

Exxon Valdez Oil Spill
Gulf Ecosystem Monitoring and Research Project Final Report

Database on the Marine Invertebrate Macrofauna of Prince William Sound: An Addition
to the University of Alaska Museum's ARCTOS Network

GEM Project 030642
Final Report

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March 2004

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Study History: This study was initiated in 2002 to support the dissemination of data on invertebrates of Prince William Sound. The project draws on data (species identification, locality, coordinates, depth and date) collected for environmental assessment studies and EVOS damage assessment studies in Prince William Sound between 1973 and 1995, including studies funded by the EVOS Trustee Council. These include Jewett, S. C., T. A. Dean, R. O. Smith, M. Stekoll, L. J Haldorson, L. McDonald, and D. R Laur, 1995. The effects of the *Exxon Valdez* Oil Spill on Shallow Subtidal Communities in Prince William Sound, Alaska, 1989-93. Restoration Project 93047 (Subtidal Study 2A) Final Report to the Alaska Department of Fish and Game; and Jewett, S. C., and T. A. Dean. 1997. The Effects of the *Exxon Valdez* Oil Spill on Eelgrass Communities in Prince William Sound, Alaska 1990-95. Restoration Project Final Report (Restoration Project 95106) Final Report to the Alaska Department of Fish and Game, Habitat and Restoration Division, Anchorage, Alaska; and Foster, N. R. and M. K. Hoberg. 2003. Permanent archiving of specimens collected in nearshore habitats, *Exxon Valdez* Oil Spill Restoration Project Final Report (Restoration Project 02628), University of Alaska, Fairbanks, Alaska.

Abstract: This project has supported editing data sets that list the marine invertebrate species known to occur in Prince William Sound, and progress toward adding a catalog of the specimens to the University of Alaska Museum's growing database. A species list and bibliography has been prepared for the Museum's website, and all specimen records for the Museum's holdings of marine invertebrates for Prince William Sound have been made available for inclusion in the Museum's ARCTOS database.

Key Words: Prince William Sound, *Exxon Valdez* Oil Spill, marine invertebrates, University of Alaska Museum.

Project Data:

Description of Data: Information on species occurrence from literature citations or observations. Taxonomic, placement, latitude, longitude, depth, (with maximum error) and date information for UAM specimens, for 4097 lots in the University of Alaska Museum.

Custodian of Data: Aquatic Collection, University of Alaska Museum. Contact Nora R. Foster, fyaqua@uaf.edu or Gordon Jarrell, fnghj@uaf.edu.

Availability: Annotated species lists, information of the availability of voucher specimens, and a bibliography are on line at www.uaf.edu/museum/marine_inverts/biodiv_PWS/index.html. Specimens are available through a loan request to Aquatic Collection, University of Alaska Museum. Specimen data are also available by request to the University of Alaska Museum Aquatic Collection or the Arctic Archival Observatory, and will be online at www.arctos.museum.uaf.edu:8080/AAO/.

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Web Pages Resulting from this Project

Introduction

Biological surveys in Prince William Sound have documented the presence of over 1,600 animal species in Prince William Sound. However, most research and restoration efforts have focused on a very small set of species, primarily vertebrates, and those invertebrate species with economic value. The scientific validity of long-term monitoring of biodiversity responses to environmental change in the GEM program depends on both accurate species-level identifications, and better resolution of data on species distributions.

The project's objectives were to:

1. Contact additional taxonomic experts, send out draft data sets for their critique
2. Edit data tables
3. Format the data sets so that they are accessible to users of the ARCTOS network, and so they can be revised as new information becomes available.
4. Make annotated specimen lists and a bibliography on the invertebrates of Prince William Sound available on a website maintained by the University of Alaska Museum.

Methods

The compilation of species and higher taxa in Prince William Sound and the Gulf of Alaska was originally prepared as part of research to describe and predict the risk of invasive aquatic species from ballast water discharged by oil tankers entering Prince William Sound (Hines et al. 2000). The data sets were refined and edited for use in this project.

The following taxonomic experts have provided editorial comment on appropriate sections:

Jerry Kudenov (University of Alaska Anchorage, polychaete annelids)

Jeff Cordell (Santa Barbara State University, opisthobranch gastropods)

Jon Norenburg (Smithsonian, nemerteans)

Judy Winston (Virginia Museum of Natural History, Bryozoa)

To edit the data sets, the occurrence of each species in the study area as presented in Foster and Feder (2000) was checked against museum specimens or citations in the peer-reviewed literature and comments from other experts. Additional specimen data obtained as part of EVOS Trustee Council Project no. 02608: *Permanent Archiving of Specimens Collected in Nearshore Habitats...*, and other donations to the Museum were incorporated.

Results

The annotated checklist of marine invertebrates: Invertebrate Biodiversity of Prince William Sound lists animals identified to the species level, and gives a literature citation and/or specimens availability at the University of Alaska Museum.

Data description:

The listing of species is divided among 15 major phyla. The table lists verified specimens or literature records.

Phylum	Total Number of species	Species identified from EVOS studies	Species identified from Port Valdez studies	Species identified from other PWS studies	Species known from literature record only
Porifera	12		1		11
Cnidaria	106	2	2	10	92
Ctenophora	5				5
Nemertea	59				59
Annelida	301	148	48	50	55
Mollusca	340	97	18	139	86
Arthropoda	554	112	15		371
Echiura	1				1
Sipuncula	4	1	1	1	1
Priapulida	1		1		
Echinodermata	72	10	4		25
Brachopoda	5	1			
Bryozoa	82	6		43	33
Chaetognatha	5				5
Urochordata	35	1		8	26
Total	1582	378	90	251	770

Data describing the occurrence by locality, depth and date of collection for 4,097 individual lots of specimens representing 719 species have been made available to the Museum's database manager. These include: 3297 specimens, representing 303 species collected as part of *Exxon Valdez* oil spill damage assessment, 500 specimens representing 90 species resulting from environmental monitoring in Port Valdez, and 300

specimens representing 251 species from other studies in Prince William Sound and the adjacent northern Gulf of Alaska.

New proposals

Two new proposals that will support the growth and continued maintenance of marine invertebrate collections from the GEM region were completed: to the National Science Foundation, to the Institute of Museum and Library Services, and to the Coastal Marine Institute have or will be submitted.

Poster

The poster, *Biodiversity of Prince William Sound: Marine Invertebrates* by Nora Foster and Max Hoberg was presented at the Marine Science in the Northeast Pacific conference, January 2003.

Discussion

There are 770 species names obtained from literature records, rather than specimens collected in the environmental studies cited for this project. Cnidaria, Ctenophora, Nemertea, Chaetognatha, and many of the small Crustacea usually require specialized collecting techniques, and often identification based on characteristics only visible when the animal is alive, for accurate species-level identification. Nematoda, Gnathostomulida, Gastrotrichida, Kinorhyncha have not been documented. These taxa are easily overlooked in environmental surveys because of their small size, cryptic appearance, and lack of taxonomic experts to work with them.

Acknowledgements

The author extends thanks to the sponsors of this project. Gordon Jarrell, University of Alaska Museum, designed the Marine Invertebrate Collection web pages, initiated proposals for continued support for specimen databases and collection care. The University of Alaska Museum Director and staff provided office and lab space, and access to the marine invertebrate collections. The species lists were originally compiled for research on potential introductions of nonindigenous species into Prince William Sound, a project supported by .

by grants from Regional Citizens' Advisory Council of Prince William Sound, the U.S. Fish and Wildlife Service, and the Alaska Sea Grant Program, University of Alaska Fairbanks. Working versions of the data sets were compiled for the Smithsonian Environmental Research Center by M. Fry and expanded by the author and Max Hoberg.

Literature Cited

Hines, A.H. and G.M. Ruiz (eds). 2000. Biological invasions of cold-water ecosystems: ballast-mediated introductions in Port Valdez/Prince William Sound, Alaska. Final Project Report to Citizen's Advisory Council of Prince William Sound, 313 pp.