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*Hot Springs, Arkansas
August 2-4, 2006*



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A Southern Region Conference on Technology Transfer and Extension

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FOREWORD

Forests cover approximately 212 million acres in the Southern United States. This equates to 40 percent of all timberland in the United States. These forests provide raw material for a vital, domestic forest products industry; habitat for countless species of plants and animals; and contribute immensely to environmental values and quality of life for residents and visitors. Urban and wildland-urban interface forests also provide critical ecosystem services and quality-of-life benefits for residents. Appropriate management and use of these various forest resources depends upon continuous research and education efforts that respond to changing human and naturally occurring pressures on the forest.

A synthesis of southern forest science was published in 2004 to describe the contributions science has made and continues to make to the care and management of southern forests (Rauscher, H.M.; Johnsen, Kurt, eds. 2004. *Southern forest science: past, present, and future*. Gen. Tech. Rep. SRS-75. Asheville, NC: U.S. Department of Agriculture Forest Service, Southern Research Station. 394 p.). However, the production of useful scientific knowledge is only part of creating and maintaining sustainable forest ecosystems in the South. Getting this knowledge to people who need it to effect positive changes in the forest landscapes is just as important as producing it in the first place. The function of science delivery/technology transfer is to (1) synthesize scientific knowledge into larger, more meaningful units; (2) translate this knowledge into the language and style that appeals to forestland owners and managers; and (3) connect scientific results, conclusions, and forecasts of impacts in a timely manner with the needs and issues of forestland owners and managers.

For the first time in recent memory, specialists in natural resource technology transfer and science delivery from throughout the Southern United States gathered together in conference in Hot Springs, AR, in August of 2006 to share experiences, identify common issues and problems, create a sense of group identity, develop a common vision, and craft working relationships and partnerships that can help us help each other do the best job possible. Of the over 100 participants at this conference, 50 percent represented extension; 30 percent came from the Forest Service; and the remaining 20 percent were members of State forestry organizations, environmental nongovernmental organizations, and other Federal Agencies. The conference participants were extension workers, natural resource specialists, teachers and professors, technology transfer specialists, and many others who work tirelessly to put new science and technology into the hands of users where that knowledge can make a difference.

Because our forestland owners and managers have different needs and preferences, it is important to use a multifaceted science delivery/technology transfer program to reach them. Multifaceted science delivery programs offer similar content in a wide range of products including printed publications, face-to-face workshops and training sessions, satellite-based and pod-casting-based distributed learning courses, and a wide range of Internet-based products. These proceedings from the Southern Region Conference on Technology Transfer and Extension in Natural Resources contain 4 keynote papers, 18 papers on various technical and procedural aspects of science delivery, and 9 papers describing successful technology transfer efforts. As a collection, these papers describe the state of activities and thinking in Southern United States natural resource science delivery and technology transfer.

The proceedings of this Southern Region Conference on Technology Transfer and Extension in Natural Resources, coupled with the proceedings of the status of southern forest science (Rauscher and Johnsen 2004) provides the best existing snapshot of natural resource science and technology transfer that exists today.

For more information on southern regional extension forestry and technology transfer products, please visit <http://www.sref.info>.

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USING THE WEB TO FACILITATE EXTENSION PROGRAM DELIVERY AND MANAGEMENT

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Abstract—Needs Assessment; Program Development/ Delivery/ Evaluation; Documenting Impact – These phrases are well-known to Extension professionals. Successful Extension professionals must conduct all these activities in a time of shrinking resources and increasing demand. Maintaining a website can be seen by Extension professionals as ‘just one more chore’ on top of already busy schedules. But busy schedules are only part of the ‘technology challenge’ facing Extension faculty. Recent research has shown a lack of preference for computer-based communication (Howell and Habron, 2004; Radhakrishna and others, 2003) among some traditional Extension clientele. At the same time, the Web is a good way to reach new, and perhaps younger, audiences. Increasing pressures for accountability further complicate the matter - how can the impact of Web-based educational materials be assessed when often the only information available is the number of website visits or ‘hits’ for materials? This paper highlights uses of the Web to ‘lighten the load’, broaden the reach, and improve the effectiveness of Extension faculty. The development of an automated ‘user registration and material delivery’ system is discussed. A case example is presented to give an overview of the development and evolution of the system and the results of a user survey. The system is applicable to any Extension or Technology Transfer professional wanting to track and survey users of Web-based materials.

INTRODUCTION

Extension professionals must balance a multitude of responsibilities including periodically assessing the needs of clientele; finding resources to develop and maintain programs; developing, delivering, and evaluating educational programs; and documenting impact. Successful Extension professionals must conduct all these activities in a time of shrinking resources and increasing demand. Maintaining a website can be seen by Extension professionals as ‘just one more chore’ on top of already busy schedules.

But busy schedules are only part of the reason that many Extension faculty members seem reluctant to devote significant energy to using the Web for delivering programs and materials. Other challenges include the preferences of how Extension clientele want to receive information, demands to reach new audiences, familiarity with the technology itself, pressures to document impacts, and how to reward Extension professionals.

Extension professionals know that they must tailor their approaches to program delivery based on the needs and preferences of the target audience. Recent research has shown that many Extension clientele still prefer ‘traditional’ modes of communication (face-to-face or telephone) over email or websites (Howell and Habron, 2004; Radhakrishna and others, 2003). This is certainly not surprising to anyone that has worked in Extension – long-term clientele value Extension as the place they can come and talk to a ‘real live person.’ At the same time, however, there are pressures to broaden the reach and ensure Extension is relevant to the next generation. While Howell and Habron (2004) found a general lack of preference for receiving information via

the Internet, the preference was much higher for younger audiences than for older audiences.

This preference among younger audiences likely coincides with their experience and comfort level using computers. Extension faculty are no exception in this regard; faculty that have not grown up using computers cannot be expected to be as familiar, or as comfortable, with using the Web for educational programming as younger, more computer-savvy faculty. And even for those that invest time and energy in learning the technology, frustration soon sets in when rapidly changing technology makes their newfound skills obsolete.

Another challenge is the increasing pressure for Extension faculty to document the impact of their educational programs and materials. In traditional face-to-face settings such as workshops, gathering participant information and conducting post-session evaluations to assess behavior change are pretty straightforward. However, the Web presents unique challenges – website visitors are typically anonymous, and it is easy to speculate that they prefer to remain so given constant reminders not to divulge personal information over the Internet. Without knowing who the clientele are it is nearly impossible to assess how educational materials impact their lives.

A final challenge is related to the well-established rewards systems for faculty. Traditional performance evaluation systems focus on publications, presentations, and workshops. Thus, the old axiom holds true, “tell me how you’ll measure me and I’ll tell you how I’m going to behave.” It is difficult for an Extension professional to justify devoting significant energy to Web-based

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programming knowing that their supervisor may not perceive such outputs as being as valuable as traditional outputs.

Given these challenges, one might conclude that the underlying message here is that the challenges to using the Web and other technology outweigh the benefits for Extension professionals. This is not the intent. Rather, the intent is to consider ways to use technology while taking into account the challenges that face Extension professionals.

Therefore, the goal of this paper is to demonstrate how Extension faculty can use the Web to not only lighten their workload and broaden their reach but also as a means to be able to document impact. A case example is used to describe how to achieve these objectives.

METHODS

Case Example - Background

The case example presented here describes the development, delivery, and evaluation of a software program for estimating shrink and swell in wood products. The most common challenges faced by anyone that works with wood – from the home hobbyist to personnel at large-scale industrial sawmills – are related to wood’s tendency to shrink and swell with changes in ambient relative humidity. The calculations for estimating shrink and swell in wood can be intimidating for some users as they must take into account variables including wood species, wood grain orientation, size of the piece, and magnitude of change in ambient conditions. The software was developed in response to clientele expressing the need for a simple tool to do these calculations.

The first version of the software was distributed by Oregon State University’s (OSU) Extension and Experiment Station Communications office in a binder containing a hard-copy user’s manual and diskette at a cost of \$15. While the publication looked very professional, the packaging greatly increased the cost and likely limited distribution and usage. After three years and a major revision of the software (from MS DOS® to MS Excel®), the author decided to ‘embed’ the user manual in the software (i.e., as one of the tabs in the spreadsheet) and distribute it free-of-charge via the Web.

Tracking Usage and Users of Web-Based Materials

When the OSU Extension Communications office distributed the software it was relatively simple to determine who was using (or at least purchasing) the material; one simply needed to contact the office and request how many copies had been sold and to whom. However, distributing the software on the Web resulted in the loss of the ability to easily track users and hence the ability to contact them for impact assessment.

The ability to track website hits and usage of materials has improved greatly in recent years. Web statistics services such as Urchin® (now Google Analytics®) provide a wealth of data on website traffic. Data provided include number of hits (in total and by individual page), number of unique visitors, search phrases entered by users to find your site, downloads of individual files, and dozens of other statistics. The author was able to use Web statistics to determine how many visitors had downloaded the wood shrink/swell software each month.

‘Webstats’ are useful data for documenting usage of materials; however they do not provide information on users. Thus, they do not provide sufficient detail for assessing impact. To assess impact, user contact information is needed. This presents a challenge for Web-based materials – How can contact information be obtained from website visitors? Further, will requesting such information lead to steering website visitors away, i.e., will they seek another source rather than provide personal information?

The author developed a simple user registration system for the wood shrink/swell software. The system used a standard Web form to collect user data. When website visitors completed the form and clicked ‘Submit’, an email message was sent to the author. User information was then copied-and-pasted into a spreadsheet and the software was emailed, or a diskette was snail mailed to the user in the event an email address was not provided.

It didn’t take long before the disadvantages of this approach became apparent. Even moderately popular materials result in quite a bit of additional email messages; and it is fairly time-consuming to copy-and-paste user data and email/mail materials.

To lessen the time commitment involved, a simple change was made to the system - when visitors filled in the form and clicked ‘Submit’, the auto-generated response message they received provided a direct link to the software. This eliminated one step in the process (i.e., emailing or snail mailing the software to users); however tracking user information was still time-consuming. Further, providing a direct link to the software resulted in two distinct disadvantages:

1. Shortly following the change to the system, Web statistics showed far more downloads than user registrations. Thus, it seemed users were simply finding (or being provided – perhaps by another user) the direct link to the software and bypassing the registration form; and
2. Several users provided incorrect contact information. This fact became clear by the number of undeliverable email messages in follow-up surveys and/ or by users providing email addresses (sometimes quite humorous) such as `u_cant_have_my_email@no_way.com!`

It seemed the optimal solution to these problems was an automated system for collecting user information and delivering the software. Web-based databases such as MySQL® allow for storing user information without requiring the additional step of transferring data to a program like Microsoft Excel® or Access®. There are computer scripts (short blocks of programming code) in the PHP programming language available to accomplish tasks such as sending emails with attachments. The author used the book *PHP and MySQL for Dummies* (2002) to develop an automated ‘user registration and educational material delivery’ system. The system works as follows:

1. Website visitors fill in a standard Web-based form to request the wood shrink/swell software (email address is a required field)
2. Upon clicking submit, a computer script is executed that automatically sends a copy of the software as an attachment to the email address provided;
3. The user information is automatically entered into a Web-based database

The entire system is ‘hands-off’; user contact information is entered into a database and the software is sent via email attachment 24 hours a day, seven days a week without any involvement by the faculty member. Conducting a survey to assess impact merely involves visiting the Web-based database and copying-and-pasting user email addresses into an email message.

To address the question of potential reduction in usage due to requiring user contact information, visitors were told that they would be contacted only once by email to evaluate the software. An anonymous download system was also created realizing that the ‘only one contact’ assurance would likely alleviate concerns for some, but not all visitors. An option was added for users to click a button to ‘Skip this Form’ and be taken directly to a link to the software without providing their contact information. Clicking the button results in incrementing a counter so that the author can compare the number of users that skipped the form to those that provided contact information.

Users were surveyed in 2002, 2003 and 2004² and asked if they had used the software; if so, the specific situation where the software was used and the outcome; whether or not the instructions were clear and the examples provided were helpful; and suggestions for improvement. Requests to complete the survey were sent by email and the survey itself was a Web-based form (see Appendix). Responses to the survey were received by email and were copied-and-pasted into the Web-based database and linked to the respondent’s contact information.

RESULTS

Since January of 2002, over 1,270 users have downloaded the software, although this figure does not include visitors that bypass the registration form. Users have come from nearly every U.S. state and 60 countries. In total, approximately 11 percent (n=144) of the users responded to the survey.

Information useful for impact documentation include the fact that all but one of the respondents that had used the software to solve a problem (many simply downloaded the software out of curiosity) said it had helped them to solve a particular problem. Useful quotes included descriptions of how the software had been used such as:

- “When designing furniture and cabinets I use it to calculate wood movement and design accordingly. It’s a very good program and very useful to me.”
- “Possible shrinkage to allow for in oak floor”
- “I was curious how much wood shrinks in our hot dry climate. Some drywallers had stated that lumber shrinkage was causing drywall cracking in newly built homes. It was our conclusion that the lumber shrinkage was not the probable cause. The most likely cause was that the drywallers were not following their own guidelines for drywall installation (No expansion joints installed, not curing the mud before finishing, not heating the buildings in winter, not cooling them in summer.) We have also learned that drywall is not always dried to proper moisture content prior to installation.”
- “Change in width of lumber and timbers cut on portable sawmill for use before dry”
- “Determine amount of shrinkage I could expect in a Maple table top that I was building”

With respect to the potential reduction in usage due to requiring user contact information, surprisingly, 60 percent provided contact information (i.e., 40 percent clicked ‘Skip this Form’ and downloaded the software anonymously). It was expected that this figure would be much higher given frequent warnings about providing personal information on the Internet, particularly considering that visitors had the option not to provide information.

²As promised, users were only surveyed once - the 2002 survey was addressed only to those that downloaded the program in that year and similarly for the 2003 and 2004 surveys. Further, no follow-up messages were sent to non-respondents.

DISCUSSION

Given the very full schedules of Extension professionals, creating and maintaining a website can be seen as just one more chore. Alternatively, Extension professionals can see the Web as one of many useful tools for delivering educational materials and assisting with program management tasks of tracking users of educational materials and assessing impact. The automated 'user registration and educational material delivery' system described in this paper is working well to lighten the burden on one Extension professional and is applicable to anyone wanting to track and survey users of Web-based materials.

For the approach to be more widely used however, the system must be standardized and streamlined in some way that it can be used by those without computer programming experience (or the inclination to become programmers). There have been discussions at Oregon State University regarding developing a Web-based template that would allow any Extension faculty member to simply complete an on-line form to upload the material they wish to track, specify the information they want to obtain from users, and write the survey questions they plan to ask. A software program would then function behind-the-scenes to develop the user registration form, email script to deliver the material to users, Web-based database, and the user survey.

Future improvements planned for the system described here include automating the survey response process. That is, instead of having survey responses come to the author, they would be automatically inserted into the user database for the appropriate user. Another valuable improvement would be to automate the survey process itself. That is, based on the date a user downloads the material, a message would be sent to them within a specified time frame (e.g., 3 months, 6 months, etc.) requesting that they visit a website and respond to a survey.

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- Valade, J. 2002. *PHP and MySQL for dummies*. New York: John Wiley. 390 p.

Appendix A: User Survey

Our records show that you downloaded the wood.xls program for estimating shrink and swell in wood. We would greatly appreciate if you would take a few minutes to provide us with feedback so that we can assess how you are using the program and how we might improve the program.

We will not contact you again unless you specifically ask us to do so. Thank you.

Name: _____

Company Name: _____

E-mail address: _____

1. Have you used wood.xls since downloading the file?

Yes No

If no, skip to question 7.

2. Please describe the specific question or problem you were hoping to address.

3. Did wood.xls help you to answer your question or solve the problem?

Yes No

4. Was the Instructions worksheet understandable and helpful?

Yes No Not applicable/can't remember

5. Was the Introduction and Example worksheet helpful?

Yes No Not applicable/can't remember

6. Please provide any suggestions or comments you have for how the program might be improved.

7. If you downloaded the file but did not use it, was there some problem with the program?

Yes No

If yes, please describe the problem (for example, were there compatibility issues with your software?)
