

OREGON ESTUARINE INVERTEBRATES: AN OPEN EDUCATIONAL RESOURCE?

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Abstract

Through a partnership of the University Libraries and the Oregon Institute of Marine Biology, we created an in-house open educational resource from a former government publication. The step-wise process to achieve and brand this resource is described with the hope that it will encourage others to self-publish and create additional open education resources.

Keywords: Open access, open educational resource

Introduction

We all know that textbooks are expensive. Kirk (2014) suggests that students can spend upwards of \$1000 per term on required readings. Students cope with the financial burden of textbooks in a number of ways as Christie et al. (2009) report: they buy used texts, share a single copy of text with other students, or rely on library resources. University of Oregon Institute of Marine Biology (OIMB) students do not face the degree of expense Kirk mentions, because courses rarely require a textbook. The reasons for this are two-fold; there are few adequate texts for upper-division marine science courses, and many students simply do not buy texts, even those required by the professor. We have come to rely on library resources, in addition to readings from the peer-reviewed literature, to meet course needs. We place copies of key monographs and important taxonomic keys in the teaching laboratories for the duration of the term.

A UNESCO forum investigating the possibility of non-commercial textbooks (UNESCO, 2002) coined the term “Open Educational Resources” (OER) which typically refers to course textbooks. Hilton (2016) suggests that freely available OER are not detrimental to student learning outcomes when used in lieu of a commercial text. The move away from required textbooks at OIMB suggests similar results—student success has not declined. The question remains, how do we meet the needs of the entire student body and provide multiple access points to these key documents?

Oregon Estuarine Invertebrates (OEI) (Rudy and Rudy 1983) is not a textbook; it is an invertebrate identification guide used by nearly every class taught at OIMB and for that reason alone is an open educational resource. I will describe how, in a stepwise fashion, we turned this publication into an OER of sorts. I hope this provides an example other marine science authors might follow.

History

Former OIMB director Paul Rudy and his wife Lynn Hay Rudy collaborated with U.S. Fish and Wildlife Service to create the first edition of *Oregon Estuarine Invertebrates*. It contained 110 one-page species descriptions and a line drawing of each dissected animal. OEI was not intended to be a key, but rather a

guide to local species to supplement other keys such as *Light's Manual: Intertidal Invertebrates of the Central California Coast* (Smith and Carlton 1975), *Keys to the Marine Invertebrates of Puget Sound, the San Juan Archipelago, and Adjacent Regions* (Kozloff 1974) and *Intertidal Invertebrates of California* (Morris et al. 1980).

The Rudys printed the final product on waterproof paper so the volumes would hold up well in the field and OIMB teaching laboratories. Each species profile contained a description of the species, a detailed section on possible misidentifications, as well as ecological, quantitative and life history information. The Rudys distributed OEI as a loose-leaf document in 3-ring binders so it could be perpetually updated. The authors wanted this to be readily available to students, faculty and others outside of OIMB, so sold copies of OEI for a nominal fee to cover the cost of production.

The Library's Role

The Rudys retired before 1990 and by 2005, there were few print copies of OEI remaining. The authors gave us permission to digitize and archive OEI in Scholars' Bank, University of Oregon's Institutional Repository (<http://hdl.handle.net/1794/1070>). This one-off approach is what many of us do when it comes time to archive a document. However, this did nothing to update the resource, the bibliographies included in the first edition were not complete, and the optical character recognition (OCR) software did not accurately render the Leroy Lettering Sets used to label the drawings. It was great to have the resource digitized and available to all, but we needed to make improvements.

Working on OEI was somewhat outside the scope of my job as a science librarian, but as champions of open resources, it made sense for the library to be involved in this project. As time and funds permitted, I hired student employees to scan and re-label the OEI illustrations using Photoshop. We entered all of the bibliographic citations into EndNote. To eliminate typing errors we uploaded citations from databases when possible, but still needed to change many citations that imported with all caps and without italicized scientific names. We also shifted from numbered footnotes to author-date citations and referred to the actual chapters cited rather than whole monographs. This was a monumental amount of work.

The original authors had adjusted print size as needed to force the more lengthy species descriptions to fit on a single page. For our edits, we used a standard 11-point font throughout. Between a larger font size and fuller bibliographies, the species descriptions no longer fit on a single page. We tried moving all the bibliographies to the end of the book, but this did not free up enough space to keep the species descriptions to a single page. We reluctantly moved to a multiple-page format, and ultimately decided it would be far easier to update species descriptions if we published each one as an individual chapter. At that point, we also re-acquired a 30-species unpublished supplement that had languished with the Rudy's USFWS publishing partner. We combined the two documents, added new taxonomic names when needed, and in 2013, published the 140 individual species chapters and full 461-page second edition of OEI: <http://hdl.handle.net/1794/12938>. In an effort to crowd-source future updates, each species description was marked with the date last updated and the date scanned, and users were encouraged to email us with corrections.

Bringing the Scientist Back to the Project

While we made OEI available to OIMB students and beyond, we never had time or resources to update

the scientific content aside from adding current scientific names. Dr. Alan Shanks enlisted the help of the OIMB graduate students for part of a term and they were able to update a few of the species descriptions. It was a valuable experience for them and introduced them to the concept of open access publishing. Two students actually created new species descriptions to add to OEI—we were up to 142 species! This gave us the momentum and visibility to lobby for support for our open-access project. I applied for funding from the University of Oregon Libraries and was able to hire a highly competent Ph.D. student to work half time for five academic quarters. She was able to update 126 of the species accounts, with some assistance from an undergraduate, during that time. When necessary she added a section on taxonomy to unravel the confusion in scientific nomenclature through the years. The content of OEI was current, and we updated each of the 142 individual species chapters and published the combined files as the 861-page third edition: <http://hdl.handle.net/1794/18839>.

The third edition of OEI is a true open educational resource. We added several features to make the volume more useful to students: An a-z list of species for students who might not be familiar with the phyla; a list of common name and previous scientific names used in OEI, as many taxonomic names had changed over time; and a map of the local Coos Bay area showing geographic locations referred to in the text. We also used LibGuides to create an online index to the individual species chapters (<http://researchguides.uoregon.edu/oei>). We printed the 861-page full volume on waterproof paper for all of the OIMB teaching labs, but its size makes it a little unwieldy. The LibGuide index will serve as the primary link to the content.

Terra C. Hiebert, and Alan Shanks helped edit the third edition. We changed the subtitle, calling the work Oregon Estuarine Invertebrates: Rudys' Illustrated Guide to Common Species. Another improvement over the second edition was a suggested citation for each species chapter as well as a link to the full third edition. We did this in alternating footnotes; for example:

Hiebert, T.C. 2015. *Pista pacifica*. In: Oregon Estuarine Invertebrates: Rudys' Illustrated Guide to Common Species, 3rd ed. T.C. Hiebert, B.A. Butler and A.L. Shanks (eds.). University of Oregon Libraries and Oregon Institute of Marine Biology, Charleston, OR.

and

A publication of the University of Oregon Libraries and the Oregon Institute of Marine Biology
Individual species: <http://hdl.handle.net/1794/12678> and
full 3rd edition: <http://hdl.handle.net/1794/18839>
Email corrections to: oimbref@uoregon.edu

In the future, OIMB Invertebrate Zoology students will help to update species descriptions. We continue to solicit corrections or additions and OIMB graduate students have already expressed interest in adding additional species to OEI.

Conclusion

I have digitized a number of items that were in the public domain and even books with the author's permission (e.g. *Identification Guide to the Larval Marine Invertebrates of the Pacific Northwest*: <http://hdl.handle.net/1794/6123>). There are a number of much used and out-of-print books by west

coast faculty that I would love to see available online. However, there is more to creating an open educational resource than simply making the text available online. It may be a lot of work to create and maintain an open resource, but from my perspective as a librarian, it provides the access we need for the entire student body. Open access does not come without costs. I did not tally the total student wages invested in this project over time, but they were substantial. It took a great deal of my time as well over the eleven years and three editions. Knowing that students cannot or will not purchase texts for classes may help faculty authors understand that open access monographs, or open educational resources, benefit their students enough to make it worth the effort.

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