APPLIED SCIENCE ASSOCIATES, INC.

Services for the Power Industry

Applied Science Associates is helpingthe electrical power generation industry meet regulatory requirements by providing strong technical solutions to problems involving aquatic impacts. Through the application of computer models we can provide analysis of thermal and chemical pollutant impacts from discharges, egg and larval entrainment and fishery population impacts from cooling water, oil spill trajectories and impacts from fuel spills, and ecological valuation and mitigation scaling. ASA combines robust analysis with visualization tools to effectively communicate results for regulatory

Capabilities

Ecological Mitigation Valuation & Scaling

Investment in restoration projects can mitigate impacts from generation, allowing a net ecological benefit while enabling producers to remain in compliance and competitive. A challenge to mitigation is the necessity to scale projects so that improvements provided are equivalent to impacts caused. ASA has been involved in ecological scaling and valuation for over 15 years and has been instrumental in developing techniques that are widely accepted by U.S. regulatory agencies.

Oil Spill Fates & Impacts

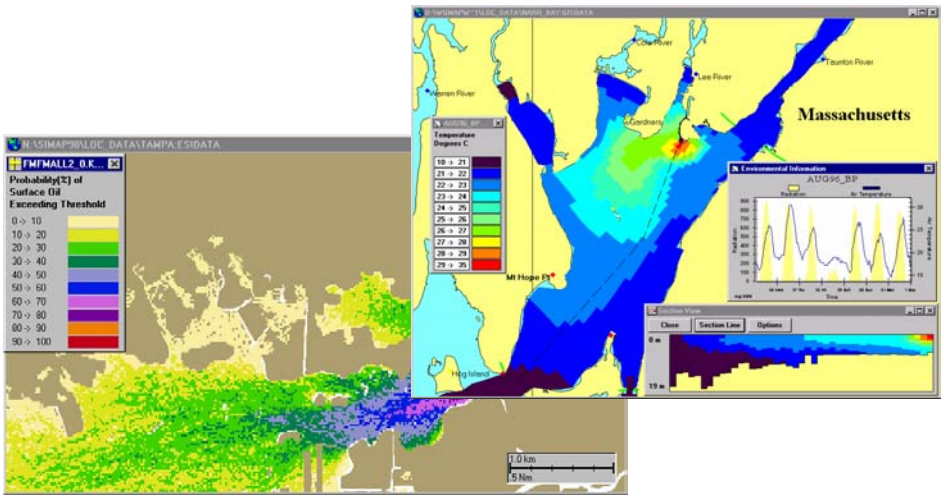
Generation facilities using oil as a fuel are responsible for spills that may occur. ASA is internationally recognized as a leader in oil spill modeling, an important aspect of contingency planning. For example, ASA produced probability maps for oil spill impacts at 11 Florida Power and Light plants, based on typical activity and historical wind and current conditions at each facility. These analyses are used to identify resources at risk, locate oil spill response equipment, and plan response activities in order to minimize costly impacts.

Cooling Water Intake & Discharge

How do you know if fish population declines are caused by over fishing, nutrient pollution, or thermal discharge from a power plant?

ASA's models help power producers separate the impacts they have on the environment from those caused naturally or by other human activity. This quantitative approach addresses issues like thermal discharge, chemical pollutants (e.g. biocides), impingement, and entrainment to answer questions for siting, licensing, and compliance, such as:

- How large a facility can be located at a specific site?
- Where are the optimum intake & outfall locations?
- What are the impacts of existing operations, specifically:
  - the extent of the thermal plume?
  - the effect on water quality (i.e. dissolved oxygen)?
  - the impacts on fisheries?



Services

The complex regulatory environment of the power industry demands a flexible and responsive consultant. That's what makes ASA the perfect partner for power generators.

For twenty years, ASA has combined computer tools with comprehensive field programs to provide customized solutions to aquatic problems for our clients.

ASA's seasoned project managers have extensive experience providing expert witness testimony as well as effectively presenting at regulatory and public hearings.

Our reputation for technical excellence is well respected in both the scientific and regulatory communities.

Software

ASA uniquely combines exceptional technical capabilities with visualization tools that present model results in an easily understandable geographic framework.
Advantages to ASA's modeling approach include:

- Models are continuously updated to incorporate the latest scientific advances, keeping them at the forefront of the field.
- Model results can be effectively communicated through animations and three-dimensional displays.
- Model grids are highly adaptable to complex shorelines and depths and allow increased resolution in areas of greatest interest.
- Each model is seamlessly integrated into a Windows-based system that streamlines the modeling process and reduces set-up time.
- Model systems can be integrated with existing GIS applications, such as ArcView or MapInfo.
- Data assimilation techniques can be used to dynamically incorporate in situ and remotely sensed environmental data into models for improved predictions.

Projects

Project: Brayton Point Station, Somerset, Massachusetts, U.S.A
Client: New England Power Co.

ASA assessed the thermal effects of the cooling water discharge on Mt. Hope Bay, both directly in raising the bay temperature and indirectly, in its effect on dissolved oxygen (DO). The study consisted of field and modeling studies. The field study characterized the physical and chemical properties of the bay. The modeling component was designed to both hindcast past conditions and forecast future conditions. A three-dimensional boundary fitted hydrodynamic model was applied to the bay. Model output consisted of time varying currents, surface elevation, temperature and salinity. The model was successfully calibrated against the field data and was then used to predict power plant effects under different seasonal conditions and with different plant loadings to determine the effects on the temperature regimes in the bay.

Project: Pembroke Power Station, Milford Haven, Wales, U.K.
Client: National Power Plc

In support of National Power Plc's plan to import and use a fuel known as "Orimulsion", ASA modeled hypothetical oil spills in Milford Haven estuary to compare the potential biological impacts from a spill of No. 6 fuel oil to those from an Orimulsion spill. To provide input for the impact models, bathymetry, hydrodynamic, habitat, biological resources, and fuel property and toxicity data were collected. The modeling results quantified the tradeoffs in impacts on birds versus fish caused by differences in fuel properties.

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