

Exploring Synergistic Opportunities Between WREN and the UN CMS Energy Task Force

Karin Sinclair, National Renewable Energy Laboratory



Smøla Wind Farm, Norway. Photo from Bjørn Iuell, Statkraft

Second Meeting of the
Multi-stakeholder Energy
Task Force

Host: UN CMS Energy Task
Force

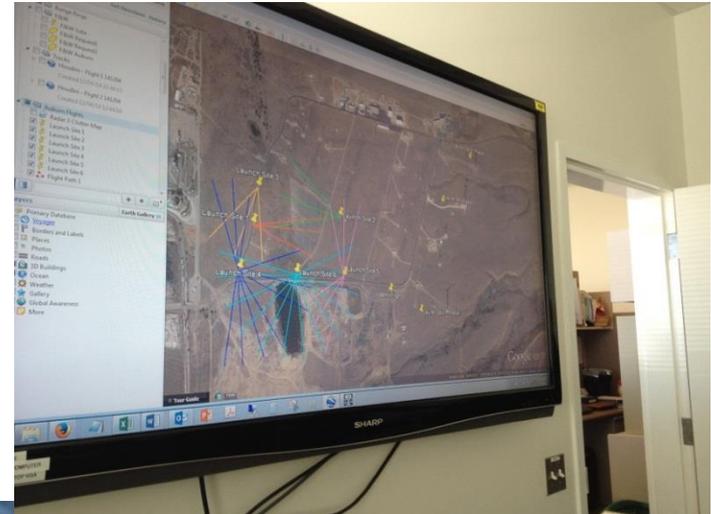
Location: Bonn, Germany

Date: September 15, 2017



Outline

- WREN (Working Together to Resolve Environmental Effects of Wind Energy) background
 - WREN Hub
 - White papers
 - Outreach and engagement
- Opportunities for synergy.



An American bald eagle (middle right) was part of research being conducted at the National Wind Technology Center at the National Renewable Energy Laboratory (NREL). Birds were released to gather predetermined flight pattern data (top right) from a crate attached to an elevated man lift (bottom right).
Photos by Lee Jay Fingersh and Karin Sinclair, NREL

International Energy Agency (IEA) Wind Task 34



Wind turbines in Jura, Switzerland.
Photo by Karin Sinclair, NREL

IEA Wind Program: 20 active countries plus Chinese Wind Energy Association, European Commission, and WindEurope

Rebranded: WREN

Objective: facilitate international collaboration to advance the understanding of the environmental effects of offshore and land-based wind energy development.

Active Members

June 2017
Gotland, Sweden



October 2015
Bern, Switzerland



March 2015
Berlin, Germany



November 2016, Colorado, United States



September 2017,
Estoril, Portugal



December 2013
Trondheim, Norway

Country	Organization
Canada	Environment and Climate Change Canada
France	EDF R&D
Ireland	BirdWatch Ireland
Netherlands	Rijkswaterstaat—Department of Water Quality
Norway	Norwegian Institute for Nature Research
Portugal	STRIX, Environment and Innovation
Spain	Spanish National Research Council
Sweden	Swedish Energy Agency; Vindval
Switzerland	Federal Office of Energy
United Kingdom	Marine Scotland Science—Marine Laboratory
United States	National Renewable Energy Laboratory Pacific Northwest National Laboratory U.S. Department of Energy

Primary Activities

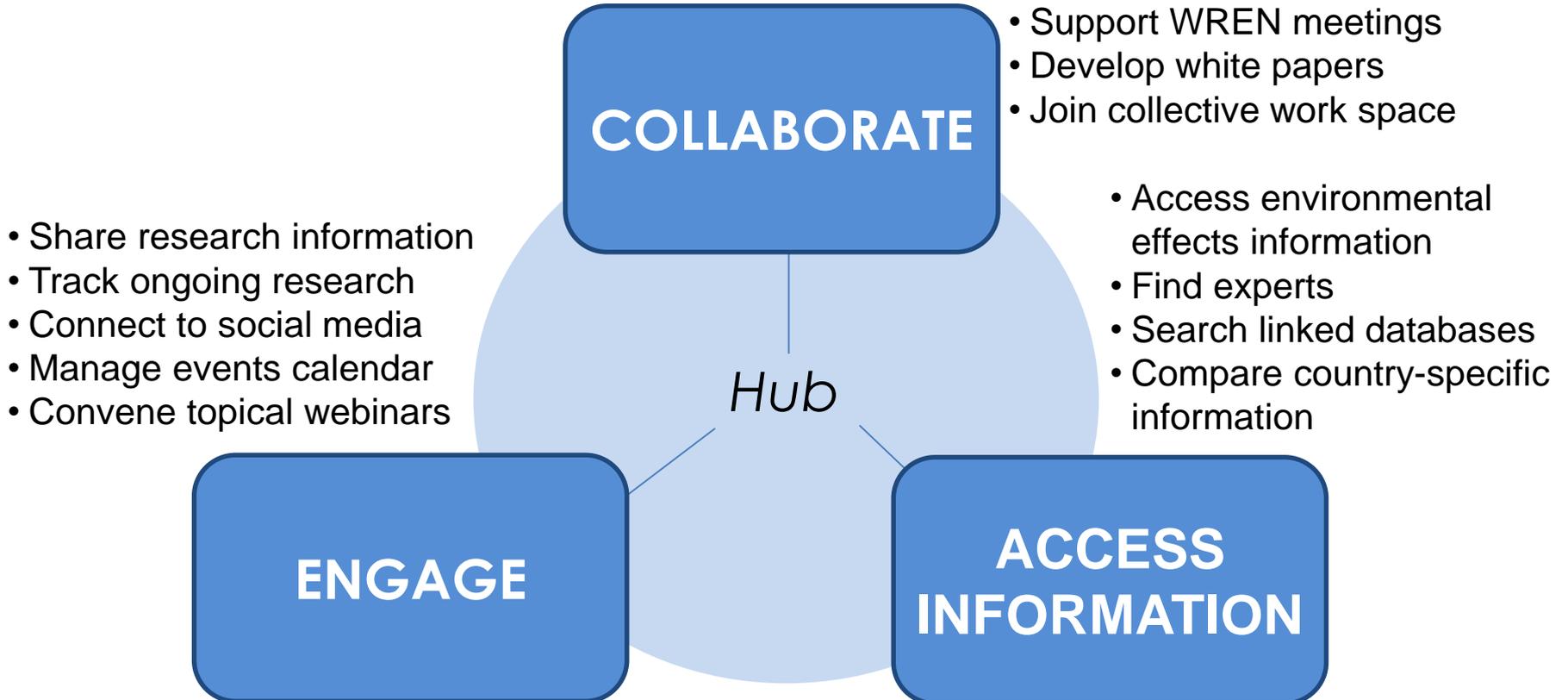
- **WREN Hub:** publicly available knowledge management system
- **White papers:** cover topics in which information is not readily available within the existing literature that are useful to meet the member country information needs
- **Outreach and engagement:** utilizing a variety of strategies.



Radio-tagged golden eagle.
Photo by Randy Flament, NREL 23585

WREN Hub

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



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Tethys is a knowledge management system that actively gathers, organizes, and disseminates information on the environmental effects of marine and wind energy development.



Marine Energy
Generating electricity from the sea



Wind Energy
Generating electricity from wind on land and at sea



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13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		



Annex IV
Addressing environmental effects of marine energy internationally



WREN
Resolving conflicts between wind and wildlife internationally

Tethys Story
Up to Date Compendium of Science on Marine Renewable Energy Effects Released
The Annex IV initiative, under the Ocean Energy Systems (OES) collaboration has released the 2016 State of the Science report on environmental effects of marine renewable energy development around the world. The



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White Papers

Current topics

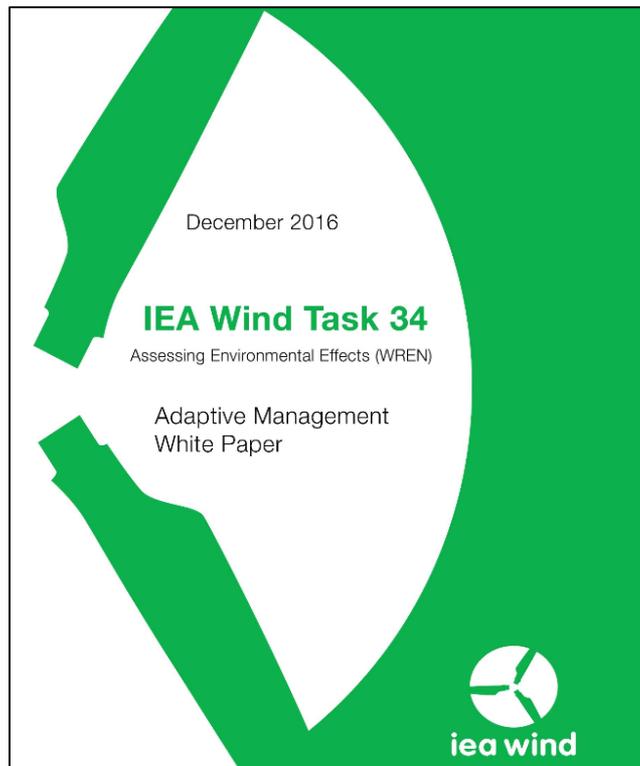
- *Adaptive Management White Paper* (published 2016)
- *Considerations for upscaling individual effects of wind energy development toward population-level impacts on wildlife* (submitted to journal in early 2017)
- Environmental risk-based management
- Cumulative effects analysis
- Green versus green (reconciling climate mitigation, water savings, and other global environmental benefits with local impacts on wildlife and habitat)
- Interrelationships of all topics.



Male greater sage-grouse on a lek in Wyoming. Photos by LuRay Parker, Wyoming Game and Fish Department, (top) NREL 20645 and (bottom) NREL 20646

Adaptive Management White Paper

- ▶ The WREN Hub site* for the *Adaptive Management White Paper* contains the following items:
 - Summary of the report
 - Link to the white paper
 - Fact sheet describing the white paper
 - Translated to French; more translations in the future.



* <https://tethys.pnnl.gov/publications/assessing-environmental-effects-wren-white-paper-adaptive-management-wind-energy>

Outreach and Engagement

Activities:

- Short science summaries
- Webinar series
- Fact sheets
- Conferences/meetings
- Targeted workshops
- Expert forums.



Researchers conducting bat fatality monitoring at a wind energy facility. Bat carcass being recorded for future data analysis.

Source: Arnett, E., M. Schirmacher, M. M. P. Huso, J. P. Hayes. 2009. *Effectiveness of Changing Wind Turbine Cut-in Speed to Reduce Bat Fatalities at Wind Facilities; 2008 Annual Report*. Prepared for the Bats and Wind Energy Cooperative and the Pennsylvania Game Commission. http://www.batsandwind.org/pdf/Curtailment_2008_Final_Report.pdf

Short Science Summaries

- Summaries provide an overview of research
- Recent summary focuses on harbor porpoises (*Phocoena phocoena*), a small and abundant cetacean species
- Most concerns about offshore wind energy and harbor porpoises are associated with construction activities (pile driving in particular).

<https://tethys.pnnl.gov/short-science-summary-harbor-porpoises-and-offshore-wind-energy>

WREN SHORT SCIENCE SUMMARY
WORKING TOGETHER TO RESOLVE ENVIRONMENTAL EFFECTS OF WIND ENERGY

Harbor Porpoises and Offshore Wind Energy

The science associated with understanding and managing the effects of offshore wind energy on Harbor porpoise populations is introduced below.

THE SPECIES
Harbor porpoises (*Phocoena phocoena*) are a small and abundant cetacean species. Found throughout the temperate and subarctic waters of the northern hemisphere, they prefer shallow, coastal waters, and feed near the bottom on small fish, squid, and crustaceans. The population status worldwide is not of concern. Repeat surveys during the last two decades of the relatively coastal North Sea population off Western Europe suggest that this local population is healthy. The status of populations on the east and west coasts of Canada and the United States are largely unknown.

THE MECHANISM OF SPECIES RISK FROM WIND ENERGY
Most concerns about offshore wind energy and Harbor porpoises are associated with construction activities, particularly if pile driving is required to install turbine foundations. These loud impulsive sounds may affect an individual's survival and reproduction with the significance of the effect likely to vary according to the importance of the area (for example, animals may respond differently in important feeding areas than in other areas). These effects on individuals could lead to impacts at the population level. Studies have demonstrated that species abundance typically returns to previous levels soon after pile driving ceases. Some studies have recorded either long-term reductions or increases in abundance once a wind farm has begun operations. However, confidence in all these results is often low owing to the challenges of distinguishing between natural variability and the wind farm effect.

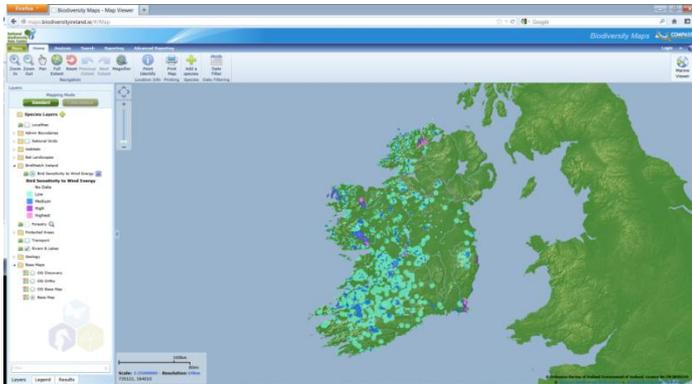


Webinar Series

- Eleven webinars have been held to date
- Topics: birds, bats, marine mammals, tools, models, and other research
- Webinars cover international perspectives
- All are recorded and posted on WREN Hub
- Webinar #12—September 20, 2017: “Upscaling Wind and Wildlife Individual Interactions to Population-Level Impacts.”



Map as shown within WREN Webinar #2 presented by Dr. Ross McGregor, senior ornithologist, Natural Power Consultants, on a presentation entitled “Results of Ornithological Analysis for a UK Offshore Wind Farm”



Screenshot of Irish Terrestrial Bird Sensitivity Map for Wind Energy (Source: <http://maps.biodiversityireland.ie/#/Map>) discussed by Sinéad Cummins from Bird Watch Ireland in a presentation entitled “Bird Sensitivity Mapping for Wind Energy Developments in Ireland” during WREN webinar #4. Development of a marine version of this sensitivity map is in discussion.

WREN Webinars: <http://tethys.pnnl.gov/environmental-webinars>

Products and Presentations

Products include:

- Manuscripts for journals
- Fact sheets
- Slide decks
- Tethys stories

Presentations to different audiences, such as:

- Industry groups
- Scientific conferences:
 - National Wind Coordinating Collaborative Research Meeting
 - Conference on Wind Energy and Wildlife Impacts
- European Wind Energy Association
- Multistakeholder groups
- Conservation organizations.

Opportunities for Synergy

- Coordinate activities
- Cross-reference networks
- Create partnership
- Knowledge sharing (WREN Hub)
- Webinar series
- Outreach and engagement
- Contribute/review white papers.

Questions?

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IEA Wind Task 34

http://www.ieawind.org/task_34.html

WREN Hub

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



A flock of black-tailed godwits (*Limosa limosa*) fly past Cahore Wind Farm in southeast Ireland.

Image by Oran O'Sullivan

Notice: The IEA Wind agreement, also known as the Implementing Agreement for Co-operation in the Research, Development, and Deployment of Wind Energy Systems, functions within a framework created by the International Energy Agency (IEA). Views, findings and publications of IEA Wind do not necessarily represent the views or policies of the IEA Secretariat or of all its individual member countries.

