

Publisher-Library Partnership for Accessibility: A Case Study of Scholarly Publishing for Public Audiences

Mark Anderson-Wilk and Sue Kunda

Abstract

Public outreach and access are becoming more and more important across institutions of higher education. Sustainable information technology approaches are necessary to communicate and preserve the public education materials generated as part of this new era of “outreach and engagement.” This paper describes the partnership between Oregon State University’s Extension Service publishing arm and Oregon State University Libraries to make Oregon State University the first land-grant institution to systematically publish outreach materials using the university’s institutional repository. This partnership models how institutional repositories can be used to publish outreach products developed through faculty scholarship; the university’s outreach materials are thus simultaneously digitally preserved and made discoverable and accessible to a wide public audience. Intra-institutional partnerships, such as the one described in the case study, can be mutually beneficial in the current environment of limited resources and desire for cross-disciplinary collaboration.

Introduction

This paper presents a case study of the partnership between Oregon State University’s Extension and Experiment Station Communications (EESC) and the Oregon State University Libraries (OSUL) to publish scholarship in the form of community outreach materials. The partnership effectively utilizes the university’s institutional repository, ScholarsArchive@OSU, to deliver open access public education with the added benefit of digital preservation.

Scholarly Publishing and Institutional Partnerships

While scholarly publishing has been accused of being exclusive, slow, and inaccessible,

[1]

great effort has been invested over the past decade to invent new scholarly publishing models that are more inclusive, quicker, and more accessible.

Among the many proposed solutions for an improved model of scholarly publishing is the institutional repository. Though much of the research on the topic deals with how an institutional repository can provide an open access option alongside traditional scholarly journal publishing, examples have also been presented of how universities can more broadly utilize their institutional repositories for a variety of publishing activities.^[2]

Institutional repositories offer an open access framework of making materials developed across the university community available through local and commercial search engines while simultaneously providing best practices for the digital preservation of university-created assets.^[3] Institutional repositories are representative of the broader advantages for university publishing houses to collaborate with their institutional libraries.^[4]

Open Access and Public Outreach

While much of the literature on open access has focused on journal articles written for a peer researcher audience,^[5] granting agencies and other stakeholders of the scholarship being funded at institutions of higher education are increasingly demanding greater outreach efforts and public impacts, not just open access to research findings.

The need for public outreach and community engagement has become central to the sustainability of all sorts of institutions of higher education.^[6] Community engagement—with Carnegie Foundation designations, new divisions forming within universities, interdisciplinary journals focusing on the subject, and national conferences on the theme—is the zeitgeist of the day. The financial security of higher education is thus connected to its ability to demonstrate its positive impacts in the broader world—locally, nationally, and globally.

These outreach and engagement efforts that are rising across college campuses can benefit by learning from the century of experience of land-grant universities and their

Extension Services.^[7] The land-grant university Extension Service is an often-overlooked pioneer in open access publishing and community outreach. Initiated with the Smith-Lever Act of 1914, Extension agents have been sharing with the public research-based knowledge in agriculture, forestry, family and community health, and youth education for nearly a century.

Our land-grant institutions, charged with providing public education and outreach, were founded on the premise that the knowledge developed in institutions of higher education should have practical application. University faculty have a responsibility to make the knowledge accessible to the public so it can benefit their lives. This public outreach mission now extends well beyond land-grant universities to, in some form, every college and research institution.

New sustainable information technology approaches are necessary to communicate and preserve the public education materials generated as part of this growing era of outreach and engagement.^[8]

Outreach Publishing at Oregon State University

At Oregon State University (OSU), a land-grant university, the outreach materials (see figure 1) developed by Extension Service faculty are based on research, undergo peer review and editorial processes, and are considered a form of scholarship recognized in the promotion and tenure process.^[9]

[figure 1 should be placed about here.]

Figure 1. Historical and current EESC publications. Photo courtesy of Sue Kunda]

OSU's Extension and Experiment Station Communications (EESC) serves as the official publisher for the university's Extension Service. For decades, EESC published and disseminated outreach publications written by Extension faculty for the public through the mail, Extension offices, and various workshops and community events.

With the advent of the World Wide Web, by the mid-1990s EESC was publishing Extension publications through an online catalog hosted on its own Web server. The advantages of delivering information online to users at any time and place were clear, but the sustainability of this model, or lack thereof, was less obvious.

One of the online outreach publishing challenges that became of increasing concern to EESC faculty was the tension between providing access to current best-known knowledge and preserving the investment of faculty scholarship even after it is replaced by work representing updated knowledge. This access-versus-preservation challenge is particularly acute for an organization focused on publishing information that will be applied to real-life situations. For example, EESC publishes publications containing information on food preservation, pesticide use, etc. that could be dangerous to public health if inaccurate. Thus, out-of-date materials must be removed from the publisher's catalog for public safety as well as for legal reasons.

These out-of-catalog materials, however, still represent an investment of public resources and have historical and scholarly value. In fact, the progression of materials demonstrates the incremental advancements of science and how best practices are refined through research and experience over time. The sequence of revisions reminds us that in 50 or 100 years people will look back at the current materials and note their limitations and imperfections as "the best we knew at the time." The need for research and improved understanding is never complete.

Thus, EESC was in need of a publishing model that would provide (1) digital preservation of all published works for the good of current and future scholars and (2) a public interface (i.e., the catalog) to provide the public access to best-known outreach knowledge to date.^[10]

Institutional Repository at Oregon State University

Academic libraries have long played an important role in collecting, disseminating, and archiving campus research and scholarship. In the late 1990s and the early part of the

21st century Oregon State University Libraries (OSUL) recognized the momentous shift in the execution of those activities. No longer were the producers—or users—of that content satisfied with the limitations of print documents; the mantra of the period could easily be summed up this way: “If it’s not online, it doesn’t exist.”

In September 2003, the University Librarian assigned a task force to investigate the possibility of establishing an institutional repository to collect, maintain, and provide access to the growing body of digital research and scholarship at Oregon State University. The importance of promoting OSU research and scholarship is also reflected in Goal 2 of the 2011-12 Strategic Plan of OSU Libraries and OSU Press: “Enhance the visibility and impact of the University’s scholarship and unique resources.”¹¹ Subsequent strategies for achieving this goal include capturing and preserving faculty and student research, working with OSU academic units to build key digital collections, and acquiring and expanding collections in support of OSU’s thematic areas.

The task force worked to identify the Oregon State University community’s needs, explored the various issues surrounding institutional repositories, and developed the following vision statement: “As one tool in the OSU Libraries’ suite of digital library tools, the OSU’s Institutional Repository will provide a reliable means for faculty members to store and access their research and teaching output, for students to do the same with their research, and for the institution to maintain its historical record.” The task force eventually recommended DSpace, an open source institutional repository platform developed jointly by MIT and Hewlett Packard, and in 2005 [ScholarsArchive@OSU](#) (see figure 2) was launched.

[figure 2 should be placed about here.

Figure 2. ScholarsArchive@OSU home page.]

ScholarsArchive@OSU exploits the power of search engines like Google to help the students, researchers, and the public search and retrieve the information they need.

The institutional repository also provides a coherent system to provide access to and preservation of scholarship and public outreach materials institution-wide.

Partnership Development

Recognizing it was unrealistic to expect faculty to fill an empty institutional repository through voluntary self-archiving and understanding a critical mass of open access content would go a long way in convincing researchers to add their own publications to an institutional repository, early efforts to build collections in ScholarsArchive@OSU focused on student scholarship and digitized print collections of Oregon State University research. The Graduate School began requiring their students to submit electronic copies of their theses and dissertations to ScholarsArchive@OSU in 2007. University Honors College, Bioresource Research and International Degree students were also required to provide digital copies of their final papers to their departments so they could be added to the institutional repository.

The OSUL Digital Production Unit, created in 2005, was responsible for digitizing—and submitting to ScholarsArchive@OSU—research collections already sitting on library shelves. Early collections included Oregon Department of Fish and Wildlife reports, College of Oceanic and Atmospheric Sciences data and research reports and Water and Watersheds Initiative Seminar Series.

At the same time, other campus units recognized the value of ScholarsArchive@OSU's ability to collect, disseminate, and preserve a variety of intellectual outputs. Journal editors, conference organizers, and others began contacting OSUL staff about depositing their items in ScholarsArchive@OSU. Although institutional repositories were originally intended to capture an academic institution's faculty and student publications, OSUL was increasingly discovering unexpected uses for ScholarsArchive@OSU, such as that of public outreach materials.

Initial discussions between OSUL and EESC focused on EESC's concern that out-of-date and potentially hazardous information would be made available to the public.

Because of this worry, the initial phase focused on OSUL digitizing legacy documents (1890–1950) that the public would clearly recognize as historical (not current) recommendations should they stumble upon them in a Web search. A number of other land-grant universities had also begun similar efforts to digitize and preserve historical materials but those were limited to a few special collections and historical documents.^[12]

In 2009, while the OSUL Digital Production Unit continued digitizing and adding legacy EESC publications to ScholarsArchive@OSU, EESC and OSUL developed an approach to also deposit both current and new outreach materials to the institutional repository. EESC staff removed current publications from the Extension catalog, submitted the files to ScholarsArchive@OSU and updated the catalog with the new associated link. In addition, the EESC publishing team submits new publications to ScholarsArchive@OSU and OSUL technicians ensure all records are properly cataloged.

The new approach adequately avoids the concern posed earlier. When an outreach product becomes outdated, it is removed from the Extension catalog and a disclaimer is added to the ScholarsArchive@OSU record to indicate that the publication is out of date. Yet the import of the work and OSU faculty investment represented by these products are preserved for the benefit of the institution and future generations.

Unexpected Challenges

While both academic units were highly motivated to see the project through, the differences in organizational purpose, culture and practice produced several unexpected challenges. The EESC Publishing Leader and OSUL Digital Scholarship Librarian resolved most issues via phone, email, and in-person conversations. In addition, a training session including EESC publishing team members and OSUL catalogers, provided a forum for understanding and resolving differences. OSUL technical staff also provided assistance with more technological concerns. Several challenges – and resolutions – are described below.

Because of their inclusion in the OSUL catalog, EESC publications in ScholarsArchive@OSU are cataloged according to Libraries' specifications, which do not always square with EESC's requirements. For example, OSUL uses a series name (e.g., Special Reports) and issue number to describe EESC publications and included the information in ScholarsArchive@OSU metadata. EESC does not use a series name, but instead assigns a series prefix (e.g., SR) and issue number to publications. Midway through the project EESC staff recognized the discrepancy and contacted OSUL. Rather than choose one format over the other ScholarsArchive@OSU staff decided to include both series formats in the metadata record.

The DSpace institutional repository platform—as installed at OSUL—lacks some of the functionality that EESC enjoyed when its online catalog pointed to publications located on its own server. Links to publications in the EESC catalog went directly to the publication; users only had to click once. Links to items in SA@OSU ordinarily go to a bibliographic record, which provides descriptive information as well as the link to the publication; users need to click twice. EESC preferred one click rather than two, and also felt the link to the publication was difficult to find on the bibliographic record. Library IT staff, familiar with usability issues, added unambiguous wording, “Click to download full text:” to each record and suggested replacing vague file names with publication titles to make it clear which link would take the user to the full-text item. (see figure 3)

[figure 3 should be placed about here.

Figure 3. Screenshot of download verbiage and file name.]

Resolving the one-click vs. two-clicks issue, unfortunately, hasn't been as straightforward. In order to continue providing a one-click experience for users, EESC continues to link directly to the publication, albeit now in ScholarsArchive@OSU. Linking directly to the publication, however, increases the likelihood of broken links as the DSpace platform provides permanent links to the bibliographic record, not the publication. Publication files are housed on a library server, and although the location is reasonably stable, links are not considered permanent, something EESC desired from

its publishing model. OSUL is currently investigating the use of digital object identifiers, such as DOIs and ARKs, in ScholarsArchive@OSU to accommodate EESC – and potentially, other researchers and academic units.

Another unexpected challenge arose when files (and associated links) were transferred from the EESC server to ScholarsArchive@OSU and OSUL servers. Extension Service offices throughout Oregon, which provide direct links to EESC publications from their web pages, were caught unaware when the EESC URLs were replaced with ScholarsArchive@OSU links. At the same time, EESC updated its online catalog by transferring all out-of-date publications to ScholarsArchive@OSU, and Extension faculty did not always agree with the decision to remove specific titles. Extension Service Offices have since replaced the broken links and publishing policies governing the removal of items from the EESC catalog have been clarified and communicated to Extension faculty.

The ScholarsArchive@OSU interface and functionality also led to frustration for both Extension and EESC staff. Extension faculty, accustomed to searching in the EESC online catalog, found the ScholarsArchive@OSU search and browse features complicated, making it more difficult to access materials. EESC staff, on behalf of Extension faculty, approached the Digital Scholarship Librarian about creating a screenshot (see figure 4) detailing the best method for searching within ScholarsArchive@OSU. The screenshot is now included in a series of FAQs on the EESC website.

[figure 4 should be placed about here.

Figure 4. Screenshot detailing method for searching for EESC documents in ScholarsArchive@OSU.]

Despite the setbacks, both EESC and OSUL agree the partnership has created strong ties between the two staffs, and the project to place all Extension and Experiment Station publications online in ScholarsArchive@OSU has benefitted both units.

Outcomes from the Partnership

The partnership benefits EESC in several ways. First, EESC now shares with OSUL the responsibility of digitally archiving the public outreach materials the university produces. Because of this shared responsibility, the communications expertise in EESC can be better focused on the creation of outreach materials. This is important in the financial context of increasing outreach expectations and reduced funding for Extension staff resources. The partnership also provides a platform for EESC to extend its working relationship with other units of the university—for example, other colleges within the division.

The partnership also benefits OSUL. The more than 6,000 items now in the EESC collections represent approximately one-fourth of the total items in ScholarsArchive@OSU, many of which hold matters of great import for Oregon citizens. Shortly before a January 2010 statewide vote on two ballot measures aimed at raising taxes on high-income residents and corporations, in order to pay for public services, EESC deposited "*Perspectives on Oregon's Taxes – An Economic Look at Measures 66 & 67*" into ScholarsArchive@OSU. This publication, written by an OSU economist, presented information about Oregon's tax levels at the time and the effect the passage of the measures would have on the state's tax situation. Within twenty-four hours after its release more than 400 viewers downloaded the information.

Providing information, such as the aforementioned document, to residents across the state is an example of OSUL's commitment to extend its service mission beyond the walls of the academy. Not only are Oregon citizens benefiting from these documents, however; in 2011 EESC resources were downloaded more than 200,000 times from audiences in nearly 200 countries worldwide, demonstrating a global demand for OSU research and educational outreach.

Conclusions and Implications

As of January 1, 2012 all digitized and born digital EESC publications are housed in ScholarsArchive@OSU; future materials will be published directly into the institutional repository by EESC staff, making the entire corpus of EESC outreach materials available to a worldwide audience. As a land grant institution, OSU's fundamental mission is to "provide the people of Oregon with graduates, scholarship and research, as well as constructive outreach and engagement."^[13] Using the institutional repository to make the EESC publications openly available to the online community demonstrates a clear commitment to that vocation.

Institutional repository deployment, among U.S. academic institutions, is rising, yet many repositories sit empty or near empty due to a narrowly-defined focus: to capture faculty scholarship, specifically, peer-reviewed journal articles, in order to make them freely available. While providing open access to toll-based research is an admirable goal, organizations clinging to this *raison d'être*, risk neglecting publishing opportunities similar to the one at Oregon State University. OSU's willingness to build campus-based collaborations around digital repository technology helps redefine the library's role and helps imagine and initiate new publishing models.

The Department of Horticulture, after working with the Digital Scholarship Librarian to create a data dictionary unique to their publications, publishes its Oregon Processed Vegetable Commission Reports directly into ScholarsArchive@OSU. The Colleges of Forestry and Earth, Ocean and Atmospheric Science use ScholarsArchive@OSU to house hundreds of departmental research and technical reports, the Graduate School and several undergraduate programs now requires students to deposit final research papers, theses and/or dissertations to ScholarsArchive@OSU before graduation, and the University Press placed several out-of-print titles – and plans to place excerpts from future manuscripts – into the institutional repository.

OSU also actively pursues opportunities to insert ScholarsArchive@OSU into campus units' activities and workflows. Learning of OSU News and Research Communications' frustration with an inability to provide original research in conjunction with news stories

written for a lay audience and disseminated to news organizations worldwide, OSUL developed a procedure to contact authors for the research and deposit it into ScholarsArchive@OSU in advance of the press release. News and Communications' writers place the resulting url at the top of the news story and OSUL staff add the link to the news story to the associated article in ScholarsArchive@OSU, giving readers the opportunity to read the news story, the original research or both. (see figures 5 and 6) While the collaboration benefits the two units, it also provides a reason for faculty to deposit their research into ScholarsArchive@OSU. The broader significance of this, and similar collaborations, however, ultimately serves the mission of Oregon State University: to promote the University and its research to a state, national and worldwide audience.

[figures 5 and 6 should be placed about here.

Figure 5. Newspaper article with link to original research in ScholarsArchive@OSU. From gazettetimes.com, *Beavers football tapes used in artificial intelligence research at OSU*. (Corvallis, OR: Lee Enterprises, 2011)¹⁴

Figure 6. Screenshot of ScholarsArchive@OSU record page directing the reader to the news story written about the research.]

Public outreach and access are becoming more and more important not only at land-grant institutions, however, but for all institutions of higher education. Sustainable information technology approaches are necessary to communicate and preserve the public education materials generated as part of this new era of outreach and engagement. The institutional repository represents a logical and tested vehicle to do this.

Acknowledgement: My co-author and good friend, Mark Anderson-Wilk, was seriously ill during the final phases of the EESC-OSUL collaboration and passed away shortly before this article's publication. Mark was a passionate believer in bringing Extension and Experiment Station research to a wider audience, and without his gentle but persistent prodding the project may never have come to fruition. He was also a kind,

generous and patient writing partner. Mark's true gift, however, was the relationship he built with everyone around him. He truly saw his family, friends and colleagues as the "sparkles of love and light"¹⁵ in his life and he will be dearly missed. Shine on, Mark.

Mark Anderson-Wilk was Publishing Leader in Extension and Experiment Station Communications at Oregon State University. His career in publishing included work in magazines, newspapers, journals, textbooks, popular books, training materials, advocacy and policy communications, and public education materials in the areas of creative writing, journalism, higher education, astronomy, civil engineering, plant sciences, forestry, and natural resource conservation.

Sue Kunda is the Digital Scholarship Librarian at Oregon State University Libraries. She received her undergraduate degree from Montana State University and worked as an elementary school teacher and school librarian in Idaho, Montana, Alaska and Washington before receiving her M.L.S. from Emporia State University. She currently manages the institutional repository, ScholarsArchive@OSU, and is involved with scholarly communication issues. Sue may be contacted at sue.kunda@oregonstate.edu.

Notes

¹ Brian Whitworth and Rob Friedman, "Reinventing Academic Publishing Online. Part I: Rigor, Relevance and Practice," *First Monday* 14, no. 8 (2009), accessed January 27, 2012,

<http://www.uic.edu/htbin/cgiwrap/bin/ojs/index.php/fm/article/viewArticle/2609/2248>.

² Richard K. Johnson, "Institutional Repositories: Partnering with Faculty to Enhance Scholarly Communication," *D-Lib Magazine* 8, no. 11 (2002), accessed January 27, 2012, <http://www.dlib.org/dlib/november02/johnson/11johnson.html>; Morag Mackie, "Filling Institutional Repositories: Practical Strategies from the DAEDALUS Project," *Ariadne* 39 (2004), accessed January 27, 2012, <http://hdl.handle.net/1905/196>; Jean-Gabriel Bankier and Irene Perciali, "The Institutional Repository Rediscovered: What Can a University Do for Open Access Publishing?" *Serials Review* 34, no. 1 (2008): 21-26, accessed January 27, 2012,

<http://www.sciencedirect.com/science/article/pii/S0098791307001517>.

³ Raym Crow, *The case for institutional repositories: A SPARC position paper* (Washington, DC: Scholarly Publishing and Academic Resources Coalition, 2002), accessed July 27, 2011, http://works.bepress.com/ir_research/7/; Clifford A. Lynch, "Institutional Repositories: Essential Infrastructure for Scholarship in the Digital Age," *portal: Libraries and the Academy* 3, no. 2 (2003): 327-336, accessed January 27, 2012,

http://muse.jhu.edu/journals/portal_libraries_and_the_academy/v003/3.2lynch.html;

Mark Ware, "Institutional Repositories and Scholarly Publishing," *Learned Publishing* 17, no. 2 (2004): 115-124.

⁴ Linda A. Watson, Ivan S. Login, and Jeffrey M. Burns, "Exploring New Ways of Publishing: A Library-Faculty Partnership," *Journal of the Medical Library Association* 91, no. 2 (2003): 245-247, accessed January 27, 2012,

<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC153166/>; Laura Brown, Rebecca Griffiths, and Matthew Rascoff, *University Publishing in a Digital Age* (New York, NY: Ithaka, 2007), accessed January 27, 2012, from <http://www.ithaka.org/ithaka-s-r/strategyold/Ithaka%20University%20Publishing%20Report.pdf>; Raym Crow, *Campus-Based Publishing Partnerships: A Guide to Critical Issues*. (Washington, DC: Scholarly

Publishing and Academic Resources Coalition, 2009), accessed January 27, 2012, http://www.arl.org/sparc/bm~doc/pub_partnerships_v1.pdf; Peter J. Dougherty, "Reimagining the University Press: A Checklist for Scholarly Publishers," *Journal of Electronic Publishing* 13, no. 2 (2010), accessed January 27, 2012, <http://hdl.handle.net/2027/spo.3336451.0013.202>.

⁵ Charles Oppenheim, "Electronic Scholarly Publishing and Open Access," *Journal of Information Science* 34, no. 4 (2008): 577-590, accessed January 27, 2012, <http://jis.sagepub.com/content/34/4/577.short>.

⁶ Alejandro Perilla, "Measuring Success in Outreach and Engagement: Arizona State University and the American Dream Academy," *Journal of Higher Education Outreach and Engagement* 14, no. 3 (2010): 97-111, accessed January 27, 2012, <http://openjournals.libs.uga.edu/index.php/jheoe/article/view/430/381>; George R. McDowell, "Engaged Universities: Lessons from the Land-grant Universities and Extension," *Annals of the American Academy of Political and Social Science* 585, no. 31 (2003): 31-50, accessed January 27, 2012, <http://ann.sagepub.com/content/585/1/31>; Elizabeth L. Hollander and John Saltmarsh, "The Engaged University," *Academe Online* 86, no. 4 (July-August 2000), accessed January 27, 2012, <http://www.aaup.org/AAUP/pubsres/academe/2000/JA/Feat/holl.htm>; Kellogg Commission on the Future of State and Land-Grant Institutions, *Returning to our roots: The engaged institution*. (Washington, DC: National Association of State Universities and Land-Grant Colleges, 1999), accessed January 27, 2012, <http://www.aplu.org/NetCommunity/Document.Doc?id=183>.

⁷ McDowell, "Engaged Universities: Lessons from the Land-grant Universities and Extension," *Annals of the American Academy of Political and Social Science* 585, no. 31 (2003): 31-50, accessed January 27, 2012, from <http://ann.sagepub.com/content/585/1/31>

⁸ Robert Heatley, *Plan to develop a digital information infrastructure to manage land grant information* (Lincoln, NE: American Distance Education Consortium, 2007), accessed January 27, 2012, <http://www.adec.edu/adec-agric-digital-inf.pdf>.

⁹ C.J. Weiser and Lyla Houglum, "Scholarship Unbound for the 21st Century," *Journal of Extension* 36, no. 4 (1998): 4FEA1, accessed January 27, 2012,

<http://www.joe.org/joe/1998august/a1.php>.

¹⁰ Sue Kunda and Mark Anderson-Wilk, "Community Stories and Institutional Stewardship: Digital Curation's Dual Roles of Story Creation and Resource Preservation," *portal: Libraries and the Academy* 11, no. 4 (2011): 895-914, accessed January 27, 2012,

http://muse.jhu.edu/journals/portal_libraries_and_the_academy/toc/pla.11.4.html.

¹¹ Oregon State University Libraries. 2011. 2011-12 Strategic Plan of OSU Libraries and OSU Press. Oregon State University Libraries website, Oregon State University, accessed January 27, 2012,

<http://osulibrary.oregonstate.edu/files/2011%20Strategic%20Plan.pdf>.

¹² Mark Anderson-Wilk, "Improving Discoverability, Preventing Broken Links: Considerations for Land-grant University Publishers," *Journal of Applied Communication* 95, no. 1 (2011): 36-49, accessed January 27, 2012,

http://journalofappliedcommunications.org/images/stories/issues/2011/jac_v95_n1final.pdf.

¹³ Edward J. Ray, "Challenges in Advancing our Land Grant Mission" (speech presented at 2003 University Day, Oregon State University, Corvallis, OR, September 16, 2003, accessed January 27, 2012, <http://oregonstate.edu/leadership/president/state-of-the-university-2003>.

¹⁴ David Stauth, "Beavers football tapes used in artificial intelligence research at OSU,;" *gazettetimes.com*, August 18, 2011, <http://www.gazettetimes.com/news/local/18ba3682-c9fa-11e0-ba5e-001cc4c03286.html>

¹⁵ Mark Anderson-Wilk. (January 12, 2012).