

## **Technical Report NEESgrid-2004-15**

**[www.neesgrid.org](http://www.neesgrid.org)**

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# **Getting Started Guide for Collaboration**

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## Table of Contents

1	Introduction.....	3
2	System Requirements .....	3
3	Connecting.....	3
4	Logging In.....	4
5	Creating and editing worksites and pages.....	6
6	Joining Workspaces .....	13
7	Participating in Workspaces .....	14
7.1	<b>Chatting</b> .....	15
7.2	<b>Discussions</b> .....	16
7.3	<b>Archiving email</b> .....	16
7.4	<b>Uploading, browsing and utilizing shared resources</b> .....	17
7.5	<b>Scheduling</b> .....	18
7.6	<b>“Participating” in a remote experiment</b> .....	19
7.8	<b>Viewing data</b> .....	23
7.9	<b>Using the Electronic Lab Notebook</b> .....	27
7.10	<b>Accessing the NEESgrid Simulation Portal</b> .....	29
7.11	<b>Using and Displaying Multiple Tools at Once via “Floating”</b> .....	31
	Appendix A: A Structural Investigation Scenario .....	33

## 1 Introduction

The NEESgrid user interface provides users with access to a range of collaboration and research tools to support the research, practice, and educational goals of the George E. Brown, Jr. Network for Earthquake Engineering Simulation (NEES). This guide is intended to get new users up and running quickly. Developers, equipment site representatives, and advanced users will find additional, more advanced documentation at <http://neesgrid.org/documentation>.

Note: San Diego (i.e. NEESit) will host this documentation after October 1, 2004.

## 2 System Requirements

A full listing of the NEESgrid end-user minimum system requirements is available at <http://neesgrid.org/most/index13.html>. The NEESgrid user interface runs on most modern operating systems with a newer web browser equipped with Sun's Java 2 Standard Edition Runtime Environment (J2SE) and Java Media Framework (JMF) and a high-speed network connection.

## 3 Connecting

Each NEES equipment site runs a NEES Point-of-Presence (NEESpop) server. You can find the URL of each site's NEESpop at the site's NEES project web site. (Typically <http://nees.<institution>.edu/> - e.g., <http://neespop.cgm.ucdavis.edu:8080/chef/portal>). After pointing your browser to a NEESpop, you will be presented with a NEESpop home page containing a login prompt and a "Message of the Day"(see Fig. 1).

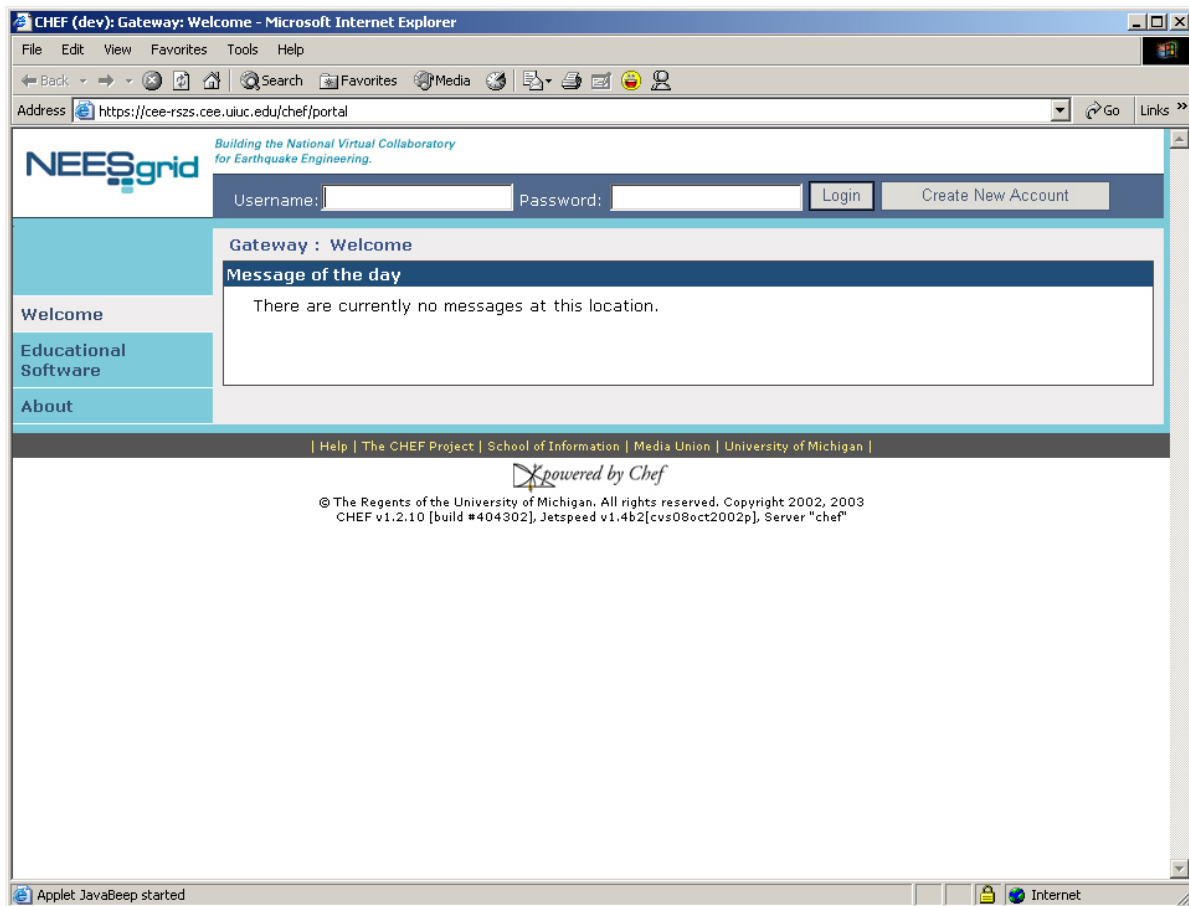


Figure 1: NEESpop Homepage

## 4 Logging In

If you have already created a login on this NEESpop, you can enter your username and password. If you do not have a username, you will need to create one by clicking on the “Create New Account” button on the top right. You will then be prompted to create an account (see Fig. 2).

Note: You will need to have a certificate from a certified authority in order to access all the features of NEESgrid. Details about the certificate procedures are available at [http://www.neesgrid.org/get\\_involved/user\\_accounts.html](http://www.neesgrid.org/get_involved/user_accounts.html). San Diego (i.e. NEESit) will be the certificate authority after October 1, 2004.

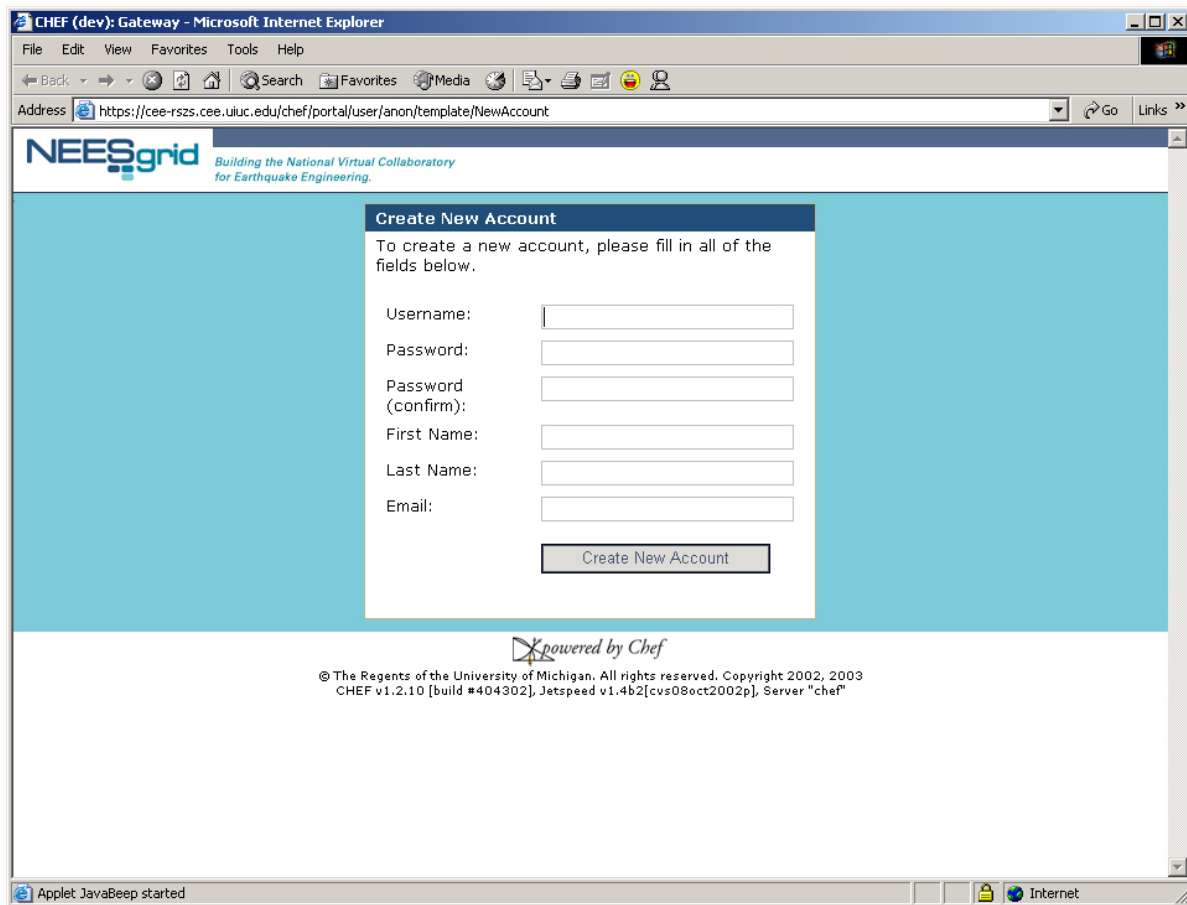


Figure 2: Create new account screen

After creating a new account or logging in, you will be taken to your “My Workspace” page (see Fig. 3). The “My Workspace” page, like all others in the NEESgrid user interface, is divided into three major parts:

### Workspaces

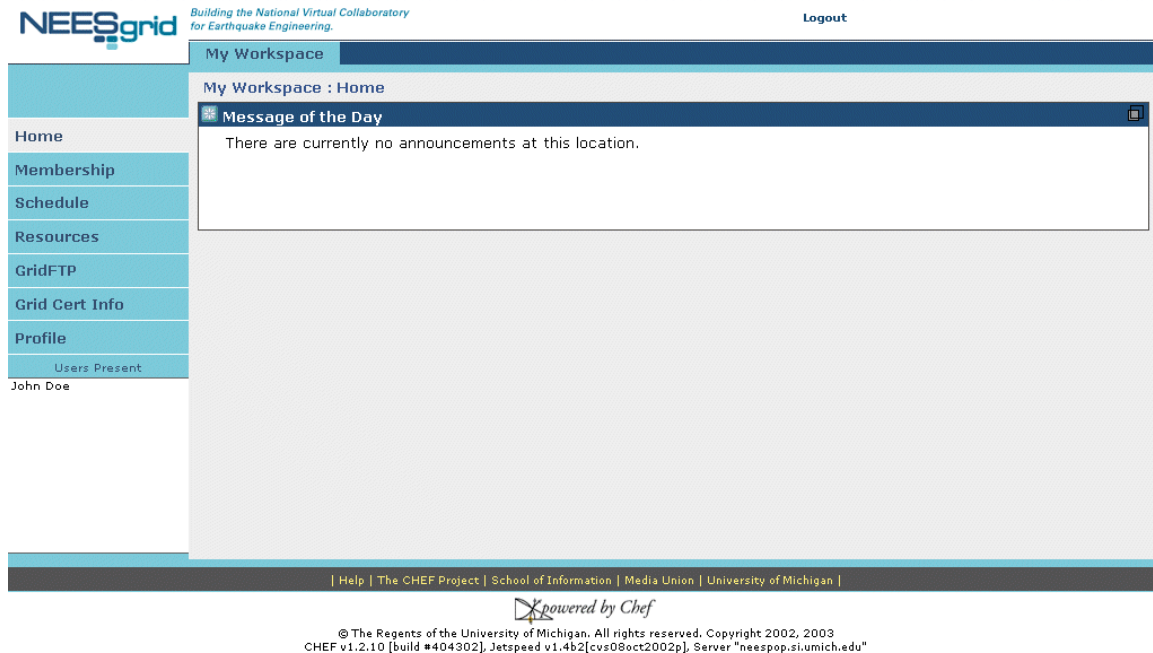
There are one or more tabs across the top of the window. Each tab represents a workspace. When you first create an account, you will have only one workspace, “My Workspace.” In a moment, you will see how to create and join other workspaces. A workspace can be associated with a project, an experiment, a research group, or any other meaningful context.

### Tools

There are a series of buttons down the left side of the browser window. These represent the tools available in the current workspace. When a new workspace is created, the creator can decide to enable all or some of the available tools. In addition, new tools may become available as programmers develop them. Below the buttons is a list of users currently online.

## Content

The content of the selected tool is displayed in the remaining part of the window.  
The exception to this is when tools are floated – this will be discussed later.



**Figure 3: “My Workspace” page**

It is important to note that the exact appearance of a workspace can vary based on the available tools and the workspace’s color scheme.

## 5 Creating and editing worksites and pages

(Please be aware that you need to have admin status or an admin login in order to be able to perform the following operations.)

To create a site, click on the “Sites” tool. This will display a list of existing sites with the site ID, Title and other descriptions as shown in Fig.4.

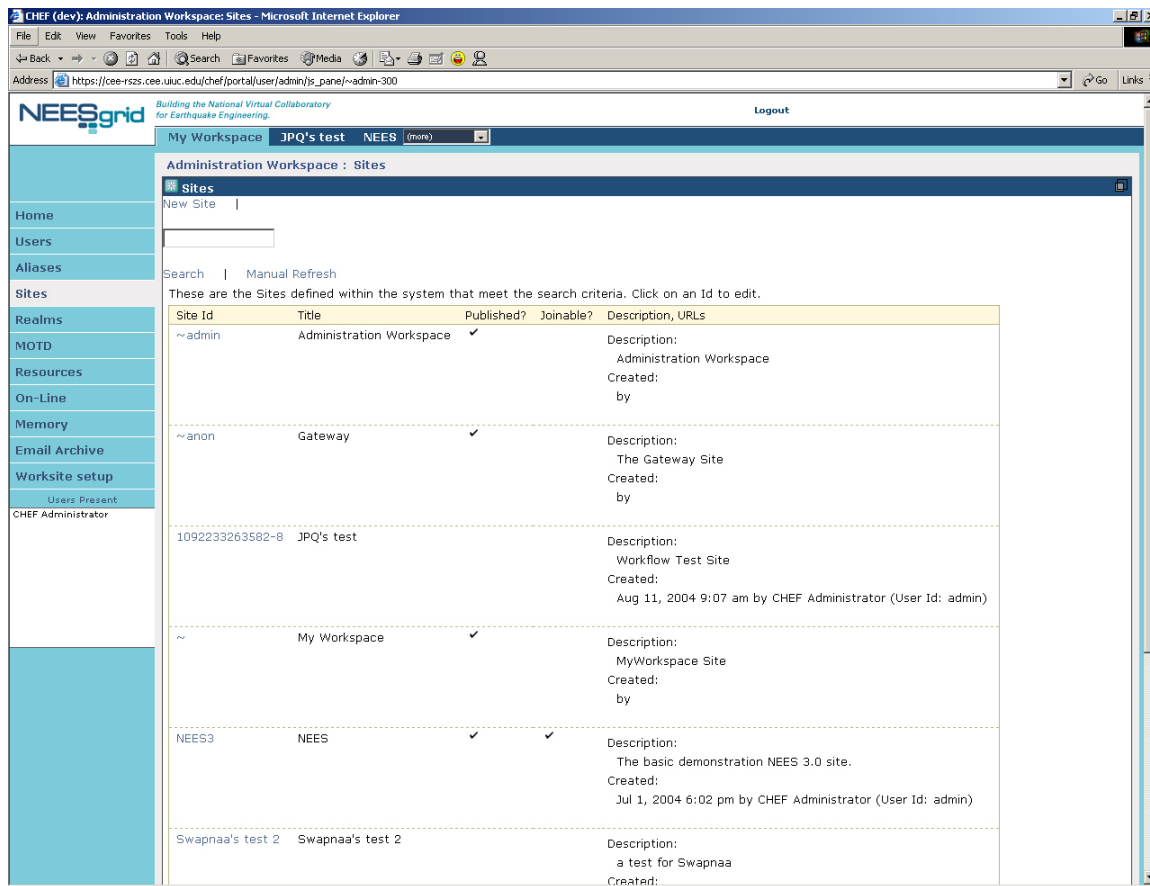
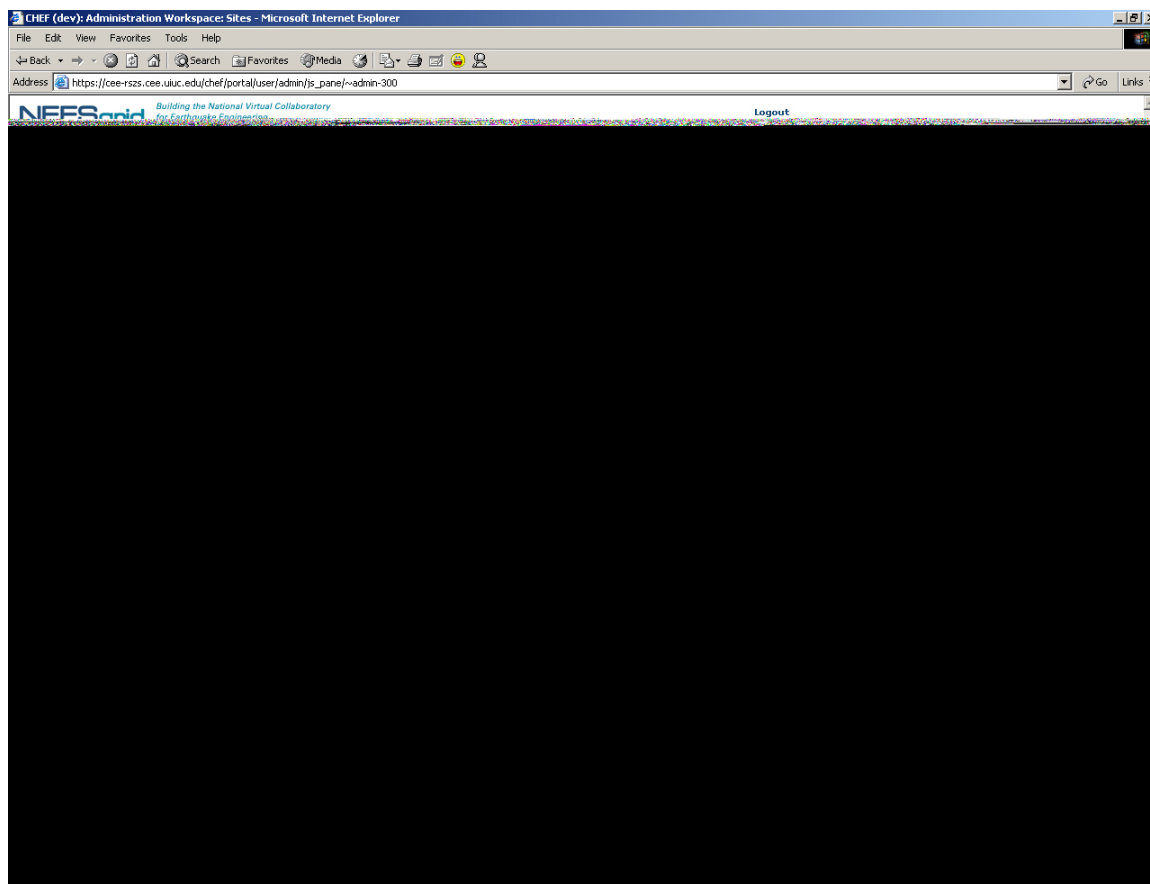


Fig.4: Sites page

Click on the “New Site” link found on the top left of the Content window. The following screen appears, requesting you to provide information to create the new site. (Fig.5)



**Fig.5: New Site page**

Provide the site ID (mandatory) and other details (optional) and then click on the Pages button to add pages to the site or simply click on the Save button to save the site as it is.

Clicking on the Pages button will take you to the following screen (Fig.6)



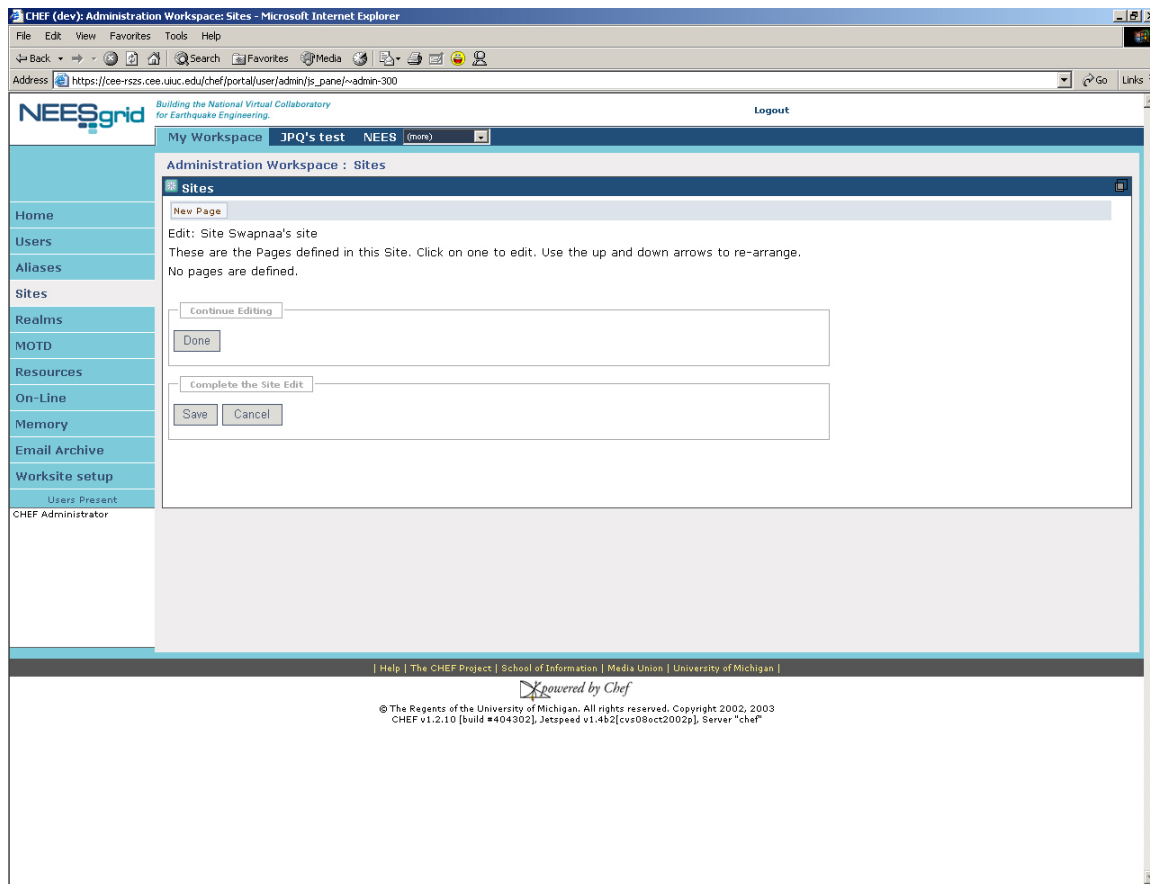
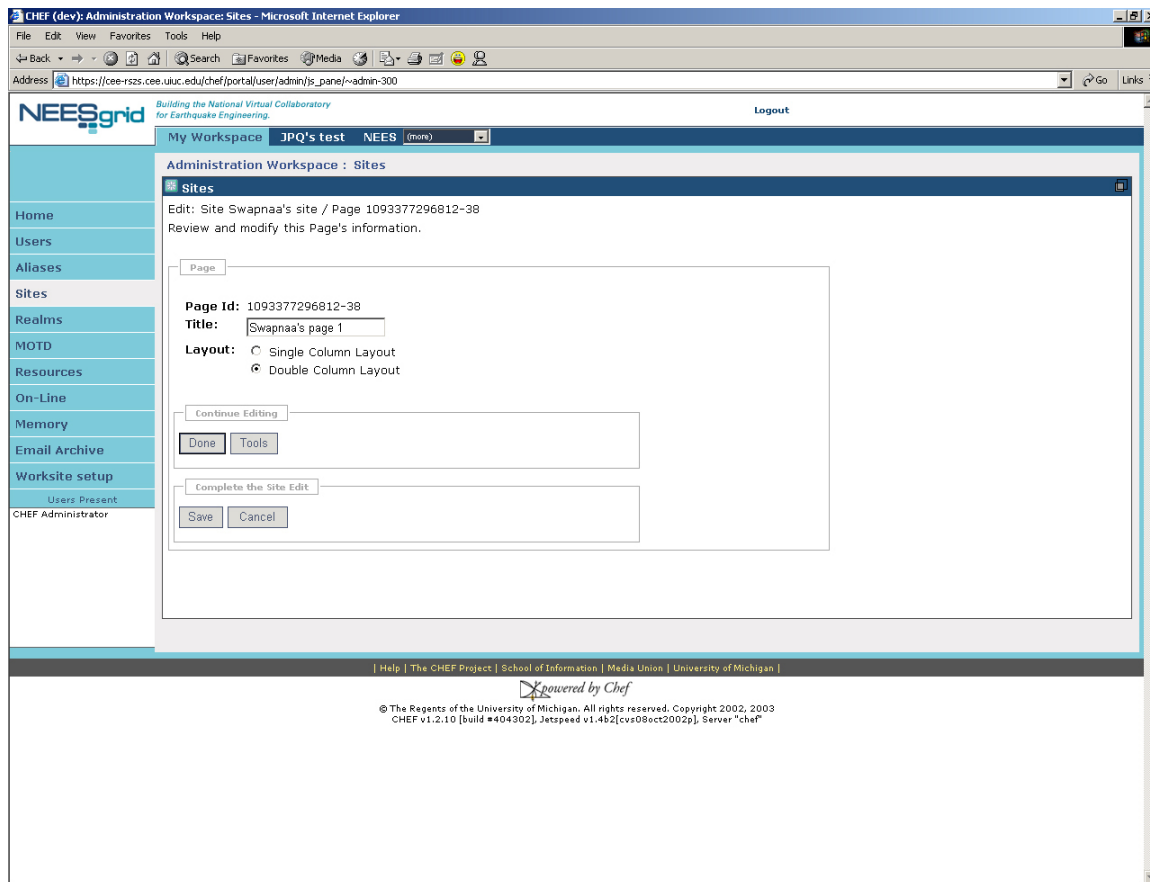


Fig.6: Pages page

Since new sites will not have any pages to display for editing, click on “New Page” to create one. The new page is given an ID automatically generated by the system - you can provide the title and the layout of the page (Fig.7). The page ‘title’ is what will show up in the left hand menu column of the site and becomes the navigation link to get to that page.



**Fig.7: Creating a new page**

You can add tools to the page you just created by performing the following operations:

Click on the Tools button. This will take you to the tools page (Fig.8) where you will have to add tools by clicking on New Tool.

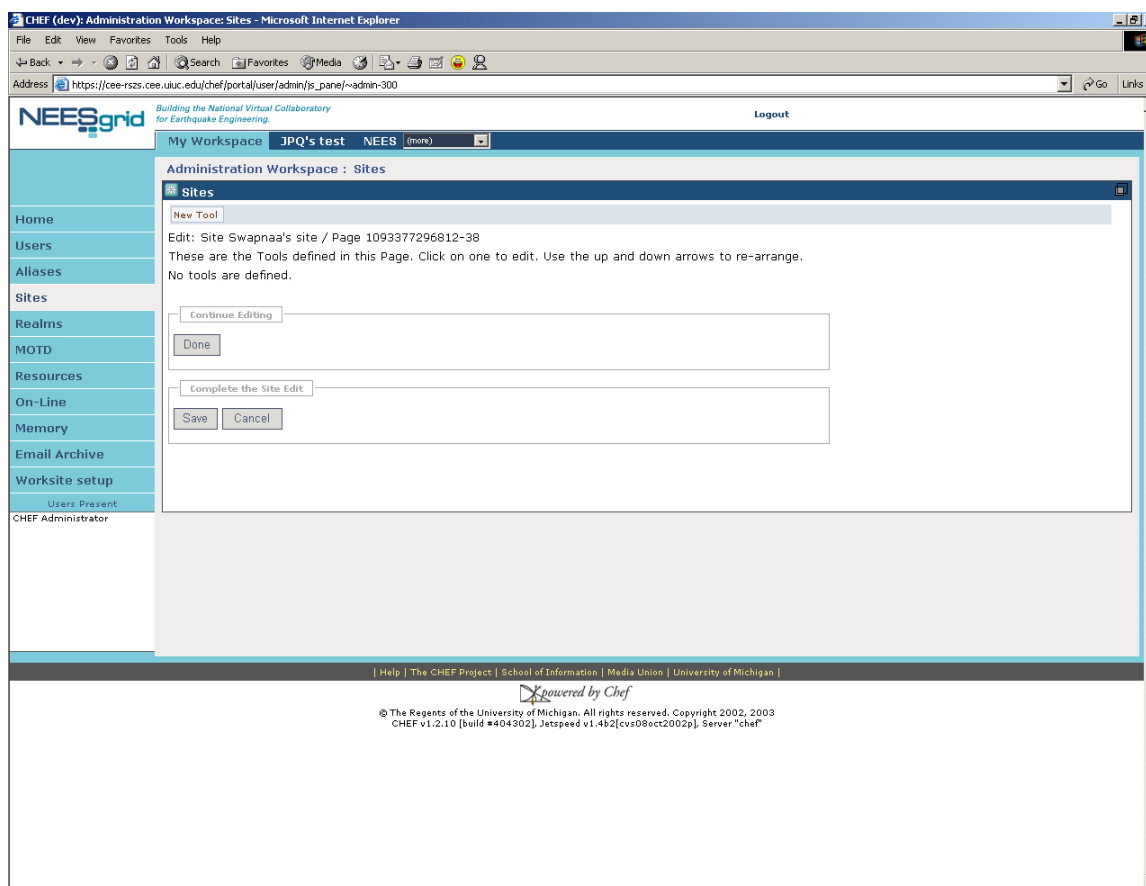


Fig.8: Tools page

From the list of tools, scroll down and select the radio button for the tool you want to add. This tool will automatically show up in the Title under Tool Configuration (Fig.9). Scroll down and click on Done.

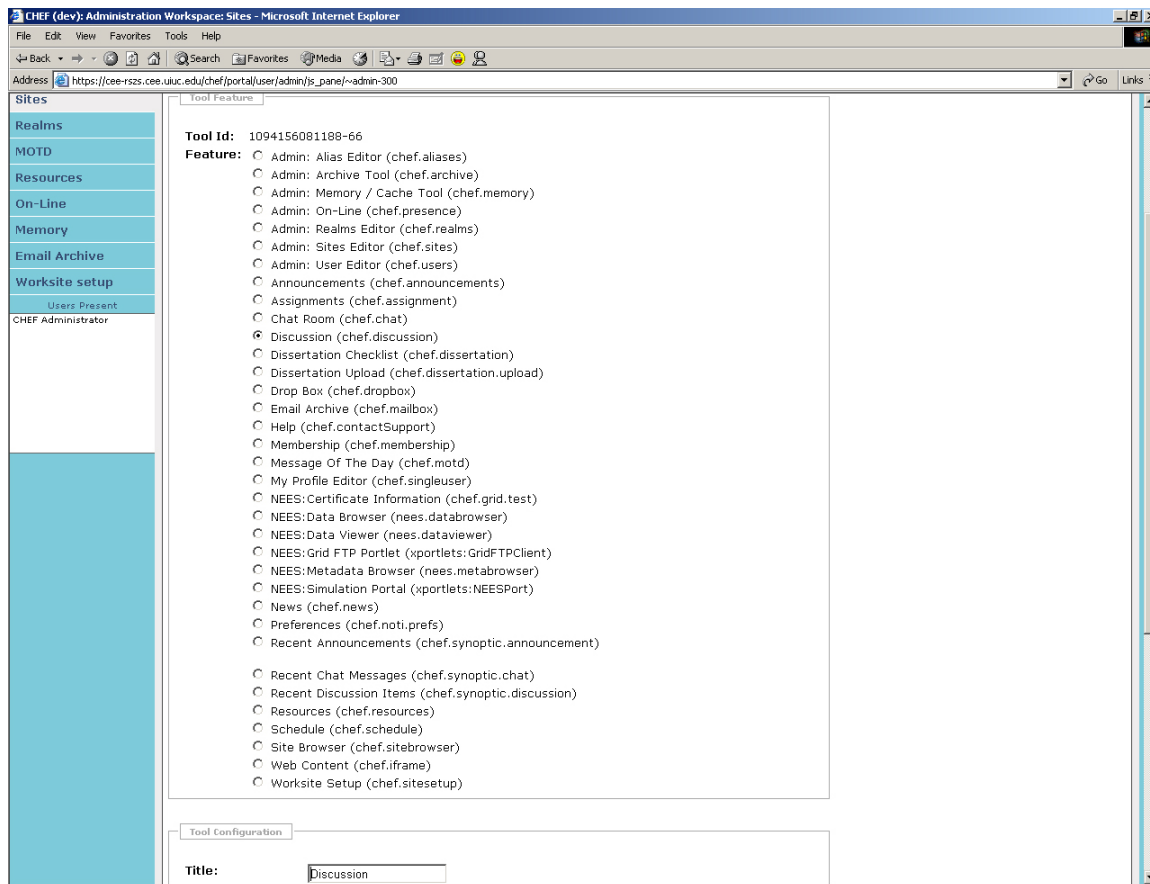


Fig.9: Selecting a tool

Clicking Done will take you to the following page (Fig.10). At this stage, you can do one of the following:

- add more new pages by going through steps 8 and 9
- click on “Done” to go back to the site information page
- click on “Save” to save the changes made to the pages and the site
- click on “Cancel” to revoke any undesirable changes and to start over again

Clicking on “Save” ultimately will take you back to the “Sites” page, displaying all the sites including the new one just created

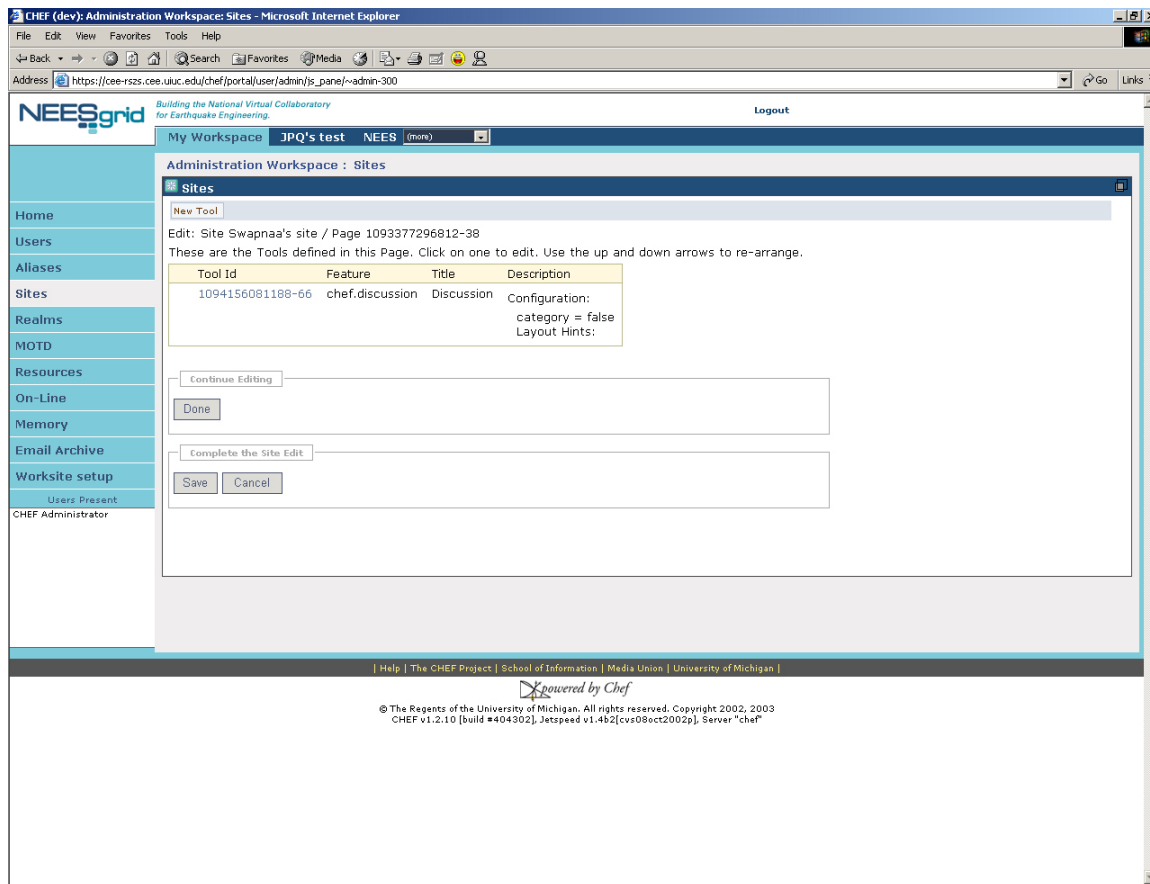
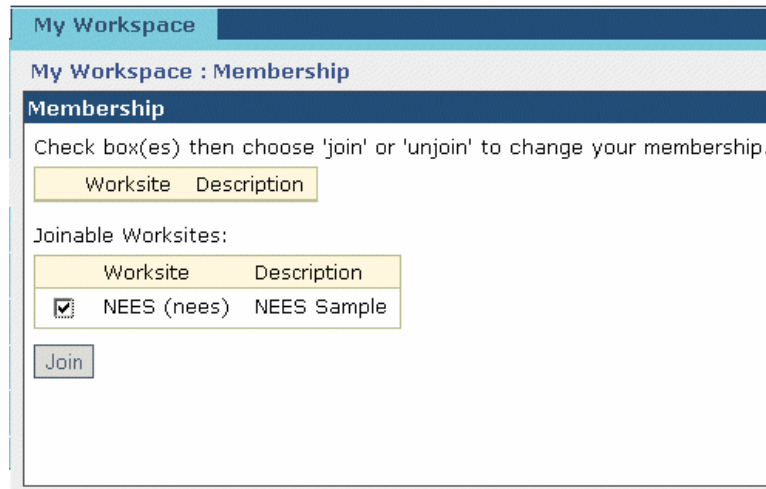


Fig.10: New site with tools added to Sites list

You can edit an existing site, by clicking on the Site ID in the Sites interface and modifying existing information.

## 6 Joining Workspaces

A workspace allows any number of users to access a set of shared tools. Each user can belong to as many workspaces as he or she would like (assuming permission to join each workspace). A workspace can support a variety of purposes (e.g., a single experiment, a research group, all users of a particular piece of equipment, etc.). Using the “Membership” tool on the “My Workspace” page, you can join other workspaces.



**Figure 11: The Membership tool**

In the Membership tool, you will see a list of all the joinable workspaces on a particular server (note that workspaces can be visible only to selected users, and that you may have to receive permission to join some workspaces). You can place a check next to each workspace that you'd like to join (see Fig. 11). A tab will appear at the top of your browser window for each workspace that you have joined (See Fig. 12).



**Figure 12: List of currently joined workspaces**

You can navigate to any workspace you have joined by clicking on the workspace name. The interface identifies the workspace that you are currently in by highlighting its name. In each workspace, the tools (identified by the buttons on the left) are specific to that workspace (e.g., Chat and Discussions only include members of that workspace).

## 7 Participating in Workspaces

The NEESgrid user interface is flexible and evolving. A range of tools is currently available to allow individuals to participate in workspaces in different ways. New tools are created regularly. What follows is a brief discussion of certain key means of participation:

- **Real-Time Chatting**
- **Discussions**
- **Archiving Email**

- **Uploading, browsing and utilizing shared resources**
- **Scheduling**
- **“Attending” an experiment at a remote site**
- **Browsing and downloading data**
- **Viewing data**
- **Using the electronic lab notebook**
- **The simulation portal**
- **Displaying and using multiple tools**

## 7.1 Chatting

Text chat allows participants to conduct real time discussions. Unlike some other chat tools, messages are persistent. In other words, messages continue to exist after their senders have logged off the workspace. This also means that a participant who arrives late can scroll back and read messages that were posted before he or she logged in. Figure 13 shows the chat tool in use.

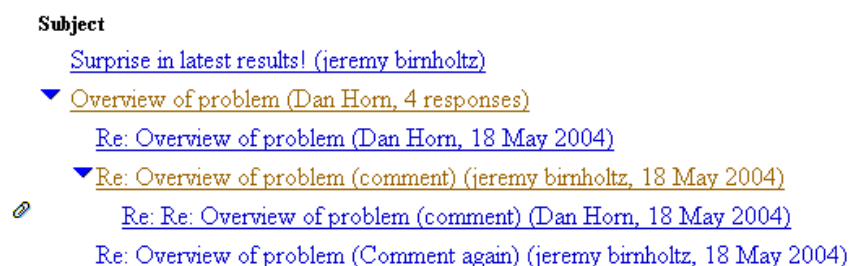


**Figure 13: Chat tool**

On the right side of the window is a list of users currently using the chat tool (this can be different than the list on the lower left corner of the screen. This is discussed below). On the left side of the chat tool is the conversation. Each user's contributions are preceded by his or her name and the time and date of the message. You can choose not to display the time and date by using the "Hide Time" and "Hide Date" buttons at the top of the tool. You can post your own messages by typing into the text box at the bottom of the chat tool and clicking the "Send" button.

## 7.2 Discussions

The discussion tool allows participants to take part in threaded textual discussions. This tool is similar to other online discussion forums (such as online bulletin boards, weblogs or Usenet news). Threaded discussions are organized like outlines, with responses to previous messages indented below parent entries (see Fig. 14). Entries can point to other online resources including documents, data, or URLs.



**Figure 14: Threaded discussion**

To view an existing discussion, click the “Discussion” button on the left menu, click “Expand All” to see all the main topics and responses, find the response you want to open and click its link.

To create a new topic, click the “Discussion” button on the left menu, click the “New” button, choose a category, and type in a message subject (this is the only thing people are going to see when they are browsing the discussion, so it is best to make the subject meaningful. E.g., “something interesting” is not sufficiently meaningful). Type in the message body, link to relevant resources, then consider previewing your entry before posting it – this will allow you to spot typos and correct them before posting the message.

To respond to an existing discussion, click the “Respond Directly” button when viewing a message, and create your message. When you click “Post,” your message will appear indented below the previous message. You can also search through existing discussions by using the search tool at the top of the discussion window.

## 7.3 Archiving email

Workspaces can also be used as email groups. The workspace owner can specify a group address or “alias” using the “options” link in the “Email Archive” area within CHEF. Mail sent to this address will be automatically saved in a searchable collection. To search or browse the email archive, click the “Email” link on the left menu. Use the interface provided to search or sort emails that are stored in the archive.

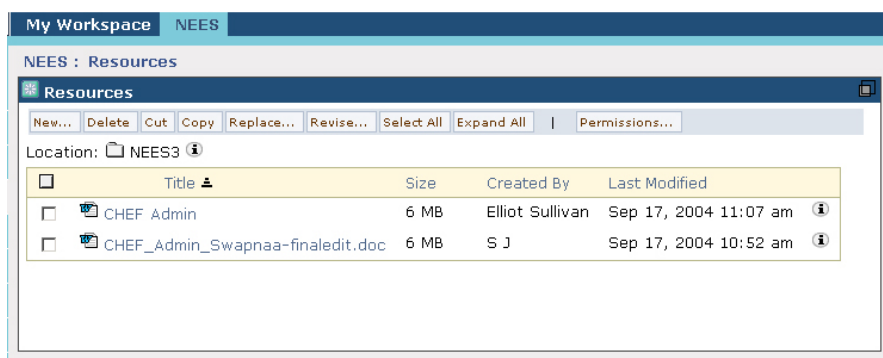
Some other features that may be enabled by the workspace owner include: 1) the ability to restrict email group participation only to those registered in that workspace (to prevent outside “spam,” for example), 2) automatic email notification when someone posts a new



announcement, and 3) the ability to grant permission to add, delete or revise emails in the stored archive.

#### 7.4 *Uploading, browsing and utilizing shared resources*

The resource function allows you to share documents, electronic files, or URLs with other worksite participants (see Figure 15). There are two types of resources: attached documents (word processing documents, spreadsheets, slide presentations, plain text, etc.) and links to other websites. Resources can be shared either with members of your worksite or with the general public (i.e. anybody who visits your worksite, whether or not they have a user account). By making a document accessible to the public, you can allow interested individuals who are not part of a worksite to read a general description of a group or project, for example. Resources that are private to the worksite are only accessible by people who have joined a particular worksite (although resources that include pointers to URLs do not limit non-worksite members from seeing the target URL, just from seeing the link on the worksite).



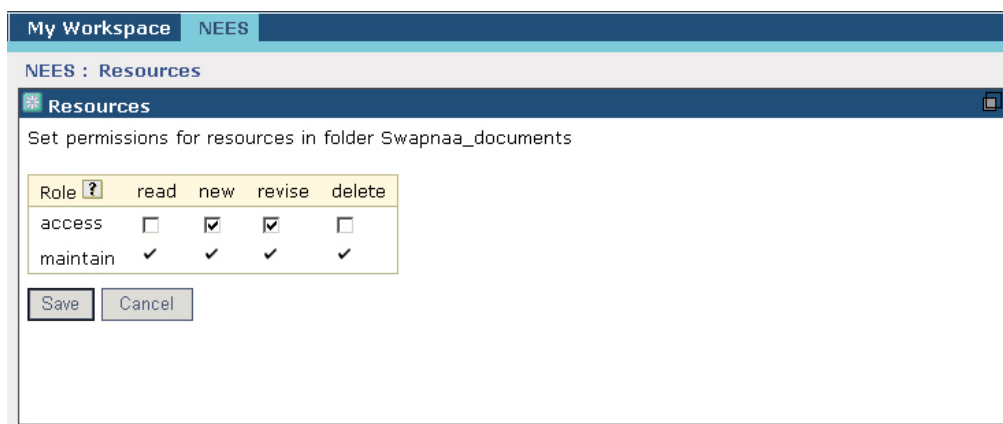
**Figure 15: The listing of available files in the “Resources” area**

To use this function, click on the “Resources” button on the left menu. Resources can be browsed by date, type, folder, or name by clicking on the appropriate button at the top of the Resource tool. To see more about a particular resource, click the ‘i’ icon. To see the resource itself, click on its title. You may need a particular program to view certain types of documents (e.g., in order to view an Excel spreadsheet, you will need a copy of Microsoft Excel on your computer).

To add a resource, click on the “New” button in the Resource tool, identify the type of resource (File on your computer, URL, plain text, etc.), provide a description of the item, identify the location of the resource (if it is on your local computer, it will be uploaded to the NEESgrid server), identify whether links to this resource will appear on the front page of the worksite, whether it will appear inside the web browser or in a new window, and what the copyright information should be. You can also specify whether or not you would like email notification sent to all members of the workspace informing them that this resource has been posted. After providing all the relevant information, click the “Post” button to add the resource.

It is possible to group resources in folders, and this is strongly recommended for workspaces that will have many files. To create a new folder, simply click the “New” button in the toolbar, and specify “empty folder” as the resource type.

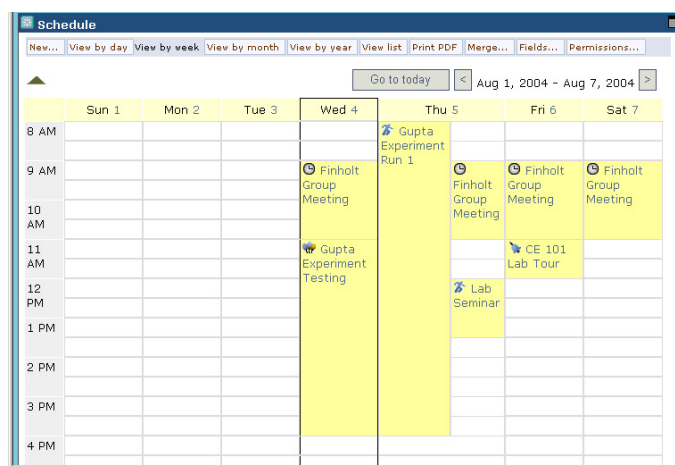
You can also add permissions to the resource folders you create or to the entire resource itself. To define permissions, click on the “Permissions...” button in the Resources view, or click on any folder and then click on “Folder Permissions...”. Now you can choose to give permissions for read, new, revise and delete. (see Figure.16)



**Figure 16: Defining Permissions**

## 7.5 Scheduling

The “Schedule” feature allows you to list and categorize events. The schedule tool is available in both “My Workspace” and group worksites (see Figure 17).



**Figure 17: Viewing a schedule by week**

Schedules can be viewed in a variety of ways (e.g. by day, by week, etc.), and may be used by groups to track upcoming events or to schedule resources such as, for example, a shaking table or particular area of a laboratory. By clicking the “Print PDF” button, it is also possible to automatically generate a PDF version of the schedule for printing.

To use the schedule tool, click the “Schedule” button on the left menu. To create a new event, click the “New” button, then specify a title, description, time, duration, location, frequency (if this is a repeating event such as a weekly meeting), and related attachments, such as a meeting agenda or readings for a seminar, if necessary.

Note that different sites and groups may develop different norms regarding the use of the schedule tool, so it may be wise to check with a group to see how they use this tool.

### 7.6 “Participating” in a remote experiment

Equipment sites may have streaming video cameras providing real time views of their facilities (see Figure 18). To access cameras, click the “Telepresence” button in a worksite. There will be a button for every camera view which you can click to view the video. The telepresence tool does not include an audio feed.

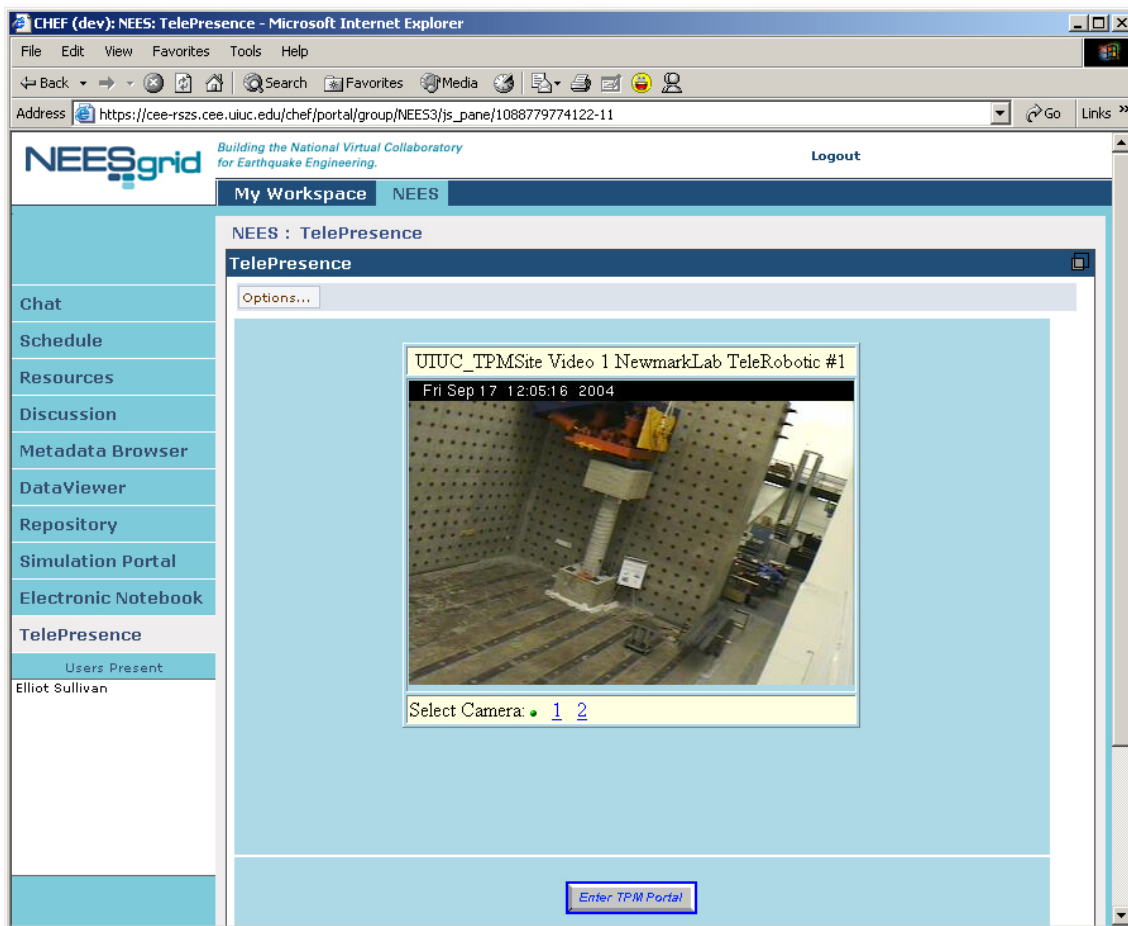


Figure 18: The Telepresence Tool

Clicking on “Enter TPM Portal” button takes you to the NEES TPM site which provides additional functionality like camera control, the “experiment window”, E-Notebook, and other useful tools. (see Figure19)



Figure 19: The TPM Portal

The resolution and frame rate of individual cameras on either site will depend on both the cameras themselves (i.e., the hardware), and the available bandwidth between the user's computer and the NEESpop. It is possible that video may appear choppy during periods of high network traffic.

### 7.7 Browsing and downloading data

The NEES **Data Browser** allows you to search for and download data files from the NEESgrid data repository, but this works only if you have a Grid Credential. To access the browser, click on the “Repository” button within CHEF. Once the browser connects to the Repository, you will then see its hierarchical structure if any. (Figure 20)

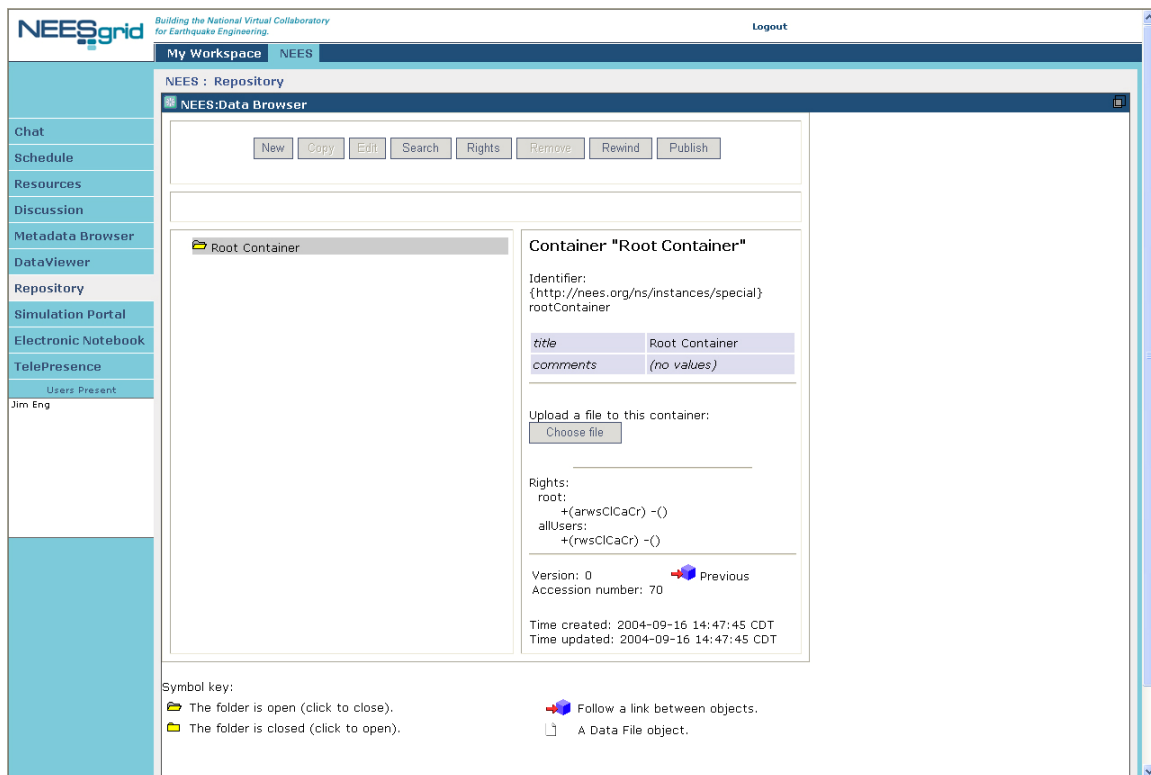
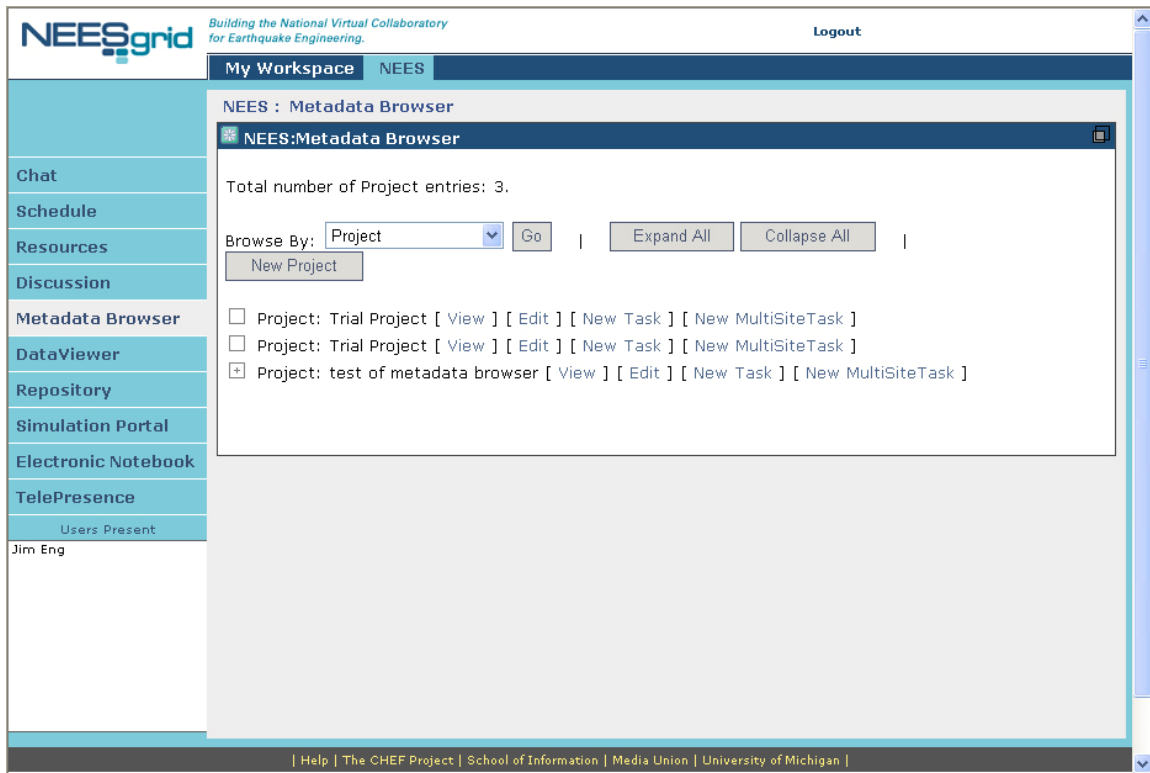


Figure 20: Data Browser

You can click on folders to open or close them. You can also create new folders, copy data files to different locations, modify who has access to them, and remove files from this interface. To search for a specific file, click the “search” button.

Using the NEESgrid **Metadata Browser**, it is also possible to search and browse metadata from experiments. To access the metadata browser, click on “Metadata Browser” button in CHEF. The first view of the browser takes a couple of minutes to load. You can choose the objects that you want to display or edit from the “Browse by” drop down box (default is Project). (See Figure 21)



**Figure 21: Metadata Browser**

You can create a new object by clicking on the “New...” button to the right of the Browse By window and create a new metadata object by supplying the requested information. (Figure 22 shows the entire length of the New Project window broken in the middle for context):

The screenshot displays the NEESgrid Metadata Browser interface. On the left is a vertical navigation menu with options: Chat, Schedule, Resources, Discussion, Metadata Browser (highlighted), DataViewer, Repository, Simulation Portal, and Electronic Notebook. The main content area is titled 'NEES : Metadata Browser' and contains a 'New Project' form. The form includes a 'name' text input field, a 'shortDescription' text area, and a 'hasRole' section with a 'More' button and a text input field. At the top of the form are 'Save Changes' and 'Cancel' buttons. A 'Choose Values' button is visible near the 'hasRole' section. The NEESgrid logo and tagline 'Building the National Virtual Collaboratory for Earthquake Engineering.' are at the top left, and a 'Logout' link is at the top right.

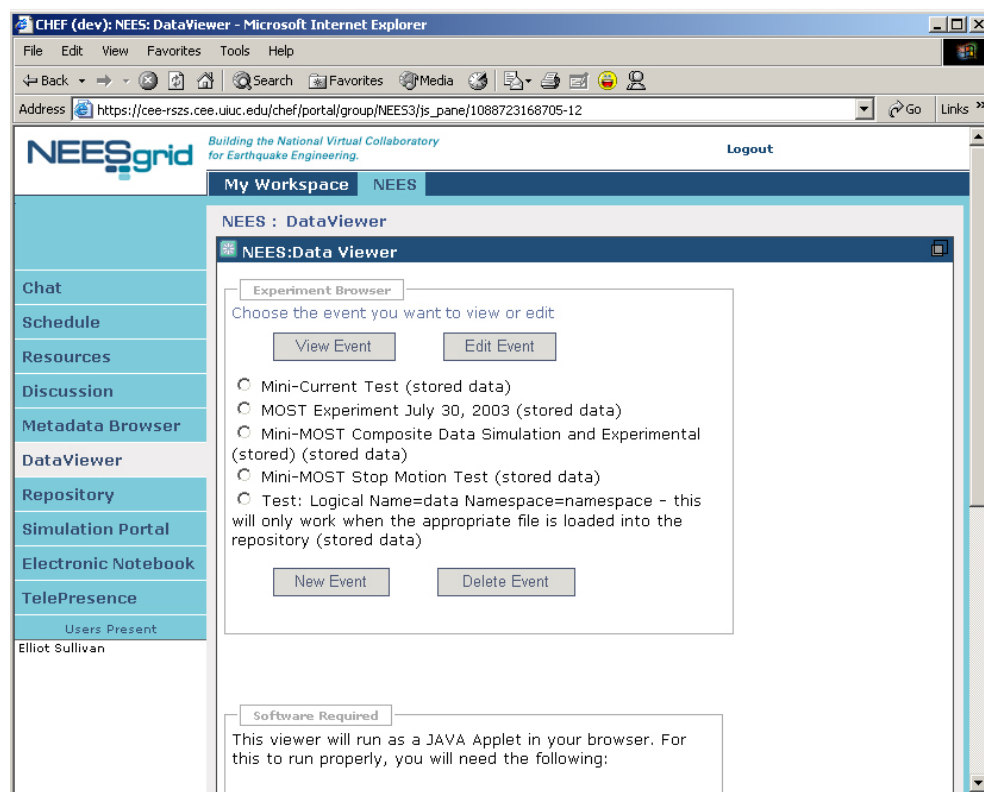
**Figure 22: Metadata Editing**

When creating or editing an object, you can select or create other objects that will be linked to it. For example, a "Project" might be broken down into several parts, which are referred to as "Tasks". So the "Project" editor has a property named "hasTasks" with a button labeled "Select Values" which, when clicked, brings up the "chooser". The "chooser" will show any values that have been defined that might be a correct value for the property. It also has buttons to let you create new objects of types appropriate for the property. Once you've created and/or selected a new value for the property, click the "Save Changes" button, and it will return you to the original editor. Complete any additional parts of the form and then click "Save Changes", which will return you to the original page, and you should see your new entry listed there.

Note that when experiments are run, data are automatically uploaded to the repository.

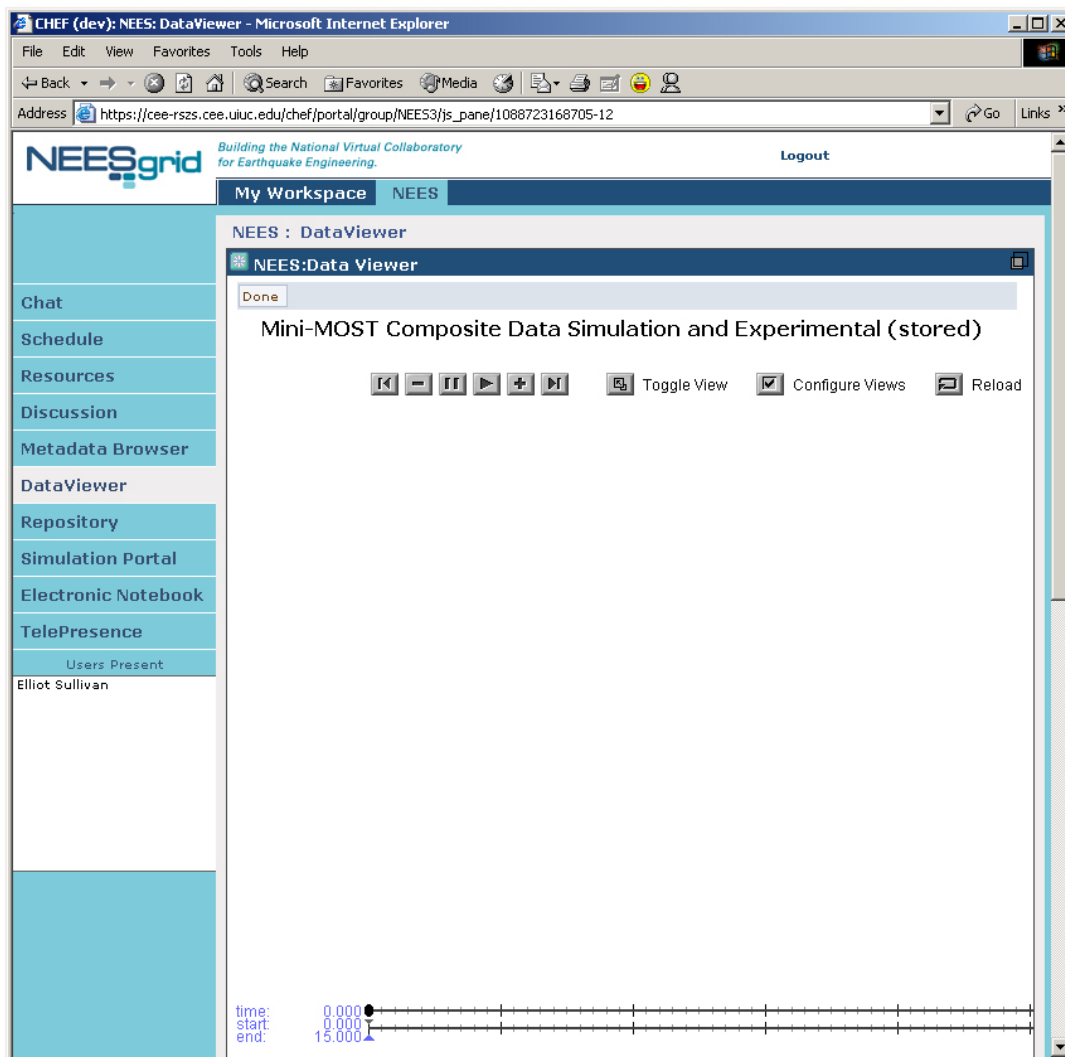
## 7.8 Viewing data

Users can view real-time and stored data using the Data Viewer tool. In order to use the Data Viewer, you must first select an "Event". Depending on the worksite permissions and whether a test is or has already been conducted, the data viewer tool will list zero or more events. If there is at least one event, you will be presented with a list from which to choose (see Fig. 23).

**Figure 23: Event Selection**


Once an event has been selected, you will have the opportunity to construct a “layout” (Figure 24).





**Figure 24: Experiment Layout**

Depending on the nature of the test, data displays available may be limited to plots and numerical data, or may also include graphs and video. Whether viewing a live or stored event, all selected data sources will be time synchronized. Once an event is chosen, you will need to construct a series of "views" into a "layout." A "view" refers to a single graph or view of a model. A "layout" is a collection of 1 or more views that are displayed together.

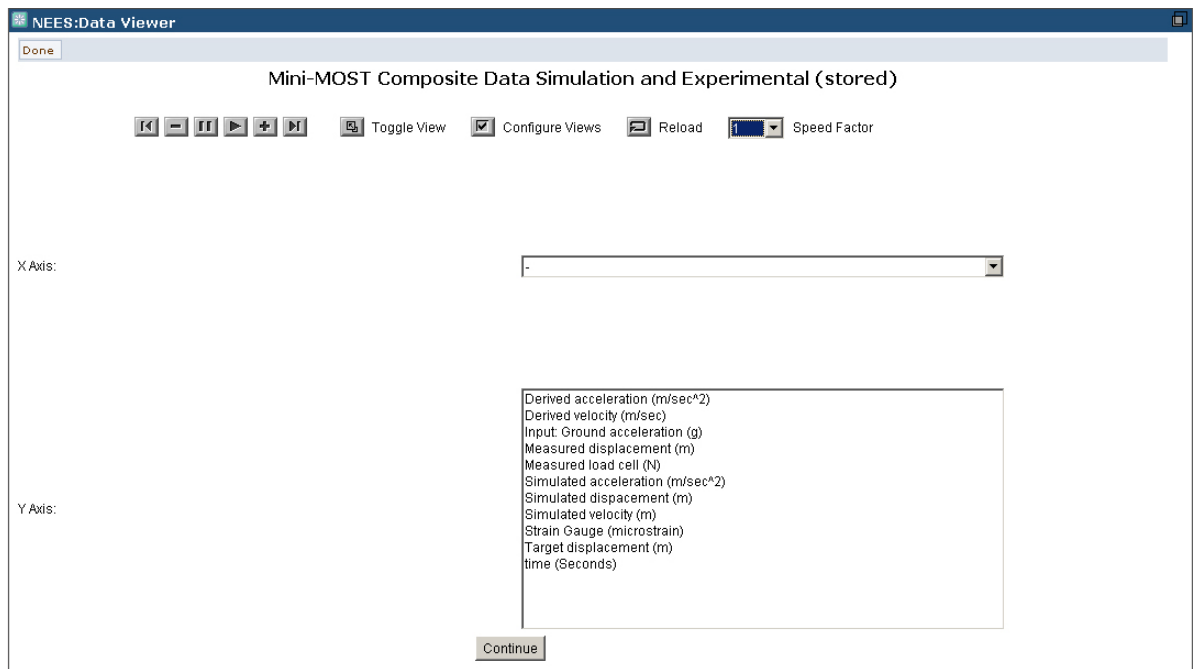
To create a layout, start by clicking the  **Configure Views** button. You will then be asked to choose how many views to include in the layout. You may include 1, 2, 4, 6, 9, 12 or 16 views by clicking on the button with the corresponding number of black boxes (see Figure 25).



**Figure 25: Buttons for choosing the number of views**

You will then be presented with a list of views, with the opportunity to configure each one individually. For each view, use the drop-down menu to select the view type. You will then be prompted to configure the view. Depending on the view type this may involve:

- Video: Selecting the camera
- Graphs and plots: Selecting the data to appear on the X and Y axes, respectively. Do this using the menus provided. Note that you may select multiple values for the Y axis, by clicking on whichever data streams you wish. To “unselect” a stream, click on it (see Figure 26).
- Numeric: Selecting which sensors or other information you would like to view. Each numeric view can display 16 individual values at a time.

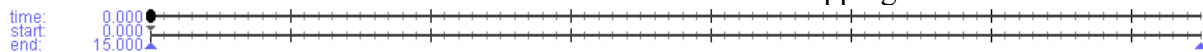


**Figure 26: Selecting the data to be displayed on the X and Y axes of a plot**

Once you have selected the data to display in a view, click the configuration button (see icon above) to return to the data display. To configure the next view, click the configuration button again. Once you are finished configuring your views, you are ready to view the data.

At the top of the Data Viewer are a set of VCR buttons that allow you to play, pause, rewind, and fast-forward the data viewer.

At the bottom of the data viewer is a time line and a tool for cropping the time scale.



You can click on any point of the timeline (before the present time if you are viewing live data) to see the state of the Data Viewer at that time point. Using the cropping tool below the timeline, you can limit the scale of the timeline by moving the starting or ending position.

## 7.9 Using the Electronic Lab Notebook

The NEESgrid electronic lab notebook serves two purposes. For the researchers conducting an experiment, it provides a convenient place to record sensor and calibration data, specimen preparation information, experiment design rationale, and other valuable metadata. For others, it provides a wealth of valuable information about how an experiment was conducted.

To use the electronic lab notebook, you must download the client software. Click on the “Electronic Lab Notebook” button within CHEF environment to view the opening page containing instructions for download (Figure 27).

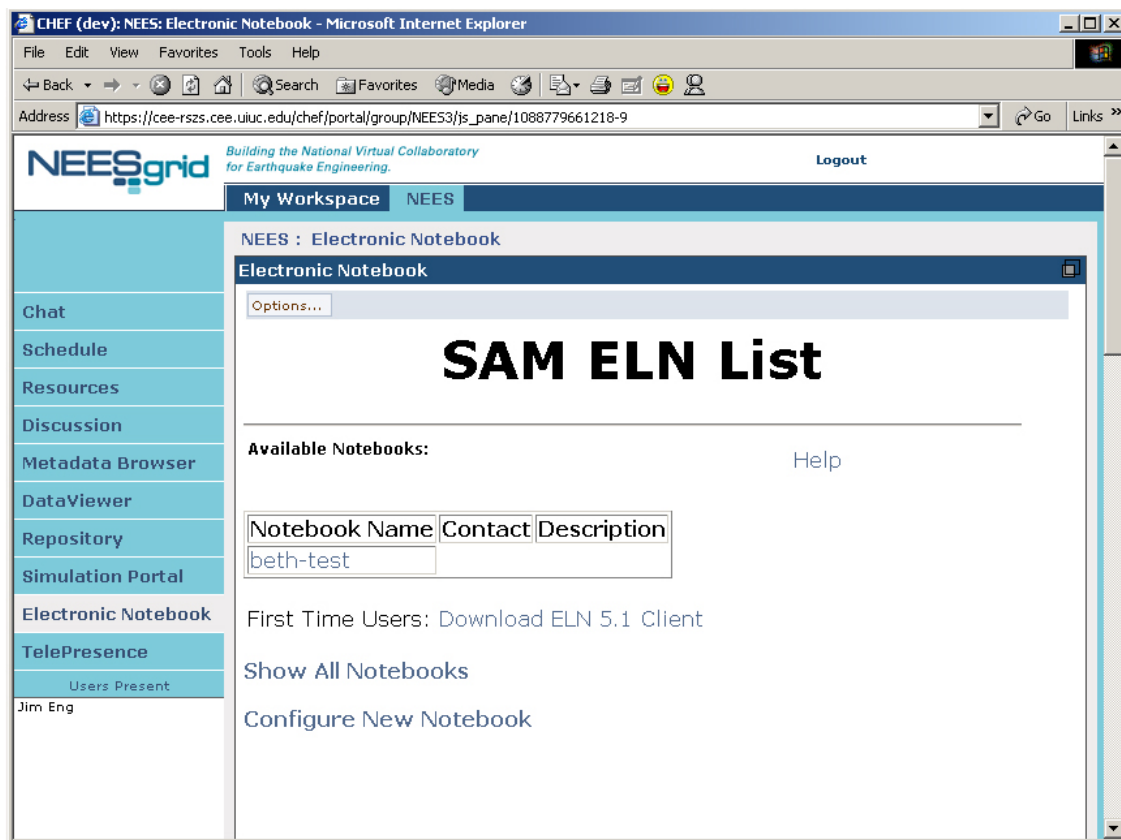


Fig.27: Electronic Notebook in CHEF

Follow the instructions that are provided. You will have to log in as a new user if you have never logged in before, or you can use the Guest Login (Figure 28).



Fig.28: Notebook login

From the main Table of Contents, you can choose to view chapters, pages and notes. Double-clicking on the name of a page, note, or attached file in the Table of Contents will open the same in a separate browser window. (Figure 29)

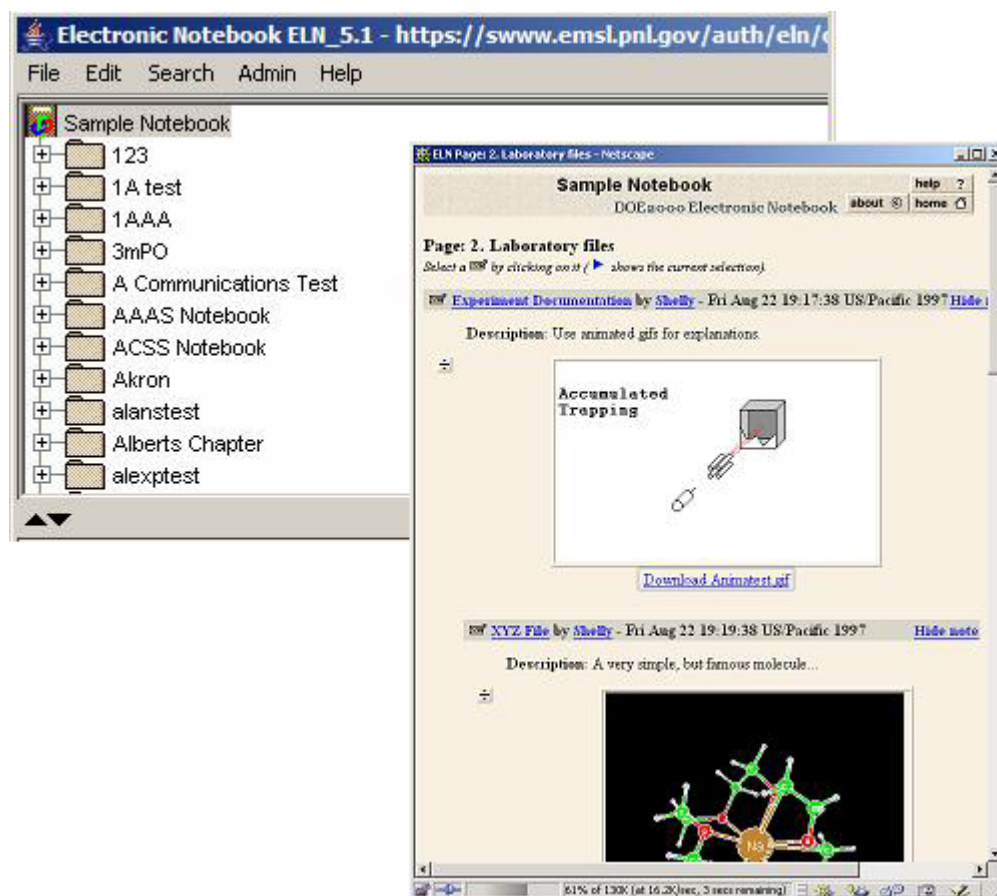


Fig.29: Table of Contents and a Sample Notebook

You can search the open notebook for keywords using the Search... button. (see Figure 30)



**Fig.30: Search facility**

You can also add new chapters, pages, notes or attachments entries using Add Entry form in the frame under the Contents listing. To attach images and data files to a notebook, you can use one of the many the Editor tools next to the Add Entry form (see figure 31).

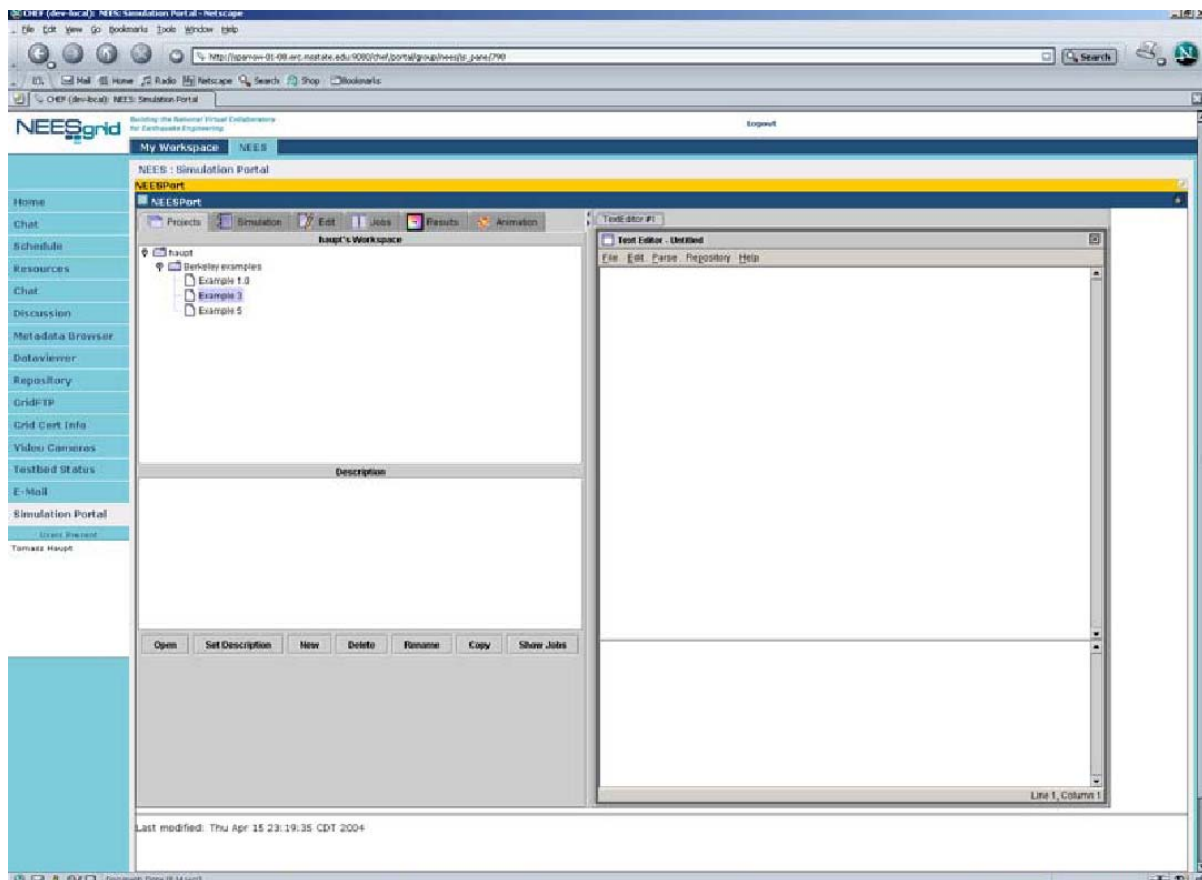


**Fig.31: Editors and the Add Entry form**

### 7.10 Accessing the NEESgrid Simulation Portal

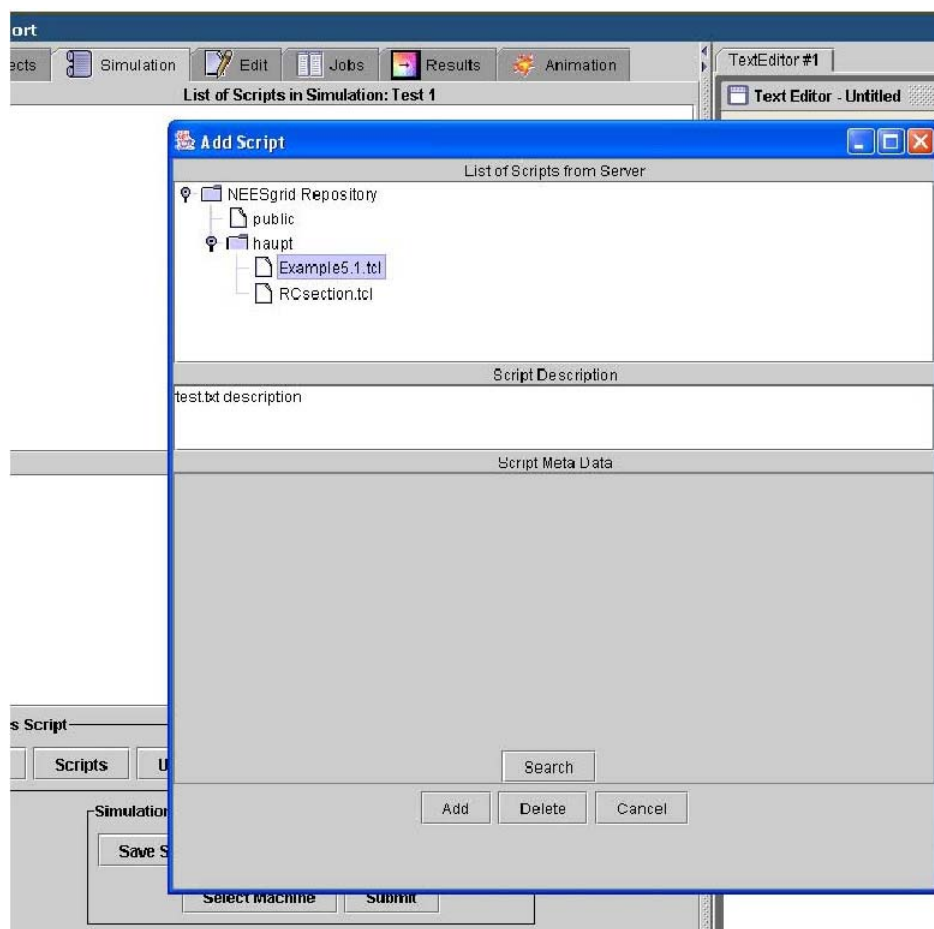
The NEESgrid Simulation Portal provides users with access to the OpenSees simulation software, computational resources on NEESgrid, and the ability to interact with simulation models and results in the NEESgrid repository. To access the full functionality of the simulation portal, a grid certificate is required.

Click on “Simulation Portal” within CHEF, click on the Launch NEESPort button and accept the security warning. You will see two panes: the left one allows you to control the workflow while the right panel shows either OpenSees scripts or results of the simulations. (Figure 32)



**Fig 32: Simulation Portal**

To create a simulation, click on the Project tab on the left panel and select a project to create it in. Now you can open the simulation and add OpenSees scripts from the NEESgrid Repository (Figure 33) or from the OpenSees editor.




**Fig.33: Adding OpenSees scripts**


Once scripts are added, they can be viewed in the OpenSees scripts editor using the View button. You can edit the simulation using the Edit tab, use the Modal builder to visualize the structure model in 3D, edit, data, specify format of output files, submit, monitor and retrieve results of simulations using the various tools in the Portal.

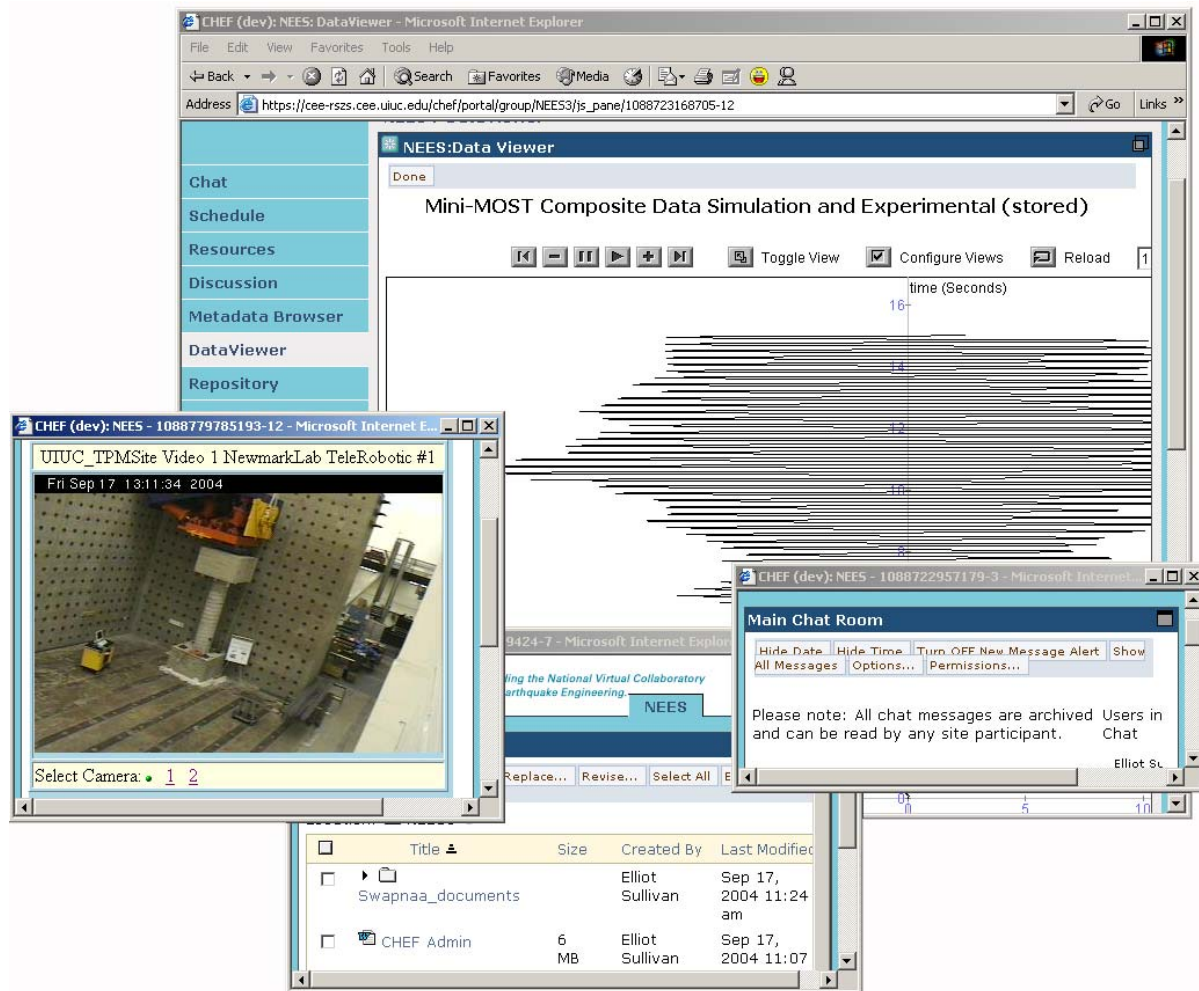
Please contact the NEESpop administrator for information on how to gain permission to access the simulation portal on a specific NEESpop and visit <http://opensees.berkeley.edu> for more information.

### ***7.11 Using and Displaying Multiple Tools at Once via “Floating”***

When participating in an experiment, you may wish to use more than one tool at a time. For example, you may wish to view a video feed while chatting with other participants and monitoring sensor data. You can do this in CHEF. In the top right corner of most CHEF tools, there is a small button that looks like this: . This is the "float" button. When it is pressed, the active tool "floats" into it's own resizable window. Once a tool has been floated, the main browser window can be used to access other tools -- many of which can also be



floated. You can float multiple tools at one time, moving and resizing them to create efficient views (see Fig. 34). To "unfloat" a tool, you can click the button in the top right corner of the tool that now looks like this: 



**Figure 34: Floating Multiple Tools**



## Appendix A: A Structural Investigation Scenario

This document describes a fictional scenario created based on a variety of sources, including feedback to the NEES User Requirements Workshop held in October 2002 at Mt. Hood, Oregon. This scenario has been designed to describe the potential patterns of use and collaboration of the CHEF interface in NEES investigations occurring in late 2004 and early 2005. It was constructed with the assistance of Jerry Hajjar from the University of Minnesota, Gokhan Pekcan at the University of Nevada-Reno, Bozidar Stojadinovic from UC Berkeley, and Lelli Van Den Einde at UC San Diego.

All of the features described in this scenario are currently available, though the current version may look slightly different than images pictured here. The purpose of this scenario is to provide concrete examples of how NEES investigations could occur. Where possible, the instructions in the first part of this document are referenced in the scenario. It is hoped that the strengths and weaknesses of this mock-up will encourage dialog regarding the design and implementation of collaborative tools in NEESgrid. This report is drawn from the structural mock-up presented in various forums by the Michigan User Requirements team in February and March 2003.

This scenario begins in late 2004 when *Elliot Sullivan* is a professor in the Civil and Environmental Engineering program at Middle State University. His primary research involves developing new composite steel/concrete lateral-resistance systems. He tests his designs using his institution's reaction wall apparatus. He has recently developed an interest in comparing the cumulative damage seen in his proposed systems during dynamic testing with that seen during an actual earthquake record, which can be tested using shake table facilities.

A recent report from a workshop on future directions in earthquake engineering sponsored by the National Science Foundation (NSF) identified the importance of this line of research, and he is motivated to pursue this further through submittal of a proposal to NSF. At a recent conference, he attended a session describing NEES, and is interested in the equipment sharing opportunities it presents. In November 2004 he visits the NEES web site, shown in Figure A1 (see also section 3 of this guide) and, after exploring the documents available online, decides to pursue this project further.

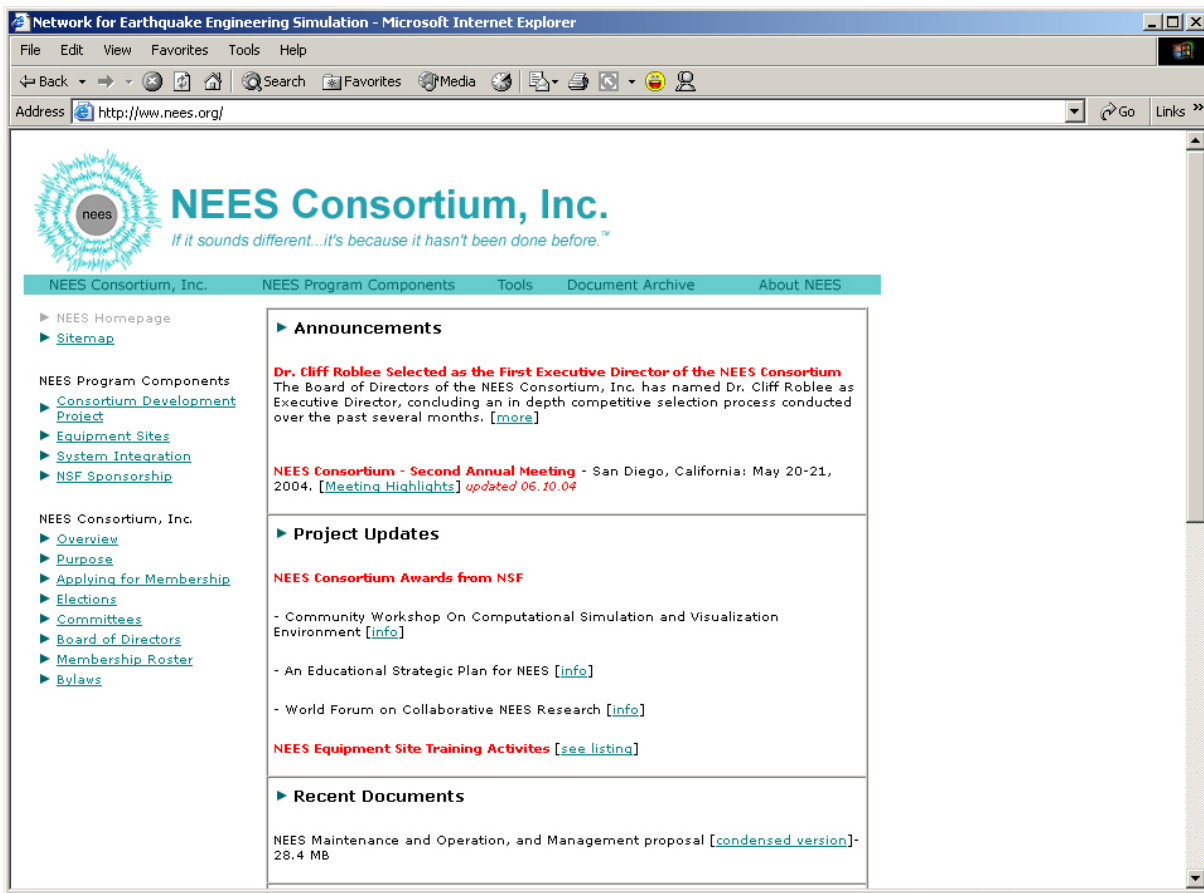
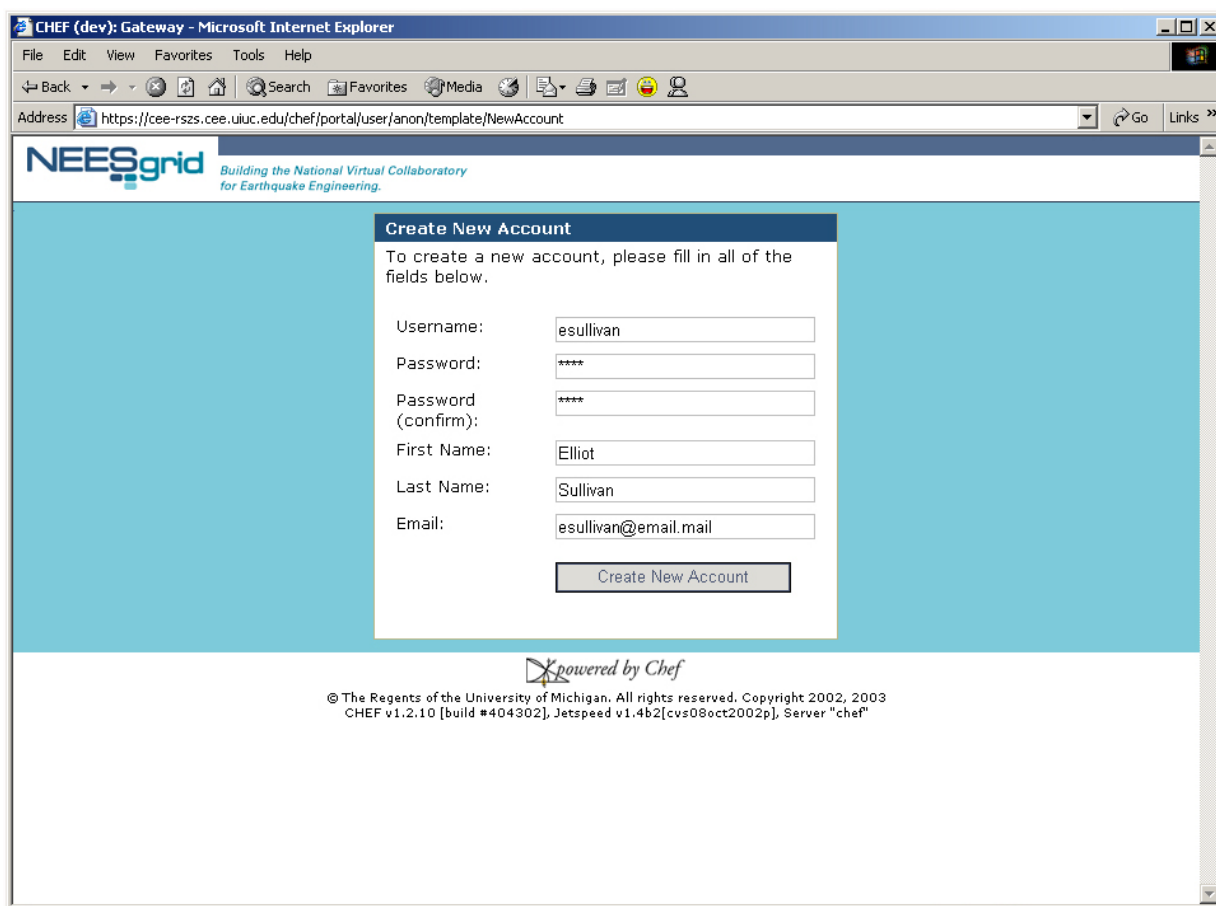


Figure A1: NEES Homepage

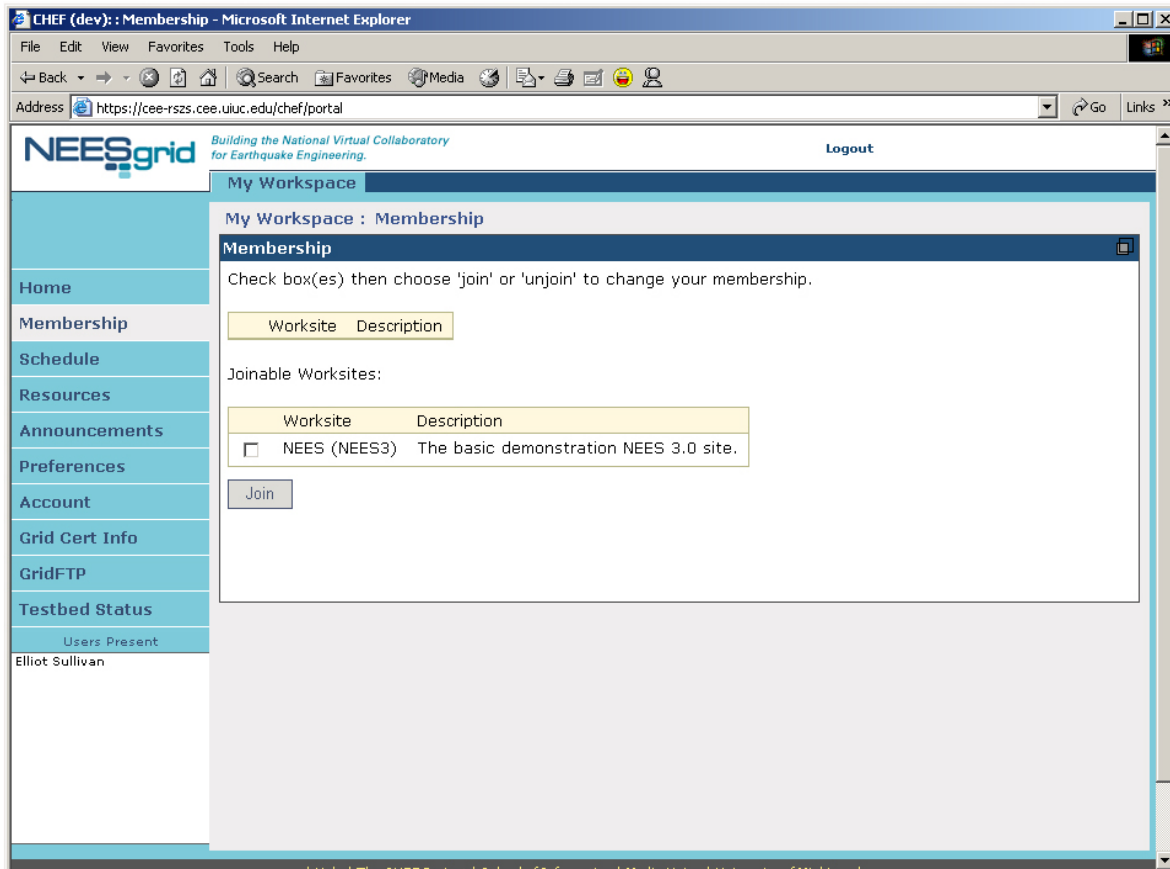
He creates an account, as shown in Figure A2 (see also section 4 of this guide), allowing him to access the CHEF-based NEESgrid environment.



**Figure A2: CHEF account creation page**

It is important to note that these features, like most of those shown in these scenarios, are accessed through the web-enabled CHEF architecture. CHEF provides a consistent, cross-platform, straightforward interface to NEESgrid resources. The use of CHEF still allows external programs to access information, so that activities such as data analysis and report writing can be accomplished using a variety of tools.

After creating a user account, the system automatically creates a personal worksite for Dr. Sullivan, shown in Figure A3. This figure shows the standard layout for the CHEF-based NEESgrid interface. A set of buttons along the left side of the screen indicate the available tools in a particular workspace. Below the buttons is a list of other members of a worksite who are currently online. Individual tabs across the top of the screen provide access to the worksites that an individual has created or joined. In this case, Dr. Sullivan is a member of a personal "My NEES" worksite. He is able to join two publicly available work sites (see also Section 5 of this document). He is interested in learning more about NEES shake table facilities, so he joins the NEES Consortium public worksite.



**Figure 3: Personal Workspace**

Joining this worksite creates a new tab at the top of the interface, indicating that he is now accessing the NEES Consortium worksite. Dr. Sullivan clicks on this new tab and is presented with the home page of the NEES Consortium public worksite as shown in Figure A4.

**NEESgrid WorkTools** My NEES NEES Consortium

**Home**  
**Announcements**  
**Resources**  
**Discussion**  
**Chat**  
**Meeting**  
**Schedule**  
**Logout**  
**Users Present**  
 Elliot Sullivan

**Worksite Information**  
 The NEES Consortium administers the mission of the George E. Brown, Jr. Network for Earthquake Engineering Simulation. It consists of an advisory board as well as additional members at both the institution and individual levels. The goal of the NEES Consortium is to ensure that the resources and potential of the NEES collaboratory are utilized in an efficient fashion. The NEES Consortium is a non-profit corporation created in 2003 as part of the NSF NEES project. [More Details](#)

**Message of the Day**  
 Minutes from the latest NEES Consortium Advisory Board meeting have been archived, and will be available on the NEES home page by 5:00PM EST today. [More Details](#)

**Recent Discussion Items**  
[Organizing Cross-Disciplinary Campaigns](#)  
 (14 Comments, [4 New](#))  
[Common Data Practices?](#)  
 (7 Comments, [2 New](#))  
[Citing Online Resources](#)  
 (4 Comments, [2 New](#))  
[NSF Funding Policies](#)  
 (6 Comments, [1 New](#))  
[NEES Consortium Advisory Board Meeting](#)  
 (3 Comments, [1 New](#))  
[More Discussion Items](#)

**Recent Announcements**  
[New NEES Computing Resources Now Online](#)  
[Take the NEES Usage Survey Today](#)  
[New Officers Elected to NEES Advisory Board](#)  
[More Announcements](#)

| [Support](#) | [Contact Us](#) | [NEESgrid](#) | [CHEF Project](#) | [NSF](#) | [School of Information](#) | [University of Michigan](#) |

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**Figure A4: NEES Consortium Public Worksite Home**

At the NEES Consortium public worksite, Dr. Sullivan is able to view information about NEES, the Consortium, equipment sites, and various NEESgrid resources. In addition, a schedule of Consortium activities is available, and users can participate in message boards.

Dr. Sullivan views a list of NEES equipment sites. Because he is interested in conducting shake table tests, he organizes the available resources by equipment type and expands the list of shake table sites as shown in Figure A5. Dr. Sullivan explores the details of the three shake tables.

The screenshot shows the NEESgrid WorkTools interface. On the left is a navigation menu with links: Home, Announcements, Resources, Discussion, Chat, Meeting, Schedule, Logout, and Users Present (listing Elliot Sullivan). The main content area is titled 'View By...' and includes filters for Equipment Type, University, Research Domain, Availability, and Operational Status. Under the 'Resources' section, a list of equipment types is shown with expandable arrows: Computing Resources, Field Experimentation and Monitoring Installations, Large Scale Lifeline Testing, Large Scale Laboratory Experimentation Systems, Tsunami Wave Basins, Centrifuge Research Equipment, and Shake Table Research Equipment. The 'Shake Table Research Equipment' section is expanded, showing three tables:

State Institute of Technology Shake Table	
Site PI: <a href="#">Lorenzo Pittino</a>	Status: Operational
Contact: <a href="#">Eduardo Ruiz</a>	Specs: <a href="#">Click for details</a>

Mountain University Shake Table	
Site PI: <a href="#">Thomas Wilbur</a>	Status: Operational
Contact: <a href="#">Rebecca St. Thomas</a>	Specs: <a href="#">Click for details</a>

State College Shake Table	
Site PI: <a href="#">Marshall Geya</a>	Status: Operational
Contact: <a href="#">Srijan Reddy</a>	Specs: <a href="#">Click for details</a>

At the bottom of the page, a footer contains links: Support | Contact Us | NEESgrid | CHEF Project | NSF | School of Information | University of Michigan |

**Figure A5: Equipment Sites Listed By Equipment Type**

After exploring details about each site, Sullivan believes that the equipment at Mountain University or State Institute of Technology could be most useful.

Having very little experience with shake table testing, Sullivan would like to be put in contact with someone at one of these sites to learn more about testing at their location. He decides to post a message to the NEES Consortium public discussion board asking for suggestions, shown in Figure A6.

NEESgrid WorkTools My NEES NEES Consortium

**Home**  
**Announcements**  
**Resources**  
**Discussion**  
**Chat**  
**Meeting**  
**Data Viewer**  
**E-Notebook**  
**Schedule**  
**Logout**

**Users Present**  
 Elliot Sullivan

You are **creating a new discussion level**

Author: Elliot Sullivan  
 Date: Nov 11, 2004 3:22 PM  
 Subject: Shake table contact

Enter your response here. You can preview and revise to save

I'm a faculty member at Middle State University. My research involves developing steel/concrete composite lateral resistance systems. Most of my research has been done on our reaction wall. At a recent conference I heard about the NEES equipment sharing project. I am interested in conducting some dynamic testing using a shake table. I've looked at the NEES equipment site descriptions and I believe that I can conduct the tests at either State Tech or Mountain University. I'd like to find someone at one of those sites who may be interested in collaborating on this project. Can you suggest a contact person at either site?

Add/ or upload a file:  
 Attachment:

Save options: Preview ☒ Post ☐

| [Support](#) | [Contact Us](#) | [NEESgrid](#) | [CHEF Project](#) | [NSF](#) | [School of Information](#) | [University of Michigan](#) |

**Figure A6: Posting a Request to the Message Board**

In response to his message, *Antonio Rocco*, the NEES Point of Contact suggests that State Tech might be a better fit, and provides Dr. Sullivan with access to the State Tech worksite.

The State Tech site contains additional information about their equipment and the types of experiments being conducted. Reading more about the shake table at State Tech, as shown in Figure A7, Dr. Sullivan sends a message to *Eduardo Ruiz*, an Assistant Professor at State Tech who is the contact person about the equipment.



**State Institute of Technology Shake Table**

The State Institute of Technology test floor is a heavily reinforced concrete slab providing 780 sq m of useable test area. This area is serviced by two 222 kN overhead cranes with a clear height of 11 m. The strong floor measures, 46 x 17 x 0.91 m (length x width x thickness), and has about 1325 tie down holes on a 0.61 x 0.61 m grid. Significant testing is conducted at SIT using independent actuators. For this purpose, the laboratory has several MTS servo-controlled static as well as fatigue-rated actuators ranging in size from 250 kN to 3.1 MN, with stroke capacities ranging from  $\pm 75$  mm to  $\pm 600$  mm. These are routinely used for large-scale experiments on structural components that are too large or unsuitable for shake table execution. Hydraulic hardlines feed the Laboratory and provide 945 l/min at 21 MPa.

Four ports along the centerline of the Laboratory floor provide access to feed, return, and drain lines. The same distribution system can supply up to 1,890 l/min depending on the pump capacity. At present, the Laboratory's pumping capacity is 1000 l/min, which is boosted up to 6,056 l/min with blowdown accumulators for short durations. The testing area is covered by 8 digital cameras, with resolutions of 2400 x 3600 and a maximum frame rate of 60 fps. We have 2 additional mobile high-speed cameras capable of capturing data at 1200 x 1000 at up to 360 fps. Our connection to the NEESpop provides 1Gb of bandwidth. In addition, the Laboratory is outfitted with an 802.11g wireless network that supports wireless sensors and equipment. Additional details regarding the SIT shake table facility are available. Contact **Eduardo Ruiz** for more information.

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**Figure A7: Equipment Description**

Dr. Sullivan and Dr. Ruiz begin discussing the project, and Dr. Ruiz mentions that this line of research would fit nicely with a larger series of projects that he and others are working on. Dr. Sullivan suggests that they work together to develop a proposal for the NSF. Dr. Ruiz agrees.

Dr. Sullivan immediately creates a worksite for this new project. (Figure A8)



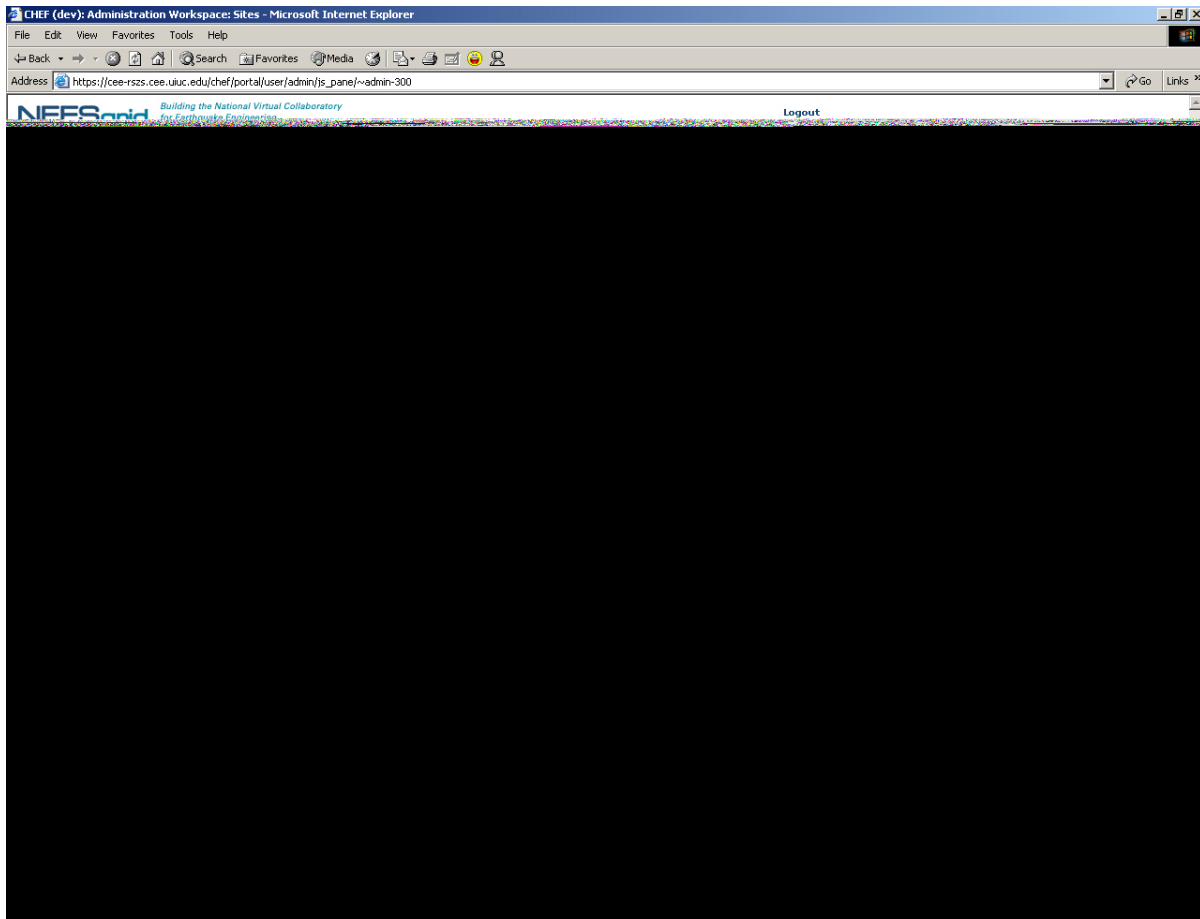


Figure A8: Creating a New Worksite

To do this, he performs the following operations (as explained in Section 5 of this document): He clicks on the “Sites” tool which displays a list of existing sites. He then clicks on the “New Site” link found on the top left of the Content window and provides information to create the new site and then adds pages to the site using the Pages button. He then adds the desired tools using the Tools button to complete his site.

He provides access to Dr. Ruiz and his Masters Student *Hideo Ishii*. Dr. Sullivan also provides access to his own student *Erica Granger* who is finishing her thesis, and will begin working as a PhD student with him.

The group immediately begins discussing the proposal, as shown in Figure A9 (see also Section 6.2 of this document). One of the major topics of discussion is the development of a budget. In particular, Drs. Sullivan and Ruiz are focused on writing in sufficient support for their students and necessary travel.

The screenshot shows the NEESgrid WorkTools interface. The top navigation bar includes links for My NEES, NEES Consortium, State Institute of Technology, and Sullivan Composite LR Test. The left sidebar contains a menu with options: Home, Announcements, Resources, Discussion (selected), Chat, Meeting, Data Viewer, E-Notebook, Schedule, Logout, and Users Present (listing Elliot Sullivan and Eduardo Ruiz).

The main content area displays a discussion thread under the 'Discussion' category. The thread is titled 'Budget Issues (4 Replies)' and is categorized under 'Budgeting'. The thread shows a series of replies:

Topic	Created By	Date
<a href="#">Budget Issues (4 Replies)</a>	Eduardo Ruiz	Dec 4, 2004 10:08 AM
<a href="#">Initial Draft</a>	Hideo Ishii	Dec 8, 2004 12:32 PM
<a href="#">Re: Initial Draft</a>	Elliot Sullivan	Dec 9, 2004 1:00 PM
<a href="#">Re: Initial draft</a>	Hideo Ishii	Dec 9, 2004 2:56 PM
<a href="#">Re: Initial Draft</a>	Eduardo Ruiz	Dec 9, 2004 3:53 PM

The current view shows the 'Re: Initial Draft' reply by Eduardo Ruiz, dated Dec 9, 2004 3:53 PM. The reply content is:

"... here are the budget numbers for our last reaction wall test ..."

Thanks Elliot. I'll update the budget with those overheads. I've checked with our grant person, and I think the student support can be handled just as we have it described. I'll upload the latest revisions to the budget document later today. Be sure to forward Erica's paperwork to Denise.

Attachments: none

At the bottom of the page, there are links for Support, Contact Us, NEESgrid, CHEF Project, NSF, School of Information, and University of Michigan. The page is powered by Chef.

Figure A9: Discussing Budget Issues for the Proposal

As they collect this information, and continue their discussions, the team works on successive revisions of their grant proposal, using the “Resources” area of their workspace (see also Section 6.4 of this document).

While the team awaits a funding decision, they continue their discussions, and have a series of meetings focusing on the development of numerical models and a testing protocol for their study. These meetings are conducted using various technologies including videoconferencing, audioconferencing, and text chat.

A few months later, when they learn that their proposal has been accepted, they begin preparing for their test in earnest.

In order to conduct the test, they need access to floor space and equipment time on the State Tech shake table. Dr. Ruiz examines the schedules of various regions of floor space and the shake table for the time period when they'd like to run their test (see also Section 6.5 of this document).

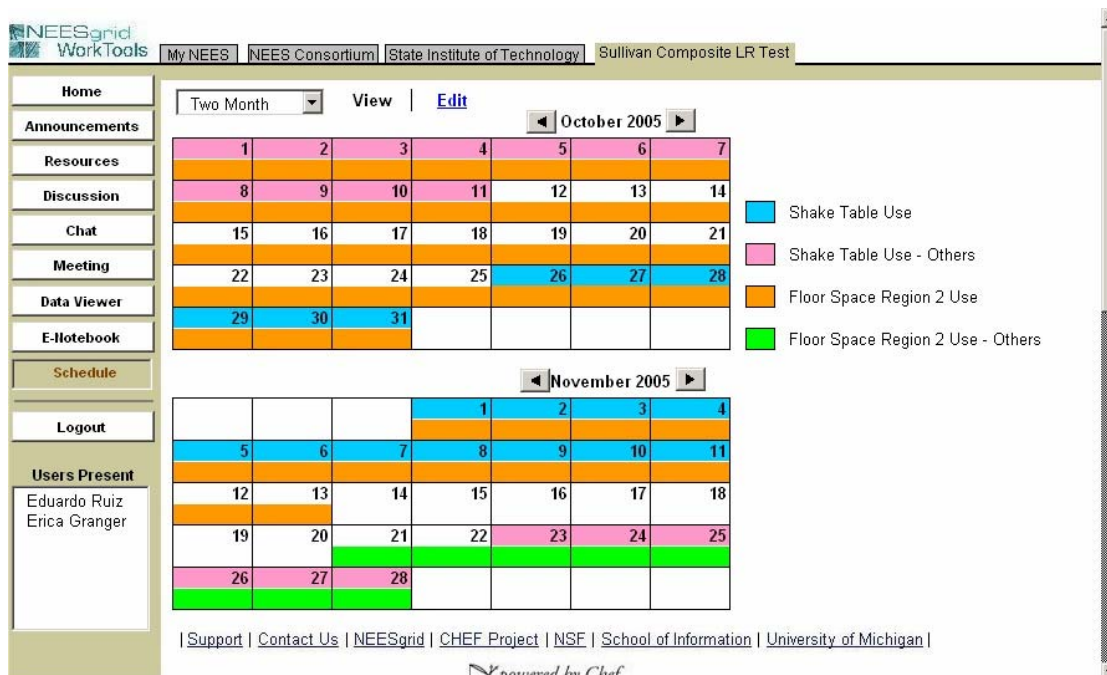
Initially, he selects the resources he is interested in scheduling – in this case, one region of the lab floor and the shake table. (Figure A10)

Figure A10: Selecting Resources to Schedule

He is able to view the usage schedules for each resource (figure A11).

Figure A11: Viewing Resource Schedules

He is then able to reserve the equipment and space for the target dates (figure A12).



**Figure A12: Scheduling Resources**

During this time, Dr. Sullivan's PhD student Erica Granger completes an online training course developed by the State Tech faculty. She then travels to State Tech where she undergoes additional training, and begins working with Dr. Ruiz's Masters Student Hideo Ishii on constructing and instrumenting the specimen. She remains in contact with her advisor Dr. Sullivan by email, telephone, and videoconferencing.

After scheduling their test, they are contacted by the NEES Consortium to provide a short write-up of their project for publicity. Eventually, a brief description of their project is featured on the NEES project home page.

In response to this description, Dr. Harish Gupta, an electrical engineer who is working on the development of Laser-based measurement tools, contacts Drs. Sullivan and Ruiz. He indicates that he has funding to test the performance of a new sensor, and asks if he can "piggy-back" on their experiment. Dr. Gupta offers to cover the capital costs of installing his sensors on (or, more appropriately, near) the specimen. So, with no additional capital cost to the original project, Dr. Gupta is able to conduct his own research as part of the project. Dr. Gupta sends a PhD student to install the sensor and attend the test.

As the test approaches, the team uploads testing protocols and the predictions from numerical models, as shown in Figure A13.

Figure A13: Uploading Resources

With everything in place, test day arrives. Dr. Ruiz, Erica, and Hideo attend the test in person, while Dr. Sullivan and Dr. Gupta view the test using the Data Viewer and Telepresence features of CHEF as shown in figures A14 and A15 respectively. (see also sections 6.6 and 6.8 of this document).

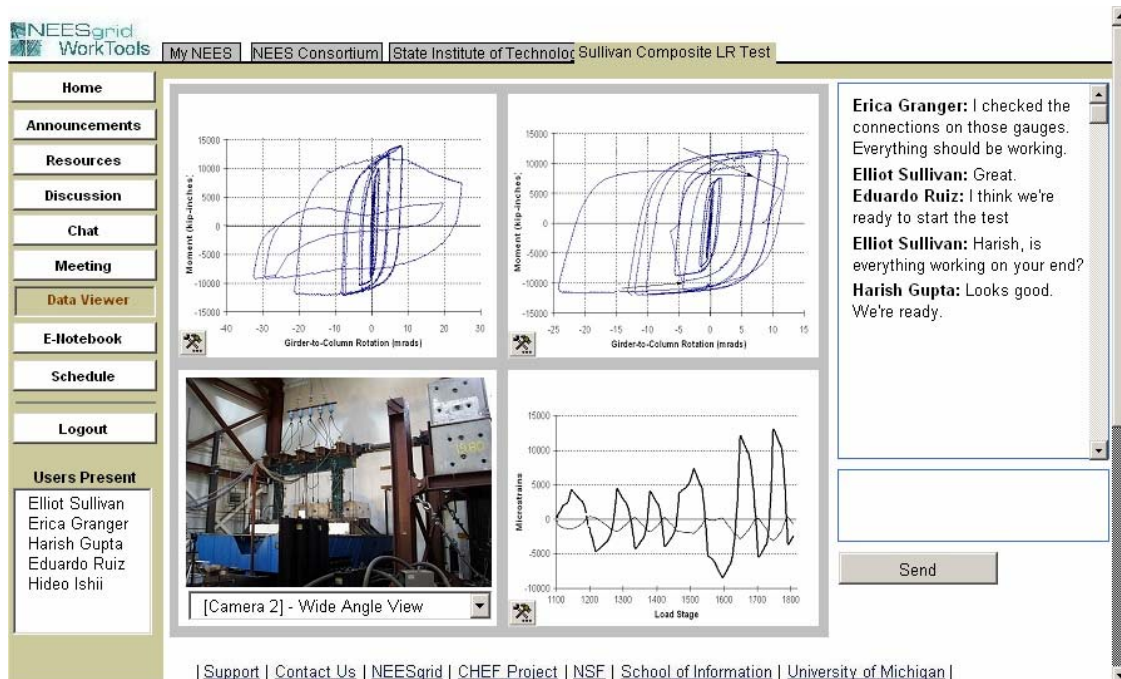


Figure 14: Dr. Sullivan's Data Viewer



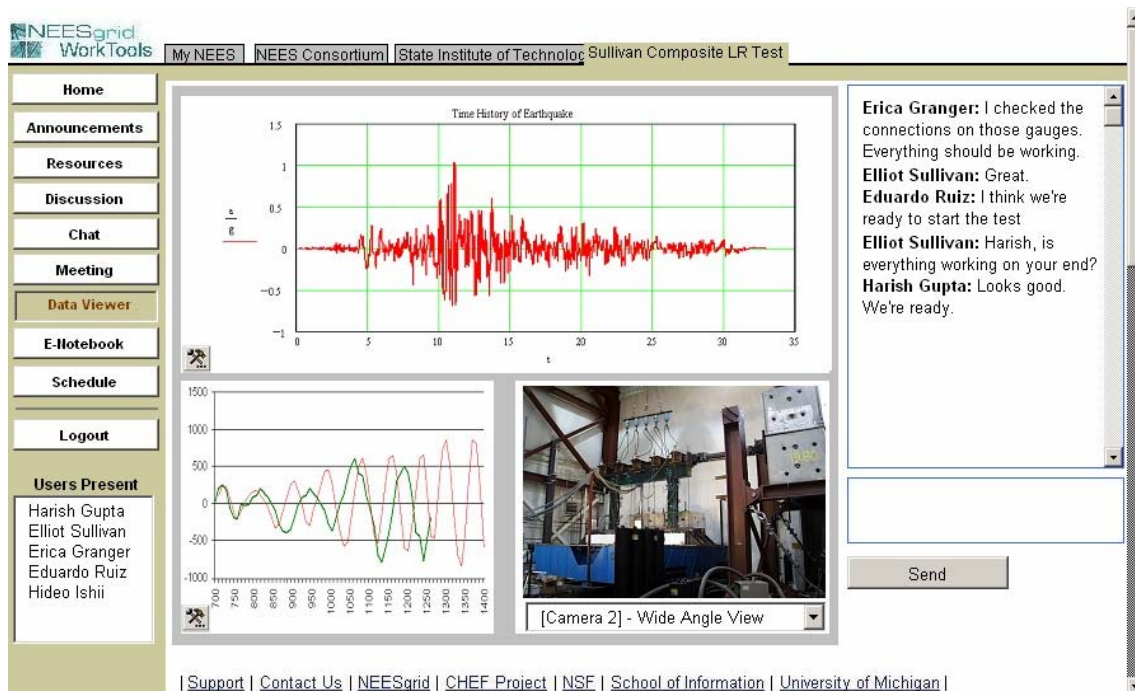


Figure A15: Dr. Gupta's Data Viewer

After the test has been completed, the data are automatically archived in the data repository. The members of the research team access the data files using CHEF's integrated data browser shown in Figure A16 (see also Section 6.7 of this document).

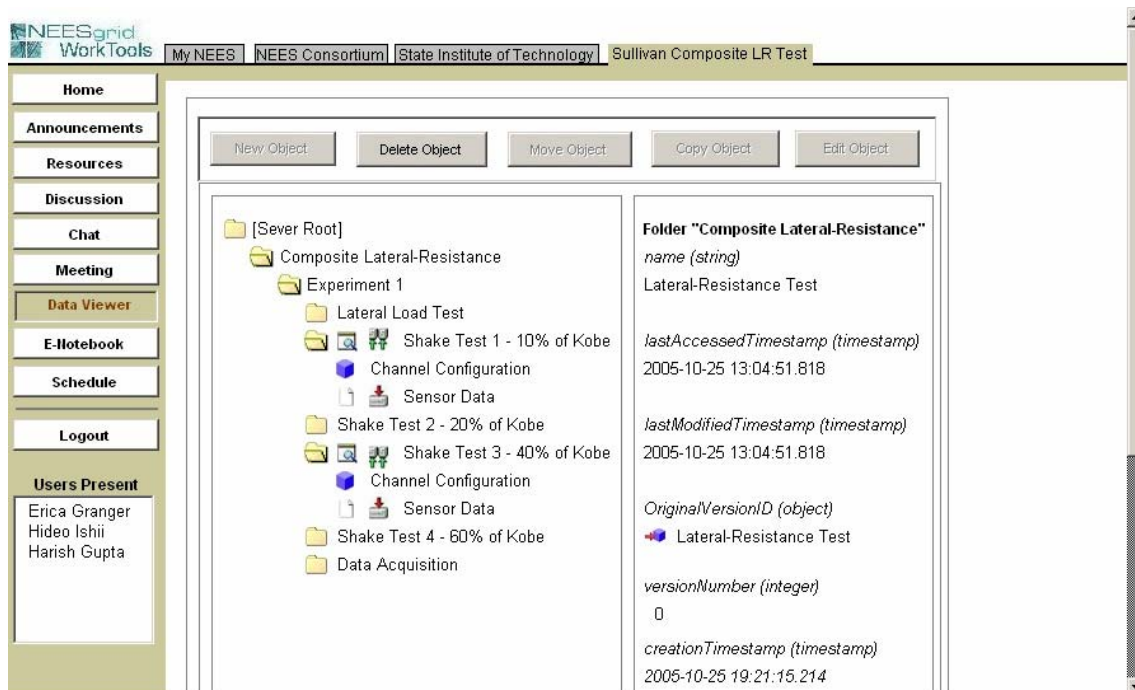


Figure A16: Data Repository

The members of the team access and analyze the data using various analysis tools not contained within CHEF.

As the data are analyzed, the team begins working on a technical report. Commenting and updates are completed using the desktop word processing systems that team members usually use as shown in Figure A17.

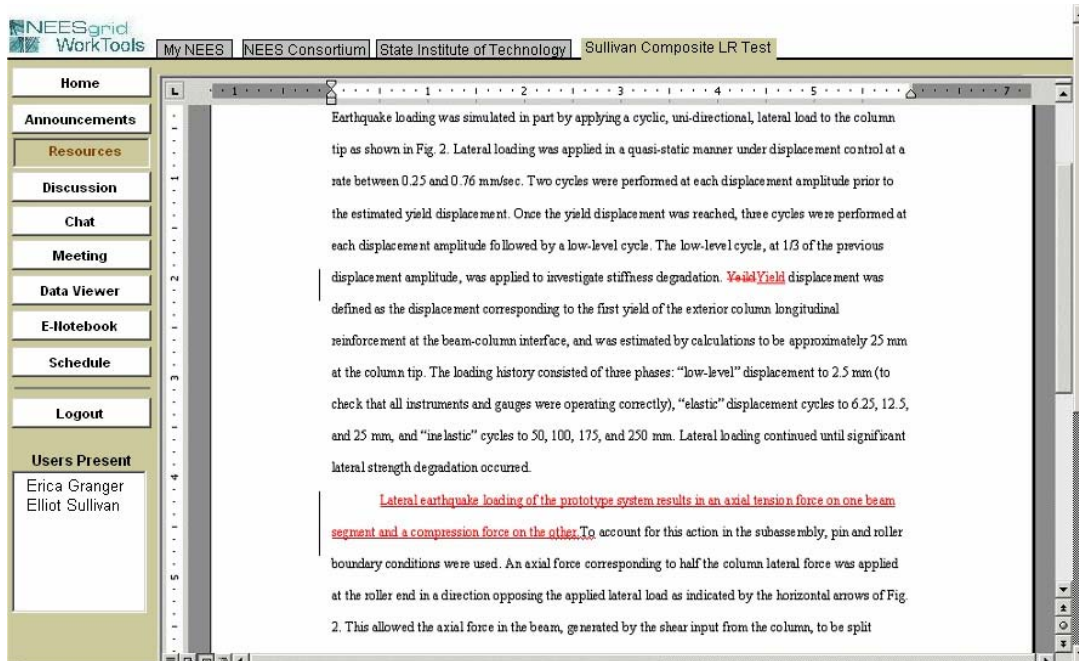


Figure A17: Document Commenting Using an External Word Processor

After producing a technical report, the team works on writing publications. Dr. Ruiz provides links to these findings for researchers involved in the larger project. Dr. Sullivan begins formulating future research to be conducted at his own site building on these findings. Erica Granger writes her dissertation based on these findings. Dr. Gupta's Laser Sensors are refined based on the data collected during the test.