

ECOTOX Knowledgebase Virtual Training

Breakout Group Worksheet Case Study Level 2

This worksheet was developed for the Breakout Group session of the ECOTOX Knowledgebase Virtual Training, hosted by the U.S. Environmental Protection Agency's Center for Computational Toxicology and Exposure on May 17, 2022.

For more information about the ECOTOX Knowledgebase tool—

- Visit the ECOTOX Knowledgebase at www.epa.gov/ecotox.
- Contact ECOTOX support at ecotox.support@epa.gov or by calling 218-529-5225.
- Read more in Olker et al. 2022, <https://doi.org/10.1002/etc.5324>.

Case Study Level 2, Breakout A

Goal

With a recent publication as an initial reference, use ECOTOX to identify additional publications that may augment related research relevant to the same chemical and species groups.

Scenario—Part 1

As a part of your work, you need to review the following recent publication on the gonadal development of fish, which has motivated you to learn more about the chemical(s) presented and effects on the relevant species group.

- Kadlec et al. 2022, <https://setac.onlinelibrary.wiley.com/doi/10.1002/etc.5320>

Directions

After reviewing the paper above, use ECOTOX to explore and document answers to the following questions:

1. What is the test compound?
2. What other types of effects have been documented for exposure to this test compound?

3. What are the most sensitive endpoints and species from studies in ECOTOX?
4. What options were selected to determine responses to questions 1 and 2 above?
5. Is the Kadlec et al. 2022 paper in ECOTOX? Why or why not?
6. When was the most comprehensive ECOTOX update completed for this compound?
7. Summarize the extent of terrestrial data (references, species, effects) in ECOTOX for this compound.
8. Summarize the extent of aquatic amphibian data (references, species, effects) in ECOTOX for this compound.

9. Compare reproductive effects of this compound in aquatic amphibians with those in fish.

10. Which plot view was best for making this comparison? Which species have reproductive effects at a lower concentration?

Scenario—Part 2

Now you realize you want to focus on reviewing the literature on reproductive effects in short-term studies in fish.

11. How can you use your current investigation to arrive at this set of literature?

12. Limit the search for reproductive effects to studies less than 4 weeks in duration. Review each study for acceptable quality.

13. Identify a set of studies that meet the above criteria. Conduct a new search for all the records from these studies and export the results to an Excel file.

Case Study Level 2, Breakout B

Goal

With a recent publication as an initial reference, use ECOTOX to provide biological relevance to the chemicals and concentrations detected in surface water samples with effects data from aquatic toxicity studies.

Scenario—Part 1

As a part of your work, you need to determine the scope of aquatic toxicity data available for the 11 chemicals that were detected in more than 25 of the surface water samples collected from the St. Louis River, St. Louis Bay, and Superior Bay sites in Minnesota and Wisconsin in 2010 (Christensen et al. 2012) by using the chemical identifiers provided (CAS Registry Numbers) and comparing measured concentrations to concentrations producing potential effects.

Christensen et al. 2012, <https://pubs.usgs.gov/sir/2012/5184/>

CAS Registry Numbers for the 11 chemicals detected in more than 25% of the samples from Christensen et al. 2012, Figure 4.
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58-08-2, 78-51-3, 119-61-9, 134-62-3, 53-16-7, 57-88-5, 298-46-4, 206-44-0, 129-00-0, 1222-05-5, 486-56-6

Directions

After reviewing the reference abstract above, use ECOTOX to explore and document answers to the following questions:

1. Does ECOTOX contain data for these 11 chemicals?
2. Describe the scope of the aquatic data available relative to this chemical list.
3. N,N-diethyl-meta-toluamide (DEET) was found in 100% of the surface water samples (see Christensen et al. 2012, Figure 4). Create a custom plot view for only DEET. How would you describe the testing concentrations for most of the studies included in this plot view?



4. Figure 5E in Christensen et al. 2012 shows concentrations of DEET measured in water samples at study sites. The maximum on Figure 5E is ~ 0.15 micrograms per liter, which is equivalent to 0.00015 ppm. How do the concentrations for DEET records in ECOTOX compare to the water sample data?
5. Limit the plot results to the lowest observed effects concentration. What effects are reported within 10 times the concentration of DEET reported in the water sample data?

Scenario—Part 2

Now you realize you want to focus on reviewing the literature on mortality effects in short-term studies in fish for the list of 11 chemicals measured at these sites.

6. How can you use your current investigation to arrive at this set of literature?
7. Limit the search to mortality effects in studies that were 2 days or less in duration. Review each study for acceptable quality.
8. Identify a set of studies that meet the above criteria. Conduct a new search for all records from these studies for this set of 11 chemicals, and export the results to an Excel file.

