DTox:
A Quantitative Database of the Toxicity of Dispersants and Chemically Dispersed Oil

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Abstract

One of the concerns on the use of dispersants is the acute toxicity of dispersed oil to water column organisms. The practical use of existing laboratory data has been limited by the lack of a centralized repository. The *Dispersant and Chemically Dispersed Oil Toxicity Database* (DTox) was created to address the shared need of unrestricted and rapid access to acute toxicity data.

Methods

Peer-review and gray literature documenting the aqueous toxicity of dispersants, and physically and chemically dispersed oil was done via online searches, direct inquiries to national and international government agencies, industries, research institutions, and leading researchers.

Database Criteria

Data sources were rigorously evaluated for their inclusion in DTox. Their selection followed a strict set of rules:

- Articles in English, except when information in other languages could be accurately translated
- Full scientific articles, numbered government, consultant and industry reports
- Data from original scientific publications/peer review literature
- Sources reporting species' common and/or scientific name, oil and dispersant type
- Sources describing or referencing biological tests and chemical analysis methods

Data QA/QC: evaluation of ~15% of all records, reviewed of accepted scientific names, identification of duplicate data

Database Fields

Examples of database attributes

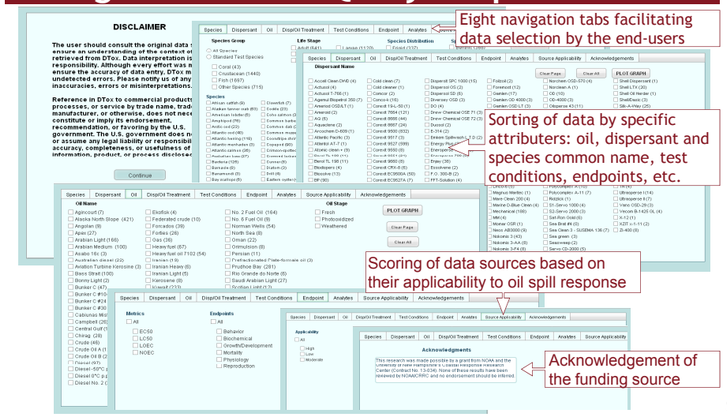
Field Category	Field Name	Examples
Species	Common, Scientific name	Silverside, *Menidia beryllina*
	Taxonomic group	Crustacean, fish, coral
	Life stage	Adult, juvenile, larvae, egg
	Species distribution	Tropical, subtropical, temperate
	U.S. standard test species	Yes, No
Experimental conditions	Water type	Freshwater, seawater
	Oil/Dispersant name	Alaska North Slope, Corexit9500
	Exposure type	Constant static, spiked flow-through
	Exposure duration (h)	24, 96
Endpoints	Endpoint	LC50, EC50
	Reported concentration (mg/L)	Measured, nominal
	Analytical methods	Fluorometry, GC-MS
Data Source	Citation	Author, Year, Title, Journal
Other	Source applicability*	Low, Moderate, High, Rejected

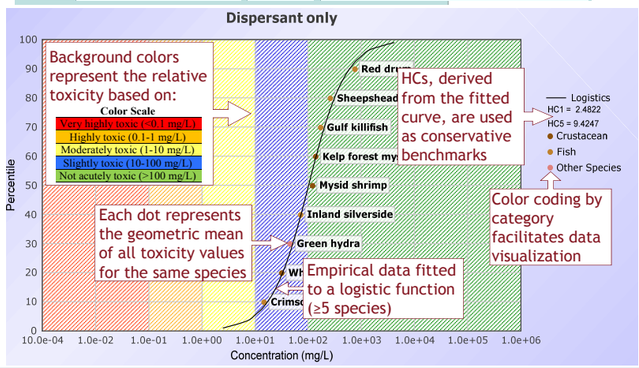
*Data sources were scored based on their relevance to oil spill response, and not on their scientific merit

Data Collection Summary

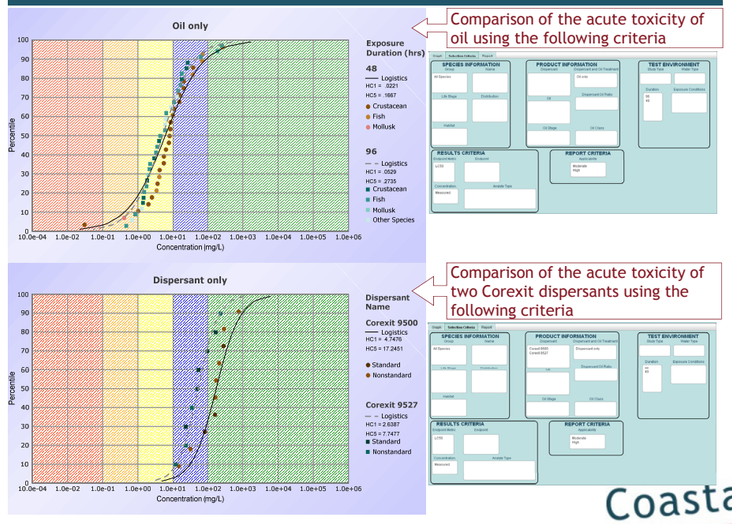
- +400 data sources evaluated, +170 with relevant information
- Toxicity data for +100 oils, +120 dispersants, and +190 unique aquatic species
- Most records for fish, crustaceans (+2,900 records); subtropical and temperate species (+2,100 records), with 1/3 of all records (+1,300 records) for 13 U.S. standard test species
- Most dispersant records for Corexits (+1,500 records)
- Most oil records for Alaska North Slope, Prudhoe Bay, and Kuwait oil (+700 records)
- Most data from static 96 & 48 h tests (+2,400 records)
- Spiked tests for short exposures (≤8 h) are underrepresented

Navigation Tabs & Query Output

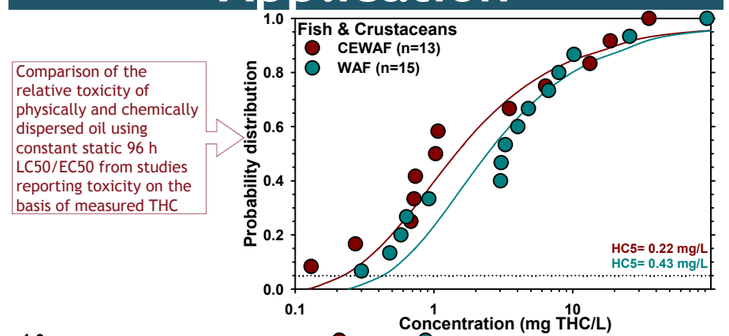


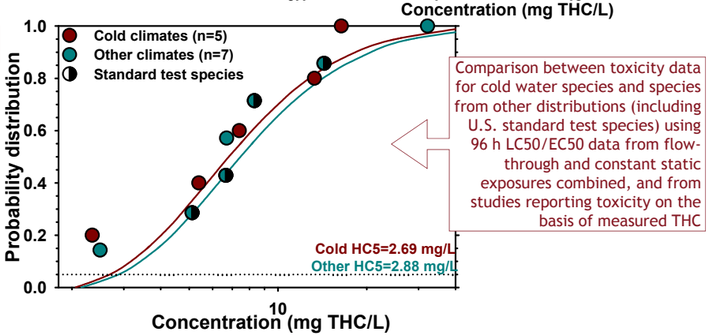


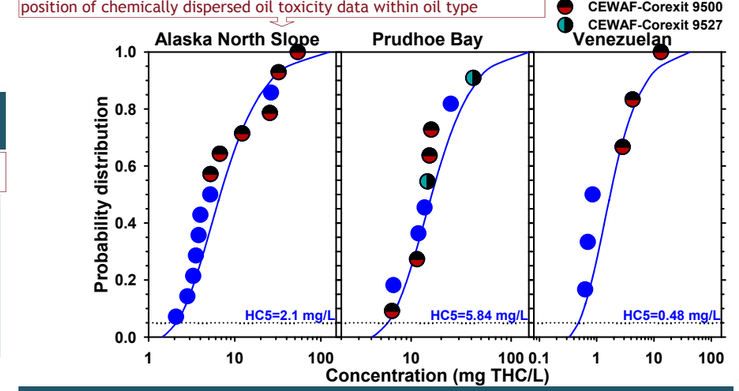
Demonstration



Application







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