



# Introducing the New *Tethys Engineering* Knowledge Base

August 7, 2019

**Jonathan Whiting, Pacific Northwest National Laboratory**

**Lysel Garavelli, Pacific Northwest National Laboratory**

**Andrea Copping, Pacific Northwest National Laboratory**

**Jon Weers, National Renewable Energy Laboratory**

**Rick Driscoll, National Renewable Energy Laboratory**

**Kelley Ruehl, Sandia National Laboratories**

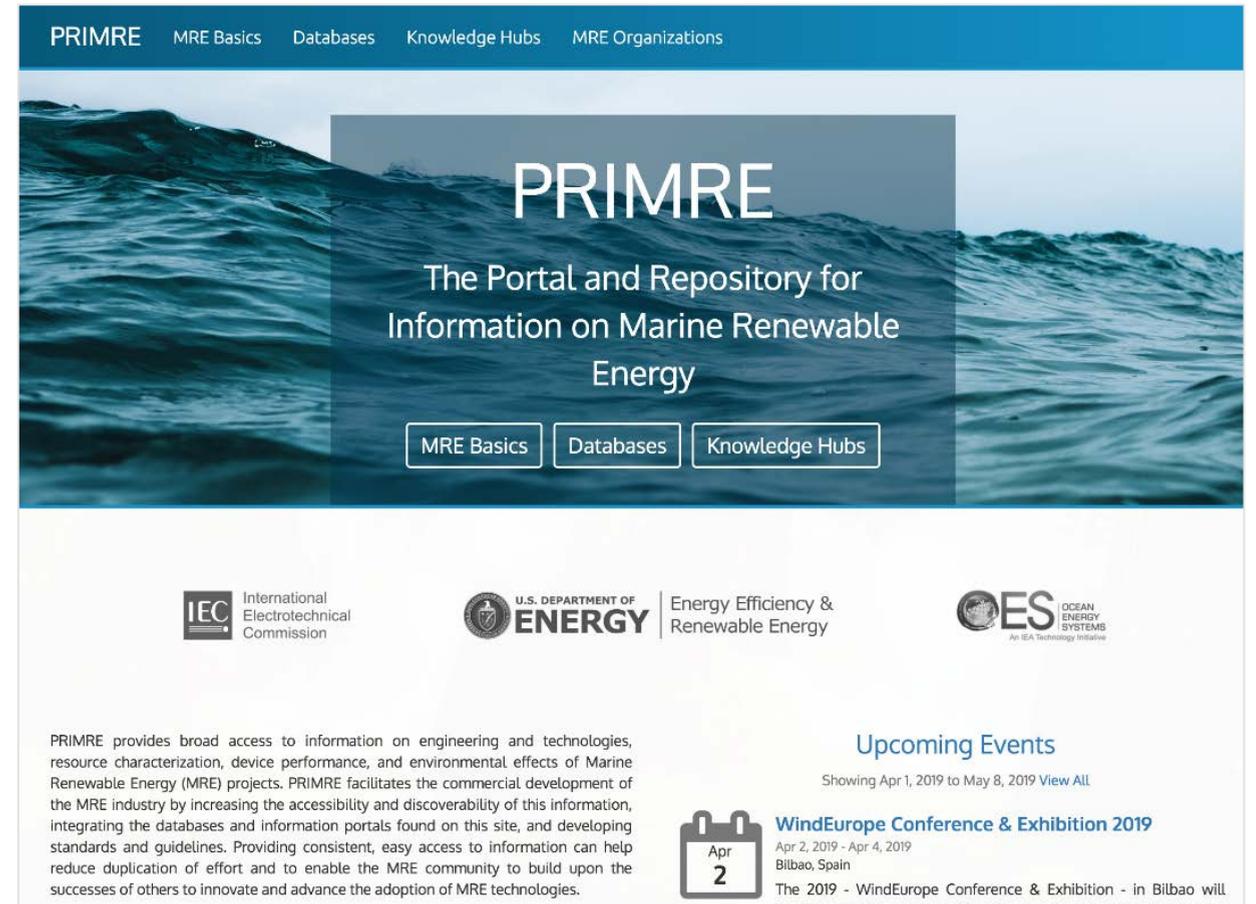


PNNL is operated by Battelle for the U.S. Department of Energy

# Portal and Repository for Information on Marine Renewable Energy

PRIMRE seeks to provide broad access to engineering, resource characterization, and environmental effects information on marine renewable energy projects to facilitate the commercial development of the marine renewable energy (MRE) industry.

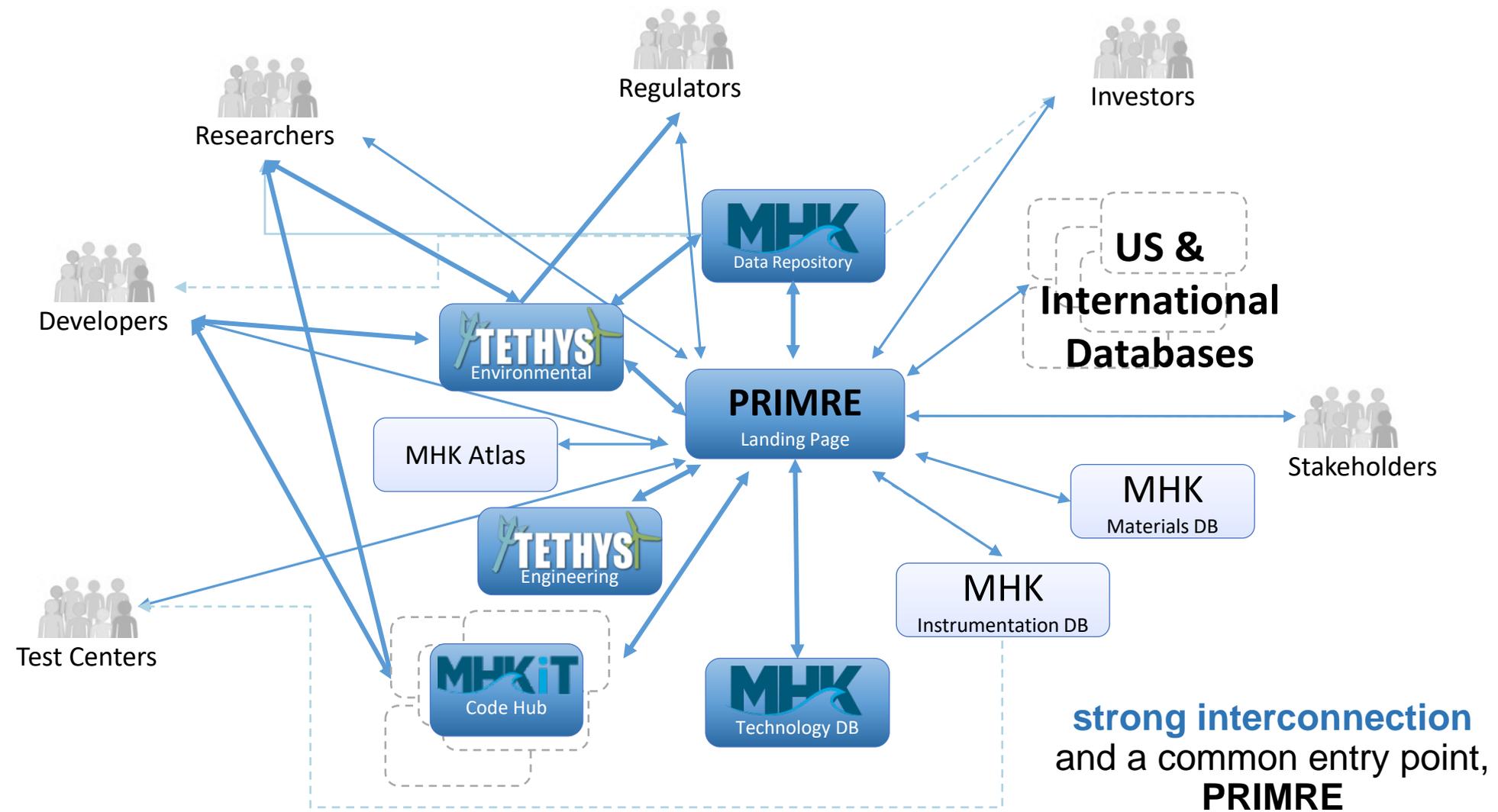
- MRE Basics (e.g., terminology)
- Databases (e.g., P MEC)
- Knowledge Hubs (e.g., *Tethys*, MHKDR)
- Upcoming Events
- Relevant Organizations (e.g., IEC, OES)
- Instructions on how to get involved with PRIMRE



The screenshot shows the PRIMRE website homepage. At the top is a navigation bar with links for PRIMRE, MRE Basics, Databases, Knowledge Hubs, and MRE Organizations. The main header features the text "PRIMRE The Portal and Repository for Information on Marine Renewable Energy" over a background image of ocean waves. Below this are three buttons: "MRE Basics", "Databases", and "Knowledge Hubs". The footer contains logos for the International Electrotechnical Commission (IEC), the U.S. Department of Energy (Energy Efficiency & Renewable Energy), and the Ocean Energy Systems (OES). A section titled "Upcoming Events" shows a calendar icon for April 2 and lists the "WindEurope Conference & Exhibition 2019" from April 2-4, 2019, in Bilbao, Spain.

<https://primre.org>

# Integration of PRIMRE Knowledge Hubs

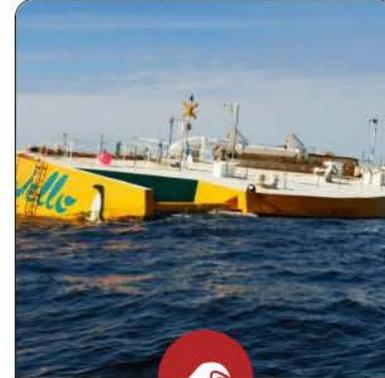




[tethys-engineering.pnnl.gov](http://tethys-engineering.pnnl.gov)




**CURRENT**  
Power from tidal, ocean current, and river flows




**WAVE**  
Power from waves at sea




**OTEC**  
Ocean Thermal Energy Conversion




**SALINITY**  
Power from differences in salt concentration



**NEW USER**

If you are new to Tethys, start here to learn more

**KNOWLEDGE BASE**

Access thousands of publications and more, all in a searchable database

**June 2019**

Today

Sun	Mon	Tue	Wed	Thu	Fri	Sat
						1
2	3	4	5	6	7	8
			13:00 Seanergy 2019			
9	10	11	12	13	14	15
			9:30 2019 OMAE-International Conference on Oci			
			1:00 European Conferen			
16	17	18	19	20	21	22

**Tethys Engineering**

Tethys Engineering is a knowledge base that collects, curates, and makes publicly available documents on engineering and technologies associated with marine renewable energy. Sponsored by the US Department of Energy, Tethys Engineering is part of the PRIMRE system, and is designed after the Tethys knowledge base.

## Knowledge Base

The Knowledge Base provides access to information about technical and engineering aspects of marine renewable energy. Relevant documents from around the world are compiled into a user-friendly table that displays all content available in *Tethys Engineering*. Results can be narrowed using the keyword filters on the right, or with search terms entered in the text box. Content may also be sorted alphabetically by clicking on column headers. Some entries will appear on the next page.

As an alternative to the Knowledge Base, check out the [Map Viewer](#) to access geotagged content in a spatial view.

Currently 2,774 documents in *Tethys Engineering*, each hand selected and tagged by PNNL staff.

Columns can be sorted alphabetically or by date

Title	Author	Date	Type of Content	Technology	Collection Method	Operations	Device	Publication Type
Modelling and field testing of a breakwater-integrated U-OWC wave energy converter with dielectric elastomer generator	Moretti, G., Malara, G., Scialo, A.	February 2020	Journal Article	Wave, Oscillating Water Column	Modeling, Scale Device		Performance, Power Take Off	Journal Article (2211) Conference Paper (347) Report (108) Book Chapter (68) Thesis (56) <a href="#">Show more</a>
The influence of dredging for locating a tidal stream energy farm	Álvarez, M., Ramos, V., Carballo, R.	February 2020	Journal Article	Current, Tidal	Modeling		Hydrodynamics	Wave (1565) Current (1109) Tidal (641) Point Absorber (291) Oscillating Water Column (270) <a href="#">Show more</a>
Unsteady hydrodynamics of tidal turbine blades	Scarlett, G., Viola, I.	February 2020	Journal Article	Current, Tidal	Modeling, Full Scale		Hydrodynamics, Performance	
Multi-objective optimization of hydrofoil geometry used in horizontal axis tidal turbine blade designed for operation in tropical conditions of South East Asia	Nandagopal, R., Narasimalu, S.	February 2020	Journal Article	Current, Axial Flow	Field Data, Modeling		Hydrodynamics, Performance	Modeling (1745) Lab Data (409) Field Data (261) Scale Device (211) Full Scale (46) <a href="#">Show more</a>
Evaluation of RANS and SRS methods for simulation of the flow around a circular cylinder in the sub-critical regime	Pereira, F., Vaz, G., Eca, L.	December 2019	Journal Article		Modeling		Hydrodynamics	surviv (153) mainten (51) deploy (28) condit (11) monitor (11) <a href="#">Show more</a>
Hydrokinetic energy exploitation under combined river and tidal flow	Fouz, D., Carballo, R., Ramos, V.	December 2019	Journal Article	Current, Riverine, Tidal	Modeling		Hydrodynamics	Performance (939) Hydrodynamics (650) Structural (422) Power Take Off (318) Array Effects (254) <a href="#">Show more</a>
A fundamental coupling methodology for modeling near-field and far-field wave effects of floating structures and wave energy devices	Stratigaki, V., Troch, P., Forehand, D.	December 2019	Journal Article	Wave	Modeling		Array Effects, Hydrodynamics, Performance	character (547) site (547) instrument (87) Event (59) extrem (59)
A parallel								

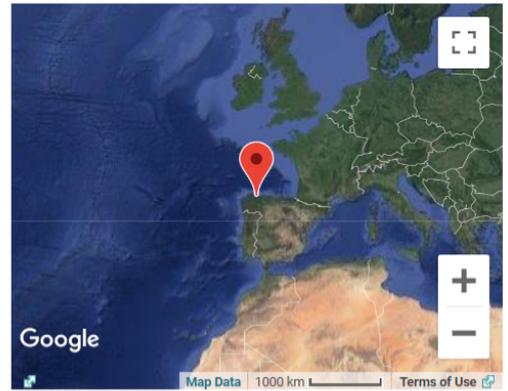
Results can be filtered down by keyword searches and tags.

# The influence of dredging for locating a tidal stream energy farm

Search Knowledge Base  
Search Map Viewer  
Event Calendar  
Photo Library

## Abstract

Development of third generation of Tidal Energy Converters (TECs) may boost the exploitation of the tidal stream energy resource in depth-limited regions. The hydrodynamic conditions of depth-limited tidal sites are highly influenced by changes in the bathymetric conditions, such as sedimentation and/or dredging operations, which are typical of these regions. Consequently, significant variations in terms of magnitude and predominant flow direction can be present during the operating life of tidal farms, which may compromise their viability. The objective of this work is to explore the potential effects caused by dredging operations on the performance of tidal farms and to propose initial threshold values for key variables (flow magnitude and direction, operating hours of TECs), to ensure the techno-economic viability of tidal farms. For this purpose, three potential tidal sites in a shallow water estuary (Ribadeo, NW Spain), were used as case study. Significant variations were found between the pre- and post-dredging scenarios in terms of energy production, with annual variations exceeding 38%, for the tidal sites present in the region. In sum, the present study highlights the importance of considering the potential bathymetric changes in the decision-making process, when planning the installation of tidal farms in depth-limited regions.



The influence of dredging for locating a tidal stream energy farm is located in *Spain*.

**Original Article**

**Title:** The influence of dredging for locating a tidal stream energy farm

**Author:** Álvarez, M.; Ramos, V.; Carballo, R.; Arean, N.; Torres, M.; Iglesias, G.

**Publication Date:** February 1, 2020

**Journal:** Renewable Energy

**Volume:** 146

**Pages:** 242-253

**Publisher:** Elsevier

**Affiliation:** University of Santiago de Compostela, University of Porto, SFI Research Centre for Marine and Renewable Energy (MaREI), University of Plymouth

**Technology:** Current, Tidal

**Collection Method:** Modeling

**Device:** Hydrodynamics

**Document Access**

**Website:** [External Link](#)

**Citation**

Álvarez, M.; Ramos, V.; Carballo, R.; Arean, N.; Torres, M.; Iglesias, G. (2020). The influence of dredging for locating a tidal stream energy farm. *Renewable Energy*, 146, 242-253. DOI: 10.1016/j.renene.2019.06.125

When copyright allows, *Tethys Engineering* hosts a PDF copy of the document.

A citation is automatically generated and can be easily copied.

## Map Viewer

The Map Viewer provides a spatial view of information about technical and engineering aspects of marine renewable energy. Documents associated with a geographic location are compiled into an interactive map with panning, zooming, clustering, and filtering. Results can be narrowed using the keyword filters on the right, or with search terms entered in the text box. Content is clustered together but will break apart into smaller clusters or bubbles by zooming in or clicking on a cluster. Individual icons can be selected to open a dialog box with more information and link to the document page.

Not all content is geotagged. Check out the [Knowledge Base](#) for access to the full suite of information in *Tethys Engineering*.



Displaying 1 - 1070 of 1070

Currently 1,056 geotagged documents in *Tethys Engineering*.

Only a subset of documents are tagged, when they can be associated with a geographic location.

## Glossary

Documents are tagged with the following:

- Technology
- Collection Method
- Resource
- Operations
- Device
- Economics

### Technology

- **Current:** Capturing energy from tidal channels, ocean currents, or rivers.
- **Axial Flow:** Water flows parallel to the device's axis of rotation.
- **Cross Flow:** Water flows perpendicular to the device's axis of rotation.
  - **Archimedes Screw:** A helical surface surrounding a ventral cylindrical shaft.
  - **Kite:** A device that 'flies' in the tidal stream, swooping in a figure-eight shape.
  - **Ocean Current:** Capturing energy from ocean currents.
  - **Oscillating Hydrofoil:** Water induces oscillating translation of hydrodynamic surface.
  - **Riverine:** Capturing energy from river currents.
  - **Tidal:** Capturing energy from tidal fluctuations using turbines, tidal barrages, or tidal lagoons.
- **Ocean Thermal Energy Conversion:** Capturing energy using temperature gradients across water depths.
  - **Closed-Cycle:** An OTEC system in which working fluid with a low-boiling point is circulated.
  - **Open-Cycle:** An OTEC system in which warm, surface seawater is the working fluid.
  - **Hybrid:** An OTEC system in which both seawater and a working fluid are circulated.
- **Salinity Gradient:** Capturing energy using salinity gradients where freshwater meets seawater.
  - **Pressure Retarded Osmosis:** Salinity gradient technology in which osmotic pressure is used to generate electricity.
  - **Reverse Electrodialysis:** Salinity gradient technology in which cation and anion exchange membranes are used to create a "salt battery".
- **Wave:** Capturing energy from waves.
  - **Attenuator:** Floating device that operates parallel to the wave direction.
  - **Oscillating Water Column:** Hollow structure that uses wave action to compress air through a turbine.
  - **Oscillating Wave Surge:** Pendulum that oscillates as waves pass by.
  - **Overtopping:** Storage reservoir filled by breaking waves that exit through turbines.
  - **Point Absorber:** Device that absorbs energy from the relative motion between a wave-activated, moving body and a fixed structure.
  - **Pressure Differential:** Submerged or semi-submerged devices that use differences in pressure to generate electricity.

### Collection Method

- **Field Data:** Data collected in a real-world scenario.
- **Lab Data:** Data collected in a laboratory setting.
- **Modeling:** A system or device that is modeled.
- **Test Center:** Data collected at an established test center.
- **Full Scale:** Devices deployed or modeled at full scale.
- **Scale Device:** Device deployed or modeled at smaller than full scale.

### Resource

- **Extreme Events:** Events such as hurricanes, storms, rogue waves, and tsunamis.
- **Instrumentation:** Instruments placed around the device to monitor it or its effects.
- **Site Characterization:** Surveying a potential site for bathymetry, energy potential, etc.

### Operations

- **Deployment:** Installation of a device.
- **Maintenance:** Work done on a device after it is operational.
- **Condition Monitoring:** Monitoring the health of a device while in operation.
- **Survivability:** How a device survives in the ocean (e.g., planned lifespan, fatigue studies).
- **Decommissioning:** Removal of a device at the end of its lifespan.

### Device

Technology definitions will conform to IEC TS 62600-1 standards.

- [Search Knowledge Base](#)
- [Search Map Viewer](#)
- [Event Calendar](#)
- [Photo Library](#)

## Current

Capturing energy from tidal channels, ocean currents, or rivers.



Current energy can be captured from tidal channels, ocean currents, or rivers. **Ocean current** energy technologies capture the energy from the relatively constant flow of ocean currents, which are driven by several factors, including wind, bathymetry, and the rotation of the Earth, as well as water temperature, density, and salinity. **Tidal** energy technologies capture the energy from flow induced by the rise and fall of tides, which is driven by gravitational influence of the moon and sun on the Earth's oceans. Land or subsea constrictions, such as straits and inlets, can create high velocity currents at specific sites, making them suitable for electricity generation. **Riverine** energy technologies extract the kinetic energy from flowing water in rivers to generate electricity. Although not technically a marine resource, as part of the natural hydrological cycle, water from drainage basins, groundwater springs, and snow melt feed rivers that flow towards lakes, seas, and oceans.

Photo: BALAO-SABELLA

Terminology pages provide a description, photo, and a table of all the documents tagged with term.

Users may also click on authors and other tags to reach similar landing pages.

Title	Author	Date	Type of Content	Technology	Collection Method	Operations	Device
The influence of dredging for locating a tidal stream energy farm	Álvarez, M., Ramos, V., Carballo, R.	February 2020	Journal Article	Current, Tidal	Modeling		Hydrodynamics
Unsteady hydrodynamics of tidal turbine blades	Scarlett, G., Viola, I.	February 2020	Journal Article	Current, Tidal	Modeling, Full Scale		Hydrodynamics, Performance
Multi-objective optimization of hydrofoil geometry used in horizontal axis tidal turbine blade designed for operation in tropical conditions of South East Asia	Nandagopal, R., Narasimalu, S.	February 2020	Journal Article	Current, Axial Flow	Field Data, Modeling		Hydrodynamics, Performance
Hydrokinetic energy exploitation under combined river and tidal flow	Fouz, D., Carballo, R., Ramos, V.	December 2019	Journal Article	Current, Riverine, Tidal	Modeling		Hydrodynamics
Unsteady hydrodynamics of a full-scale tidal turbine operating in large wave conditions	Scarlett, G., Sellar, B., van den Bremer, T.	December 2019	Journal Article	Current, Axial Flow, Tidal			Hydrodynamics, Performance
Turbines for modular tidal current energy converters	Kaufmann, N., Carolus, T., Starzmann, R.	November 2019	Journal Article	Current, Tidal	Modeling, Full Scale		Structural
A review of deep learning for renewable energy forecasting	Wang, H., Lei, Z., Zhang, X.	October 2019	Journal Article	Current, Wave	Modeling		
Power variability of tidal-stream energy and implications for electricity supply	Lewis, M., McNaughton, J., Márquez-Dominguez, C.	September 2019	Journal Article	Current, Tidal	Field Data		Hydrodynamics, Performance
Design and test of a 600-kW horizontal-axis tidal current turbine	Li, Y., Liu, H., Lin, Y.	September 2019	Journal Article	Current, Tidal			Control, Performance, Structural
Reducing variability in the cost of energy of ocean	Topper, M., Nava, V., Collin,	September 2019	Journal Article	Current, Wave	Modeling		Array Effects

- [Search Knowledge Base](#)
- [Search Map Viewer](#)
- [Event Calendar](#)
- [Photo Library](#)

## Event Calendar

The Event Calendar highlights key events from around the world related to marine renewable energy, including conferences, workshops, webinars, and more. Clicking on an event will show more information and link to the event organizer. While some of these events are hosted by *Tethys Engineering*, the majority are not, so queries about specific events should be sent to the event organizer. If you would like to recommend an event for this calendar, please email [tethys@pnnl.gov](mailto:tethys@pnnl.gov).

### June 2019

Today

Sun	Mon	Tue	Wed	Thu	Fri	Sat
						1
2	3	4	5	6	7	8
			13:00 Seanergy 2019			
9	10	11	12	13	14	15
	9:30 2019 OMAE-International Conference on Ocean, Offshore and Arctic Engineering					
	1:00 European Conference on Renewable Energy Systems VII (ECRES) 2019					
16	17	18	19	20	21	22
23	24	25	26	27	28	29
	0:00 3rd World Congress and Exhibition on Wind & R					
30						
9:00 Test Event						

### Upcoming Events

- **13th European Wave and Tidal Energy Conference (EWTEC):** September 1, 2019 01:00 - September 6, 2019 09:00
- **OceanObs '19:** September 16, 2019 11:30 - September 20, 2019 15:30
- **Offshore Energy 2019 Exhibition and Conference:** October 7, 2019 01:00 - October 9, 2019 10:00
- **13th International Tidal Energy Summit:** November 11, 2019 01:00 - November 12, 2019 09:00
- **PAMEC 2020:** January 26, 2020 06:00 - January 28, 2020 15:00

## Photo Library

The *Tethys Engineering* Photo Library hosts photos and illustrations of marine renewable energy devices, arrays, and facilities that have been graciously provided by several developers and are free for third party use.

### Andritz Hydro



### CorPower Ocean



The *Tethys Engineering* Photo Library hosts photos and illustrations of marine renewable energy devices, arrays, and facilities that have been graciously provided by several developers and are free for third party use.

### Andritz Hydro



### CorPower Ocean



Provided by developers for public use in presentations and publications.

## MRE Organizations

This list compiles organizations from around the world that are involved in research pertaining to marine renewable energy devices. Clicking on the organization will direct you to a page which includes additional information on the organization as well as a list of all documents in Tethys Engineering affiliated with the organization. The organizations list is not exhaustive, and will be updated as needed. If you have comments on incorrect or missing material, please email [tethys@pnnl.gov](mailto:tethys@pnnl.gov).

Organization Type:  Country:  Search Organization Names:

Organization	Organization Type	Country	Website	Content Count
<a href="#">University of Edinburgh</a>	Academic	United Kingdom	<a href="https://www.ed.ac.uk/home">https://www.ed.ac.uk/home</a>	116
<a href="#">Uppsala University</a>	Academic	Sweden	<a href="http://www.uu.se/en">http://www.uu.se/en</a>	76
<a href="#">University College Cork</a>	Academic	Ireland	<a href="https://www.ucc.ie/en/">https://www.ucc.ie/en/</a>	69
<a href="#">Plymouth University</a>	Academic	United Kingdom	<a href="https://www.plymouth.ac.uk/">https://www.plymouth.ac.uk/</a>	64
<a href="#">University of Strathclyde</a>	Academic	United Kingdom	<a href="http://www.strath.ac.uk/">http://www.strath.ac.uk/</a>	61
<a href="#">University of Santiago de Compostela</a>	Academic	Spain	<a href="http://www.usc.es/en/index.html">http://www.usc.es/en/index.html</a>	60
<a href="#">University of Exeter</a>	Academic	United Kingdom	<a href="http://www.exeter.ac.uk/">http://www.exeter.ac.uk/</a>	60
<a href="#">Aalborg University</a>	Academic	Denmark	<a href="https://www.en.aau.dk/">https://www.en.aau.dk/</a>	59
<a href="#">University of Washington</a>	Academic	United States of America	<a href="http://www.washington.edu/">http://www.washington.edu/</a>	55
<a href="#">Norwegian University of Science and Technology (NTNU)</a>	Academic	Norway	<a href="http://www.ntnu.edu/">http://www.ntnu.edu/</a>	48
<a href="#">University of Oxford</a>	Academic	United Kingdom	<a href="http://www.ox.ac.uk/">http://www.ox.ac.uk/</a>	48
<a href="#">University of Southampton</a>	Academic	United Kingdom	<a href="http://www.southampton.ac.uk/">http://www.southampton.ac.uk/</a>	47
<a href="#">Oregon State University</a>	Academic	United States of America	<a href="http://oregonstate.edu/">http://oregonstate.edu/</a>	46
<a href="#">Sandia National Laboratories (SNL)</a>	Government Research	United States of America	<a href="https://www.sandia.gov/">https://www.sandia.gov/</a>	45
<a href="#">Maynooth University (National University of Ireland, Maynooth; NUIM)</a>	Academic	Ireland	<a href="https://www.maynoothuniversity.ie/">https://www.maynoothuniversity.ie/</a>	38
<a href="#">National Renewable Energy Laboratory (NREL)</a>	Government Research	United States of America	<a href="https://www.nrel.gov/">https://www.nrel.gov/</a>	37
<a href="#">Cardiff University</a>	Academic	United Kingdom	<a href="http://www.cardiff.ac.uk/">http://www.cardiff.ac.uk/</a>	37
<a href="#">University of Lisbon</a>	Academic	Portugal	<a href="http://www.ulisboa.pt/">http://www.ulisboa.pt/</a>	37

Added documents are tagged with author affiliations. This view lists which organizations are the top contributors of MRE technical and engineering documents.

The list can be filtered by organization type, country, and by keyword searches.

## MRE Databases

The list below compiles and provides access to external databases. While the respective scopes of each of the databases are varied, all convey information relevant to marine renewable energy. The list of databases is not exhaustive, and will be updated as needed. If you have comments on incorrect or missing material, please email [tethys@pnnl.gov](mailto:tethys@pnnl.gov).

Country:  Search Databases:

Title	Technology Type	Country	Description
<a href="#">MHK Tech Papers Blog</a>	Current, Wave	United States of America	MHKTech Papers Blog aggregates technical papers related to the development of marine and hydrokinetic technologies and focuses on technology development, economics, and resource assessment.
<a href="#">OpenEI</a>	Current, Wave	United States of America	OpenEI is an energy information portal sponsored by the U.S. Department of Energy and developed by the National Renewable Energy Laboratory in support of the Open Government Initiative to make energy data transparent, participatory, and collaborative. In wiki format, OpenEI hosts a collection of content and data on a wide variety of topics from renewable energy resources and technologies, policy and regulations, and analyzed and raw data.
<a href="#">Marine and Hydrokinetic Data Repository (MHKDR)</a>	Current, Wave	United States of America	The Marine and Hydrokinetic Data Repository (MHKDR), hosted on OpenEI, is the repository for all data collected using funds from the Water Power Technologies Office of the U.S. Department of Energy (DOE).
<a href="#">Marine and Hydrokinetic Technology Database</a>	Current, Wave	United States of America	The U.S. Department of Energy's Marine and Hydrokinetic Technology Database, hosted on OpenEI, provides up-to-date information on marine and hydrokinetic renewable energy, both in the U.S. and around the world. The database includes wave, tidal, current, and ocean thermal energy, and contains information on the various energy conversion technologies, companies active in the field, and development of projects in the water.
<a href="#">Hydrodynamic Testing Facilities Database</a>	Current, Wave	United States of America	The U.S. Department of Energy's Hydrodynamic Testing Facilities Database, hosted on OpenEI, couples a map-based viewer with a list of hydrodynamic testing facilities to provide data on a range of testing capabilities and services available at commercial, academic, and government facilities, as well as offshore berths, within the United States.
<a href="#">Tethys</a>	Current, Ocean Thermal Energy Conversion, Salinity Gradient, Wave	United States of America	<i>Tethys</i> is an online knowledge management system that provides access to information on the environmental effects of wind and marine renewable energy. Launched by the Pacific Northwest National Laboratory to support the U.S. Department of Energy's Water Power Technologies Office and Wind Energy Technologies Office, <i>Tethys</i> houses thousands of peer reviewed papers, technical reports, geospatial content, and other media and metadata.
<a href="#">MHK &amp; Wind Materials Database</a>	Current, Wave	United States of America	The U.S. Department of Energy's Wind Energy Technologies Office and Water Power Technologies Office have funded Sandia National Laboratories and its partner, Montana State University, to conduct extensive testing and analysis on wind turbine blades and materials for marine hydrokinetic (MHK) devices in support of the industry and research communities. The results of over 16,000 tests on 500 materials (since 1989 for wind, and more recently for water) have been compiled and published annually in the MHK & Wind Material Database, along with numerous technical publications analyzing the key trends and technical results of the tests.
<a href="#">Marine Cadastre</a>	Current, Wave	United States of America	Marine Cadastre is an integrated marine information system that provides data, tools, and technical support for ocean and Great Lakes planning. Developed through a partnership between the U.S.'s National Oceanic and Atmospheric Administration (NOAA) and Bureau of Ocean Energy Management (BOEM), Marine Cadastre provides information regarding biologically important areas, maritime boundaries, offshore wind technology depth zones, offshore tidal stream, wave, and wind resource potentials, and more.

*Tethys Engineering* also maintains a list of other MRE databases. This includes all PRIMRE databases and many international databases.



Home » Connections » Tethys Engineering Community

## Tethys Engineering Community

The Tethys Engineering Community is comprised of a diverse group of researchers, developers, regulators, and stakeholders working in the field of and/or interested in marine renewable energy. The Tethys Community is defined by registered users within Tethys Engineering; users who have given permission to share professional contact information with other registered users are displayed in the table below.

Background:  Country:  Search by Name:

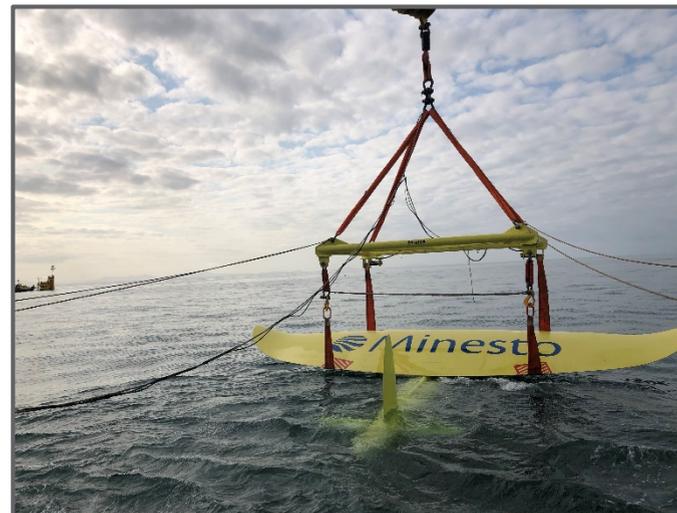
Name	Background	Organization	Department	Interest	Phone Number	Country	Content Count
<a href="#">Jonathan Whiting</a>	Researcher	Pacific Northwest National Laboratory	Marine Science Laboratory	Environmental Impacts, Risk Modeling, Social Outreach	+1 206-528-3060	United States of America	0
<a href="#">Wei-Cheng Wu</a>	Researcher	Pacific Northwest National Laboratory	Coastal Sciences	Hydrodynamic Modeling; Wave Modeling; Marine Renewable Energy	+1 541-602-9879	United States of America	0
<a href="#">Hayley Farr</a>	Researcher	Pacific Northwest National Laboratory	Coastal Sciences	Wind & Marine Renewable Energy		United States of America	0

Displaying 1 - 3 of 3 users



# Upcoming Features

- Continuing content collection
- Improving linkages with Tethys and other PRIMRE sites
- *Tethys Engineering Blasts*
- Signature Projects



## TETHYS BLAST

26 July 2019

The bi-weekly *Tethys Blast* highlights new information on *Tethys*, news articles of international interest, and opportunities in wind and marine renewable energy. We hope you find this a valuable tool to keep you connected to colleagues, new research, opportunities, and industry milestones.

### Request for Information

The Department of Energy's (DOE) Water Power Technologies Office is requesting your input on the use of the Pacific Northwest National Laboratory's (PNNL) Marine Sciences Laboratory (MSL) facilities in Sequim, Washington, for research, technology development, and testing related to all aspects of renewable energy, maritime markets, and energy storage. This information will help DOE and PNNL prioritize resources and investments. Please respond to this [Request for Information](#) via email to [wptorfi@ee.doe.gov](mailto:wptorfi@ee.doe.gov) by 8 August 2019.

### Upcoming Workshop on Retiring Risk: Registration Extended

OES-Environmental (formerly Annex IV) and ORJIP invite you to join a workshop on Thursday, 5 September 2019 from 14:30 to 17:30 CEST on retiring risks of effects on marine animals from electromagnetic fields and underwater noise from marine energy devices. The workshop will be held in Naples, Italy, at the Centro Congressi della Stazione Marittima di Napoli, following the European Wave and Tidal Energy Conference (EWTEC). You can register for the workshop by sending an email to ORJIP ([ORJIP@aquatera.co.uk](mailto:ORJIP@aquatera.co.uk)) by 2 August 2019. Once you are registered, you will receive materials at least two weeks prior to the workshop. For more information, visit the workshop's [event](#) page on *Tethys*.

### Upcoming Workshop on Ocean Energy Reliability

MONITOR and RiaSoR2 invite you to join a workshop on Tuesday, 3 September 2019 from 15:30 to 19:00 CEST on wave and tidal energy reliability. The workshop will be held in Naples, Italy, at the Renaissance Hotel Mediterraneo in Napoli during the European Wave and Tidal Energy Conference (EWTEC). You can register for the workshop by sending an email to [carlv.tait@emec.org.uk](mailto:carlv.tait@emec.org.uk) by 31 July 2019. For more information, view the workshop invite [here](#).

# Upcoming PRIMRE Workshops

- European Wave and Tidal Energy Conference
  - Conference in Napoli, Italy
  - Workshop from 5:30-7pm on 2 September 2019
- Ocean Renewable Energy Conference
  - Conference in Portland, Oregon, USA
  - Workshop on 11 September 2019





# Thank you! Questions?

Additional questions and  
comments may be sent to:  
[tethys@pnnl.gov](mailto:tethys@pnnl.gov)



PNNL is operated by Battelle for the U.S. Department of Energy