U.S. DEPARTMENT OF ENERGY

Office of ENERGY EFFICIENCY & RENEWABLE ENERGY

2021 PROJECT PEER REVIEW

U.S. DEPARTMENT OF ENERGY
WIND ENERGY TECHNOLOGIES OFFICE

Wind Operational Issue Mitigation (WOIM)

Pacific Northwest NATIONAL LABORATORY

Mitigate Market Barriers – Environmental Research

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FY21 Peer Review - Project Overview

Project Summary:
- *Challenge*: Concerns of potential environmental effects of wind energy development generate regulatory uncertainty and slow permitting
- *Approach*: Support research and development (R&D) of solutions to address wind-wildlife concerns; provide broad access to and information sharing of the current understanding of the environmental science
- *Key Project Partners*: AXYS Technologies, Inc. (AXYS), National Renewable Energy Laboratory (NREL), Texas Christian University (TCU)

Project Objective(s) 2019-2020:
- *Avian Remote Sensing*: Develop/demonstrate thermal imaging technology to assess the impact of offshore wind facilities on birds/bats
- *WREN/Tethys*: Collect, curate, and disseminate information on wind-wildlife interactions, including potential effects and mitigation measures
- *Strategic WETO Support*: Provide strategic support to WETO to assist in stakeholder engagement, strategy, and ocean resources planning
- *Miniaturized Radio Frequency Transmitter*: Develop radio frequency (RF) transmitters for macro and micro scale bat tracking applications
- *U.S. Offshore Wind Synthesis of Environmental Effects Research (SEER)*: Synthesize and disseminate existing knowledge about wind-wildlife interactions and prioritize U.S. research needs

Overall Project Objectives (life of project):
- Support the testing of wind-wildlife monitoring/mitigation technologies and ensure public access to wind-wildlife research to support siting, permitting processes, management decisions, and operational strategies

Project Start Year: 2011
Expected Completion Year: 2021
Total expected duration: 10 years to date

FY19 - FY20 Budget: $1,595,148

Key Project Personnel: Alicia Gorton (PI), Shari Matzner, Andrea Copping, Daniel Deng, Genevra Harker-Klimes, Simon Geerlofs

Key DOE Personnel: Jocelyn Brown-Saracino

WREN
Working Together to Resolve Environmental Effects of Wind Energy

TETHYS

SEER
U.S. OFFSHORE WIND SYNTHESIS OF ENVIRONMENTAL EFFECTS RESEARCH

Project Impact

Advance the State of the Technology

Catalyze Wind Energy Deployment

Address Key Stakeholder Challenges

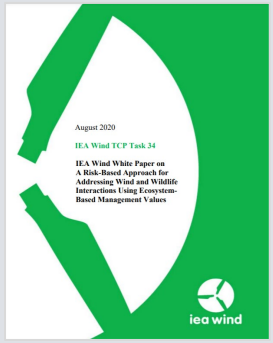
Support the Advancement of Sustainable, Equitable Wind Energy

Avian Remote Sensing

- R&D to advance technology and commercial readiness
- Increase our understanding of the risks/impacts of wind turbines on birds and bats

WREN/Tethys

- Facilitate knowledge sharing to advance wind energy development
- Host webinars and publish materials of interest to international stakeholders



Strategic WETO Support

- Engage with strategic ocean planning efforts
- Develop engagement strategy for coastal communities/stakeholders
- Strategize offshore wind messaging and engage in policy and planning dialogues

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Project Impact

Advance the State of the Technology

Catalyze Wind Energy Deployment

Address Key Stakeholder Challenges

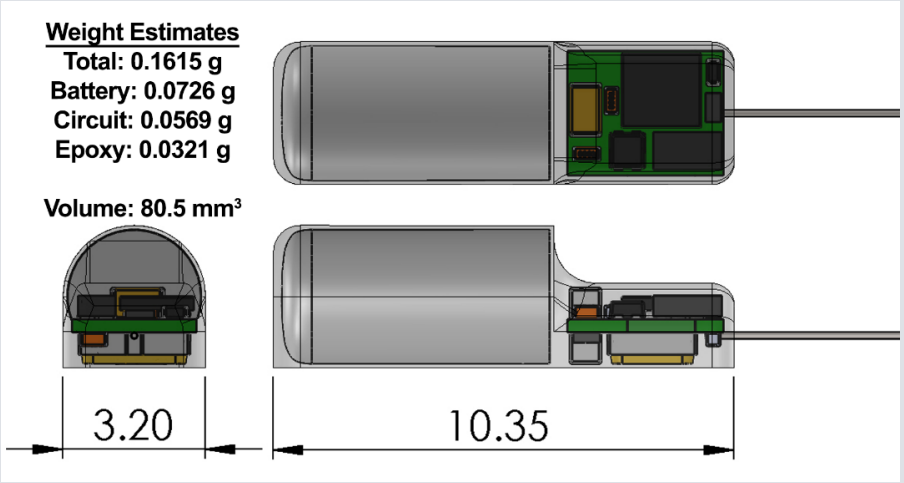
Support the Advancement of Sustainable, Equitable Wind Energy

Miniaturized RF Transmitter

Develop smaller RF transmitter with increased detection range and tag life

Enable macro and micro-scale behavior monitoring to explain the relationship between bats and wind turbines

Option 1 (Small Size)

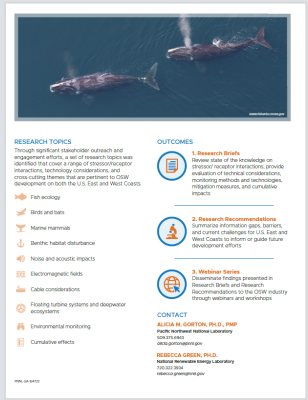


SEER

Facilitate knowledge sharing to advance U.S. offshore wind development

Address issues of stakeholder concern

Summarize state of the science to inform applicability to U.S. waters and prioritize future research needs



Program Performance – Scope, Schedule, Execution

	Scope	Schedule	Execution
Avian Remote Sensing	✓ Improve species classification models ✓ Complete technology validation ✓ Initiate prototype for offshore deployment	Schedule Delays	✓ Developed species database ✓ Advanced Technology Readiness Level from 4 to 6 ✓ Published peer-reviewed manuscript
WREN/Tethys	✓ Increase content in Tethys Knowledge Base ✓ Engage WREN and wind stakeholders to increase visibility of Tethys	On Schedule	✓ Developed Tethys Wind Outreach Implementation Plan ✓ Published IEA Wind technical paper ✓ Completed annual Tethys Peer Review
Strategic WETO Support	✓ Provide strategic support to WETO ✓ Assist in stakeholder engagement, strategy, and regional ocean resources planning	On Schedule	✓ Developed stakeholder engagement strategy ✓ Engaged in regional policy and planning dialogues

Program Performance – Scope, Schedule, Execution

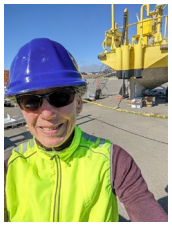
	Scope	Schedule	Execution
Miniaturized RF Transmitter	✓ Develop smaller RF transmitter with increased tag life ✓ Develop 3D localization algorithm to provide high-resolution behavioral information	 Schedule Delays	✓ Completed circuit designs of transmitter options ✓ Fabricated transmitter prototypes ✓ Developed preliminary 3D localization software
SEER	✓ Synthesize key issues and disseminate existing knowledge about environmental effects ✓ Inform applicability to U.S. waters ✓ Prioritize future research needs	 On Schedule	✓ Engaged stakeholders to effectively gather feedback ✓ Developed project workplan ✓ Established Advisory Committee to help refine focus of research topics

Program Performance – Accomplishments & Progress

	Technology R&D	Publications	Presentations	Stakeholder Engagement	Data Dissemination
Avian Remote Sensing	✓	✓	✓	✓	✓
WREN/Tethys		✓	✓	✓	✓
Strategic WETO Support				✓	
Miniaturized RF Transmitter	✓	✓	✓	✓	✓
SEER			✓	✓	✓

Project Performance - Upcoming Activities

FY21+





Federal Laboratory Consortium for Technology Transfer

Avian Remote Sensing	• Finalize and test offshore prototype • Deploy with DOE lidar buoy off California	• Archive data on Data Archive and Portal • Conduct at-sea seabird survey to validate technology
WREN/Tethys	• Continue to curate literature in the Knowledge Base and engage stakeholders • Enhance land-based wind content	• Complete FY21 Tethys Peer Review • Develop Monitoring and Mitigation Technologies Database
Strategic WETO Support	• Develop WETO offshore wind social science strategy • Continue Sea Grant coordination and mentorship	• Support development of offshore wind environmental funding opportunity • Integrate offshore wind messages into Blue Economy engagement and outreach
Miniaturized RF Transmitter	• Field testing for technology validation • Patent approved and another pending • Commercially available through license to Advanced Telemetry Systems	• Included in suite of U.S. Fish and Wildlife Tracking Technologies • Won 2020 Federal Laboratory Consortium Excellence in Technology Transfer Award
SEER	• Complete literature reviews of research topics • Develop and publish Research Briefs on research topics	• Host webinars on Research Brief topics • Plan and execute regional workshops on research recommendations

Stakeholder Engagement & Information Sharing

	Pathway to Commercialization	Engagement Strategy	Outreach Material	Advisory Group / Project Partners	Information Sharing
Avian Remote Sensing	✓		✓		✓
WREN/Tethys		✓	✓	✓	✓
Strategic WETO Support		✓			
Miniaturized RF Transmitter	✓		✓		✓
SEER		✓	✓	✓	✓