Pacific Northwest
NATIONAL LABORATORY
Proudly Operated by Battelle Since 1965
Tel: (206) 528-3049
Andrea.copping@pnnl.gov

March 29th 2013

To: Hoyt Battey, Jocelyn Brown-Saracino, DOE Wind and Water Power Program
From: Andrea Copping
Cc. Scott Butner
Subject: Q2 Milestone for *Tethys* and Annex IV

This task concerns the maintenance, expansion, and evaluation of the Tethys knowledge base, and all activities under the Ocean Energy Systems Annex IV.

Shortly after the start of Q2 FY2013, the restricted Annex IV information and metadata housed within *Tethys* was made publicly accessible. Both the *Tethys* and Annex IV material were combined to make one comprehensive knowledge base and map viewer. In addition, the Final Annex IV report was completed and became publicly accessible from the *Tethys* site. Although the *Tethys* and Annex IV collections are now stored in and accessible through the same knowledge base, the collections can be separated if the need arises in future.

Website Metrics and Goals were developed for *Tethys* during 2012; each quarter the nine metrics are summarized. As *Tethys* is a repository for both OSW and MHK information, the analysis of the web metrics and goals refers to both MHKS and OSW material.

Tethys

Q2 Milestone: Quarterly report on website metrics.
Progress: New web metrics recording software called Google Analytics was brought online in Q2 to enhance PNNL's ability to efficiently and accurately record web metrics and data for *Tethys*. Google Analytics includes several new metrics that are not listed as metrics or goals in the *Tethys* Website Metrics and Goals Plan, but are referenced here, including: **Unique Visitors, Pages/Visit, Bounce Rate, Average Visit Duration, and % New Visits.** These new metrics, along with other *Tethys* highlights and key findings, are described in more detail below.

- Two new features were added to the Tethys site in Q2:
    1. The Annex IV metadata and information became publicly accessible, and has been combined with the rest of the *Tethys* information into one comprehensive knowledge base and map. The Final Annex IV report is also now available for download from *Tethys*.

2. A new Connections tab has been added to the main menu of *Tethys*, consisting of an **Institution Connections** page (list of university and research organization contacts), a **Database Connections** page (other databases pertaining the environmental effects of MHK and OSW developments), and an **International Regulations** Page (brief summaries of the regulatory requirements and bodies in associated countries).

- *Tethys* had a total of **3,624 Unique Visitors** during Q2, which refers to the number of unduplicated (counted only once) visitors to the site over a specified amount of time. This metric is particularly important to monitor for *Tethys* because it can be a good indicator of site traffic and usage. When re- evaluated with the site's **Bounce Rate** (visits in which a person left *Tethys* from the home or entrance page), the quantity of Unique Visitors can be used to gauge what percentage of visitors are actually 'users' of *Tethys*, versus people who come across *Tethys* by accident. The Bounce Rate for Q2 was **66.76%**, suggesting that roughly **1205** of the unique visitors are actually users of the site. However, it should be noted that it may be possible that these users are accessing *Tethys* through an external link to a specific page. If the user reads this page then leaves, it may be viewed as a bounce. This issue will need to be further investigated in Q3 and Q4.

- During Q2, *Tethys* saw a total of **4,780 Visits**, referring to the total number of visits to the site, including duplicates. This metric is useful to monitor because it can be used to assess the total amount of site traffic over a certain amount of time. It can also be combined with **Unique Visitors** and **Pageviews** to begin to gain a better understanding of site traffic and the extent of the average user session. The difference between visits and unique visitors can give insight into the size and interest of the repeat users that represent the core *Tethys* community.

- Total **Pageviews** for Q2 were **10,187**. Note this metric only refers to the actual web pages, and not downloaded PDFs. PNNL is still trying to determine a method to track the quantity of downloaded PDFs from *Tethys* using the new Google Analytics software.

- The top 10 most frequented media pages on the Tethys site were:
    1. San Juan Islands Tidal Currents
    2. Final Annex IV Report 2013
    3. Methodology for Tidal Turbine Representation in Ocean Circulation Model
    4. Evaluation of Fish Injury and Mortality Associated with Hydrokinetic Turbines
    5. Cobscook Bay Tidal Energy Project
    6. Environmental Impacts of Tidal and Wave Energy Technology in Canada
    7. Olympic Coast National Marine Sanctuary: Invertebrates List
    8. Estimation of Tidal Power Potential

9. Yakutat Wave Energy Project
10. Offshore Windmill Farms: Threats to or Possibilities for the Marine Environment

- During Q2, the **Pages/Visit** ratio was roughly **2.13**, including repeated visits of a single page. This value is fairly typical of websites, and can be used as a baseline for the purposes of *Tethys*.

- *Tethys* saw a **75% New Visit** rating in Q2, which means that 75% of all the recorded visits to *Tethys* were for the first time. While this metric is useful to monitor, it is important to consider both the **Bounce Rate** and total number of visits. In this case, 75% of the visits may be for the first time; however, 66% of the people that visited the site left from a start page and probably should not be included. This means that after factoring in the bounce rate, *Tethys* saw roughly **1192** new visits to the site.

  4,780 total visits * .6676 bounce rate = 1589 users that did NOT bounce.
  75% of 1492 = **1192** new visits to the site excluding those that bounced from the start page.

- The **Average Visit Duration** for *Tethys* in Q2 was 02:12 minutes. As a new metric, this will be monitored on a quarterly basis. While this may seem like a short amount of time, it may also indicate proficient search capabilities within *Tethys* that allows users to find the information and data fairly quickly. PNNL will further investigate this metric to determine how it can be utilized to enhance *Tethys*.

- Roughly 12 external links were identified linking to *Tethys*. This is an improvement from the recorded 3 links in Q1. *Tethys* was also added as a reference to the "Tidal Power" Wikipedia page, which has triggered a number of wiki sites based on Wikipedia to cite *Tethys*. While this significantly increased the number of external sites linking to *Tethys*, PNNL staff feel these should not be included in this count as they stem from a single source.

<u>Tethys Performance Metrics for Q2 FY2013</u>

The table below lists the metrics and goals identified in the *Tethys* Website Metrics and Goal Plan, as well as the data collected during Q2 (January 1 2013 – March 31 2013) for the nine metrics and goals. More information on the metrics can be found at: http://mhk.pnnl.gov/wiki/index.php/Deliverables

Metric	Goal	Q2 Progress	Based on Q1 Data
Total user sessions	10% increase on annual basis, based on first year of operation, to be tracked on revolving quarterly basis.	4,780 Visits; 3,624 Unique Visitors	*383,229 unique user sessions in Q1.
Total page impressions	10% increase on annual basis, based on first year of operation, to be tracked on revolving quarterly basis.	10,187 Pageviews	*446,600 pages were accessed in Q1.
Average page impressions per user session	30% increase over the baseline (October 2012) average page impression per user session.	2.13 Pages/Visit	1.17 in Q1; +.96 pages/visit (**96% increase**)
Number of documents indexed	Increase by 40 documents per quarter, through FY12-FY13	The *Tethys* team added a total of **59** additional documents; **23** OSW and **22** MHK	48 MHK and 40 OSW in Q1; The rate at which documents were added has **decreased**.
Number of websites linked from Tethys	Increase by 10 links to external websites per quarter, through FY12-FY13	A total of **397** external websites are linked from *Tethys.*	**+245** external websites liked from *Tethys* within Q2
Number of external websites linked to Tethys		At the time, a total number of **12** external websites are linked to *Tethys*.	**+9** external websites linked to *Tethys*
Percentage of valid links in the Tethys knowledge base	90% of all links working at any time	**100%** of all links are functioning properly.	25 problematic links out of 152 in Q1; **Improved**
Increased functionality and usefulness of site	Continued improvements annually.	This metric has yet to be evaluated.	N/A
Availability of information useful to users	Majority of site users are satisfied with the information they retrieved from Tethys	This metric has yet to be evaluated.	N/A

*- A new software, Google Analytics, was used in Q2 to record and analyze *Tethys* usage and traffic. Google Analytics excludes most search engine bots, so these counts will be smaller but more accurate.

Note on Data Used in this Report:

As noted in the Q1 *Tethys* progress report, PNNL experienced several technical difficulties stemming from the Laboratory's cyber security practices, and the *Tethys* staff were not able to provide complete information about traffic on the *Tethys* site such as referring URLs, user IP addresses, and search parameters. Due to these technical difficulties and lack of data, PNNL moved to new web metrics recording software in Q2 called Google Analytics. Although Google Analytics records much of the same information as the log files (method used for recording web data in Q1 of FY13), it does not rely on user IP addresses to record usage data. This was very appealing to the *Tethys* staff for several reasons: first,

several technical difficulties arose in Q1 which prevented the team from collecting IP information from *Tethys* users, limiting the amount of information PNNL was able to record. Second, *Tethys* saw more than 340,000 page impressions during Q1 due to a significant presence of search engine "bots", or automated software tools used by search engines to explore the content of websites. Because Google Analytics is programmed to detect and exclude these search engine bots from the data it records, the results may seem to be significantly smaller than those from Q1; however, Google Analytics' data are much more accurate and pragmatic.

Although Google Analytics will be the primary method of recording and analyzing web metrics and goals for *Tethys* from here on, log files will continue to be collected as a backup source of data. PNNL intends to provide DOE with a detailed description and comparison between log files and Google Analytics, including a description of the new metrics available through Google Analytics and how they may be used to further examine *Tethys'* usage and traffic.

<u>Annex IV</u>

Q2 Milestones: Quarterly report that lists criteria and progress in identifying analysts from participating Annex IV nations and their responsibilities in reviewing the Annex IV database, to be supplied to the Annex IV member nations for their use in choosing analysts from their nations. Initial plans for scientific conference including draft requests for scientific papers.

The Annex IV knowledge base provides users with research, data and information on the environmental effects of MHK developments worldwide. At the end of Q1, the Annex IV information and data became publicly accessible and was combined with *Tethys* information into one comprehensive *Tethys* and Annex IV knowledge base and map view.

<u>Annex IV Database Review Process</u>

To ensure that Annex IV information and metadata are current, accessible, and considered a useful tool to international MHK researchers, developers and regulators, PNNL will facilitate a formal review process of the Annex IV database, involving experts from the international community.

During Q2 of FY2013, PNNL developed a draft list of criteria for identifying analysts from participating nations, and describing their responsibilities for reviewing the Annex IV database:

Criteria for Choosing Analysts from Annex IV Nations

Tasks for Annex IV National Analysts

- Review Annex IV database for completeness, need for updates, need for additional content (as it becomes available);
- Provide feedback on usefulness of Annex IV collection as it stands now;
- Provide input on future Annex IV additions/activities;
- Act as point of contact for their nation (maybe surrounding nations) to gather new info, bring other expertise into play, update current material; and
- Participate in semi-annual check in on Annex IV with PNNL/DOE.

Criteria for Choosing Analysts

- Experience in marine energy field (developer, government, researcher);
- Focus on environmental science, effects, or regulation;
- Availability for 50-100 hours per year; could be shared between one or more people; and
- Support from home nation and/or OES ExCo member.

Process for Choosing Analysts

- US (Mike Reed) informs OES ExCo;
- PNNL/DOE contacts OES ExCo members and/or Annex IV reps, asks for nominees, assurance that nation will support the effort; and
- PNNL/DOE contacts analysts and briefs on responsibilities, schedule via webinar.

Annex IV Scientific Conference

As the Annex IV effort progresses into its fourth year, DOE and PNNL are beginning plans for an international scientific conference that will take place in 2015 or 2016. This conference will include Annex IV and OES represented countries, as well as other researchers, developers and regulators sharing current research and progress on the environmental effects of ocean energy development. It is likely that the conference will be organized in conjunction with the organizers of the successful EIMR conference in 2012, or will take the form of a major track in a significant scientific conference. To begin preparing for the Annex IV Scientific Conference, PNNL has examined topics and track potentials, drafted a request for scientific papers, and discussed formats.