



Comprehensive renewable energy solutions

ENVIRONMENTAL SERVICES FOR OFFSHORE WIND ENERGY



We've got the environment down to a science

Your offshore wind project's environmental needs are varied and complex, and we believe the best solution is to choose an environmental services consultant who understands these challenges and will work in partnership with you to creatively and efficiently implement solutions. Stantec is recognized for providing high quality environmental services to the North American wind energy industry. Our 2,700-person multidisciplinary environmental services team of senior professionals located across our 250-plus offices in North America means we have a local understanding of your project and the community it serves.

With decades of experience in the Atlantic, Arctic, and Pacific Oceans, Stantec offers a wealth of technical knowledge and a strong understanding of federal, provincial, state, and local regulations. Stantec's professional scientists and engineers routinely work on highly visible and fast-paced offshore projects requiring in-depth technical expertise and regulatory knowledge. We are frequently involved with the planning and permitting for large-scale marine projects, utility-scale wind farms, offshore transmission, LNG facilities, pipelines, ports, ferry terminals, bridges, and harbor channels.

Stantec has established excellent working relationships with federal and state regulatory agencies, and is routinely involved in the preparation and support of complex permitting efforts for our clients. Stantec prepares resource permit applications including the Bureau of Ocean Energy Management (BOEM), National Environmental Policy Act (NEPA), U.S. Army Corps of Engineers (USACE), and Federal Energy Regulatory Commission (FERC) applications. We also regularly provide supporting studies including habitat assessments, marine ecological studies, alternatives analyses, and natural resource analyses for permit and license applications. Regardless of the role, we work with our clients to help develop their projects and streamline the regulatory process.

Whether working on large-scale offshore power development projects or small coastal construction projects, our reputation is built on our ability to accurately document field conditions, assess project impacts, determine regulatory jurisdiction, and develop cost-effective and efficient solutions to project challenges.



A large sea turtle is shown swimming underwater in clear, light blue water. The turtle's head is in the foreground, facing right, with its eye and nostrils visible. Its shell is dark with lighter, yellowish-brown patterns. The background is a soft, out-of-focus blue, suggesting a deep underwater environment. In the top right corner, there is an orange rectangular box containing white text.

2,700+

With over 2,700 environmental professionals working out of 250-plus offices throughout North America, our environmental team can deliver the local understanding your offshore wind project needs.

A collaborative team approach

We've helped our clients successfully meet environmental and regulatory requirements to deliver wind projects in highly remote and challenging areas. We have supported ocean energy projects including offshore wind, tidal power, wave energy, pump storage, and underwater pipelines and transmission lines. What sets us apart is our ability to manage projects locally using staff who understand the local and regional regulatory environment, while providing industry leading resources from our pool of technical experts from coast to coast. We understand the evolving issues associated with offshore wind projects and how to incorporate them into the regulatory strategy, corresponding environmental assessment, and socioeconomic analyses. Most importantly, we understand that because offshore wind development in the US is an evolving industry, these projects are inherently complex and require a team approach in order to successfully move them forward.

Stantec has well-respected and recognized expertise in industry, natural resource, and regulatory environments, and we know that the key to successfully navigating an offshore wind project is through a single-point consultant who works in partnership with the developer to both complete required services and manage subconsultants when needed. We recognize the complex nature of offshore wind development, and that no one firm will be able to provide all services for every project. We are experienced at managing large, complex, multi-disciplinary projects from beginning to end.

We have a network of teaming partners who, along with our depth of internal resources, comprise the best subject matter expert teams for your project. Over the last 3 decades of natural resource and permitting experience, we have teamed with a consortium of consultants on a variety of projects and pride ourselves in being a true team champion for our clients and their projects.





Our commitment to safety

Stantec is committed to providing and maintaining an incident-free, healthy, and safe workplace. At Stantec, we believe in doing what is right, which includes sending our people home injury-free every day. Through our Health, Safety, Security, and Environment Program, Stantec employees are committed to:

- Complying with client health and safety requirements at all times when working on project sites.
- Identifying, assessing, and managing the environmental aspects and impacts associated with the services and products we provide.
- Identifying and managing the health, safety, security, and environmental risks and hazards to which our employees are exposed.
- Assisting our employees to develop an awareness and understanding of the health, safety, security, and environmental issues relevant to their work.
- Complying with legislation, regulations, and appropriate industry standards.
- Monitoring and enhancing the program through inspections, audits, reviews, investigations, corrective actions, and other processes.
- Facilitating communication regarding health, safety, security, and environmental issues.


Our Health, Safety, Security, and Environment Program applies to anyone employed by Stantec including employees, consultants, contractors, subcontractors, and suppliers working within Stantec workplaces.

At Stantec, we make safety a pillar in our company culture and incorporate it into all aspects of our business. Our team continually strives to improve the safe and efficient manner in which we execute our work. Stantec's commitment to health and safety is integrated into all aspects of our business.









Nobody knows marine systems like we do

Stantec has more than 30 years of marine experience in the Atlantic, Pacific, Gulf of Mexico, and Arctic Ocean basins, with a dynamic team of marine professionals from technicians to internationally recognized scientists.

We provide expert ecological assessment and permitting services for offshore projects for the full range of environmental disciplines, including fisheries studies, avian and bat surveys, marine mammal and sea turtle monitoring, benthic sampling and characterization, marine sediment analyses, aquatic resource habitat mapping, restoration, and water quality monitoring. We provide our clients with expertise on projects that range from utility-scale wind farms, hydropower, LNG facilities, and linear transmission programs to dredging, ports and harbors, and coastal infrastructure.

We also provide risk assessment services to our energy clients to help quantify environmental and financial risk, for use in adaptive management strategies and allowing for the development of appropriate mitigation using a weight-of-evidence approach.

Our natural resource studies follow scientifically defensible methodologies starting with data gap analysis and literature review followed with baseline ecological assessments, and subsequent successful survey implementation. We continue our studies by monitoring performance with respect to our client's needs and the regulatory requirements. This wide range of services coupled with our extensive experience with state and federal regulations allows us to fully support our clients as they comply with regulatory demands related to Sections 401 and 404 of the Clean Water Act, Shoreland and Coastal Zone Permitting, Section 7 of the Endangered Species Act, NEPA, Section 10 of the Rivers and Harbors Act, and the Magnuson-Stevens Act.

Stantec provides a full range of services related to Site Assessment Plan (SAP) and Construction and Operation Plan (COP) development in accordance with BOEM requirements.

Offshore wind energy services at every stage

PLANNING & STAKEHOLDER INVOLVEMENT



- Due diligence review
- Critical issues analysis
- Regulatory roadmaps
- Environmental constraints mapping
- Workplan development
- Feasibility studies
- Stakeholder involvement
- Public meeting and workshop facilitation

RESOURCE ASSESSMENT SERVICES



- Bird, bat, and mammal monitoring
- Marine sediment and benthic sampling
- Coastal wetland delineations
- Scientific diving
- Biodiversity assessments
- Physical oceanographic surveys
- Aquatic vegetation and rare species assessments
- Marine characterization studies
- Cultural resource evaluation
- Geological and geophysical survey interpretation
- Marine fisheries assessments
- Protected Species Observers
- Hydroacoustic monitoring
- Sound source verification studies

REGULATORY & PERMITTING SUPPORT



- Federal regulatory review and agency permitting
- State and local wetland alteration permitting
- Section 7 Biological Assessments
- NEPA, Environmental Assessment (EA), and Environmental Impact Statement (EIS) preparation
- Agency coordination
- Project alternatives analysis
- Mitigation design and restoration management
- Expert testimony
- Incidental Take Permit authorizations

CONSTRUCTION & OPERATIONS



- Site observation
- Environmental compliance monitoring
- Regulatory agency coordination
- Marine mammal protection planning and management
- Wildlife impact monitoring
- Permit compliance
- Post-construction monitoring





25 years

of renewable energy
experience



Our roadmap to success

Stantec has well-established relationships with state and federal agencies across the US. We work with developers in coordination with the resource agencies to design and implement environmental assessments that will be accepted and that make the most sense based on the questions being asked, with cost efficiencies in mind. We have developed a technical approach that draws upon our project team's extensive experience conducting surveys at other wind projects and development projects in the marine environment. We also provide a regulatory

approach that builds on the technical analysis to provide permitting support throughout the project development process. The key issues for successful project development and permitting include both schedule and resource management. Stantec manages these issues through a combination of seasoned project managers, regulatory analysts with extensive permitting experience, and skilled scientists with appropriate marine and offshore experience. Stantec's roadmap to a successful project implementation is summarized below.

ISSUE OF FOCUS	CONTROL STRATEGY
Technical approach that is scientifically sound, reasonable, and legally defensible	<p>Establishment of clear and concise goals and objectives</p> <p>Early identification of metrics designed to meet the project objectives</p> <p>Early development of a rigorous project roadmap and survey plan</p>
Technical strength necessary to address key issues identified by agencies and the public	<p>Selecting the right project team at the inception of the project, with robust technical capabilities, the capacity to handle multiple surveys at the same time, and extensive permitting experience</p>
Production of high-quality documentation in compliance with permitting agency expectations	<p>Stantec is committed to the philosophy that quality products result from quality planning, design, and work performance by skilled and experienced professionals. Production of high quality products will be achieved by:</p> <ul style="list-style-type: none"> • Self-review is conducted by each project team member to confirm that the work they have completed is correct • Quality review of all project deliverables through peer review is completed by staff skilled in the subject area • Independent review of all project deliverables by senior staff who do not have direct responsibility for the report
Effective communication with our client and other team members	<p>Project managers with extensive wind energy experience who understand the unique needs of the development process</p> <p>Development of a clear scope of work and schedule for each project, and task, identifying responsibilities and milestones</p> <p>Regular communication between the client, Stantec, and partners</p>
Monitoring and control of overall project costs	<p>Use of local staff – key to efficiencies in both mobilization and costs</p> <p>Maintaining key staff throughout each project</p> <p>Timely receipt of project information</p>

The best solutions are created when we work together

We're proud of our contribution — we're providing the energy the world needs for today and tomorrow and creating lasting connections with our clients and communities.





Diane Sullivan
US Renewable Energy Sector Leader

Diane has gained a broad range of experience: from conducting on-the-ground ecological resource surveys and preparing key regulatory project permitting strategies, to directing multidisciplinary service teams and managing a growing renewable energy consulting program.

Her expertise encompasses the full gamut of environmental impact issues related to power development – both conventional and renewable – including surface waters and wetlands, siting and routing, aesthetic and cultural resources, threatened and endangered species, and more. She’s directed and managed planning, environmental, and engineering services for over 2,000 megawatts of renewable energy and over 600 miles of gas and electric transmission and distribution systems.

As Stantec’s Environmental Sector Leader for Renewables in the US, Diane draws from that experience to manage our renewable energy work, bringing together our network of experts to help renewable energy clients. Whether it’s technical challenges, market opportunities, or development constraints and regulatory requirements, Diane helps our team and our clients create effective strategies that make wind, solar, and other renewable energy projects successful.



John Crowther
Offshore Wind Program Manager

John has been involved with the offshore wind industry from its inception in the US and has over 30 years of experience in the environmental engineering and construction industries. A geologist by education and training, John applies his diversified experience in the physical and infrastructure environment as well as the marine ecological environment. His experience includes strategic planning, infrastructure evaluations, site assessment and construction and operations plans (SAP/COP) for offshore wind (OSW) projects, supply chain studies, transmission consulting, and feasibility studies for offshore wind staging and deployment facilities.

His recent work includes consulting assignments for the development of New York and New Jersey OSW Strategic Plans, management of Bureau of Ocean Energy Management (BOEM) evaluations and submittals, federal and state permitting, offshore and inshore hydrographic, geophysical, and ecological surveys as well as marine sampling and analysis programs.

John has co-authored professional papers and presentations including “Assessment of Coordinated Port Facility Deployment for Offshore Wind Project Staging in Baltimore, MD” and “Lessons in US Offshore Wind Port Facility Design – New Bedford, MA.” At Stantec, John is helping lead our initiatives within the offshore wind industry including a full suite of services related to strategic planning and consulting, SAP and COP development, marine surveys, data collection, transmission, construction and post-construction monitoring, and port infrastructure development.



Joy Prescott
Senior Advisor, Project Manager

Joy is an environmental planner and project manager with more than 20 years of environmental compliance and natural resource planning experience. She has specific management experience in the development of utility-scale alternative energy projects, including offshore wind farms. Her practice focuses on the development of programmatic and comprehensive approaches to project documentation and environmental compliance including BOEM SAP and COP requirements, USACE permits, as well as NEPA environmental impact statements. She has also managed many wind power related field surveys and assessments and has coordinated more than 40 studies for recent major energy projects.

Joy excels at managing complex projects. Her information management and reporting skills include project planning and tracking, budget development and database system management, data compilation and analysis, technical presentation development, and multimedia document production. Technically, she has considerable permitting experience, including extensive data collection, impact evaluation, compliance and documentation, and permit planning and management for linear transmission and power generation projects.



Steve Pelletier
Technical Advisor, US Ecosystems Discipline
Lead for Environmental Services

Steve is a Certified Wildlife Biologist and Professional Wetland Scientist with over 30 years of professional experience. He specializes in site- and landscape-level habitat assessments and offers expertise in rare species evaluations, avian/bat risk assessments, and compensation planning for diverse projects ranging from transportation to energy development. He has provided expert witness testimonies and third-party reviews in both the US and Canada and served on federal and state advisory committees and numerous stakeholder groups involving diverse resource issues, including impact assessments and conservation of bats, raptors, passerines, coastal waterfowl, and shorebird species. He has conducted shoreline habitat assessments and performed dive surveys in association with marine substrate and coastal habitat characterizations.

Steve has designed/managed avian and bat studies since 2004 utilizing a variety of tools and techniques including combined radar, infra-red, thermal, and acoustic technologies. He designed and served as Principal Investigator (PI) of a 6-year offshore acoustic bat research study in the Gulf of Maine, mid-Atlantic coast, and Great Lakes regions on behalf of the U.S. Department of Energy (USDOE), and as PI of a comparative analysis of terrestrial/offshore acoustic bat data on behalf of BOEM. Recent publications (in press) involve investigations of collisions of birds and bats with offshore structures and measuring offshore bird/bat collision and avoidance.



Erin Healy

**Senior Environmental Planner,
Project Manager**

Erin is a Senior Environmental Planner and Project Manager with over 25 years of experience managing and providing technical support for interdisciplinary environmental impact and siting studies. As a project manager for offshore wind projects, she brings her extensive experience preparing documentation to support environmental reviews for complex, high profile projects involving offshore, coastal and onshore infrastructure. Erin has supported the offshore wind industry in the US for over a decade, beginning with one of the first studies conducted by the newly formed alternative energy group of the US Minerals Management Service (now BOEM). As the regulatory framework for the offshore wind industry developed in the U.S., she has worked on a wide range of projects including area specific and programmatic NEPA reviews, and regional socioeconomic impact studies for BOEM. For offshore wind developers, Erin has led interdisciplinary teams to look at markets and renewable energy credits, technology development and permitting. She has a very strong understanding of the BOEM regulatory procedures, the technical information required to meet permitting requirements, and the socioeconomic and environmental issues of concern that must be addressed to successfully develop a project.



Andrea Ahrens

**Senior Marine Biologist, US National Subject
Matter Expert, Marine Mammals**

Andrea is a professional marine mammal biologist with 14 years of experience practicing marine ecology and environmental science, including conducting baseline and analytical research, policy and planning for protected areas, and recovery planning and management of endangered species. Her current work focuses on developing environmental impact assessments and monitoring programs, with an emphasis on mitigating potential effects of industrial activities, particularly underwater noise, on marine wildlife and species at risk. Andrea is Stantec's US National Marine Mammal and Sea Turtle Subject Matter Expert and has recently served as the Marine Mammal and Underwater Acoustics Lead on several large-scale Atlantic, Pacific, and Arctic Ocean programs.

Andrea has extensive field experience, which includes more than 220 days at sea on marine research and monitoring surveys in inshore and offshore waters. She is proficient at interpreting acoustic modelling to assess potential effects of underwater noise on marine wildlife and strives to develop innovative mitigation and monitoring options that balance industry, regulatory, and environmental needs.



Dr. Francis Wiese

**Technical Advisor, Canada and Alaska
Technical Lead for
Marine Science**

Francis brings over 20 years of experience working in the marine environment throughout the world. He serves as the Canada and Alaska National Technical Lead for Marine Science. As part of his role he designs, implements, and manages large multi-disciplinary, multi-institutional marine ecosystems programs in north, polar regions. Since 2011, he has served on the Chukchi-Beaufort Ecosystem Collaboration Team of the Interagency Arctic Research Policy Committee and was lead-author on a conceptual ecosystem model document for the US Arctic. His technical skills include a broad background in ecosystem program development, assessing environmental impacts, environmental policy, population and bio-energetic modeling, and public speaking. Francis has worked for and with academia, government, non-profits and industry, is a technical reviewer for over 20 international journals and has served on a variety of national and internal science panels and working groups.



Amy Krebs

**Project Manager, Senior Environmental
Scientist**

Amy is a senior environmental scientist and project manager, with over 17 years of environmental consulting experience currently serving as the project manager for a Maryland offshore wind farm. Amy is leading a diverse team of experts and subconsultants responsible for the environmental analysis and permitting support activities associated with this offshore wind project. As a project manager, Amy leads major programs and projects across a variety of market sectors for Stantec. She has significant experience in local, state and federal regulatory compliance and permitting and environmental impact analysis for projects located in both coastal, tidal, and terrestrial environments.

Amy's extensive technical experience includes climate change vulnerability/sustainability planning, wetland delineation and wetland mitigation, habitat restoration planning, as well as the design, permitting and execution of a variety of major projects ranging from roadway and pipelines, to coastal improvements and structures. She has managed large, complex projects involving multi-disciplinary teams and multi-million-dollar master services agreements. As a program manager, Amy understands how to communicate effectively, disseminate complex subject matter, navigate the regulatory climate, and coordinate efforts to complete the tasks with attention to quality. She finds solutions by looking at a program holistically while considering the client's larger goals.



Dr. Tim Edgell
Fisheries and Aquatic Ecologist

Tim has over 15 years of experience serving the offshore energy and academic research sectors. He is a marine ecologist with expertise in benthic ecosystems, and founding member of Stantec's Data Analysis and Statistics service, which provides sound advice on the design, implementation, and analysis of data used for environmental monitoring projects in marine, aquatic, and terrestrial ecosystems.

Since 2012, Tim has been the lead scientist for a long-term monitoring project on the Grand Banks, working with industry and academia to better understand impacts to the seafloor caused by offshore infrastructure. He has led the design and execution of environmental assessment and permitting surveys in the north Pacific for port development projects, development of geographic-scale environmental effects monitoring programs for coastal resources, biophysical surveys in the Arctic Beaufort Sea for oil and gas explorations, and coastal biodiversity surveys throughout the Gulf of Maine and Bay of Fundy to study the impact of marine invasive species. He has also acted as client representative at several engagements and consultations with regulators, First Nations, municipalities, and other public stakeholders during the planning and assessment phases of major energy projects.



Brent Courchene
Senior Marine Scientist

Brent is a Certified Ecologist and Fisheries Professional with over 17 years of experience in the field of marine science. He has been involved with multiple aspects of offshore wind development, offshore transmission projects, ports and harbor development, sediment dredge and disposal programs, oil and gas exploration, and heavy marine infrastructure construction along the Atlantic coast. This experienced has included all project phases and required a fundamental understanding of marine systems and collaboration with diverse teams of engineers, scientists, economists, planners, legal strategists, policy makers, and public relations analysts for effective project delivery. Brent currently manages and advises large multidisciplinary projects that focus on benthic habitat and aquatic ecological resource characterizations, feasibility and impact assessments, oceanographic processes, and restoration and mitigation. These projects include serving as the subject matter expert for benthic, essential fish habitat, hydrological modeling, commercial and recreational fisheries, and spatial planning elements associated with multiple offshore wind developments in New England and the Mid-Atlantic.

Brent's recent work includes contributing to Construction and Operations Plans (COP) for offshore wind projects focused on fisheries and benthic aspects. Brent is a subject matter expert (SME) on these projects for elements related to essential fish habitat, commercial and recreational fisheries, benthic habitat, water quality, and sediment transport modeling. He is also providing technical leader support for strategic and spatial planning as it pertains to modeling of marine ecological resource, habitat, and commercial and recreational fisheries for state level offshore wind strategic planning efforts.



Deep technical knowledge

Stantec has some of the most highly qualified scientists in the US, recognized for their environmental subject matter expertise. We have the technical understanding and project management expertise to assist our clients with meeting their environmental obligations, from baseline data collection through regulatory permitting and expert testimony, to construction and post-construction monitoring. Our staff includes Professional Wetland Scientists, Certified Wildlife Biologists, Expert Botanists, Certified Fisheries Biologists, Geologists, Protected Species Observers, and support staff. Our project managers and regulatory experts have successfully managed large- and small-scale energy projects, and understand the critical issues, the importance of project schedules, and the value of communication. Your projects will be supported by both a client manager and a project manager, who call on technical advisors and subject matter experts who are supported by over 2,700 environmental services staff throughout North America.



Our team includes:

- Program and Project Managers
- Federal, state, and local permitting experts
- Marine acousticians and mammalogists
- Marine and wildlife biologists
- Benthic and fisheries ecologists
- Geologists and geoscience professionals
- Wetland scientists
- Oceanographers and modellers
- Data analysts and statisticians
- GIS professionals



Representative offshore wind project experience

With tens of thousands of megawatts delivered, we have the technical experience in markets across North America to meet your project needs.



SKIPJACK OFFSHORE WIND FARM

Maryland

Stantec is currently serving as the prime consultant leading the environmental analysis and permitting support activities for the Orsted Skipjack Wind Farm (SJWF) project. Stantec is supported by a team of subconsultants that provide a variety of studies such as acoustical noise analysis, air permitting, visual and historic architectural investigations, GIS support and assistance with federal and state permitting.

The Stantec team is responsible for the environmental analysis, documentation, and permitting, which includes the development of a SAP, COP, and key federal, state and local permits, approvals and consultations. This project includes considerable coordination and communication with the various Federal agencies (BOEM, Environmental Protection Agency [EPA], US Fish and Wildlife Service [USFWS], National Oceanic and Atmospheric Administration [NOAA] National Marine Fisheries Service [NMFS]) and state agencies (MD MDE, MD DNR and DE DNREC). Stakeholder input is critical to the successful implementation of this project.

BLOCK ISLAND WIND FARM

Rhode Island

Stantec worked with Deepwater Wind (now Orsted) to provide specialized regulatory environmental compliance services that included hydroacoustic monitoring of underwater noise associated with the project's submarine cable laying barge. This barge was used to install the submarine cable that connects five offshore wind turbines to Block Island for energy transfer. Stantec's team worked collaboratively with Deepwater Wind and the permitting agencies to develop a field verification monitoring program that ultimately created efficiencies for the client by not having to perform continuous monitoring during the cable laying process. Additionally, Stantec is currently providing Deepwater Wind with innovative bat and avian post-construction monitoring testing proprietary offshore thermal camera imagery as well as ship-based observations.

NEW JERSEY BOARD OF PUBLIC UTILITIES (NJBP) ENVIRONMENTAL MODELING ANALYSIS

New Jersey

Stantec is providing environmental consulting, PJM grid and interconnection review, and stakeholder outreach as part of a multi-disciplinary team for the development of an Offshore Wind Strategic Plan (OWSP) for the State of New Jersey. Current activities include advanced environmental modeling and analysis of a large area offshore New Jersey, New York and Delaware. Stantec is evaluating priority development scenarios including environmental, fishing industry, other resource uses, and economic cost factors. Modeling of wind lease and wind energy areas includes the development of spatial overlays and a weighting system to identify areas of lowest and highest potential impacts. Mitigation measures will also be included as part of the evaluation. Stantec is also providing stakeholder outreach to the environmental, fisheries and grid system stakeholders in conjunction with the NJBP and other team members. Other topics being addressed in the OWSP include:

- Cumulative Impacts
- Regional considerations
- Migratory pathways
- Distribution and abundance
- Port impacts and strategy .



SOUTH FORK WIND FARM

Rhode Island/New York

As part of a multi-disciplinary team, Stantec supported the preparation of technical studies and sections of a COP for submittal to BOEM for the Orsted South Fork Wind Farm. Technical studies included the preparation of assessment of potential impacts to avian and bat species, including project-specific field surveys. Stantec also provided overall quality review of the COP and supported the preparation of the project's associated state and federal applications to permit the construction, operation, and maintenance of the associated utility scale transmission and interconnection facilities. Included in the state permitting was an Article 7 application to the New York Public Service Commission. Stantec is also preparing the project's federal permit applications pursuant to Section 10 of the Rivers and Harbors Act and Section 404 of the Clean Water Act, for submittal to the USACE.

VINEYARD WIND OFFSHORE WIND FARM

Massachusetts

Stantec is currently serving as Vineyard Wind's Owner's Engineer in the development of an offshore wind generation project, where we are currently focused on the "upland" portion of the project. Stantec developed the conceptual design and thermal loading calculations for an underground electrical ductbank that routes cables from the landfall to the interconnection with the utility grid, including the transition vaults where the undersea cable is connected to the upland cable, as well as the slice vaults along the ductbank routing. Stantec conducted studies to determine the optimal method to land cables onshore and route to the interconnection point, including evaluation of horizontal directional drilling (HDD), jack and bore, open trench crossing. Stantec is currently providing as-needed engineering and design services in support of permitting.

NYSERDA WORKFORCE OPPORTUNITY OF OFFSHORE WIND

New York

Stantec participated in a study for the New York State Energy Research and Development Authority (NYSERDA) entitled "The Workforce Opportunity of Offshore Wind in New York" as part of the New York State Offshore Wind (OSW) Masterplan. The study considered the economic development and potential job impacts, associated with OSW by assessing three primary industry needs: (1) component and equipment manufacturing, (2) port infrastructure (which supports manufacturing, installation, and operations and maintenance [O&M] activities), and (3) required workforce skills needed to support any New York-based manufacturing, installation or O&M activities. The study quantifies the demand for workers in this emerging industry and compares the needs of the OSW industry with the worker strengths already existing within New York.

As part of this study, Stantec tabulated a port facilities and infrastructure screening for New York State based on geography and function. Stantec collaborated with NYSERDA, Global Wind Network, and BVG Associates for this fast-tracked project completed in December 2017.



SEA2SHORE: THE RENEWABLE LINK SUBMARINE CABLE TO BLOCK ISLAND WIND FARM

Rhode Island

Stantec worked closely with National Grid to provide environmental permit and regulatory compliance services. We provided protected species observer (PSO) monitoring, hardbottom and submerged aquatic habitat surveys, and assistance with agency interaction. Stantec's team of experts worked collaboratively with National Grid to develop a unique hydroacoustic field verification monitoring program that met federal and state agency requirements while creating efficiencies for National Grid by not having to perform continuous sound monitoring associated with thruster use of the dynamically positioned vessel during cable laying process. This cable connects Block Island to Rhode Island mainland and transfers energy generated by the first permitted offshore wind farm in the US.

AVIAN SHIP-BASED SURVEYS AND SHOREBIRD SURVEYS, PROPOSED OFFSHORE WIND PROJECT

Buzzard's Bay, Massachusetts

Stantec conducted avian ship-based surveys and shorebird surveys for a proposed offshore wind project in Buzzard's Bay. Our work included standard transects to identify and document all species that were moving through the area. We also conducted shorebird surveys to characterize differences in near-shore and off-shore avian use. Results were analyzed and compiled to provide direction for potential future pre-construction monitoring efforts.

OFFSHORE BAT AND AVIAN MONITORING PROGRAM

New England, Mid-Atlantic, Great Lakes

As a part of a 3 year pilot study, Stantec designed and conducted a series of bat and avian surveys using prototype arrays of remote-controlled digital bat echolocation detectors and radar units deployed at sites located up to 23 miles offshore and extending along an approximate 150-mile transect along the Maine coast. The research revealed a variety and abundance of bat species offshore, including several migratory species considered at risk from wind farms in the terrestrial environment, and provided an important insight into equipment design and operational requirements for future deployments. Based on the results of that effort, the USDOE awarded Stantec a research grant to conduct an offshore acoustic survey of bat activity in the Gulf of Maine, coastal mid-Atlantic, and Great Lakes regions. Acoustic bat detectors were deployed at 39 sites in the survey area and included a total of 16,761 detector nights. We detected bats at every site we monitored. After six years of intensive monitoring across a wide range of sites, this study has demonstrated that bats occur regularly at a variety of isolated offshore sites, including the most remote sites we surveyed. The study also demonstrated that a variety of species occur offshore, with species composition varying among sites, regions, and seasons. Stantec successfully collected a large volume of acoustic bat data, allowing for an unprecedented characterization of patterns in offshore bat activity on a large scale. This survey demonstrated the utility of acoustic detectors for long-term offshore monitoring and provided a robust baseline dataset to which future studies can be compared.

MAINE AQUA VENTUS I OFFSHORE WIND DEMONSTRATION PROJECT

Maine

Stantec has been providing environmental permitting and technical support for the Maine Aqua Ventus Offshore Wind demonstration project funded by the USDOE. The project is located 3 miles southwest of Monhegan Island and 12 miles from the coast of Maine. Project participants include The University of Maine, Advanced Structures & Composite Center, Cianbro, and Naval Energies.

The project includes the deployment of two 6 MW turbines on floating concrete semi-submersible foundation hulls. Each floating hull will be held in position in the ocean by three marine mooring lines anchored to the seabed with the electrical generation connected by subsea cable to the Maine power grid onshore. Stantec is currently providing environmental consulting for the subsea cable route and will provide guidance for cable installation permitting and installation methods. Stantec is working closely with the Maine Aqua Ventus team to bring this advance technology demonstration project to full operation, expected in 2020.

CAPE WIND OFFSHORE ENERGY PROJECT ENDANGERED SPECIES ACT SECTION 7 CONSULTATION, BIOLOGICAL ASSESSMENT, AND ENVIRONMENTAL IMPACT STATEMENT

Massachusetts

Stantec co-authored a landmark EIS for the Cape Wind offshore project. This represents the first EIS completed for an offshore wind project in the US, and its development benefited from Stantec's prior experience on over 100 wind farms and related transmission projects throughout North America. Work included extensive data reviews and data gap analyses, scientific analysis, agency coordination and consultation, effects analysis, endangered species evaluations, avian and bat risk assessments, and mitigation measures. Stantec also conducted the Endangered Species Act (ESA) Section 7 consultation and prepared those sections of the Biological Assessment specifically dealing with two endangered bird species: piping plover and roseate tern. The USFWS's resultant Biological Opinion concluded the project was not likely to jeopardize the continued existence of these two species.

MARINE RENEWABLE ENERGY STRATEGIC ENVIRONMENTAL ASSESSMENT

Nova Scotia

Nova Scotia has substantial potential for marine renewable energy development. To build upon existing research, the Department of Energy commissioned the Offshore Energy Research Association (OERA) to develop a strategic environmental assessment (SEA) focusing for marine renewable energy, with emphasis on in-stream tidal technology, in the Cape Breton Coastal Region and Bras d'Or Lakes.

While new technology represents great opportunity for the region, it's important to understand potential social, economic, and environmental impacts that may result. For example, how will equipment affect fishing passages? How many potential jobs could be created? To help answer these questions, Stantec led consultation and engagement with the Cape Breton community, stakeholders, and Mi'kmaq representatives. Understanding the opinions, issues, concerns, and recommendations from these publics is critical to identifying potential locations for marine renewable energy development.

We led stakeholder roundtable sessions, conducted community engagement sessions, organized Mi'kmaq representatives meetings, and supported a stakeholder communications forum. Our outreach effort involved four community open houses in Chéticamp, Membertou, Wagmatcook, and Chapel Island. The open house meetings involved a survey (also available online), short presentations, information storyboards, and interactive storyboards to gain public feedback. This insight was gathered and documented in a report and shaped the overall approach of the SEA. Through this effort, the province can better identify potential impacts from future development of marine renewable technologies for nearby communities.

INFORMATION SYNTHESIS ON THE POTENTIAL OF BAT INTERACTIONS WITH OFFSHORE WIND FACILITIES

Eastern US

In support of the development of offshore wind energy, BOEM requested Stantec develop and synthesize information of bats occurring in the offshore environment relative to potential risk with offshore wind facilities. Research tasks included a comprehensive literature review and statistical comparison of acoustic bat activity data gathered from inland, coastal, and offshore sites within the eastern US. The published study results support balanced decision processes in the development of renewable energy in the federal waters of the Outer Continental Shelf.

Communities are fundamental. Whether around the corner or across the globe, they provide a foundation, a sense of place and of belonging. That's why at Stantec, we always **design with community in mind.**

We care about the communities we serve—because they're our communities too. This allows us to assess what's needed and connect our expertise, to appreciate nuances and envision what's never been considered, to bring together diverse perspectives so we can collaborate toward a shared success.

We're designers, engineers, scientists, and project managers, innovating together at the intersection of community, creativity, and client relationships. Balancing these priorities results in projects that advance the quality of life in communities across the globe.

Stantec trades on the TSX and the NYSE under the symbol STN. Visit us at stantec.com or find us on social media.

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