

Tsunami Digital Library Needs Assessment

Final Report to Oregon State University Libraries and the Northwest Alliance for Computational Science & Engineering

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Executive Summary

Tsunamis can trigger significant and immediate socio-economic and environmental impacts including loss of human life. Relevant and useful tsunami information is difficult to access effectively, since it is maintained by many organizations, at different sites, in multiple languages and formats, and representing different disciplinary perspectives. The unique information challenges presented by tsunamis, the history of research collaboration among the tsunami scientific community, and increasing public awareness of the danger to life posed by these natural hazards combine to make tsunamis an obvious focus for a digital library. Additionally, Oregon State University is becoming a focal point for experimental research with the completion of the Tsunami Wave Tank as part of the National Science Foundation's George E. Brown, Jr. Network for Earthquake Engineering Simulation (NEES).

The need for a digital library is obvious to those involved with managing the data generated by the NEES and to librarians charged with providing adequate access to information. However, it is not clear that the community of tsunami researchers and mitigation managers recognize the same need. For information professionals, a digital library would be a collection of existing electronic documents and data with an effective search mechanism and the means to maintain high quality in the library using the expertise of all involved. For those outside of the information profession, the very concept of a digital library may be unknown despite the need for one. To address these issues and to validate the creation of the Tsunami Digital Library (TDL), we assessed the information needs of this user community.

The project team surveyed and interviewed forty identified experts within the diverse tsunami community. The survey revealed that this community is a sophisticated user of Internet search engines and tools and is very familiar with existing information. The sites mentioned most frequently as being helpful were those of the National Oceanic and Atmospheric Administration (NOAA) and the United States Geological Survey (USGS) as well as the International Tsunami Information Center and the National Earthquake Information Center. The primary criticism of other sites is that many of these sites are difficult to utilize. The survey results list uneven organization, dead links, and poor quality information as part of these difficulties. From the results, this community is looking for a centralized means to find and retrieve real-time as well as historical data, geographic resources, outreach materials, and modeling information. The data demon-

Tsunami Digital Library Needs Assessment

strate a clear need for more coherent and effective access to tsunami information such as could be found in a Tsunami Digital Library.

We recommend further development of the TDL including further testing and refining of the TDL interface and collaborative filtering functions. We also suggest developing a collection policy for digital information that involves the expertise of users as well as librarians. To further these recommendations, we suggest holding a workshop for tsunami experts to augment the findings of the needs assessment and to establish functional partnership protocols.

The following report describes the concept of the TDL, its technical framework and proposed content. We explain the methodology of the needs assessment, report the results of our survey, and recommend further work.

The Tsunami Digital Library (TDL)

Digital collections of Internet resources place important information close at hand. They facilitate the dissemination of new research faster, and create access for wider audiences. Rather than searching the entire Internet, a collection limits resources to those pertinent to a subject. A collection also suggests that material has been identified as useful by a qualified librarian or subject expert. Given the diversity of tsunami research and information, a digital collection would provide the means to search materials from all areas of tsunami research. A tsunami collection would address language issues, data preservation, maintenance, and quality management. This last point, the assurance of high quality information, requires the direct involvement of the diverse tsunami research community.

This type of collaboration is not unusual in tsunami research. Numerous national and international partnerships, including the Tsunami Hazard Mitigation Program, the Pacific Tsunami Warning Centre, the proposed Intra-Americas Sea Tsunami Hazards System, and the Intergovernmental Oceanographic Commission's International Tsunami Information Center (ITIC) share information. These partnerships have generated significant, high quality digital resources. However, the information that they provide is often located in disparate and hard to find sites, housed for an indeterminate amount of time, or not maintained for the most effective use. This lack of coordination is problematic as it does not adequately promote information sharing between the multi-faceted tsunami researchers, nor does it aid a public that is still mostly unaware of the basic facts of tsunami dangers. It is these thoughts that have spurred the development of the TDL.

The TDL, part of the Oregon State University Digital Library Framework, is an information portal designed to coordinate the access and distribution of Internet based tsunami related information. It is a specialized portal that utilizes collaborative filtering to enhance the selection and evaluation of materials within the collection. The TDL can facilitate communication within the multidisciplinary tsunami research community by providing the following:

- an easily navigated organizational structure
- a simplified distribution of information from contributing sites
- access to the content within those sites that relates to specific research questions.
- ability to suggest sites / pages for inclusion within the digital library
- assurance of high quality information (through collaborative filtering mechanism and collection guidelines)
- access to site statistics and technical tracking for contributing sites

The TDL does not house the tsunami information nor tsunami research sites. Rather, it is an intelligent interface that centralizes access to contributing partner sites within a digital library system. This makes it different than most digital libraries. The distributed collection is maintained by contributing partner sites within a digital library system. The TDL retrieves links to pertinent content and entire sites by “answering” queries posed by TDL users. For example, a TDL patron asking about “shoreward-propagating wave energy” will be provided with two sets of links:

- a list of related questions and links to sites / pages that contain answers to the question
- a list of links to sites / pages that may keywords found in the original question.

Tsunami Digital Library Needs Assessment

The TDL tailors results on topic sensitive information by utilizing a “peer rating” system of site / page content. Content is intended to be rated for usability and accuracy by TDL patrons. Through this system of peer rating (collaborative filtering), subsequent queries can be answered with increased reliability and accuracy. Each question posed is matched against previous questions so that the system can recommend documents, pages, or other resources that others found to best answer those queries.

In addition to the rating of content, patrons can suggest sites / pages for inclusion within the digital library system. Site inclusion in the TDL aids the greater distribution of tsunami related information that might not otherwise be easily located. It also furthers the development of existing research networks. These functions, and the added ability of patrons to annotate information found through the TDL, facilitate information sharing within the tsunami research community.

The TDL recognizes that contributing sites have spent considerable time and effort developing their web presence and that these sites reflect the different aspects of the tsunami community. The TDL does not diminish the web identity of the varying sites, nor does it change the content of the individual contributing sites. Each site is presented as it would if it were accessed directly but with added administration and recommendation features.

Assessment Methods

With the underlying framework in place, the project team proposed an assessment process to ensure that the information identified by the TDL was closely related to the target audience's needs. The assessment was designed to assess interest in the TDL, identify web resources that are frequently utilized as well as those at risk of disappearing, and to explore and guide the development of the collaborative administration of web based information.

The goals we wanted to achieve by the assessment were to identify up to fifty experts within the tsunami community and to interview them concerning their use of tsunami digital information. Identifying experts first entailed addressing two questions:

- Is the tsunami community self-identified as an actual community?
- What constitutes an “expert” in this multidisciplinary field

To answer these, we spoke with a known tsunami expert, Dr. Harry Yeh, the Edwards Chair in Engineering at Oregon State University (OSU). He described the tsunami field as multidisciplinary and comprised of people that often identify themselves as tsunami specialists within a larger field (such as engineering). He also explained that the field is roughly comprised of two separate groups—research and mitigation. Researchers are primarily defined as those actively involved in tsunami related studies, often within the context of academic institutions. The mitigation group is defined as those working to craft and coordinate policies and emergency plans in response to tsunami events, often in the context of state or federal agencies. There is, however, no clear distinction between the two groups as there are numerous researchers involved with mitigation as well as mitigation /agency experts that participate in active research. The assessment goals were modified so that the identified experts would be representative of both groups and as many of the tsunami related fields as possible. Dr. Yeh identified ten people as experts to initially interview. The additional experts were identified from the initial interviews, solicitation on the tsunami email list hosted by ITIC, and review of the tsunami literature.

We developed the interview questions using input from Dr. Jon Herlocker of OSU's Electrical Engineering and Computer Science School, Dr. Yeh, and Ms. Janine Salwasser of the OSU Libraries. (See Appendix A for the questions.) The questions and process were submitted to and approved by Oregon State University's Institutional Review Board. The preliminary version was tested with the first ten identified experts and then modified slightly. The initial set of questions was rearranged into a more intuitive order. The contact procedure was streamlined to use email rather than the phone as the primary conduit.

The contact information for each expert (e-mail addresses, phone numbers, agency/institution) was compiled into a database. Each expert was approached through an e-mail that provided a description of the TDL, the questionnaire, and why they were being contacted. E-mails were tailored to each potential responder and were not a generic mass mailing. Each e-mail outlined the assessment procedure as follows:

- Please read the enclosed materials.
- Please respond to the questionnaire in as much depth as possible.
- Please send the completed questionnaire back to me with a good time and date for me to contact you regarding your questionnaire.

Tsunami Digital Library Needs Assessment

After receipt of the completed questionnaire the results were reviewed and partial or limited answers were flagged for discussion during the telephone interview. Interviews were arranged according to the availability of the respondents. At the end of the allotted time, a total of 40 experts responded. Only three were not interviewed over the phone. These interviews were conducted through electronic communications or were not conducted at the request of the respondent. As the interview responses were designed to remain anonymous, no interview remained associated with identifying information after the interview process.

Assessment Results

The complete compilation of the responses is found in Appendix B organized by each of the questions in the survey. The results presented below describe the tsunami user community, their patterns of Internet usage as well as resources used, challenges encountered using digital information, and concepts about the utility of the TDL.

The Tsunami Community

The 40 respondents were chosen to represent the broad spectrum of people actively involved in the tsunami community. All of the respondents are based in the United States, and are mostly from the west coast and Hawaii. While Figure 1a indicates the breakdown between researchers and mitigation / agency staff, it does not indicate the true diversity of the community. Among other backgrounds, these people are engineers, geologists, historians, and educators, and managers of both academic departments and agencies who are involved in or require tsunami information in a variety of forms. Figure 1b shows the responses of those surveyed regarding their Internet use for work related research and communication.

Some respondents are interested only in the most current information available—the raw data from a tsunami event—and some are interested only in historical information or in materials that indicate what to do or where to go in the event of a tsunami. Respondents often utilize the same information for different purposes. Some indicated that they needed to have access to all of these types of information as well as those materials that are not currently in English or in a digitized format.

Despite the range of backgrounds, the assessment indicates that the tsunami community uses the Internet daily. The information delivered digitally is often critical to their work. Some rely on their agency's web site or Intranet in addition to the Internet. Most, however, are using freely accessible information and would like to have better access to more. Almost all respondents mentioned using databases—most of which are probably restricted to institutions with subscriptions or other forms of access.

Figure 1a: 40 Respondents from the Tsunami Community

- 23 tsunami researchers
- 17 hazards mitigation / agency staff

Researcher and Agency / Mitigation is a loose division of the tsunami community as a whole. There are numerous types of researchers and many different facets of mitigation / agency.

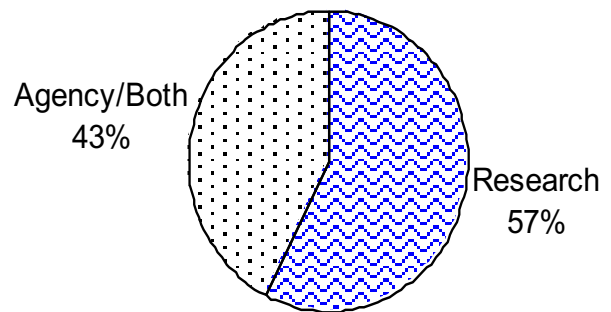
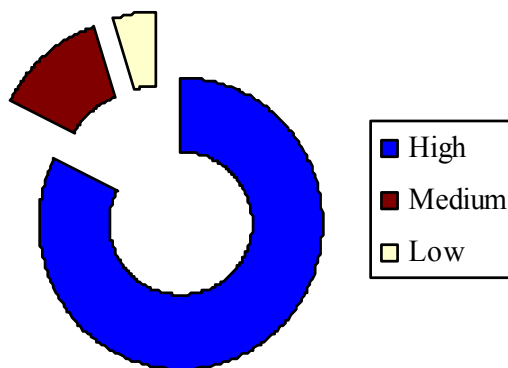


Figure 1b: Do you use the Internet for tsunami work?

- 33 heavy users, 5 medium users and only 2 light users
- Agency people tend to use their agency web site.
- Some use Internet accessible databases.



Primary Internet Resources

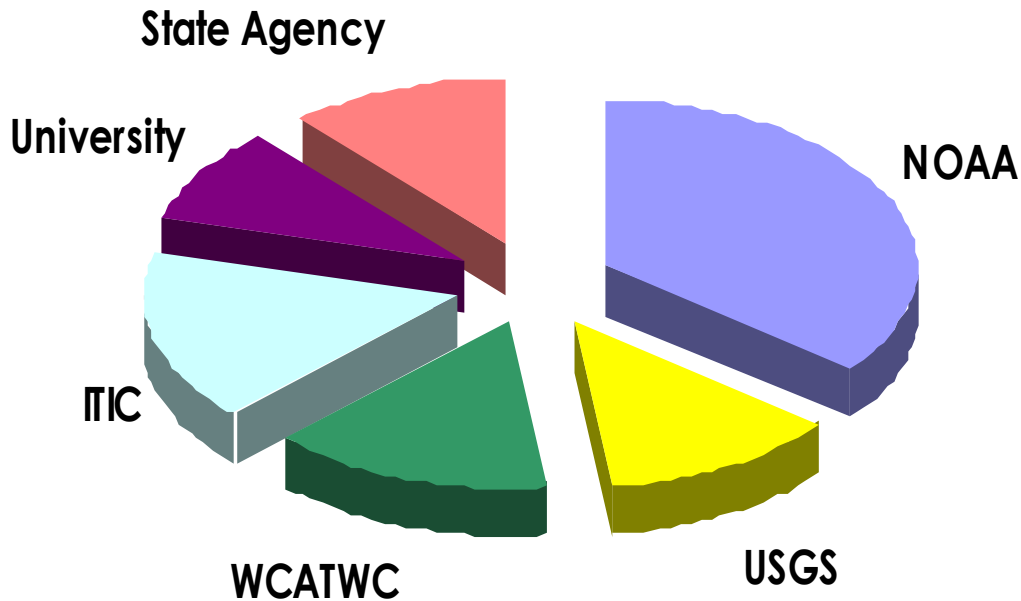
As the TDL is intended to be a ‘high-quality’ tsunami information and data portal, the TDL assessment was designed to identify those sites that currently provide the most utilized information. Table 1 lists the most frequently mentioned sites and provides an outline of what tsunami information on the Internet landscape looks like.

Table 1 Primary sites and addresses

National Oceanic and Atmospheric Administration (NOAA)	http://www.noaa.gov/
West Coast & Alaska Tsunami Warning Center (WCATWC under NOAA)	http://wcatwc.gov/
International Tsunami Information Center (ITIC under NOAA)	http://www.prh.noaa.gov/itic/index.html
United States Geological Survey (USGS)	http://www.usgs.gov/
National Earthquake Information Center (NEIC under USGS)	http://neic.usgs.gov/
Academic/University related sites — example: Oregon State University	http://nees.orst.edu/

Many highly utilized tsunami resources are part of larger sites that are usually not dedicated solely to tsunami information. For example, though respondents frequently identified it separately, the West Coast Alaska Tsunami Warning Center site (WCATWC) is actually part of the larger National Oceanic and Atmospheric Administration (NOAA) website. Figure 2 shows that respondents often referred to these sub-sites as if they were entirely separate entities.

Figure 2: Most frequently mentioned sites. (See Table 1 for key to acronyms.)



Sites are primarily accessed to find real time gauge data, utilize link pages, read newsletters, find contact information, and to discover warning and hazards materials. Warning and hazards materials for distribution to a larger audience include multimedia, photographs, images, video recordings, and animations. Respondents also used the sites to track current research results and to find conference proceedings and other materials. As indicated above, NOAA sites (other than WCATWC) have the most utilization. The ITIC site is visited very often because of their library resources but respondents noted that those holdings cannot be accessed through inter-library loan.

State Agency Internet websites have high use but the Intranet use for each agency site is not included. Respondents from the agency “group” often noted that they were developing information “clearinghouses” which will likely draw more use when they are fully functional.

Site Navigation, Accessibility and Usability

Respondents were asked what they looked for in a website as well as what made it useful. While sites such as NOAA’s were indicated as high-quality, they were also routinely indicated as hard to navigate. This partially explains why WCATWC was identified as if separate from NOAA more frequently than sites like the Pacific Marine Environmental Laboratory (PMEL). WCATWC maintains a very good working set of links for the tsunami community.

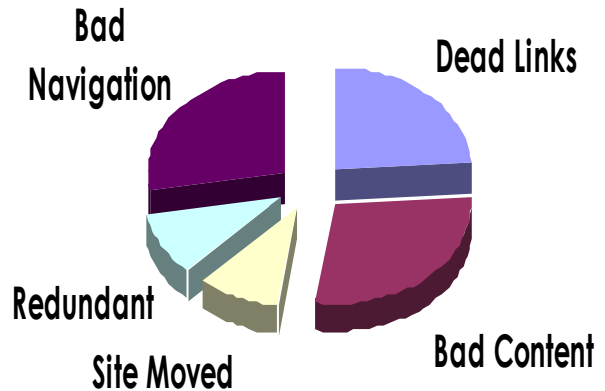
Figure 3 shows the details of problems encountered by respondents. Bad content, bad navigation and dead links are the three most frequently mentioned problems. Poor usability in terms of searching and locating is deterring access to quality information at the same time as poor quality information is becoming more available. The replication of reports and information across numerous sites was also considered frustrating. One respondent noted that they “refused to even go

looking for something they really wanted when the site was impossible to navigate” and that the “stuff that was useless was now all over the place.”

Figure 3: Problems encountered accessing electronic information

- **The worst problems mentioned:**
 - Out-of-date/incorrect information
 - Difficult navigation & inadequate search engines

- **Others mentioned:**
 - Dead links
 - Redundancy of information
 - Lack of information in English



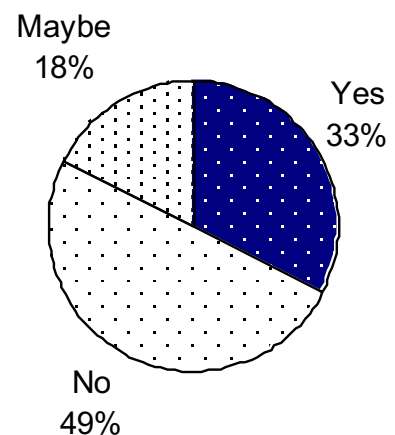
Utility of a Tsunami Digital Library

Before discussing the utility of a TDL, we posed a series of questions to determine the awareness level of the respondents to the concept of digital libraries. When questioned, respondents clearly indicated what search engines and databases are, but had a harder time defining a digital library. Over half of the respondents could not directly offer a definition of a digital library when asked. It became apparent, however, that most of these respondents could present descriptions of what a digital library is when asked what resources they would most like to have.

Figure 4: Do you know what a digital library is?

Eighteen responses were categorized as “maybe” because the respondents often blurred the distinction between a digital library and a database.

Thirty-three positive responses were very clear: respondents described a digital library and gave examples of types of digital libraries that they had used or could identify.



In general, the respondents were intrigued with the TDL and wanted to know when it would be available to try. They indicated that they would use it if it was easy to navigate and it provided easier searching for relevant information. Table 2 shows the types of information that is considered relevant and a description of the current availability of that information on the Internet. Thirty-four respondents indicate a high interest in the tsunami digital library dependent on knowing how much time would be involved.

Table 2: Comparison of current and desired resources

<u>Desired Resources</u>	<u>Available Resources</u>
<ul style="list-style-type: none"> • Real time data 	<ul style="list-style-type: none"> • Real time reliable information is increasingly available
<ul style="list-style-type: none"> • Historical and current information 	<ul style="list-style-type: none"> • Current information is often available though difficult to find. This includes event, seismic and flood data sets. Historical information is available but to a very limited extent. Language issues and availability only in non-digital format makes this type unavailable to most of the tsunami community.
<ul style="list-style-type: none"> • Peer reviewed information—both data & literature. (With access to print and digital information.) 	<ul style="list-style-type: none"> • There is increasing amounts of data and literature though much of it is not deemed “quality information” by the tsunami community. Most respondents also wanted links between online and print resources which are not currently widely available.
<ul style="list-style-type: none"> • Multi media collections – equally pertaining to analysis and modeling information and active/interactive materials for outreach and education. 	<ul style="list-style-type: none"> • There are some multi media tools in development but not enough. Access to those that are available is limited.
<ul style="list-style-type: none"> • Up to date literature collection 	<ul style="list-style-type: none"> • There are literature collections but accessibility to these collections is limited.
<ul style="list-style-type: none"> • One stop for mitigation materials 	<ul style="list-style-type: none"> • Respondents indicated that looking for these materials is still difficult though some respondents (5) indicated that resources for these materials are increasing
<ul style="list-style-type: none"> • Better data layers for GIS materials 	<ul style="list-style-type: none"> • GIS data is available but not as much as is wanted / needed. Better data layers and more access to those layers were strongly advocated by those respondents needing GIS materials (9).
<ul style="list-style-type: none"> • Quality materials for presentation and education 	<ul style="list-style-type: none"> • Outreach materials are available but not easily accessible

Tsunami Digital Library Needs Assessment

The above table, while not exhaustive of the materials indicated by respondents, is a summary of the most frequently mentioned types of “needed” information. Comparing the sites and probing respondents about what they deemed “useful” and “relevant” provided a basis for examining the most frequented sites critically, and for determining where there are gaps in the currently provided tsunami materials. Foreign language materials, maps and charts with good metadata, and multimedia resources were indicated by respondents as the most desired materials not currently available or adequately available.

Discussion of Assessment Results

The tsunami community uses the Internet heavily and demonstrates a need for better Internet tools such as digital libraries. Internet based resources are used as part of their research, as a communication tool, and as an educational resource and community outreach tool. Consequently, we believe that the TDL is a valid concept that could improve the tsunami information environment. The survey instrument was designed to capture the tsunami community's definition and reflections on a tsunami information digital library. When responding to questions about what they would seek in a digital library, the following criteria were clearly indicated:

- A centralized place, often described as “one stop shopping” for only tsunami materials
- Easier navigation and searching abilities
- Materials that are of good quality—some form of peer-review was often mentioned
- An assortment of materials that are not currently available (in other words, materials that need to be digitized including those materials that could be lost)

Access

A strong feature of the TDL is increased accessibility to pertinent material. While the development of a collection of tsunami-only materials is helpful in itself, the TDL will provide easier navigation by presenting patrons with specific sites and / or pages so that they do not have to attend to multiple navigation schemas or poor navigation schemas. The range of materials requested by the tsunami community indicates two things: the need to fully assess where pertinent materials are currently located and the development of partnerships with many sites and / or sub-sites to larger sites (such as NOAA).

The TDL is intended to be a collaboration of participants that control valuable tsunami content on the web. Some of the areas requiring work focus on developing the policies that formalize the relationship of the participants and the collaborative partners of the TDL as well as clarifying the expectations and responsibilities of the TDL and its partners. One approach would be to learn what expectations already exist and what would motivate partner sites to participate. This requires speaking with people who make the organization's decision to participate in the TDL, the people responsible for the day-to-day management of the content, and the people responsible for the technical infrastructure they use to supply the content.

Usability

Part of the benefit of the TDL is that it does not alter the layout and functioning of participating sites. The TDL interface is specifically designed to be easy to use and navigate—more so than most of the navigation areas of other sites—while “laying over” each partner site's content. Full sentence questions and the ability to see numerous search results will make the TDL amenable to searching and browsing of the included tsunami materials. In addition, the TDL can provide site statistics and track dead links for site owners.

Tsunami Digital Library Needs Assessment

Authority

The ITIC has offered assistance to the TDL in reviewing the materials for inclusion in the TDL. The available evaluation and collection skills of the project librarians augmented by ITIC assistance will facilitate the development of the collection and collection policies that underlie the TDL. With the benefit of collaborative filtering, the TDL collection can be more easily maintained and its relevance to the tsunami community ensured. The TDL may also be able to provide a means of facilitating peer review of materials for inclusion but the collection policy and the infrastructure to maintain the TDL must be developed prior to any additions to the collection.

Permanence

The needs assessment indicates that many materials that are deemed important are not currently or are not adequately accessible through the Internet. Respondents indicated that they had difficulty finding materials related to conferences, workshops, and meetings. This difficulty indicates another possible problem with Internet materials – longevity. While the TDL can provide help with site maintenance and statistics for site owners, it may in some circumstances need to take responsibility over materials that are no longer being maintained but still have great use within the tsunami community. Taking responsibility for site content and addressing the expressed need for digitization of many currently unavailable tsunami related information sources are important areas for consideration within the collection policy.

Recommendations

It is evident from the responses that the TDL needs to move towards usability testing and to address any outstanding technical issues with the collaborative filtering functionality. The project has already received requests for use from the tsunami community. A demonstration version can be presented to prospective partners and to the wider tsunami community for any further refinement. While completing testing of the TDL interface and functions, the existing site list of recognized high-quality materials should be developed into a comprehensive list of available tsunami materials. This list should be developed so that each site is annotated with the types of tsunami materials that it provides. This will establish a list of possible partners, contact information for site administrators, and will identify where the resource needs of the tsunami community are not being adequately addressed.

The policies that govern collection of materials and the formalization of partnerships need to be addressed. The development of a draft TDL collection policy is currently underway. The formalization of partnerships will require a workshop of interested tsunami experts from across the tsunami community. The workshop will help establish how collaborative management of the TDL will work as well as how to facilitate peer-review of materials for inclusion.

The TDL can serve as a model for distributed maintenance and collaborative administration. Eventually, however, it will need to expand its collaborative model to an international scale in order to provide the full range of requested materials.

Appendix A

Tsunami Digital Library Interview Questions

1. Do you use Internet resources for your work or research? How do you use that information?
2. What types of problems have you encountered accessing electronic information?
3. What types of tsunami information do you use/look for through the Internet? Are there specific tsunami related sites that you visit often for your work or research?
4. Do you use these sites because the information is timely, specific to your needs, etc? Please describe what makes that information useful.
5. Do you know what a digital library is? Have you ever used a digital library before? How would you describe one?
6. The Tsunami Digital Library (TDL) is a collaborative effort that:
 - utilizes a “recommender system” to create a peer reviewed collection of tsunami related materials.
 - allows easy access to the tsunami materials within the digital collection.
 - is a specialized search engine for digital tsunami materials

If you had access to such a digital library would you use it?

7. What collections, information, resources would make a tsunami digital library most useful to you?
8. Although it might take some of your time, being a partner in the TDL would allow the following opportunities:
 - the opportunity to help assure the quality of tsunami information within the digital library
 - the ability to recommend information, web sites, and agency materials for the tsunami digital library
 - access to site usage and function statistics

Is this something that you find interesting?

9. Do you have any other comments about tsunami information, digital information in general, or access issues to digital information?

Appendix B

Full Summary of Results

Question 1.

Do you use Internet resources for your work or research? How do you use that information?

33 YES responses that indicate high Internet usage
5 responses that indicate usage but not heavy usage
2 responses that indicates usage on a “need to” only basis

Those that responded positively also freely discussed their Internet browsing/surfing habits and displayed a high familiarity with digital documents. Search engines and databases were frequently mentioned. The general split in the tsunami community between research groups and mitigation / government agency is apparent. Most of the agency affiliated people interviewed mentioned their agency sites and / or Intranets in addition to the most frequently mentioned NOAA and ITIC sites. Several responses indicated frequent use of the Internet or Internet based resources (databases) for bibliographic research, citation information. Many of the agencies are currently creating electronic “clearinghouses” or repositories for a variety of documents.

Question 2.

What types of problems have you encountered accessing electronic information?

31 responses indicate a variety of problems encountered.
6 responses indicate minimal or no problems.

Minimal problems are those that are identified out of the context of the immediate question. For example, when asked what problems they experienced using the Internet for their work / research several respondents stated that they had none. Later in the interview, however, they would plainly state what problems occurred during their searching.

Within the 6 negatives, the answers indicated that response times for Internet queries was often slow, that problems stemmed from server issues, and that the Internet was unreliable..

The 31 positive responses to having general problems can be further broken down into categories of problems. Each category is based on interview details derived from the questionnaire and developed during the telephone interviews.

- Dead links
- Bad navigation/ Inability to find
 - Lack of information
 - Lack of information in English
 - Bad search engines/interfaces
- Site unavailable or moved

Tsunami Digital Library Needs Assessment

- Bad information and poorly documented information
 - Out of date information and incorrect information
- Redundancy

Respondents clearly viewed quality of information as a priority. They also specifically indicated NOAA sites as the most problematic for navigation and searching. Familiarity with where certain resources are located was mentioned as the usual means of finding items. Preservation of information was a very important concern for 5 respondents.

Question 3.

What types of tsunami information do you use/look for through the Internet? Are there specific tsunami related sites that you visit often for your work or research?

WCATWC

NOAA – variety of sites within NOAA

ITIC/ITSU

USGS

NEIC

Academic/University related sites – Colorado, Washington, California

These are the most frequently listed main sites. Main sites can house a variety of smaller sites and pages. This was apparent in the responses of most respondents because they would refer to both the sites that they were familiar with and the main site. For example, NOAA (<http://www.noaa.gov/>) and PMEL (<http://www.pmel.noaa.gov/>) would be listed as the most frequently visited sites. PMEL is located within the NOAA pages.

Often the same information was cited but for different purposes.

Question 4.

Do you use these sites because the information is timely, specific to your needs, etc? Please describe what makes the information useful.

Access to current materials, speed when functioning properly, and centralization were mentioned most frequently. Most respondents noted that quality control of information was important. NOAA sites were cited as having the best information despite problems finding that information.

Accessibility in general, ability to make referrals for other's requests, contact information, and familiarity were often mentioned.

Question 5.

Do you know what a digital library is? Have you ever used a digital library before? How would you describe one?

Tsunami Digital Library Needs Assessment

20 respondents said no, they did not know. Furthermore, they were very hesitant to even guess. They did turn to the description of the TDL that we provided as a guide when directly asked.

7 respondents indicated they thought they knew what a digital library was but they often blurred electronically accessible databases with digital libraries. Responses that were hesitant or very vague were put into this category.

13 respondents were either familiar with the concept of a digital library, had used an existing searchable collection available through an academic institution, or adequately described a digital library by differentiating it from a database.

The descriptions varied – which is in keeping with how new digital libraries are and that there is no single description of one. Several used a collection of pdf's as a type of digital library. They were familiar with the TsuInfo publication and also indicated that something other than pdf's would be appropriate for much of the “needed” material.

When asked what would make features they would like to have available, most respondents indicated that a collection of tsunami only materials that was easily accessible, searchable, and contained quality information would be ideal.

Question 6.

The Tsunami Digital Library and collaborative efforts.

The general response was very positive. Many respondents initially left this blank and only provided an answer during interviews. The most important aspect of this question was that people wanted to see a demonstration of the TDL. They were also hesitant on the idea of partnering without further discussion of time commitments. Many of the respondents indicated that they had no direct work with any tsunami related site but they are interested in assuring that the information that is available through it is good information. (See question 2.)

I believe that without a demo of the system there is no adequate way of describing the recommender system or the nature of the available digital materials (sites) that are indexed. Having a demo. that is seeded with a variety of questions will be necessary to show the worth of the project to the tsunami community. I believe that this is indicated because the respondents indicate the need for such a tool but little or no familiarity with anything other than link pages and databases. After collating the existing sites with pertinent tsunami material it will not be difficult to seed the demo. TDL with the frequently asked questions (FAQ) collected from respondents.

Question 7.

What collections, information, resources would make a tsunami digital library most useful to you?

- real time information (gauge data, seismograph data)
- historical information (specifically oral histories and foreign language information)
- foreign language data
- analysis and modeling/simulation information

Tsunami Digital Library Needs Assessment

- event data sets
- GIS data (specifically good metadata information layers and good quality)
- seismic and flood data sets
- tide reports
- maps, inundation data, bathymetric charts
- current research
- educational materials
- agency information (warning literature, emergency procedures, location, contact information)
- mitigation information
- conference information
- gray literature
- graphic materials, images, video
- field event notes
- archived reports, articles

Question 8.

Most respondent noted that they would like to help with quality control of materials but that they did not work directly with a site that would be a partner. This question did help establish many avenues of contact for possible partnerships.

Question 9.

Do you have any other comments about tsunami information, digital information in general or access issues to digital information?

Although the information given in response to this section was minimal (mostly “good luck”), many respondents indicated that “it was about time.” Several respondents noted that the ITIC is very small and needs help, that the information that is out there is not in one place and not easy to use, and that anything that coordinated the available materials and promoted the digitization of materials would be very welcome.

It was also noted in a few responses that there has never been a test of the functionality of the existing sites in a post-event situation. They indicated that the probability of system overload was likely.

Four respondents indicated that the TDL should be maintained by OSU because of credibility, longevity, and available resource issues.

Appendix C: Biographies

Heather L. Lehman

Education:

University of Washington, Information School, Master of Library and Information Science - in progress

Washington State University Vancouver, B.A., May 2001

Activities and Interests:

Ms Lehman's studies are centered on multi-disciplinary research and the tools needed to facilitate access to and dissemination of such research. Her current projects include the development of an information portal for archaeobotanical research in the Indus Valley, a digital comparative seed collection for South Asian paleoethnobotanical research, the development of a digital archive of "Bollywood" film costumes, and Oregon State University's Tsunami Digital Library.

Ms Lehman is interested in digital collection development and the possibilities for digital libraries in research and education. She currently holds two graduate intern positions – one under the direction of Janet Webster (OSU) and one under Dr. Steve Weber (WSUV).

Sample Publications:

Pennington-Lehman, Heather, Steve Weber. 2004. Paleoethnobotany: Modern Research Connecting Ancient Plants and Ancient People. In *Critical Reviews in Plant Sciences* 23 (1), 13-20.

Webster, Janet G., Jon Herlocker, Heather Pennington-Lehman & Seikyung Jung. 2004. Collaborative Filtering: Possibilities for Digital Libraries. In *Navigating the Shoals: Evolving User Services in Aquatic and Marine Science Libraries--proceedings of the 29th Annual Conference of IAMSLIC*, edited by J.W. Markham & A.L. Duda. Fort Pierce, FL: International Association of Aquatic and Marine Science Libraries and Information Centers. Pp. 89-103.

Janet G. Webster

Education:

Oregon State University, College of Library Arts, Scientific and Technical Communication, M.S., September 1994.

Columbia University, School of Library Service, M.S., June 1986

University of Chicago, B.A., March 1975

Activities and Interests:

Ms Webster's work involves facilitating the use of information by the broad range of users in marine and coastal related fields. Her years of direct involvement in building a specialized marine/coastal/estuarine collection and providing library services to all levels of users give her a unique perspective on the effective use and archiving of information. Her users include such groups as federal researchers in NOAA's Pacific Marine Environmental Laboratory's VENTS program, graduate students in OSU's Marine Resource Management program, K-12 teachers, and state coastal hazard managers. She addresses the challenges of outreach to people with varying age and knowledge levels in her library position as well as her research.

Ms Webster has recently examined how to effectively deliver information to end users in the seafood industry by developing web-based products and evaluating usage. She also explores the role of grey literature in research and education. This information is not broadly distributed and hence difficult to identify and access. Her early work on the information of the Columbia River salmon and her more recent work on Yaquina Bay illustrate the possibilities when all types of information are identified, collected, and effectively indexed for public access.

Webster has served in a variety of leadership roles in the library community. Her willingness to collaborate is reflected in her work within the International Association of Aquatic and Marine Science Libraries and Information Centers. There, she has facilitated the adoption of a strategic plan for building capacity. In 2004, she was been awarded Visiting Expert status at the Food and Agriculture Organization of the U.N. to work on guidelines for enhancing access to fisheries information through digitization and use of electronic repositories. Her contacts within the international marine libraries network are extensive giving her excellent access to international information and expertise.

Professional Appointments:

Associate Professor, OSU Libraries, Oregon State University, 2000-present

Assistant Professor, OSU Libraries, Oregon State University, 1994-2000

Instructor, OSU Libraries, Oregon State University, 1989-1994

Assistant Circulation Supervisor, Vancouver Community Library, Vancouver, Washington, 1987-1988

Professional Recognition:

Oregon Librarian of the Year, Oregon Library Association, 2003

President, Oregon Library Association, 2001-2002

President, International Association of Aquatic and Marine Science Libraries and Information Centers. 1995-1996

Sample Publications:

Webster, Janet G., Jon Herlocker, Heather Pennington-Lehman & Seikyung Jung. 2004. Collaborative Filtering: Possibilities for Digital Libraries. In *Navigating the Shoals: Evolv-*

Tsunami Digital Library Needs Assessment

- ing User Services in Aquatic and Marine Science Libraries--proceedings of the 29th Annual Conference of IAMSLIC*, edited by J.W. Markham & A.L. Duda. Fort Pierce, FL: International Association of Aquatic and Marine Science Libraries and Information Centers. Pp. 89-103.
- Webster, Janet G. 2003. Bibliographies as an Extension Outreach Tool: An Old Method in a New Age. *Journal of Extension* 41(3): <http://www.joe.org/joe/2003june/a7.shtml>
- Herlocker, Jon, Siekyung Jung and Janet Webster. 2003. Collaborative Filtering for Digital Libraries. Technical Report 03-40-01, Department of Computer Science, Oregon State University. Available online: <http://eecs.oregonstate.edu/library/files/2003-17/jcdl2003.pdf>
- Webster, Janet G., Larry Schmidt & Edward Kolbe. *Seafood Technology Information*. Available: <http://osulibrary.orst.edu/guin/seafood/index.html>. Created July 2003.
- Webster, Janet G. 1999. Theses and Dissertations for the Next Millennium. In *Electronic Information and Publications--proceedings of the 24th Annual Conference*, edited by J.W. Markham & A.L. Duda. Fort Pierce, FL: International Association of Aquatic and Marine Science Libraries and Information Centers. Pp. 75-86.
- Webster, J.G. 1994. Endangered Information: Grey literature, the Columbia River salmon, and the Endangered Species Act. In *Preserving the Past, Looking to the Future--proceedings of the 19th Annual Conference*, edited by J.W. Markham & A.L. Duda. International Association of Aquatic and Marine Science Libraries and Information Centers. Pp.119-134.

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