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Tethys Peer Review FY2015

March 2015

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Summary

The purpose of this report is to provide the US Department of Energy (DOE) with an overview of the Tethys peer review process in FY2015. Two distinct approaches were taken to evaluate the content, functionality, and overall usage of Tethys by its members and the Tethys community in general. This report summarizes the responses that Pacific Northwest National Laboratory (PNNL) received from both peer review approaches, and discusses how each of these approaches differ with respect to their target audiences and how they can be used to inform PNNL about how Tethys is perceived and used.

Contents

1.0 Introduction

Tethys is an online knowledge base that is intended to serve as a premier tool for disseminating information on the environmental effects of marine renewable and wind energy. To evaluate the effectiveness of Tethys, in Q2 of FY2015 PNNL solicited reviews from the Tethys community using two distinct approaches; 1) a targeted peer review distributed to a select group of marine renewable and wind energy practitioners (identical to what has been used in previous years); and 2) a broad-based review of the site and its overall usage through Survey Monkey, which was given to a large group of *Tethys* users. Both of these approaches were aimed at ascertaining the perceived functionality of *Tethys*, the extent to which *Tethys* is known within the offshore renewable energy community, and how often the tool is used. Each of these approaches and their associated results are summarized in the sections below.

2.0 Peer Review

Peer reviews were solicited from the Annex IV country analysts, WREN members, and several other marine and hydrokinetic (MHK) and offshore wind (OSW) energy professionals. In total, 15 peer review forms were received; 10 reviewers had a background in MHK and 8 reviewers had a background in OSW, with some overlap (Table 1). All feedback was organized in a comment matrix and has been addressed, noted, or included in the PNNL developer backlog for future work on the *Tethys* knowledge base. A summary of the feedback is provided in subject driven topics below; the complete comment matrix is included as Appendix A at the end of this report. A total of 98 comments were compiled from the 15 completed forms and organized according to the most relevant corresponding topics. The topics are discussed in the following sections, in alphabetic order.

List of peer reviewers of *Tethys* in FY15

Reviewer Name	Organization	Focus	Country
Adesina Adegbie	Nigerian Institute for Oceanography and Marine Research	MHK	Nigeria
Anne Marie O'Hagan	University College Cork	MHK	Ireland
Craig Stevens	NIWA	MHK	New Zealand
Daisuke Kitazawa	University of Tokyo	MHK	Japan
Elizabeth Masden	North Highland College UHI	MHK and OSW	United Kingdom
Juan Bald	AZTI Tecnalia	MHK	Spain
Lisa Isaacman	Fundy Energy Research Network (FERN)	MHK	Canada
Teresa Simas	WavEC	MHK	Portugal
Jan Sundberg	University of Helsinki	MHK and OSW	Sweden
Joop Bakker	Rijkswaterstaat	OSW	Netherlands
Sharon Kramer	H.T. Harvey & Associates	MHK and OSW	United States
Luke Feinberg	WWPTO, Department of Energy	OSW	United States
Mary Boatman	Bureau of Ocean Energy Management (BOEM)	OSW	United States
Shane McGuiness	BirdWatch Ireland	OSW	Ireland
Muriel Perron	Nateco AG	OSW	Switzerland

2.1 Broadcasts

In general, feedback pertaining to webinars and expert forums was very positive. As reviewers pointed out, these online meetings provide an efficient means for disseminating information and bringing broad groups of individuals together. The archive of these broadcasts for future viewing and reference was also perceived as an ideal feature in *Tethys*.
Suggestions/Issues:

- Unclear about process for signing up for webinars.
- Send reminders with log-in instructions in the days leading up to the webinar.
- Technical difficulties during the webinar; some individuals were not able to participate in verbal discussions.
- There was some confusion about archived presentations and distinguishing those which included video versus those that were limited to audio recording with accompanying presentations slides. Related to that, one reviewer did not understand why so many conferences were missing from the list of conferences and workshops.
- The registration and set-up (e.g. downloading software) required for participating in a webinar was cumbersome which deterred interest in future webinars.
- Attributes distinguishing webinars from expert forums are unclear.
- All webinars and expert forums are presented in English which can cause some difficulty for participants from other countries.
- Difficulty in downloading archived video content potentially due to large file sizes.

Responses:
- Language will be added to *Tethys* to clarify mechanisms for signing up for webinars, the format of archived presentations, and the difference between webinars and expert forums.
- Following the initial announcement for webinars, reminders and corresponding instructions for participating in the event will be emailed.
- Technical difficulties during webinars have arisen for some participants. However, this problem has not been systemic. We will follow up with reviewers to obtain a better understanding of the technical difficulties experienced to determine if there is a workable solution for future participation.
- Language has been added to the respective broadcast pages to clarify the content of the pages – e.g. audio and video files as well as the inventory of archived content.
- Registration requirements are determined by the software client. Additional reviews for the webinar platform itself may be solicited to identify specific issues. In the future, efforts will be made to reduce video file sizes.

2.2 Connections

The *Tethys* Connections houses information pertaining to organizations, external databases, country specific regulatory frameworks, and experts working in the field of offshore renewable energy. Reviewers asserted these features are useful within *Tethys* so long as this information is kept up-to-date.
Comments:
- Add search and filter functions to the Expert Connections page to facilitate ease of access to information.
- Expand expert list beyond universities to include individuals working for government entities.
- There were several specific suggestions for adding relevant groups and organizations to the existing *Tethys* lists.

Responses:
- Search and filter options will be incorporated into the Expert Connections page.
- We will also solicit input from Annex IV members to review and update the Expert Connections page.
- Language on the Expert Connections page has been broadened to include individuals working within a variety of organizations. Additional renovations which expand the functionality of the Experts page are planned for future development activities.
- Relevant groups suggested by reviewers have been added to *Tethys*.

2.3 Content

Feedback pertaining to the content in *Tethys* was, in general, varied. However, there were some overarching commonalities in the comments received. Several reviewers with backgrounds in marine renewable energy noted the land-based wind content was extraneous. Conversely, reviewers working in the field of land-based wind suggested additional material relevant to this field. The inclusion of land-based wind content into *Tethys* is a new feature and deviates from the original focus of disseminating information related to the environmental effects of marine renewable energy. The *Tethys* project team will coordinate with DOE to address this issue and derive clarity for the *Tethys* community.

Reviewers provided new and updated references as well as identified topic areas that appeared to be underrepresented. Specific documents suggested by reviewers were added to *Tethys*, and activities to update references and include additional content, as a result of general comments received by reviewers, are underway. Several reviewers suggested including material that is indirectly connected to issues pertaining to MRE – e.g. literature on "surrogate" devices, offshore development of oil and gas, ocean thermal energy conversion systems, and benefits of low carbon energy. To maintain continuity within *Tethys*, the primary focus has been to disseminate information specific to the environmental effects of renewable energy in marine environments and, more recently, to land-based wind. While it is important to ensure this focus remains intact, we also recognize there are opportunities for including content that may pose indirect connections to the primary objectives of *Tethys*. Therefore, the indirectly related content within *Tethys* will continue to be adaptively managed on a case-by-case basis.

To help make determinations about potential environmental impacts associated with various construction methods (e.g. horizontal directional drilling, anchor placement, etc.), one reviewer suggested including

this type of information within *Tethys*. Housing this information in *Tethys* has the potential to provide utility for users and will be considered in future *Tethys* development activities.

2.4   General

Several reviewers noted the overall speed of the website was a drawback, and as a result, PNNL will meet with software developers to determine if there are potential remedies to augment this issue.
Tethys includes a global community comprised of a diverse suite of individuals working in marine renewable energy related fields. The unavailability of non-English literature within *Tethys*, as pointed out by one reviewer, is perceived as a drawback.

2.5   Home Page

Many reviewers provided constructive comments and suggestions aimed at streamlining and reorganizing content on the home page. The comments provide thoughtful insight that will help guide future development activities associated with revamping the home page.

2.6   Knowledge Base

Several reviewers provided suggestions for improving search and filter features within the Knowledge Base to facilitate more intuitive approaches for finding documents.
Suggestions included:
- Amend filter functions by allowing a user to exclude certain content from searches.
- Include a tool tip or pop-up window to clarify the meaning of some filters – e.g. stressors, receptors.
- Provide language to clarify the content offered on WREN and content found within the *Tethys* knowledge base.
- Improve the filter features for land-based wind. These appear inferior compared to the options available for MHK and OSW topic areas.
- Add images relevant to the content – receptors, stressors, etc.
- Add new filters such as effect type and reorganize existing filter structure.

Suggestions aimed at improving the functionality of the knowledge base were constructive overall. Most will likely be explored during development activities in the future. However, suggestions centering on additional and/or reorganized filters will need to be carefully weighed as this type of endeavor would require revisiting each of the 2,000+ documents already tagged in *Tethys*.
One reviewer questioned the value of the *Tethys* database, given public databases such as Google Scholar. While it is likely that many of the documents housed within *Tethys* could be discovered via Google

searches, the scope and focus of *Tethys* is a unique asset to the marine renewable energy sector and also provides information relevant to land-based wind. *Tethys* brings together data relevant to marine renewable energy with a focus on understanding the environmental consequences. The Knowledge Base, in particular, combines project specific information with peer reviewed and gray literature sources and offers topic driven filters to refine search criteria. As for adding images to the knowledge base, while it may add to the page's aesthetics, additional images would likely increase processing time for searching for material. Furthermore, images for stressors, receptors, and other categories can be access by simply clicking on them when they appear in the knowledge base.

2.7   Map Viewer

Reviewers provided specific feedback on geo-referenced errors indicating that some Annex IV metadata for project sites were not projected in the correct location. Specific errors have been corrected within the Map Viewer; more generalized issues will require follow up with reviewers.

Several reviewers noted the slow response of the map to reload when zooming. This issue will require interaction with the software developers to determine what can be done to augment the speed.

2.8   New Features

Many reviewers suggested that a listing of relevant conferences and meetings would provide a great deal of utility to *Tethys*; this task is currently under development. Another new idea for consideration included creating a location within *Tethys* to feature broad categorical topics relevant to marine renewable energy research – e.g. acoustic impacts. The page could feature various sources of information on a given topic area, and as necessary, be linked to specific documents found within the Knowledge Base.

2.9   Regulatory Frameworks

There was some confusion expressed by one reviewer pertaining to the section on Regulatory Frameworks. We will provide additional context to help clarify how various frameworks are used in the management of environmental regulation for marine renewable energy and determine if there are additional sources that we can reference/link so that the reader can seek outside information, where appropriate.

2.10 Social Media

Of all the topics addressed by reviewers, social media elicited the most contradictory responses. For example, one reviewer asserted that social media has more impact than email when it comes to information dissemination, while a second reviewer suggested email is better suited for distributing information. Even among the group of reviewers that collectively supported the use of social media, there was disagreement as to which platform was best suited to promote *Tethys* and disseminate information. Perceptions of those supporting social media:
- Social media is a great tool for this field.
- Useful tool for incorporating new data and educating target groups about *Tethys*.
- Twitter is useful at disseminating information that may not otherwise come through list serves and other means of notification.
- Facebook is not useful but Twitter and LinkedIn are.
- LinkedIn may be a viable media source for *Tethys*

Perceptions of those not supporting social media:
- Social media is not a widely used tool by scientists and researchers.
- Social media doesn't seem applicable to *Tethys*.
- Three reviewers report not using social media.

Based on lack of engagement by *Tethys* community members in social media, efforts to bolster *Tethys* presence in social media platforms have been fairly minimal during the past six months. *Tethys* was engaged with LinkedIn for about 12 months, but due to a lack of interest and engagement by others, this effort was canceled. Presently, Tethys maintains Facebook and Twitter accounts. One reviewer suggested that the ability for users to ask questions and have members respond is a useful function. These features exist in *Tethys*, but have received little use. We will continue to offer commenting features as well as maintaining a presence on social media platforms as a way to diversify our outreach activities. Connecting with reviewers who reported successful experience with social media may also provide additional ideas for increasing the level of engagement with *Tethys* community members.

2.11 Tethys Blast

Tethys Blast has received favorable feedback during the last six months. During this peer review, one respondent provided accolades to this feature while suggesting there might be opportunities to reduce the text burden in these announcements. A reviewer working in the land-based wind sector inquired as to the possibility of tailoring the *Tethys* Blasts to specific topics of interest – namely, land-based wind. Determining a user's particular research interests, and desire for receiving information on specific content, could be achieved when a user signs up for an account. This suggestion undoubtedly has utility; however, *Tethys* Blast was created as a tool to share general information relevant to newly added *Tethys* content. Generating *Tethys* Blasts which are tailored to a specific field of interest would narrow the existing scope and intent of the current effort, but may be considered in the future.

2.12 Tethys Stories

The purpose of the *Tethys* stories was unclear to one reviewer, who also inquired as to whether there were opportunities to contribute to these stories. We plan to clarify the intent of the stories and inform community members that contributed stories are welcome.

2.13 User Accounts

Several reviewers brought up questions regarding user accounts:
- Since access to content and material is possible without being logged in, the need for registering is unclear.
- To increase registration, consider making the registration/log in feature more prominent.
- Some of the registration process seemed redundant – e.g. required to enter user name more than once

Responses:
- The purpose of registering for an account will be clarified by adding language explaining the benefits of registering as a *Tethys* user.
- The current arrangement of placing account material in the upper right hand corner of the page is intuitive and consistent with other websites. However, we may consider increasing the visibility of this feature in conjunction with updating the home page.
- The redundancies within the registration process will be minimized.

3.0   Survey Monkey

Survey Monkey was used to solicit feedback from a broad group of Tethys community members. While less in depth and comprehensive than the peer review, the brief survey consisted of five questions focused on determining the extent to which Tethys is used, as well as soliciting feedback on additional features that users would like to see on Tethys. Surveys were sent to approximately 700 members of the Tethys community, and the availability of the survey posted on social media; 58 responses were received. The majority (74%) of respondents reported being aware of Tethys for longer than 12 months, whereas approximately 20%of respondents had become aware of Tethys within the last 12 months (Figure 1). Approximately half (53%) of respondents reported using Tethys on a weekly to monthly basis while the remaining respondents (47%) reported rarely to never using Tethys (Figure 1).
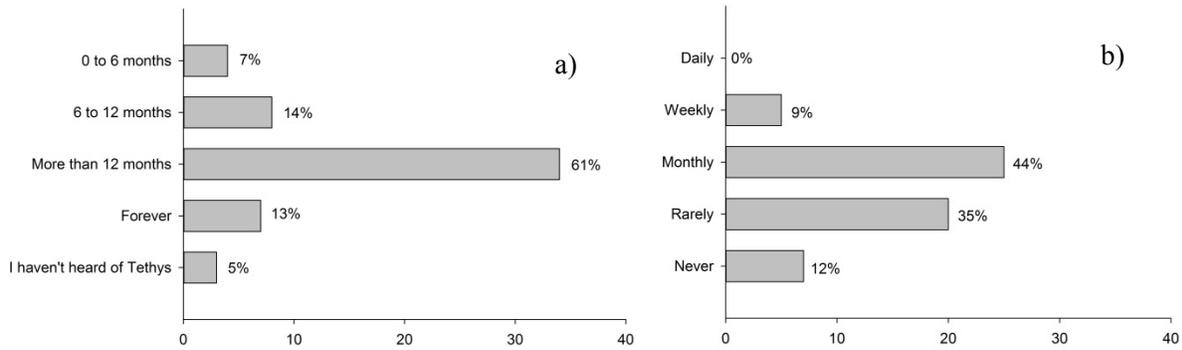
Figure 1. Survey Monkey Responses to a) length of time a user has been aware of Tethys and b) how often Tethys is used by a particular individual.

The Survey Monkey question on the use of Tethys allowed respondents to select one or more of the seven available options (Figure 2). Percentages for a given category are based on the number of responses within an individual category relative to the total number of responses to this particular question, meaning the total proportions across all categories exceed 100%. Overall, responses indicated near equal weight in the use of Tethys for accessing papers (70%), receiving the Tethys Blast (68%), and learning about environmental effects (64%). Many expressed interest in live events such as webinars and expert forums (51%). Survey results indicated that the respondents had less interest in linking to other databases (23%), reviewing archived information (21%), and making external connections with individuals (4%).

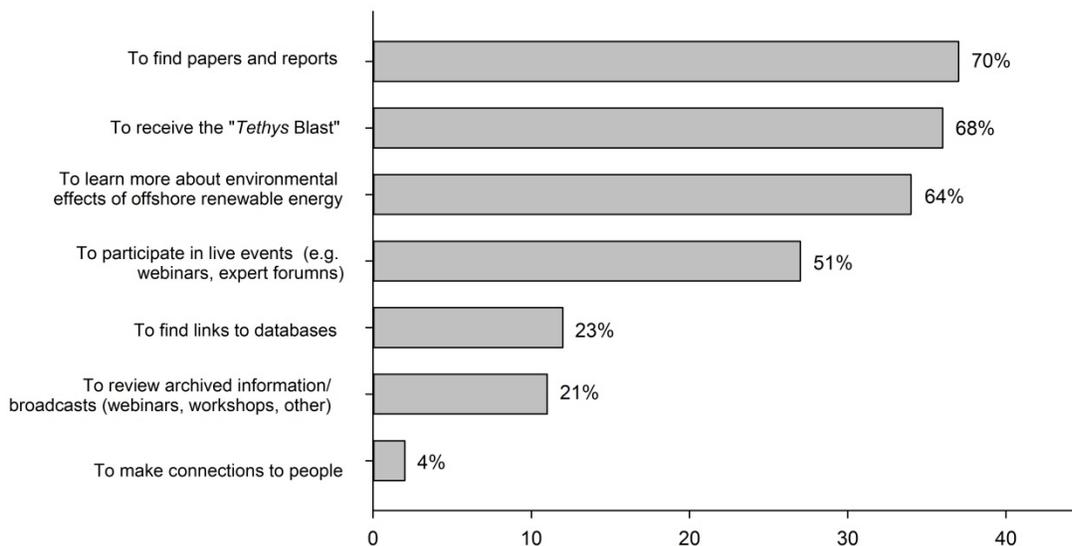Figure 2. Survey Monkey responses to: How do you use Tethys?

Specific feedback and suggestions from Survey Monkey respondents included:
- Improve data search capabilities on the *Tethys* knowledgebase;
- Provide a list of upcoming events somewhere on the site;
- *Tethys* should have more of a focus on river hydrokinetic projects; and
- The site should provide notifications for funding opportunities.

Responses:

- As noted above, PNNL will be looking into enhancing the knowledge base's search capabilities in future development sessions. Additional language will also be added to certain pages to provide additional directions on how to effectively search through *Tethys*.
- *Tethys* contains information and literature on any available river hydrokinetic projects.
- Providing additional funding opportunities is currently not included in the overall scope of *Tethys*. This may be discussed as a possible addition in the future.

4.0   Conclusion

In conclusion, both the peer review and Survey Monkey approaches had great participation rates from the *Tethys* community; which strongly indicates their overall engagement and interest in the site. The addition of the Survey Monkey approach allowed PNNL to reach a much broader audience than what is typically targeted for the traditional *Tethys* review process, providing new information on how well *Tethys* is known and how it is used by the offshore renewable energy community. Both approaches yielded positive responses associated with a number of the site's components such as the broadcasts, connections, and the *Tethys* Blasts. The peer review and Survey Monkey approaches also provided constructive feedback for *Tethys* content, design, and functionalities. Some of the primary areas where feedback and suggestions were received dealt with the *Tethys* home page, search features on the *Tethys* knowledge base and map view pages, additional *Tethys* content including analogous industries, directions for participating in webinars and other broadcast events, and the site's overall speed.

All of the comments received from both reviews have been noted in Appendix A, including PNNL responses and/or action items associated with each comment. Most of the smaller issues or concerns identified through the reviews have been implemented on the site already or are scheduled to be implemented in upcoming development stages, notably the site's overall speed and redesigning the Tethys home page. Other topics such as the need for more analogous content and improving the site's search features and functionality have larger implications for other areas of the site or the overall scope of Tethys; these topics are being discussed internally to develop a clear path forward.

Appendix A

List of Peer Review Comments and PNNL Responses

Comment Category	Reviewer Name	Reviewer Comment	PNNL Response
Broadcasts	Lisa Isaacman	The Tethys / Annex IV broadcasts are very interesting/useful resources. It is very useful that they are made available online after the original broadcasts. I encourage these to continue. One comment I have received from my members is lack of clarity/instructions for signing up/registering for webinars. It looks like some changes have been made recently to this process so that issue may have been resolved. I do recommend that you send reminders with log-in instructions as the event approaches – including on the day of.	Lyris has the ability to postpone messages until a certain date. We could set up a better process where we write all the emails at one point and the system automatically remembers to send them out. These emails also need an attachment for an outlook event... so it shows up on calendars.
Broadcasts	Daisuke Kitazawa	I feel a little bit difficulty of language problems in webinar, but it is quite better than seeing face to face every time (very expensive).	Noted.
Broadcasts	Adesina Adegbie	I am familiar with Tethys broadcasts. On the Webinars and Expert forums, it was easy and quick to download the attached PDF files. The video seems to be too large in size in that it took a great length of time before it could play. I think the Webinars and the expert forum would be very useful if the videos can be minimized or posted in batches rather than in whole.	Noted. We will try to keep the video size as small as possible in the future. However, the video player only supports a single video so we can't break these up.
Broadcasts	Elizabeth Masden	Yes, I have attended several. On one occasion the connection did not seem that reliable for some people but this is often the case with webinars.	We need to follow up to get examples.
Broadcasts	Muriel Perron	We could not play the webinar in the integrated player of the Internet browser. The sound was working fine, but the video was not playing (only the first slide of the presentation was showing). We tried both with Firefox and Internet Explorer browsers without success. Downloading the video and playing it with a locally installed media player was possible, however when played, the video also got stuck at the first slide.	It seems that they were confused about what was meant by "video". People assume this means you watch a video of a person, rather than the slides. We will clarify this in several locations.
Broadcasts	Shane McGuiness	Yes, though I did not know they were called broadcasts. I have attended a webinar before, which was quite cumbersome to register for and set-up. This required downloading a substantial package from Cisco (Web Meetings, or similar?). Simplifying this process would encourage me to attend future events.	We will improve the reminders. But there is little we can do about the software downloads... this all depends on which client we use and there is not much flexibility there.

Comment Category	Reviewer Name	Reviewer Comment	PNNL Response
Broadcasts	Joop Bakker	Conferences and Workshops Experts' Forums: needs to be kept updates to be a functional tool. For instance CWW2015 is missing. As such is the Tab very useful, e.g. the Webinars and the possibility to watch the video footage.	This list only has those conferences and workshops for which we have recorded video. I added language in the header to better explain this. Another (new) page will list all upcoming conferences.
Connections	Lisa Isaacman	I think the 'connections' databases are also a very useful resource as long as they are kept up to date. It would be good if the databases and experts lists have search, filter and/or sorting functions.	Agreed, the experts list will be renovated with input from Annex IV country analysts to include sorting and searching capabilities. Adding search capabilities to the databases page is more difficult and may not provide much benefit with such a short list.
Connections	Teresa Simas	In the "Connections"/"Organizations" tab please replace "Wave Energy Centre (WavEC)" by "Wavec – Offshore Renewables". We have changed the name to cover also offshore wind since we have been involved in some projects.	Changed.
Connections	Teresa Simas	The Martifer group doesn't have any more activity on offshore renewables so I think it makes sense to remove it from the list. However, if the rationale is to list all companies that have been involved with MHK please don't remove it.	There were no documents linked to them - removed.
Content	Anne Marie O'Hagan	Land-based wind may be extraneous content, but I think there is a clear distinction in Tethys as to what material belongs to which category so it may not be an issue at all.	The addition of wind content was mandated by DOE - our client.
Content	Anne Marie O'Hagan	When you zoom in to the west coast of Ireland some of the AMETS resources are located in Achill Island, no Belmullet (further north)	This has been corrected.
Content	Luke Feinberg	I am not sure if there is a process for including new data, but I would be happy to include my Master's work on the feasibility of OSW in central California. It can be found here: http://www.calwindproject.com/documents.html	Added: http://tethys.pnnl.gov/publications /evaluating-offshore-wind-energy-feasibility-california-central-coast
Content	Sharon Kramer	It doesn't appear that any seminal papers are missing but I have not checked Tethys against my personal or company reference library. We have a large volume of "surrogate" literature that likely is not in Tethys, and perhaps should not be.	We will follow up with Sharon for examples.

Comment Category	Reviewer Name	Reviewer Comment	PNNL Response
Content	Sharon Kramer	The recent (2014) EA for the Navy's WETS site in Kāneʻohe is missing (based on the Map Viewer).	Looking and I see that the EA was completed in 2014, but can't find the actual document… perhaps Sharon can provide it?
Content	Sharon Kramer	I would like to see more on methodology, e.g., cable laying, HDD, anchor deployment, I still struggle with evaluating effects of these activities for lack of understanding.	We will follow up with Sharon for examples.
Content	Sharon Kramer	I understand copyright issues but it would be nice to have the journal articles.	Noted. Sadly there is nothing we can do here.
Content	Sharon Kramer	I did find it interesting when I searched on fish aggregation that the references were pretty dated.	We will follow up with Sharon for examples of new references.
Content	Lisa Isaacman	The addition of the onshore wind resources has cluttered the Knowledge base.	The addition of wind content was mandated by DOE - our client.
Content	Craig Stevens	Missing articles about the connection back to benefits of low-carbon energy.	Not relevant enough.
Content	Craig Stevens	I guess I need convincing that data bases of papers/reports are worth it … can it be demonstrated that this gets us somewhere than what would return from Google Scholar? I wonder if position synthesis or Annual Review article might be more use?	As a dedicated knowledge base with only documents relevant to the environmental effects of offshore renewable energy, the search has been well proved to assist in literature searches. Grey literature is also captured that is difficult to find elsewhere. Compare to a Google Scholar search and see for yourself.
Content	Jan Sundberg	I cannot landbased wind has no access.	In late January I realized that Tethys was set up to deny access to anything tagged as WREN. Therefore, all the land-based wind was showing up in the KB, but not accessible. Developers fixed this as soon as it was reported.
Content	Jan Sundberg	Most likely wind is underrepresented, considering installed effect - chr wave/tidal	There is much effort looking into balancing this out. Yet literature may not reflect installations, because there are more unknowns with MHK technologies.

Comment Category	Reviewer Name	Reviewer Comment	PNNL Response
Content	Daisuke Kitazawa	The information from the other marine development (oil and gas, electric cables between islands, etc.) may be useful for the assessment of the effects such as underwater noise and electromagnetic field.	Not relevant enough.
Content	Teresa Simas	Simas, T., O'Hagan, A.M., O'Callaghan, J., Hamawi, S., Magagna, D., Bailey, I., Greaves, D., Saulnier, J.-B., Marina, D., Bald, J., Huertas, C., Sundberg, J., 2015. Review of consenting processes for ocean energy in selected European Union Member States. International Journal of Marine Energy, 9: 41-59. http://www.sciencedirect.com/science/article/pii/S221416691400037X	Added: http://tethys.pnnl.gov/publications /review-consenting-processes-ocean-energy-selected-european-union-member-states
Content	Juan Bald	Simas, T., A. M. O'Hagan, J. O'Callaghan, S. Hamawi, D. Magagna, I. Bailey, D. Greaves, J.-B. Saulnier, D. Marina, J. Bald, C. Huertas y J. Sundberg, 2015. Review of consenting processes for ocean energy in selected European Union Member States. International Journal of Marine Energy, 9: (0): 41-59.	Added: http://tethys.pnnl.gov/publications /review-consenting-processes-ocean-energy-selected-european-union-member-states
Content	Adesina Adegbie	The Ocean Thermal Energy conversion System (OTEC) seems to be underrepresented compared to the representations of the Tidal and Wave energy fields.	We can do a small push to getting more OTEC papers.
Content	Mary Boatman	Offshore Wind only has 8 papers included in the Knowledge base. I believe there is a lot more out there on the topic. You can start with the completed studies from BOEM at: http://www.boem.gov/Renewable-Energy-Completed-Studies/ Also, quite a bit of work is being done by COWRIE (Collaborative Offshore Wind Research Into The Environment) http://energy.nstl.gov.cn/MirrorResources/662/index.html	There are actually 705 OSW documents currently - we are not sure what view you were looking at, but will follow up. We will also follow those links in case we can find more documents.
Content	Elizabeth Masden	I think land-based wind could be better included. For example, in the 'regulatory frameworks' section these mainly apply to marine-based activities and not for land-based wind.	This page was created through Annex IV and therefore only applies to marine energy (specifically wave and tidal). The intro will be reworded to specify this.

Comment Category	Reviewer Name	Reviewer Comment	PNNL Response
Content	Elizabeth Masden	Not seminal but this could be added: Masden, E., Foster, S., & Jackson, A. (2013). Diving behaviour of Black Guillemots Cepphus grylle in the Pentland Firth, UK: potential for interactions with tidal stream energy developments. Bird Study, 60, 547–549. doi:10.1080/00063657.2013.842538	Added: http://tethys.pnnl.gov/publications /diving-behaviour-black-guillemots-cepphus-grylle-pentland-firth-uk
Content	Elizabeth Masden	I think that generally the effects on seabirds are underrepresented relative to marine mammals and fish.	We are always happy to add more papers. The importance of seabirds is specific to the UK, so we will follow up with Elizabeth.
Content	Muriel Perron	The fact that non-English literature is not available on the platform is an important drawback.	We could add a new field to documents, tagging the language. The challenge is then collecting documents from other languages… not easy.
Content	Muriel Perron	In the WREN hub, several important publications are missing, although they are available in the global Tethys database. A few papers on the effects of land-based wind energy on terrestrial mammals could be added to the Tethys database as well. We can provide a list of documents that seem relevant to us.	We can follow up with them about additional documents.
Content	Muriel Perron	Concerning land-based wind energy, there are nearly exclusively studies about birds and bats. Environmental effects on habitats or other wildlife is missing.	We need to have a discussion with DOE about whether we should be collecting land-based wind documents. Is this a task for NREL to be imported into Tethys, or should we be actively searching?
Content	Joop Bakker	Suggestion to add a column "Effect type" after 'Stressor' and 'Receptor'.	PNNL has plans to add an "interactions" filter in Tethys (i.e. reefing, avoidance, collision, etc.), which addresses the same idea. An intern will need to be hired to review all existing 2000 documents and tag accordingly.

Comment Category	Reviewer Name	Reviewer Comment	PNNL Response
Content	Joop Bakker	Alternatively to use the DPSIR methodology: [Driver] – Pressure {Stressor} – Status {Species group pop size decline} – Impact {Effect on Species group} – Response {Adaptive measures to mitigate/prevent the "Pressure". E.g. Driver = Renewable Energy need – Pressure = Collision Mortality – Status = number of Birds, Bats killed – Impact = PBR (Potential Biol Removal) exceeded – Response = wind turbines larger than 8 MW; idle at wind < 4 Bft.	Noted, but the organization of Tethys is already fairly set in stone. A change this drastic would need good reasoning.
Content	Joop Bakker	There are underrepresented fields like ecologically optimal: - spatial planning, - internal lay-out of wind farms, - type / power rate of wind turbines (larger wind turbines exert less collisions)	Noted, but these are outside of the scope of Tethys.
Expert Forums	Juan Bald	I don't see very clear the difference between Webinars and Experts forums. Both tools are suitable to bring together researchers on a regular basis to discuss topics in an informal online setting. Webinars are also quite technical, so the audience could be almost the same for both. In my opinion Webinars and Expert forums could be joined in a unique forum.	We will better explain the differences between these.
Experts	Joop Bakker	Suggestion to name here the government experts involved in the types of renewable energy. Thus the column University may change to 'Institution' and contain names of Universities, Research institutions, Consultancies, Government institutions.	The column has been renamed to say "Organization". We have plans to do a major renovation of the experts list with the following steps: 1. asking country analysts to identify their country experts, going off the current list; 2. create user accounts for those individual people, 3. create a new view that adds user accounts to the list depending on a new field.
Experts Connections	Teresa Simas	In the "Connections"/"Experts" it might be useful to have the possibility to search for a specific person with a dialogue box to be filled with the researcher name or surname.	This would be possible if we change this to link to the user profiles, which is a ticket in the backlog.
Experts Connections	Juan Bald	I miss experts. Maybe it could be useful that each country analyst review their contacts in environmental aspects and send it to Tethys (even if they belong to another country different to their own country).	Great idea, we will ask Annex IV and WREN people to review.

Comment Category	Reviewer Name	Reviewer Comment	PNNL Response
Experts Connections	Juan Bald	It could be useful to put some filter (by Country, specialization, etc.) to facilitate the search. Similar to the filters in the Organizations section:	This would be possible if we change this to link to the user profiles, which is a ticket in the backlog.
General	Anne Marie O'Hagan	I think the site is very comprehensive and user friendly. I would like to see it have a more obvious presence on the IEA-OES website. Perhaps under the 'Resources' tab on the main page? It is listed as a related link under the Work Programme webpage but I'm not sure who would think of looking there for it and it might get more hits if it was more prominent.	Agreed, we will follow up with OES.
General	Craig Stevens	I guess I use the site most to prove to people the level of activity in ORE globally. I feel like it is a somewhat clunky interface that might benefit from some rethinking around how to get the large collection of info now residing within – to the user? I am wondering about more theme-interactive tools… so perhaps you shift the pointer around themes and info appears on a panel. Some libraries use them to provide a more non-linear experience in searching. http://www.wcl.govt.nz/easyfind/ In the search engine it might be good to have selectable boxes for the panel on the right so you could select any tech type except say onshore, and journals and reports…	Many similarities between the ways that Tethys functions to the way the Wellington City Libraries functions. In general, this will be addressed with two tickets: one to increase speeds, one to add an exclude option to filters.
General	Adesina Adegbie	Yes, Tethys does meet my needs as a renewable energy practitioner. However, as a nation Nigeria is yet to be fully involved in renewable energy projects.	He is probably talking generally about the status of their country. Noted, and we look forward to more projects in the future.
General	Mary Boatman	My only issue is that I find the website to be very slow to load up and to go to new pages. I do like the metadata records which have just enough information to aid in finding the documents and knowing what is in them prior to accessing them.	A JIRA ticket was created to look at options for increasing speeds.

Comment Category	Reviewer Name	Reviewer Comment	PNNL Response
General	Muriel Perron	For a practitioner in the field of land-based wind energy, it is less straightforward to find material on this topic. The whole web site is clearly focused on energy from the sea (MHK and OSW). It is more difficult to access pertinent information about onshore wind, because the search features are not oriented towards onshore wind. The filters/categories of the knowledge base are only pertaining to MHK/OSW (e.g. there is no filter for terrestrial mammals as a receptor). Similarly, the definitions in the glossary all refer to marine devices. The focus on marine energy is best exemplified by the title on the homepage "Environmental effects of renewable Energy from the Sea", which is somewhat misleading. It is not obvious at first glance for the visitor that the knowledge base also contains information related to onshore wind. This point could be improved.	We need to establish to what extent land-based wind will be added to Tethys and how the branding, taglines, and general feel of the site should be altered to accompany the addition. We will discuss with DOE.
General	Joop Bakker	Links in the main tabs 'HOME' 'ABOUT' concerning WREN are not coherent. E.g. HOME links to 2 categories of Wind (Land and Offshore), while ABOUT links to Tethys Knowledge Base and Map Viewer.	We are having difficulty discerning this comment. There is only one knowledge base and one map viewer, each containing all available technology types.
Home Page	Mary Boatman	I do think you should revise the section under "What is Offshore Wind?" Because the text does not address the question as it does for "What is MHK?" The current text immediately starts delineating all of the environmental concerns without an introductory paragraph that states something like: Offshore wind is the use of devices to convert abundant wind resources into electricity. The turbines are located in the water rather than on land (could be marine, estuarine, or freshwater – Great Lakes). The advantages over onshore development are the more continuous and predicable source of wind with fewer conflicts with other uses such as cities, farms, etc.	We have plans to renovate the home page. In the meantime, we have reduced the text, provided links that go into greater detail about the technology types, and we changed the titles on the tabs to be more general and lose the "What is".

Comment Category	Reviewer Name	Reviewer Comment	PNNL Response
Home Page	Muriel Perron	The overall structure of the homepage could be improved. At present, the 5 tabs contains descriptions of various projects (Tethys, Annex IV, WREN) and definitions of energy types (MHK, offshore wind). It would be beneficial - for the sake of clarity - to reorganize the structure of the homepage by grouping these topics and present them apart from each other in 2 distinct sections (section projects, section energy types).	We plan to redesign the home page. We will take these comments into consideration then.
Home Page	Shane McGuiness	Some aspects of the functionality are counterintuitive. It is a dense resource which has the potential to provide excellent access to information. However, the homepage could do with brushing up to allow for easier discovery of key content. For example, it is very hard (relatively) to find the database containing information.	We plan to redesign the home page.
Home Page	Shane McGuiness	Try duplicating the links to certain sections on the homepage. At present, a lot of the very interesting sections are hiding on the top banner sections. Incidentally, there is a discernable delay in these revealing down when hovered over. This could discourage use further. Can this be improved? More colour is really required. For example, I clicked into this page (http://tethys.pnnl.gov/risk-analyses-and-models) expecting to see an engaging graphic, when all I got was extensive, small black text on white background. Very similar to the document I am now typing in fact.	Very good comments to keep in mind when redesigning the home page.
Home Page	Joop Bakker	What does "MHK" mean? Change to MarHydrKinetic?	This is a term commonly used by DOE, our sponsor. While we cannot change the acronym, we can use "marine energy" more often to be internationally-minded.

Comment Category	Reviewer Name	Reviewer Comment	PNNL Response
Knowledge Base	Luke Feinberg	Given todays unprecedented access to information, users have a very high expectation of usability and website functionality. I believe that there is a great deal of useful information that can be accessed from the Tethys website; however it could be more intuitive. For example, if one wanted to search for a technology type, such as offshore wind, the intuitive thing to do would be to sort for it. One can click on the column header and sort by type, but 'land-based wind' is the first technology type that turns up, and you cannot access other technology types easily without scrolling through all of the information available. A more intuitive approach would be to have a search or filter tool at the top of the table allowing for easy searching. Alternatively, it may identify more with your audience if a filter was designed after an online shopping tool; Overstock.com for example, makes it very easy to find the product you are looking for. After reading the filter information and clicking to a separate window, the user can gain access to what they are looking for. So the functionality clearly exists, however, from my experience as a first time user, it was not intuitive.	There are filters on the knowledgebase that work in conjunction with the column sort and text filters. I find it difficult to determine how to improve the knowledgebase based on these comments.
Knowledge Base	Luke Feinberg	Another idea to make it more interactive could be including some images in the search function. For example, different images depicting OSW or MHK. Also, receptors, stressors, etc. could all be enhanced by adding in some imagery.	The idea is good, but the effort to make this happen is not worth the benefit.
Knowledge Base	Lisa Isaacman	Yes. However, I think the filtering feature could use improvement, perhaps by further refining the categories or by including an 'exclude' category function. For example, the addition of the onshore wind resources has cluttered the Knowledge base. It would be good to be able to filter those resources out.	This is a good idea that has been on our radar for some time. We created a development ticket for this.

Comment Category	Reviewer Name	Reviewer Comment	PNNL Response
Knowledge Base	Mary Boatman	I wanted to look at the knowledge base and had difficulties with the search functions, could not easily figure out how to reduce my search. Suggest looking into doing something like filters on the left hand side for geography, topics etc. like many sites use today to help focus searches.	We currently have filters for the knowledge base. Not sure how to more clearly identify the filters…
Knowledge Base	Muriel Perron	Another difficulty is that some content is found only in the WREN database but not in Tethys and vice versa. Accordingly, it is not clear which database should be searched for. The access to the WREN database is not straightforward. The only link to it is within the "About WREN" page. There is no filter option on the knowledge base to extract only WREN content.	They seem to be getting confused about the knowledge base… we need to make it clear that there is only one database.
Knowledge Base	Muriel Perron	The table listing the publications is good, but the titles of columns are not self-explanatory. In particular, it is not obvious what is meant under the terms stressor/receptor. A tooltip or a pop-up window opening when clicking on the column title would be appreciated.	Clicking on the column header sorts the table, so we can't make it a link. We will explore the option of tool tips.
Knowledge Base	Shane McGuiness	I can navigate well, though not completely. See above comments. More interactivity is required. At present it is very text-heavy and "blank" looking, with many empty white spaces.	The white space should help reduce the clutter and allow it to seem cleaner. Not sure how else to improve based on the comment.
Knowledge Base	Joop Bakker	Suggest changing the sorting system. E.g. I am interested in Offshore Wind. Sorting on 'Technology Type' I have to scroll down at least 30 pages to reach Offshore Wind.	It seems that he had the same issues as Mary Boatman. Follow-up revealed that both reviewers are no longer having issues. Our best guess is that they clicked a hyperlink on the table, so we removed excess hyperlinks so the table is clearer.
Knowledge Base	Joop Bakker	Would it be possible to have gross categories in separate tabs (although this is already hidden under HOME > What is WREN)? Even better, use filters instead of sorting (like in SharePoint)? The latter best enables searches in all columns (including authors).	He is referring to the filters, which already exist.

Comment Category	Reviewer Name	Reviewer Comment	PNNL Response
Knowledge Base	Joop Bakker	There might be papers missing, but it's very difficult to extract that from the listing at the Tethys knowledge-base. Refer remarks under 1. The thematic linking in the knowledge-base to receptors needs explanation.	Noted. Stressors and receptors are described in the glossary and several other locations. These are also exclusively native to offshore. We have a task that will add tooltips to the header of those columns.
Map Viewer	Craig Stevens	Map slow to load and doesn't really make much use of spatial information so not so great… I'd say the www is slow in general but not sure if that's just the long pipe I peer up (from NZ).	Others have also commented on the slowness. A development ticket was created to look at options for increasing speeds.
Map Viewer	Adesina Adegbie	We hereby look forward to an icon on the Map viewer representing resources from Nigeria.	Noted, and we look forward to more projects in the future.
Map Viewer	Mary Boatman	I found the system to be very slow to load up and move between pages. I was looking for offshore wind, so I sorted on the technology type, and then scrolled through pages to find the offshore wind items. It would be nice to have page numbers and not just forward and back arrows as it took me several clicks and slow loads to get to the page that had offshore wind. I would have preferred selecting page numbers that were several pages back.	Since most views use the "infinite scroll", I'm not sure where she found pages… but we do need to look into better loading speed. A JIRA ticket was created to look at options for increasing speeds.
Map Viewer	Elizabeth Masden	I find it useful and relatively easy to navigate. The Map viewer page can be frustrating because not all of the projects are in the right place when you zoom in on a country.	We need to follow up to get examples.
New Features	Anne Marie O'Hagan	Relevant conferences might be a worthwhile addition but I expect there are too few to do this currently.	We have a preliminary list of conferences (OSW and MHK) that will be compiled into a connections page.
New Features	Teresa Simas	It would be interesting to add the links to future events (those that are planned for the next year or so) e.g.: http://www.bilbaomarinenergy.com/index.aspx http://www.oceans15mtsieeegenova.org/ http://www.ewtec.org/ewtec2015/ http://www.energyocean.com/	These events were added to our preliminary list of conferences.

Comment Category	Reviewer Name	Reviewer Comment	PNNL Response
New Features	Juan Bald	I don't have very clear why to include "Risk analyses and models" in the section Tethys content. There could be other research topics that could be on interest that could merit some introduction or explanation. In this sense, a possibility could be to include another section named Frontier of knowledge where we can explain the main research topics on environmental impacts of MRE and link these topics to the Knowledge Base. For instance, if one topic is acoustic impact, be able to see all the documents, projects, etc., related to this topic.	This feature is currently available via the glossary.
New Features	Juan Bald	Regarding conferences and workshops, to gather information about conferences and workshops worldwide will be very suitable.	We have a preliminary list of conferences (OSW and MHK) that will be compiled into a connections page.
Organizations	Joop Bakker	Some information is use full but outdated. E.g. National Institute for Coastal and Marine Management ceased to exist 1 October 2007. Suggestion to add a time frame of existence. E.g. RIKZ: 1994 – 2007. Rijkswatertaat WVL : 2014 - present

The current name is Rijkswaterstaat , Branch Water, Traffic and Environment (WVL). Organization type: Government.

Rijkswaterstaat, Branch Sea and Delta is another important player in Dutch offshore wind and may be mentioned as well. Organization type: Government.

Institutions to mention: Noordzeewind BV; ENECO; GEMINI windpark (Northland Power) | This is not a list of current organizations, but any that have been involved in this field - linked to publications. Added Rijkwatertaat WVL. I found no mention anywhere online for Branch Sea and Delta… Added ENCO and Northland Power, Noordzeewind already there. |
| Organizations | Joop Bakker | Several other groups may wish to consider promoting Tethys (e.g. ICES WGMRE, OSPAR EIHA). | We will reach out to these groups. |
| Partnerships | Joop Bakker | Tethys as such may remain stand-alone, properly referenced (bi-directionally linked) with other wind websites (like e.g. offshoreWIND.biz). | These opportunities will be better facilitated with the "Partnership" page. We will follow up with OffshoreWIND.biz. |

Comment Category	Reviewer Name	Reviewer Comment	PNNL Response
Regulatory Frameworks	Juan Bald	In the Regulatory framework section I miss an introduction about those regulations strictly related with the environmental impact of MRE. Some text to contextualize how we manage from the point of view of regulations the environmental impacts of MRE: · Environmental Impact Assessment (EIA) · Marine Spatial Planning. · European Directives for the conservation of marine health status (Water Framework Directive and Marine Strategy Directive). · Etc. This introduction could aid to understand why we describe the regulatory framework of the different countries. Maybe the article written by Simas et al. (2015) and the result of the SOWFIA project could help on this.	Text was added in the header to reference Simas et al. 2015. There are plans to renovate this page with input from the Annex IV country analysts and the referenced OES report.
Social Media	Anne Marie O'Hagan	Twitter links are useful. I often find things there that I don't get from mailing lists, alerts etc.	Noted.
Social Media	Luke Feinberg	Social media could be an effective tool to get new data incorporated into the system and educate target communities about the website functionality.	Noted.
Social Media	Sharon Kramer	I don't think social media is necessary.	Noted.
Social Media	Lisa Isaacman	From my consultations with scientists and research organization coordinators, scientists and policy-makers do not generally use Facebook pages or Twitter feeds, where available, for research/science organizations. A common comment was that posts/conversations tended to become more social/personal in nature instead of professional. Email seems to be a more effective and preferred medium for these audiences. If the audience is meant to be the general public, however, social media might be effective.	Noted. We are trying to reach both research community and general public.

Comment Category	Reviewer Name	Reviewer Comment	PNNL Response
Social Media	Craig Stevens	I don't see it as being the market you are seeking to inform… Someone's going to decide to build a ORE farm because of a tweet? I guess you could hook up with some green energy forum and provide updates of how much energy is being captured/could be captured?	Noted.
Social Media	Jan Sundberg	Do not use e.g. Facebook or Twitter	Noted.
Social Media	Daisuke Kitazawa	I think these social media will be effective to share the information between us. But, in my case, I do not use Facebook and Twitter since I'm busy.	Noted.
Social Media	Juan Bald	Social media are tools (for better or worse) that we cannot ignore.	Noted.
Social Media	Juan Bald	Maybe LinkedIn could be another media where Annex IV could be present. Some European projects, such as Devotes and others are present in this media. They could be an example.	Not enough people were interested in LinkedIn while we had it up for a year. Therefore we canceled that page.
Social Media	Mary Boatman	I do not participate in Facebook and Twitter. An effective social media option is the ability to ask questions and have members of the community respond.	Noted. We have commenting enabled on some pages, but haven't gotten much usage.
Social Media	Elizabeth Masden	I'm not sure Facebook is the right platform, however twitter can be useful, as well as LinkedIn.	Noted.
Social Media	Muriel Perron	Yes. Publishing news on social media rather than with an emailed newsletter could have more impact. Newsletters are not always read and often land directly in the trash bin.	Noted.
Social Media	Shane McGuiness	Yes, extremely. Though I did not know they were/are active in the field. I am very active in this outreach stream and have not encountered Tethys…..?	Very interesting… though not too surprising. Noted.
Social Media	Joop Bakker	Maybe LinkedIn page/group is an option, but many already exist and create the effect of "the Trees and the Wood" (Dutch saying), in other words "confusion".	Noted. We removed the old LinkedIn page after a lack of interest.

Comment Category	Reviewer Name	Reviewer Comment	PNNL Response
Tethys Blast	Adesina Adegbie	I support Tethys Blast, but it was frustrating subscribing to it because the process demanded the use of Microsoft Outlook. In my opinion, it should have been better and straight forward to use choice email address. However, Tethys Blast will serve as an effective tool for communicating and updating the Tethys community.	The email link to sign up by default uses whatever email program is set as default on their computer. If Outlook is default, then he simply needs to change it on his end - nothing we can do about this. (I did verify his email is on the Tethys Blast list now)
Tethys Blast	Muriel Perron	The content of the newsletter is generally interesting. However, it would be nice to have different news for different audience. Someone involved in land-based wind energy projects is not especially interested in tidal energy. Upon registration, users have to select their interests. We suggest filtering news in the Tethys Blast according to the interests specified by each user.	This is a good idea, and would be nice. But it expands the scope of task too much. Our focus remains on offshore energy… this is where the funding is coming from.
Tethys Blast	Shane McGuiness	Yes. Yes, it is effective with some interesting information. Again, I would reduce the text burden on the initial email newsletter.	Noted.
Tethys Blast	Joop Bakker	Considering the lay-out: I really like the offshoreWIND.biz daily newsletters. Know it? The "read more…" items all end up in a website visit.	Noted. We are unable to view these newsletters because we need a subscription.
Tethys Stories	Juan Bald	In my opinion, we need to clarify the objective of the Tethys stories section: which kind of "stories" can be published in this section. It´s open to anyone? How we can contribute?	We will explain Tethys stories in the next Tethys Blast. We will also add some details in the header of the main stories page.
User Accounts	Luke Feinberg	Registration was a smooth process. If you wanted more people to register, perhaps the location of the registration button could be moved to a more central location.	Perhaps, but we don't want to overplay the user accounts. People are also very used to account management being in the upper right of websites. This is common practice.
User Accounts	Teresa Simas	The only question I have is about the need to have a log in since it seems to me the information is all available anyway (logging in or not). Maybe I'm missing some functionality that is only available when I'm logged in…	Eventually, more functionality will be added so this is more worthwhile. There are currently some benefits to logging in currently, as outlined on the login page.

Comment Category	Reviewer Name	Reviewer Comment	PNNL Response
User Accounts	Mary Boatman	I easily created an account with Tethys. When I logged on, I first had to enter my username, a new page appeared and I had to re-enter my username and then my password. It would be better if I did not have to re-enter my user name. It is very confusing with the WREN section that has separate users and a separate log-in.	Ticket was created about re-entering username.
User Accounts	Mary Boatman	It is not clear to me why I need to log in – isn't it supposed to be open to everyone?	More features with time will make user accounts more beneficial.