Overview: ECOTOXicology Knowledgebase

NAMs Training Workshop

RTP, NC
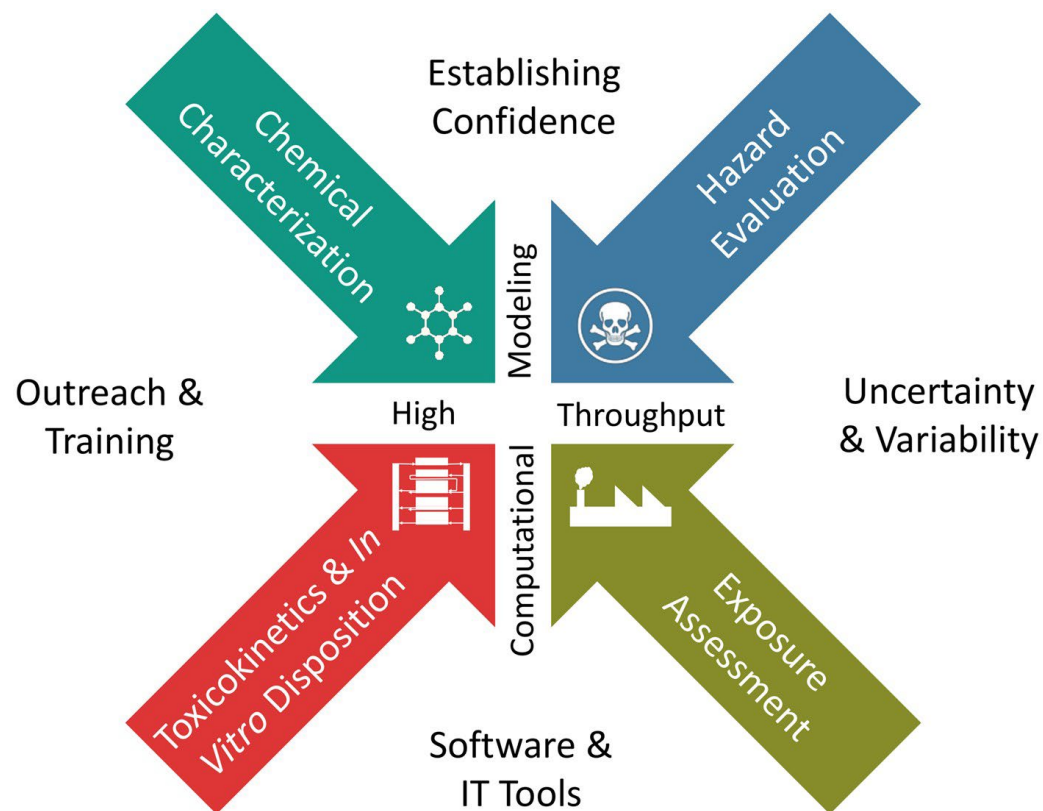
April 24– 25, 2024

Jennifer Olker

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

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

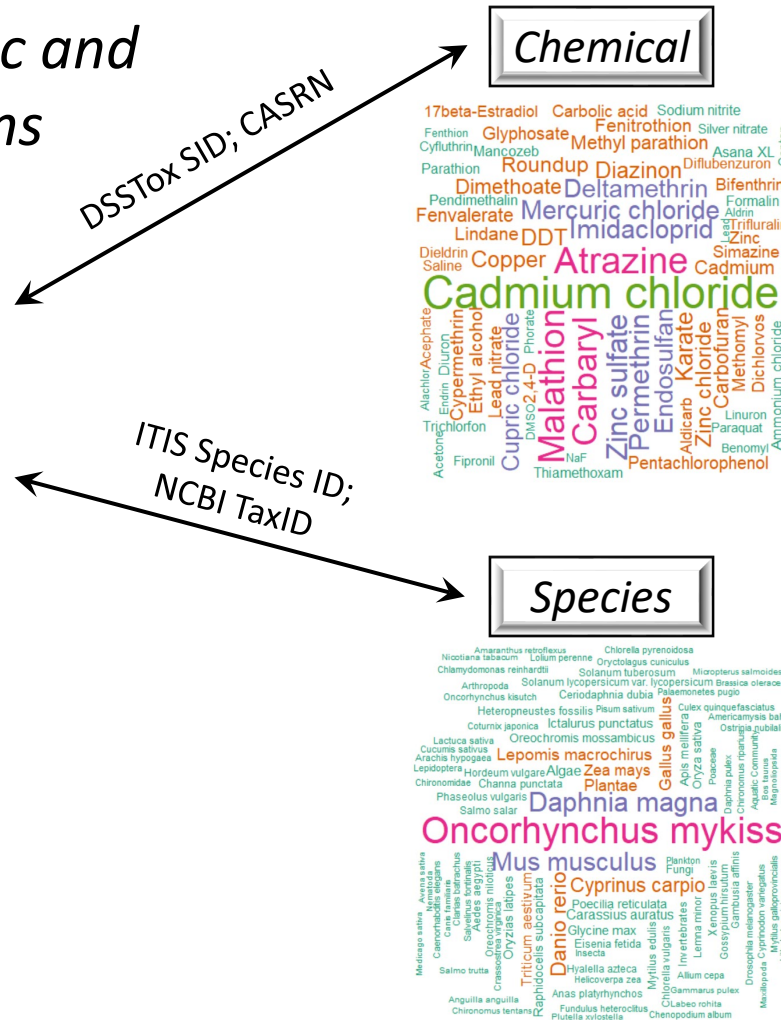- Publicly available website, updated quarterly: www.epa.gov/ecotox

Data and Connections

Example of Tool/Data Use

Chemical environmental toxicity data for aquatic and terrestrial organisms

Provides data to

Data used for

Curated data can be downloaded from: www.epa.gov/ecotox

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

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

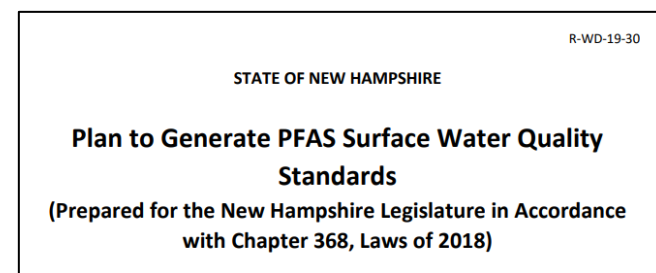Show 10 entries   Search: [   ]

Pollutant (P = Priority Pollutant)	CAS Number	Freshwater CMC[1] (acute) (µg/L)	Freshwater CCC[2] (chronic) (µg/L)	Saltwater CMC[1] (acute) (µg/L)	Saltwater CCC[2] (chronic) (µg/L)	Publication Year	Notes
4,4'-DDT (P)	50293	1.1	0.001	0.13	0.001	1980	
Acrolein (P)	107028	3ug/L	3ug/L	—	—	2009	
Aesthetic Qualities	—	—	—	—	—	1986	Refer to Quality Criteria for Water, 1986 ("Gold Book") for narrative statement.
Aldrin (P)	309002	3.0	—	1.3	—	1980	These criteria are based on the 1980 criteria which used different Minimum Data Requirements and derivation procedures from the 1985 Guidelines. If evaluation is to be done on 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

R-WD-19-30

STATE OF NEW HAMPSHIRE

Plan to Generate PFAS Surface Water Quality Standards
(Prepared for the New Hampshire Legislature in Accordance with Chapter 368, Laws of 2018)

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

- Comptox.epa.gov

- APIs in development

ECOTOX Knowledgebase Points of Contact

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