

Exxon Valdez Oil Spill
Restoration Project Annual Report

Hydrocarbon Data Analysis, Interpretation and Database
Maintenance for Restoration and NRDA Environmental
Samples Associated with the *Exxon Valdez* Oil Spill

Restoration Project 98290
Annual Report

This annual report has been prepared for peer review as
Part of the Exxon Valdez Oil Spill Trustee Council
Restoration program for the purpose of assessing project
Progress. Peer review comments have not been
Addressed in this annual report.

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Study History: Restoration Project 98290 was initiated in 1993 as a continuation of Technical Services Study Number 1 (TS#1 – Hydrocarbon Analytical Support Services and Analysis of Distribution and Weathering of Spilled Oil) funded from 1989 through 1992. TS#1 was a service project coordinating sample storage and dissemination of hydrocarbon analysis data to principle investigators for Trustee funded projects. TS#1 produced an archival database called PWSOIL which contains hydrocarbon sample and analysis information collected for Trustee funded NRDA and Restoration projects funded from 1989 to the present. In 1992, a related project, Subtidal Study Number 8 (ST8- Mussel Tissue and Sediment Hydrocarbon Data Synthesis), was funded to evaluate the internal consistency of sediment and mussel tissue hydrocarbon data in PWSOIL. Project ST8 produced a final report (Short et al, 1996) which included a public release of a subset of the hydrocarbon sample and analysis data from PWSOIL. This product, *Exxon Valdez Oil Spill of 1989: State/Federal Trustee Council Hydrocarbon Database 1989-1995 – EVTHD* contained the analytical results of the environmental samples collected in the spill zone between 1989 through 1995. Restoration project 98290 continues to integrate new hydrocarbon sample and analysis information into the Trustee hydrocarbon database (PWSOIL) as well as updates the public release of the data set EVTHD with new information. The updated version of EVTHD includes all laboratory samples analyzed since 1989 in addition to new environmental samples. In FY98, sample and analytical data were integrated into the database.

Abstract This project is a continuation of the NRDA and Restoration database management, sample storage, and interpretive services. New data has continued to be incorporated into the Trustee hydrocarbon database. Updated summary reports for investigators and managers are produced upon request along with an electronic copy of the data. Updated copies of the public release dataset EVTHD and users manual are produced each fiscal year. In the last year, the database has integrated new analytical data from four projects, been used to support several manuscripts, and has been used to satisfy two FOIA requests.

Key Words: *Exxon Valdez*, hydrocarbon, database, oil spill

Project Data:

1. PWSOIL contains collection information for 47,000 samples and hydrocarbon analysis for 15,000 of those samples collected for Restoration and NRDA Trustee funded projects from 1989 to the present. EVTHD is a subset of PWSOIL and contains only the sample and analysis all samples analyzed for

hydrocarbon analyses. PWSOIL is stored in RBASE software and EVTHD is a Visual Basic stand-alone product.

2. Data are available by request. A users guide is available for EVTHD and is updated in October of each year.
3. The custodian of PWSOIL an EVTHD is:
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Hydrocarbon Data Analysis, Interpretation and Database
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Executive Summary: This report contains the description of the archival EVOS Trustee hydrocarbon database PWSOIL and the associated activities related to maintaining the data. The primary purpose of this project is maintenance of PWSOIL, an 80 megabyte database which is the collection and analysis information for samples generated for hydrocarbon analysis from NRDA, Restoration and Subsistence studies funded by the EVOS Trustees. Currently the database has over 47,000 lines of information describing sample collection details for over 65 projects and 15000 lines of hydrocarbon analysis information for 63 analytes. The matrices of the samples include sediments, tissues, waters or oil. The database also contains information used to track sample shipping and storage. A user-friendly public release of all of the analyzed data (EVTHD) and its users guide is also maintained and available on request. We also provide interpretive services for hydrocarbon analyses, which distinguish the source of hydrocarbons in samples analyzed. In the last year, the database has integrated new analytical data from four projects, been used to support several manuscripts, and has been used to satisfy two FOIA requests. This service is expected to have activity for the next year and afterwards the service will be to archive the hydrocarbon records and provide public releases of the data as necessary.

INTRODUCTION

The Auke Bay Laboratory provides data and sample archiving services for all samples collected for hydrocarbon analysis in support of the *Exxon Valdez* Trustee Council projects. These data represent samples collected since the oil spill in 1989 to the present and include environmental and laboratory Response and Restoration data as well as subsistence information. Additionally, we provide interpretive services for the hydrocarbon analyses, which aid investigators in determination of the origin of the hydrocarbons found in analyses. Currently, the database contains the collection information from more than 47,000 samples and the analyses information from over 15,000 of those samples. The data represent sediment, tissue, water or oil samples collected from over 65 projects. The primary purpose of this project is to maintain the integrity of the database, incorporate new data and continue hydrocarbon data interpretive services. The secondary purpose of this project is to make the information available to interested parties and maintain the integrity of the stored unanalyzed samples.

The Trustee hydrocarbon database not only contains sample collection and hydrocarbon analyses data but also has tracking information related to sample shipment and storage. Original copies of the chain of custody forms are maintained. A public version of the analyzed environmental samples was released in 1996 (*Exxon Valdez Oil Spill of 1989: State/Federal Trustee Council Hydrocarbon Database 1989 – 1995 / EVTHD*). Updating the main database, PWSOIL, and the set of analyzed data is an on-going program. Although the number of volume of samples has decreased over the past few years, new samples are still being added to the database, usually during the same fiscal year they are collected depending on completion of laboratory analyses. Data added in FY98 include those from the Chenega Monitoring project – 98291, Pink Salmon Oil Toxicity- 98476 , Mussel bed -090 and samples collected in conjunction with analyses of the Katalla Oil Seep/Coal determination studies.

The hydrocarbon interpretive service is designed specifically for investigators and managers. This includes: (1) identification of the probable sources of the hydrocarbons observed in the samples, (2) evaluation of new hydrocarbon data for evidence of systematic bias, (3) hydrocarbon data editing according to consistent criteria. Recently interpretation has grown to include identification of potential hydrocarbon sources (e.g. coal) for the background hydrocarbon signal in Prince William Sound. This is a continuation of project 97290 previously funded under TS#1, 93290, 94290, 95290, and 96290.

The Trustee hydrocarbon database is a dynamic structure, which requires updating and maintenance because of new samples being added and because of new types of data request. Over the past year, requests for the data have been generated from sources other than principle investigators, which requires public releases of specific data sets or clarifications of issues related to those data. Additionally, in FY98 and FY99 we received FOIA requests for hydrocarbon data for Trustee funded projects.. We were able to comply with the FOIA request because of the accuracy of the data in the hydrocarbon database and the format it is in. However, new data requests such as FOIAs requires a

new type of data release process. The database will move into a long-term archival form during the next two fiscal years.

OBJECTIVES

1. Continue maintenance of the Trustee hydrocarbon database by updating the database with new information and continue the sample archiving procedures developed under NRDA.
2. Continue interpretation of hydrocarbon data, including new data products for principal investigators, resources managers, synthesis products, FOIA as needed and to apply PAH source ID Model to samples collected .
3. Provide new software updates of the publicly accessible database.

METHODS

All Trustee funded hydrocarbon samples and data are archived at the Auke Bay Laboratory in Juneau. Incoming samples are inventoried and stored in freezers, sample collection information is entered into PWSOIL. Samples are released from hydrocarbon analysis by the database custodian when requested by the project leader. The analytical laboratory reports hydrocarbon data to the database custodian who matches the appropriate sample collection information. All the data re sent to principle investigators or other requesters.

An updated version of the analyzed data is released on October 1 of each year in the form of EVTHD version 2.-. The updated version will include all samples collected analyzed to date. The users guide will be updated if necessary. Samples included for FY98 are those from the Chenega clean up in 1998, laboratory samples from Pink Salmon Oil Toxicity Studies, Mussel bed analyses samples analyzed for background coal.

The weathering model of Short and Heintz (1997) is used interpret the hydrocarbon data for investigators. This model identifies the PAH sources in samples along measures of statistical reliability. In 1997, samples from the Katalla oil seep and coalfield were examined and found to support the conclusion that PAH derived from coal characterized the background hydrocarbon signal in Prince William Sound. This work continued in through 1998.

Any requests for data will be fulfilled in a timely basis. This includes FOIA requests, which include providing all of the analytical detail from the chemical laboratory that analyzed the hydrocarbon samples and the sample information of data requested. A copy of all data sent to requestors is maintained.

RESULTS AND DISCUSSION

New versions of EVTHD are produced at the end of each fiscal year. 1000 lines of sample data were added in FY98 from 4 projects. Results from a FOIA request for hydrocarbon data relating to pink salmon and herring toxicology were generated. Three full file cabinets worth of data were sent in response. Data from the Restored mussel bed project will be added in FY99 as well as from project 99459- Residual Oil of Armored Beaches and Musselbeds. Finally, this project will generate a hydrocarbon pristane database and fatty acid/lipid class database for Trustee funded projects in FY99.

CONCLUSIONS

PWSOIL and EVTHD are dynamic structures that require periodic maintenance. This project provides a service that insures that the Trustee hydrocarbon data will be available to interested parties for as long as necessary. This project is designed to provide easy access to the Trustee hydrocarbon database and ensure the accuracy of the data. These data form the basis of all toxicological studies performed by the Trustees, and provide an important baseline against which future analyses can be compared. The volume of data contained in the database PWSOIL suggests that other uses will benefit from access.

ACKNOWLEDGEMENTS

Marie Larsen organized the analytical data from the chemistry laboratory and Jacek Malseko writes the program for EVTHD. Both of these people's efforts, attention to detail and adherence to accuracy greatly insure that PWSOIL has accurate data that can be easily obtained by the public.

LITERATURE CITED

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