science. services. solutions.

Offshore Energy Services

ASA provides scientific and engineering analyses for offshore energy and infrastructure development projects. The oceans' waters, the air above the oceans, and the land beneath them contain enormous energy resources. These energy resources include oil and gas, as well as renewable energy sources, such as offshore wind, wave, and ocean and tidal currents. For decades, ASA has been on the forefront delivering services and solutions for ocean energy development projects.

Services & Capabilities

Offshore energy development services and capabilities include:

- Siting analysis using ASA's **Renewable Energy Siting** Toolbox[SM]
- Metocean climatology for site suitability and operations
- Scour analysis around structures
- Structural loading (wind, wave, currents)
- Cumulative effects of multiple hydrokinetic devices on waves and currents
- Current velocity modeling including climatology
- Wave modeling, climatology, extreme wave analysis
- Tsunami, storm surge, and seiching effects
- Cumulative effects of structures on currents and waves
- Cable/sand wave interaction
- Seabed scar recovery
- Sediment transport for cable and pipeline burial operations
- Biological effects of suspended sediment and deposition
- Biological characterization of affected environment
- Essential fish habitat (EFH) characterization
- Assessment of impact to affected environment
- Iichthyoplankton impact studies (water use)
- Behavioral and population modeling
- Spill simulation of oils from facilities and vessels
- Spill risk/consequence assessment
- Waste discharge analysis from facilities and vessels

ASA has experience and deep understanding of offshore environments where energy development projects are conducted for both oil & gas as well as renewable resources. Regardless of the energy resource infrastructure, the issues impacting ocean environments are shared. From oil rigs to wind farms, ASA provides quantitative estimates of the environmental effects of siting energy facilities, energy extraction, energy transmission, and resource transportation using sophisticated analyses and modeling simulations of all relevant physical, chemical and biological processes.

Key Projects

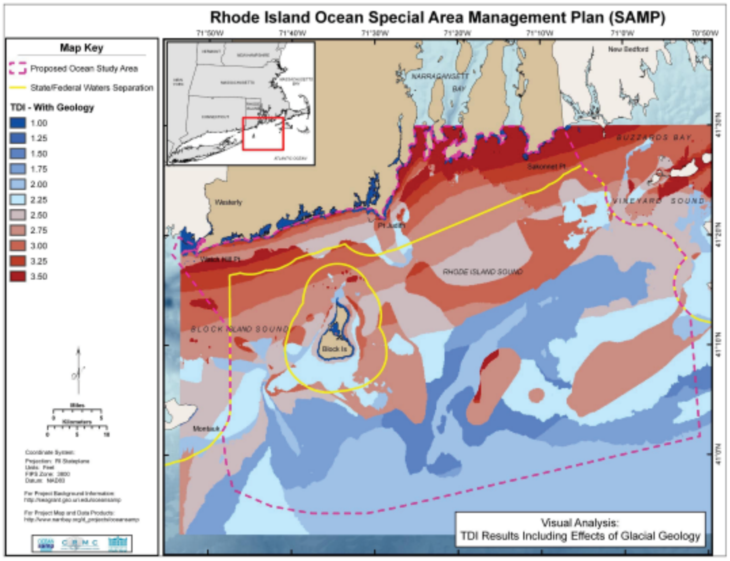
Ocean Energy Resources Management on the Outer Continental Shelf (OCS)
U.S. Minerals Management Service

Analysis of Potential Impacts from a Proposed Nantucket Sound Wind Farm
Nantucket Sound, Massachusetts for Cape Winds LLC

RIWINDS Wind Feasibility Assessment: Phase I Siting Study
Rhode Island Governor's Office

Siting Analysis with ASA's Renewable Energy Siting Toolbox℠

Renewable Energy Siting Toolbox℠ is ASA's technology-based assessment service and in-house toolset that employs a set of screening methods for siting of renewable energy facilities. Siting of both onshore (wind) and offshore renewable energy facilities (wind, wave, and current) is performed using a spatial planning, geographic information system (GIS) approach. ASA's toolbox includes two new indices: Technical Challenge (TCI) and Ecological Service Value (ESVI). The TCI assesses the technical difficulty in siting the facility compared to the power production potential while the ESVI assesses the ecology service values that might be impacted by various siting locations and patterns. In addition tools are available to perform the same assessments based on Principal Component Analysis and Cluster Analysis methods. ASA's toolbox represents a significant advance on existing screening methods as it allows quantitative rankings of development sites which include project technical complexity and quantitative ecological valuation.



Renewable Energy Siting Toolbox contour map visualizing TDI results including the effects of glacial geology

Renewable Energy Siting Toolbox Highlights:

- Evaluates the tradeoff between power production potential and the technical challenge to extract the power and the ecological value of the biological resources
- Applies to any spatially variable renewable energy source (wind, waves, in-stream tidal currents and ocean currents)
- Applies at a wide variety of spatial scales (large scale screening, site specific evaluation)
- Provides quantitative analysis approach that allows numerical ranking of potential sites
- Incorporates uncertainties in input data and TCI/ESVI formulation via Monte Carlo simulation strategy and allows for in depth sensitivity studies
- Provides objective methodology for alternatives analysis
- Enables input of geospatial data readily available (bathymetry, NOAA ENC Maps, wind, wave, in-stream tidal current power distribution maps, seabed sub-bottom geology, extreme wind and wave conditions, etc.)
- Enables evaluation of use conflicts with existing fisheries (fixed and mobile gear and recreational), aquaculture operations, leases, mineral and aggregate extraction, conservation, and marine transportation)
- Allows evaluation of hard and soft constraints on siting
- Enables assessment of environmental impacts using ASA's well developed bird, fish, and marine mammal population and migration model systems

ASA science, services, and solutions provide functional answers to the world's toughest questions confronting industry, academia, energy, environment, and health & safety. ASA's innovative technology solutions are combined with over 25 years of service experience with issues including: water quality management, biological assessment, and oil and hazardous materials modeling. ASA develops and applies modeling software, technology platforms, and data delivery solutions to solve problems relating to marine, freshwater, air, and land resources.

ASA's family of environmental modeling tools that are available for licensed use and customization include: AIRMAP™, CHEMMAP™, HYDROMAP™, OILMAP™, SARMAP™, SIMAP™, MUDMAP™, WQMAP™, and EDS: Environmental Data Server™.

ASA's clients include international governments, universities, research institutes and major energy companies. ASA has a proven track record in providing high quality scientific support services to these clients in support of their global operations.

For more information visit our web site at www.asascience.com.

asa
science. services. solutions.
55 Village Square Drive • South Kingstown, RI 02879 USA • +1 401 789-6224
South Kingstown | Seattle | São Paulo | Gold Coast | Perth
www.asascience.com