# Oil Spill Modeling on Sakhalin Island, Russia

## CLIENT:

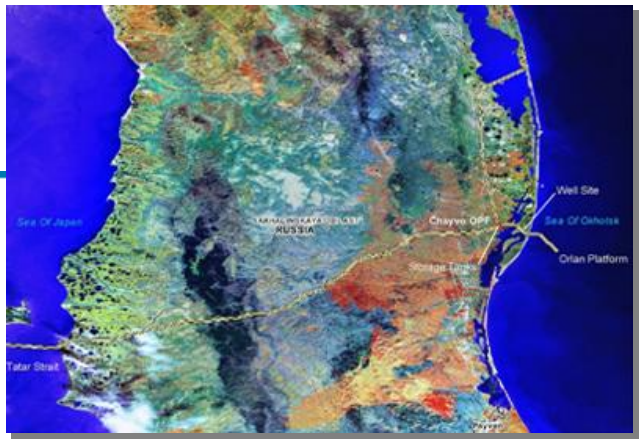
confidential

## PROJECT #:

2004-213

## PROJECT ELEMENTS:

- Oil spill prediction model system (OILMAP)
- Land oil spill prediction model system (OILMAPLAND)
- Incorporation of seasonal data variability
- Volume-based model sensitivity analysis




## PROBLEM. PURPOSE.

ASA was requested to simulate oil spills from proposed pipelines, onshore and offshore processing and exploration facilities on and around Sakhalin Island to examine the potential risk to areas of special concern. Spill scenarios were based on spill risk analysis and include the maximum credible and worst case definitions of oil releases.

## SCIENCE. SERVICES. SOLUTIONS.

Spill simulations were performed using the OILMAP and OILMAP Land modeling systems. Simulations modeled the oil trajectory and fate during summer season with flowing rivers and streams and during the winter season when surface water is frozen and extensive sea ice is present.

Spills of Chayvo #6 crude oil were modeled at equally spaced points along a proposed pipeline running from Chayvo Bay on the east coast to the Tatar Strait on the island's west coast, and from storage and processing facilities along the pipeline route. Oil releases were also modeled with OILMAP at locations of proposed exploration facilities off the east and west coast of the Island.

OILMAPLAND was used for land spill scenarios and is a model system that simulates the down slope flow of oil over the land surface. If the spill reaches a stream or other surface water feature, the model calculates the movement of oil downstream or across small ponds and lakes. The overland model calculates an oil mass balance that includes losses from oil adhesion over the oiled path, oil infiltration to the ground, puddle formation, oil pooling in depressions on the land surface, and oil evaporation to the atmosphere. The water transport model moves oil on the water surface at a constant velocity, simulating oil loss to the shore and the atmosphere.

## PRODUCTS. RESULTS.

Modeling services with OILMAP and OILMAPLAND were conducted and model results were delivered to client to aid emergency spill response planning.