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Editorial

One Ecosystem: Innovation in ecology and sustainability research publishing

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Background

The last decades have witnessed an unprecedented shift in scholarly publishing which greatly influences the academic environment. Open access to content and data is rapidly becoming the prevailing model in academic publishing, resulting in part from changes to policies of governments and funding agencies and in part from scientists' desires to have their work more widely read and cited. The European Commission, for example, obliges all projects funded within its latest Framework Programme for Research & Innovation "Horizon 2020" to make sure that all published peer-reviewed journal articles are openly accessible and free of charge (European Commission 2011, European Commission 2013). Open access benefits scientists with greater dissemination and citation of their work, and provides access to the latest research to society as a whole. Results of publicly-funded research should eventually benefit society by contributing to socio-economic welfare, better quality of life, and a more sustainable use of resources by public and private sectors. This is recognized as an accelerator of innovative and efficient science and thus largely adapted by the new generation scholars. At the same time, there is also an increasing interest in making primary data from published research publicly available (Alsheikh-Ali et al. 2011). New scholarly article formats have also been introduced recently, such as data papers,

single-figure publications, and nanopublications (Groth et al. 2010, Chavan and Penev 2011).

However, despite these promising developments, in the ecology and sustainability domains, only a small proportion of research output is freely accessible to the public. Out of 11,607 open access scholarly articles in the Directory of Open Access Journals, only 77 fall in the category of ecology (as of 26 April 2016), and only a small proportion of these has a policy concerning data publishing.

One Ecosystem - The Mission

One Ecosystem aims to respond and to adapt to the newest developments in scholarly publishing in Ecology and Sustainability domains. The journal goes beyond the conventional research article publication. Launched in January 2016, it welcomes research outputs ranging across the entire research cycle, including data, models, methods, workflows, results, software, and policy recommendations. The journal specifically addresses the following topics: ecosystem services, climate change, landscape ecology, land use change, marine and freshwater ecology, forest ecology, and forestry, agriculture, tourism, urban ecology, restoration ecology, environmental impact assessment, health, waste and water management, sustainable land development, environmental economics and policy, and urban development. Ecosystem services, the contributions of nature to human well-being, have become a highly relevant topic in science, policy, and society in the last decades. Therefore ecosystem services, including aspects related, for example, to ecosystem services indicators, modelling and mapping of ecosystem services potentials, flows and demands and their application in decision-making all represent topics of special interest for One Ecosystem. The journal is generally open for submissions from all fields related to ecology and sustainability sciences dealing with the complementary, interconnected, and interdependent components of the natural world (Fig. 1).

Figure 1.

The nature of One Ecosystem is evident in the logo symbolysing the yin-yang complementary interface of the natural world.

With this new journal, the main intention is to really make a difference, by promoting and supporting methods and data sharing, idea exchange, and dissemination of relevant applications in the spheres of ecology and sustainability (Table 1). For this reason, the focus of One Ecosystem is rather broad, welcoming all contributions related to research methods, data, and their applications in science, policy making, society, and practice. Potential authors are welcome to contact the journal editors if they are unsure whether a specific topic is suitable.

Table 1.

Quotes by the One Ecosystem editors

"*With One Ecosystem we want to accelerate scientific progress in the frontier research fields of ecology and sustainability. We are convinced that this new format of writing, reviewing and open access publishing of scientific findings is the future*." Benjamin Burkhard, Kiel University.
"*We need better incentives for scientists who want to share their data. One Ecosystem provides such incentives by linking peer review to open data*." Joachim Maes, European Commission - Joint Research Centre.
"*We believe that open access to all the relevant products of the scientific cycle is key to both scientific advancement and innovation in the real world. With One Ecosystem we aim to foster open exchange of information to address sustainability challenges.*" Davide Geneletti, University of Trento.

Publishing process

The journal offers a wide set of article templates, including domain-specific ones, such as Ecosystem services mapping, ecological models, and environmental monitoring, allowing scientists to publish and get credit for their work at any stage of the research cycle. The templates and the innovative writing tool features facilitate the manuscript preparation process significantly for the authors, the reviewers, and the editors.

To meet the increasing demand of the academic community, funding agencies and global data indexers encouraging data archiving as part of the publication process (Whitlock 2011), One Ecosystem requires publishing of the raw data that underpin a given study in the form of supplementary files. Through the technologically advanced ARPHA publishing platform (*see below*) and an innovative publishing model, all data are made freely available for everyone and are integrated into relevant and domain-specific global data repositories. The proper archiving of data increases re-usability and can lead to new scientific insights, synergies, innovation and more efficient use of available resources.

Large data sets (e.g., ecological observations, environmental and other data types) can be published as data papers (Chavan and Penev 2011) or deposited in the Dryad Data Repository (http://datadryad.org) or KNB (http://knb.ecoinformatics.org), either prior to or upon acceptance of the manuscript. The publication of raw data along with the article enables re-usability and increases discoverability of published information, leading to new empirical knowledge. In addition, data papers provide an incentive for scientists to invest in

organizing and making their database accessible to the wider scientific community. All too often potentially valuable datasets remain buried in scientists' hard drives, once a specific research endeavour is completed. Data papers allow for these datasets to be further used and improved, ensuring that the authors will receive the appropriate credits.

One Ecosystem also provides the possibility for automated import of data-structured manuscripts generated in various platforms, such the Global Biodiversity Information Facility (http://gbif.org), DataOne (https://www.dataone.org), author's databases. It is using an entirely XML-based workflow which reduces the costs and speeds up authoring, reviewing, and publishing.

One Ecosystem proposes a solution for the so called 'reviewer's fatigue' problem (Breuning et al. 2015) concerning the increasing burden placed on peer reviewers to assess an increasing number of submitted manuscripts. Thus, in addition to the conventional (single-blind) peer review, further two peer-review modes, community-restricted and public, have been introduced to allow better control on the published content. In addition to the conventional post-submission evaluation, referees can provide their reviews also prior to submission (upon direct invitation from authors) and after publication (via commentaries to the published article). On the more technical side, an innovative interface for reading and answering reviewers' comments makes the revision process much faster and user-friendly, both for authors and reviewers, who can easily track the queries and the way they have been addressed.

Though still in its infancy, the potential of the journal has already been recognized by scholars and endorsed by international networks, such as the global Ecosystem Services Partnership (ESP) http://www.es-partnership.org/esp, to which One Ecosystem is associated. The journal has also a partnership and will feed spatial data to the ESP visualization tool: http://esp-mapping.net/Home. In the future, maps from ecosystem services studies published in One Ecosystem can be visualised via the tool.

One Ecosystem considers the following categories of papers for publication: research article, review article, data paper, software description, ecosystem services mapping, ecological model, methods, policy brief, case study, editorial, corrigendum, conference abstract, research poster, research presentation, single-figure publication, correspondence, as well as special issues and monographs.

What is ARPHA?

One Ecosystem is published on Pensoft's next-generation publishing platform ARPHA. ARPHA stands for Authoring, Reviewing, Publishing, Hosting, and Archiving and is a publishing solution that supports the full life cycle of a manuscript, from authoring and reviewing to publishing and dissemination. It is XML-based from end to end and integrates the narrative with the data presentation. The data publishing strategy in ARPHA aims at increasing the proportion of structured text and data within the article's content, allowing for both human use and machine readability to the maximum extent possible. The core of this novel technology is a collaborative online manuscript authoring module called ARPHA

Writing Tool (AWT). AWT's innovative features allow for upfront mark-up, "atomization" and structuralisation of the free-text content already during the authoring process, import/ download of structured data into/from human-readable text, automated export, and dissemination of small data, instant layout of composite figures, and import of literature and data references from trusted online resources into the manuscript. Within the ARPHA-XML publishing workflow, reviews are done collaboratively through change tracking, comments, and replies, as well as automated, but customisable email notifications. For the editor's convenience, all peer reviews are consolidated into a single online file that makes the editorial process simple and straightforward.

Towards Open Ecology

One of the primary roles of ecology in the 21st century will be the sustainable management of ecosystems (Day et al. 2009). If we want to preserve the planet, maintain a liveable climate, and restore our natural capital and biodiversity so that essential ecosystem services are secured, we need to upscale efforts which turn the growing ecological knowledge base into practical applications with up-scaling potential and socio-economic relevance (Maes and Jacobs 2015). The ecological innovations and nature-based solutions that are key to support the transition to a more sustainable economy cannot come from research results alone. They require an “Open Ecology”. Open Ecology, or Open Science in general, is not only about sharing data and making these publicly available. Open Science reflects the novel way of how many, in particular young, researchers conduct science. They share their research ideas on social media; they download, use, improve, and upload methods, models and program code for statistical analysis of data, all of this supported by free software such as R or QGIS; and they rapidly communicate research results using platforms such as Research Gate.

Open Science provides better transparency and reproducibility of results (Reichman et al. 2011). For ecology and earth sciences, it provides baselines against which future environmental change can be evaluated. Open data and open science are a source of innovation. Innovation is high on the agenda of economic policies as it spurs economic growth, a central objective of governments at different levels. Therefore it is not a surprise that the EU strongly endorses Open data policies. Examples are geographical information, statistics, environmental monitoring, research, cultural heritage, and tourism, all disciplines which are in the focus of One Ecosystem. Such information has a significant and currently insufficiently exploited potential for re-use in new products and services, for citizens' information, for efficiency gains in administrations and for sustainable development (European Commission 2011).

Our journal, One Ecosystem, supports this transition to Open Ecology and follows this new approach to science. Publication of research is and will remain a priority driver for scientists, not only to seek recognition from peers, but importantly, to find a job in research or to obtain success with grant proposals. One Ecosystem extends the publishing model to

all the steps of research instead of limiting it to results, so that scientists are rewarded for all the efforts they make.

Conclusions

One Ecosystem aims to provide a platform for scientists, decision makers, and the interested public to share their knowledge in an efficient and open manner. In these days of continuous speeding up of paces of work and life, the idea of facilitating the sharing of existing knowledge in order to create synergies, new knowledge, and innovation is more than timely.

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