PUBLIC SITE UPDATES

Plains CO_2 Reduction (PCOR) Partnership Phase III
Task 2 – Deliverable D13

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PUBLIC SITE UPDATES

EXECUTIVE SUMMARY

This report summarizes the 2014 contractual update to the Plains CO_2 Reduction (PCOR) Partnership public Web site for the period of July 1, 2012, through June 30, 2014. The central focus of this update is the implementation of a comprehensive Web-tracking and research effort based on Google Analytics. This tracking work included an inventory of Web pages and other trackable elements (PDFs, documentaries, and video clips) and the development and implementation of a standard operating procedure for tracking, included as an appendix to this report. Other modifications include a video player upgrade that improved functionality for video streaming and made the tracking of video clip access possible. In addition, several pages were revised including the Home page, Atlas page, About the Partnership page, Carbon Capture and Storage page, Fact Sheets page, and several project pages in the CO_2 Sequestration Projects section. A Final Reports page was also added. The PCOR Partnership public Web site has been online since early 2004, and the next contractual update is due in July 2016.

PUBLIC SITE UPDATES

INTRODUCTION

The U.S. Department of Energy (DOE) Office of Fossil Energy National Energy Technology Laboratory's Regional Carbon Sequestration Partnership (RCSP) Program requires that each regional partnership have a public Web site to inform and educate the general public regarding sequestration in general and regional RCSP activities. The Plains CO_2 Reduction (PCOR) Partnership's public Web site has been live since the second quarter of 2004, and the PCOR Partnership outreach team is continuously striving to keep the public Web site content up to date, characterize the attributes of Web site use, and provide content in a valuable and understandable format to the general public. Three updates will be reported during Budget Period 4 (October 2009 to September 2015), with minor elements updated on a more regular basis. The most recent Web site update was provided July 31, 2012.

The PCOR Partnership is led by the Energy & Environmental Research Center (EERC) at the University of North Dakota. The PCOR Partnership public Web site team members include Dan Daly (Outreach and Education task leader), Charlene Crocker, Janet Crossland, and Katherine Anagnost. The Web site update was supported by the Programming, Communications, and Graphics groups at the EERC as well as other PCOR Partnership personnel.

SITE IMPROVEMENTS

The updates completed for the PCOR Partnership public Web site for the period of July 1, 2012, through June 30, 2014, include extensive review and revision to tracking visitor interactions, an upgrade of the video player and Video Clip Library, and updates to several existing Web pages. These include the home page, replacing the *PCOR Partnership Atlas*, 4th edition, with the 4th edition, revised, minor changes to text and images on individual project pages in the CO_2 Sequestration Projects section and updates to the About the Partnership page and the Reports page. Each of these changes went live during the reporting period as noted in the information that follows.

TRACKING VISITOR ACTIVITY ON THE WEB SITE

The PCOR Partnership Web site was originally designed and programmed in 2004, a time when measuring the impact of a Web site was in its infancy. Since then, monitoring visitor behavior, henceforth referred to as tracking, has become one of the most important behind-the-scenes components of an outreach Web site. If set up and maintained properly, tracking can be a very powerful tool for research. To that end, the PCOR Partnership outreach team focused on implementing a comprehensive Web-tracking upgrade during this reporting period.

Background

The ability to track visitor interactions provides the means to evaluate the effectiveness of a Web site to engage visitors. In addition to counting the number of visitors to the site, tracking software has evolved to record how visitors arrive at a Web site, length of their stay, and how they move through the Web site (pathflow). Analysis of the results can be used to infer what attracts visitors, where to focus future upgrades, and the effectiveness of those upgrades (provided adequate baseline data were collected prior to upgrades). The tracking data collection tool is ideal for experiments designed to measure the impact of site modifications as well as the impacts of efforts to attract visitors (called campaigns), for example, e-mail blasts with embedded links. In addition, tracking results are critical for assessing the role of the Web site in the sum of all outreach activities.

Tracking visits to the public outreach Web site was initiated in 2006 using Web Trends software. Reporting initially did not differentiate among users (i.e., internal and external visitors) and was used primarily to give an indication of the total number of visitors to the Web site and the geographic location where they accessed the Web site. In April 2010, the tracking software for the Web site was replaced with Google Analytics (GA) Standard, a free product offered by Google. This change was made as part of a move for all EERC-administered Web sites, including the PCOR Partnership public outreach site. As before, using the 2010 version reporting did not differentiate among users (i.e., internal and external visitors), and GA was used primarily to give an indication of the total number of visitors to the Web site and the location from where they accessed the Web site. The desire to take advantage of the ever-improving level of assessment offered by evolving GA tracking technology was the driving force to implement a more comprehensive tracking scheme in 2012. It should be noted that the Web Trends data are not comparable to the GA data, and as a result, the tracking data cannot be aggregated to provide a meaningful long-term assessment of visitor behavior.

The Web site-tracking objectives for this reporting period included:

1. Inventorying the tracking status of the public Web site.

2. Ensuring that all elements were appropriately tracked.

3. Adjusting Web site elements to take fullest advantage of the streamlined reports available in the free version of GA tracking software.

4. Developing a standard operating procedure (SOP) for tracking visitor characteristics, traffic sources, and content viewed for quarterly and annual reporting.

The steps taken and outcome of efforts to achieve these objectives are as follows.

Initial Inventory of Tracked Components and Reporting

Integral to a comprehensive Web-tracking and data collection scheme is placing a tracking tag on every item for which visitor data are to be collected. The tag consists of a short string of computer code recognized by the tracking software as instructions to collect data. Thus the first step was a review of all of the elements of the Web site to determine which elements were actually tagged for tracking. The elements investigated included Web pages, PDFs, and streaming video (both short clips and full-length documentaries).

Performed in July 2012, the inventory of the Web element-tracking status revealed that 51 of 55 Web pages were being tracked and that none of the 123 other trackable elements (PDFs and videos) were being tracked. Among the untracked pages were the home page, Educators page, Educator Links page, and Kids page. Because of this incomplete page-tracking situation, data prior to July 2012 do not provide a comprehensive representation of visitor behavior on the Web site as a whole.

Since the other elements of the Web site were not tracked, it was impossible to determine whether visitors were accessing the video and document components. Likewise total visits to the Web site were underreported because of the omission of pages and other elements from the tracking scheme. The extent of this bias cannot be determined retroactively.

At the time of the inventory, the reporting techniques did not differentiate between internal and external visitors. This meant that the manner in which data were being reported did not distinguish between the activities of project personnel involved in reviewing, updating, and programming site components and actual visitors to the Web site for the pages that were being tracked. Thus all site activity resulting from programming, testing, and reviewing of the Web page changes on the test servers were being counted by GA as visits to the live Web site unless the programmers specifically turned off tracking for their computers. Even though programmers turned off the tracking function during their work, tracking continued for project personnel and other reviewers who accessed the test site. This resulted in inflation of total visits and activity data, the extent of which can be determined retroactively, but only for the pages that were actually tracked.

Improved Scheme for Tracking Elements

Once the inventory exposed the shortcomings of the tracking scheme, preparation began to improve the system on two fronts: implementing broader tracking capabilities and refining data analysis capabilities.

Determining whether a Web page contains a tracking code is a relatively simple process visible by viewing the source code while visiting a Web page (see instructions in Appendix A,

Section 3.3.3). It is also a simple process to ameliorate. Determining whether other elements are tracked requires accessing the GA account as well as coordinated action on the Web site either using real-time reporting or GA reports (see instructions in Appendix A, Section 3.3.3). This was not achievable until the project team gained access to the GA account, which was provided to the outreach team in September 2012. To add tracking codes to PDFs, a click event (onClick) JavaScript was added to each link and the "pageTracker._TrackPageview" method of GA was called to track the PDF as a page view. No change to the GA setup was needed. Streaming video tracking was not achievable until a new player was installed in September 2013 (described in the Video Clip Library section, page 6).

Refining the data analysis capabilities required developing a system to separate project traffic (hereafter internal traffic) from actual outreach visitor traffic (hereafter external traffic). Since internal computer-based traffic comes from computers with known IP addresses, efforts focused on separation via computer address. Although the most straightforward method would be to use GA filters, this method irrevocably eliminates data. Thus the team has relied on a GA sorting technique called "advanced segments" that will not alter the original data set (similar to the function of a filter in an Excel spreadsheet) and can be applied to past data. The method is described in Appendix A, Section 5.5.1. Procedures were also developed to use the advanced segments technique to divide the visitor data into geographic categories for quarterly and annual reporting. It should be noted that all of this data collection and sorting takes places within the GA software and thus requires access to the Web site's GA account.

The results of this effort are that internal desktop computer traffic has been isolated in GA. When the segment is activated, GA reprocesses the data, reporting only external visitor traffic. Beginning in October 2012, the outreach team now reports only external visitor activity to DOE.

Visitor data are much more accurate now that all elements of the Web site are being tracked and monitored periodically. For example, the "top pages visited" statistic generated by GA is accurate because the software is actually tracking all pages. Table 1 compares the state of Web site tracking at the beginning and end of this reporting period. Figure 1 illustrates the time line of achieving the Web component-tracking objective.

Table 1. PCOR Partnership Public Web Site Elements and Tracking Status

	July 1, 2012		June 30, 2014		
	Total Each	No. Tracked	Total Each	No. Tracked	As of
Pages	55	51	66	66	7/5/2012
Documentaries	5	0	5	5	9/30/2013
Video Clips	51	0	55	55	9/30/2013
PDFs	57	0	68	68	12/19/2012
Top Pages Visited	Not accurate (bias low)		Accurate		7/9/2012
External vs. Project Traffic Reporting	Not separated (bias high)		Separated Accurate		Retroactively to 4/1/2010

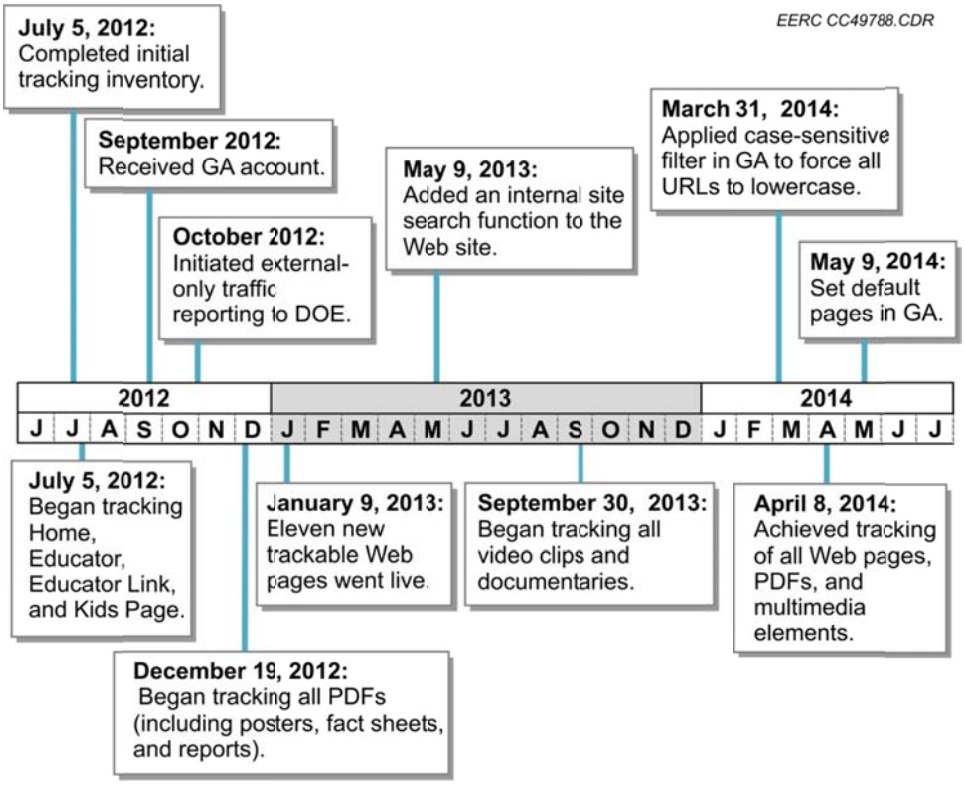

Figure 1. Tracking time line for the period July 1, 2012 – June 30, 2014.

Improved Consistency for Web Page Construction

The GA software offers several types of reports that include both summary and statistical analysis of the tracking data, an example of which is presented in Figure 2. These reports can greatly reduce the data reduction effort for the analyst. However, the Web site must be structured to consolidate the data as accurately as possible and to be aware of its limitations in order to make adjustments as needed. An example of a problematic situation is presented in Figure 3, where what appear to the GA software to be three different Web pages are actually different addresses (URLs) for the same Web page, in this case, the home page. There were, in fact, six separate instances of the home page listed in the reporting period selected.

In order for the program to do the best job of consolidating the data into the appropriate category, the outreach team inventoried all issues and worked with the EERC Web team to resolve the issues. The results of the inventory are summarized in Table 2. Some of these issues required alterations to the programming on pages of the Web site, while others required actions to be taken within the GA account. All actions were undertaken by EERC programming personnel.

Page	Pageviews ↓	Unique Pageviews	Avg. Time on Page	Entrances	Bounce Rate	% Exit	Page Value
PCOR US region	1,946 % of Total: 11.95% (16,284)	1,494 % of Total: 11.90% (12,557)	00:01:33 Site Avg: 00:01:43 (-9.00%)	688 % of Total: 10.75% (6,401)	55.96% Site Avg: 64.74% (-13.56%)	35.35% Site Avg: 39.31% (-10.06%)	$0.00 % of Total: 0.00% ($0.00)
1. /pcor/	352 (18.09%)	288 (19.28%)	00:01:14	283 (41.13%)	43.46%	42.61%	$0.00 (0.00%)
2. /PCOR/videogallery/default.aspx	148 (7.61%)	54 (3.61%)	00:01:30	31 (4.51%)	45.16%	26.35%	$0.00 (0.00%)
3. /pcor/sequestration/whatissequestration.aspx	142 (7.30%)	125 (8.37%)	00:04:22	125 (18.17%)	84.00%	82.39%	$0.00 (0.00%)
4. /PCOR/about/default.aspx	94 (4.83%)	68 (4.55%)	00:01:59	10 (1.45%)	20.00%	23.40%	$0.00 (0.00%)
5. /pcor/videogallery/default.aspx	76 (3.91%)	22 (1.47%)	00:00:39	2 (0.29%)	50.00%	11.84%	$0.00 (0.00%)
6. /PCOR/	71 (3.65%)	59 (3.95%)	00:02:28	57 (8.28%)	28.07%	32.39%	$0.00 (0.00%)
7. /PCOR/co2seqprojects/default.aspx	58 (2.98%)	45 (3.01%)	00:00:52	7 (1.02%)	100.00%	25.86%	$0.00 (0.00%)
8. /PCOR/default.aspx	54 (2.77%)	41 (2.74%)	00:02:02	7 (1.02%)	71.43%	40.74%	$0.00 (0.00%)
9. /PCOR/region/default.aspx	52 (2.67%)	39 (2.61%)	00:00:24	1 (0.15%)	0.00%	3.85%	$0.00 (0.00%)
10. /PCOR/sequestration/default.aspx	49 (2.52%)	38 (2.54%)	00:00:55	0 (0.00%)	0.00%	18.37%	$0.00 (0.00%)
11. /PCOR/newsandpubs/default.aspx	46 (2.36%)	38 (2.54%)	00:01:16	4 (0.58%)	25.00%	8.70%	$0.00 (0.00%)
12. /PCOR/about/team.aspx	32 (1.64%)	26 (1.74%)	00:01:22	2 (0.29%)	0.00%	21.88%	$0.00 (0.00%)
13. /PCOR/Educators/	28 (1.44%)	20 (1.34%)	00:01:52	2 (0.29%)	0.00%	14.29%	$0.00 (0.00%)
14. /PCOR/about/becomeapartner.aspx	25 (1.28%)	20 (1.34%)	00:02:43	3 (0.44%)	33.33%	24.00%	$0.00 (0.00%)
15. /PCOR/FAQ/default.aspx	24 (1.23%)	23 (1.54%)	00:04:00	2 (0.29%)	0.00%	29.17%	$0.00 (0.00%)
16. /PCOR/newsandpubs/factsheets.aspx	24 (1.23%)	17 (1.14%)	00:01:34	2 (0.29%)	100.00%	16.67%	$0.00 (0.00%)
17. /PCOR/co2sequestrationprojects/default.aspx	20 (1.03%)	15 (1.00%)	00:00:52	0 (0.00%)	0.00%	20.00%	$0.00 (0.00%)
18. /pdf/PCOR_ATLAS_2012.pdf	20 (1.03%)	18 (1.20%)	00:03:18	0 (0.00%)	0.00%	50.00%	$0.00 (0.00%)

Figure 2. Example of GA report illustrating Web page visits and statistics.

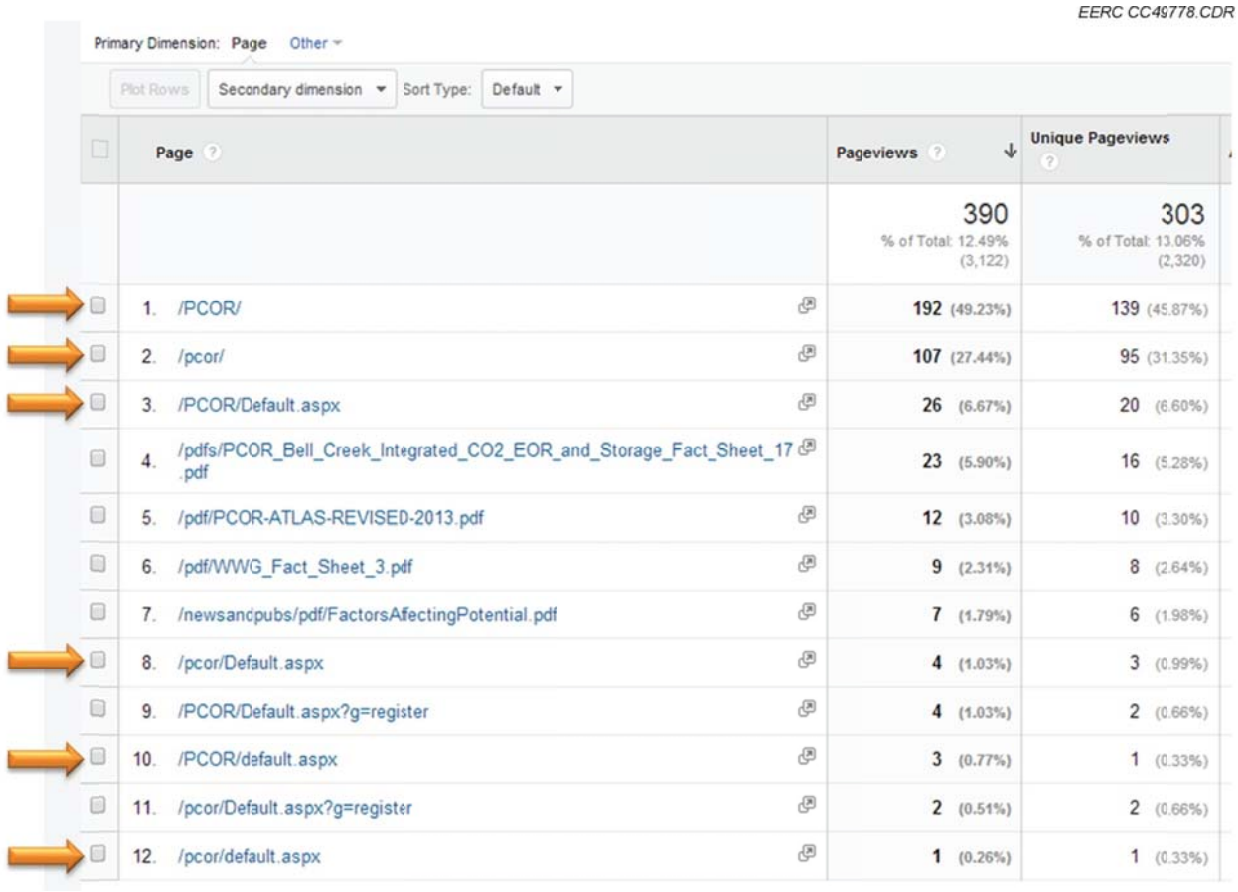

Figure 3. Example of GA report illustrating different addresses (URLs) for the same Web page. A total of six separate instances of the home page were listed in the reporting period selected.

Table 2. Summary of Issues Interfering with Accurate Consolidation of Data in GA

Issue	No. of Elements Involved	Resolution
Multiple URLs for the Same Web Page	249	Case sensitivity filter
Multiple URLs for the Same Web Page	32	Set default page
Incorrectly Named Page	2	Rename pages

Two examples of actions taken within the GA account were instrumental in resolving the bulk of the consolidation issues. They are the elimination of separate listings for addresses (URLs) with different combinations of upper- and lowercase letters (case sensitivity) and the presence versus absence of the filename at the end of the address (aka default page file). These are both illustrated as follows.

Example: Case sensitivity.
Filters were applied to eliminate multiple page counts by ignoring case sensitivity. Initially, undeerc.org/PCOR/ and undeerc.org/pcor/ were counted as separated pages. The filter forces GA to report the pageviews to undeerc.org/pcor/ regardless of the case types on the address bar.

Example: Set the default page of the Web site and subfolders.
undeerc.org/PCOR/default.aspx and undeerc.org/pcor/ were counted as two different pages. By setting a default Web page, they are counted as the same page, yielding more accurate results for page tracking in the standard report forms.

The procedure for implementing both of these changes is included in Appendix A, Section 3.3.3.

Standard Operating Procedure

Because data consistency is critical to efficient Web traffic reporting, the Web team prepared a draft SOP that outlines the current procedure for programming, data analysis, and reporting, including quality assurance and quality control (QA/QC) measures of Web visitor activity using the free version of GA Web-tracking software. The draft SOP is attached as Appendix A. Once approved, the document will be reviewed periodically to keep pace with the changing functionality of GA software and the project Web site.

Going forward, the changes implemented during this reporting period are expected to provide more comprehensive Web site tracking using GA for the remainder of the PCOR Partnership Program. Implementation of tracking at this time allows for the possibility of testing and research involving visitor preferences as well as the testing of strategies to increase visits in the future.

VIDEO CLIP LIBRARY

The Video Clip Library underwent the greatest change of the Web pages, both in ease of function and tracking capabilities. The new version has a similar layout to the previous library, but the appearance, shown in Figures 4–8, and feel are much more user-friendly. Whereas the previous player required a visitor to start at the beginning of a clip and play it through with only start and stop functions, this player functions as effortlessly as any Web-based streaming technology. This was accomplished by the purchase and implementation of Adobe Media Server (AMS) to host the videos on the server. AMS was selected for several reasons:

- The streaming speeds are faster compared to third-party services such as Vimeo and YouTube because the content is hosted on our servers.

- AMS produces an advertising- and pop-up-free experience for users.

- The elimination of "related content" after the video has played avoids potential inappropriate content (such as often seen on YouTube) being displayed.

- Some social video hosts such as YouTube are blocked at schools; this will not be blocked.

- AMS has dedicated hosting for different platforms such as Windows, MacIntosh, and mobile devices.

- AMS has the ability to serve up different streams and live-streaming content.

- Up-time and maintenance hours are controlled by the PCOR Partnership because the videos are hosted on our servers.

- Video access is now tracked via GA because the videos are hosted on our servers.

Figure 4. Landing page for the upgraded Video Clip Library.
Existing link: www.undeerc.org/PCOR/Video-Clip-Library/

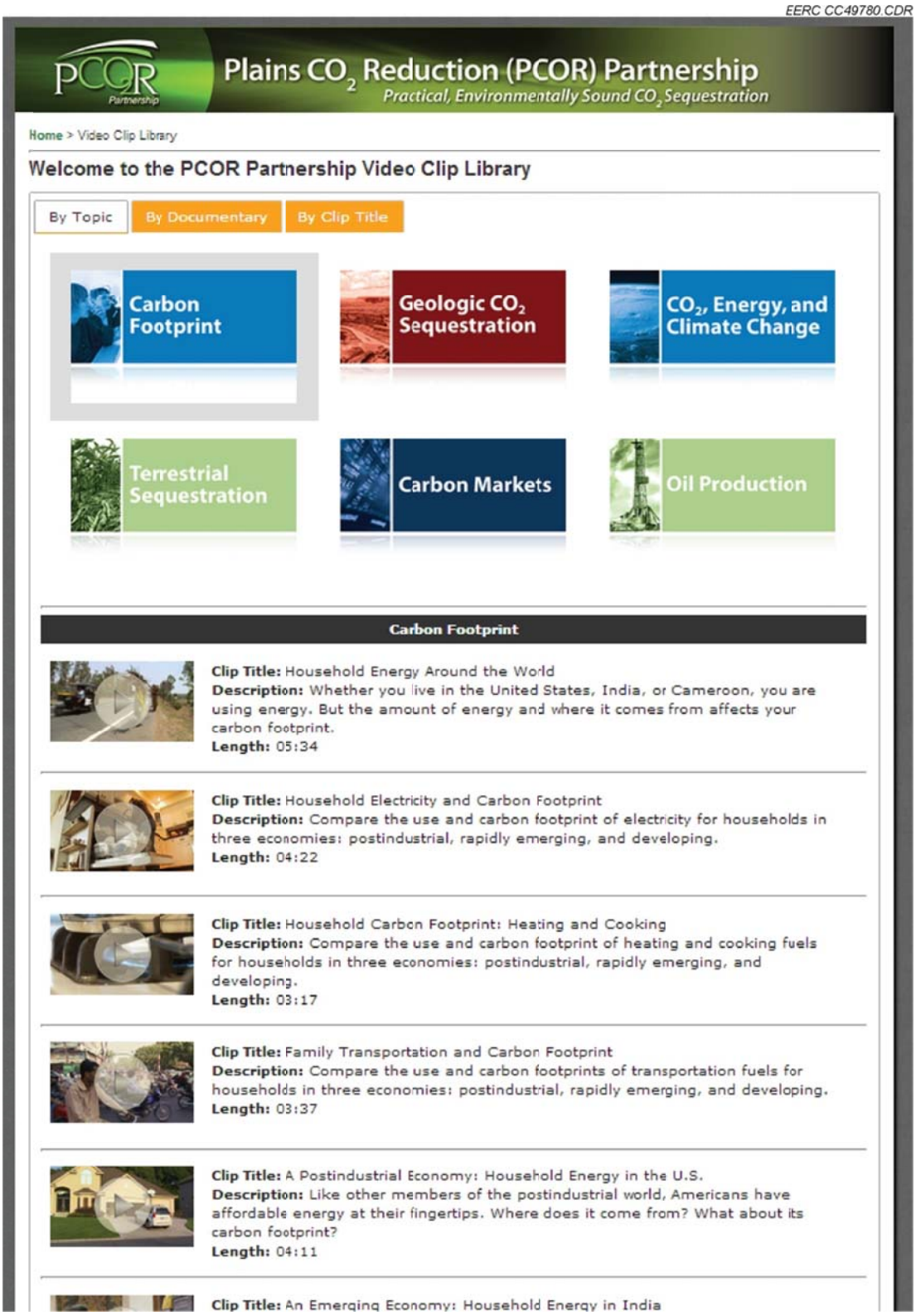

Figure 5. Landing page for the upgraded Video Clip Library, expanded to show five of the ten available clips under the topic “Carbon Footprint.”

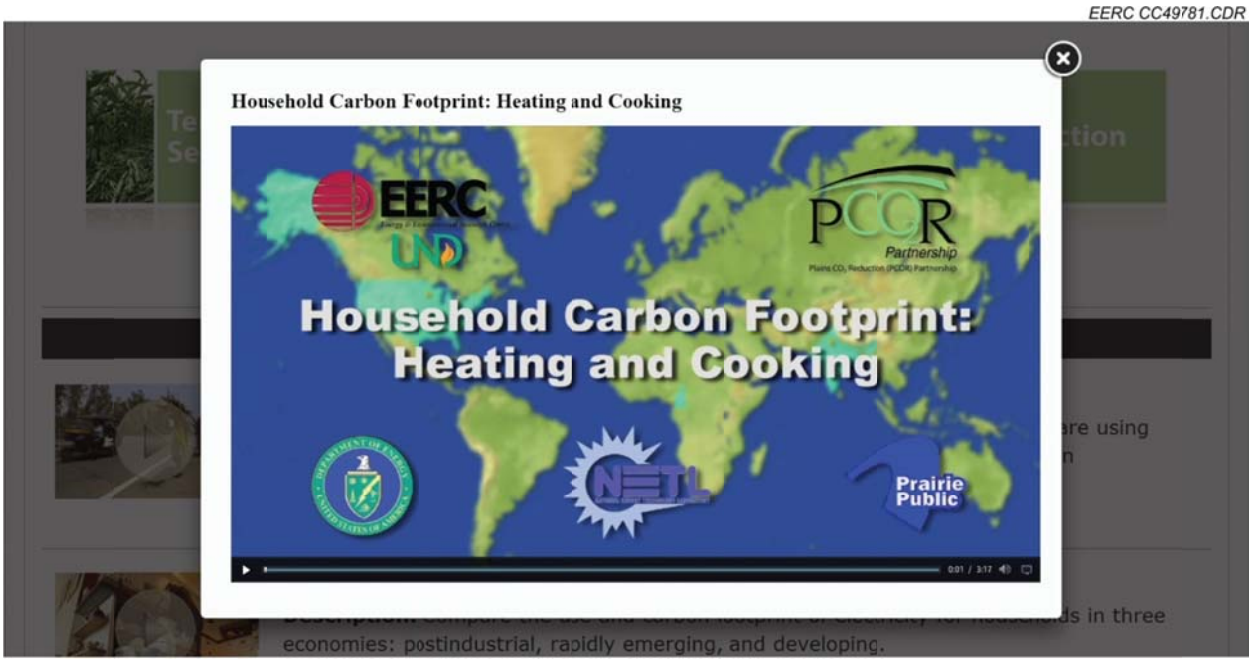

Figure 6. Clips in the upgraded Video Clip Library, which appear to play on top of the existing library page. In fact, they play in a separate page to facilitate tracking. The streaming options on the playing include start/pause, stop, moving the play point manually, and toggling between smaller and full-screen versions.

Figure 7. Documentary tab for the upgraded Video Clip Library.

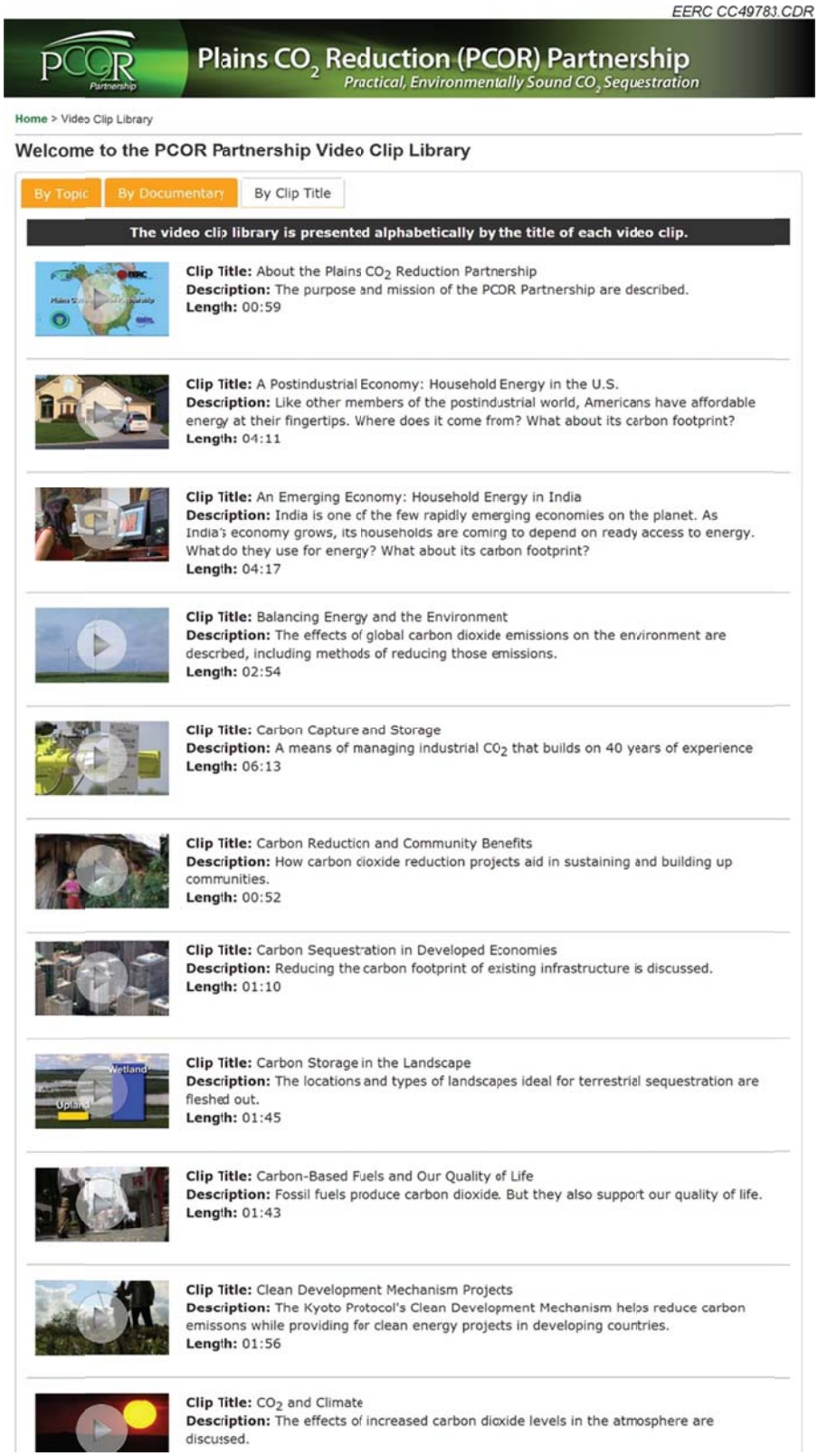

Figure 8. Clip title tab for the upgraded Video Clip Library shows 11 of 55 clips available.

HOME PAGE

Several elements comprise the changes to the home page (Figure 9). The horizontal navigation scheme near the top of the page has been streamlined to one row of audience-targeted choices that incorporates a search function heretofore unavailable on the Web site. Links to the home page, site map, and EERC Web site were removed from this location as they already appear in the footer of each page. The navigational changes took place in May 2013, and the capability of the search function to limit the search to within the PCOR Partnership Web site was implemented June 20, 2013.

A spot in the lower left corner has been reserved for the addition of the image and link for the Water Working Group fact sheets. "MVA Plans for Protection of Water Resources During the Geologic Storage of CO_2" is currently being featured. The home page has also been updated to include the updated images of the revised Bell Creek fact sheet; *PCOR Partnership Atlas*, 4th edition, revised; and the shortcut button for the PCOR Partnership annual meeting (which will be removed after the September meeting). All changes have already been implemented on the existing public Web site home page.

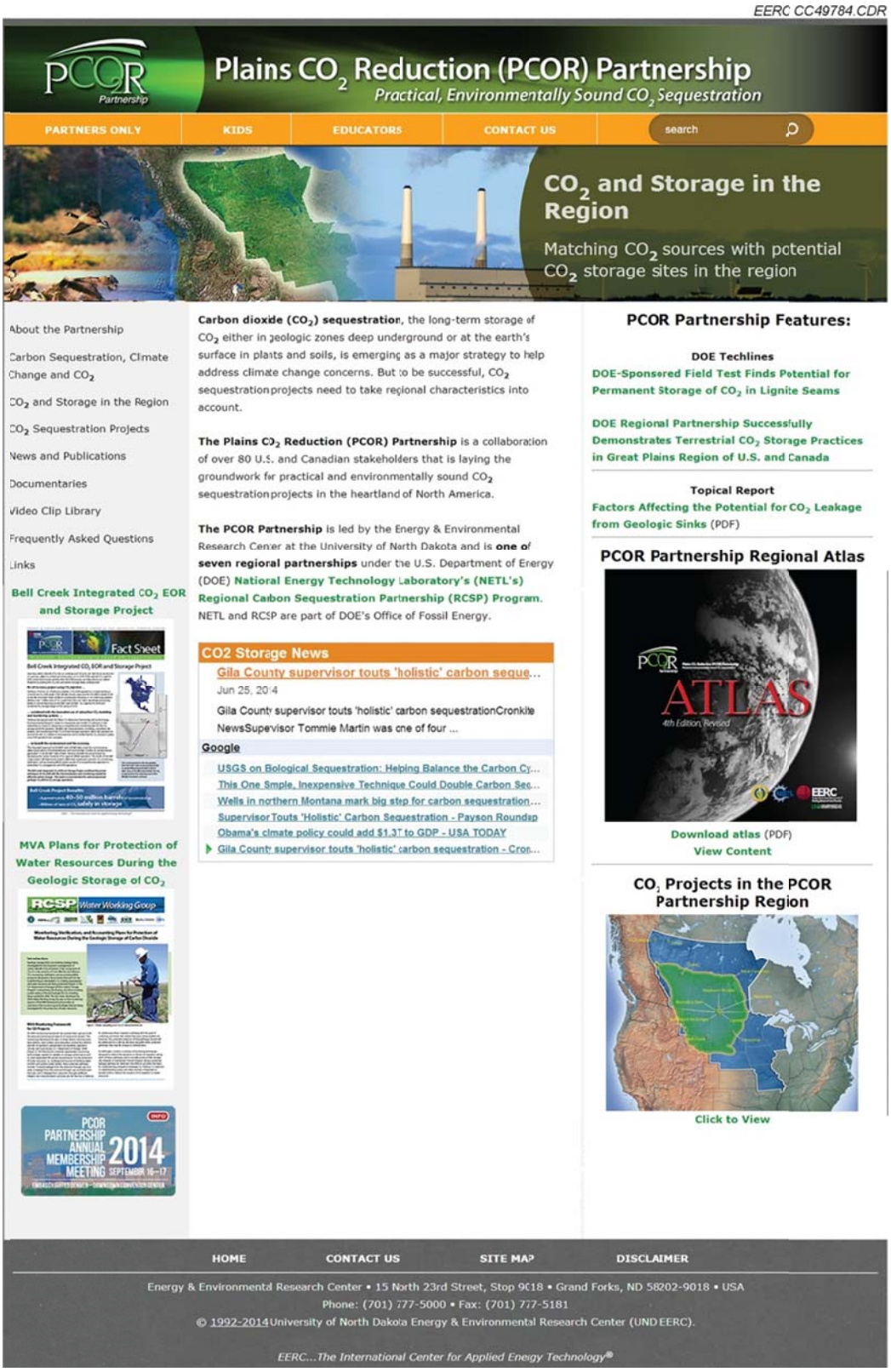

Figure 9. Updated home page.
Existing link: www.undeerc.org/PCOR

THE ATLAS, 4TH EDITION REVISED

The PCOR Partnership Regional Atlas page (accessed via the home page and the News and Publications menu selection) has been updated with content from each of the seven chapters and the reference section of the 4th edition, revised (published 2013). Whereas the previous version included hyperlinks to the corresponding page in the Atlas PDF for each individual topic listed, the updated page has hyperlinks from the chapter headings to the beginning of each chapter's PDF, which has a much shorter downloading time. Clicking on these hyperlinks now records visitor behavior in GA. As was available in the previous version, the PDF of the entire atlas can be downloaded from both the home page and the Atlas page. This update became available on the public Web site in August 2013.

ABOUT THE PARTNERSHIP PAGE

The About the Partnership page, shown in Figure 10 was augmented in September 2013 with more information on Phase III, which includes the Phase III prospectus and Phase III fact sheet.

Figure 10. About the Partnership Web page.
Existing link: www.undeerc.org/PCOR/About/

CARBON CAPTURE AND STORAGE (CCS) PAGE

Adjustments were made to the CCS page, shown in Figure 11 top, in April 2014 to distinguish between definitions that appear in front of the page (see Figure 11 bottom) when the visitor clicks on the associated question mark in a green circle and hypertext that moves the visitor to another page (geologic sequestration Figure 11 top). Prior to developing the ability to track visitor access to definitions, those were hover links.

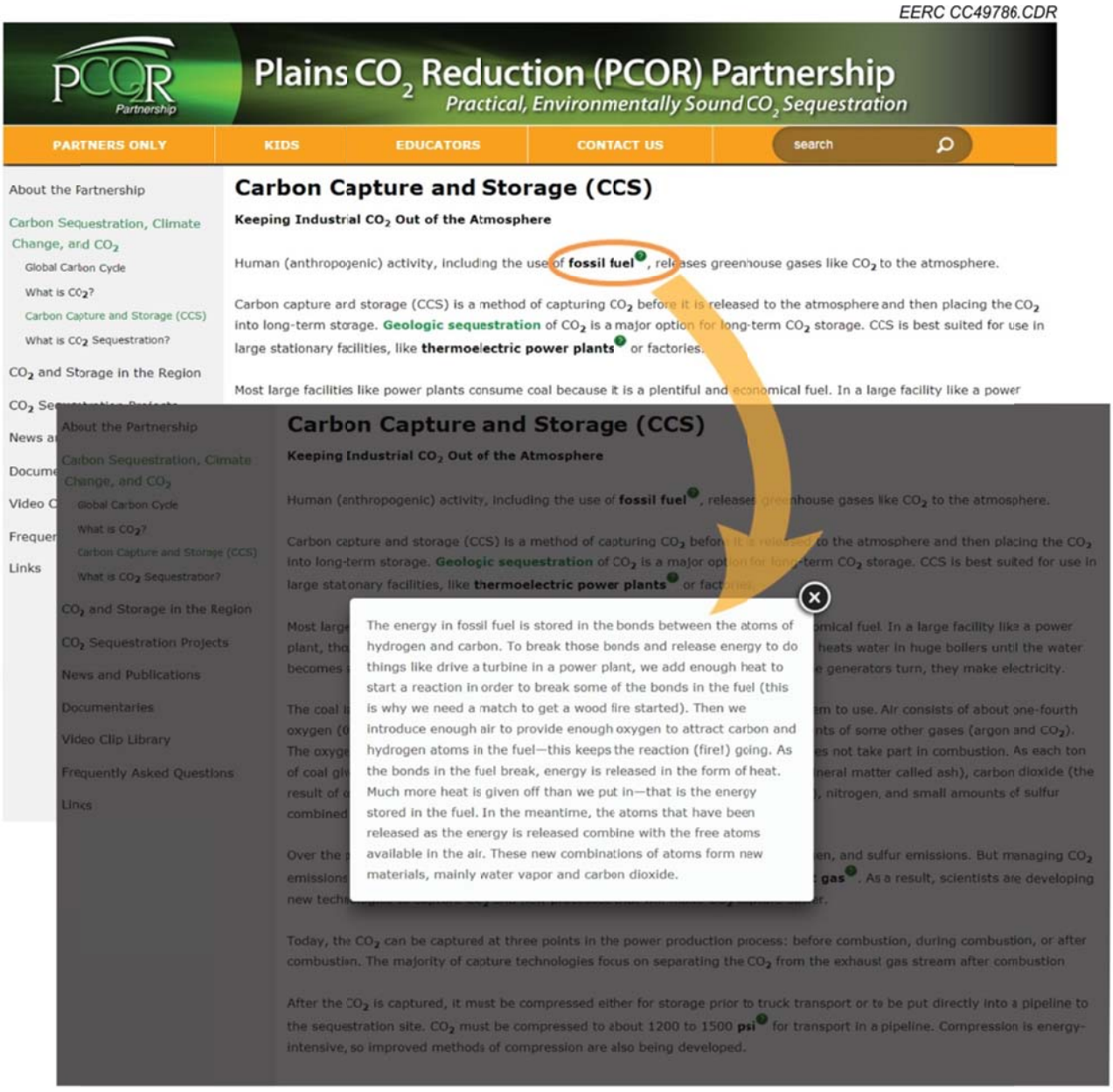

Figure 11. Carbon Capture and Storage Web page. Clicking on green circles activates definitions.
Existing link: www.undeerc.org/PCOR/Sequestration/CCS.aspx

CO_2 SEQUESTRATION PROJECT PAGES

Although the main landing page for this section of the Web site has remained the same, changes were incorporated into several of the individual project pages to update information. All project pages were reviewed, and the changes were implemented in February 2014. The four PCOR Partnership Phase II field validation "Learn More" links now go to the Regional Technology Implementation Plan (RTIP) executive summaries for each project rather than to the older project-specific fact sheets. It is anticipated that as updated Phase II field validation fact sheets become available, they will replace the RTIP executive summaries (images not included).

The Bell Creek Integrated EOR and CO_2 Storage Project page includes updated information on the estimated production (was ~35 million barrels, now ~40–50 million barrels [www.undeerc.org/PCOR/CO2SequestrationProjects/BellCreek.aspx]; current as of January 2014). Denbury's Commercial Project page has been updated to include the completion date for the Greencore pipeline (December 2012) (images not included) (www.undeerc.org/PCOR/CO2SequestrationProjects/Denbury.aspx).

The Quest CCS Project page (shown in Figure 12) now contains a photograph of the Shell Scotford facility in place of an image of the Quest CCS Project Overview.

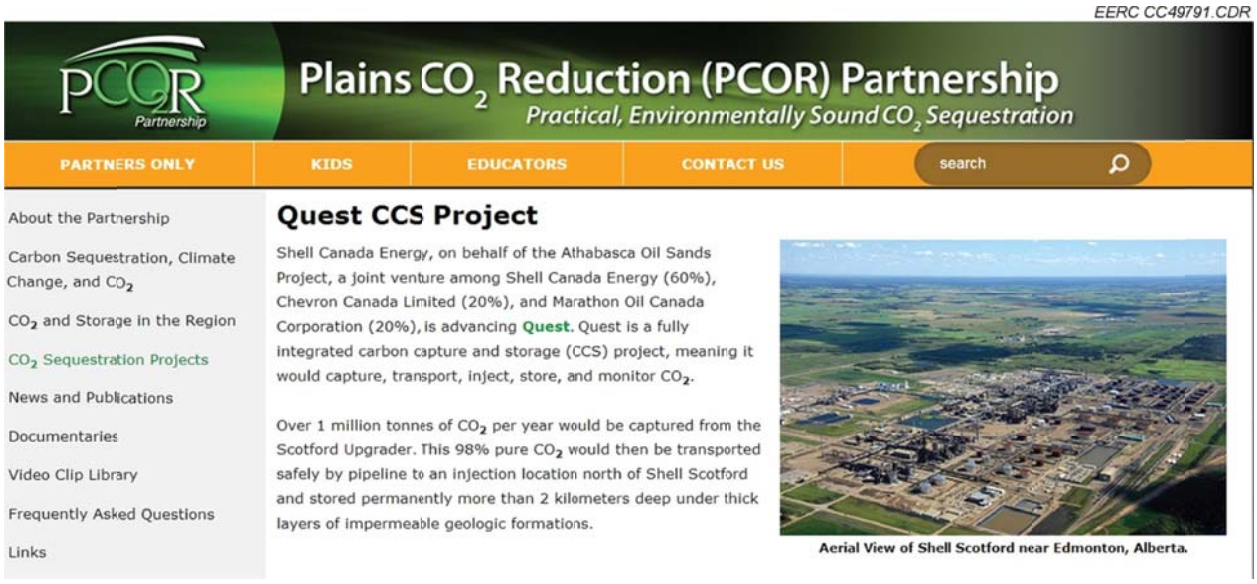

Figure 12. Quest CCS Project page, accessible from the CO_2 Sequestration Projects landing page.
Existing link: www.undeerc.org/PCOR/CO2SequestrationProjects/Quest.aspx

The Aquistore Project page (shown in Figure 13**)** now includes images and links to PDF downloads of the D94 Aquistore Project fact sheet and D95 Aquistore Project poster approved in February and January 2014, respectively.

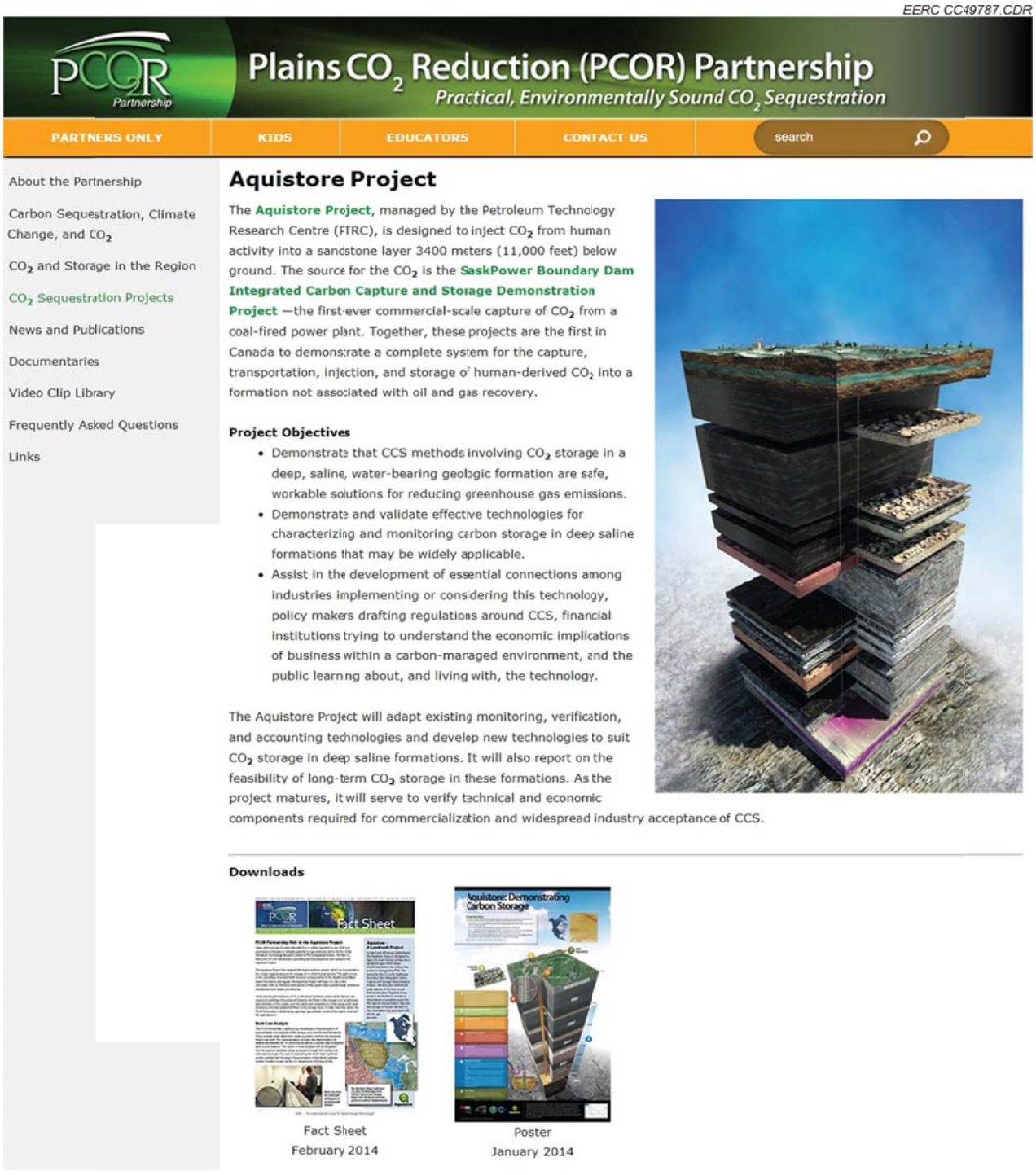

Figure 13. Aquistore Project page, accessible from the CO_2 Sequestration Projects landing page. Existing link: www.undeerc.org/PCOR/CO2SequestrationProjects/Aquistore.aspx

The Weyburn–Midale CO_2 Project page (shown in Figure 14) now includes a video clip from the documentary *Managing Carbon Dioxide: The Geologic Solution* added after the video play was updated in August 2013. The clip describes the Weyburn–Midale project and is entitled "CO_2 Goes Canadian."

Figure 14. Updated Weyburn–Midale CO_2 Project page—accessible from the CO_2 Sequestration Projects landing page—which now includes the video clip describing the project.
Existing link: www.undeerc.org/PCOR/CO2SequestrationProjects/Weyburn.aspx

FACT SHEETS PAGE

The Fact Sheets page, shown in Figure 15, was rearranged in November 2013 to include categories that organize the list of 2- and 4-page fact sheets developed over the three phases of the PCOR Partnership Program. The page also includes the three fact sheets developed through the RCSP Water Working Group.

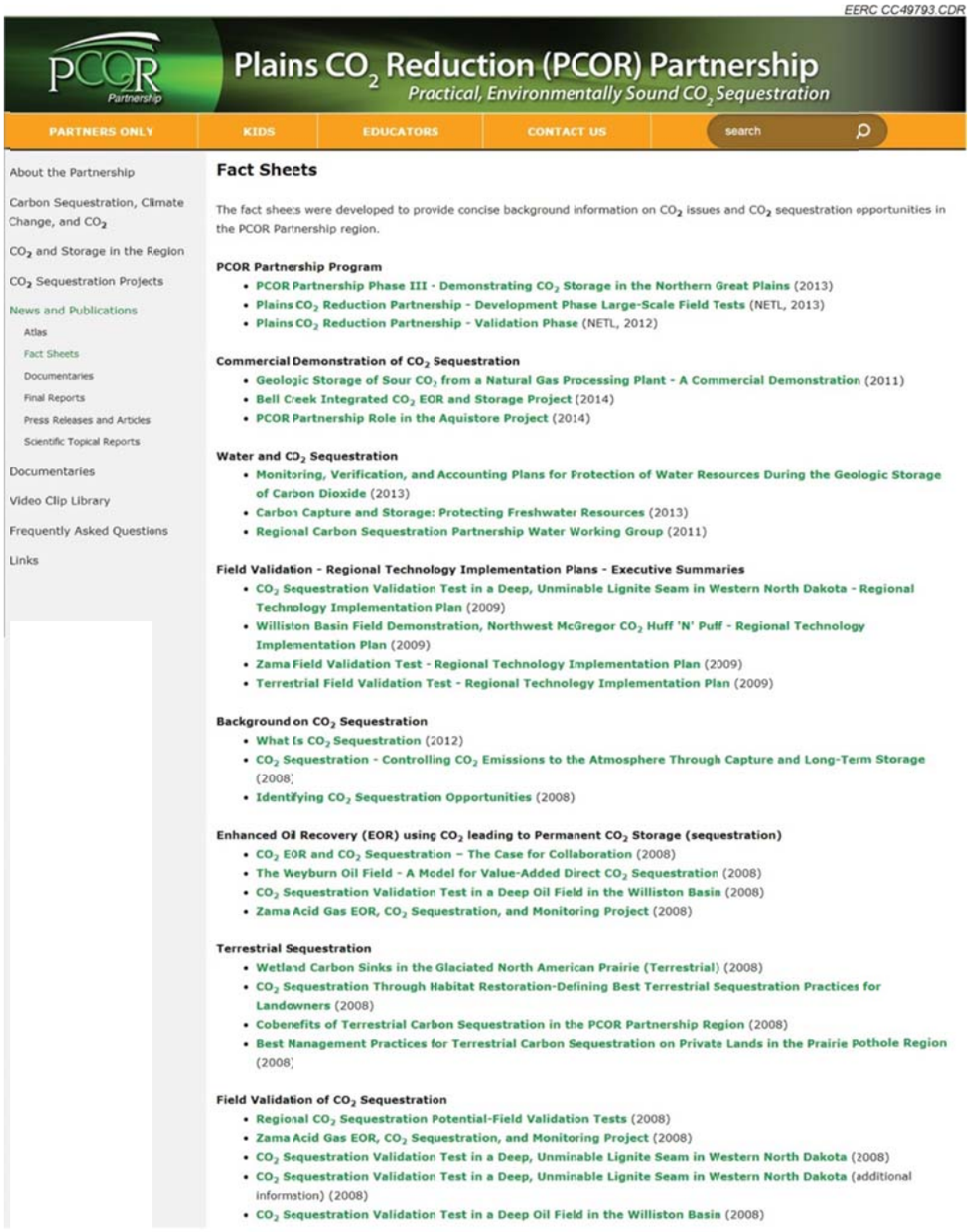

Figure 15. Updated Fact Sheet Web page includes categories to organize the materials available. Existing link: www.undeerc.org/PCOR/newsandpubs/factsheets.aspx

FINAL REPORTS PAGE

The Final Reports page, shown in Figure 16, was added in October 2013 to provide a separate location for the Phase I and Phase II final reports.

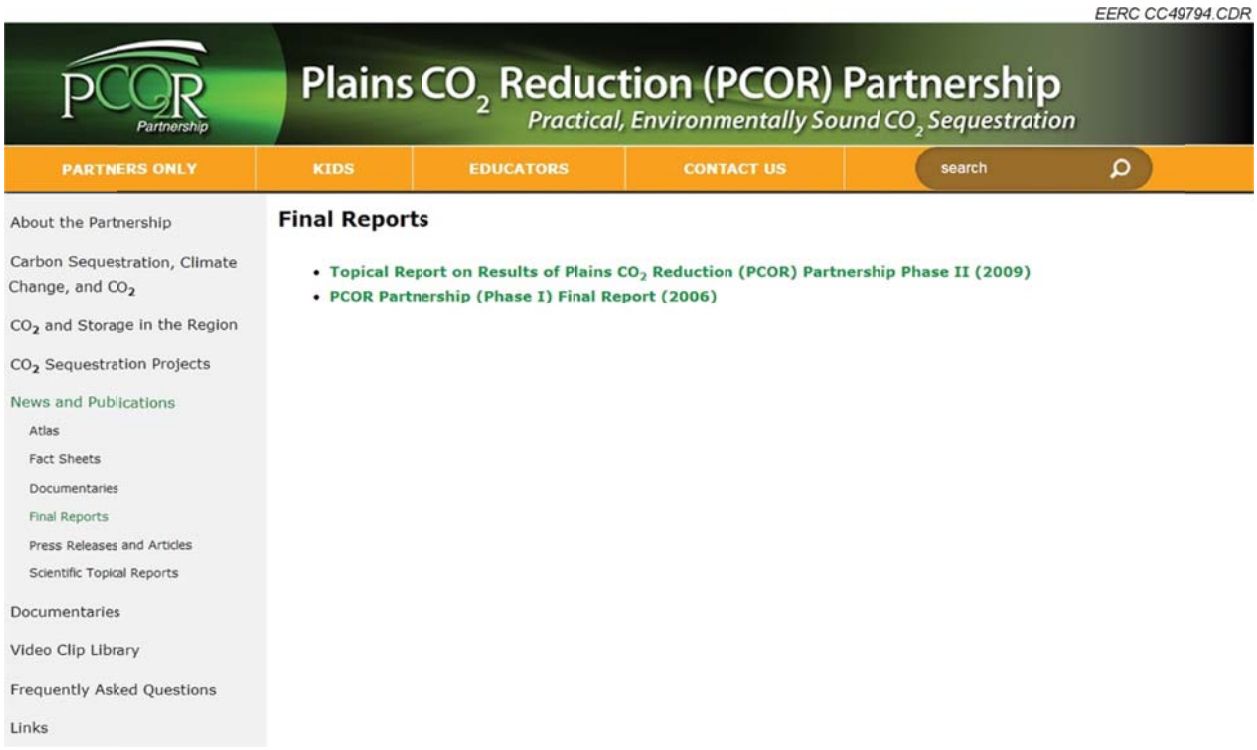

Figure 16. New Final Reports page.
Existing link: www.undeerc.org/PCOR/newsandpubs/final-reports.aspx

FUTURE WORK

The next Web update is due on July 31, 2016. In the area of Web traffic tracking, future work is expected to include periodic review and refinement of the tracking SOP, configuring the Web site search function to record words visitor search, adjust the session timeout length to accommodate full-length documentary viewing, refine the bounce rate parameters, and set up tracking events to improve data collection for video interactions and PDFs. On the visible components of the Web site, work is expected to include updating several pages to improve interactivity, updated information on active projects, and more materials targeting K–12 education (for teachers and students). These changes will be made as part of the effort to provide products that will serve the needs of key audiences, increase overall traffic to the site, and improve our ability to track and assess Web site use.

APPENDIX A

STANDARD OPERATING PROCEDURE (SOP) FOR TRACKING USER ACTIVITY ON THE PCOR PARTNERSHIP PUBLIC WEB SITE

STANDARD OPERATING PROCEDURE (SOP) FOR TRACKING USER ACTIVITY ON THE PCOR PARTNERSHIP PUBLIC WEB SITE

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STANDARD OPERATING PROCEDURE (SOP) FOR TRACKING USER ACTIVITY ON THE PCOR PARTNERSHIP PUBLIC WEB SITE

1. Introduction

1.1. Purpose

Web site analytics[1] are tracked in order to evaluate visitor behavior and to estimate the effectiveness of the Plains CO_2 Reduction (PCOR) Partnership public Web site in meeting its objectives. Analytics-monitoring software is used to measure online performance through user interactions on a Web site from which visitor behavior trends can be inferred. The performance of analytics software, including its ability to capture, record, and present data accurately, is affected both by the way in which the initial tracking code is set up and administered on the Web site and by a variety of other programming decisions and activities.

The purpose of this standard operating procedure (SOP) is threefold: 1) ensure every item is properly coded for tracking, 2) ensure all changes to the Web site (e.g., new Web pages, PDFs, videos, updates, etc.) are aligned with existing parameters for reporting accuracy, and 3) describe the procedure for analyzing and reporting data for the quarterly reports.

1.2. Materials

Google Analytics (GA) Standard, a free product offered by Google, has been implemented on the PCOR Partnership public Web site to provide standardized data analysis on user interaction for the public Web site as well as focused in-depth research into visitor behavior.

Spreadsheets (Microsoft Excel) are used to document changes and reduce data.

1.3. Maintaining Extensive History Notes

Regardless of whether the Web site is new or is already live, a detailed spreadsheet of all Web pages, PDFs, and other multimedia items should be developed and maintained. This spreadsheet is used for quality assurance and quality control (QA/QC) to ensure that all Web items are accounted for and also as a reference if naming conventions differ from elements on the Web site. In addition to file names, the spreadsheet should include original author, go-live dates, QA/QC activities, and changes. Specific details are described in each section of this SOP.

2. What You Need to Know Before You Start

2.1. How GA Works

When visitors view a page on a Web site, the embedded tracking code is executed and begins collecting information on how users interact with the Web site's content. Raw data are sent to GA servers where single parameters are pieced together in a coherent manner for the characterization of visitor interactions. The reprocessed data are used to generate reports which are displayed in the GA interface (Google Developers, 2014). This basic process is shown in Figure 1.

[1] The field of data analysis. Analytics often involves studying past historical data to research potential trends . . . to evaluate the performance of a given tool or scenario (Business Dictionary, 2014).

Figure 1. GA data collection example (Brown and Molnar, 2011).

Once data have been processed in GA, the original data cannot be retrieved.

2.2. Cookies

GA will only track Web pages that contain the GA tracking code. This code uses a JavaScript embedded on each page to record information about the pages a user has seen. The tracking code uses "cookies," which are small pieces of data sent from the Web site and stored in a user's Web browser while the user is browsing a Web site. Example data include the Web site URL, information about the user's computer (operating system and Web browser), and how that user arrived at the Web site. Every time the user loads the Web site, the browser sends the cookie back to the server to notify the Web site of the user's previous activity (Internet Engineering Task Force, 2011). Figure 2 illustrates the cookies part in the data collection process.

Data collected from cookies are not infallible. Cookies can be blocked (removed or not reported) during private browsing (e.g., signing in with a Google account prevents GA from displaying user interactions while logged in). Also visitors who access the Web site using multiple devices and/or multiple browsers inflate Visitor data to a Web site (because GA will read that single user as multiple visitors. See more in Section 5.3.2.).

Figure 2. The role of cookies in GA data collection (Brown and Molnar, 2011).

3. Setup

3.1. Web Site Inventory and Documentation

A Web site comprises many components (Web pages, PDFs, videos, etc.) that change over time; it is imperative to create a detailed spreadsheet that accurately portrays the contents of the Web site at any given time and documents how it changes.

The PCOR Partnership public Web site spreadsheet is laid out with each row representing individual objects and each column documenting the attributes of that object as follows:

- An individual identification (ID) number for each Web link, page, video, PDF, and external link for easy reference (objects that appear on more than one page will have multiple entries; each are given a unique ID number).
- Object type (used to sort objects into the following categories: Web pages, videos, PDFs, and off-site links).
- Tracking status (tracked or not).
- Object links (as they appear on the site; pasted from the Web site to the spreadsheet).
- Page title names as they appear on the programmed page (recorded as another way to sort objects).
- The actual URL (pasted and used as a reference).
- Dates documenting updates and/or changes to any object.
- Notes relevant to Web objects.

3.2. GA Setup

3.2.1. GA Account

A Google account must be set up before GA can be implemented for a Web site. A Google e-mail address is not required to gain an account. Instructions for creating an account are provided at https://accounts.google.com/NewAccount.

Create a separate administrator account with your organization domain credentials, e.g., admin@undeerc.org, rather than creating a personal G-mail account such as JanePDoe@gmail.com. This offers the administrator the ability to add/edit users in case of personnel turnover.

After setup, GA will provide a unique tracking code like that shown in Figure 3. This tracking code will need to be installed across all pages of the Web site. For PCOR Partnership Web pages, this code is placed at the bottom of the page and is the last thing to load, thus ensuring the Web page and the content will load quickly for users.

Figure 3. Tracking code example (DBD Media, 2012).

The code beginning with UA-XXXXXXX-X should be unique to every newly created Web site.

3.2.2. Filters

GA provides multiple ways to sort data through the use of filters. Filters are applied before extracting the data from the Web site and are implemented in the order in which they are listed. Application of filters fundamentally changes the data processing in ways that cannot be reversed. Thus it is critical both to apply them thoughtfully with respect to possible data deletions and to consider the effect of applying one filter after another.

Filters cannot impact historical data, and the information excluded (if any) cannot be retrieved (DBD Media, 2012).

If the URLs for the Web site allow upper- and lowercase characters, GA will report on each version of the URL separately, recording these as independent Web pages. Forcing the URL reports to convert all URLs to one or the other (e.g., lowercase) will streamline data acquisition and reporting in GA. This filter was applied to the entire PCOR Partnership public Web site to set all URLs to lowercase on April 1, 2014. The following steps were applied in GA Administrator and used to implement the filter.

1. Enter your filter name: Force lowercase URL.
2. Filter Type: Go to custom then click on the lowercase radial.
3. Filter Field: In the drop-down, choose Request URL.

Example: *www.undeerc.org/PCOR/*
www.undeerc.org/pcor/

The outcome is that both URLs will be consolidated to *www.undeerc.org/pcor/*.

A filter was applied to the PCOR Partnership Web site on April 1, 2014, to consolidate multiple URLs. Barring unforeseen circumstances, they should not need to be reapplied. Steps may be subject to change. Check the GA Web site for updated procedures.

3.2.3. Default Page

The default page for a Web site is the page shown to a visitor when they type and paste only the Web site domain into the browser's location bar. Depending on the technology used, it is necessary to specify the default page (e.g., *default.aspx* or *index.html*) so that reference to a folder and file is not counted as a separate pageview.

> **Example**: *www.undeerc.org/pcor/* and *www.undeerc.org/pcor/default.aspx* are recorded as the same page in GA only after specifying the default page.

To avoid multiple listings for the same page and to further ensure the quality of GA report data, the PCOR Partnership Web programmers performed the following steps:

1. Click **Admin** at the top of any Analytics page.
2. Use the menus at the tops of the columns to select the relevant account, property, and view.
3. In the *View* column, click **View Settings**.
4. In the *Default page* field, enter the default page for this domain. This is the page that loads when a user enters only the domain of the site into their address bar. For example, if *www.example.com* loads the *index.html* Web page, enter `index.html` in this field.
5. Click **Apply**.

Steps may be subject to change. Check the GA Web site for updated procedures (start the help center).

3.3. Web Site Programming for Implementing GA

3.3.1. Naming Conventions

While GA allows a programmer great flexibility in naming Web elements, e.g., page titles, PDFs, and videos, there must be a consistent naming practice implemented in order to avoid data errors resulting from name duplication. Once a naming scheme has been developed, **stick with it**. Develop both a filing name and a navigation structure that remains consistent through the life of the project and ensures that internal links use the prescribed scheme. Changes made to names already embedded in the Web page impede GA's ability to aggregate data correctly when comparing data across time periods; i.e., changes occurring within a reporting cycle or period of interest must be aggregated manually. These changes must be recorded in the history notes section of the Web Inventory and Documentation spreadsheet (Section 1.3).

Web Page Titles

Each page title needs a separate and unique name (maximum of 60 characters). For practical purposes, the PCOR Partnership page name is first followed by the Plains CO_2 Reduction

Partnership as shown in the example below. This format provides Web users with an easy view of the unique page names on the Web browser tab (that is, the name of the page is first).

Example: Home | Plains CO2 Reduction Partnership
Atlas | Plains CO2 Reduction Partnership

PDFs
All PDFs need a unique and descriptive name. When a document is replaced with an updated version, the original name is retained to prevent reporting errors in GA.

1. Record all the PDFs in the Web Inventory and Documentation spreadsheet (Section 1.3). Include the date of publication.
   This spreadsheet provides a record of all PDFs available on the Web site, is integral to the QA/QC process to ensure all Web pages are accounted for, and is the reference for PDF document update activities.

2. Check that each PDF is dated within the document.
   The date should occur on the title pages for reports and in the lower right corner of the last page of fact sheets and posters. The date will include the month and year; day of the month is optional. If there is no date, request that it be added by the appropriate person (e.g., graphic designer, document control person, etc.).

3. If it is an update to a PDF that is already on the Web site, change the document name to match the original PDF currently on the Web site.

   Example: Fact Sheet 1 was updated in March 2013.
   Proper Updated PDF: */pdf/FactSheet1.pdf*
   Improperly Updated PDF: */pdf/FactSheet1RevisedMarch2013.pdf*

Videos
Each video on the Web site should have a unique and descriptive name including the word video for easy report identification. This naming structure will facilitate easy navigation among user traffic.

Example: */pcor/video-clip-library/videos/topics/carbonfootprint/cuttingcarbonwhatcanido*

Remember to document all existing Web items, any new items added, and changes that occur in the Web Inventory and Documentation spreadsheet (Section 1.3). The Web site itself is continually changing and thus cannot serve as a permanent record of your efforts.

3.3.2. Tracking Codes
As stated earlier, a standard JavaScript code, shown in Figure 3, must be embedded into a Web page in order for GA to collect, process, and report data. GA uses tracking codes to record user interactions via pageviews. Some types of interactions do not generate pageviews, e.g., file downloads and video players. While there are alternative methods to tracking these elements, the

PCOR Partnership currently uses only pageviews to track individual Web pages, PDFs, and videos.

3.3.3. Setup Validation (QA/QC)

Three different validation methods are employed upon initial setup and at periodic intervals to authenticate that the naming and tracking code components will be recorded correctly in GA. They are 1) checking the source code, 2) using Real-Time reports, and 3) viewing GA standard reports after a 24-hour period.

1. ***Source Code***

The source code comprises the instructions embedded in each Web page that specify the actions performed by GA (Google Analytics, 2014a). Although all Web elements (Web pages, PDFs, videos) on the PCOR Partnership public Web site contain GA instructions, only the source code for Web pages is visible through a Web browser. Both the tracking code and Web page identification components can be viewed in the source code. Thus the source code is used to verify both upon initial implementation.

The source code can be accessed on the Web page via any browser. Navigate to any page on the Web site. Right click within the browser window and select the "View Page Source" or "View Source" option on the menu. This will open a new window that contains the source code for that page. To find out whether GA tracking code has been installed, search for "ga.js" (Google Analytics, 2014a). This code can be seen Figure 4.

```
<script type="text/javascript">

  var _gaq = _gaq || [];
  _gaq.push(['_setAccount', 'UA-XXXXXXXX-X']);
  _gaq.push(['_trackPageview']);

  (function() {
    var ga = document.createElement('script'); ga.type = 'text/javascript';
ga.async = true;
    ga.src = ('https:' == document.location.protocol ? 'https://ssl' :
'http://www') + '.google-analytics.com/ga.js';
    var s = document.getElementsByTagName('script')[0];
s.parentNode.insertBefore(ga, s);
  })();

</script>
```

EERC CC49854.CDR

Figure 4. Source code example (DBD Media, 2012)

2. ***Reports in Real-Time***

GA Real-Time reports allow visual confirmation of Web activity seconds after it occurs. Its value lies in the instant feedback it produces during testing. Since the source codes for PDFs and videos cannot be accessed via Web browser, the PCOR Partnership team uses Real-Time reports to verify both naming and tracking code components upon initial implementation. Figure 5 illustrates the instantaneous data visible after a Web site visit.

To verify the GA tracking code is functioning properly, look at the Web site activity reports in Real-Time. Navigate to the Reporting tab and select Real-Time from the left navigation column. While viewing the Real-Time screen, browse a Web page at the same time, and the visit will appear in the real-time window.

Caution: Real-Time is used mainly for testing and should not be relied on when reporting data because the lag time may create temporal errors.

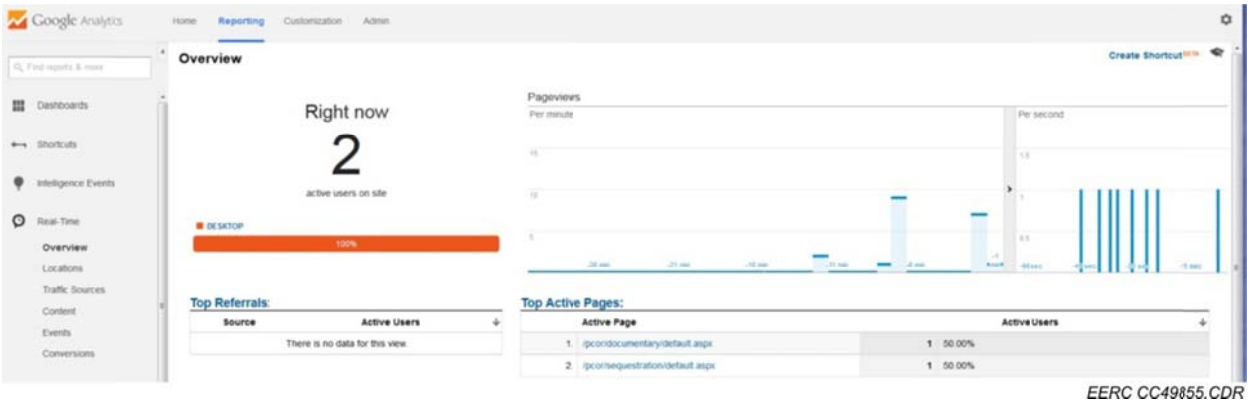

Figure 5. Real-Time report example.

3. GA Reports

The GA reports are the last verification step used to confirm the initial setup of tracking codes and naming protocols for all Web pages, PDFs, and videos. While source codes and naming components are accessible for viewing via the Web page's source code, errors can prevent GA instructions from properly implementing the tracking code or other changes (e.g., renaming a Web element), resulting in reporting inaccuracies such as the page failing to appear in the report. These same execution errors can occur for PDFs and videos even if Real-Time reports were used to verify setup. As a result of errors such as these, Google recommends waiting 24 hours for GA servers to update changes and for new data to appear in GA reports. After 24 hours has passed, the changes can be verified in the standard reports section of GA.

Select "Behavior" in the left navigation column, and select "Overview" to view the pageview numbers for each Web page, PDF, and video (Google Analytics, 2014b).

In addition to using GA reports to view newly tracked items and changes after implementation, GA reports are accessed on a quarterly basis for reporting Web site usage to the U.S. Department of Energy (DOE). Upon accessing these reports, Web pages, PDFs, and videos, data are scrutinized for errors (e.g., improper page consolidation, etc.) that may occur because of changes to the GA software or as a result of errors in the PCOR Partnership Web server. Table 1 provides a summary the PCOR Partnership public Web site validation process.

Waiting 24 hours to view GA reports is the best way of verifying proper Web page naming and that the Web page is tracked.

Table 1. PCOR Partnership Public Web Site Validation Matrix

Validation Matrix							
Components		**Initial Implementation**			**Quarterly**		
		Source Code	Real-Time	GA Reports (wait 24 hr)	Source Code	Real-Time	GA Reports (wait 24 hr)
Naming Convention	Web page	✓		✓			✓
	PDFs		✓	✓			✓
	Videos		✓	✓			✓
Tracking Code	Web page	✓		✓			✓
	PDFs		✓	✓			✓
	Videos		✓	✓			✓

4. Measure

Once you have established that all Web items are tracked properly, GA will automatically and continuously collect data.

5. Data Analysis and Reporting

5.1. Introduction

GA offers many standardized reports or dashboards (customizable reports) that provide statistical information on Web site usage and performance. Understanding basic terminology, key metrics (e.g., number of visitors for a date range), and GA software data assumptions creates the foundation of knowledge needed to perform more complex analytics techniques, e.g., custom segments. These fundamentals together with Web site goals provide the necessary knowledge and focus used in data analysis and for reporting meaningful insights into visitor activity on the Web site. GA tools can be configured incrementally to facilitate data replication, creating established procedures necessary to institute QA/QC to ensure consistent data collection and analysis.

5.2. Discussion and Application – Overview

This section provides contextual information on GA terminology, principles, and caveats in data processing, collection, and reporting directly relevant to PCOR Partnership Web site goals established by the Task 2 Outreach Team. These goals guide the current procedure for data analysis and reporting. They include the following:

- Track all Web items by GA.
- Isolate and report external traffic usage.
- Evaluate visitor engagement for Web site and content.
- Establish a baseline for visitor engagement on the Web site.
- Increase awareness of the PCOR Partnership.
- Increase Web site traffic.

- Track visitor flow between Web pages – examine traffic patterns on the Web site, and troubleshoot the efficacy of the site.
- Monitor top landing pages – how search engines make any page a "home page."
- Evaluate the effectiveness of our outreach efforts.

To address the goals listed above, three Web site categories were chosen as the focus in GA and are analyzed and reported in the following order:

1. Audience – Who is coming to the PCOR Partnership Web site?
2. Traffic sources – Where is our audience coming from?
3. Content – What content is being viewed?

Within these categories are attributes individually measured in GA. Combining various attributes correctly can provide meaningful insight into Web user behavior, but rudimentary knowledge of GA is needed and thus will be explained. The background information for GA was obtained at the GA home page (Google Analytics, 2014c). At the time of the writing of this SOP, GA was poised to transition to GA Universal to improve on the existing free version of GA. Several terms are expected to change. We have chosen to introduce the new terms, e.g., sessions and users for visits and visitors, respectively, but as GA has not completely converted to the new naming structure, the terms will be used interchangeably throughout the rest of this document.

5.2.1. Audience

The audience report in GA provides insight into the number and type of visitors, the technology used to view Web site content, and how interactive visitors were while viewing content (loyalty and engagement as measured by time spent on the site).

Visitors (will be transitioning to "Users")
A visitor is a person (set of cookies) who visited the Web site. Visitors are uniquely identified by a GA user cookie, which assigns a random ID to the user's computer or mobile device and combines it with the timestamp of the user's first visit. Data describing the number of users to the site are only as accurate as the cookies. If a person visits a site from both home and work computers, for example, the same person will be assigned two sets of cookies and be counted as two visitors.

Visits (will be transitioning to "Sessions")
A visit is a group of interactions (e.g., pageviews, watching videos, etc.) that take place on the Web site within a given time frame. Users can perform numerous actions on the Web site or just one and then exit the site, each resulting in a counted session. Visits end when the Web browser is closed or after 30 minutes of inactivity on the Web site.

Pageviews
A pageview is counted every time a page on the Web site loads. For example, if someone comes to your site and views page A, then page B, then page A again, and then leaves your site, the total pageviews for the visit is three. Average pages per visit indicates the mean number of pages viewed on the Web site by all users over a set amount of time. This mean can be an indication of the level of interest that users have in the Web site.

Bounce Rate

The ***bounce rate*** is the percentage of single-page visits. If a person only views one page before leaving the site, GA reports this as a bounced visit. Bounce rates can be used as a measure of a Web visitors' intent. There are a number of factors that may contribute to this number, both bad (visitors leave from the entrance page because of faulty Web design, usability issues, or disinterest) and good (users found the information they need on that first page and did not need to go on).

Always use the bounce rate in combination with other attributes such as landing page (e.g., video clip), as a high bounce rate is not always indicative of a problem.

Calculating Time

Time on a page is the amount of time a user spends on a single page. Time is calculated only on visits that include multiple pageviews. To calculate time on a page, GA compares the timestamps of the visited pages. In Figure 6, the user started on page 1, moved to page 2, and then viewed page 3 and left the site. The time the user viewed page 1 is calculated by subtracting the page 1 timestamp from the page 2 timestamp. Time on page 1 and 2 are calculated in the same way, but because the user left the site after viewing page 3 and no other action was performed, GA could not record a time stamp.

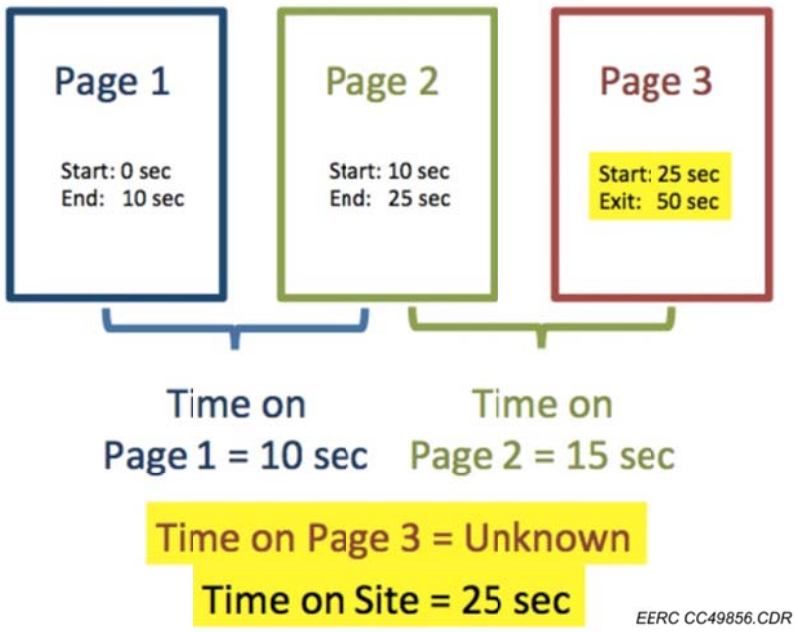

Figure 6. Example of calculating pageview time (Analytics Talk, 2012).

Geographic Location

Geo (geographic) reports provide information on user location. GA uses the computer's IP address to determine Web visitors' geographic location. GA displays the results on a world map (see Figure 7) by default and provides options for displaying a specific country, state/province, or city.

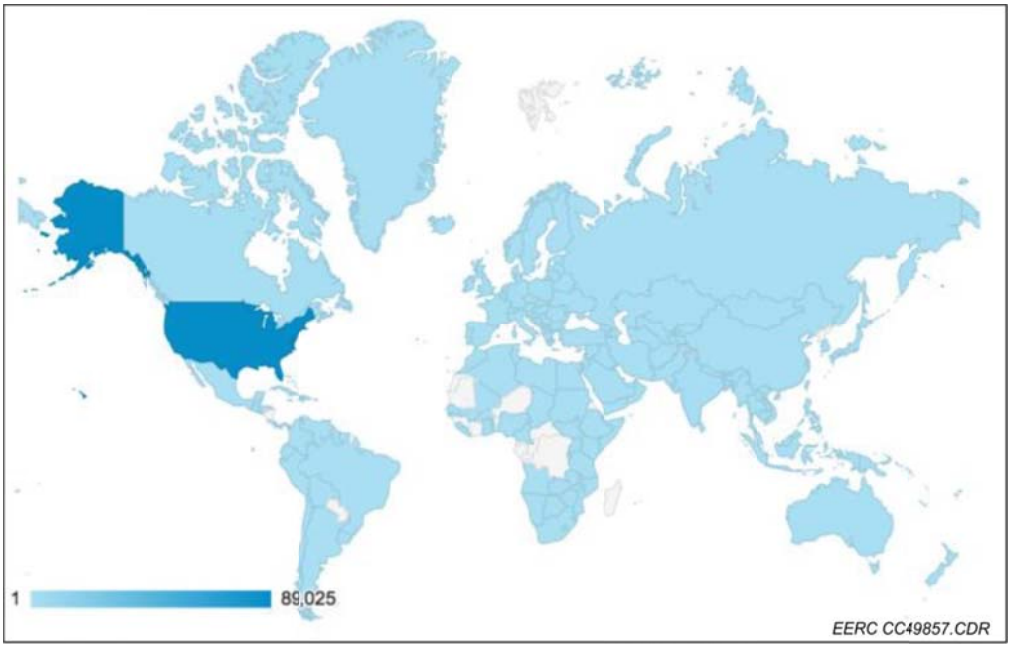

Figure 7. Sample map showing visitor's geographic location provided by GA.

Visit comparisons can be made between different countries, states, or even cities. Visitor engagement can be determined by changing the map from Visits to Time on Site or Pages/Visit. This provides an idea of the Web site's ability to retain and engage visitors who come from a particular region.

Visitor Behavior

The new vs. returning report classifies each visit as coming from either a new visitor or a returning visitor based on cookie IDs. When someone visits a site for the first time, the session is categorized as a new visit. If the person has previously browsed the Web site, GA will recognize the existing cookie ID, thus recording a returning visitor.

A high number of new visits can suggest Partnership activities are successful at driving traffic to the Web site, while a high number of return visits suggest that the site content is engaging enough for visitors to come back. This information is especially useful when trying to expand different types of audiences with varied interests from various locations.

There are several things to keep in mind when looking at new and returning users. New users are those that have no cookies in their computer from the Web site. However, if that same individual erases those cookies, uses a different computer, a different Web browser, or a mobile device, these visits will be tracked as new visitors even though the same person is in front of the screen.

Visitor behavior statistics are ideal to determine whether users are coming back to the site and, by adding other attributes such as Time on Site and Pages/Visit, how engaged users are during that session.

5.2.2. Traffic Sources

Traffic in GA denotes the path by which visitors arrived to the Web site. Traffic sources (as called channels in GA) are listed and compared in the GA acquisitions report to find out which channels send the most Web site visits.

Channels

- **Search Traffic:** Visitors who click on a search results link in Google, Yahoo, or any other search engine.
- **Direct Traffic**: Visitors who clicked on a bookmark to arrive at the site or who typed the URL directly into their browser.
- **Referral Traffic**: Visitors who came from links on other Web sites or blogs.
- **Social Traffic**: Visitors who came from social media sites.
- **E-Mail Traffic**: Visitors who came from a link in an e-mail.

Looking at the highest traffic drivers is helpful, but additional attributes such as bounce rate, etc., can be used to fully understand what is affecting site traffic.

Campaign tracking is another method of identifying how users enter the Web site. Campaign tracking works like this:

- A special link is created to direct visitors to a specific location on the Web site.
- A label is added to the end of this link and is associated with additional event information.
- The link is distributed through specific events, e.g., e-mails, social media messages, etc.
- When a visitor clicks the link and enters the site, GA records those labels, thus providing information regarding what means of traffic drove visitors to the Web site.

For example, the PCOR Partnership uses campaigns to measure the effectiveness of outreach and education presentations to stimulate Web site visits. Attendees receive a flash drive containing a uniquely coded Web site link specific for each meeting. When the link is accessed, the number of users and their Web site interactions can be viewed in GA.

Keywords

Keywords are words visitors use to arrive at the Web site when using a search engine. These keywords provide insight into understanding what visitors were expecting to find on the site. Keywords with a high bounce rate indicate their expectations were not met.

5.2.3. Site Content

The behavior reports in GA are designed to provide information on Web site content performance of individual pages, thus providing feedback on content being used and helping producers infer what content should be improved. Basic data on each page provide understanding of the interaction level of the page:

- **Pageviews:** How many times the page was viewed.
- **Avg. Time on Page:** Uses the time metrics available for the page and works out the average across the pageviews.

- **Entrances:** How many times this page was the first page in a session.
- **Bounce Rate:** The percentage of entrances on this page where the user did not interact with the Web site any further.
- **% Exit:** The percentage of pageviews that were the final page in a session.

A home page on a Web site is not always the first page viewed if traffic originates from search engines or is directed via a link. Therefore, knowing which pages are viewed first on entering the site and applying additional attributes to evaluate page performance (e.g., bounce rate) may indicate the need for a Web page update or overhaul.

5.3. Data Assumptions

5.3.1. Tracking Code

GA can track information for any visitor that loads the JavaScript tag in the page code. Pageviews will be underreported if:

1. The Web page does not contain a JavaScript code.
2. The visitor's Web browser disables the JavaScript.
3. The code fails to execute because of an error on that page.

5.3.2. Visitors

The term visitor infers people but is in fact a set of cookies generated by Web browsers and viewing devices (e.g., computers, smartphones etc.). These cookies are important because they are used to tag a visitor and aggregate that visitor's behavior over the course of multiple visits. There are a number of ways visitor cookies can inflate or deflate data (high ↑ or low ↓) in GA. This can occur if the visitor's:

1. Web browser does not accept cookies ↓
2. Firewall blocks or deletes cookies ↓
3. Cookies are manually deleted ↓
4. Google account is logged into while viewing the Web site ↓
5. One person uses multiple devices to view the Web site ↑
6. One person uses multiple Web browsers ↑

5.3.3. Visits

A visit is a group of interactions (e.g., pageviews, watching videos, etc.) that take place on the Web site within a given time frame. Users can perform numerous actions in GA or just one and then exit the site, each resulting in a counted visit. Visits end when the Web browser is closed or after 30 minutes of inactivity on the Web site. A new visit will be recorded for a visitor who has left for over 30 minutes and then returns to interact with the Web site. This can create an inflated number of returning visits.

5.3.4. Date Ranges

All data are processed in GA based on the date ranges selected to view data. Irrespective of segments or filters applied to data, viewing data in 3-month increments is different than viewing data for an entire year. Visitors that were new in one quarter can also be new in another quarter if

they return to the Web site, thus affecting new and returning visitors. To retrieve data for an entire year, a new date range must be selected as combining quarterly data will provide different values.

5.3.5. Calculating Time

Although the time on a page is defined as the amount of time a user spends on a single page, it is actually the time elapsed between Web site interactions. For a timestamp to register, the user must perform more than one action on the Web site. If no second action is performed, a timestamp will not register and no amount of time will be recorded for that page.

5.3.6. "Not Provided or Not Set"

There are two key phrases that will appear in different areas of a report; "not provided" and "not set." Not provided indicates that data were recorded but because the user was signed into a Google account, the information is encrypted and not available for reporting. "Not set" has a number of different meanings depending on the report section in which it appears. Generally, it means that traffic came from referral and direct links, not from search engines. These categories contribute to total numbers, but extra steps must be taken to exclude them from specific data sets such as listing the top 10 countries; they are documented in the spreadsheet but excluded from quarterly reports.

5.3.7. Bounce Rate

Content-rich Web pages, such as those containing lots of text or direct links to PDFs and videos, often produce higher bounce rates because they provide a wealth of information to the visitor without required further actions that are currently being recorded by the pageview-tracking scheme. If no other action is performed after landing on these Web pages, a bounce will be recorded in GA, increasing the bounce rate for that Web page (all PDFs and video clips are tracked as pages). Bounce rates can be adjusted in the administrator settings to define when a visit should time out (usually set at 30 minutes of inactivity), thus providing a more representative value in GA.

5.3.8. Advanced Segments

Advanced segments are used to isolate internal traffic for reporting. It should be noted that this segment only isolates internal desktop computer traffic. The segment does not isolate internal traffic from mobile devices.

5.4. Summary of Method

Most of the data are reduced in the GA software online while logged into a GA account. Using a sorting technique called advanced segments, data are isolated to report external Web site visits as well as additional Web user attributes. Further data reduction, if needed, is performed in Excel. Data are analyzed and the results reported in a quarterly or annual report to DOE.

5.5. Data Preparation (prior to data analysis)

5.5.1. Materials

- An e-mail account to gain access to the Web site-tracking profile.
- A GA account (set up by GA account administrator).

- Internet access to run the GA software.
- "Google Analytics Reporting" spreadsheet from OutreachShareFolder/Janet/.
- "GA Web Page History" spreadsheet from OutreachShareFolder/Janet/.

5.5.2. Advanced Segments

Advanced segments are used to isolate certain portions of GA data. Once segments are created and saved, they do not need to be re-created each time data need to be accessed, although adjustments may be needed occasionally (see QA/QC section 5.8). However **segments must be selected in GA to ensure the correct data are reported**. Two advanced segments were created and are routinely used to analyze data for the PCOR Partnership Web site.

External Traffic

To isolate and exclude internal visits from GA reports, a new segment called "External Traffic" was created. Two conditions had to be met and exist together in order for this segment to exclude the proper traffic:

a. The network domain must be *nodak.edu*.
b. Only those *nodak.edu* computers accessing the Web site from Grand Forks.

Creating the segment involves the following steps:

1. At the top of the GA screen, Click **+Add Segment**.
2. Click on **+Create New Segment**.
3. Enter name for the segment, "External Traffic."
4. Under Advanced, click on **Conditions** to set dimension and metric conditions.
5. Select **Network Domain**.
6. Select **does not contain**.
7. Type in "nodak.edu."
8. Select **OR**.
9. Select **City**.
10. Select **does not contain**.
11. Enter "Grand Forks."

The External Traffic segment excludes most of the internal traffic to the public Web site, i.e., from desktop computers, thus providing a more accurate representation of the behavior of external visits and their interactions with the Web site. However, there is no way to isolate internal Web visitors using mobile devices.

PCOR Partnership Traffic Only

The following advanced segment was created to isolate and report external Web site traffic from users located within the PCOR Partnership region:

1. At the top of the GA screen, select the segment **External Traffic**.
2. Click the arrow in the upper right corner to open a menu.
3. Select **Copy**. By copying this segment, all existing properties from the External Traffic segment will be applied to this new segment.

4. Enter “PCOR Partnership Traffic Only” in Segment Name box.
5. Click **Save**.
6. Reopen “PCOR Partnership Traffic Only.”
7. Scroll to the bottom of the conditions list and select **AND** to begin.
8. Select **Region**.
9. Select **contains**.
10. Enter “Alberta” and then select **OR** (region and contains will appear automatically); continue entering the states and provinces of the PCOR Partnership Region, and then select OR after each entry. This will create one condition that must be met in order for the segment to function:
    a. British Columbia
    b. Iowa
    c. Manitoba
    d. Minnesota
    e. Missouri
    f. Montana
    g. North Dakota
    h. Nebraska
    i. Saskatchewan
    j. South Dakota
    k. Wisconsin
    l. Wyoming
11. Click **Save** when finished.

Changes made to the External Traffic segment must be applied to the PCOR Partnership External Traffic segment to maintain data consistency.

5.6. Procedure

This section outlines the steps performed to access, analyze, and report data (quarterly and annually) from the PCOR Partnership public Web site.

5.6.1. Web Site Visits (audience)

1. Locate and open the Excel spreadsheet in OutreachShareFolder/Janet/ named “Google Analytics Tracking.”
2. Enter the new reporting period following the examples in this spreadsheet.
3. Log in to your GA account.
4. Select the date range from the box located in the upper right corner of the GA window for the reporting period.
5. Click on **+Add Segment** to view the segments list in GA.
6. Locate and select the **External Traffic** segment from the list and press **Apply**.
   Two data sets will be displayed. The data set of interest is External Traffic. To view only this segment:
   - *Click on the dropdown arrow on the upper right of the All Sessions segment.*
   - *Select **Remove**.*
   - *Press **Apply**.*

7. From the **Audience Overview Report** in GA, copy and paste the numbers on the screen for the corresponding items below in the spreadsheet tab "Cumulative Data":
   a. Sessions
   b. Users
   c. Pageviews
   d. Pages/session
   e. Average session duration
   f. Bounce rate
   g. % new sessions
8. Under **Geo** in the GA left navigation, select **Location**.
9. Enter the top ten countries listed by GA and the sessions/visits for each in the spreadsheet tab "Cumulative Data." (*If the phrase "not set" is present in the top ten countries, record the location in the spreadsheet but exclude the "not set" data from the top ten list*.)
10. In the bottom right corner, next to **Show Rows**, select a number that will reveal all countries, e.g., 100.
11. Scroll to the bottom of the list for the total number of countries that accessed the Web site. Subtract 1 from the total count (because of those individuals recorded in GA as "not set"). Record this number into the spreadsheet tab "Cumulative Data."
12. All countries need to be exported to Excel so a map can be created in geographic information system (GIS) software and inserted into the report.
    - *Under Audience>Geo>Location, click on the **Export** button and select **Excel**.*
    - *When the file appears, click **OK**.*
    - *Delete all columns except for A (country/territory) and B (sessions).*
    - *Locate (not set) and delete that row.*
    - *On the bottom tab of the spreadsheet, rename "All Countries."*
    - *Leave the spreadsheet open as it will be used later.*
13. Under **Behavior** in the left navigation, select **New vs. Returning** from the GA menu. Enter the number of new and returning visitors as well as the percentage of each in the spreadsheet tab "Cumulative Data."
14. Under **Mobile** in the left navigation, select **Overview**. Enter the sessions/visits for each device used to access the Web site into the spreadsheet tab "Cumulative Data."

<u>The following steps are used to isolate data from the PCOR Partnership</u>:

1. Click on **+Add Segment** to view the segments list in GA.
2. Locate and select the **PCOR Partnership External Traffic** segment from the list and press **Apply**.
   Two data sets will be displayed. The data set of interest is PCOR Partnership External Traffic. To view only this segment:
   - *Click on the dropdown arrow on upper right of the External Traffic segment.*
   - *Select **remove**.*
   - *Press **Apply**.*
3. Under **Audience** in the left navigation, select **Geo**, then **Location**.
4. Select the **United States**.
5. Copy and paste the visits for each state into the corresponding cell in the spreadsheet tab "Cumulative Data."

6. Press the back arrow on the Web browser to return to the GA page listing the United States and Canada.
7. Select **Canada**.
8. Copy and paste the visits for each province into the corresponding cell in the spreadsheet tab "Cumulative Data."
9. In the spreadsheet created above (all countries and their visits), open a new tab and rename "PCOR visits."
10. **Copy** the headings and values for all PCOR Partnership states and provinces from the "Cumulative Data" spreadsheet.
11. **Paste Special>Transpose** into the new tab labeled "PCOR visits."
12. Save this spreadsheet and send to Kyle Glazewski to create two maps: a world map with country visits to the Web site and a PCOR Partnership region map depicting visits.

We do not use the graphics from canned reports for two reasons:
1. *Data can be better represented for the needs of the report.*
2. *Charts are streamlined for graphics.*

5.6.2. Traffic Sources

1. Locate and open the Excel spreadsheet in OutreachShareFolder/Janet/ named "Google Analytics Tracking."
2. Enter the new reporting period following the examples in this spreadsheet.
3. Log in to your GA account.
4. Select the date range from the box located in the upper right corner of the GA window for the reporting period.
5. Click on **+Add Segment** to view the segments list in GA.
6. Locate and select the **External Traffic** segment from the list and press **Apply**.
   Two data sets will be displayed. The data set of interest is External Traffic. To view only this segment:
   - *Click on the dropdown arrow on upper right of the All Sessions segment.*
   - *Select **remove**.*
   - *Press **Apply**.*
7. Under **Acquisitions** in the left navigation, select **Channels.**
8. Copy/paste the number of sessions and their percentage for each traffic channel in the spreadsheet tab "Cumulative Data."
9. In the spreadsheet "Google Analytics Tracking," select the tab "Reporting Pie Chart," update all traffic values for the pie chart (This will be used in Section 5.7.2).
10. To view referral traffic; select **All Referrals** in the left navigation.

This action will display traffic from referral sites, number of sessions, bounce rate, and number of pages/session. Although this information is not reported in the "Google Analytics Tracking" spreadsheet, it is described in the quarterly report (Section 5.7.2).

11. To view keywords typed into search engines to find the public Web site, select **Keywords** in the left navigation then **Organic**.

This action will display keywords used by visitors to access the public Web site. Although this information is not reported in the "Google Analytics Tracking" spreadsheet, it is described in the quarterly report (Section 5.7.2).

5.6.3. Content/Nature of Visits

1. Locate and open the Excel spreadsheet in OutreachShareFolder/Janet/ named "Google Analytics Tracking."
2. Enter the new reporting period following the examples in this spreadsheet.
3. Log in to your GA account.
4. Select the date range from the box located in the upper right corner of the GA window for the reporting period.
5. Click on **+Add Segment** to view the segments list in GA.
6. Locate and select the **External Traffic** segment from the list and press **Apply**.
   Two data sets will be displayed. The data set of interest is External Traffic. To view only this segment:
   - *Click on the dropdown arrow on upper right of the All Sessions segment.*
   - *Select **remove**.*
   - *Press **Apply**.*
7. In GA left navigation, under **Behavior**, select **Overview**, copy/paste the numbers for the corresponding items below in the spreadsheet tab "Cumulative data":
   a. Unique pageviews
   b. Average time on page
   c. % exit
8. At the bottom right corner of the screen, select **View Full Report**.
9. In the bottom right corner, next to **Show Rows**, select the number that will reveal all Web page URLs (e.g., 200).
10. Locate and open the spreadsheet in OutreachShareFolder/Janet/ named "GA Web Page History."
11. Add a new tab and rename with the current reporting period.
12. Export all Web page URL's into Excel:
    - *Go to Behavior>Site Content>All Pages, click on the **Export** button at the top of the page and select **Excel**.*
    - *When the file appears, click **OK**.*
    - *Copy/paste all data in this opened spreadsheet to "GA Web Page History" under the tab with the current reporting period created above.*
    - *Leave the spreadsheet open as it will be used later.*
13. Highlight the top five pages with the most pageviews (this spreadsheet will be used in Section 5.7.3 and in the QA/QC Section 5.8).
14. Save the "GA Web Page History" after pasting new Web pages from the current reporting period. Leave open for reporting.

5.7. Calculations and Reporting

A report "template" is used for both quarterly and annual reports. Format and flow of these reports do not need to change unless directed by the Task 2 supervisor.

5.7.1. Web Site Visits (audience)

1. Report any spikes in visit/session numbers, and explain if this increase can be linked to a specific event (e.g., education workshop).
2. Many of the numbers go from the "Google Analytics Tracking" spreadsheet tab "Cumulative Data" to the report without data reduction and, therefore, are pasted directly into the report. They include the following:
   a. Current reporting period values
      - Visits/sessions
      - Visitors/users
      - New visitors
      - % of new visitors
      - Returning visitors (if significant)
      - Total number of countries to visit Web site
      - Top ten countries (name and visits)
      - PCOR Partnership visits to each state and province
   b. Previous reporting period values
      - Visits/sessions
      - Visitors/users
      - PCOR Partnership visits
3. Other data require additional reduction as described below.

   a. Change in Web visits from previous quarter, reported in percent:

      Example:

$$\%\ change\ in\ Web\ visits\ = \frac{current\ visits - previous\ visits}{previous\ visits} \times 100\%$$

   b. Domestic Web site visits for the current quarter, reported in percent:

      Example:

$$\%\ domestic\ Web\ visits\ = \frac{U.S.\ visits}{total\ visits} \times 100\%$$

   c. International Web site visits for the current quarter, reported in percent:

      Example:

$$\%\ international\ Web\ visits\ = \frac{total\ visits - U.S.\ visits}{total\ visits} \times 100\%$$

   d. Change in PCOR Partnership visits from previous quarter, reported in percent:

      Example:

$$\%\ change\ in\ PCOR\ visits\ = \frac{current\ visits - previous\ visits}{previous\ visits} \times 100\%$$

   e. U.S. PCOR Partnership Web visits, reported in percent:

Example:

$$\%\ U.S.\ PCOR\ visits\ = \frac{U.S.\ PCOR\ visits}{total\ PCOR\ visits} \times 100\%$$

f. Canadian PCOR Partnership Web visits, reported in percent:

Example:

$$\%\ Canadian\ PCOR\ visits\ = \frac{Canadian\ PCOR\ visits}{total\ PCOR\ visits} \times 100\%$$

g. Visits originating from the PCOR Partnership area, reported in percent:

Example:

$$\%\ PCOR\ visits\ = \frac{PCOR\ visits}{total\ visits} \times 100\%$$

5.7.2. Traffic Sources

1. Many of the numbers go from the "Google Analytics Tracking" spreadsheet tab "Cumulative Data" to the report without data reduction and, therefore, are pasted directly into the report. Percentages from current reporting period include the following:
   a. Direct traffic
   b. Search traffic
   c. Referral traffic
   d. Campaign traffic (if applicable)
2. Report the top traffic referral Web sites to the public Web site (Section 5.6.2). Compare sessions, bounce rate and pages/session to provide context into which referral site(s) provided the higher-quality traffic.
3. Report the top keywords use by search traffic. Disregard the "not provided" and/or "not set" in this section.
4. Export the traffic pie chart located in the "Google Analytics Tracking" spreadsheet tab "Reporting Pie Chart" (Section 5.6.2).

5.7.3. Content/Nature of Visit

1. Many of the numbers go from the "Google Analytics Tracking" spreadsheet tab "Cumulative Data" to the report without data reduction and, therefore, are pasted directly into the report. These include the following:
   a. Pageviews
   b. Current reporting period visits
2. The pages, URLs, and pageviews exported from the "GA Web Page History" spreadsheet (current reporting period tab) to the report do not need data reduction and, therefore, are pasted directly into the report.
3. Data requiring additional reduction are described as follows:
   a. Individual pageviews for each of the top five Web pages, reported as a percent of the total number of pages viewed:

Example:

$$\%\, pageview\ = \frac{Page\ X\ pageviews}{total\ pageviews} \times 100\%$$

where X = the top viewed Web page
(repeat calculation for each of the top five pages)

4. Report any significant changes in the current reporting period from the previous reporting period (e.g., pageviews, bounce rates, exit %, etc.).

5.8. QA/QC

1. Most numbers reported do not need data reduction and, therefore, can be pasted directly from the GA report into the appropriate spreadsheet and/or report, thereby avoiding the transposition of numbers or other keyboard errors. Numbers needing further data reduction are double-checked by the report author and further checked by at least three additional individuals in the report review process.
2. Pages and traffic sources are reviewed quarterly for anomalous data. Any anomalies are added to the segments to ensure that the most accurate data are reported.

Example 1: The External Traffic segment has been updated to exclude pages found to have originated from testing purposes. Additions to this segment include the exclusion of pages containing the following in the URL:

- ctt
- tyler
- wwwroot

*To implement page exclusion, select "**Pages**" and then select "**does not contain**."*

Example 2: The External Traffic segment has been updated to exclude traffic sources found to have originated from testing and internal EERC traffic. Additions to this segment include the exclusion of traffic sources containing the following in the URL:

- wwwtest.undeerc.org
- stage.undeerc.org
- intranet.undeerc.org

*To implement traffic source exclusion, select "**Sources**" and then select "**does not contain**."*

6. Making Changes to the Web Site

6.1. Introduction

Changes to the Web site have the potential to disrupt the data collection and analysis process. Once a tracking system is incorporated into the Web site, it is essential that all changes to the Web site follow the established SOP to maintain the integrity of the data and the continuity of

data collection in the most efficient manner possible. Changes follow many of the same steps as detailed in Setup, Section 3.0.

6.2. Procedure

Additional procedural components will be described in the future.

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