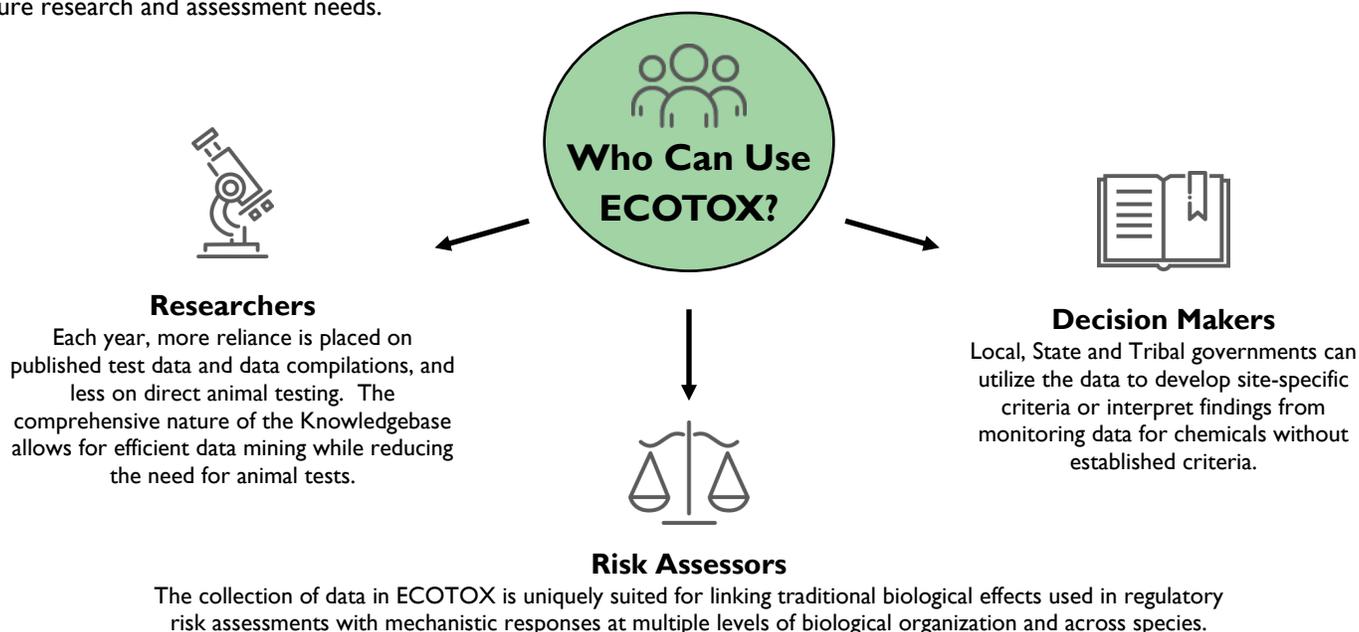# ECOTOX Knowledgebase

EPA/600/F-18/260

What is the ECOTOX Knowledgebase?

The ECOTOX Knowledgebase is a comprehensive, publicly available application providing chemical environmental toxicity data on aquatic life, terrestrial plants and wildlife. Data are curated from the scientific literature after an exhaustive search protocol. It is updated quarterly and as of June 2018, data were available for over 11,500 chemicals and 12,590 species from 47,800 references capturing more than 910,400 test results.

In addition to facilitating efficient mining of ecotoxicology information, ECOTOX is used to develop and validate models to extrapolate data from *in vitro* (cell-based) to *in vivo* (whole organism) effects and across species to evaluate the safety of chemicals. The Knowledgebase is also useful for building quantitative structure activity relationship (QSAR) models to predict toxicity based on physical characteristics of a chemical's structure, as well as to conduct data gap and meta-analyses to support current or guide future research and assessment needs.

Who Can Use ECOTOX?

Researchers
Each year, more reliance is placed on published test data and data compilations, and less on direct animal testing. The comprehensive nature of the Knowledgebase allows for efficient data mining while reducing the need for animal tests.

Decision Makers
Local, State and Tribal governments can utilize the data to develop site-specific criteria or interpret findings from monitoring data for chemicals without established criteria.

Risk Assessors
The collection of data in ECOTOX is uniquely suited for linking traditional biological effects used in regulatory risk assessments with mechanistic responses at multiple levels of biological organization and across species.

ECOTOX *in ACTION*

CHEMICAL SPILL RESPONSE: ECOTOX was used for the 2014 Elk River chemical spill when crude 4-methylcyclohexanemethanol (MCHM) was released from a tributary into the Elk River in West Virginia, and the ECOTOX Knowledgebase provided unique access to EPA toxicity data not published in scientific literature for assessment of risk to fish.

NATURAL DISASTER RESPONSE: In 2005, after Hurricane Katrina, ECOTOX was used as a rapid source for toxicity data to develop chemical benchmarks for water and sediment quality assessments (e.g. mercury, cyanide, heavy metals, polycyclic aromatic hydrocarbons (PAH), pesticides, salinity).

INTERAGENCY RESOURCE: ECOTOX has been used by the National Oceanic and Atmospheric Administration (NOAA) to assess and remediate chemical spills in companion with NOAA's "Chemical Aquatic Fate and Effects" database, which is a software program that risk assessors can use to estimate the fate and effects of thousands of chemicals, oils and dispersants.

RESEARCH IMPLEMENTATION RESOURCE: Adverse Outcome Pathways (AOPs) are frameworks that assemble knowledge about biological events that can be used to help interpret how a stressor (e.g., chemical) can lead to an adverse health effect in an organism. Current enhancements to the ECOTOX Knowledgebase are specifically aimed to further the development of AOPs for both pathway discovery purposes and implementation of AOP frameworks in regulatory applications.

Visit ECOTOX: https://www.epa.gov/ecotox/

Learn More about ECOTOX 5.0

Refine and filter data searches by 19 parameters and customize output selections from over 100 data fields

SEARCH feature:
New SEARCH feature on the Knowledgebase can be used to select and search for data on a specific Chemical (with a link to the CompTox Dashboard to give you more information about your chemical) or Species, Effect, or Endpoint of interest to find information in the ECOTOX Knowledgebase.

Parameters | Aquatic | Terrestrial

All Chemicals +
All Effects +
All Endpoints +
All Species +
All Test Conditions +
All Publication Options +

About Search

Search is a great tool for retrieving data from the ECOTOX Knowledgebase if you know the exact parameters you want to search.

The **Search** function provides a direct method to retrieve data that can be refined by limiting the search based on specific parameters including but not limited to: Chemical, Species, Endpoint, Control, and Media Type. Once you have selected your search options, you are able to view the report in the browser or export to an Excel spreadsheet or delimited text format.

EXPLORE feature:
New EXPLORE feature on the Knowledgebase can be used when the exact parameters for a search are not known. You can search by Chemical, Species, or Effects. Additional data fields allow you to customize your output results.

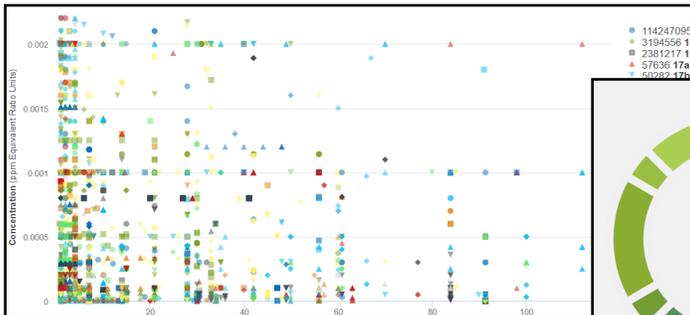Choose a starting point below.
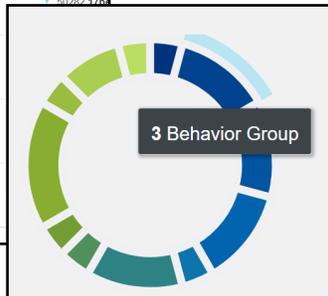
Chemicals | Species | Effects

About Explore

Explore is a great tool for searching the ECOTOX Knowledgebase if you do not know the exact parameters you want to search, or would like a visual representation of general and specific data trends.

The ECOTOX Knowledgebase **Explore** function is an interactive way to examine search paths by Chemical, Species, and Effects. Once you've selected the path to explore, additional data fields will be displayed to filter your data, e.g. Effects, Endpoints, Publication Year.

During the exploration there are also options to examine the data visually via plotting functions. Once you have completed your exploration, you are able to select different options for exporting the data.

Scatter plots and donut plots are available in ECOTOX for data visualization.

DATA VISUALIZATION features:
New DATA VISUALIZATION features on the knowledgebase can be used to view your results while exploring data. Data plots are interactive. Features allow you to hover over data points and scroll to zoom in on specific sections of data to get the information you need.

Visit ECOTOX: https://www.epa.gov/ecotox/

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