

# **Outer Continental Shelf Environmental Assessment Program**

**Final Reports of Principal Investigators**

**Volume 36**  
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**It is** suggested that sections of this publication be cited as follows:

Laevastu, T., R. Marasco, N. Bax, R. Fredin, F. Fukuhara, A. Gallagher, Jr., T. Honkalehto, J. Ingraham, P. Livingston, R. Miyahara, and N. Pola. 1985. Northwest and Alaska Fisheries Center Processed Report 85-19: Evaluation of the effects of oil development on the commercial fisheries in the eastern Bering Sea. U.S. Dep. Commer., NOAA, OCSEAP Final Rep. 36 Part 1 (1986): 1-48

Kim, S., and A.W. Kendall, Jr. 1983. **Northwest and Alaska Fisheries** Center Processed Report 83-22: The numbers and distribution of walleye pollock eggs and larvae in the southeastern Bering Sea. U.S. Dep. Commer., NOAA, OCSEAP Final Rep. 36 Part 1 (1986): 49-94

Laevastu, T., and F. Fukuhara (eds.). 1984. Northwest and Alaska Fisheries Center Processed Report 84-06: Quantitative determination of the effects of oil development in the Bristol Bay region on the commercial fisheries in the Bering Sea. U.S. **Dep. Commer.**, NOAA, OCSEAP Final Rep. 36 Part 1 (1986): 95-180

Swan, N.P. 1984. Northwest and Alaska Fisheries Center Program Documentation No. 21: Biological impact of an oil spill (B10S) model documentation, part 1: fish migrations and exposure to contamination. U.S. Dep. Commer., NOAA, OCSEAP Final Rep. 36 Part 1 (1986): 181-210

Gallagher, A.F., Jr. 1984. Northwest and Alaska Fisheries Center Program Documentation No. 22: Documentation of the biological impact of an oil spill model (**BIOS**), part 2: fish feeding and contamination through consumption - subroutine FEDDIL. U.S. Dep. Commer., NOAA, OCSEAP Final Rep. 36 Part 1 (1986): 211-240

Gallagher, A.F., Jr., and N.B. Pola. 1984. Northwest and Alaska Fisheries Center Processed Report 84-16: The uptake and deputation of petroleum hydrocarbons in marine species - a simulation study of the uptake and deputation of petroleum hydrocarbons and its effect on selected marine species in the **Bristol Bay** ecosystem, U.S. Dep. Commer., NOAA, OCSEAP Final Rep. 36 Part 1 (1986): 241-318

Miyahara, R.K., and W.J. Ingraham, Jr. 1984. Northwest and Alaska Fisheries Center Processed Report 84-20: Physical factors affecting the fate of a petroleum spill in the southeastern Bering Sea. U.S. Dep. Commer., NOAA, OCSEAP Final Rep. 36 Part 1 (1986): 319-394

Laevastu, T., and F. Fukuhara. 1985. Northwest and Alaska Fisheries Center Processed Report. 85-01: Oil on the bottom of the sea - a simulation study of oil sedimentation and its effects on the Bristol Bay ecosystem. U.S. Dep. Commer., NOAA, OCSEAP Final Rep. 36 Part 1 (1986): 395-454

Bax, N.J. 1985. Northwest and Alaska Fisheries Center Processed Report 85-03: Simulations of the effects of potential oil spill scenarios on juvenile and adult sockeye salmon (Oncorhynchus nerka) migrating through Bristol Bay, Alaska. U.S. Dep. Commer., NOAA, OCSEAP Final Rep 36 Part 1 (1986): 455-595

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FINAL REPORTS OF PRINCIPAL INVESTIGATORS

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