

ASA uses computer models to answer interdisciplinary questions related to marine and freshwater environments. Our area of expertise may be narrowly focused but our scope of services is broad, reflecting 24 years of experience addressing environmental and engineering by simulating physical, chemical, and biological processes. Listed below are some of the industries we have served and environmental analyses we have performed.

## INDUSTRIES SERVED:

### OIL AND GAS

ASA's oil and chemical spill models have been used for spill response; training; contingency planning; natural resource damage assessment; risk assessments; spill impact; produced water and drill cutting discharges impacts; and pollutant discharges impacts.

### POWER GENERATION

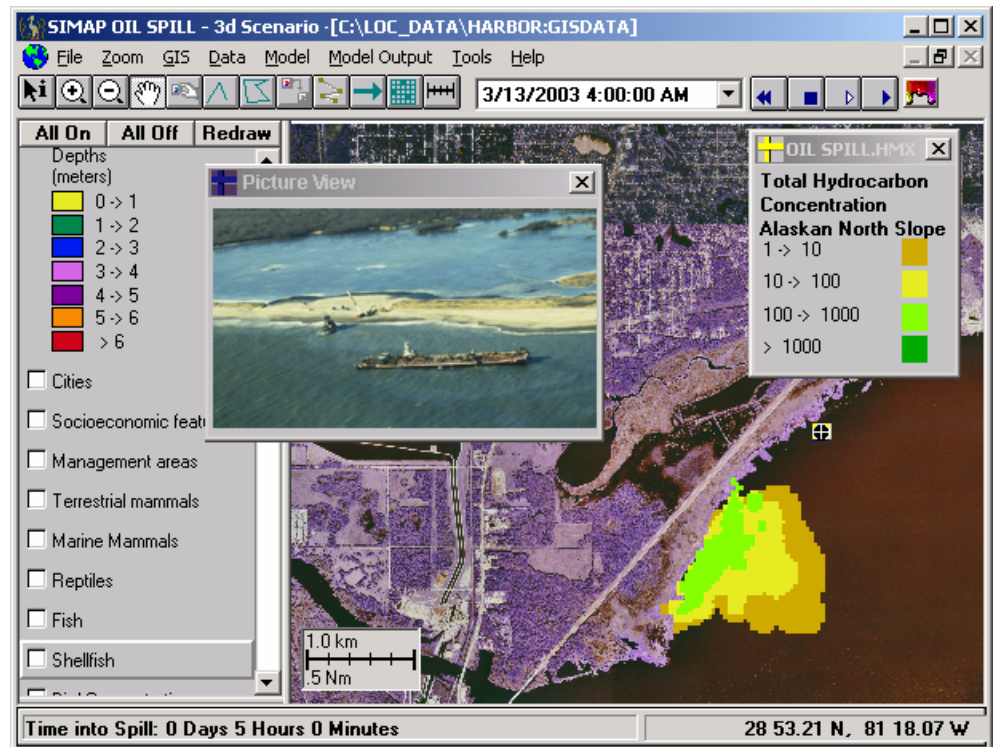
ASA helps the electrical power generation industry meet regulatory requirements. We provide analyses of thermal and chemical pollutant impacts from discharges; egg and larval entrainment; fishery population impacts from cooling water, oil spill trajectories and impacts from fuel spills; ecological valuation; mitigation scaling; and effects from cable and pipeline burial.

### PORT AND HARBOR

ASA helps the port and harbor sectors meet both environmental regulatory requirements as well as security concerns. We provide predictions of transport and fate of sediments and pollutants; flushing; impacts of accidental or intentional oil and hazardous material releases; as well as integrated data management and crisis management tools.

### WASTEWATER

ASA assists wastewater treatment facility operators and regulatory agencies to minimize environmental effects by evaluation of receiving water impacts. We provide predictions of transport and fate of pathogens, conventional and toxic pollutants; conceptual designs of outfall discharges; and flushing analyses.



## ENVIRONMENTAL ANALYSES PERFORMED:

### COASTAL MANAGEMENT AND CRISIS RESPONSE

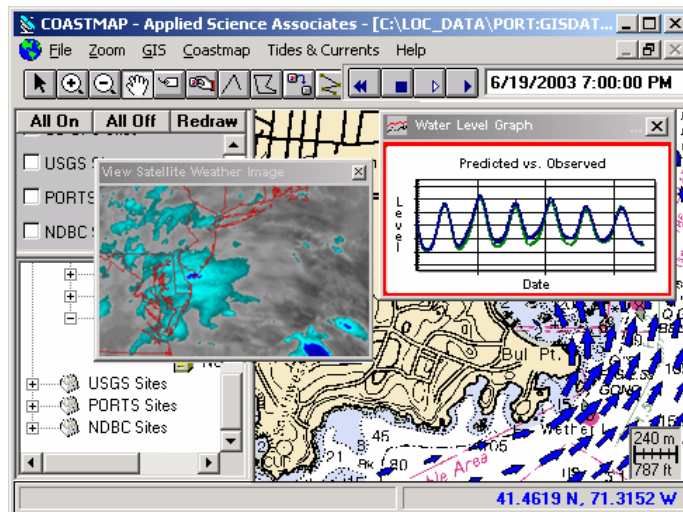
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ASA's crisis management simulation tools can be used for response and training (oil/chemical spills, nuclear explosions, search & rescues, resource management and personnel evacuation). Our monitoring and forecast systems manage real-time and historical environmental data through internet-based and LAN distribution and collection, as well as model-based hindcasting and forecasting.

### ECOLOGICAL RISK ASSESSMENT

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Ecological Risk Assessments are performed using computer models that evaluate the transport, fate, and biological effects of oil and chemicals. Our models are also used for environmental impact assessments; natural resource damage assessments; restoration scaling; and spill impact probabilities.



### HYDRODYNAMICS

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ASA routinely performs two - and three - dimensional simulations of hydrodynamics in lakes, rivers, estuaries, and the coastal ocean. These simulations are based on tides, winds, and density differences. We have developed our own hydrodynamic models, but use others as needed.

### DREDGING

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ASA models the transport, fate and effects of suspended material during dredging and disposal activities as well as cable and pipeline burial. We predict the transport of suspended sediments, the redeposition of the suspended sediments and the exposure of aquatic organisms.

### WATER QUALITY

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ASA quantitatively evaluates water quality issues for a broad range of concerns, including permit support. Such concerns are total maximum daily loads (TMDL); eutrophication; transport and fate of sediment as well as biological and chemical pollutants.

### COASTAL ENGINEERING

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ASA helps evaluate environmental effects on structures in coastal areas. We provide analyses of conceptual designs of outfall discharges; design of monitoring programs; influence of marinas on the environment; environmental condition forecasting; and wave fields.

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ASA has developed a wide range of computer modeling tools to solve environmental problems summarized above. Some of these tools are available for licensed use: AIRMAP, CHEMMAP, CMSMAP, COASTMAP, HYDROMAP, OILMAP, SARMAP, SIMAP, and WQMAP. For more information visit our website at [www.appsci.com](http://www.appsci.com).



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