

FY16 Annual Report on *Tethys* Offshore Wind

During FY16, PNNL staff worked to better integrate wind energy material into *Tethys*, redesigning high-level pages to include both wind and water equally. A major redesign of the home page was undertaken, creating an inviting feel that clearly identifies the mission of *Tethys* while equally representing both wind and marine renewable energy and their international programs. The Knowledge Base and Map Viewer were both divided by wind and MRE content, allowing users to search content within the industry of their choice. Connections and Broadcasts pages were also changed to allow filtering options between wind and water.

***Tethys* Wind Peer Review Results**

The annual peer review of *Tethys* invited 24 reviewers with backgrounds in wind energy, resulting in ten responses. Responses were largely focused on functionality for various views of *Tethys*, including the Map Viewer, Knowledge Base, Broadcast pages, and Connections. Suggestions included making events more visible, improving map clustering, adding filter options, and improving speed. All of these issues will be examined during FY17 development activities.

Some reviewers also had comments related to the content. Several reviews noted that it would be useful to include additional filtering for socioeconomic literature. In response, during FY16, the *Tethys* socioeconomic category was subdivided into: aesthetics, climate change, fishing, legal & policy, navigation, recreation, and stakeholder engagement. One reviewer suggested the Knowledge Base and Map Viewer display a date when the information was last updated. *Tethys* currently states that information is living and regularly updated, but options will be explored to actually list a date on these views. Some reviewers requested more outreach to indicate how to sign up for *Tethys* Blasts and webinars. In response, we've considered changing to a new mailing system that will facilitate signing up for these activities as Lyris, the current mailing software, is limited by the PNNL firewall.

Performance Metrics for *Tethys* Wind Energy

Performance metrics are collected and analyzed quarterly, as well as annually, for *Tethys*. Metrics and goals were defined in the *Tethys* Management Plan that was developed in FY14 and is available on the Deliverables page. To minimize bias in the summarized metrics, all traffic from PNNL has been excluded from these metrics. The metrics have been calculated from October 1st 2015 to September 20th 2016; the last 10 days of September have been estimated and the totals extrapolated to include a full year of data (Table 1). Unadjusted metrics, reports for previous quarters, webinar attendance, and a list of recently added documents are available on *Tethys* at:

<http://tethys.pnnl.gov/deliverables>.

Table 1. Annual Performance Metrics for FY16.

Metric	Goal	FY16 Results	Compare to FY15 Data
Total Visits	10% increase on annual basis, to be tracked on revolving quarterly basis.	41,686 visits	FY15: 35,304 visits 18.1% increase
Total Pageviews	10% increase on annual basis, to be tracked on revolving quarterly basis.	162,635 pageviews	FY15: 166,991 pageviews 2.6% decrease
Average Pages per Visit	No goal, but activity should be tracked on revolving quarterly basis.	3.90 pages/visit	FY15: 4.73 pages/visit 17.5% decrease
Number of Documents Indexed	Increase by 25 documents per quarter.	3268 documents	FY15: 2461 documents +807 documents; 249 MRE, 469 wind
Number of External Websites Linked to <i>Tethys</i> (3+ links)	No goal, as this is outside of our control, but active outreach may increase.	94 domains	FY15: 82 domains +12 domains
Number of Websites Linked from <i>Tethys</i>	Increase by 10 links per quarter.	3673 links	FY15: 2907 external links +766 links
Percentage of Valid Links in <i>Tethys</i>	90% working links at any time.	This number varies by quarter based on the number of broken links, but was never less than 90%. Any broken links are fixed during this quarterly check.	

Tethys FY16 Highlights and Key Findings

- The average bounce rate was a low 12.5%, meaning 87.5% of users continued beyond the first page they landed on. Google Analytics benchmarks averages for “content websites” at 40-60%. Therefore, *Tethys* is successfully attracting users who are interested in the content and continue to explore the content.
- Over 53% of traffic comes from search engines (primarily Google), another 32% of traffic comes from bookmarked pages or and document links, and 14% of traffic comes from other websites. These statistics tell us where to focus our efforts to improve usage numbers.
- The significant increase of 766 links was largely due to new organization landing pages on *Tethys*. We now have 1,188 organizations in *Tethys*, each page providing basic information and listing all other documents in *Tethys* by that organization.
- Geotagged content on the Map Viewer was increased from approximately 700 documents to 2,120 documents, a 300% increase. This was mostly accomplished by geotagging existing documents that referenced a location.

- Additional *Tethys* features developed over the last year include:
 - The home page was redesigned with a fresh look and feel: providing better visuals to represent the content, equally representing wind and MRE, providing more intuitive entry points to explore *Tethys*, and more.
 - Wind and MRE content on the Knowledge Base and Map Viewer were clearly separated out, allowing users to select what content they are interested in from the loading screen, and allowing users to save their preference to their account.
 - Videos are now mounted on YouTube (although found on *Tethys*) to reduce data usage on *Tethys* and to ensure video compatibility for all users.
 - An end-of-the-year push to improve speeds across the site is currently underway, focusing on the Map Viewer and Knowledge Base.
- A new *Tethys* Blast was released every other Friday morning during FY16, for a total of twenty-seven *Tethys* Blasts. The list for *Tethys* Blast dissemination grew from 801 to 1,027 individuals, a growth of 226 new subscribers over the year.
- Eight *Tethys* stories were released during FY16.
- Social media has been used primarily to announce webinars and *Tethys* stories. The Facebook page currently has 135 likes (+25 since last year) and the Twitter account has 215 followers (+63 since last year).

WREN Hub

WREN Hub is hosted on *Tethys* to highlight wind-related activities by the international collaboration. A prominent link was added on the home page that provides direct access to WREN HUB (<http://tethys.pnnl.gov/about-wren>). This public-facing page lists all the WREN activities, but is typically missing details that are specific to the inner workings of WREN. Details are available on the private WREN members' page (<http://tethys.pnnl.gov/wren-members-page>). The WREN Members' page provides meeting notes, a list of contact information, access to a Google Drive that can be used for preparing collaborative products, and a comment board.

Under the banner of WREN Hub, *Tethys* added 469 new wind documents, hosted and made quarterly webinar recordings available (as seen in Table 2), sent out 27 total *Tethys* Blasts with wind content, added wind organizations, and more. These activities provide information to a growing community interested in wind energy and the environment.

Table 2. Viewership summary for WREN webinars: FY14 – FY16.

Year	Title	Views*	Live Attendees
Webinars			
FY14 Webinars 1-2	Bats and Wind Energy	454	60-70
	Attraction and Interaction of Marine Mammals and Seabirds to Offshore Wind Farms	429	60-70

FY15 Webinars 3-5	Understanding Avian Collision Rate Modeling and Discussing what this Means in a Population Context at Land-Based and Offshore Windfarms	2,480	138
	Avian Sensitivity Mapping and Wind Energy	1,264	65
	Wildlife Monitoring and Wind Energy	923	62
FY16 Webinars	Monitoring Bat Activity Offshore	1,054	76
	Wind Energy Development Impacts on Marine Environment	639	55
	Assessing Marine and Avian Wildlife Off the New York Coast	618	71

*Views are tracked as pageviews within *Tethys*.

WREN Activities

In addition to efforts to continue to develop, expand, and maintain WREN Hub, during FY16, PNNL was also involved in:

- Assisting NREL in choosing and arranging for webinar speakers;
- Hosting webinars and making them available on *Tethys*;
- Assisting NREL with planning and preparation for in person WREN meetings, as well as documenting outcomes through meeting notes;
- Assisting NREL in preparing the proposal to IEA Wind for a second phase of WREN;
- Preparing and redrafting an outreach plan for WREN; and
- Rewriting and further preparation of the first WREN white paper on Adaptive Management.

During FY16 PNNL staff attended the two in person WREN meetings: in Bern Switzerland in October 2015, and in Dublin Ireland in April 2016.

During the Bern meeting, PNNL staff presented ongoing improvements and direction of WREN Hub, as well as participating in decisions associated with stakeholder surveys, future white paper development, and review of the draft Adaptive Management white paper.

During the Dublin meeting, PNNL staff presented:

- Ongoing improvements and direction of WREN Hub including the integration with the rebooted *Tethys* homepage and wind/water separation;
- Presented and received input to the draft outreach plan for WREN, including the potential for producing short science summaries as a new set of WREN products;
- Presented progress and received input on Adaptive Management white paper;
- Participated in discussions of future white paper development,
- Assisted in finalizing the work plan for second phase of WREN,
- Contributed to planning for NWCC conference in Colorado in December 2016 and a co-located WREN meeting, and planning for future WREN meetings.

Google Analytics for FY16

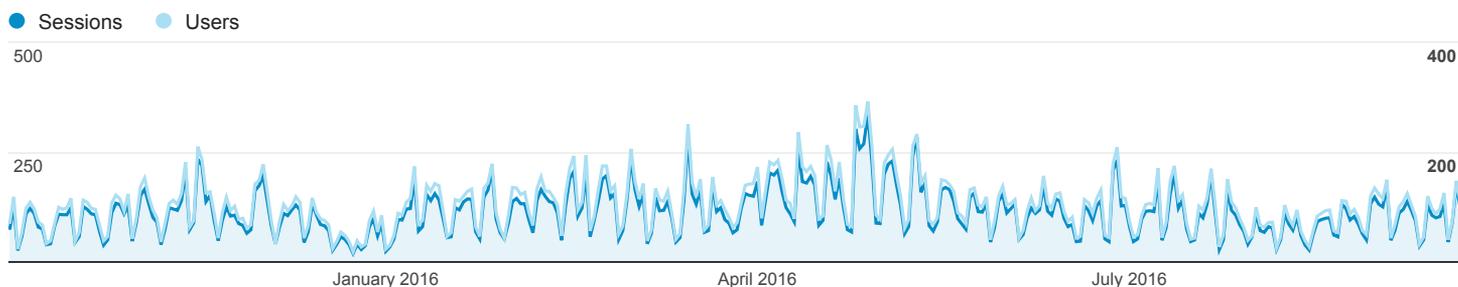
The following several pages are a direct output of annual statistics from Google Analytics, showing information that may prove helpful in identifying the audience of Tethys and top referral sources:

Printout for U.S. Department of Energy

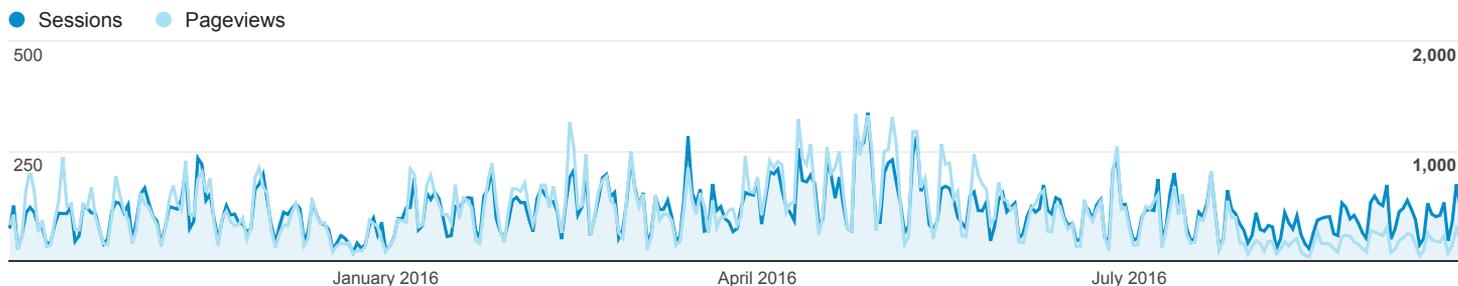
Oct 1, 2015 - Sep 20, 2016

Exclude PNNL
63.02% Sessions

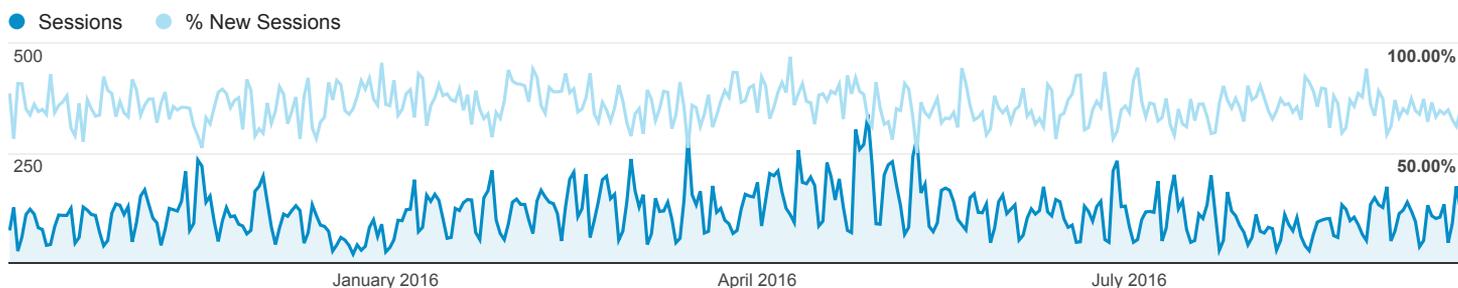
Sessions and Unique Visitors



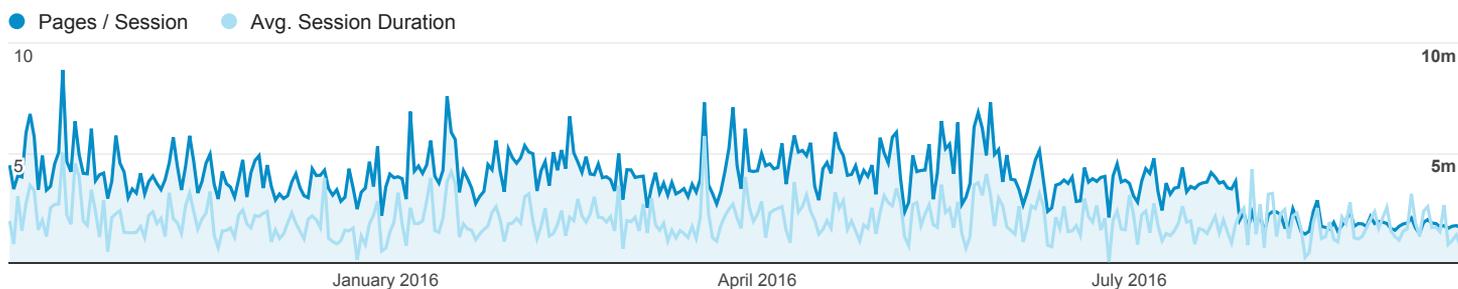
Sessions and Pageviews



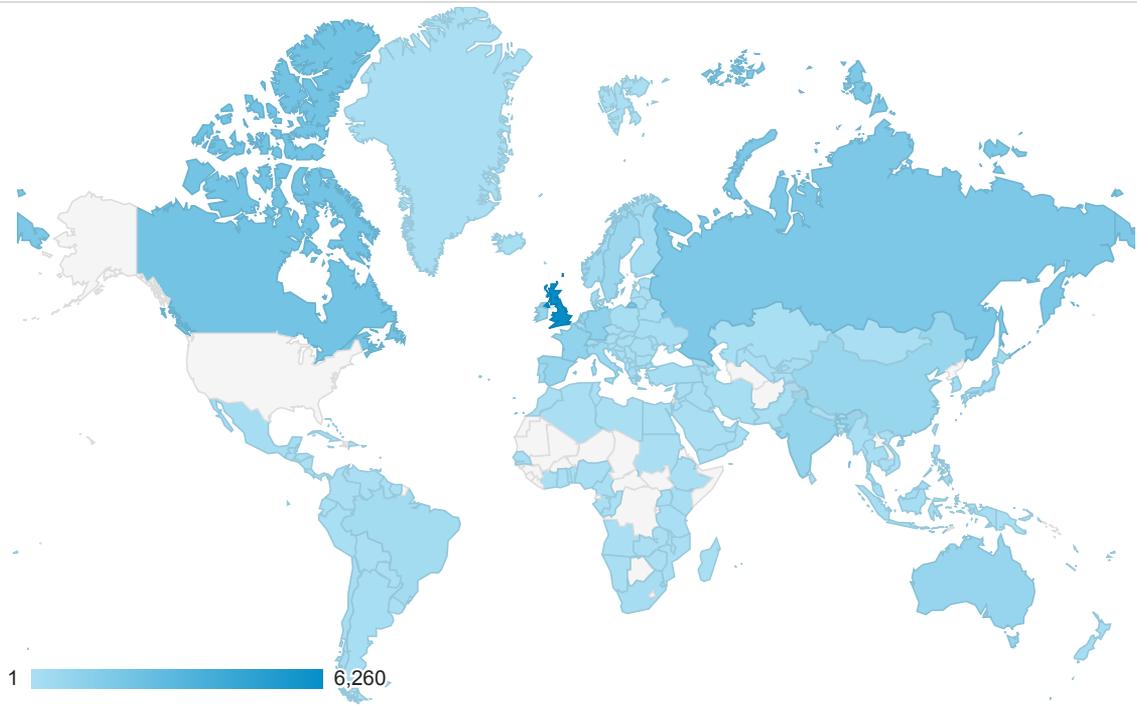
Sessions and % New Sessions



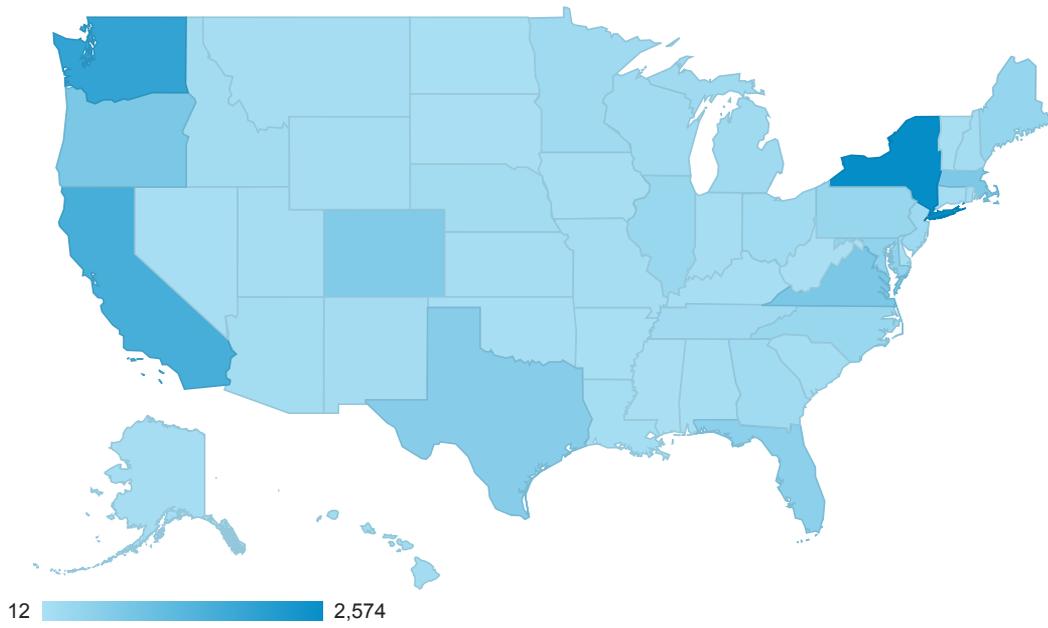
Pages / Session and Avg. Session Duration



Visits Per Country (excluding the U.S.)



Visits Per State



Sessions and Bounce Rate by Source / Medium

Source / Medium	Sessions	Bounce Rate
google / organic	19,513	9.34%
(direct) / (none)	12,884	6.15%
bing / organic	1,314	8.30%
rank-checker.online / referral	736	98.10%
en.wikipedia.org / referral	598	8.36%
site-auditor.online / referral	510	98.43%
yahoo / organic	510	7.45%
links.govdelivery.com / referral	454	2.42%
energy.gov / referral	404	4.70%
monetizationking.net / referral	315	98.10%

Sessions and Bounce Rate by Page

Page	Sessions	Bounce Rate
/	6,150	36.73%
/user/register	1,954	0.15%
/annex-iv-sites/la-rance-tidal-barrage	1,131	10.79%
/publications/state-of-the-science-2016	947	6.34%
/publications/san-juan-islands-tidal-currents	825	17.45%
/technology-type/wave	595	8.40%
/about-wren	477	15.09%
/annex-iv-sites/sihwa-tidal-power-plant	464	9.27%
/technology-type/tidal	463	8.42%
/events/mid-atlantic-baseline-study-webinar	424	0.00%