

Open Peer Review Module (OPRM) *Final Report*



Leader: Open Scholar CIC¹

Partners: DIGITAL.CSIC², e-IEO³, IIIA-CSIC⁴, ARVO⁵,
SECABA-UGR⁶

Authors: Pandelis Perakakis¹, Agnes Ponsati², Isabel Bernal², Concha Mosquera
de Arancibia³, Carles Sierra⁴, Nardine Osman⁴, Emilio Lorenzo⁵

May 2016



Index

Index	2
Background	3
The Open Peer Review Module	4
Technical Implementation	4
Reputation Assessment Model	5
Implementation and Preliminary Results	6
DIGITAL.CSIC	6
e-IEO	8
Deliverables	10
Figures	12

Background

Research productivity is increasing at an unprecedented rate. Technological innovations, a surge in available computing power, and the ease with which digital information is stored and communicated is helping researchers to cross experimentation boundaries, to increase data availability, and to facilitate the transfer of knowledge. As a result, traditional research is being transformed into a dynamic and globally interconnected effort where ideas, tools and results can be made instantly accessible to the entire academic community. Institutional and multidisciplinary open access repositories play a crucial role in this emerging landscape by enabling immediate accessibility to all kinds of research output.

One important element still missing from open access repositories, however, is a quantitative assessment of the hosted research items that will facilitate the process of selecting the most relevant and distinguished content. Common currently available metrics, such as number of visits and downloads, do not reflect the quality of a research work, which can only be assessed directly by peers offering their expert opinion together with quantitative ratings based on specific criteria.

To address this issue we developed an **Open Peer Review Module (OPRM)** to be installed on existing open access repositories and offered as an overlay service. Any digital research work hosted in a compliant repository can then be evaluated by an unlimited number of peers who offer not only a qualitative assessment in the form of text, but also quantitative measures that are used to build the reputation of the research work and its authors. Crucially, this evaluation system is open and transparent. By **open** we mean that the full text of the peer reviews are publicly available along with the original research work. By **transparent** we mean that the identity of the reviewers is disclosed to the authors and to the public. In our model, openness and transparency are two elemental aspects we consider necessary to address the issue of biased or non-expert opinions, which is inherent in the anonymous peer review model, characterized by the unaccountability of reviewers.

Importantly, our open peer review module includes a **reviewer reputation system** based on the assessment of reviews themselves by other peer reviewers. This allows a sophisticated scaling of the importance of each review on the overall assessment of a research work, based on the reputation of the reviewer.

The implementation of a peer review layer on top of institutional repositories could have the potential to transform the current academic publication landscape by introducing **new scholarly workflows** where a research item can be openly evaluated by the world's experts right at the institutional repository of its authors, before being submitted to an academic journal. This workflow challenges the current practices of peer review research evaluation. In most cases, journals, acting as brands in a competitive market, foster academic competition for a limited number of publication slots, instead of promoting open scholarship and collaboration. The integration of peer review in repositories will enable direct and

transparent **academic collaboration** between authors and reviewers. In addition, the use of the OPRM will produce **novel metrics** directly reflecting the perceived quality of a research work by expert peers, contrary to current available altmetrics that only indirectly account for quality through usage statistics.

The Open Peer Review Module

Technical Implementation

The OPRM can be considered is an add-on for the DSpace platform. Detailed instructions on how to install the addon on top of DSpace JSPUI or XMLUI are provided at the module's webpage on Github: <https://github.com/arvoConsultores/Open-Peer-Review-Module/wiki/Installation>

The module is built around the following components and elements:

- Invitations component
- Reviews component
- Comments component
- Object data model
- Reputation engine

Invitations subsystem. The system allows the author to send review requests to select peers. The submission-item-interface has been extended to specify the email addresses of the proposed reviewers. The system sends a customised email including a token that grants to the reviewer access to the research object and to the reviews subsystem.

Reviews subsystem. The reviewer accesses the reviews subsystem acting with sufficient privileges granted by the token. The evaluation forms are then presented to the reviewer, together with relevant terms and conditions regarding the whole review process. The proposed forms can be configured using standard data types when applicable, although an additional schema has been added to accommodate specific model's metadata.

The submission-item interface, already available in Dspace, is used to support this step, covering metadata declaration and attaching license attributions. The submission workflow can assign the review object to the repository administrators, with a single Accept/Reject/Edit Metadata step or just deposit the review in a specific collection.

Following this step, specific background tasks are attached to the process, via consumer events, to perform automatic validation of the metadata, linking reviews and reviewed objects, and calling the reputation submodules to calculate new numeric values (for authors and research objects) and automatically incorporate them into the reviewed object and into the review.

This subsystem is complemented with the **judgments subsystem**, a specialization of the reviews subsystem that allows reviewers to judge other reviews of the same research object.

The object data model has been extended to incorporate relevant metrics as well as the back-and-forth relations between research objects and their reviews.

In order to process information about the reputation of the authors, and make this information persistent, the system uses extensions to the author's data-model (DSpace-CRIS and other extensions). However, the module can be used without these extensions, although in this case the consolidation and visualization of the reputation of authors and reviewers is not available.

The **Digital object's reputation submodule** bundles the functions to invoke, calculate and retrieve a digital object's reputation. This submodule obtains information of the digital object and its reviews, calculate reputations based on the submitted parameters and update the reputations with the new calculated values. In order to maximize its evolution and reuse across platforms, this submodule is an independent plugin, facilitating the installation and deployment process and even its substitution by any other set of algorithms.

The **Author/reviewer reputation submodule** exposes the functions of obtaining reputation information from objects, including reviews, calculate the author's reputation and update the reputation with the new calculated values.

Reputation Assessment Model

The reputation assessment model is based on peers evaluating (quantitatively, in addition to qualitatively) each other's research works as well as each other's reviews. The latter allows for a sophisticated scaling of the importance of each review on the overall assessment of a research work, based on the reputation of the reviewer. We note that our model assumes that evaluations may be done on a number of dimensions (e.g. originality, technical soundness, predicted impact, etc.), however, an 'overall quality' dimension is needed for computing the general reputation of the research work. This is because aggregating the reputation for all dimensions into a single index may depend on a number of issues that are outside the scope of this work.

The model quantifies a reputation for articles (can be any research object hosted by the repository), authors, reviewers, and reviews. The reputation of an article is the weighted aggregation of the reviews it receives, where the weight depends on the reputation of the reviewer (discussed below). A single metric is provided for each evaluation dimension: overall quality, expected impact in the field, expected impact for society, etc. A scholar's reputation as an author is an aggregation of the reputation of their papers. Again, this reputation is

computed for each dimension separately. The reputation of a reviewer is essentially a weighted aggregation of the judgements over her reviews by other reviewers who evaluated the same research works. The weight in this case is the reputation of reviewers who offer an opinion. Finally, the reputation of a review is similar to the one for articles, but using judgements instead of reviews. Extensive information about the model, including the code for its implementation, is provided in the published conference paper (also attached in this report):

Osman, N. & Sierra, C. (2016). Reputation in the Academic World. In Proceedings of the 18th International Workshop on Trust in Agent Societies (TRUST @ AAMAS 2016) (pp. 1--17). CEUR Workshop Proceedings

Implementation and Preliminary Results

As part of this project, the OPRM was implemented in two Open Access repositories: the **Institutional Repository of the Spanish National Research Council** (DIGITAL.CSIC), and the **Institutional Repository of the Spanish Institute of Oceanography** (e-IEO). What follows is a description of the implementation process and a report of preliminary results from these two repositories.

DIGITAL.CSIC

DIGITAL.CSIC has taken part in the OPRM project through different working lines. First, the repository has participated in discussions about the design and workflow of the module to be integrated with DSpace software. DIGITAL.CSIC runs on the DSpace-CRIS 4.3 version which means that besides developing an OPRM module that is interoperable with the standard DSpace system, the ARVO partner needed to consider some characteristics inherent to DIGITAL.CSIC specific DSpace version, in particular as far as DSpace-CRIS author module is concerned. In addition, the DIGITAL.CSIC team worked closely with ARVO so as to customize the OPRM module in line with general item submission workflow and metadata records visualization on the repository. Last but not least, the repository team has contributed to preparing the support guides to help authors and reviewers go through the entire OPRM module process.

The OPRM module went live in DIGITAL.CSIC on the week of April 18, 2016 and in preparation for its release the repository team launched a preliminary internal campaign to attract CSIC researchers to test the module. The strategy was based on a one to one approach where selected researchers across all scientific areas were contacted to invite them to take part in the role of authors willing to receive open peer reviews. The selection of researchers took into account several considerations: in the first place, the repository team

contacted researchers with a well-known OA-friendly attitude and a long record of item submissions into DIGITAL.CSIC. Second, the repository produced a list of CSIC researchers with a public profile on the reviewer-based platforms Publons and PubPeer and with publications in the open peer review F1000Research journal. In total, the repository collected around 60 potential candidates and amongst them 20 researchers in Humanities and Social Sciences, Chemistry, Natural Resources, Biology and Biomedicine, Food Science and Physics were briefed on the OPRM project and invited to participate. It is worth mentioning that except for 2 researchers who openly declined the invitation all the others showed interest in the module and committed to participate in its pilot phase.

Without being exhaustive, below is a list of selected comments gathered during this process. This preliminary feedback by scientists can shed light on the sort of issues that caught their attention the most when understanding the goals and functioning of the module in this first phase. This process is also explained in the DIGITAL.CSIC presentation (<http://digital.csic.es/handle/10261/131576>) at the OPRM official launch at the end of April.

First feedback from CSIC researchers:

- A **long awaited service** in the repository
- **It is a great idea that merits success as currently peer review is not credited in researchers CVs at all due to its anonymity. But researchers will not have time to review and comment on other peers works as long as this activity remains outside of CVs recognition and lacks strong support from the research institutions.**
- The functionality may be also used to evaluate, accept and comment conference contributions before the event
- The project seems very interesting, but I decline to participate right now due to lack of time and current demands [preparation of proposals for a national research call]
- I have contacted 3 reviewers: **one has no time available, another is against any type of peer review as reviewing is a subjective activity in such a reduced scholarly discipline and the third one has accepted to do it**
- **The service should promote spontaneous discussion** by anybody willing to send comments
- **Inviting peers to an open evaluation may place people in an uncomfortable situation**, the module should work 100% open
- **The service is great for preprints and other unpublished works but has limited applicability for works that have been already evaluated and published.**

Moreover, the service has a difficult application for very recent publications as publishers reserve an exclusive exploitation for a period of time

- **How does open peer review operate in relation to “finished” pieces of work** (i.e., a book)?
- **How will the service compete with Academia.edu open review/comments?**

To date, DIGITAL.CSIC hosts 4 open peer reviews: one in the area of Natural Resources/Biology, one in Physics and 2 in Bibliometrics and Documentation Studies: they are all accessible from the Open Peer Review Collection in the repository: <https://digital.csic.es/handle/10261/131210>.

As a general consideration, it may be useful to note that 1) even for those researchers supportive of this new service on the repository finding the time to select works to be reviewed, invite peers and comment on the reviews received was reported to be an issue that can slow down the uptake of the module, and 2) in all the real cases already available in the repository, as well as in those that are underway, the authors decided to select works that have already been peer-reviewed (i.e., published papers and conference contributions), with the exception of a policy paper waiting to be reviewed.

These matters of fact may be a major deterrent for the wide and fast applicability of the module. Further, it remains a challenge to convince authors to use the module for their article preprints as fears of journal rejection later on still prevail. In addition, it is paramount to design an effective and attractive campaign to reach out to the wider institutional community in order to consolidate the service as an active one on the repository in upcoming months. Without such campaign, reticence concerning lack of linkage with institutional assessment exercises and rewards system, limitations associated with an invitation-based module and misunderstandings about the OPRM reputation sub-module and what type of open peer review it supports are expected to be the potential stumbling blocks.

e-IEO

With the OPRM the IEO aims to foster scientific collaboration among its research community by allowing peer discussion through an evaluation system that is open (the full text of the reviews is publicly available) and transparent (the identity of the reviewers is disclosed). With the OPRM, the IEO enhances its policy of providing added value, further to already implemented functionalities, such as authority control and author profiles.

The OPRM was set up and launched in e-IEO on the 19th of March 2016. Its release was accompanied by an official announcement, via a press release (<http://hdl.handle.net/10508/9996>), and an internal communication to all scientific staff of the IEO, via e-mail, and

preceded by the OPRM Project at e-IEO (<http://hdl.handle.net/10508/9990>) one week earlier.

The OPRM runs at e-IEO on DSpace version 5.2, with user interface xmlui and authority control system in which the authority values are stored in the solr indexing system and search engine. e-IEO has also implemented the author profiles, where author reputation and reviewer reputation are shown.

Following the module's release, the e-IEO team carried out a pilot study evaluating three published works, one for each IEO scientific area (Fisheries, Aquaculture and Marine Environment and Environmental Protection). We had the full collaboration of nine IEO scientists who responded in three weeks: three of them as authors to be evaluated and six as reviewers to provide reviews and comments. IEO authors also commented on the reviews of their works.

In summary, the pilot resulted in:

- **6 reviews** (2 reviews per work)
- **12 comments** (2 comments per review, one by the author and one by the other reviewer)
- weighted **reputation metrics** for the works, authors, reviews and reviewers

At the repository, a work's page displays the work's reputation value ("Publication reputation"), and provides links to related reviews and their quality ratings given by each reviewer (**Figure 1**). A review's page displays: the review (pdf), the overall quality of the work, the reputation of the particular review, and links to the related work (with its reputation value), and to related comments with their corresponding quality ratings (**Figure 2**). A comment's page displays: the comment, the overall review quality and a link to the related review with the corresponding reputation value (**Figure 3**). Author reputation and reviewer reputation are shown at the author profile, if available (**Figure 4** and **Figure 5**). All reviews and comments are grouped in a new community at the repository called OPRM.

A list of reviewed works at the e-IEO:

1. <http://hdl.handle.net/10508/8123> (Fisheries: article published in Journal of Marine Biology, 2011)
2. <http://hdl.handle.net/10508/2494> (Aquaculture: poster, abstract published in Aquaculture Europe 14 Congress, 2014)
3. <http://hdl.handle.net/10508/7818> (Marine Environment and Environmental Protection: article published in Marine Ecology Progress Series, 2009)

Examples of **researcher profiles**:

- [de-la-Gándara, F. \(Fernando\)](#)
- [García-Rodríguez, M. \(Mariano\)](#)
- [Jerez, S. \(Salvador\)](#)

- [Orejas, C. \(Covadonga\)](#)
- [Rodrigues-dos-Santos-Domingues, P.M. \(Pedro Miguel\)](#).

The Open Peer Review Module at the Spanish Institute of Oceanography is also available at the e-IEO presentation <http://hdl.handle.net/10508/10124> (OPRM official launch at 27 April 2016).

Some initial **feedback** from IEO researchers suggests that the Open Peer Review Module (OPRM) could be a useful objective tool to evaluate scientific papers as it is intuitive and easy to use. Comments suggest it is a very good idea because it may lead to a future of **open collaboration** fostering research, development and innovation. By knowing the reviewers' identity, **authors can ensure that the review of their works has been made by experts in the field**. Moreover, revealing the texts of the reviews and the comments of other referees, an **exchange of information among experts is possible, thereby avoiding, as far as possible, subjectivity by the reviewers. This open peer discussion facilitates the evaluation by the reviewer**. Nevertheless, the current peer review journals system is so integrated in the scientific community that the **OPRM implementation will take a long time**. Some researchers suggest that **a negative assessment of a colleague's work could create an uncomfortable situation among colleagues**. However, many researchers expect the OPRM to unveil its full potential in the future and say that **everyone should support this initiative to ensure full open science as soon as possible**. Regarding **future prospects**, in order to encourage researchers to use the module, it seems essential that the OPRM should become a cross-platform evaluation system whose advantages are widely disseminated, resulting in comparable platform-independent metrics.

Deliverables

Bellow is a list of all project deliverables:

The **OPRM** available at:

<http://github.com/arvoConsultores/Open-Peer-Review-Module/wiki>

The **OPRM launch event** organised and hosted by DIGITAL.CSIC on the 27th of April 2016:

http://proyectos.bibliotecas.csic.es/digitalcsic/oprm/programa_eng.html

Blog posts and press releases:

- <http://www.openscholar.org.uk/developing-the-first-open-peer-review-module-for-institutional-repositories/>

- <http://www.openscholar.org.uk/institutional-repositories-start-to-offer-peer-review-services/>
- <http://www.repositorio.ieo.es/e-ieo/handle/10508/9996>
- <http://www.repositorio.ieo.es/e-ieo/handle/10508/9990>
- <http://digital.csic.es/dc/noticias/listarNoticias.jsp?pos=10&locale=en>

Presentations:

Open Peer Review Module for Open Access Repositories:

<http://digital.csic.es/handle/10261/131572>

The Open Peer Review Module... some technical details:

<http://digital.csic.es/handle/10261/131573>

Reputation in the Academic World:

<http://digital.csic.es/handle/10261/131575>

OPRM Pilot Project in Digital.CSIC: first experience and thoughts:

<http://digital.csic.es/handle/10261/131576>

The Open Peer Review Module at the Spanish Institute of Oceanography (IEO):

<http://www.repositorio.ieo.es/e-ieo/handle/10508/10124>

Dissemination material (logos):

<https://digital.csic.es/handle/10261/129662>

Figures

Cold-water corals in the Cap de Creus canyon, northwestern Mediterranean: spatial distribution, density and anthropogenic impact

View/Open

 m397p037.pdf (861.8Kb)

Identifiers

URI: <http://hdl.handle.net/10508/7818>
DOI: 10.3354/meps08314

Export

RIS

Share

Statistics




Cited 72 times in **Scopus**

[View Usage Statistics](#)

Metadata

[Show full item record](#)

Authors

Orejas, C. (Covadonga) ; Gori, A. (Andrea); Lo-Iacono, C. (Claudio); Puig, P. (Pere); Gili, J.M. (Josep Maria); Dale, M.R.T. (Mark R.T.)

Editor's version

<http://www.int-res.com/abstracts/meps/v397/p37-51/>

Date

2009

Type

article

Publication reputation



Related reviews



[View review by Cristobo, J. \(Javier\)](#)



[View review by Serrano, A. \(Alberto\)](#)


Keywords

Cold water corals
Submarine canyons
ROVs
Manned submersible
Population density

Figure1. A research work's page at the e-IEO repository displaying the Publication reputation and the submitted reviews with their individual ratings.

Demersal assemblages on the soft bottoms off the Catalan-Levante coast of the Spanish Mediterranean [Review]

View/Open

 [García-Rodríguez et al 976396_rev_-PazSampedro.pdf \(416.3Kb\)](#)

Identifiers

URI: <http://hdl.handle.net/10508/10080>

Export

RIS

Share



Statistics



[View Usage Statistics](#)

Metadata

[Show full item record](#)

Authors

[Sampedro-Pastor, P. \(Paz\)](#) 

IEO

Date

2016-04-08

Type

review

Overall quality



Review reputation



Related works



<http://hdl.handle.net/10508/8123>

Related comments



[View comment by Bellido-Millán, J.M. \(José María\)](#)



[View comment by García-Rodríguez, M. \(Mariano\)](#)

Figure 2. A review's page at the e-IEO repository displaying the overall quality assigned to the research work, the reputation of the review, a link to the original article and the comments made on this review with their corresponding ratings.

Demersal assemblages on the soft bottoms off the Catalan-Levante coast of the Spanish Mediterranean [Comment]

View/Open

 [Comentarios a la revisión \(13.59Kb\)](#)

Identifiers

URI: <http://hdl.handle.net/10508/10110>

Export

RIS

Share



Statistics



[View Usage Statistics](#)

Metadata

[Show full item record](#)

Authors

[García-Rodríguez, M. \(Mariano\)](#) 

Subdirección General de Investigación

Date

2016-04-19

Type

comment

Overall quality



Related reviews



[View review by Sampedro-Pastor, P. \(Paz\)](#)

Abstract

Answer to the referee report of Paz Sampedro Demersal assemblages are often stable over time and sampling season has little or no effect in their study; however sampling was performed only in spring so, rigorously, only this season is mentioned in the study. In my opinion the main objection argued to the differentiation of the two groups in the upper shelf is not well supported: Firstly, groups were established based on the results of the similarity analysis between samples, being subsequently grouped by a cluster. The MDS allowed arrange them as function of their depth, performing one ANOSIM, with the sub-routine one-way-ANOVA, to verify their separation. Thus five groups were identified, clearly separated by depth, being two of them located in the upper platform, with an average depth very similar between. Secondly the contribution of the species in each group was analyzed (SIMPER) as well as their abundance-biomass relationships and biodiversity indices. Temperature, salinity, ...

Figure 3. A comment's page at the e-IEO repository displaying the overall quality assigned to the review and a link to the review with its corresponding rating.

de-la-Gándara, F. (Fernando)**Biography**

Fernando de-la-Gándara, born in Barcelona (Spain) in 1958, is graduate and PhD in Biology from the University of Murcia (Spain). Researcher at the IEO (Spanish Institute of Oceanography) and Director of the Murcia Oceanographic Center since February 2015. Expert on bluefin tuna (*Thunnus thynnus*) aquaculture and farming research with 18 years coordinating and participating more than 20 Spanish and European projects. President of the Spanish Aquaculture Society (SEA) in 2006-07. Authored or co-authored over 50 papers in books and peer-reviewed journals

[Download in PDF](#)

[Download in CVN fragment](#)

Contact Information**Fields of Specialization**

Expert on bluefin tuna (*Thunnus thynnus*) aquaculture and farming research

Degrees

Graduate and PhD in Biology from the University of Murcia (Spain)

Departments

C.O. MURCIA

Last updated marzo 15, 2016

Author's reputation

Figure 4. An author's profile at the e-IEO repository displaying the author's reputation based on the reviews of his works.

Rodrigues-dos-Santos-Domingues, P.M. (Pedro Miguel)



Biography

Pedro Miguel Rodrigues-dos-Santos-Domingues (Portugal, 1966) is graduate in Biologia Marinha e Pescas from the Universidade do Algarve, Portugal (1994), on stomach contents of *Loligo vulgaris*, and PhD on Aquaculture, speciality in nutrition (1999), conducted at the National Resource Center for Cephalopods (NRCC) in Galveston, Texas, USA, on auxiliary prey (mysids, *Mysidopsis almyra*) and artificial diets for the cuttlefish (*Sepia officinalis*). Researcher at the IEO (Spanish Institute of Oceanography) in Vigo since November 2009. Expert in cephalopod culture (*Octopus vulgaris*, *O. maya* and *Sepia officinalis*), and also in a lesser extent on crustaceans (*Maja brachydactyla*), and fish (*Scophthalmus rhombus*). Authored or co-authored 60 papers in books and peer-reviewed journals

[Download in PDF](#)

[Download in CVN fragment](#)

Contact Information



Fields of Specialization

Expert in cephalopod culture (*Octopus vulgaris*, *O. maya* and *Sepia officinalis*), and also in a lesser extent on crustaceans (*Maja brachydactyla*), and fish (*Scophthalmus rhombus*)

Degrees

Graduate and PhD in Biologia Marinha e Pescas from the Universidade do Algarve, Portugal

Departments

C.O. VIGO

Last updated marzo 15, 2016

Reputation as a reviewer



Figure 5. An author's profile at the e-IEO repository displaying the author's reputation as a reviewer.