

Report for 2004ME28B: Integrating Biological and Streams Data into PEARL

- Other Publications:
 - Vaux, Peter, Jeffrey S. Kahl, 2004, PEARL - The Source for Environmental Information in Maine. Website, Senator George J. Mitchell Center for Environmental and Watershed Research. Live site www.pearl.maine.edu ; production site www.pearlmaine.com.

Report Follows

Integrating Biological & Streams Data into PEARL

Progress Report

May 2005

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## **Project Overview**

This project builds on an existing website (PEARL) to provide a forum for accessing and integrating a multidisciplinary array of data pertaining to lake and stream systems in Maine. Expansion of PEARL is being implemented in three arenas. First, the site has been re-designed to permit the incorporation of stream-based data – formerly PEARL focused entirely on lakes. Second, a broad range of biological data, already compiled by a separate project, is being uploaded to PEARL. Third, two new information interfaces are being designed for the following targeted user-groups: lake association members and other lake users, educators/students, and anglers. Design of these interfaces, along with overall site design, has benefited from input from surveys and focus group sessions that have solicited site reviews from a range of user groups. In addition to these three primary project objectives, PEARL's data submission feature has been upgraded to permit direct uploading by data providers of their stream-based and biological data sets.

PEARL is designed to serve a diverse audience, including scientists, resource managers and planners, educators and students, and segments of the general public. PEARL is able to address these audience segments by adopting two broad approaches to information access. First, users interested in accessing the PEARL data bank are able to execute targeted data searches that are structured on one or more criteria, including: (a) data category (e.g. water quality, flora and fauna); (b) town; (c) lake or stream name or waterbody code, (d) watershed. These initial search(es) will yield a list of data sets, any of which can then be selected, providing access to both metadata and to the underlying data table(s). The user is offered a choice of which fields are to be presented from the full data table. The data are downloadable for additional data manipulation and analysis by the user. Numerical parameters can be graphed via a new, on-line, plotting feature.

The second approach to accessing information in PEARL entails the development of customized information interfaces for targeted, user-groups: lake users, educators and students and anglers. These interfaces are being designed for a largely non-technical audience. They will focus on guiding users to those parts of the PEARL data bank that are likely to be of most interest to them. The interfaces will also provide series of data syntheses and interactive data queries designed to extract pertinent information summaries from the PEARL data bank.

## **Development Overview**

All work undertaken on PEARL over the past year has been implemented at a parallel development address: [www.pearlmaine.com](http://www.pearlmaine.com). For review purposes, this address has been made available to state and federal agency personnel, and other interested individuals. It is important

to underscore the fact that, as a development site, this version of PEARL is a work in progress. In addition to on-going site enhancements taking place on the development server, some of the 'background' material is being compiled on non-server machines and is being added to the development server as this material is completed. Current plans are to migrate the development version of the site to the primary PEARL address ([www.pearl.maine.edu](http://www.pearl.maine.edu)) in summer 2005.

## **Project Deliverables: Status Update**

### **(1) Enabling PEARL for streams data.**

This capability is now in place. Enabling PEARL for streams data has been the key technical site development during the project. It represents the core feature for ensuring seamless integration of a broad range of biological and chemical data into PEARL. To "tag" stream data, PEARL uses stream segment codes from the National Hydrographic Dataset. Through the use of a master look-up table in PEARL, all on-line stream records automatically display county, town and watershed (HUC-12) attributes, in addition to stream code and NHD-based stream segment name (where available). Supplementing the NHD data, we have generated a series of dummy stream codes to use for stream segments that are not currently present in NHD – generally the smallest streams. There is one dummy stream code for each unique township / HUC-12 combination. Thus, all streams data in PEARL, whether or not they are from an NHD-mapped stream, always display on-line – and can be accessed via town-based and watershed-based searches. A similar system of dummy lake codes has also been implemented so that data from "uncoded" ponds can be served on-line.

### **(2) Site enhancement: providing access to a broad range of information on Maine's lakes and streams, including both chemistry and biology data sets.**

Major site enhancements are now in place and operational. PEARL's home page has been re-designed to provide a simpler, cleaner, entry into the site (Figure 1). From PEARL's "front end" interface, users can browse available datasets (Figure 2A). Users can also execute text-based and map-based searches (Figures 3 and 4). Both text- and map-based searches can return data records by watershed (down to HUC-12), town or river name/code. (Note that the latter is likely to be of limited use at the current time because of the way river segments are coded and named in the National Hydrographic Dataset.) Searches extract and display location-specific records from the pertinent data tables, not the entire data table. The map search feature in PEARL has been completely re-designed over the past 6 months and now runs in ArcIMS. This has provided not only substantial enhancements to functionality, but also the foundation for the future development of a series of truly interactive mapping modules

**(3) An enhanced version of the PEARL data submission feature allowing providers to upload streams data in addition to lakes data.**

Extensive re-development of PEARL's Data Annex system (the "back-end" of the site, not viewable through the main pages) has been implemented in order to enable the site for streams data. Anyone provided with password access can now remotely upload data tables (Figure 5) and then configure them for on-line viewing (Figure 6). There is now also in place a system for specifying the order in which data tables appear when the user browses available information in the PEARL data bank.

**(4) Customized information access and display interfaces.**

A "Lakes Guide" is being developed (currently approximately 70% complete in terms of required time investment) that focuses on non-technical lake users as well as students and educators (Figure 7A). The Water Quality sections of the Lakes Guide contain background information on various water quality parameters, how they are measured and what the data typically can mean (Figure 7B). Users can then access pertinent data for any selected lake. The Lake Overview section will be implemented in the fall of 2005 and will generate lake summary forms "on-the-fly" from the most recent data in the PEARL data bank. The fisheries and biodiversity components of the Lakes Guide (Figures 8A and 8B) are still under development – they will contain direct access to key data tables and information syntheses. Data tables are already in the PEARL data bank. Information syntheses (text and graphics) are largely complete, although they do not yet appear on-line.

**(5) A brochure describing PEARL and how it can be used.**

This will be prepared in fall of 2005, towards the end of the project period to ensure that all site developments are accurately represented in the brochure.

**(6) A procedures manual (on-line and hardcopy versions) explaining data uploading protocols to data providers.**

As with the brochure, the procedures manual will be developed in fall of 2005 so that it can be fully representative of PEARL.

**(7) User-group focus sessions designed to test draft versions of the information interfaces.**

A survey instrument was designed and mailed to a group of PEARL users in 2004 (Appendix 1). Results have been summarized in a report and have been used to inform site developments. A second round of consultations with users is currently (May-June 2005) in progress (Appendix 2).

These consultations take the form of focus group sessions. Groups include students, teachers, lake association members and lake volunteer monitors.

**(8) PEARL presentations at the Maine Water Conference and other venues.**

Three poster presentations were given at the 2005 Maine Water Conference:

Ph.D. student, Dave Kramar: Presentation focused on PEARL architecture.

M.S. student, Sara McCabe: Presentation focused on the “Lakes Guide” section of PEARL.

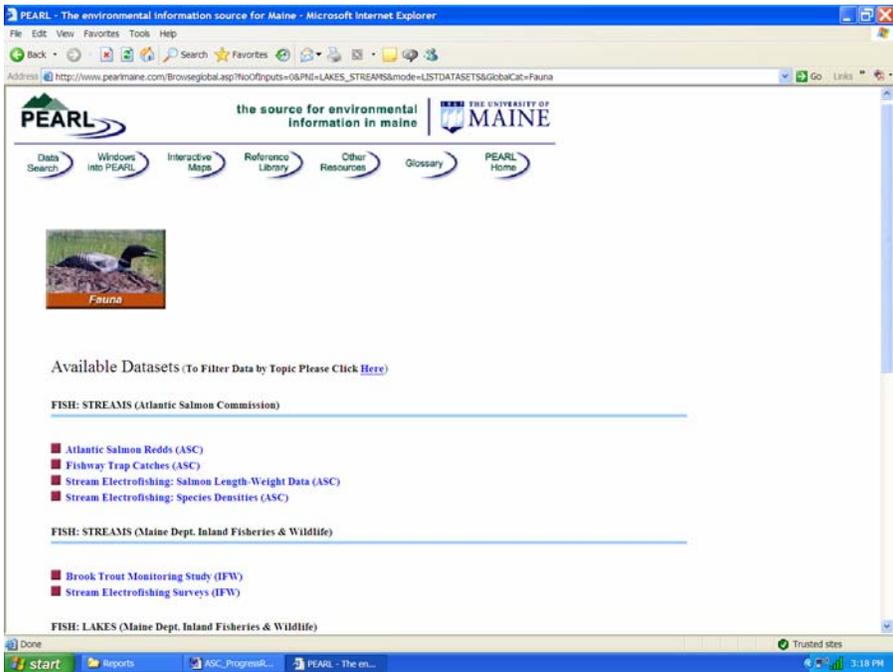
PEARL Director, Peter Vaux: Presentation focused on the Maine Aquatic Biodiversity Project, whose database is providing the majority of the biological information presented on PEARL.

Vaux has also made presentations about PEARL to Maine Dept. of Environmental Protection, Maine Dept. of Inland Fisheries & Wildlife, and the Atlantic Salmon Commission.

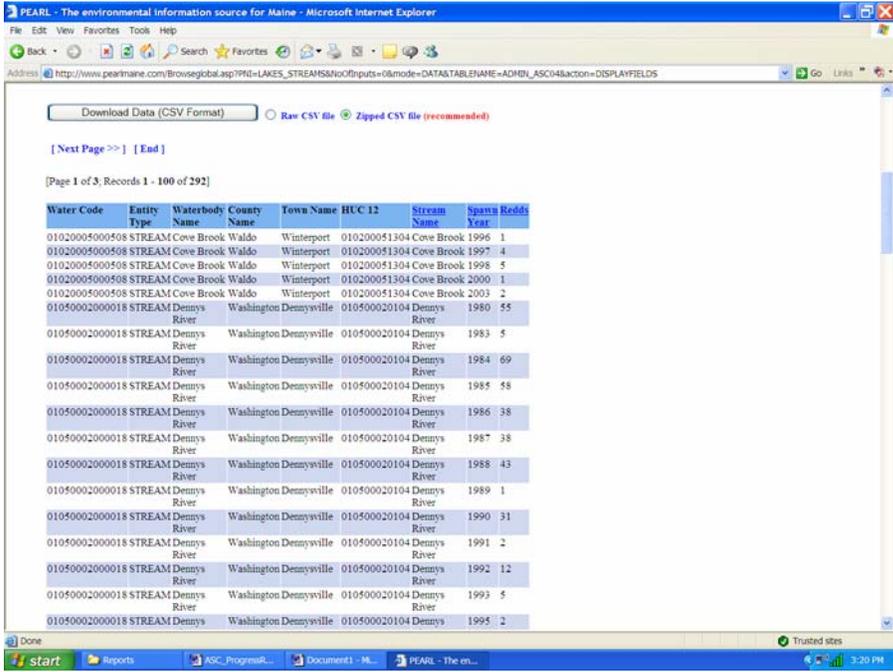
McCabe has also made a presentation at the Maine Stream Team Summit in March 2005, as well as numerous teacher/student groups.



Figure 1: New PEARL homepage.

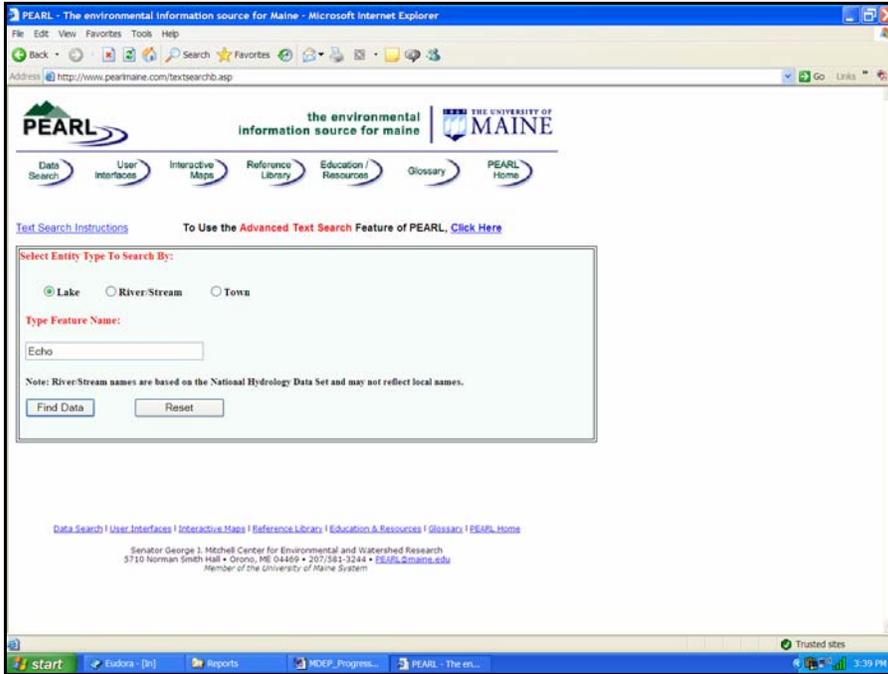


(A)

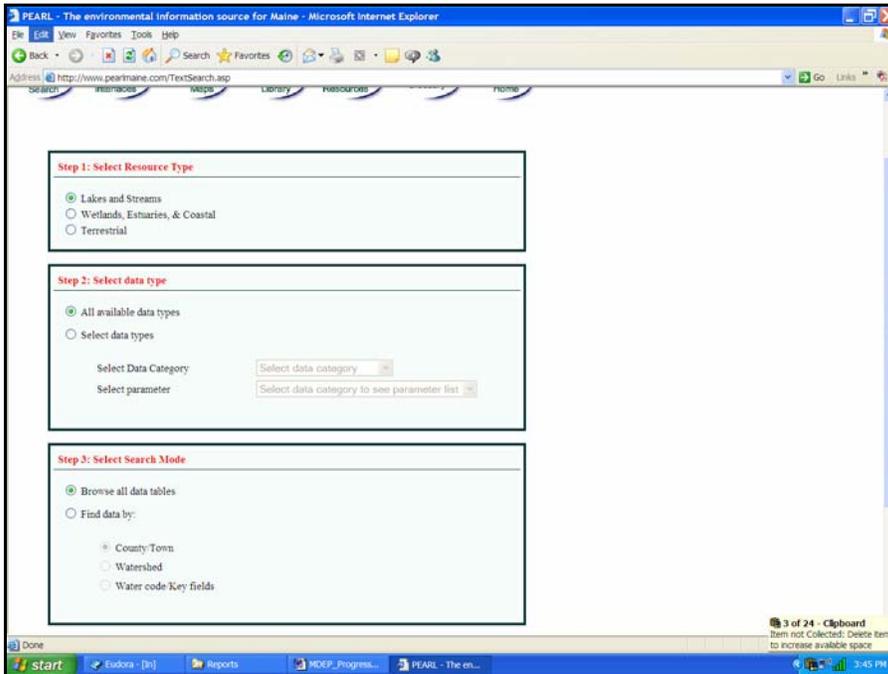


(B)

Figure 2: (A) Section of the Browse Data Sets (Fauna) page on PEARL. (B) Section of one of the PEARL stream data tables.

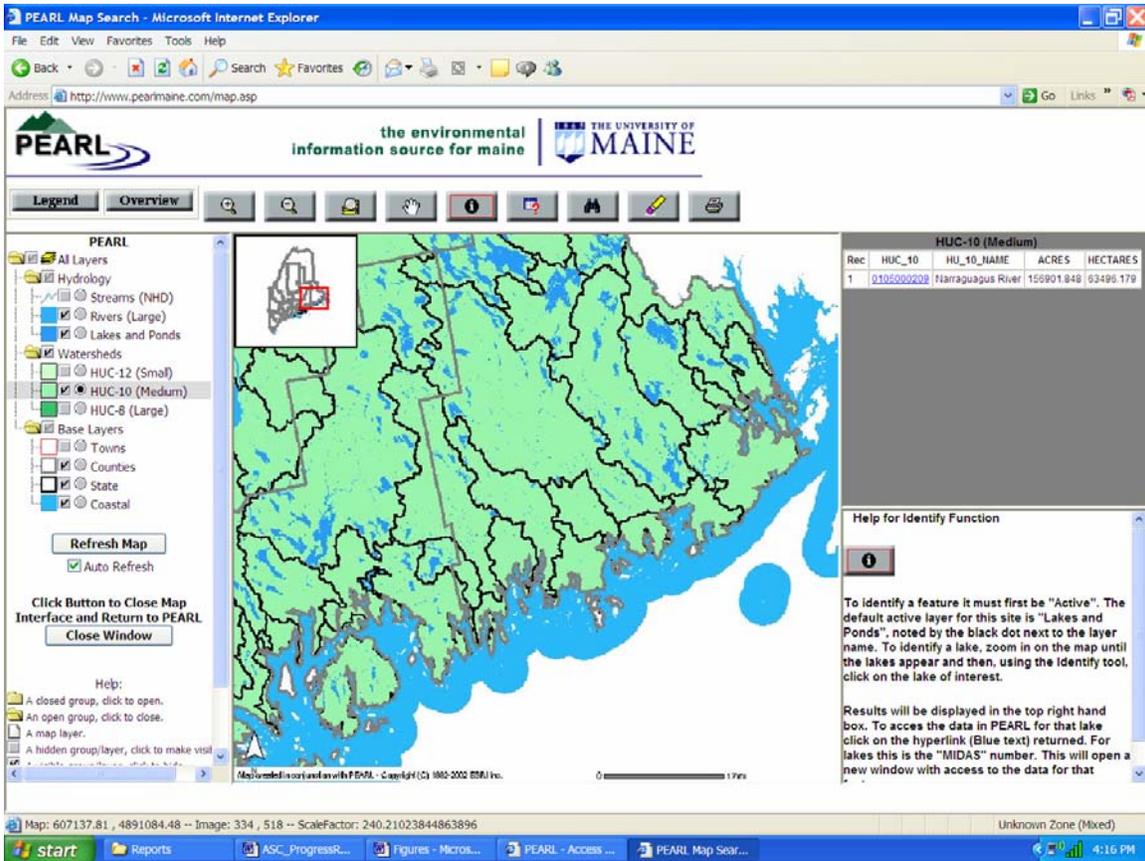


(A)



(B)

Figure 3: (A) Basic text-search and (B) advanced text-search windows in PEARL.



(A)



(B)

Figure 4: PEARL's new map-based search feature. In this example, a watershed layer (HUC-10) has been opened (A) and the Narraguagus watershed identified ("selected"). Clicking on the HUC-10 code in top right attributes panel will lead to a display of all categories of tables in the PEARL data bank that contain any records from the Narraguagus basin (B). Selecting any category will list the contributing data tables. When any one of these tables is opened, the presentation will contain a sub-set of the full table in the PEARL data bank, that consists only of those records from (in this case) the Narraguagus basin.

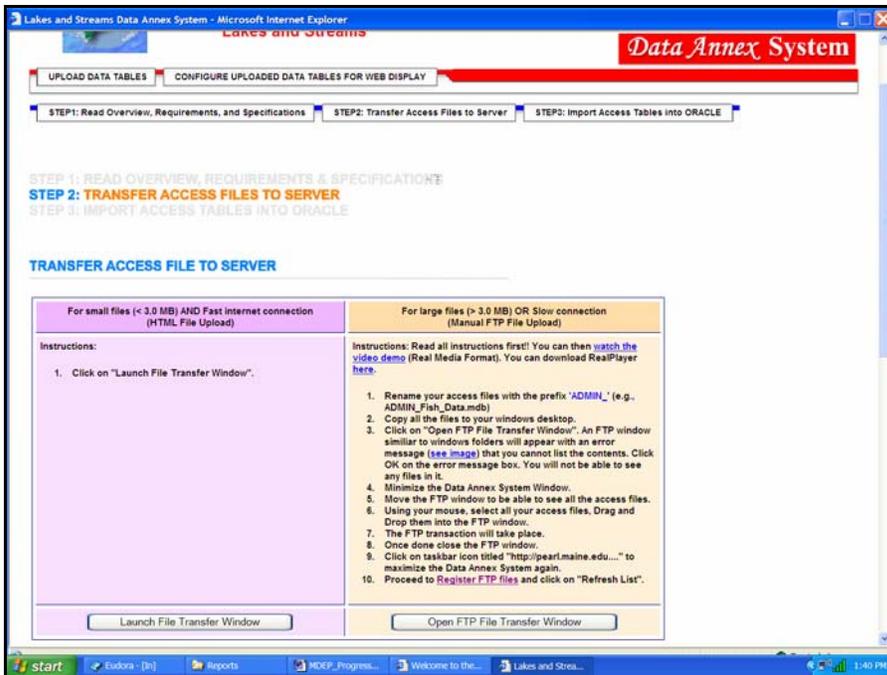
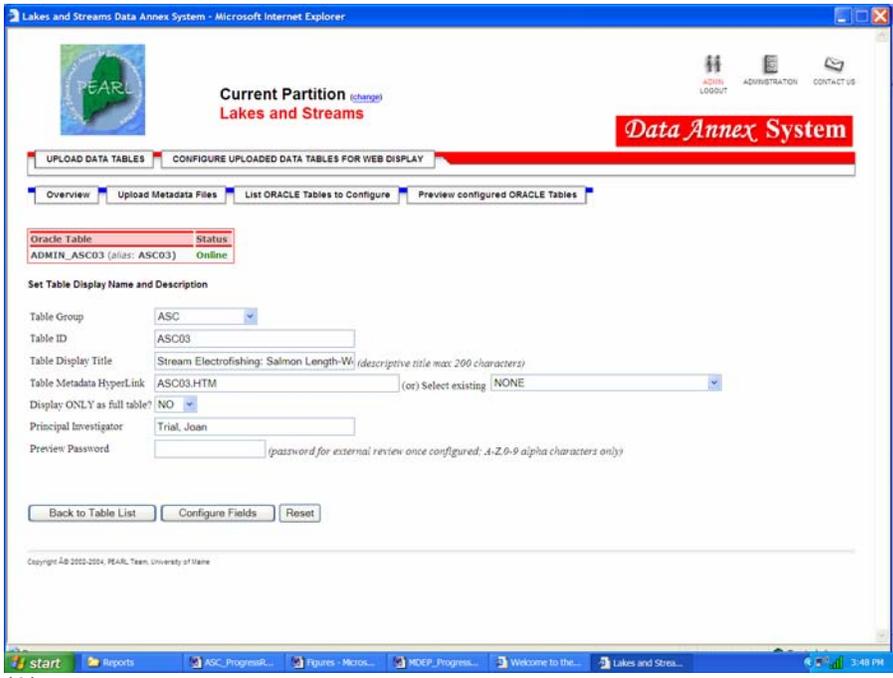
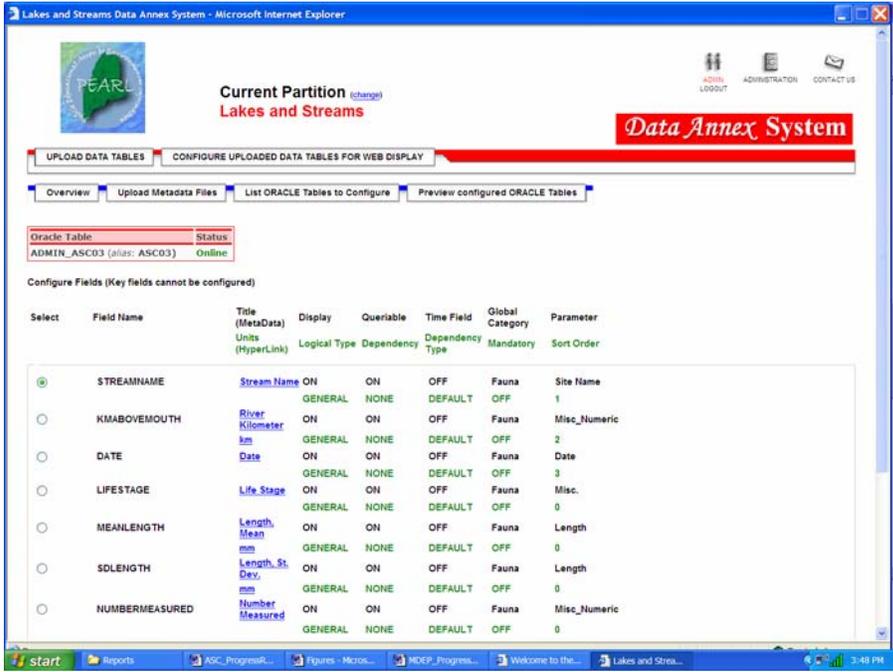


Figure 5: Data upload window in the PEARL Data Annex System.

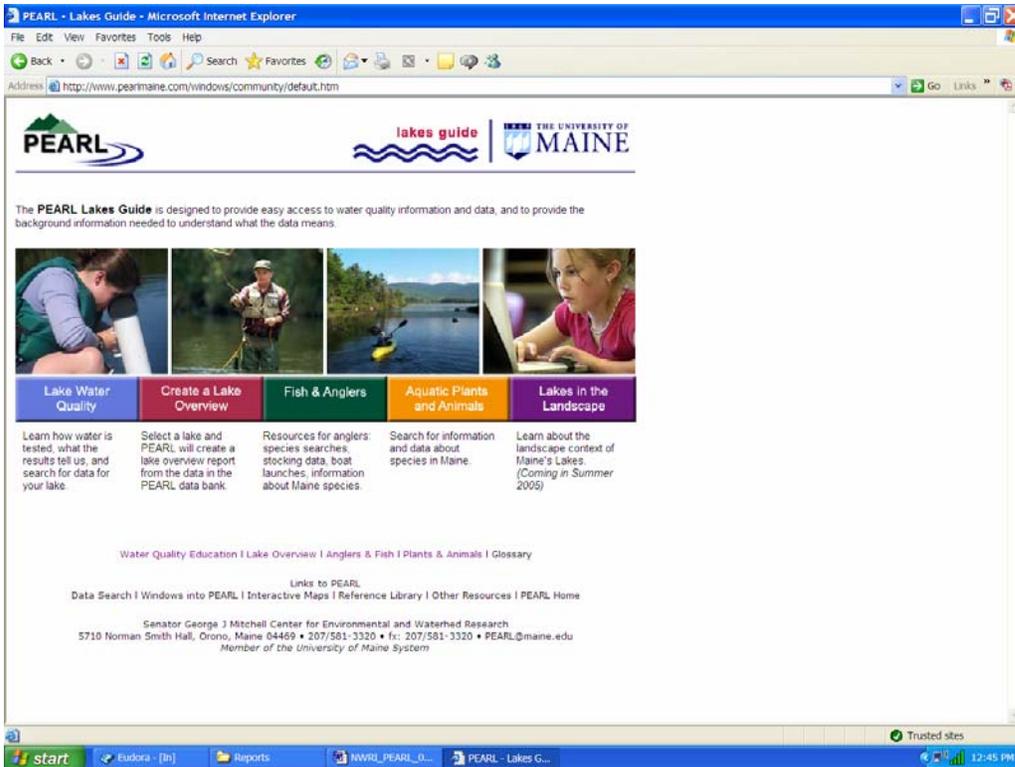


(A)



(B)

Figure 6: Table configuration windows in the PEARL Data Annex System. (A) Table title, P.I., etc. (B) Individual table fields.

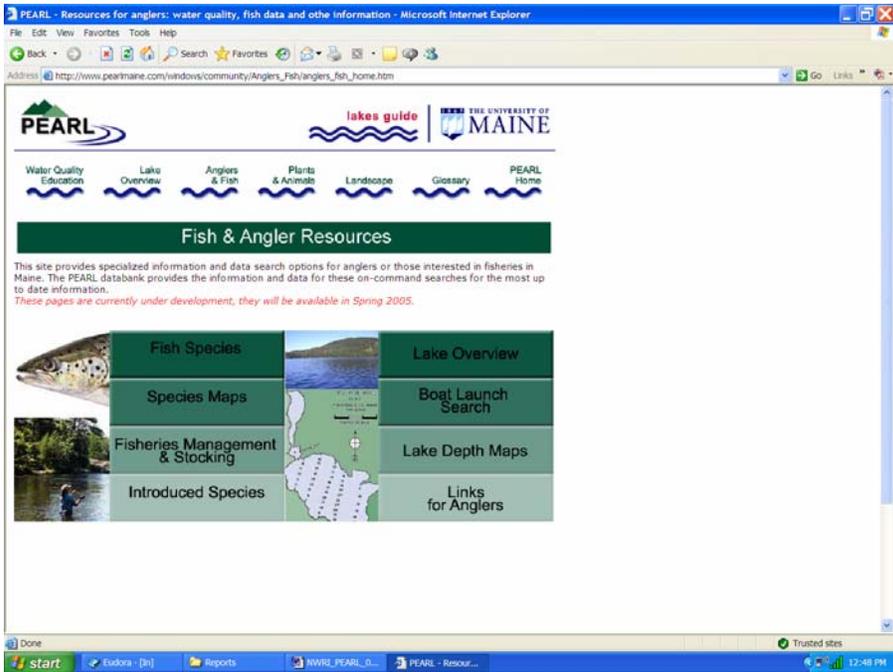


(A)

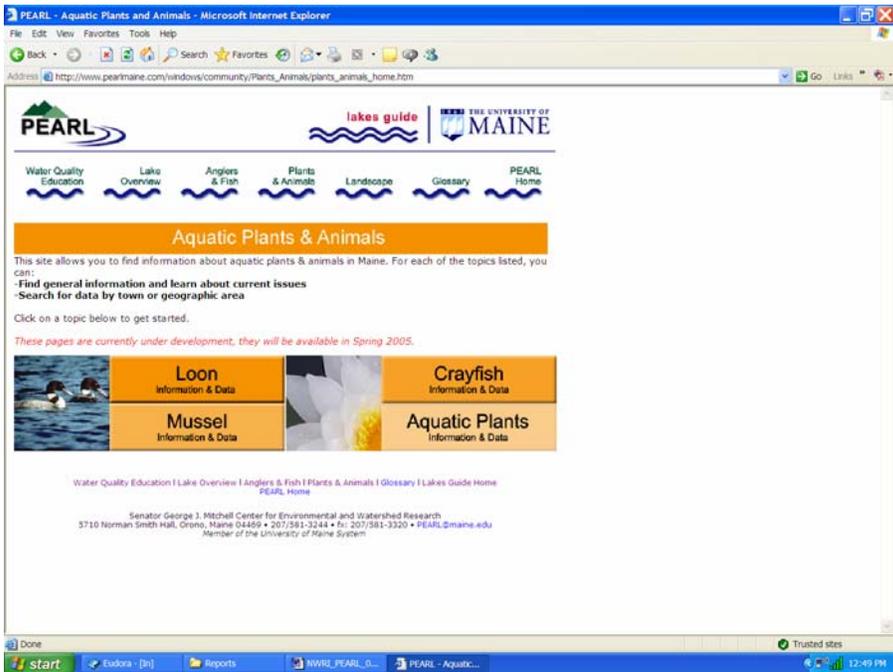


(B)

Figure 7: (A) Front page of new “Lakes Guide” in PEARL. (B) Index page of the Lake Water Quality component of Lakes Guide.



(A)



(B)

Figure 8: (A) Fisheries, and (B) Biodiversity components of PEARL's new Lakes Guide.

## **APPENDIX 1**

### **A User Survey of Lake Information Websites: Lessons for the Improvement of PEARL**

Summer 2004

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## **Introduction**

The PEARL website was designed in the mid-90's as a way to compile and communicate lake data collected by state and federal agencies, non-profit groups and community organizations. The PEARL website management and design team is in the process of re-working and revitalizing the site to enhance its flexibility and user-friendliness. As a beginning step, an evaluation of the current website was designed. There are two major purposes of The Lake Information Website User Survey. The first is to evaluate the current PEARL website, and the second is to compare it to other similar functioning websites in order to identify its strengths and areas where it can be improved.

The survey was sent to a wide range of PEARL website users including members of state agencies, volunteer lake water quality monitors, and teachers. Thirteen volunteers completed the survey and provided feedback on the PEARL site. Gained from this survey were ideas and feedback that will be vital to the improvement of the site. Members of this group who have chosen to stay involved in the evaluation and improvement process will form a core evaluation group who will give the needed feedback as the site is revamped.

This report summarizes the comments and ideas expressed by the survey participants. Specifically, it examines the strengths of PEARL as it is today, the areas of PEARL in need of improvement, what other similar sites are doing, ideas for new user interfaces, and ultimately how we can improve the PEARL site for the future.

### **Part I Strengths of the PEARL Website Today**

Before the idea of PEARL existed, environmental data from state, local, and non-profit agencies resided in separate databases throughout the state. One of the successes of the PEARL website that users commented on is the amount of environmental data that is available. Some individuals commented favorably to specific aspects of the website. These comments included: the ease of finding lakes when using a text search, the

usefulness of the datasets, and the fact that multiple searches were not necessary to find meaningful data.

## **Part II Areas in Need of Improvement**

The major task ahead for PEARL seems to be exactly how to organize data, information and searches in the clearest most user-friendly manner. All of the survey participants voiced this concern in at least one area of the survey. This was probably the most common comment on the survey. We can expect user-friendliness to be a top priority on a website improvement survey. As computer programs and web design become more sophisticated, the general public becomes more computer savvy and the bar is raised for user-friendliness and efficiency in web design.

With user-friendliness the focus, survey participants cited many specific areas in need of improvement. We can group these comments into 5 general areas of concern: improving the visual design of the site, redesigning the data search process, improving links to supplementary information like metadata, data explanation and the glossary, changing the vocabulary so that the site is more usable to the average person, and additional information that would be useful on the site.

### **1) Improving the Visual Design of the Site**

Making the site more visually appealing, simplifying the appearance of the site, and the inclusion of more visuals and pictures were priorities to many survey participants. Increasing the consistency of design between different parts of the website was also a concern.

Specific ideas included link buttons at the top of the page, more pictures of lakes and boat launches

### **2) Redesigning the Data Search Process**

The data search process was a major concern with a majority of the participants. Suggestions included: redesigning the data search process so that it

is more intuitive and so that it requires less steps, more efficient ways of displaying categories of datasets available, and fixing errors in data tables. Many survey users thought that other websites such as the Minnesota DNR website had a better data search process (see Part III).

Another concern expressed was that of problems with the data tables. The use of the number “999.9” in the data tables for data that is missing was a particular point of frustration for several users. Frustration was centered around the fact that it was not apparent in the data table that “999.9” meant missing data, and that these “999.9” numbers threw off the plotting of the data. Other users had problems with plotting Secchi depth. A suggestion for improving the “Plotting the Data” option was to permit the plotting options for only meaningful data relationships. All of the users responded favorably to the option to creating their own graphs. This option would allow users to choose the specific data for the x and y axis and the format of the graph.

One other area where users found problems and frustration in the data search process was when they tried to use the “Back” button in their browser, they received a “Page Expired” message. The option to go back to the previous page is not built into how the website currently works, but users agreed that internal links back would be helpful.

### **3) Improving Links to Supplementary Information like Metadata, Data Explanation and the Glossary**

Participants responded that they did not notice the Metadata button, which is at the top of the page when any data table is shown. The metadata can be very

useful to users because it gives supplemental information about how the data was collected, and contact information for those responsible for data collection. Participants voiced the need to make the metadata button more noticeable.

Other participants commented that they would like access from the data search area of the website to the supplementary information that is available in the education section. An option like this would allow users the option to learn more about the data they are looking at in the tables by clicking on a button for supplementary information such as background information on a water quality topic, or links to the glossary.

#### **4) Changing the Vocabulary so that the Site is More Usable to the Average Person**

Comments from several areas of the survey indicated that users thought that the vocabulary on the website either needed to be changed to a more simplified, universal vocabulary, or if scientific vocabulary was used, a short explanation should accompany it so that the non-academic community could easily complete a data search. An example of this is the “List by Dataset or List by Parameter” option in the search process. If a user does not understand the meaning of the word “dataset” or the word “parameter”, which are essentially scientific vocabulary, they are forced to click on either term to continue their data search by trial and error. Users all agreed that a few words to explain the function of these search processes would be helpful. Another specific suggestion was to change the names of datasets so that they are more identifiable to the general public.

## **5) Additional Information that Should be Included on the Site**

Users were also given the opportunity identify additional information that would be useful on the website. These areas of interest included the addition of river, stream and estuary data to the site, fisheries and other biological data, a list of ponds/lakes in recent watershed surveys, TMDL Reports, climate data, more graphs and maps to help interpret data, and more up-to-date data for lakes. A significant amount of the information requested for the website can be grouped into education-focused topics. These topics included: more background information for the layperson, current issues, history, understanding lakes, understanding fish and other biology of water systems, and links to environmental information on other websites. There is a clear desire for more generalized information about water systems in Maine on the PEARL website.

### **Part III**

#### **What Other Sites are Doing Well, and How We Can Learn From Them**

As part of the survey process, three sites with similar purpose and function were identified for comparison with the PEARL site. The first site was the Minnesota Department of Natural Resources “Lake Finder” site [www.dnr.state.mn.us/lakefind/index.html](http://www.dnr.state.mn.us/lakefind/index.html). Of the three sites selected, participants responded with the most enthusiastic comments about this site. The site (which is just a small part of the Minnesota DNR site) has a very efficient and simplified search process for lakes data, and is reason that most users rated it above the PEARL site in preference. The first page has a space to enter a lake name in a text box, or below that there is an option to find the lakes in a certain county, and gives a drop-down box that lists all of the counties in the state.

The part of the site that users seemed to respond most enthusiastically to was the way that the lake name and information/data categories available for that lake are displayed. The screen has a list of the lake names on the left side and the names of the categories of information/data are listed along the top of columns which go across the top of the screen. A checkmark appears in the column if that type of information/data is available. Visually, the way that the screen is set up is very efficient. Users liked the way that you could see the categories of information/data available for all lakes on one page, and suggested adopting this format for the PEARL data search process. The survey participants found many strengths to this site, most of which they thought should be incorporated into the PEARL site. The comments included that the site was “cleaner”, “faster”, “more user-friendly” and “you can jump right in”. Some survey participants still liked PEARL’s organization of information better, but the majority thought that the Minnesota site as stronger than PEARL.

One thing to remember when comparing PEARL to this site is that PEARL contains much more data than the Minnesota DNR site, and the data is more varied on the PEARL site. Simplicity and efficiency is a huge lesson that can be learned, however, by studying the design of the Minnesota DNR site.

Data/information categories included in the Minnesota site that users suggested adding to the PEARL website include: fish consumption advisories, recreational compass maps, satellite images, lake maps and water lake levels.

The next site on the survey was the Wisconsin Department of Natural Resources (DNR) site [www.dnr.state.wi.us/org/water/fhp/lakes](http://www.dnr.state.wi.us/org/water/fhp/lakes) .Users agreed that this site was too busy and not well organized. One trap to stay away from is clutter and too much information on the site.

The last website used in the survey is the Lake Access website [www.lakeaccess.org](http://www.lakeaccess.org) . Users responded positively to several areas of the site: the way that the navigation buttons were located along the top of the page, the current issues, history and angler sections, and the graphing applettes.

## **Part IV**

### **New User Interfaces**

In planning a way to communicate information to the specific user groups, the idea of specialized user interfaces was developed. The target user groups for these interfaces are groups that could potentially use the data on the PEARL website, but do not currently use the information because of a “barrier” in scientific understanding or vocabulary. The target groups are currently teachers/ students, anglers, and the general public concerned with lakes/water issues (lake association members, for example).

Ideas from survey participants for information to include in the new user interface for anglers include: fish stocking reports, Maine fish species information for the general public, depth and transparency information, thermoclines and Secchi depth, individual lake regulations, locations of boat launches, fish surveys, historic stocking records, and warning about illegal introduction of non-native species. For the teachers/student interface, suggestions included information on water quality, aquatic plants, fish, lake stewardship programs, and community service needs. These ideas are currently in consideration as the new user interfaces are developed.

### **Conclusions**

The feedback gained from the survey can be used to construct a framework of priorities for the improvement of the PEARL site. The priorities would be to:

- Improve the accessibility of the data and information on the website for the general public.
- Redesign the data search process so that it is more intuitive and efficient.
- Improve the visual design of the site.
- Improve the connection between data and tools on the site that facilitate understanding and synthesis of the data. (for example, connections from data sets to “Understanding the Data” pages or to the glossary)
- Add more data and background information to the site.

With these priorities in place, we are able to clearly look forward and plan strategies to make these ideas happen. As we move through this process of improvement it will be important to seek and document more feedback from users,

respond to the concerns or suggestions that are voiced, and to modify our actions accordingly. Understanding the relationship that the user has with the PEARL interface will be the key to continuing the success of the site.

## Lake Information Websites: A User Survey

Name \_\_\_\_\_ Organization \_\_\_\_\_

Date of completion of the survey \_\_\_\_\_

### Part One: Evaluation and suggestions for the PEARL site

Please go to the homepage of the PEARL website: [www.pearl.maine.edu](http://www.pearl.maine.edu)

1. On first impression, how visually appealing is the homepage in comparison to other websites?
- |                         |   |                    |   |               |
|-------------------------|---|--------------------|---|---------------|
| Very visually appealing |   | Somewhat appealing |   | Not appealing |
| 1                       | 2 | 3                  | 4 | 5             |

*First, please take some time to navigate around in the site so you have a feel for how the site is organized and the information that it contains. Next, pretend that you are coming to this site to find specific water quality data for a lake that you are interested in. Please try to complete a search for information on your chosen lake by following the directions listed below. Please answer the questions as you conduct the search.*

**Go to the first page of the site. Scroll down to the search buttons at the bottom of the page.**

2. Are the labels on the search buttons "Browse Data Sets" and "Text search" easy to understand? **YES NO**

**Click on the "Text Search" button. Next click on the scrolling menu labeled "County" and choose a county. Look at your results (we will use this in comparison to another site later).**

**Go back to the "Text Search" page and type in your lake name under "Lake Name"**

3. How easy was it to find the lake that you were looking for under "Lake Name" only?
- |           |   |               |   |              |
|-----------|---|---------------|---|--------------|
| Very Easy |   | A little work |   | Hard to find |
| 1         | 2 | 3             | 4 | 5            |

4. Were the options to select multiple search criteria helpful to find the lake that you were looking for?
- |              |   |                  |   |             |
|--------------|---|------------------|---|-------------|
| Very Helpful |   | Somewhat Helpful |   | Not Helpful |
| 1            | 2 | 3                | 4 | 5           |

5. Are there other ways of searching for lakes by text that would be helpful to you? Please give specific ways that you would like to search for data by text.

6. Would you use a multiple-lake search if it was available? **YES NO POSSIBLY**

**Once you have reached the Lake Summary Data page for your lake...**

7. How useful is the information listed on this page?
- |             |   |                 |   |            |
|-------------|---|-----------------|---|------------|
| Very useful |   | Somewhat useful |   | Not useful |
| 1           | 2 | 3               | 4 | 5          |

8. Is there other useful summary data that you would like to see on this page? Please list your ideas:

9. How clear is it that the buttons with pictures (Labeled Water Quality, Fauna, ect.) contain data sets for the lake that you have selected?

|            |   |                    |   |                                             |
|------------|---|--------------------|---|---------------------------------------------|
| Very Clear |   | A little confusing |   | Not clear, I had to click on it to find out |
| 1          | 2 | 3                  | 4 | 5                                           |



|                       |   |                        |   |        |
|-----------------------|---|------------------------|---|--------|
| Not long<br>long time |   | A short amount of time |   | A very |
| 1                     | 2 | 3                      | 4 | 5      |

23. How easy was the map tool to use?

|                          |   |                                |   |               |
|--------------------------|---|--------------------------------|---|---------------|
| Very easy<br>frustrating |   | Somewhat difficult/frustrating |   | Difficult and |
| 1                        | 2 | 3                              | 4 | 5             |

24. Would the amount of time that it took for the maps to load discourage you from using this tool in the future? **YES NO**

25. How useful is the "Map Search" tool in your opinion?

|                       |   |                 |   |     |
|-----------------------|---|-----------------|---|-----|
| Very Useful<br>useful |   | Somewhat useful |   | Not |
| 1                     | 2 | 3               | 4 | 5   |

26. How could the "Map Search" tool be improved?

**Click on the "Education and Outreach" button on the left side of the page.**

27. How well do you think this page is organized for an average user to find educational information?

|                     |   |                    |   |               |
|---------------------|---|--------------------|---|---------------|
| Very well organized |   | Somewhat Organized |   | Not organized |
| 1                   | 2 | 3                  | 4 | 5             |

**The PEARL team is in the process of developing new user interfaces for two specific user groups: anglers, and students/teachers. We would love your feedback and ideas about this future program.**

28. How could you see data from the PEARL database utilized by specific user groups such as fishermen/anglers and teachers/students? What type of data/information would be useful for each these groups?

fishermen/anglers:

teachers/students:

## Part Two: Evaluating Similar Sites

**Please go to the Minnesota Department of Natural Resources "Lake Finder" site [www.dnr.state.mn.us/lakefind/index.html](http://www.dnr.state.mn.us/lakefind/index.html) Please take a few minutes to navigate through this site.**

1. What are your first impressions of the site, as it compares to PEARL?

**Go back to the first page of the site. Under the tab that is labeled "Find a Lake", click on the pull down list under "County". Choose a county from the list and click on the "Get Lake Data" button. The "Search Results" page should come up.**

2. How does the way that available data is organized on this page compare to the way it is organized on PEARL?

|                                              |   |                     |   |           |
|----------------------------------------------|---|---------------------|---|-----------|
| PEARL is more effective<br>is more effective |   | They are comparable |   | Minn. DNR |
| 1                                            | 2 | 3                   | 4 | 5         |

3. Do you like the way that this page shows the available data in each category for each lake? **YES NO**

**Click on one of the information categories for a lake in your selected county by clicking on the checkmarks located under each column category. Please view all 9 categories.**

4. In comparison to the information provided on PEARL, please comment on the communication of data on the Minnesota DNR site. Specifically, please identify methods of data communication that would be helpful on the PEARL website.

Lake Survey:

Lake Maps:

Lake Water Levels:

Fish Consumption Advisory:

Lake Water Quality:

Lake Water Clarity:

Lake Water Quality by Satellite:

Recreation Compass:

Topographic Maps:

**Go back to the first page of the “Lake Finder” site. Use the search for “Stocking Reports” and “Generate a Report”**

5. How useful do you think this tool would be for the PEARL site?

|             |   |                 |   |            |
|-------------|---|-----------------|---|------------|
| Very Useful |   | Somewhat Useful |   | Not Useful |
| 1           | 2 | 3               | 4 | 5          |

**Please go to the Wisconsin Department of Natural Resources “Wisconsin Lakes” site [www.dnr.state.wi.us/org/water/fhp/lakes](http://www.dnr.state.wi.us/org/water/fhp/lakes)**

**Take a few minutes to navigate through the site. Next, go back to the first page. Click on the “Lake Data” choice on the list on the left side of the page. Then click on the “Download Data” button at the top of the next page.**

1. How does their searching method for lake data compare to those on PEARL and the Minnesota DNR “Lake Finder” site?

2. Look around on this site, are there things that you like that might be applied to the PEARL site? Please be specific.

**Please go to [www.lakeaccess.org](http://www.lakeaccess.org) to answer the questions below. Please keep in mind that the Lake Access site is different from PEARL in that it only manages lake data from a few lakes, and the data managed on the site is real-time data gathered from specialized data collection tools. The site was chosen because of its design elements and the pages designed for specific user groups.**

1. Do you think that the format of the link buttons on the top of their homepage would benefit the PEARL website? **YES NO**  
Why/ why not?

**Click on the “Anglers” button on the left side of the screen on the homepage. Look at the graph that shows where the thermocline is (dissolved oxygen to depth).**

2. How valuable do you think that this graph would be to anglers?

|               |   |                   |   |                     |
|---------------|---|-------------------|---|---------------------|
| Very Valuable |   | Somewhat Valuable |   | Not Valuable At All |
| 1             | 2 | 3                 | 4 | 5                   |

**Scroll down the page and look at the chart “Fish Water Quality Needs”**

3. How valuable do you think that a graph like this with Maine species would be to anglers using the PEARL website?

|               |   |   |                   |   |                 |
|---------------|---|---|-------------------|---|-----------------|
| Very Valuable |   |   | Somewhat Valuable |   | Not Valuable At |
| All           | 1 | 2 | 3                 | 4 | 5               |

**Click on the “Lake Data” link button at the top of the page, and then click on the “About the Data” on the left hand side of the page.**

4. How useful are the Data Visualization Tools included in this part of the site?

|             |   |   |                 |   |            |
|-------------|---|---|-----------------|---|------------|
| Very Useful |   |   | Somewhat Useful |   | Not useful |
| 1           | 2 | 3 | 4               | 5 |            |

5. Do you think that these tools would be useful on the PEARL website? **YES NO**

**Click on the “Understanding Lakes” button at the top of the page. Check out the pages included in this section.**

6. What do you like about this section of the Lake Access site? What parts could be used on the PEARL website- especially on the education section of the site?

7. What else about this website do you like and think might be useful on the PEARL website?

### Part Three: Conclusions

1. Based on what you have seen on the other sites, and based on what you have noticed while completing the question ere, what do you think should be the top three priorities in improving the PEARL site?

2. What other data or information would you like to see on the PEARL website?

3. Please provide any other suggestions or ideas for improvement:

## **APPENDIX 2**

**Materials prepared by Sara McCabe (M.S. student) for PEARL-evaluation focus sessions, May-June 2005.**

**PEARL Website Research Project Teacher Participant Survey**

Age: \_\_\_\_\_ Gender: M / F Profession,  
Title: \_\_\_\_\_

**Computers:**

1. What computers do you normally use? (circle all that apply)
- A school laptop
  - A computer at home
  - Computers at school(in a class or library not laptops)
  - A computer at a friend or relative’s house
  - A computer at a local library
  - Other, list \_\_\_\_\_

**Internet Use:**

2. How often in a week do you use the internet? (circle one)
- 1 – 2 days
  - 3 – 4 days
  - 5 – 6 days
  - Everyday
3. How much time do you spend using the internet on a daily basis? (circle one)
- do not use daily
  - 1-30 min.
  - 30 min.- 1 hour
  - 1 - 2 hours
  - 2 – 3 hours
  - more than 3 hours
4. Where do you use the internet? (circle all that apply)
- at home
  - at work
  - at a local library
5. What do you use the internet for? Circle all that apply, and give the percentage of total time on the internet that you use for this task (all should add up to 100)
- | <u>Task</u>                       | <u>Percentage of time on Internet</u> |
|-----------------------------------|---------------------------------------|
| ▪ e-mail for work                 | _____                                 |
| ▪ e-mail for fun                  | _____                                 |
| ▪ search for information for work | _____                                 |

- search for information for fun  
(travel, topic of interest) \_\_\_\_\_
- search for info. for personal task  
(Government info ex. tax laws) \_\_\_\_\_
- surfing for fun \_\_\_\_\_
- playing games \_\_\_\_\_
- Other \_\_\_\_\_

6. As a teacher, do you use the internet in you classes? Yes / No

7. How often do you use the internet in your class? (circle one)

- Every couple of months
- Once a month
- Several times a month
- Once a week
- Several times a week
- Everyday

8. What do you use the internet for? (circle all that apply)

- Research
- Word processing
- Online tutorials
- Online learning games
- E-mail
- Other, list \_\_\_\_\_

9. What are the greatest barriers to using the internet in your classroom?

10. What are frustrating aspects of using the internet in the classroom?

11. What are the things that you look for most in an internet source to use in your classroom?

12. Did you use the PEARL website [www.pearl.maine.edu](http://www.pearl.maine.edu) before getting involved in this research? Yes / No

13. Have you had a chance to use the new PEARL website [www.pearlmaine.com](http://www.pearlmaine.com) before attending the meeting?  
Yes / No

14. If yes, how much time did you spend on the site? \_\_\_\_\_

15. Do you have any general comments or questions about the site?

## Teacher Focus Group Script

### Introduction

Hello, my name is Sara Colburn McCabe, I am a graduate student at the University of Maine. I work for the Senator George J. Mitchell Center for Environmental and Watershed Research. The focus of my graduate thesis is about how people interact with environmental data on the internet, and how website design effects this interaction.

In this group interview I will be asking you some questions and I would like everyone to feel like you can talk freely to each topic.

### Opening

To get us started, let's do some introductions. Tell us your name, where you teach, and your favorite activity when you are not teaching.

### Question #1

Think back to the past couple of years since the internet has become such a major part of our society. What is the best experience you have had using the internet in your classroom?

### Question # 2

Based on your experience, what types of things do you think make websites successful for student learning?

### Question # 3

Thinking about the units or topics that you have taught, what ways could you see using existing environmental data in your classroom?

Let's go ahead and start looking at the PEARL website.

The first thing I would like you to do is to just look at the homepage- don't go any further than that yet.

I want you to imagine that you are looking for information about chlorophyll on the lake in town.

### Question # 4

Is it clear on this page where you would go for this information?

Do you have any ideas of how this could be improved?

Next, we are going to look at the different ways of searching for data and information on the PEARL site. I am going to point them out to you on the projector screen, and then I would like you to try them out.

- Basic Text Search

- Advanced Text Search

- Browse Datasets

- Map Search

## Lakes Guide

### Question # 5

Which mode of searching would you be most likely to use yourself? With students? Talk about the features that you found most useful.

### Question # 6

Were there specific parts of the search process that were confusing, frustrating, or in need of change?

Now we are going to look more closely at the Lakes Guide. I would like you to look at the different sections within the Lakes Guide. Keep in mind that because the site is still under construction, there may be many dead links. Take a few minutes to try it out and then we will discuss.

### Question # 7

Think about if you were using this site with your class, what aspects of the Lakes Guide would help your students find and understand data?

### Question # 8

Were there any confusing or frustrating parts of the Lakes Guide?

### Question # 9

Can you identify things that are missing on the Lakes Guide that would be helpful to you or your students?

Now let's go back to the home page again. Check out the other tools and resources on the site such as the Education Resources, the Glossary, and the other "Windows" such as the Atlantic Salmon, Freshwater Biodiversity and Penobscot River Synthesis sections that are coming in the future.

### Question # 10

If you could add one thing to the PEARL website to make it more useful for teachers and students, what would it be?

## PEARL Website Research Project Student Survey

Age: \_\_\_\_\_

Gender: M / F

### Computers:

1. What computers do you normally use? (circle all that you use)

- A school laptop
- A computer at home
- Computers at school(in a class or library not laptops)
- A computer at a friend or relative's house
- A computer at a local library
- Other, list \_\_\_\_\_

### Internet Use:

2. How often in a week do you use the internet? (circle one)

- 1 – 2 days
- 3 – 4 days
- 5 – 6 days
- Everyday

3. How much time in a day do you spend using the internet? (circle one)

- do not use daily
- 1-30 min.
- 30 min.- 1 hour
- 1 - 2 hours
- 2 – 3 hours
- more than 3 hours

4. Where do you use the internet? (circle all that apply)

- at home
- at school
- at a local library
- at a friend or relative's house

5. What do you use the internet for? Circle all that apply, and give the percentage of total time on the internet that you use for this task (all should add up to 100) For example, I use email 50% of the time and search for information for school the other 50% of the time I use the internet. Break 100 down how ever you want to.

| <u>Task</u>                         | <u>Percentage of time on Internet</u> |
|-------------------------------------|---------------------------------------|
| ▪ e-mail for fun                    | _____                                 |
| ▪ search for information for school | _____                                 |

- search for information for fun  
(hobby, something you like) \_\_\_\_\_
- surfing for fun \_\_\_\_\_
- playing games \_\_\_\_\_
- Other \_\_\_\_\_

6. Do you use the internet in your school classes? Yes / No

7. How often do you use the internet in class at school? (circle one)

- Every couple of months
- Once a month
- Several times a month
- Once a week
- Several times a week
- Everyday

8. How many different classes do you have at school? \_\_\_\_\_

How many of those classes use the internet? \_\_\_\_\_

9. What do you use the internet for in class? (circle all that apply)

- Research
- Word processing
- Online tutorials
- Online learning games
- E-mail
- Other, list \_\_\_\_\_

10. Do you like using the internet in the classroom? Why or why not? Give examples if you can.

11. Are there any frustrating parts of using the internet in the classroom? What are they?

12. What are the things that a website can have that makes it better than another site?

13. Did you use the PEARL website [www.pearl.maine.edu](http://www.pearl.maine.edu) before getting involved in this research? Yes / No

14. Have you had a chance to use the new PEARL website [www.pearlmaine.com](http://www.pearlmaine.com) before attending the meeting?  
Yes / No

15. If yes, how much time did you spend on the site?\_\_\_\_\_

## Student Assent Script for Interview

Thank you for agreeing to talk to me today about the PEARL website. I am trying to find out more about the ways that people use the website, and how people use environmental data on the internet. Our discussion will take about 50 min, including time that you will be using the website, and time filling out an anonymous survey. The survey should take no more than 5 min. and includes questions like “How much time do you spend on the internet each day”, and “Do you enjoy using the internet for learning in the classroom”. I have some questions to ask you. You are free to answer however you wish, and also to skip any questions you do not want to answer. Also you can end the interview any time you want. I would like to record the interview on tape. The only people who will hear the tape are the researchers at the University of Maine. I will be combining the information you share with the information that other students, teachers, and lake volunteers share with me to write a report. I will not use your name or identify you in any way in these reports. Do you have any questions for me before we begin? Are you still willing to talk with me?

1min. Read Student Assent Script

5min Student Survey

2min Intro question- What is your first name, and what is your favorite website?

3min #1 Think about how you have used the internet in your classes in the past, do you enjoy using the internet to learn in school?  
Explain why or why not- try to give specific examples

5min #2 What do you think makes one website for learning new information better than another? Lets make a list of requirements for websites that hold your attention and help you learn.

Have students look at the first page only of PEARL

2min #3 Pretend that you are looking for water quality data for a certain lake, is it clear where you could go to find

this? What might help make this page clearer so that you can get to the information you need?

Have students look away from their computers, show them the search methods available- text, map.

3min Have them try the search method out for a lake in their town.

5min #4 How did your search for data go? Was the process clear or confusing? What parts did you get stuck on? What parts did you like?

3min Now look at the Lakes Guide- water quality section. Pretend you are looking for information about chlorophyll.

5min #5 How does this way of finding information compare with the other searches you did on PEARL? Is it easier to use or not? Given three different ways of finding data, which is the easiest for you? Why?

How easy is the information on chlorophyll to read and understand?

Should it be changed in any way to make it easier to understand?

Do the pictures help you learn more about the subject?

What could be added to this to make it easier to understand and more interesting?

3 min Now, look at the other parts of the Lakes guide- lake overview, fish & angler, aquatic plants and animals.

5min #6 How could you see using this data and information in your classroom or at home?

What other types of data or information would be interesting to you?

What could be included that is not on the site now?

3min What is your favorite part of the site? Why?  
If you had the power to change or add one thing to this site to make it better (more interesting, more effective), what would it be?

**PEARL Website Research Project Lake Volunteer Participant Survey**

Age: \_\_\_\_\_ Gender: M / F Profession,  
Title: \_\_\_\_\_

**Computers:**

1. What computers do you normally use? (circle all that apply)
- A computer at home
  - Computers at work
  - A computer at a friend or relative's house
  - A computer at a local library
  - Other, list \_\_\_\_\_

**Internet Use:**

2. How often in a week do you use the internet? (circle one)
- 1 – 2 days
  - 3 – 4 days
  - 5 – 6 days
  - Everyday
3. How much time do you spend using the internet on a daily basis? (circle one)
- do not use daily
  - 1-30 min.
  - 30 min.- 1 hour
  - 1 - 2 hours
  - 2 – 3 hours
  - more than 3 hours
4. Where do you use the internet? (circle all that apply)
- at home
  - at work
  - at a local library

5. What do you use the internet for? Circle all that apply, and give the percentage of total time on the internet that you use for this task (all should add up to 100)

| <u>Task</u>                                                     | <u>Percentage of time on Internet</u> |
|-----------------------------------------------------------------|---------------------------------------|
| ▪ e-mail for work                                               | _____                                 |
| ▪ e-mail for fun                                                | _____                                 |
| ▪ search for information for work                               | _____                                 |
| ▪ search for information for fun<br>(travel, topic of interest) | _____                                 |

- search for info. for personal task  
(Government info ex. tax laws) \_\_\_\_\_
- surfing for fun \_\_\_\_\_
- playing games \_\_\_\_\_
- Other \_\_\_\_\_

6. What aspects of the internet do you enjoy the most?

7. What are frustrating aspects of using the internet?

8. Have you used the internet to look for information about lakes or environmental topics?

Yes / No

-Was the search successful? Yes / No

-Were there frustrating parts of that process? What were they?

9. Has your volunteer group used the internet to guide any understanding about lake ecology or lake issues? Describe your experience.

10. What are the things that you look for most in an internet source for environmental information?

11. Did you use the PEARL website [www.pearl.maine.edu](http://www.pearl.maine.edu) before getting involved in this research? Yes / No

12. Have you had a chance to use the new PEARL website [www.pearlmaine.com](http://www.pearlmaine.com) before attending the meeting?

Yes / No

13. If yes, how much time did you spend on the site? \_\_\_\_\_