

# PRESTO: Online Calculation of Carbon in Harvested Wood Products

Coeli M. Hoover, Sarah J. Beukema, Donald C.E. Robinson, Katherine M. Kellock, and Diana A. Abraham



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## Abstract

Carbon stored in harvested wood products is recognized under international carbon accounting protocols, and some crediting systems may permit the inclusion of harvested wood products when calculating carbon sequestration. For managers and landowners, however, estimating carbon stored in harvested wood products may be difficult. PRESTO (PProduct ESTimation Tool Online) is a Web-based tool that enables users to easily estimate the carbon stored in harvested wood products and the changes in this quantity over time. The tool may be used in an exploratory mode to examine the impacts of changing the amounts of longer- and shorter-lived products, or with specific harvest data to produce stand-level reports. The methods used are consistent with the Intergovernmental Panel on Climate Change (IPCC) Good Practice Guidance, as well as U.S. voluntary carbon accounting guidelines.

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## The Authors

COELI M. HOOVER is a research ecologist with the U.S. Forest Service, Northern Research Station, Durham, NH. SARAH J. BEUKEMA is a senior systems analyst, DONALD C.E. ROBINSON is a senior systems ecologist, and KATHERINE M. KELLOCK is a senior systems analyst with ESSA Technologies Ltd., Vancouver, BC. DIANA A. ABRAHAM is a senior technical writer with ESSA Technologies Ltd., Peterborough, ON. Coeli Hoover is the corresponding author: to contact, email [choover@fs.fed.us](mailto:choover@fs.fed.us) or call 603-868-7633.

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# Contents

Introduction.....	1
Application Requirements.....	1
User Interface .....	2
Home Page .....	2
New Stand .....	3
Entering Stand Details.....	3
Calculating Carbon Storage .....	4
Viewing Results.....	5
Editing Input Values.....	6
Upload Batch .....	7
Using the Upload Template—Manual Data Entry .....	7
Using the Upload Template—Copy and Paste Append .....	11
Uploading Batch Data into the PRESTO Database.....	12
Review .....	16
Add a New Stand.....	16
Delete a Stand.....	17
Filter the List of Stands.....	17
Edit Stands .....	17
Sort the List of Stands.....	18
Change the Number of Stands to Display .....	18
Export Calculations to Excel.....	18
Questions and Answers.....	19
Acknowledgments.....	20

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## INTRODUCTION

Forest carbon is stored in harvested wood products. Although some carbon credit trading systems may give credit for this carbon, estimating the size of this carbon pool is often cumbersome, especially for small landowners. Many forest carbon calculators do not include the harvested wood products category, and managers must use coefficients and spreadsheets to estimate the carbon in wood products over time. The task becomes complicated when multiple stands or sequential partial harvests are involved. PRESTO (PProduct EStimation Tool Online) is a Web-based tool to help land managers and landowners estimate the amount of carbon stored in products over time, based on harvest volume, geographic region, and wood type.<sup>1</sup> PRESTO can also be used in an “easy” mode, where detailed harvest volumes are not required, allowing landowners to estimate the effects of shifting the relative amounts of pulpwood and sawtimber harvested. Reports are available in two formats: a detailed report providing carbon estimates every 10 years for a 100-year period, or as a 100-year average value.

## APPLICATION REQUIREMENTS

PRESTO is an online tool for calculating the amount of carbon stored in harvested wood. It is linked to a database located on a remote server. To use PRESTO you must have:

- An active Internet connection and
- A PRESTO account (log in at <http://presto.essa.com>).

To request an account, go to the PRESTO login page and click on **New user?**; complete and submit the **New User Registration** form.

If you wish to upload multiple stands in batch mode, or export your results, you will also need:

- Microsoft Access<sup>®</sup> (2003 or later)—required to upload data about multiple stands using the **Upload Batch** feature.
- Microsoft Excel<sup>®</sup> (2003 or later)—required to [copy information for multiple stands](#) into the Access template for batch uploads, and required to [export the results of carbon calculations](#) from PRESTO for further analysis.

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<sup>1</sup> PRESTO is applicable for forests in the conterminous United States only.

# USER INTERFACE

## Home Page

When you log in, PRESTO will open to its **Home** page (Fig. 1), which contains a brief description of the tool and a menu bar with a series of tabs that access all features and functions of the **PRESTO Wood Calculator**. More information about the development of PRESTO is provided on the **Background** tab.

At present, you can enter information about a new stand, upload information about multiple stands from an Access template file, calculate the amount of carbon stored for each of the harvested stands you have entered, export calculations to an Excel spreadsheet, and review summary information about all of the stands you have entered and for which calculations have been made.



Figure 1.—Screen capture of PRESTO home page (as of October 23, 2014).

From a development perspective, the tool is flexible. Any number of new tabs can be added to the interface to provide additional functionality as needed.

The header information on the **Home** page is visible on any page in PRESTO. At the top right of the header, there are four options: **Home**, **Help**, **Report a Problem**, and **Logout**. Click on **Home** from any page (other than the **Home** page) to return to the **Home** page. You can also return to the **Home** page by clicking on the **tree icon** in the upper left corner of the header. On the **Help** page, click on the URL to access this PRESTO user guide, and use the email address provided to submit questions about PRESTO to technical support. Click on **Report a Problem** to access the **PRESTO Bug Reporter** form. Complete the required fields on this form to describe and submit to the support team the error you encountered while using PRESTO. Click on **Logout** to exit PRESTO.

Your feedback on current and potential future features of the PRESTO Wood Calculator would be greatly appreciated. Use the email address provided on the **Home** page to send us your comments.

## New Stand

Clicking on the **New Stand** tab opens a **Stand Details** page (Fig. 2). Use the fields on this page to enter information about the harvest in your stand. The **Notes** field is optional. All other fields on this form must be filled in. If you have information about many stands to enter, you can use the **Upload Batch** option.

### Entering Stand Details

The fields and options on the **Stand Details** page are:

- Name Enter an informative name for the harvested stand (for example, a stand identifier number or a descriptive name). This is a free-form text field (accepts any character) that can accommodate a maximum of 50 characters.
- Region Open the drop-down list and select the region in which your stand is located. The map beside the field boxes shows the location for each region.
- Notes Enter information about the stand. This is a free-form text field (accepts any character) that can accommodate a maximum of 255 characters.
- Area/Units Enter a numerical value (without commas) to indicate the size of the stand, and select the appropriate units (**Acres** or **Ha**) from the drop-down list on the right.
- Calculate By Select the calculation method (**Lump sum** or **Wood type**) you wish to use from the drop-down list. For calculation by **Lump sum**, you need to know the relative proportion of sawlogs and pulpwood in the total harvest. For calculation by **Wood type**, you need to know the actual volumes harvested for sawlogs and pulpwood.

The screenshot shows the 'Stand Details' entry page of the PRESTO Wood Calculator. The page features a green header with a tree icon and the title 'PRESTO Wood Calculator'. Below the header is a navigation bar with tabs: 'New Stand', 'Upload Batch', 'Review', and 'Background'. The 'Stand Details' section includes a 'Save' button with a green checkmark and a 'Cancel' button with a red X. The 'Name' field contains 'Test Stand'. The 'Region' dropdown is set to 'Pacific Southwest (PSW)'. The 'Notes' field contains the text: 'This is a test record. Enter information in this text box for your own reference.' The 'Area' field is set to '250 Ha'. The 'Calculate By' dropdown is set to 'Lump sum'. To the right is a map of the United States divided into regions labeled with abbreviations: PWW, PWE, PSW, RMN, RMS, NLS, NPS, SC, SE, and NE.

Figure 2.—Screen capture of Stand Details entry page, used to enter information on a single stand. To add multiple stands at once, use the Batch Upload process. The Notes field is optional and can be used to record information about the stand if desired. Choose Lump sum data entry to explore the effects of different levels of sawtimber and pulpwood harvest; use the Wood type entry when data on specific harvest amounts are available.

After you have selected a calculation option, PRESTO will automatically refresh the page and display the rest of the fields you need to fill. Do not click on the Save button at this point. If PRESTO throws an error, you will need to log out and log back in to clear it.

### Calculating Carbon Storage

The calculation method you choose determines what additional information is required to complete the requested calculation.

*To calculate by Lump sum:*

1. If applicable, enter the total volume of **Hardwood** harvested, and select the appropriate units from the drop-down list at right.
2. If applicable, specify the percentage of the hardwood harvest destined for **Sawlogs** and the proportion destined for **Pulpwood**. These two values must sum to 100 percent, as in the example below (Fig. 3).

Calculate By	Lump sum ▾	
<b>Hardwood Proportions</b>		
Harvest Amount	750	m <sup>3</sup> ▾
• Sawlogs	90	(%)
• Pulpwood	10	(%)
<b>Softwood Proportions</b>		
Harvest Amount	300	m <sup>3</sup> ▾
• Sawlogs	10	(%)
• Pulpwood	90	(%)

Figure 3.—Screen capture of Lump sum data entry form.

3. If applicable, repeat steps 1 and 2 for the **Softwood** component of the harvest.
4. When done, click on the **Save** button at the top of the page. PRESTO will perform the requested calculation and display the results.

To calculate by Wood type:

1. If applicable, specify the actual volumes of **Hardwood** harvested as **Sawlogs** and as **Pulpwood**, and select the appropriate units for each from the drop-down lists at right (Fig. 4).
2. If applicable, repeat the first step for the **Softwood** component of the harvest.

Calculate By	Wood type ▼	
Amounts by Wood Type	Hardwood / Softwood	
Hardwood - Sawlogs	50	m <sup>3</sup> / ha ▼
Hardwood - Pulpwood	25	m <sup>3</sup> / ha ▼
Softwood - Sawlogs	75	m <sup>3</sup> / ha ▼
Softwood - Pulpwood	50	m <sup>3</sup> / ha ▼

Figure 4.—Screen capture of Wood type data entry form.

3. When done, click on the **Save** button at the top of the page. PRESTO will perform the requested calculation and display the results.

## Viewing Results

The results of PRESTO's calculations are displayed on a refresh of the **Stand Details** page, along with a summary of the stand and harvest information you entered. The example below (Fig. 5) shows calculations by **Wood type**.

Stand Details	
← Back	✎ Edit
Name	ExampleStand
Region	Northern Lake States (NLS)
Notes	This is a demonstration record. Enter information about your stand here.
Area	150 Acres
Calculate By	Wood type
Amounts by Wood Type	Hardwood / Softwood
Hardwood - Sawlogs	40 cu ft / acre
Hardwood - Pulpwood	2.5 Cord / acre
Softwood - Sawlogs	90 cu ft / acre
Softwood - Pulpwood	0 Cord / acre
Products (C <sub>100</sub> )	0.6
Landfill (C <sub>100</sub> )	1.1
Stored (C <sub>100</sub> )	1.8
EnergyCapture (C <sub>100</sub> )	1.9
NoCapture (C <sub>100</sub> )	2.0
Products (C <sub>Avg</sub> )	1.2
Landfill (C <sub>Avg</sub> )	0.9
Stored (C <sub>Avg</sub> )	2.2
EnergyCapture (C <sub>Avg</sub> )	1.8
NoCapture (C <sub>Avg</sub> )	1.7

Figure 5.—Screen capture of Wood type calculation results showing the 100-year and average values for each harvested carbon pool.

All results are expressed in tonnes per hectare. Values for total carbon in storage after 100 years ( $C_{100}$ ) and values for annual average amount of carbon in storage ( $C_{Avg}$ ) are provided for five storage categories:

Products	End-use products that have not been discarded or otherwise destroyed, such as construction products, containers, and paper products.
Landfill	Discarded wood and paper products in landfills.
Stored	The sum of Products and Landfill.
EnergyCapture	Combustion of wood products with energy capture as the carbon is emitted to the atmosphere (alternatively called Energy).
NoCapture	Carbon in harvested wood emitted to the atmosphere through combustion or decay without energy recapture (also called Emissions).

A **10 Year Report** (Fig. 6) at the bottom of the page shows carbon storage calculations in 10-year increments, so you can see how carbon storage changes over time for each of the five storage categories.

<b>10 Year Report</b>					
All C units = tonnes/ha					
<u>Year</u>	<u>Products (C)</u>	<u>Landfill (C)</u>	<u>Stored (C)</u>	<u>Energy (C)</u>	<u>Emissions (C)</u>
0	17.4303	0.0000	17.4303	6.4848	4.8765
10	10.1923	3.3365	13.5288	8.5213	6.7313
20	7.3244	4.5937	11.9181	9.2960	7.5590
30	5.7776	5.1894	10.9670	9.7070	8.0786
40	4.7198	5.5837	10.3036	9.9844	8.4646
50	3.9497	5.8547	9.8044	10.1755	8.7829
60	3.3809	6.0292	9.4101	10.3091	9.0436
70	2.9169	6.2036	9.1205	10.3852	9.2571
80	2.5494	6.3206	8.8700	10.4427	9.4501
90	2.2497	6.4375	8.6872	10.4613	9.6245
100	1.9973	6.5442	8.5415	10.4613	9.7600

Figure 6.—Screen capture of 10 Year carbon report. This report provides the values for the hardwood pulpwood carbon pools at 10-year intervals.

You can sort the values in the table by **Year**. To do this, click on any column header. Successive clicks toggle the sort between ascending (Year 0-100) and descending (Year 100-0) order.

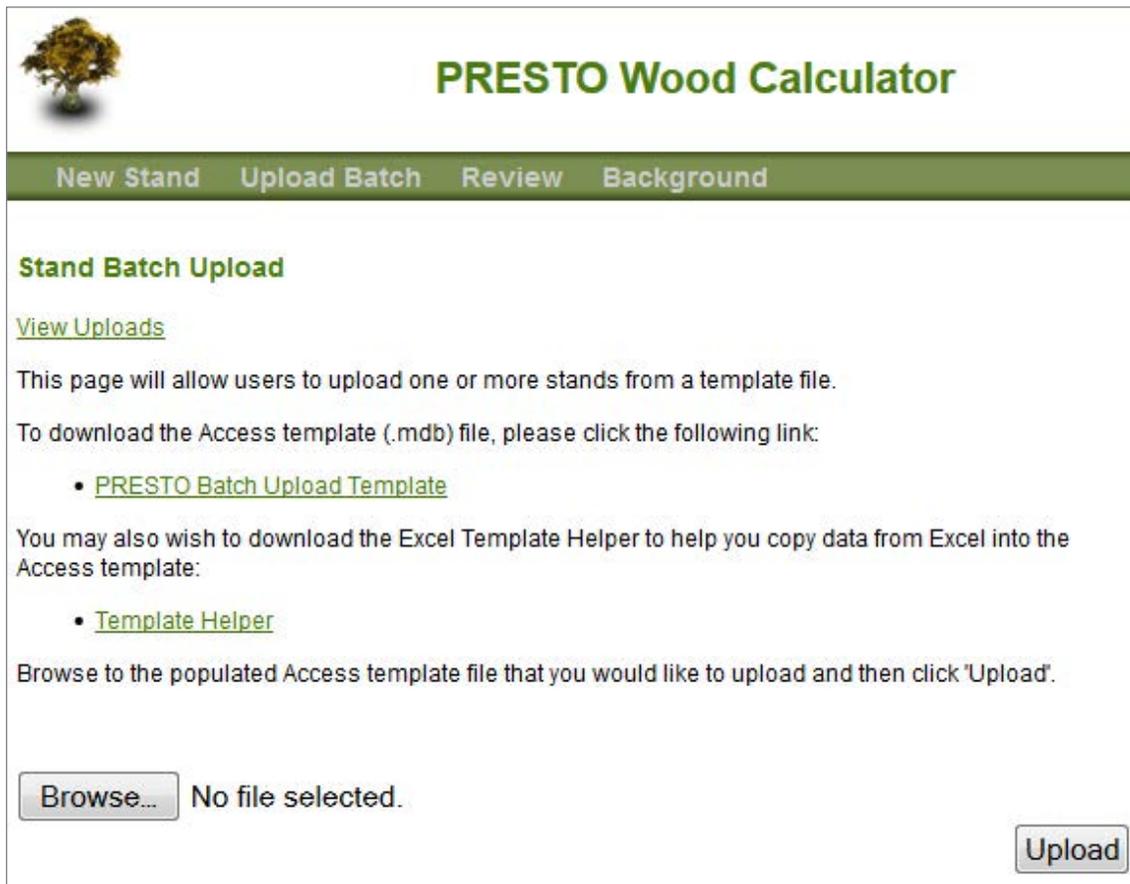
### Editing Input Values

If you need to change any of the stand details you entered, you can do so by clicking on the **Edit** button at the top of the **Stand Details** page. When you have finished making your changes, click **Save** again. PRESTO will recalculate carbon storage based on your updated input and redisplay your results.

You can also edit your input from the **Review** page.

## Upload Batch

Use the **Upload Batch** option (Fig. 7) to simultaneously enter information for multiple stands. Click on the **Upload Batch** tab to open the **Stand Batch Upload** page.



The screenshot shows the 'PRESTO Wood Calculator' interface. At the top left is a tree icon. The title 'PRESTO Wood Calculator' is in green. Below it is a navigation bar with tabs: 'New Stand', 'Upload Batch', 'Review', and 'Background'. The 'Upload Batch' tab is active. The main content area is titled 'Stand Batch Upload' and includes a link for 'View Uploads'. It explains that users can upload multiple stands from a template file and provides links to download the 'PRESTO Batch Upload Template' and 'Template Helper'. Below this is a file selection area with a 'Browse...' button, the text 'No file selected.', and an 'Upload' button.

Figure 7.—Screen capture of Batch Upload page. The batch upload allows data from multiple stands to be loaded into PRESTO at one time. Batch upload is available for both the Lump sum and Wood type data entry methods.

### Using the Upload Template—Manual Data Entry

From the **Stand Batch Upload** page, download the Access template file by clicking on the **PRESTO Batch Upload Template** link. Save the file in a folder on your computer and then open it.

If necessary, enable all content in the database. Your copy of Access may be set to disable certain content for security reasons. You will need to enable this content to use the template. In Access 2007, do this by clicking on the **Options** button in the **Security Warning** message bar, and then clicking on the **Enable this content** radio button in the **Security Alert** window. In Access 2010, click on the **Enable Content** button in the yellow **Security Warning** message bar to enable all content.

If you do not see an option to enable content, it is likely that your copy of Access is set to block active content without providing you with notification. You will need to change this security setting in order to enable the content in the template. Close the template and follow the steps outlined below for your version of Access.

*To change security settings in Access 2007:*

1. Open MS Access.
2. Click on the **Office** button (upper left corner), and then click on the **Access Options** button at the bottom of the window.
3. Go to the **Trust Center** (bottom portion of the frame at left) and click on the **Trust Center Settings** button.
4. On the **Trust Center** window, click on **Macro Settings** in the frame at left.
5. Click on the **Disable all macros with notification** option.
6. Click **OK** and close Access.
7. Open the **PRESTO Batch Upload Template** and enable the active content by clicking on the **Options** button in the **Security Warning** message bar, and then clicking on the **Enable this content** radio button in the **Security Alert** window.

*To change security settings in Access 2010:*

1. Open MS Access.
2. Under the **File** menu, click on the **Options** button near the bottom of the frame at left.
3. Go to the **Trust Center** (bottom portion of the frame at left) and click on the **Trust Center Settings** button.
4. On the **Trust Center** window, click **Macro Settings** in the frame at left.
5. Click on the **Disable with notification** radio button.
6. Click **OK** and close Access.
7. Open the **PRESTO Batch Upload Template** and enable the active content by clicking on the **Enable Content** button in the yellow **Security Warning** message bar.

Once all content is enabled, you will see a blank form with a menu bar at the top, and a series of buttons across the bottom (Fig. 8).

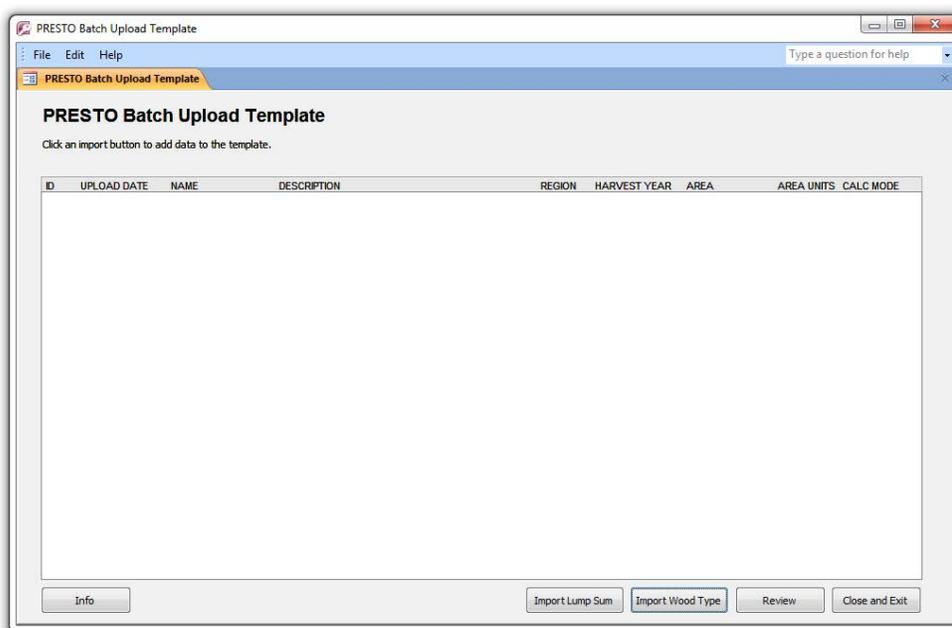


Figure 8.—Screen capture of PRESTO Batch Upload Template. Select the button for the appropriate data entry method to activate the data entry form. If the buttons do not respond, follow the instructions to enable all macro content.

## Menus

- File** The only option under this menu is **Exit**, which closes the Access template. You can also exit the template by clicking on the **Close and Exit** button at the bottom of the form.
- Edit** This menu contains options that enable you to replicate records in the **Lump sum** and **Wood type** data forms, or **Copy** them from an Excel file and **Paste Append** them into the data forms.
- Help** Click on the **About** option to see information about the Access template; click on the **Help** option for guidance on how to use the template.

## Buttons

- Info** Click on this button to open the form that provides information about the Access template (the same form that can be accessed from **Help | About**).
- Import Lump Sum** Click on this button to open the data form required to enter stands for which you know the percentage of sawlogs and pulpwood in the harvest.
- Import Wood Type** Click on this button to open the data form required to enter stands for which you know the actual volume harvested for sawlogs and pulpwood.
- Review** Click on this button to open a form that provides a read-only display of the data you entered.
- Close and Exit** Close the Access template by clicking on this button, or by choosing **Exit** from the **File** menu.

### *To manually populate a **Batch Upload Template**:*

1. Click on the **Import Lump Sum** button to enter stands for which you know the percentage of sawlogs and pulpwood in the harvest.
2. Enter information about your stands into the fields of the **Batch Upload – Lump Sum** data form. No fields in this form can be left blank. When there is no harvest for a particular wood type, enter a zero and select any units. Use the tab key on your keyboard to move from one cell to the next, until you have entered data into every field.
3. When done, click on the **Validate** button to ensure that your data will upload into the Access template without errors. If the data you entered violate any of the validation rules (such as missing values), an error message will appear directing you to correct the error or cancel data entry. When validation is successful, the data you entered will be imported into the template database, and summary information for each stand will be displayed on the **Batch Upload Template** form.
4. Click on the **Import Wood Type** button at the bottom of the template to enter stands for which you know the actual volume harvested for sawlogs and pulpwood.

- Repeat steps 2 and 3 to enter your remaining stands. In the example below (Fig. 9), stands have been entered using both calculation modes.

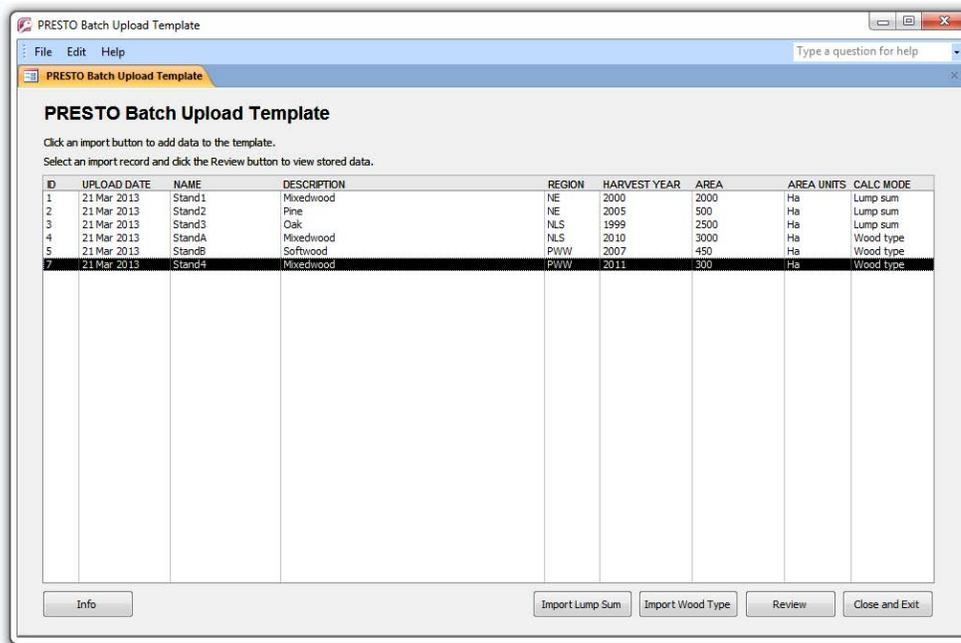


Figure 9.—Screen shot of Batch Upload Template records. This screen lists all records that were uploaded and allows the user to select and review records.

- You can review the data you entered for any stand by selecting the record for that stand on the **Batch Upload Template** (left-click to highlight it) and then clicking on the **Review** button at the bottom of the form. The **Review** form (Fig. 10) is read-only; you cannot make changes here to the data you entered.

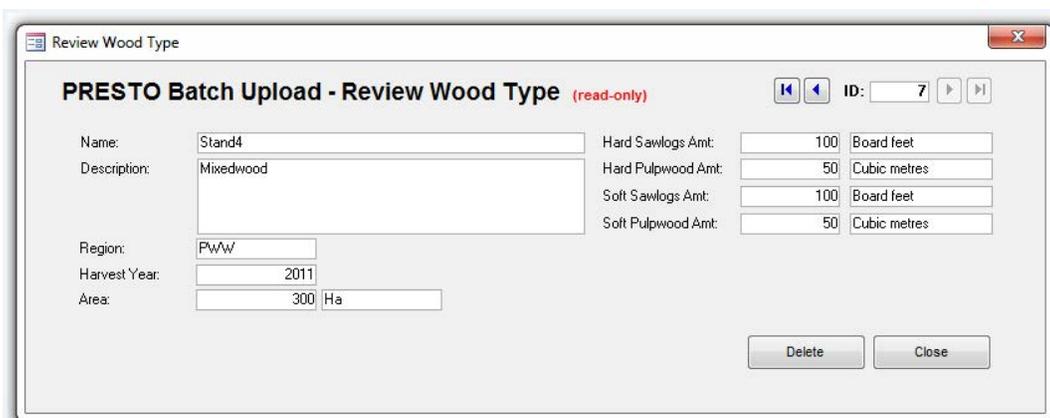


Figure 10.—Screen shot of Batch Upload record review form. Note that data may not be edited from within this form.

- Click **Delete** if you wish to remove the selected record from the template database, or **Close** to return to the **Batch Upload Template**.
- When done, click on the **Close and Exit** button (or select **Exit** from the **File** menu) to close the Access template.

## Using the Upload Template—Copy and Paste Append

You can also enter information into the **Batch Upload Template** from an Excel spreadsheet by using the **Edit | Copy** and **Edit | Paste Append** options in the **Lump sum** and **Wood type** data forms. The fields in your Excel spreadsheet must be in the same order as the fields in the data forms, and your data must comply with the validation rules in the Access template; be sure to use the same *Region* abbreviations and *Units* as in the drop-down lists.

To assist with the process of importing data from Excel into the Access template, a **Template Helper** has been provided. This is an Excel file that contains the required fields in the required order for each calculation mode, and drop-down lists for **Region** and **Units**. Download the file from the **Stand Batch Upload** page by clicking on the **Template Helper** link (Fig. 11).

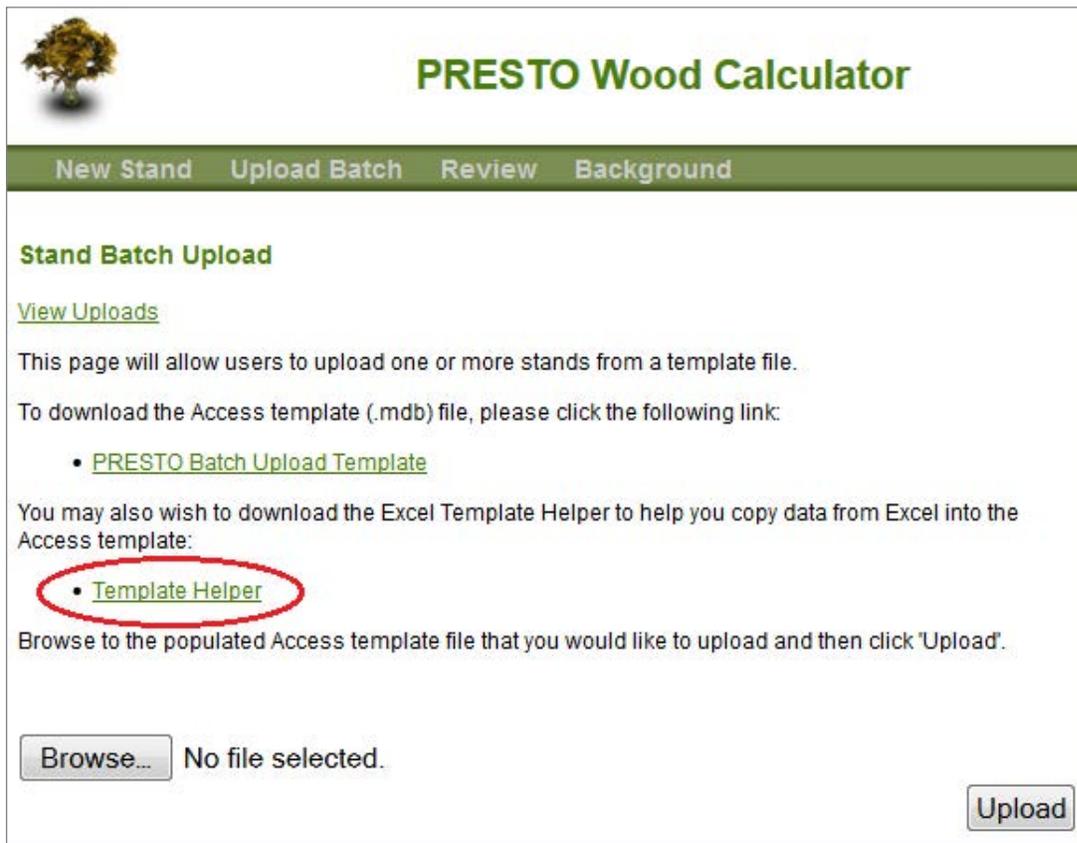


Figure 11.—Screen shot of the Stand Batch Upload page showing the location of the Template Helper link. Use of this spreadsheet will ensure that data are formatted correctly for upload.

Save the file in a folder on your computer. Open the file and enter your data.

*To populate an Access data form by using **Copy and Paste Append**:*

1. With the Access **Batch Upload Template** open, open the **Lump Sum** data form (**Import Lump Sum** button) to enter stands for which you know the percentage of sawlogs and pulpwood in the harvest.

2. Open the Excel worksheet that contains your lump sum data; select only the data (not the field headings) and copy (Ctrl-C or use the copy option in Excel) to place the data on your clipboard.
3. Toggle over to the **Batch Upload - Lump Sum** Access data form and click in the first cell of the first empty row.
4. From the **Edit** menu, select **Paste Append**.
5. If you encounter a paste error, you may be missing a value in a required field (bold column names in the Template Helper). You can see the number of records that were NOT added to the template by clicking on the **Paste Errors** button in the bottom left corner of the data form. Review your data, ensuring all required fields are fully populated, and try again.
6. Repeat steps 1 through 5 to copy and paste append your wood type data.

The **Edit | Copy** option on the **Lump Sum** and **Wood Type** data forms can also be used to replicate records already in the template.

*To replicate stand data already in a Lump Sum or Wood Type data form:*

1. With your Access data form open (for example, **Lump Sum**), select the records you wish to replicate (left-click and drag to select multiple contiguous records; the form will not allow you to select noncontiguous records).
2. From the **Edit** menu, select **Copy** and then select **Paste Append**.
3. The selected records will be appended to the existing records in the data form.
4. [Edit the values as needed](#) and then click **Validate** to upload the records into the **PRESTO Batch Upload Template**.
5. When done, click **Close and Exit** to close Access and return to the **Stand Batch Upload** page in PRESTO.

*Note to users with Access 2013:*

The **Paste Append** command may not appear under the **Edit** menu, but may be located on the **Add Ins** menu. Click in the first cell of the batch upload data form to activate it and select **Add Ins | Paste Append** from the menu bar. If the command is not active, you may access this function by adding the **Paste Append** button to your Quick Access Toolbar. Select the drop-down arrow on the Quick Access Toolbar and select **Customize Quick Access Toolbar | More Commands**. Choose **Paste Append** from the list of **Popular Commands**, and click on the **Add** button to add the function to your toolbar.

### **Uploading Batch Data into the PRESTO Database**

When you have successfully entered your data into the **PRESTO Batch Upload Template**, the next step is to upload those data into the PRESTO database.

To upload data into the PRESTO database:

1. From the **Stand Batch Upload** page (Fig. 12) in PRESTO, click on the **Browse** button.

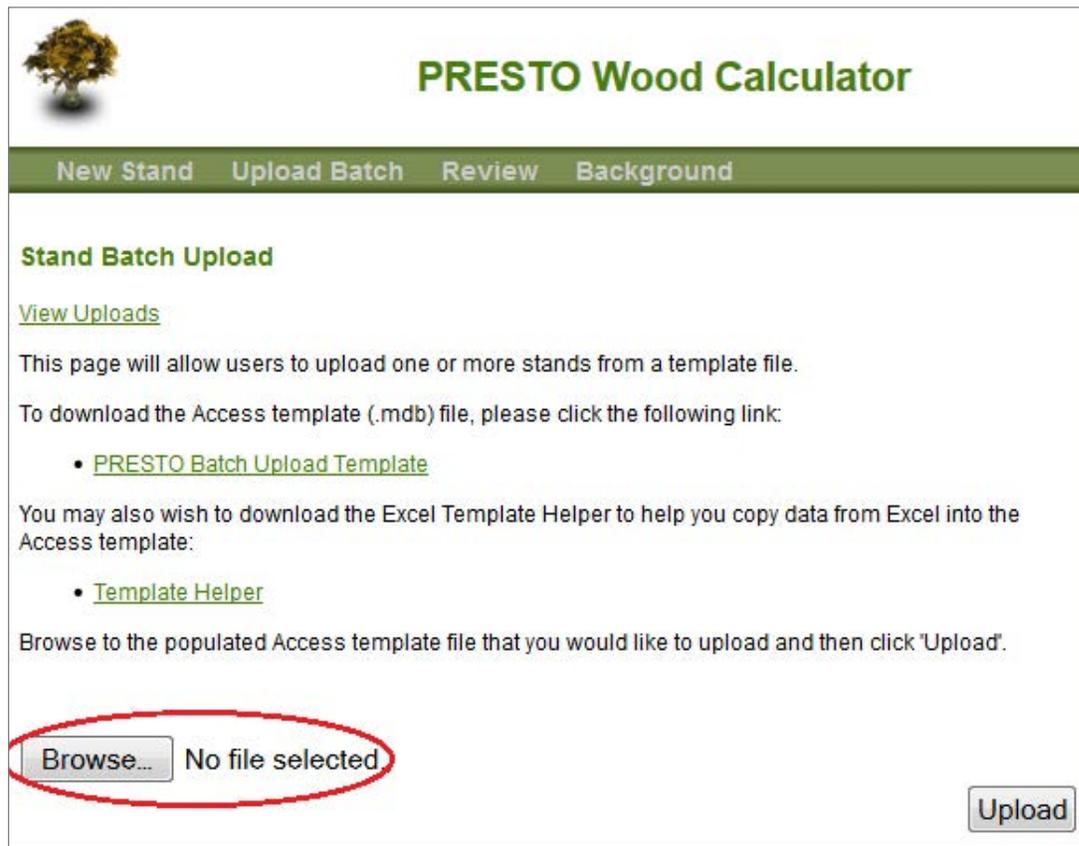


Figure 12.—Screen shot showing the location of the Browse button on the Stand Batch Upload page.

2. Navigate to the **PRESTO Batch Upload Template** file you just populated, click on it to select it, then click **Open**. The **File Upload** window will close, and you will see the name of the file you just selected displayed beside the **Browse** button on the **Stand Batch Upload** page.
3. Click on the **Upload** button to start the batch upload. A status bar will show the progress of the upload. Uploading stand information from the Access template into PRESTO includes the process of carbon calculation for each stand (you can see the results of those calculations by clicking on the **Review** tab).

- When the upload is completed, PRESTO will display a **Template Upload** page (Fig. 13) that identifies the **Import template file** by name (note the automatically revised filename), provides an **UploadID**, confirms the number of stands imported, and lists the **StandID** numbers for each uploaded stand.

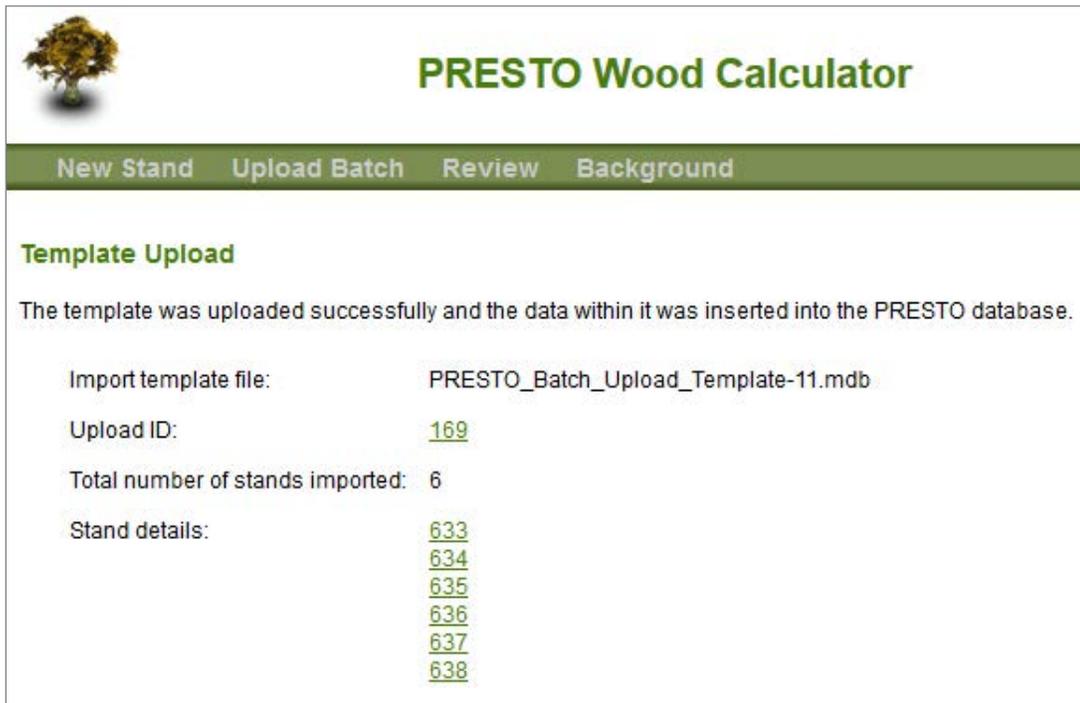


Figure 13.—Screen shot of Template Upload summary report. This report provides a list of the stands that were successfully uploaded into PRESTO.

- On the **Template Upload** page, click on the **UploadID** to see a summary list of the stands contained in the upload. For each stand, the **StandID**, **Stand Name**, **Calculation Mode**, the **Added On** date, and the username of the person it was **AddedBy** (your username) will be displayed. Use the *Back* button of your browser to return to the **Template Upload** page.
- You can also view the stand details for each of the uploaded stands. To do this, click on a hyperlinked **StandID** to open a **Stand Details** page for the selected stand. Use the *Back* button of your browser to return to the **Template Upload** page if you wish to view the details of another stand. Alternatively, you can view details for any stand you have entered from the **Review** tab on the PRESTO menu bar.

At any time, you can review all of the uploads you have made. To do this, click on the **Upload Batch** tab on the PRESTO menu bar to open the **Stand Batch Upload** page. From there, click on the **View Uploads** link (Fig. 14).

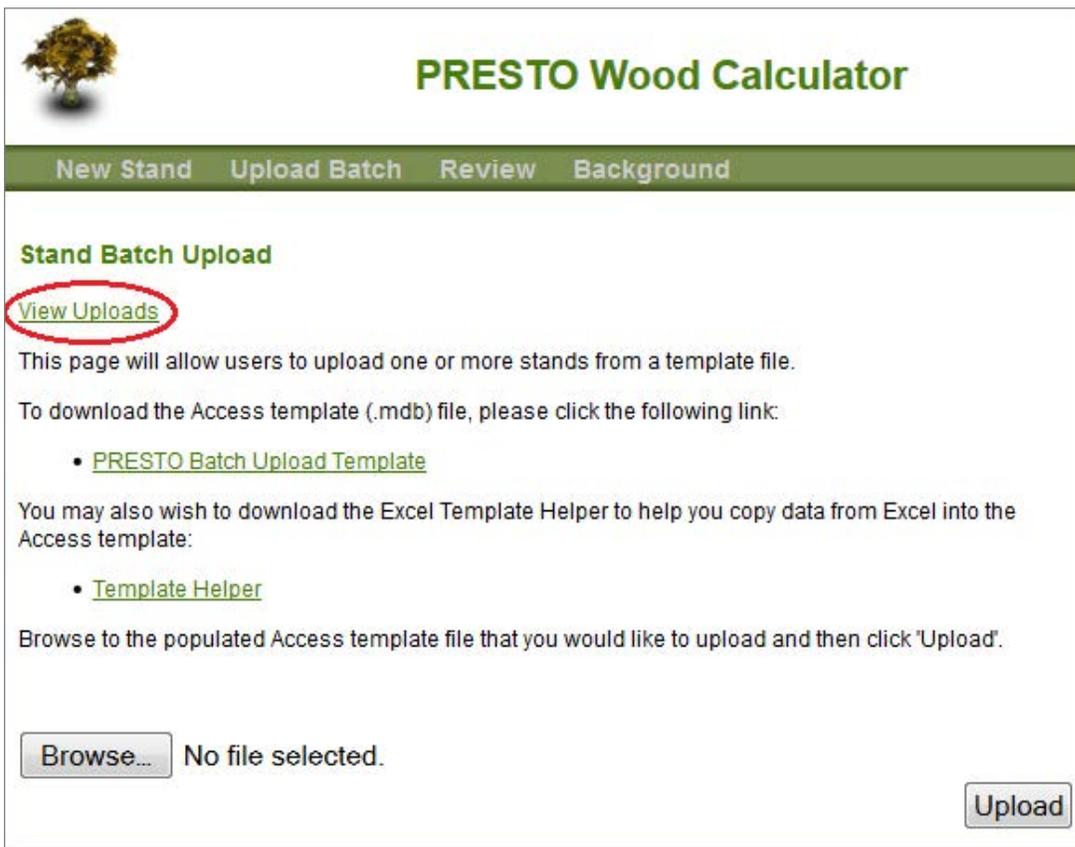


Figure 14.—Screen shot showing the location of the View Uploads link on the Stand Batch Upload page.

This action opens a page that displays a table listing all of the template files you have uploaded into the PRESTO database. Each upload has a unique numerical identifier. Click on a hyperlinked **ID** to see a summary of the data uploaded from the corresponding template file. Use the *Back* button of your browser to return to the table.

## Review

Click on the **Review** tab to open the **Review Stands** page. This page displays the full list of stands you have entered, and shows the results of carbon calculations. From this page, you can add a new stand, delete one or more stands, edit stands, filter your list of stands, sort your list of stands by any of the parameter headings, change the number of stands displayed per page, and export the carbon calculations for some or all of your stands to an Excel spreadsheet.

### Add a New Stand

To add a new stand, click on the [\[ + \] Add new item](#) hyperlink in the upper left corner of the form (Fig. 15).

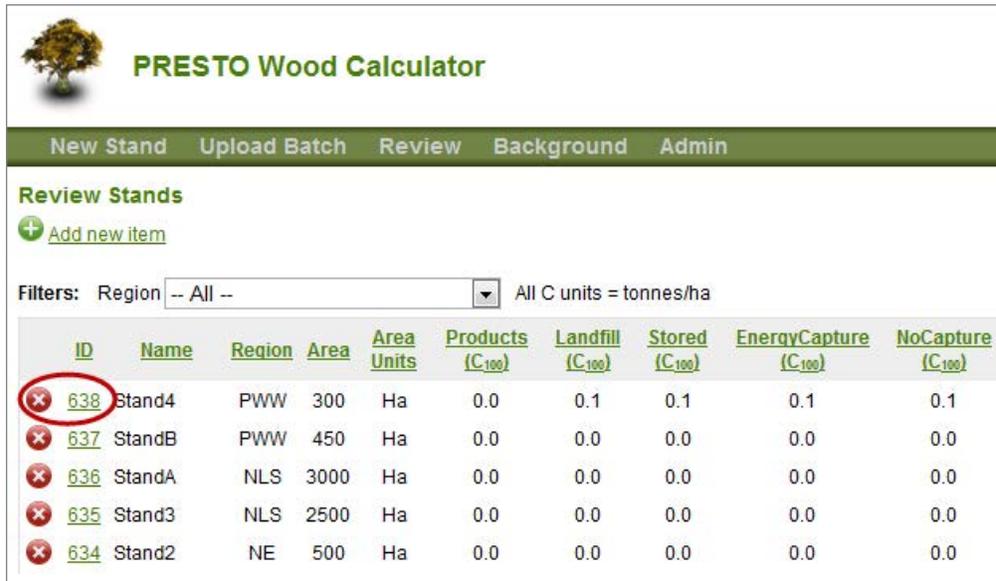
ID	Name	Region	Area	Area Units	Products (C <sub>100</sub> )	Landfill (C <sub>100</sub> )	Stored (C <sub>100</sub> )	Energy Capture (C <sub>100</sub> )	NoCapture (C <sub>100</sub> )
<a href="#">638</a>	Stand4	PWW	300	Ha	0.0	0.1	0.1	0.1	0.1
<a href="#">637</a>	StandB	PWW	450	Ha	0.0	0.0	0.0	0.0	0.0
<a href="#">636</a>	StandA	NLS	3000	Ha	0.0	0.0	0.0	0.0	0.0
<a href="#">635</a>	Stand3	NLS	2500	Ha	0.0	0.0	0.0	0.0	0.0
<a href="#">634</a>	Stand2	NE	500	Ha	0.0	0.0	0.0	0.0	0.0

Figure 15.—Screen shot of the Review Stands page showing the location of the Add New Item option. This link may be used to add additional stands, if needed.

This action opens the **Stand Details** form; enter your stand information as described above for [Entering Stand Details](#).

## Delete a Stand

To delete a stand, click on the red **Delete** marker (Fig. 16) beside the stand you wish to remove. All information about deleted stands, including carbon calculations, is removed from the PRESTO database.



PRESTO Wood Calculator

New Stand Upload Batch Review Background Admin

Review Stands

+ Add new item

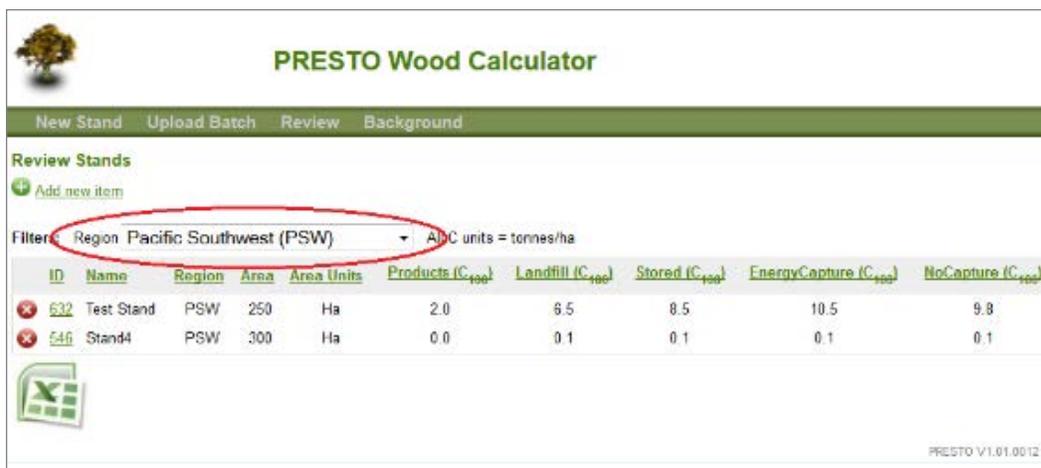
Filters: Region -- All -- All C units = tonnes/ha

ID	Name	Region	Area	Area Units	Products (C <sub>100</sub> )	Landfill (C <sub>100</sub> )	Stored (C <sub>100</sub> )	EnergyCapture (C <sub>100</sub> )	NoCapture (C <sub>100</sub> )
638	Stand4	PWW	300	Ha	0.0	0.1	0.1	0.1	0.1
637	StandB	PWW	450	Ha	0.0	0.0	0.0	0.0	0.0
636	StandA	NLS	3000	Ha	0.0	0.0	0.0	0.0	0.0
635	Stand3	NLS	2500	Ha	0.0	0.0	0.0	0.0	0.0
634	Stand2	NE	500	Ha	0.0	0.0	0.0	0.0	0.0

Figure 16.—Screen shot of Review Stands page showing the location of the Delete Item button. This option may be used to delete the data for a particular stand.

## Filter the List of Stands

You can filter your list of stands on the **Review Stands** page (Fig. 17) by region. Open the **Region** drop-down list and select a region; only the stands from that region will be displayed. All stands in your list will be filtered, not just the ones you have displayed (if less than – All –).



PRESTO Wood Calculator

New Stand Upload Batch Review Background

Review Stands

+ Add new item

Filters: Region Pacific Southwest (PSW) All C units = tonnes/ha

ID	Name	Region	Area	Area Units	Products (C <sub>100</sub> )	Landfill (C <sub>100</sub> )	Stored (C <sub>100</sub> )	EnergyCapture (C <sub>100</sub> )	NoCapture (C <sub>100</sub> )
632	Test Stand	PSW	250	Ha	2.0	6.5	8.5	10.5	9.8
546	Stand4	PSW	300	Ha	0.0	0.1	0.1	0.1	0.1

PRESTO V1.01.0012

Figure 17.—Screen shot of Review Stands page showing the location of the Filter by Region drop-down menu. If working with data from a variety of regions, you may use this option to display only those stands in the selected region.

## Edit Stands

You can edit any stand in your list by clicking on the hyperlinked stand ID value. This action opens the **Stand Details** page where you can make your edits as described above in [Editing Input Values](#). When you save your work, PRESTO will recalculate the carbon storage values based on your revised input.

## Sort the List of Stands

Sort your list of stands by clicking on one of the parameter headings. For example, to sort by **Area**, click on the **Area** heading. Successive clicks will toggle the sort between ascending and descending order. All stands in your list will be sorted, not just the ones you have displayed (if less than – All –).

## Change the Number of Stands to Display

You can change the number of stands displayed per page on the **Review Stands** page (Fig. 18). For example, if you have entered more than 10 stands and wish to see them all on a single page, select the next largest value (or – All –) from the **Items Per Page** drop-down list.

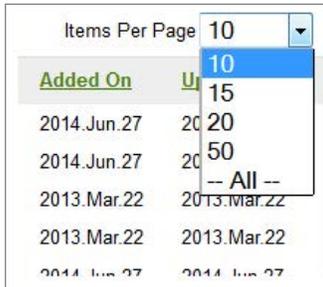


Figure 18.—Screen shot of the drop-down menu used to select the number of records to display on the Review Stands page.

## Export Calculations to Excel

You can export the stand details, including carbon calculations, for some or all of the stands you entered to an Excel spreadsheet.

*To export carbon calculations to Excel:*

1. From the **Review Stands** page, click on the Excel icon [  ] at the bottom of the list of stands.
2. Name the file and save it to a folder on your computer, then open it.
3. All information (except stand ID) about all of the stands listed on the **Review Stands** page will be exported to Excel (Fig. 19).

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
	Name	Region	Area	Area Units	Products (C <sub>100</sub> )	Landfill (C <sub>100</sub> )	Stored (C <sub>100</sub> )	EnergyCapture (C <sub>100</sub> )	NoCapture (C <sub>100</sub> )	Products (C <sub>Avg</sub> )	Landfill (C <sub>Avg</sub> )	Stored (C <sub>Avg</sub> )	EnergyCapture (C <sub>Avg</sub> )	NoCapture (C <sub>Avg</sub> )	Added On	Updated On
1	StandA	NLS	3000	Ha	0	0	0.1	0.1	0.1	0	0	0.1	0.1	0.1	2013.Mar.22	2013.Mar.22
2	StandB	PWW	450	Ha	0	0.1	0.1	0.1	0.1	0.1	0	0.1	0.1	0.1	2013.Mar.22	2013.Mar.22
3	Stand1	NE	2000	Ha	0.6	3.4	4	8.2	6.7	2	3.1	5.1	7.8	6	2013.Mar.22	2013.Mar.22
4	Stand2	NE	5500	Ha	0	0	0	0.2	0.1	0	0	0	0.2	0.1	2013.Mar.22	2013.Mar.22
5	Stand3	NLS	12500	Ha	0	0.1	0.1	0.1	0.1	0	0	0.1	0.1	0.1	2013.Mar.22	2013.Mar.22
6	StandA	NLS	3000	Ha	0.1	0.5	0.6	0.8	0.7	0.3	0.4	0.7	0.8	0.6	2013.Mar.22	2013.Mar.22
7	StandB	PWW	450	Ha	0	0.1	0.1	0.1	0.1	0.1	0	0.1	0.1	0.1	2013.Mar.22	2013.Mar.22
8	Stand4	PSW	300	Ha	0	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	2013.Mar.22	2014.Jun.27
9	Test Stand	PSW	250	Ha	2	6.5	8.5	10.5	9.8	5.2	5.3	10.5	9.8	8.4	2014.Jun.27	2014.Jun.27
10	Stand4	PWW	300	Ha	0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	2014.Jun.27	2014.Jun.27

Figure 19.—Screen shot of Excel spreadsheet created by using the Export Stands to Excel option on the Review Stands page.

4. You can also export information only for stands in a particular region. To do this, filter your list of stands by the region you want, and then click on the Excel icon to export. Only the filtered records will be exported.

## QUESTIONS AND ANSWERS

*Why are there different ways to enter data? When would I use “Lump Sum”?*

Data may be entered into PRESTO in several ways, depending on your objectives. Lump sum data entry is an “exploring” mode and does not require detailed harvest volumes. One of the issues that managers and landowners often want to understand is the effect of changing rotation length, which changes the product mix. Using lump sum data entry, you can quickly assess the differences in stored carbon over time with varying amounts of pulpwood and sawtimber. The wood type entry is appropriate when you know your harvested volumes of pulpwood and sawtimber and are working with just a few stands. For users with multiple harvests and stands, using the batch upload template will eliminate the need to enter each stand individually.

*How does PRESTO calculate carbon from harvest volume?*

PRESTO is based on the methods and ratios that were developed to support the 1605b program of voluntary greenhouse gas reporting; these methods are consistent with the IPCC guidance on harvested wood products. For a detailed explanation, see Smith and others (2006).<sup>2</sup>

*Why are there only categories of hardwood and softwood, and not individual species?*

The ratios that PRESTO uses were developed as general ratios for each region, compiled from available data. Species-specific ratios were not developed as the available data sets would be too small to produce values that could be widely applied.

*Does PRESTO have built-in error checking? What if I make a mistake when I enter my data?*

PRESTO checks that the correct fields have been completed, but does not have an error-checking routine to flag extreme values. If you enter a harvest of 120,000,000 mbf of hardwood sawtimber per acre in the Lake States region, PRESTO will apply the correct coefficients to the data that you entered and return a result, even though such a harvest value does not make sense. Please enter data carefully, and if using the batch upload, check your spreadsheet for errors before loading your data into PRESTO. Always check your output to ensure that the carbon values returned are logical for a given harvest level. If they seem to be unreasonable, review your stand to ensure that the correct values and units were entered.

*Why is there no option to select a bioenergy product, such as wood chips or pellets?*

Although the methods to account for the amount of energy or heat units that could be produced from a given harvest value are straightforward, many other factors are involved in bioenergy calculations, and these are often the result of operational or policy parameters (for example, are the chips to fuel a cogeneration system or for direct production of electricity?). As such, bioenergy calculation is outside the scope of this tool.

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<sup>2</sup> Smith, J.E.; Heath, L.S.; Skog, K.E.; Birdsey, R.A. 2006. Methods for calculating forest ecosystem and harvested carbon with standard estimates for forest types of the United States. Gen. Tech. Rep. NE-343. Newtown Square, PA: U.S. Department of Agriculture, Forest Service, Northeastern Research Station. 216 p.

*How do I interpret and use the report? Why are there two types of reports, the 10-year and the 100-year average?*

Carbon that may be considered to be stored is reported in the “Stored” column, and is the sum of the carbon in products in use and carbon in products in landfills. The amounts of carbon in the categories change over time, as products remain in use, are discarded to landfills, decay in landfills, are burned, etc. To estimate total carbon for a stand, you would add the value in the “Stored” column to your estimate of carbon in your stand (depending on the pools that you choose to inventory and estimate, this may be just live tree carbon, or may include other pools such as standing dead and down dead). The 10-year reports illustrate how the carbon in the different pools shifts and changes over time. The 100-year average represents the average carbon in that pool over a 100-year period, and is the metric used by the California Air Resources Board protocol. If you want to explore the effects of changing the mix of products between wood types and pulpwood and sawtimber, either report format may be used. In any case, the value in the “Stored” column is the variable to compare between harvest scenarios.

*What about logging slash? Does PRESTO track the carbon harvested but not removed from the stand?*

No, PRESTO deals only with the main stem and does not track slash. If you are interested in a more comprehensive carbon report, consider using the Forest Vegetation Simulator (FVS), which is a stand-level growth and yield modeling system that allows the user to simulate a variety of harvests and other management treatments. The Fire and Fuels Extension to FVS includes options for stand-level carbon reports and harvested carbon reports. By using both reports, you can estimate carbon in a wide variety of pools, and manage logging slash in several ways. For more information on these reports, see Hoover and Rebain (2011)<sup>3</sup>. Note that FVS requires detailed data and is a complex model requiring a significant amount of time to learn.

## **ACKNOWLEDGMENTS**

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<sup>3</sup> Hoover, C.M.; Rebain, S.A. 2011. Forest carbon estimation using the Forest Vegetation Simulator: seven things you need to know. Gen. Tech. Rep. NRS-77. Newtown Square, PA: U.S. Department of Agriculture, Forest Service, Northern Research Station. 16 p.

Hoover, Coeli M.; Beukema, Sarah J.; Robinson, Donald C.E.; Kellock, Katherine M.; Abraham, Diana A. 2014. **PRESTO: online calculation of carbon in harvested wood products**. GTR-NRS-141. Newtown Square, PA: U.S. Department of Agriculture, Forest Service, Northern Research Station. 20 p.

Carbon stored in harvested wood products is recognized under international carbon accounting protocols, and some crediting systems may permit the inclusion of harvested wood products when calculating carbon sequestration. For managers and landowners, however, estimating carbon stored in harvested wood products may be difficult. PRESTO (PProduct ESTimation Tool Online) is a Web-based tool that enables users to easily estimate the carbon stored in harvested wood products and the changes in this quantity over time. The tool may be used in an exploratory mode to examine the impacts of changing the amounts of longer- and shorter-lived products, or with specific harvest data to produce stand-level reports. The methods used are consistent with the Intergovernmental Panel on Climate Change (IPCC) Good Practice Guidance, as well as U.S. voluntary carbon accounting guidelines.

**KEY WORDS:** harvested wood products, carbon accounting, forest carbon, HWP carbon estimation

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