **READ MORE IN THIS BLOG →**

Powered by F1000

Grid of logos for AMRC member charities:

- amrc
- Alzheimer's Research UK
- ATAXIA
- AUTISTICA
- BRACE
- Children's Cancer and Paralysis Group
- epilepsy research uk
- WE ARE MACMILLAN. CANCER SUPPORT
- Marie Curie
- Meningitis Research Foundation
- MQ
- MS Society
- national eye research institute
- National Osteoporosis Society
- Pancreatic Cancer UK
- HUNKINSON'S CHANGE ATTITUDES. FIND A CURE. JOIN US.
- Pharmacy Research UK
- Royal Hospital for Neuro-disability
- spinal research
- Stroke
- TARGET OESOPHAGEAL CANCER
- THE BRAIN TUMOUR CHARITY
- The Cure Parkinson's Trust
- The Lottery Trust
- THE SIBERT FREE FOUNDATION

BILL & MELINDA GATES foundation

ARTICLE GUIDELINES FAQs


**COMING SOON**

## GATES OPEN RESEARCH

A platform for rapid author-led publication and open peer review of research funded by Bill & Melinda Gates Foundation

**READ MORE IN THIS BLOG →**

**STAY UPDATED** **HOW TO SUBMIT**



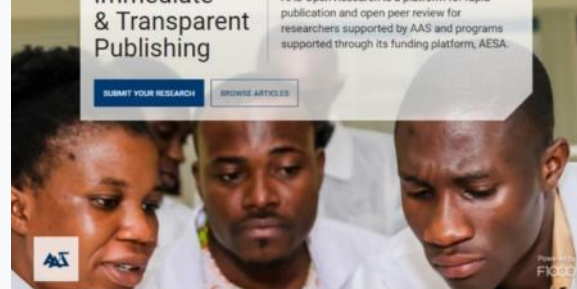
AAS Open Research

BROWSE HOW TO PUBLISH ABOUT BLOG MY ACCOUNT SIGN IN

**Immediate & Transparent Publishing**

AAS Open Research is a platform for rapid publication and open peer review for researchers supported by AAS and programs supported through its funding platform, AESA.

**SUBMIT YOUR RESEARCH** **BROWSE ARTICLES**



**Recent Articles | Source all →**

- 21 JUN 2018 The Collaborative African Genomics Network (CAGEN): Applying Genomic tr...
- 17 MAY 2018 Characterization of culturable airborne bacteria and antibiotic susceptibility prof...
- 10 MAY 2018 Physiologically-based pharmacokinetic modelling of infant exposure to flavonoids...

UCL Child Health Open Research

**COMING SOON**

## UCL Child Health Open Research

A platform for rapid, author-led publication and open peer review of any research focusing on child health from UCL Great Ormond Street Institute of Child Health.

**STAY UPDATED** **READ MORE IN THIS BLOG**



**UCL**  
GREAT ORMOND STREET  
INSTITUTE OF CHILD HEALTH

Powered by F1000





## RESEARCH ARTICLE

**REVISED** The age of heterozygous *telomerase* mutant parents influences the adult phenotype of their offspring irrespective of genotype in zebrafish [version 2; referees: 2 approved]

Catherine M. Scahill<sup>1</sup>, Zsolia Digby<sup>1,2</sup>, Ian M. Sealy<sup>1</sup>, Richard J. White <sup>1</sup>, Neha Wali<sup>1</sup>, John E. Collins<sup>1</sup>, Derek L. Stemple<sup>1</sup>, Elisabeth M. Busch-Nentwich <sup>1,3</sup>

[Author details](#)

<sup>1</sup> Wellcome Trust Sanger Institute, Wellcome Genome Campus, Hinxton, UK

<sup>2</sup> Department of Veterinary Medicine, University of Cambridge, Cambridge, UK

<sup>3</sup> Department of Medicine, University of Cambridge, Cambridge, UK

Catherine M. Scahill

Roles: Conceptualization, Investigation, Visualization, Writing – Original Draft Preparation, Writing – Review & Editing

Zsolia Digby

Roles: Investigation, Visualization

Ian M. Sealy

Roles: Data Curation, Formal Analysis, Visualization

Richard J. White

Roles: Data Curation, Formal Analysis, Visualization

Neha Wali

Roles: Investigation

John E. Collins

Roles: Conceptualization

Derek L. Stemple

Roles: Funding Acquisition, Resources

Elisabeth M. Busch-Nentwich

Roles: Conceptualization, Funding Acquisition, Resources, Supervision, Writing – Original Draft Preparation, Writing – Review & Editing

[Grant information](#)

## METRICS

338

VIEWS

125

DOWNLOADS

Get PDF

Get XML

Cite

Export

Track

Email

Share

## Open Peer Review

Referee Status:

| Version(s)  | Invited Referees |                 |
|---|------------------|-----------------|
|   | 1                | 2               |
| <b>REVISED</b><br>Version 2<br>published<br>22 Feb 2018 | <br>read report  | <br>read report |
| Version 1<br>published<br>04 Sep 2017                   | <br>read report  | <br>read report |

1 **Noriyoshi Sakai** , National Institute of Genetics, Japan

2 **Karl-Lenhard Rudolph**, Leibniz Institute For Age Research, Germany

[All reports \(4\)](#), [Responses and comments \(2\)](#)

## Comments on this article

[All comments \(0\)](#)

[Add a Comment](#)

## Subscribe to Table of Content Alert

SUBSCRIBE



## PERSPECTIVE

# Transparency in authors' contributions and responsibilities to promote integrity in scientific publication

Marcia K. McNutt<sup>a,1</sup>, Monica Bradford<sup>b</sup>, Jeffrey M. Drazen<sup>c</sup>, Brooks Hanson<sup>d</sup>, Bob Howard<sup>e</sup>, Kathleen Hall Jamieson<sup>f</sup>, Véronique Kiermer<sup>g</sup>, Emilie Marcus<sup>h</sup>, Barbara Kline Pope<sup>i,2</sup>, Randy Schekman<sup>j,k</sup>, Sowmya Swaminathan<sup>l</sup>, Peter J. Stang<sup>m</sup>, and Inder M. Verma<sup>n</sup>

Edited by Karen S. Cook, Stanford University, Stanford, CA, and approved January 18, 2018 (received for review August 30, 2017)

In keeping with the growing movement in scientific publishing toward transparency in data and methods, we propose changes to journal authorship policies and procedures to provide insight into which author is responsible for which contributions, better assurance that the list is complete, and clearly articulated standards to justify earning authorship credit. To accomplish these goals, we recommend that journals adopt common and transparent standards for authorship, outline responsibilities for corresponding authors, adopt the Contributor Roles Taxonomy (CRediT) ([docs.casrai.org/CRediT](https://docs.casrai.org/CRediT)) methodology for attributing contributions, include this information in article metadata, and require authors to use the ORCID persistent digital identifier (<https://orcid.org>). Additionally, we recommend that universities and research institutions articulate expectations about author roles and responsibilities to provide a point of common understanding for discussion of authorship across research teams. Furthermore, we propose that funding agencies adopt the ORCID identifier and accept the CRediT taxonomy. We encourage scientific societies to further authorship transparency by signing on to these recommendations and promoting them through their meetings and publications programs.

authorship principles | research transparency | scientific integrity





# First insights into CRediT value

Vincent Larivière, Université de Montréal

Cassidy R. Sugimoto, Indiana University Bloomington



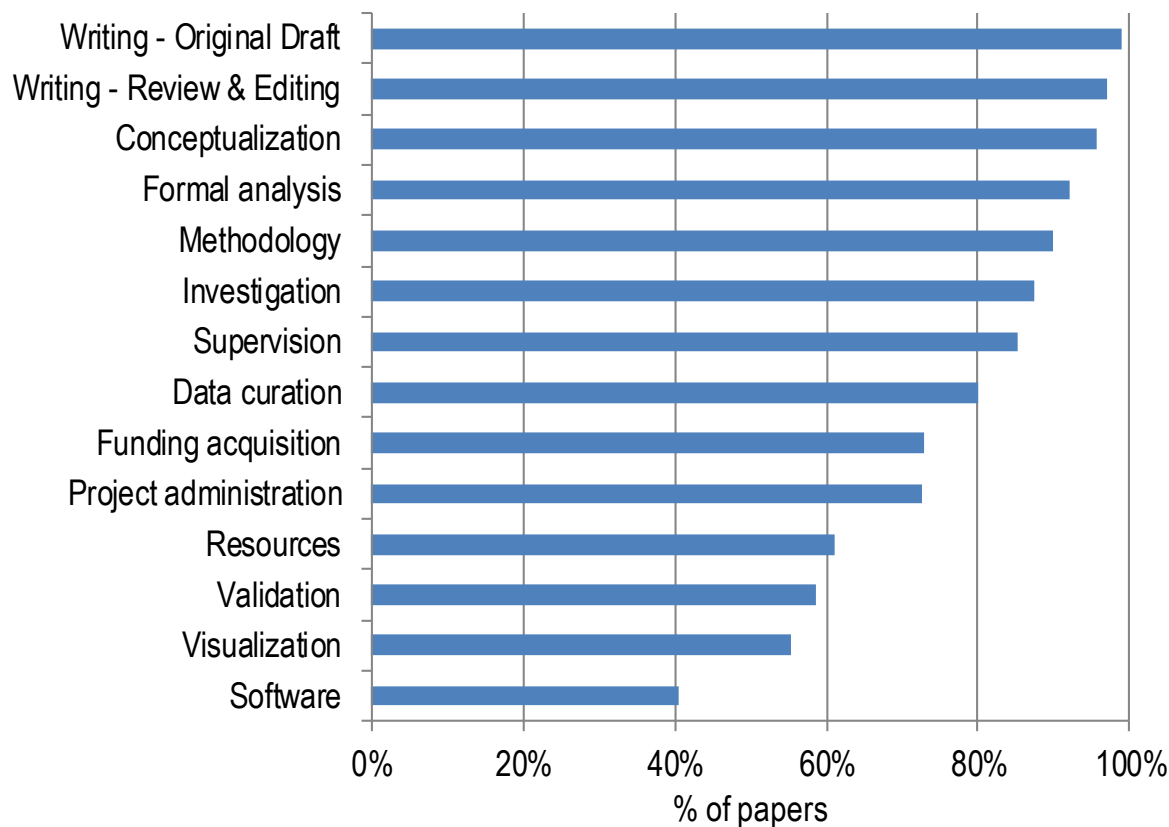


# Dataset: PLOS contributions July 2017-June 2018

| Journal                          | N.<br>papers | Mean N. of CRediT<br>Contributions per paper | Mean N. of<br>authors per paper |
|----------------------------------|--------------|--|---------------------------------|
| PLOS Biology                     | 1            | 14.0   | 1.0                             |
| PLOS Computational Biology       | 376          | 11.1   | 5.2                             |
| PLOS Genetics                    | 375          | 11.2   | 9.1                             |
| PLOS Medicine                    | 129          | 10.9   | 15.5                            |
| PLOS Neglected Tropical Diseases | 607          | 11.3   | 10.0                            |
| PLOS One                         | 13,667       | 10.8   | 7.2                             |
| PLOS Pathogens                   | 411          | 11.2   | 10.1                            |
| All PLOS Journals                | 15,566       | 10.9   | 7.5                             |

*Vincent Larivière, Cassidy Sugimoto, preliminary results*

## Percentage of papers with specific CRediT role

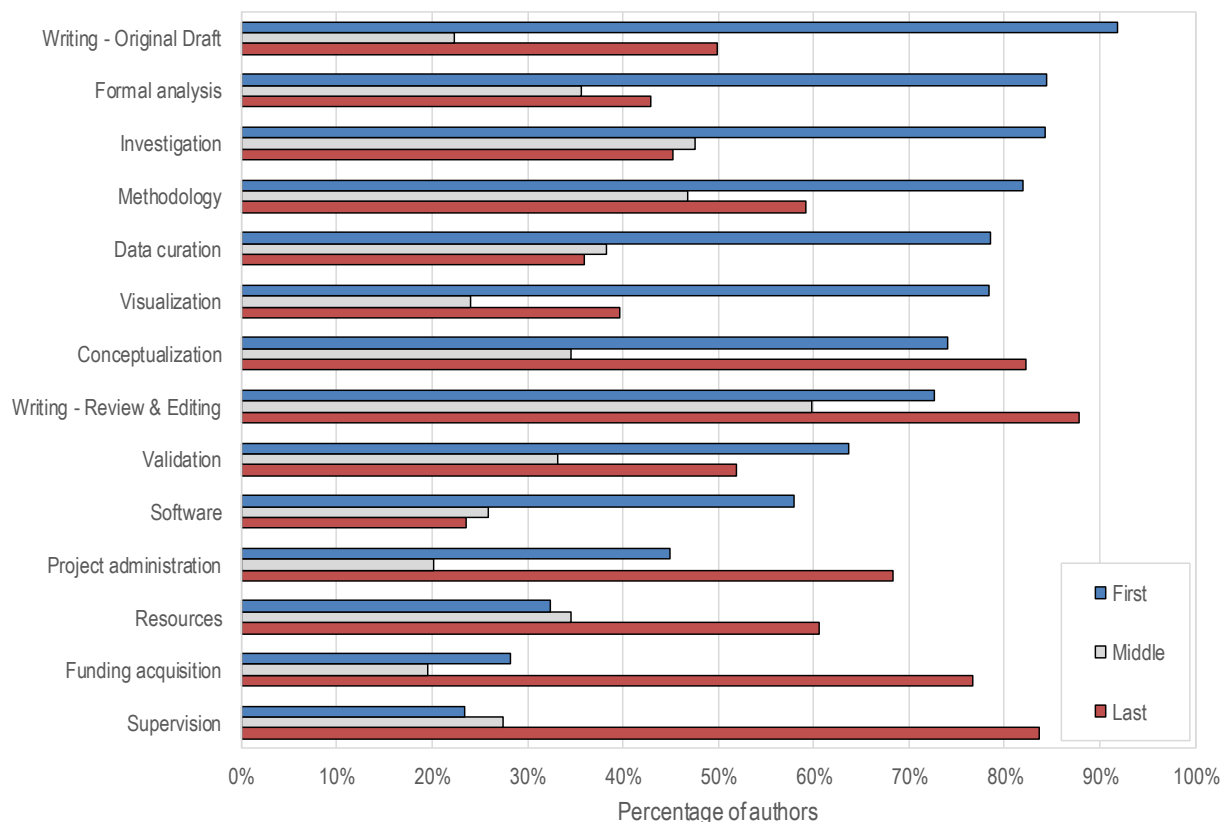


Each role reported in >50% articles (except software 40%)

*Vincent Larivière, Cassidy Sugimoto, preliminary results*

# What do 'middle authors' do?

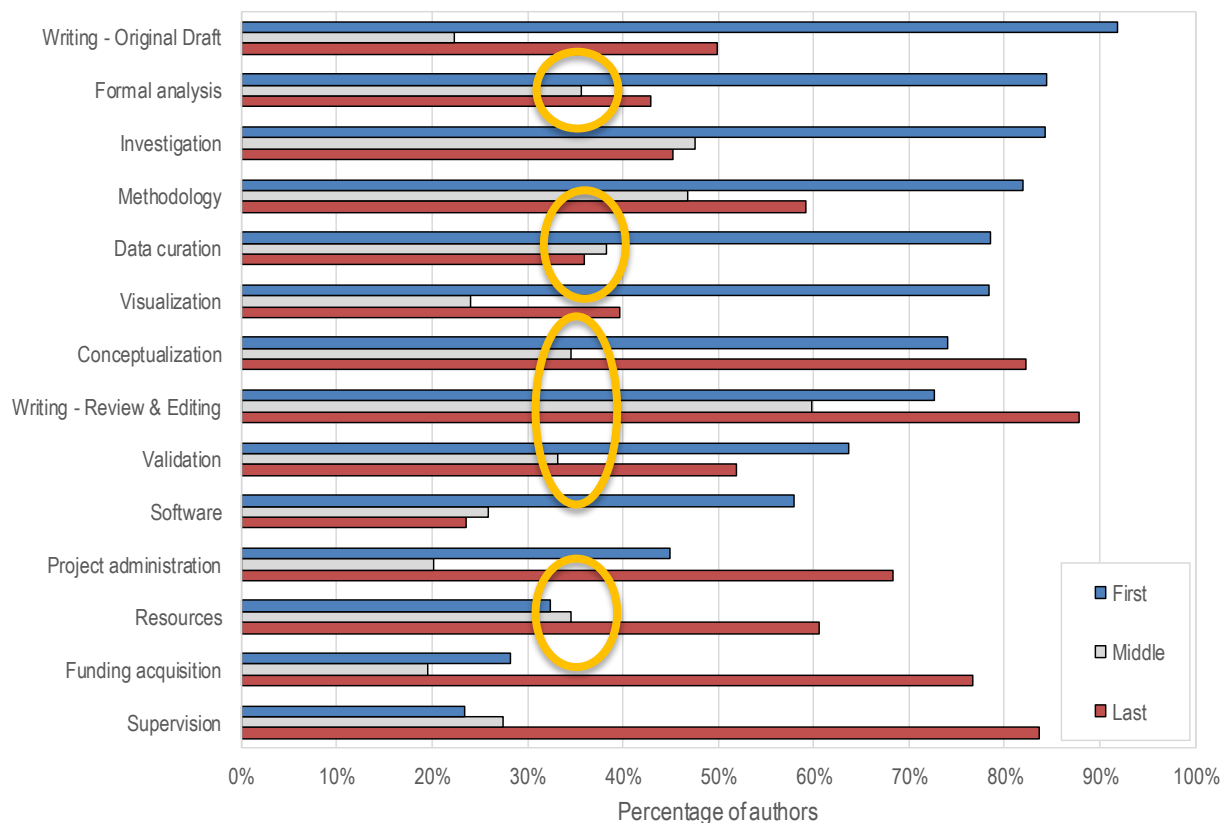
% authors performing contribution by author's order



*Vincent Larivière, Cassidy Sugimoto, preliminary results; subset data: n=11k*

# What do 'middle authors' do?

% authors performing contribution by author's order



1/3 contribute to:

Formal analysis  
Data curation  
Conceptualization  
Validation  
Resources

*Vincent Larivière, Cassidy Sugimoto, preliminary results; subset data: n=11k*

# What I am going to talk about

1. Origins of the Contributor Roles Taxonomy (CRediT)
2. Adoption & implementation
3. First insights into its value!
4. Where next ...



# Where next ...



- Building awareness of CRedit – significant interest
- Lyrasis/CASRAI supporting implementations of CRedit
- Feedback routes – working to future versions/keeping CRedit current (while practical)
- More analysis & usage
- Links to ORCID & Crossref – metadata
- <https://casrai.org/credit/>

# DORA 2.0

University of  
**Kent**



[SIGN DORA](#) [READ THE DECLARATION](#) [SIGNERS](#) [BLOG](#) [GOOD PRACTICES](#) [CONTACT US](#)

Follow us on [twitter](#)

## Improving how research is assessed

Join the organizations and individuals who have signed the Declaration on Research Assessment.

[Sign the declaration](#)

[Read the full declaration >](#)

### Latest news



Assessing scientists for hiring,  
promotion, and tenure

PLOS BIOLOGY

Improving How We Evaluate Research:  
How We're Implementing DORA

CANCER RESEARCH UK

Few UK universities have adopted rules  
against impact-factor abuse

NATURE



If you authorize Crossref  
and DataCite to update  
your ORCID record



ORCID



## CrossRef ORCID auto- update

University of  
**Kent**



and you add your ORCID  
to your paper or  
dataset submission

when your  
publication  
gets a DOI,  
your ORCID  
record will  
get updated



**AUTOMATICALLY!**





# CRedit contact

*With thanks to*

**Liz Allen:** Director of Strategic Initiatives, F1000  
And CRedit Co-Chair  
**@allen\_liz**

**@CASRAI**

**@EARMA.org**

**#EARMAConference**

<https://casrai.org/credit/>



- International Research Data Management Glossary (IRiDiuM)
- Open Access Glossary
- Research Impact Glossary
- Career Levels Glossary / Taxonomy
- Notice of Award Definition
- CVs
- <https://casrai.org/>

- The CASRAI-UK community has identified a number of issues related to the lack of an accurate and consistent way to classify researchers and scholars by the stage they are at in their career. There is fragmentation in this level of information - across research institutions, research funders, disciplines and countries. In short, how does the community denote 'research age'? This classification is needed in multiple stages of research information collection: eligibility for funding opportunities, Athena SWAN and the Race and Equality Charter Mark. This activity will look at what definitions are currently in place in the UK context to start (REF, ECR, HESA categories, etc.) and what commonalities exist across these contexts them? The output will be a first-draft standard agreed taxonomy.
- <https://forum.casrai.org/c/standards/career-levels>

- The H-group's aim is to pragmatically and proactively investigate, if and how it would be feasible to develop a standard CV structure for applications to research funding organisations based upon all participating organisations' experience as well as the latest insights from research on research.
- As an immediate output from the group's efforts we hope to publish a joint report or paper with an outline of what such a CV could entail and where we see the biggest challenges to its realisation. CASRAI will be working with Funders and other experts in a workshop in Zurich to try to address:
  - 1. What would constitute a minimal set of core, shared CV elements for funders?
  - 2. What would be a good framework for sharing of contextual and narrative information alongside standardised 'factual' CV elements?
  - 3. Can and should we create a model for interoperable, describable 'extensions' to the minimal core set for local or context-specific data?
- The CASRAI CV is one key core component of these discussions

# Overall CASRAI INFORMATION HARMONY areas

- Notice of Opportunity
- Proposal
- Budget
- CV
- Notice of Award
- Compliance Reporting
- Financial/Progress Reporting
- Data Management Plans
- Impacts
- Metrics
- <https://casrai.org/>

CASRAI EU

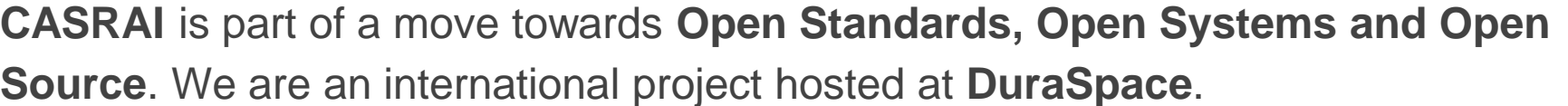
# CASRAI-EU Relaunch

---

## Opening work programme

- Research Information producers and consumers landscaping
- Researcher Administrative Effort Survey
- Exploring closer links with European Associations related to this space.
- CASRAI-EU needs EU
- ReConnect-EU in Oslo, April 2020

\_\_\_\_\_





# Ways to get involved

— — —

- Contribute as an institutional member
- Contribute as a volunteer
- Landscape
- Researcher Survey
- Efficiency and Insight week

# Call to Action!

**John Donovan**

CASRAI EU Chair

**Simon Kerridge**

CASRAI International Past Chair

**Kes Morton**

CASRAI Executive Director

**CASRAI**

<https://casrai.org/>

Consortia Advancing Standards in Research  
Administration Information

— — —