Guide regarding professional responsibility with accent on new tendencies related to open data, open science

National Research and Development Institute for Industrial Ecology – ECOIND

NATIONAL RESEARCH AND DEVELOPMENT INSTITUTE
FOR INDUSTRIAL ECOLOGY

ECOIND

EXCELLENCE IN RESEARCH AND ENVIRONMENTAL SERVICES

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Contents

Professional responsibility for researchers

Professional responsibility for scientists is built on the foundation of research integrity, which involves honesty, accuracy, efficiency, and objectivity in all aspects of research. This guide is not just about avoiding misconduct but actively fostering a culture of integrity.

The 2023 Revised Edition of the European Code of Conduct for Research Integrity[1] has been updated to ensure that the European Code of Conduct remains fit for purpose and relevant to all disciplines, emerging areas of research, and new research practices. The European Commission recognises the European Code of Conduct as the primary standard for upholding research integrity across all research projects funded by the EU.

The Universal Ethical Code for Scientists[2] is a set of core principles—Rigour, Respect, and Responsibility—designed to guide scientific integrity. It promotes honest research, minimization of harm to people and the environment, and social accountability. Developed to foster ethical research, it applies to all, including, but not limited to, social, natural, medical, and engineering sciences.

Key principles of professional responsibility for researchers within National Research and Development Institute for Industrial Ecology – ECOIND are:

Research integrity and rigour

- Methodology: Employ high-quality, reproducible research methods and base conclusions on critical analysis of evidence
- Data management: Maintain clear, accurate, and secure records of data to allow others to verify and replicate the work
- Transparency: Report results and interpretations fully and accurately, disclosing any potential biases
- Errors: Promptly admit, correct, and minimize the consequences of any errors in research

Preventing research misconduct

- Avoid FFP: Strictly avoid Fabrication (making up data), Falsification (manipulating data), and Plagiarism (using others' work without credit)
- Report misconduct: Actively work to correct unethical actions or policies and report misconduct when observed

Ethical treatment of subjects and environment

- Human subjects: Protect the dignity, rights, and safety of human participants, ensuring informed consent and confidentiality

[1] https://allea.org/code-of-conduct/
[2] https://www.gov.uk/government/publications/universal-ethical-code-for-scientists

- Animal subjects: Justify the use of animals, minimizing pain and distress, and complying with all relevant ethical guidelines
- Environmental impact: Minimize and justify any adverse effects of research on the natural environment

Publication and authorship

- Authorship credit: Limit authorship to those who have made significant contributions to the concept, design, execution, or interpretation of the study
- Citation: Accurately credit the work of others, avoiding plagiarism
- Transparency in publication: Disclose all sources of financial support and any potential conflicts of interest
- Duplicate publication: Avoid publishing the same work in multiple journals to artificially inflate publication counts

Collaboration and mentoring

- Mentoring: Mentors have a responsibility to provide a safe, respectful, and productive environment for trainees, fostering their professional development
- Fairness: Act with courtesy and fairness in collaborations, respecting the rights of colleagues and trainees to disagree or pursue their own research

Responsibility to society

- Public good: Use knowledge and skills to support the sustainability, health, and welfare of society
- Communication: Communicate findings honestly, clearly, and transparently, not knowingly misleading the public or policymakers
- Public policy: When acting as a citizen, distinguish personal opinions from scientific expertise

Professional development

- Competence: Maintain up-to-date skills and avoid taking on work for which you are not competent
- Continuous learning: Engage in continuous professional development to maintain the quality of scientific work

Open and reproducible research practices for researchers

Open research practices within National Research and Development Institute for Industrial Ecology – ECOIND are derived from the general guidelines on responsible open science[3] developed within ROSiE Responsible Open Science in Europe project. The ROSiE guidelines is the Open Science complement to the European Code of Conduct for Research Integrity. It is an aspirational document that aims to provide guidance on how to conduct Open Science responsibly in everyday research practice, following established ethical and integrity principles and values.

Open research practices

- As much as reasonably possible researchers should ensure open access to the entire research lifecycle (including publications, data, metadata, protocols, images and other research materials and methods)
- Contracts with funding organisations should include equitable agreements about access to and dissemination of research results
- Research organisations and repositories (such as Ecolib) should ensure appropriate infrastructures to allow the proper conservation and management of all research results generated in the research lifecycle
- Researchers should ensure that the research lifecycle, including interim evaluation results, are documented in a detailed, accurate, and clear manner. All information and resources produced throughout the research lifecycle, including those that have not yet been published, should be responsibly managed and conserved by the research institutions and the researchers
- Researchers should ensure that sources are verifiable, and that open data practices are responsible, to allow the research to be examined and, when relevant, reproduced. The methods used and the respective steps of the entire research lifecycle should be clear.
- Researchers should always provide references when reusing research data, materials, software, and tools

Open data

- Whenever possible and reasonable, research data should be open and accessible to promote integrity, accountability, advance public awareness, ensure public trust, encourage data reuse, advance collaborative research, and guide practice and policy
- Responsible research data management should ensure that data are FAIR (Findable, Accessible, Interoperable, Reusable) and foster CARE (Collective Benefit, Authority to Control, Responsibility, Ethics) whenever possible
    - Researchers should collect, analyse, and present research data with the prospect of making it open and reusable
    - Researchers should ensure that research data is properly documented, formatted, and stored to facilitate findability and reusability

[3] https://zenodo.org/records/10046520

- Researchers should ensure that datasets are uploaded in repositories that assign a DOI or other persistent identifiers
- Researchers should respect privacy and confidentiality by de-identifying research data where necessary and complying with ethical guidelines and legal requirements
- Researchers should encourage data reuse by providing appropriate metadata, licenses, and citations that enable other researchers to find, access, and use the data for other studies
- Researchers should guarantee that the data will be made as open as possible but will be allowed to stay as closed as necessary, safeguarding legitimate interests or constraints
- Researchers should provide a good account of why research or data are not open or give a convincing explanation why certain portions of the research or data cannot be open
- Researchers should provide transparent and repeatable data acquisition protocols, that should be in full compliance with FAIR and CARE principles
- Reseachers should ensure that metadata and data are well described so that they can be replicated and/or combined in different settings
- Researchers should ensure in their publications that it is clearly described how/where data, software codes, and research materials can be accessed and/or obtained

Open methods and tools

- Researchers should be open and honest about the methodological techniques or study design used in their research. This includes documenting these methods in study protocols, logs, laboratory journals, or reports. The research lifecycle steps should be verified, and the line of reasoning should be clear. This means the description of research should be detailed enough for the data collection and analysis to be replicated
- Whenever possible, researchers should contribute to and make use of open-source tools in their research. This allows other researchers to replicate the research, build on the findings, and potentially identify errors or limitations in the methodology
- When developing new methods or tools researchers should make them openly available to the research community. This promotes innovation and allows for the development of new techniques and tools that can be used by other researchers in the future

Open access publications

- Researchers have an ethical and social responsibility to make their research results open to peers and to the public in a timely manner
- National Research and Development Institute for Industrial Ecology - ECOIND should provide guidelines to support researchers in finding reputable publishers to avoid supporting predatory practices
- Researchers are encouraged to use Creative Commons (CC) licenses, meaning authors retain their rights under predefined conditions
- Preprints are an important element of Open Science; however, preprints should be treated according to their status, not as peer-reviewed publications. Papers deposited on preprint

platforms have not been subjected to formal quality control, such as peer review, and thus should be read carefully, especially by non-experts

Open science journals types

- Gold Open Access: Articles are immediately and fully free to access, read, and download on the publisher's website, often under a Creative Commons license
- Diamond / Platinum Open Access: The journal is free to both readers and authors, often funded by institutions, societies, or grants
- Green Open Access: The author deposits a version of the paper (preprint or postprint) in a free, public repository
- Hybrid Open Access: A subscription-based journal that allows authors to pay an optional fee (APC – Article Processing Charge) to make individual articles open access
- Bronze Open Access: Articles are free to read on the publisher's website, but lack a clear, open, and machine-readable license for reuse