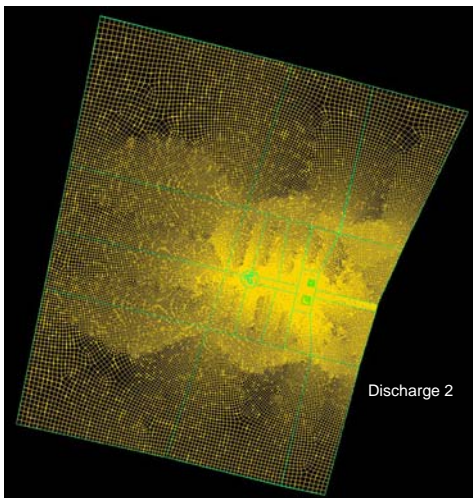


Hydraulic Zone of Influence Determination In Lake

Background

Power plant water intakes may entrain some biological organisms with the cooling water. Determination of the environmental impact of a cooling water intake is required by the EPA. CFD can be used to determine a non-motile particles probability of entrainment.



MODEL GEOMETRY



DC COOK POWER STATION, LAKE MICHIGAN

Objectives

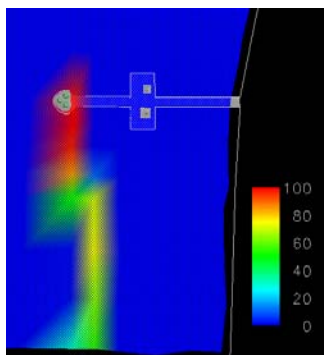
The objective of this study was to determine a non-motile organisms probability of entrainment by the Cooling Water Intake situated in a lake. The demonstration project considered DC Cook Power Station on Lake Michigan.

Approach

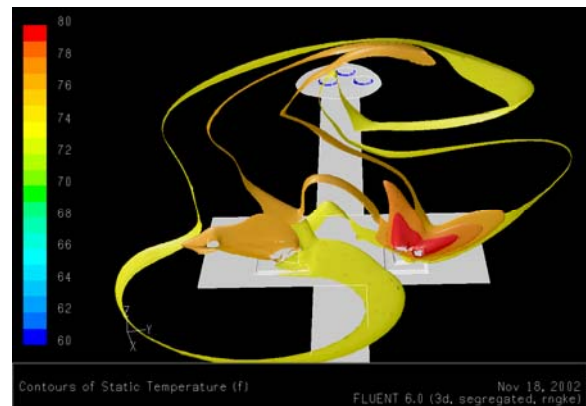
The Fluent software package was used to model the steady state flow field. The model includes thermal effects, accounting for distinct thermal stratification. Discrete particle tracking with random walk was used to determine the probability of entrainment.

Results

Model results show that Fluent can be used to predict the hydraulic zone of influence in a lake with a steady state flow field. At DC Cook, currents induced by the intake are minimal.



ENTRAINMENT PROBABILITY FOR POINTS
NEAR INTAKE



ISOTHERMS GENERATED BY NUMERICAL
SIMULATION