

Oil Slicks Capable of Killing Fish

The Arctic Environmental Research Laboratory released a report entitled "Effects of Crude Oil and Some of Its Components on Young Coho and Sockeye Salmon."

"This report discusses a laboratory study conducted under conditions which attempted to duplicate a natural Alaskan environment," said Richard W. Latimer, director of the Arctic Environmental Research Laboratory.

The purpose of the research was to investigate some effects of crude oil spilled on the fisheries of Prince William Sound. This area is one of the major fisheries in Alaska and is also the site of the terminus facilities for the Trans-Alaska Pipeline.

By determining the toxicity levels of crude oil and understanding the mechanisms of this toxicity, public officials may be able to predict, ameliorate, or hopefully, avoid any damage to this important area.

The report concludes that young coho and sockeye salmon are vulnerable to Prudhoe Bay crude oil slicks when the amount of oil present is in the equivalent of 500 ppm or greater.

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Slicks Kill Fish . . .

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This concentration could occur, for example, if spilled oil drifted into a shallow cove. Fish so exposed exhibit a typical behavior pattern, and a majority die within 96 hours.

At lower concentrations of oil, the behavior pattern is less marked and mortalities are lower. Oil that had been exposed to air for 30 days produced no significant mortalities.

The toxicity of crude oil to fishes is most likely attributable to unsaturated cyclic compounds in the oil.

These compounds probably act by increasing cell membrane permeability of the gills, resulting in ionic imbalance and internal CO₂ poisoning.

The study found that water temperature may also be an important factor. Experiments with sockeye salmon showed increased mortality as the temperatures

decreased.

One possible explanation is that at lower temperatures the volatile compounds evaporate more slowly, hence, the fish are exposed to higher concentrations for a longer time.

It is also possible that the fish are under greater stress at low temperatures and, hence, succumb more readily to adverse conditions.

The research was conducted at the Arctic Environmental Research Laboratory by Dr. James E. Morrow, professor of zoology, through a grant to the University of Alaska.

Copies may be obtained, free of charge, by writing to: Director, Environmental Protection Agency, Arctic Environmental Research Laboratory, College, Alaska 99701.