



# Overview: ECOTOXicology Knowledgebase

NAMs Training Workshop

RTP, NC

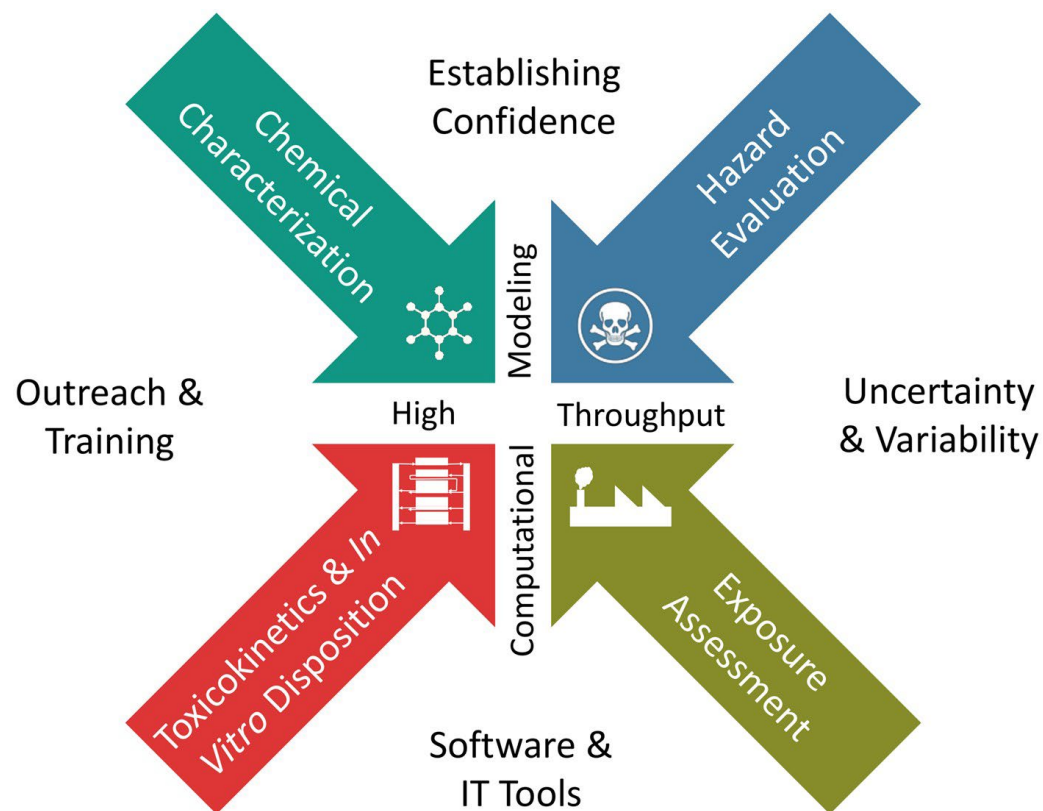
April 24– 25, 2024

Jennifer Olker



# Purpose of ECOTOX Knowledgebase

## ECOTOX



Provides accessible, structured empirical data from *in vivo* ecological toxicity tests

- Chemical risk assessments
- Identify data gaps and guide targeted testing
- Development of computational models
- Support development, evaluation and adoption of new approach methodologies

# Data and Connections

- Adverse effects of single chemical stressors to ecologically relevant aquatic and terrestrial species
- Curated data from scientific literature after an exhaustive search protocol
- From over 54,000 references
  - 1.1 million test records
  - ~ 14,000 aquatic and terrestrial species
  - ~ 13,000 chemicals
- Publicly available website, updated quarterly: [www.epa.gov/ecotox](http://www.epa.gov/ecotox)

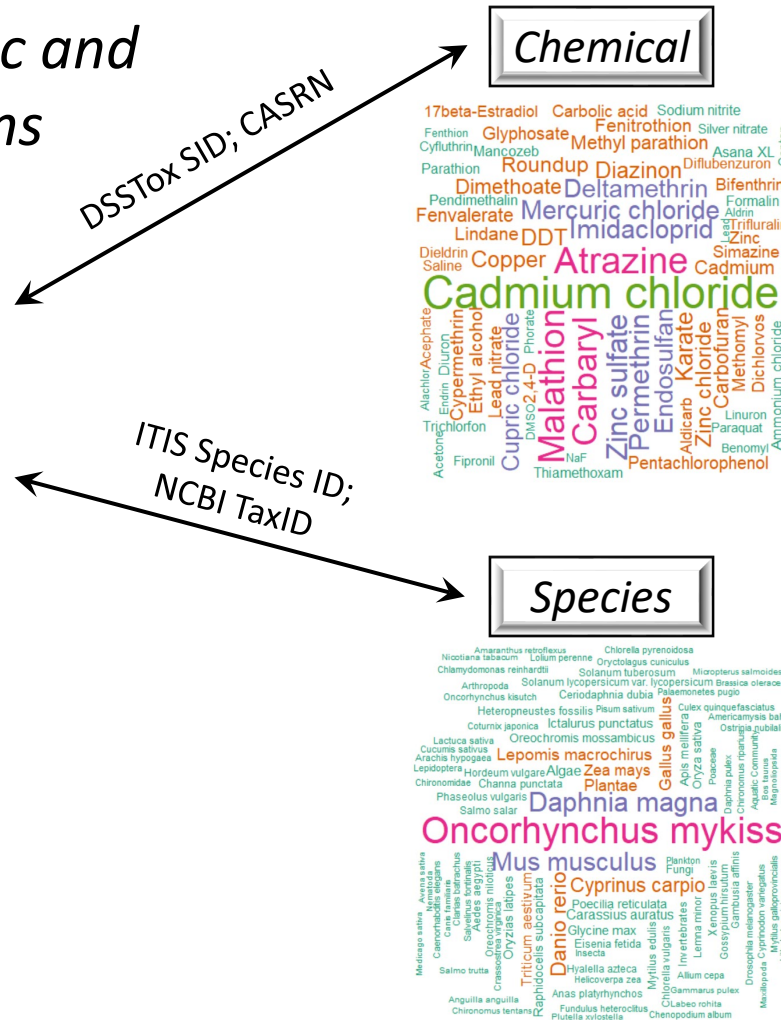


# Data and Connections

*Chemical environmental toxicity data for aquatic and terrestrial organisms*



Curated data can be downloaded from:  
[www.epa.gov/ecotox](http://www.epa.gov/ecotox)



Links from:

*U.S. EPA CompTox Chemicals Dashboard*  
<https://comptox.epa.gov/dashboard/>

*OECD eChemPortal*  
<https://www.echemportal.org/echemportal/>

*Sequence Alignment to Predict Across Species Susceptibility (SeqAPASS)*  
<https://seqapass.epa.gov/seqapass/>

# Example of Tool/Data Use

*Chemical environmental  
toxicity data for aquatic and  
terrestrial organisms*



Curated data can be  
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Provides data to

## **EPA Program Offices and Regions, States, Tribes, Other Federal Agencies and International Entities**

- Ecological Risk Assessments
- Ambient Water Quality Criteria
- Ecological Screening Values
- Chemical Prioritization
- Emergency Response

Data used for

## **Tools and Applications**

- Species Sensitivity Distributions
- Predicted No-Effect Concentrations and Eco-Thresholds for Toxicological Concern
- Quantitative Structure–Activity Relationships
- Bioaccumulation Factor Modeling and Validation
- Adverse Outcome Pathway Development



# Example of Tool/Data Use

## Ambient Water Quality Criteria for Aquatic Life (USEPA Office of Water)

National Recommended Aquatic Life Criteria table

Show 10 entries Search:

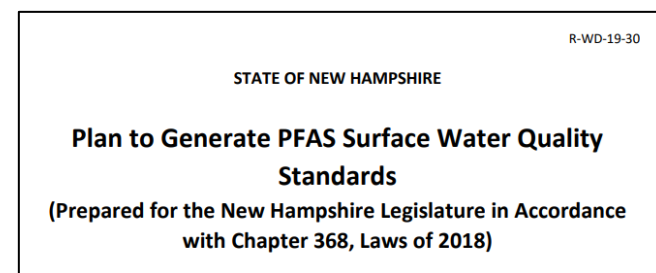
Pollutant (P = Priority Pollutant)	CAS Number	Freshwater CMC <sup>1</sup> (acute) (µg/L)	Freshwater CCC <sup>2</sup> (chronic) (µg/L)	Saltwater CMC <sup>1</sup> (acute) (µg/L)	Saltwater CCC <sup>2</sup> (chronic) (µg/L)	Publication Year	Notes
<a href="#">4,4'-DDT (P)</a>	50293	1.1	0.001	0.13	0.001	1980	
<a href="#">Acrobin (P)</a>	107028	3µg/L	3µg/L	—	—	2009	
<a href="#">Aesthetic Qualities</a>	—	—	—	—	—	1986	Refer to <a href="#">Quality Criteria for Water, 1986, "Gold Book"</a> for narrative statement.
<a href="#">Aldrin (P)</a>	309002	3.0	—	1.3	—	1980	These criteria are based on the <a href="#">1980 criteria</a> which used different Minimum Data Requirements and derivation procedures from the <a href="#">1985 Guidelines</a> . If evaluation is to be done using an averaging period, the acute criteria values given should be divided by 2 to obtain a value that is more comparable to a CMC derived using the 1985 Guidelines.

Ecological hazard data for the Prioritization and Assessment of Chemicals for Toxic Substances Control Act/Lautenberg Act  
(USEPA Office of Pollution Prevention and Toxics)

### Overview of TSCA Work Plan Methodology

Maria Doa  
U.S. EPA, Office of Pollution Prevention and Toxics  
December 11, 2017

## New Hampshire's plan to Generate PFAS Surface Water Quality Standards



Development of Predicted-No-Effect Concentrations and Ecological Threshold for Toxicological Concern (EnviroTox)

EnviroTox Search Analysis Documentation About

<https://envirotoxdatabase.org/>

PNEC Derivation and EcoTTC Analysis; CTD Analysis

Empirical Toxicity Data for modeling T.E.S.T (Toxicity Estimation Software Tool)

<https://www.epa.gov/chemical-research/toxicity-estimation-software-tool-test>

# Considerations

- Most curated data in ECOTOX are identified through chemical-based literature searches.
- We are continually conducting literature searches, reviewing citations, and incorporating curated toxicity data into ECOTOX.
- ECOTOX attempts to be comprehensive, but our searches may not locate all relevant literature and not all chemicals can be updated each year.
- ECOTOX users should also consult the original publications because not all nuances of study design and toxicity results can be conveyed in the structured database.

# Accessing ECOTOX



- [Epa.gov/ecotox](https://epa.gov/ecotox)
- [Comptox.epa.gov](https://comptox.epa.gov)
- APIs in development

The screenshot shows the ECOTOX Knowledgebase website. The header includes navigation links for Home, Search, Explore, Help, and Contact Us. A main content area displays statistics: 'Data last updated Mar 14, 2024', 'Recent chemicals with full searches completed and data extracted' (listing Arsenic, Phthalates, and Per- and Polyfluoroalkyl Substances (PFAS)), and 'Total in database' (12,934 Chemicals, 13,915 Species, 54,475 References, 1,167,326 Results). Below this are three columns: 'About ECOTOX' with a description and a 'Learn More' button; 'Getting Started' with a list of links to search, explore, and user guides; and 'Other Links' with a list of documentation and resource links.

## ECOTOX Knowledgebase


Home Search Explore Help Contact Us

Data last updated <b>Mar 14, 2024</b> See update totals	Recent chemicals with full searches completed and data extracted Arsenic Per- and Polyfluoroalkyl Substances (PFAS)	Phthalates	Total in database	
			12,934 <b>Chemicals</b>	13,915 <b>Species</b>
			54,475 <b>References</b>	1,167,326 <b>Results</b>

### About ECOTOX

ECOTOX is a comprehensive Knowledgebase providing single chemical environmental toxicity data on aquatic and terrestrial species.  
Read more in: [Olker et al. 2022](#)

[Learn More](#)



### Getting Started

- Use [Search](#) if you know exact parameters or search terms (chemical, species, etc.)
- Use [Explore](#) to see what data may be available in ECOTOX (including data plots)
- [ECOTOX Quick User Guide](#) (2 pp, 104 K)
- [ECOTOX User Guide](#) (100 pp, 735 K)
- [ECOTOX Terms Appendix](#)

### Other Links

ECOTOX-related documentation and resources.

- [Frequent Questions](#)
- [Limitations](#)
- [Other Tools/Databases](#)
- [Recent Additions](#)
- [Literature Search Dates](#)



# ECOTOX Knowledgebase Points of Contact



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## Contract staff:

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SpecPro Professional Services (SPS)

## Senior Environmental Employment (SEE) staff

*The views expressed in this presentation are those of the author and do not necessarily reflect the views or policies of the US EPA.*