



Environmental Residue-Effects Database (ERED)

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US Army Corps of Engineers



Interpreting bioaccumulation data in the U.S. dredging program.



“Green Book”

U.S. Environmental Protection Agency. 1991. Evaluation of dredged material proposed for ocean disposal. EPA-503/8-91-001. Washington, DC.

The “Green Book” Bioaccumulation Interpretation

The amount of bioaccumulation in organism is compared to a numerical limit, such as an FDA fish advisory.

Level I

Level II

Statistical comparison of data collected from animals exposed to a reference sediment.

Assessment factors considered to determine if dredged sediment will result in an "unacceptable adverse effect."

Level III

- a. Number of species tested
- b. Number of bioaccumulated contaminants
- c. Magnitude of bioaccumulation
- d. Toxicological importance of contaminants
- e. Biomagnification
- f. Comparison to background concentrations

Limitations

- 1) A small number of FDA action levels available for first level interpretation compared to the large number of contaminants that may be present
- 2) Uncertainties involved in applying arbitrary statistical cutoffs
- 3) Largely qualitative or subjective nature of the evaluation factors applied in the third level of interpretation

What is ERED?

1:1

Tissue contaminant: effect

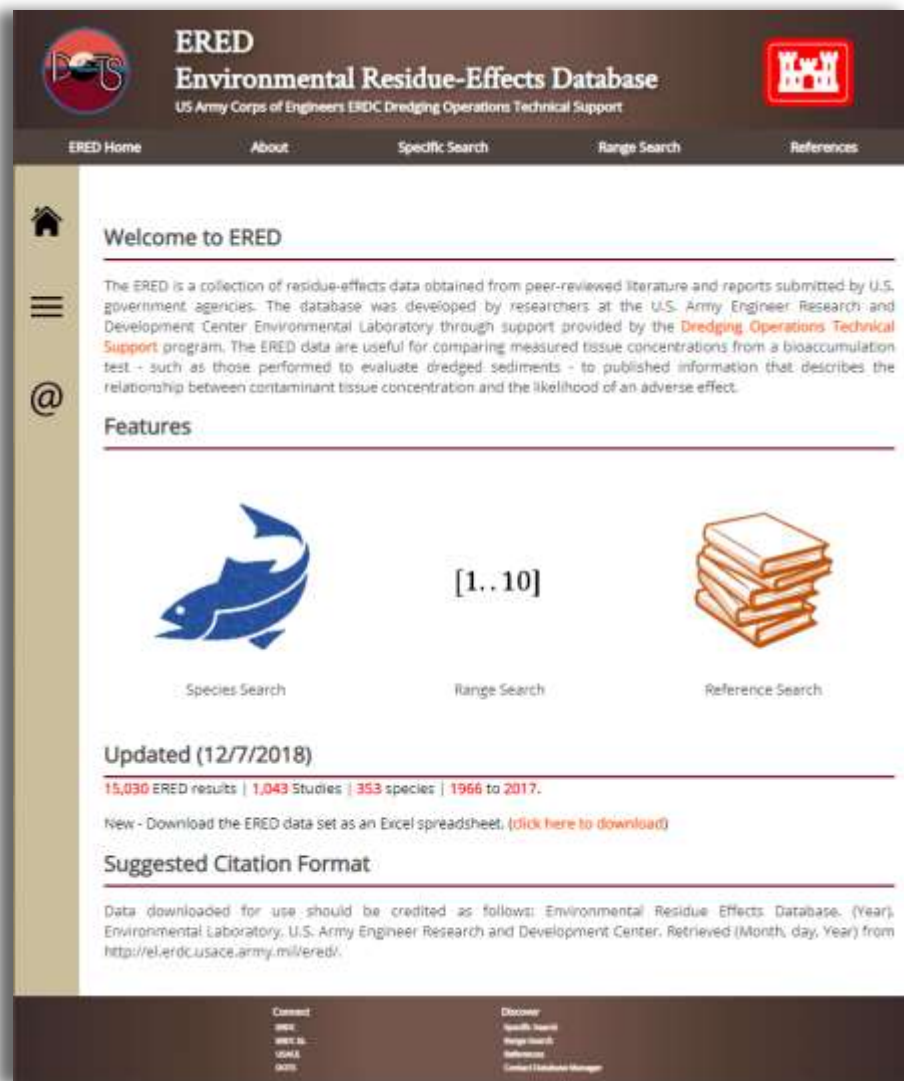


Centralized repository



Regulatory uses

<https://ered.el.erdcdren.mil>



ERED
Environmental Residue-Effects Database
US Army Corps of Engineers ERDC Dredging Operations Technical Support

ERED Home About Specific Search Range Search References

Welcome to ERED

The ERED is a collection of residue-effects data obtained from peer-reviewed literature and reports submitted by U.S. government agencies. The database was developed by researchers at the U.S. Army Engineer Research and Development Center Environmental Laboratory through support provided by the **Dredging Operations Technical Support** program. The ERED data are useful for comparing measured tissue concentrations from a bioaccumulation test - such as those performed to evaluate dredged sediments - to published information that describes the relationship between contaminant tissue concentration and the likelihood of an adverse effect.

Features

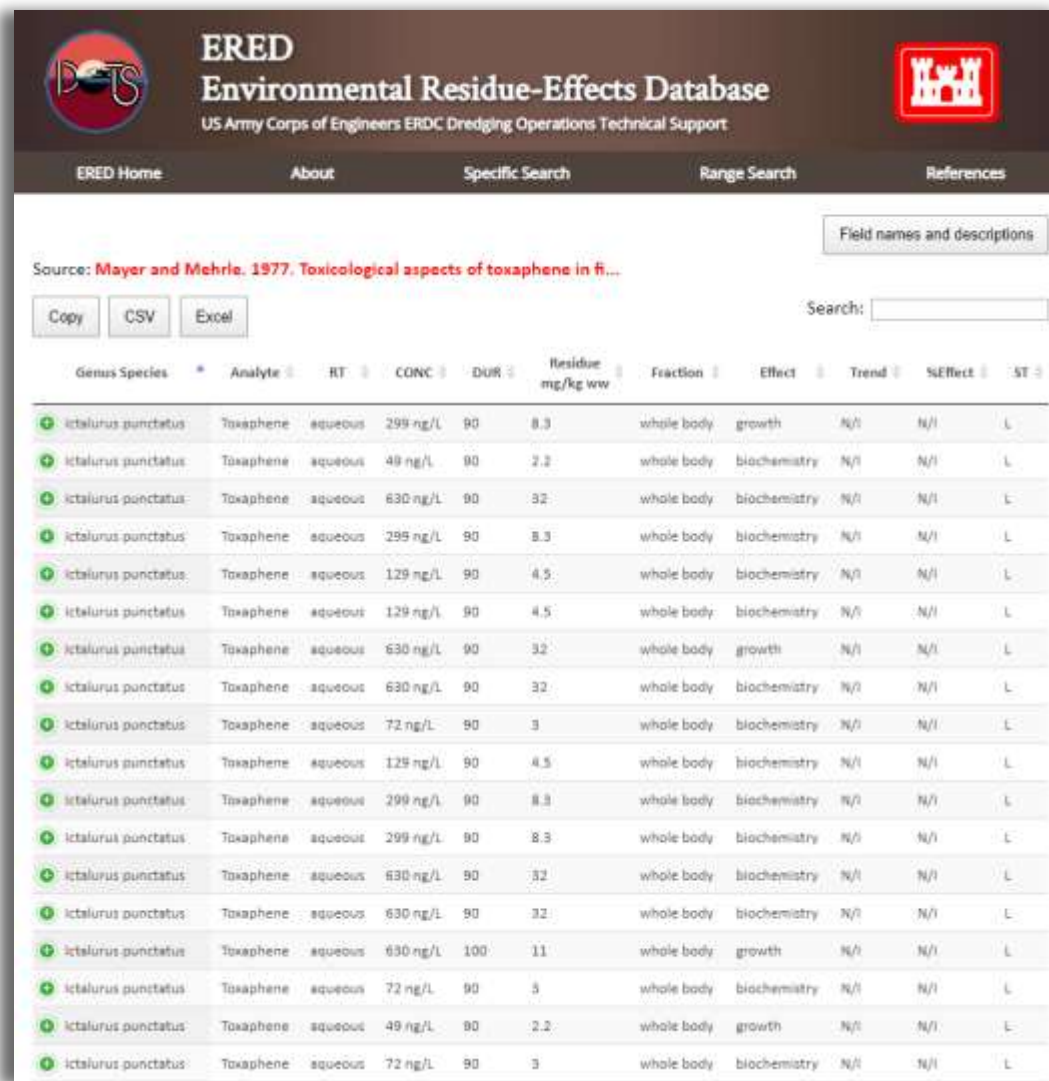
Species Search [1..10] Reference Search

Updated (12/7/2018)
15,030 ERED results | 1,043 Studies | 353 species | 1966 to 2017.

New - Download the ERED data set as an Excel spreadsheet. ([click here to download](#))

Suggested Citation Format

Data downloaded for use should be credited as follows: Environmental Residue Effects Database. (Year). Environmental Laboratory, U.S. Army Engineer Research and Development Center. Retrieved (Month, day, Year) from <http://el.erdcdren.mil/ered/>.



ERED
Environmental Residue-Effects Database
US Army Corps of Engineers ERDC Dredging Operations Technical Support

ERED Home About Specific Search Range Search References

Field names and descriptions

Source: **Mayer and Mehrle, 1977. Toxicological aspects of toxaphene in fi...**

Copy CSV Excel Search:

Genus Species	Analyte	RT	CONC	DUR	Residue mg/kg ww	Fraction	Effect	Trend	%Effect	ST
Ictalurus punctatus	Toxaphene	aqueous	299 ng/L	90	8.3	whole body	growth	N/I	N/I	L
Ictalurus punctatus	Toxaphene	aqueous	49 ng/L	90	2.2	whole body	biochemistry	N/I	N/I	L
Ictalurus punctatus	Toxaphene	aqueous	630 ng/L	90	32	whole body	biochemistry	N/I	N/I	L
Ictalurus punctatus	Toxaphene	aqueous	299 ng/L	90	8.3	whole body	biochemistry	N/I	N/I	L
Ictalurus punctatus	Toxaphene	aqueous	129 ng/L	90	4.5	whole body	biochemistry	N/I	N/I	L
Ictalurus punctatus	Toxaphene	aqueous	129 ng/L	90	4.5	whole body	biochemistry	N/I	N/I	L
Ictalurus punctatus	Toxaphene	aqueous	630 ng/L	90	32	whole body	growth	N/I	N/I	L
Ictalurus punctatus	Toxaphene	aqueous	630 ng/L	90	32	whole body	biochemistry	N/I	N/I	L
Ictalurus punctatus	Toxaphene	aqueous	72 ng/L	90	3	whole body	biochemistry	N/I	N/I	L
Ictalurus punctatus	Toxaphene	aqueous	129 ng/L	90	4.5	whole body	biochemistry	N/I	N/I	L
Ictalurus punctatus	Toxaphene	aqueous	299 ng/L	90	8.3	whole body	biochemistry	N/I	N/I	L
Ictalurus punctatus	Toxaphene	aqueous	299 ng/L	90	8.3	whole body	biochemistry	N/I	N/I	L
Ictalurus punctatus	Toxaphene	aqueous	630 ng/L	90	32	whole body	biochemistry	N/I	N/I	L
Ictalurus punctatus	Toxaphene	aqueous	630 ng/L	90	32	whole body	biochemistry	N/I	N/I	L
Ictalurus punctatus	Toxaphene	aqueous	630 ng/L	100	11	whole body	growth	N/I	N/I	L
Ictalurus punctatus	Toxaphene	aqueous	72 ng/L	90	3	whole body	biochemistry	N/I	N/I	L
Ictalurus punctatus	Toxaphene	aqueous	49 ng/L	90	2.2	whole body	growth	N/I	N/I	L
Ictalurus punctatus	Toxaphene	aqueous	72 ng/L	90	3	whole body	biochemistry	N/I	N/I	L

Papers of interest



Aquatic

Laboratory and field studies.



Organism

Focused on fish and invertebrates.



Chemical

Exposure to a single chemical.



Tissue

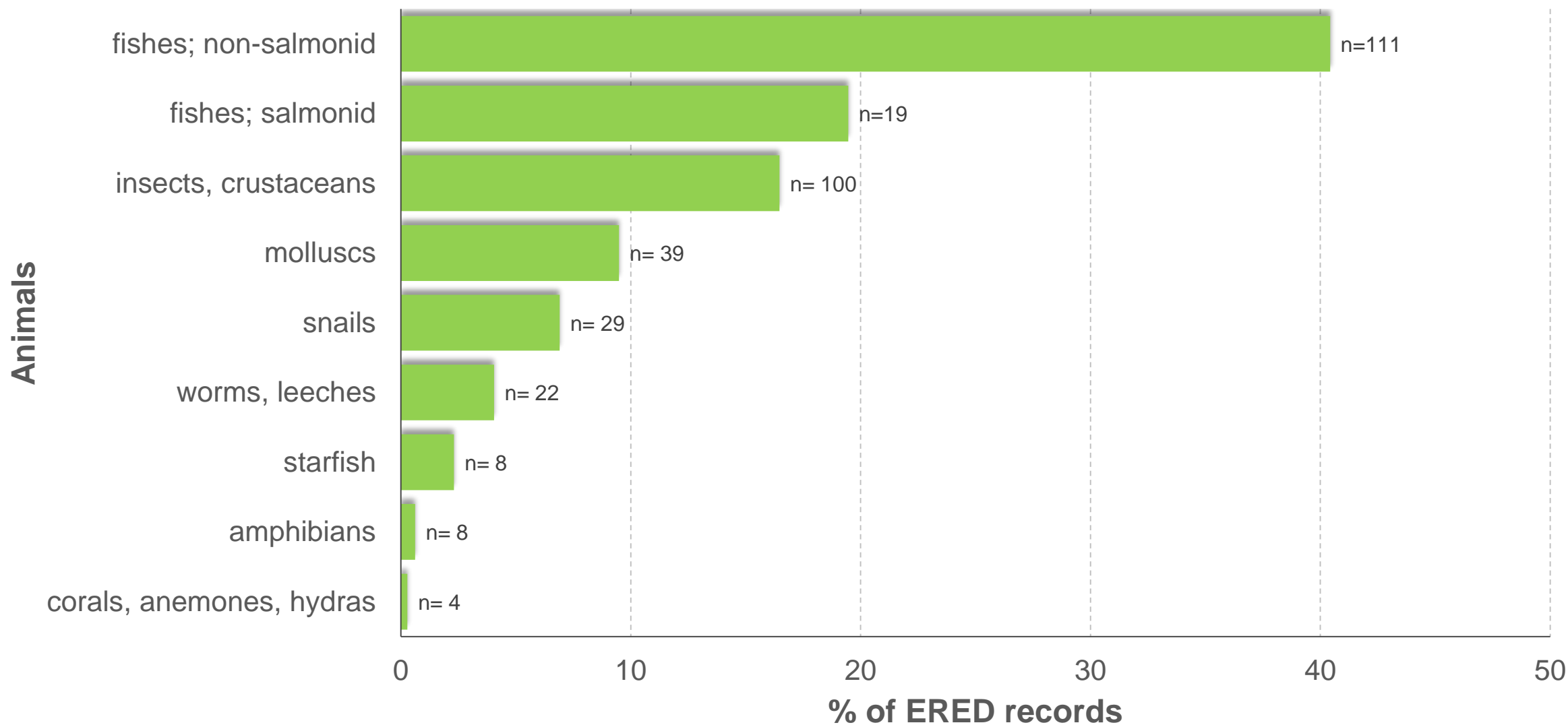
Chemical residue reported in tissue.



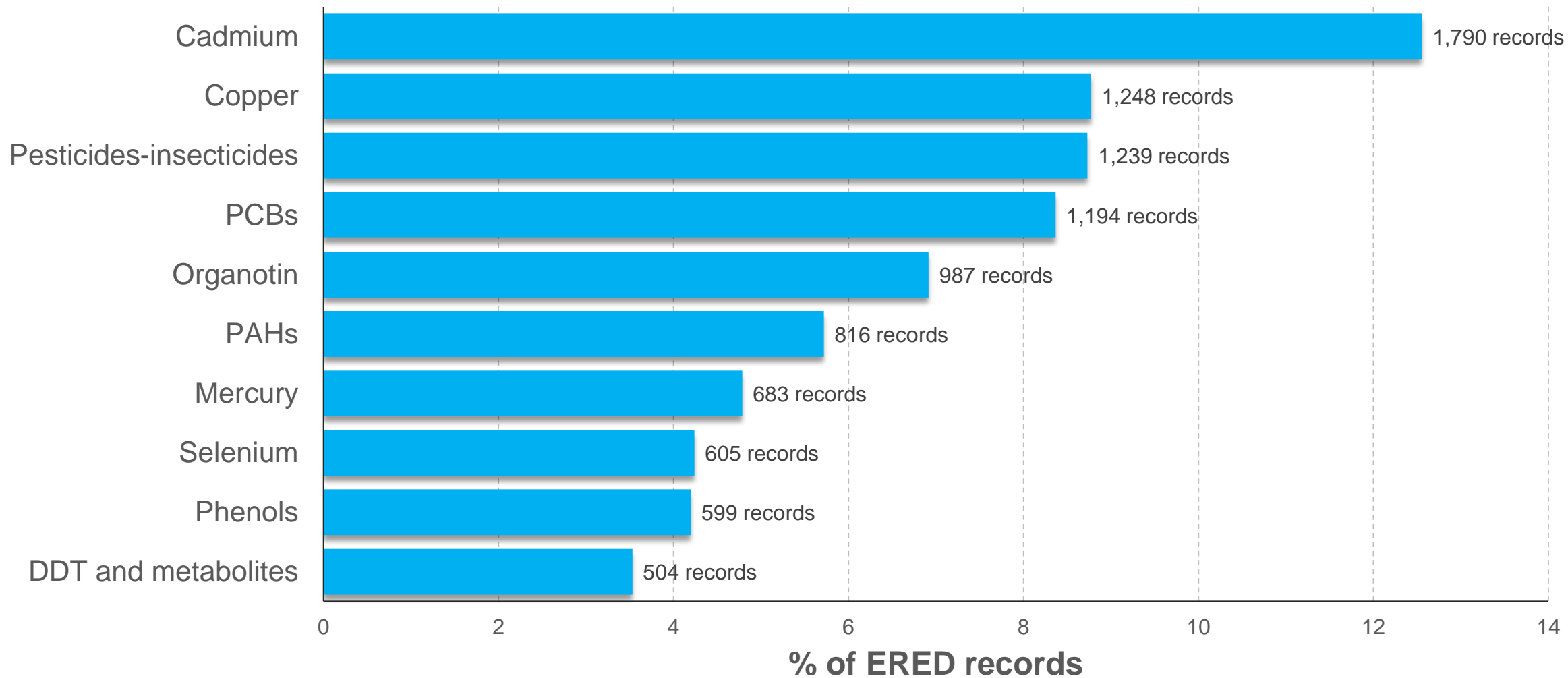
Effect

Link to endpoints such as survival, growth, and reproduction.

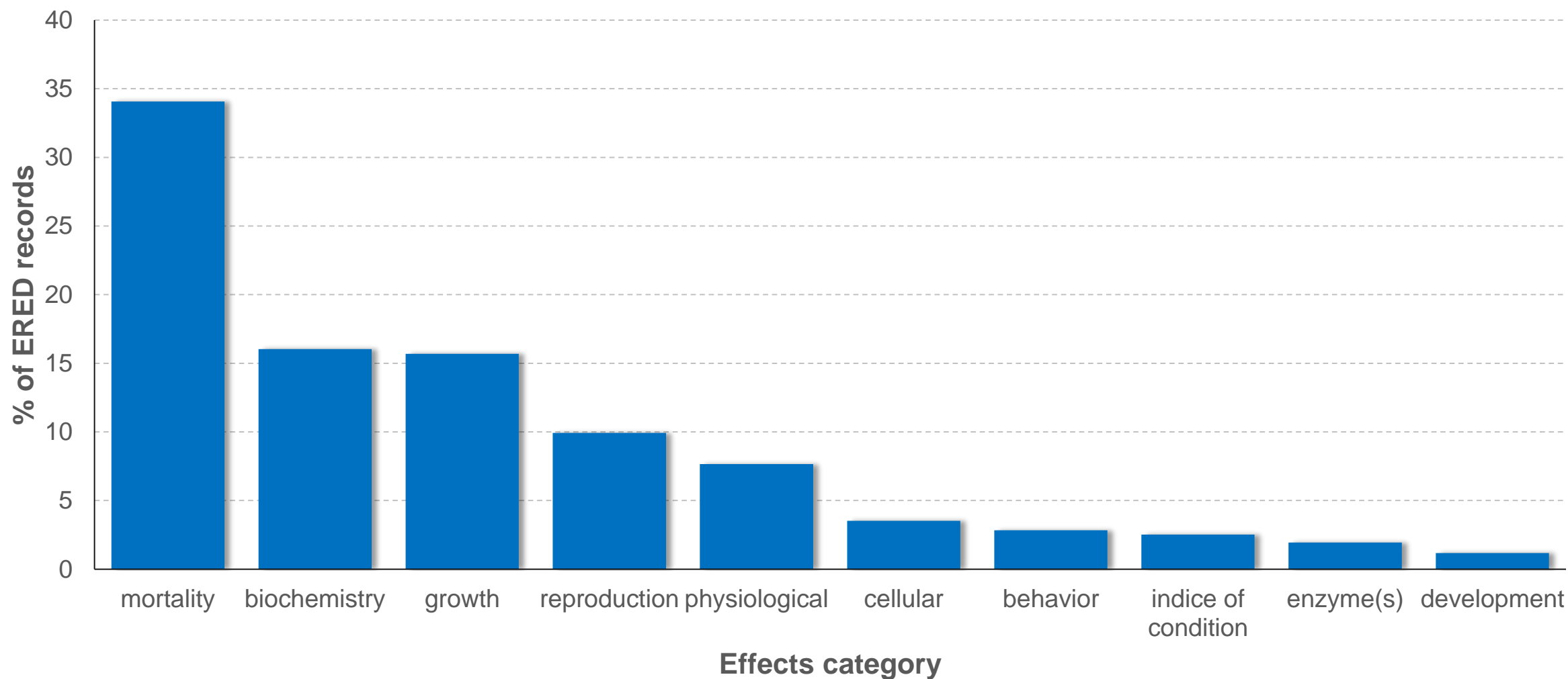
Record distribution by major animal groups, N=340 species



Top 10 chemicals, N=378 chemicals



Top 10 effects, N=22



ERED uses and considerations...

Which has the greater likelihood for inferring higher order effects on whole organisms or populations?

induction of an enzyme

– or –

whole organism effects on survival

ERED uses and considerations...

How similar are the bioaccumulation test species and the species in the ERED?

Select species that are taxonomically or ecologically similar.

ERED uses and considerations

Are the exposure conditions used to derive the effect appropriate for your application?

Users should evaluate the original study.

i.e., a study is reliable or unreliable

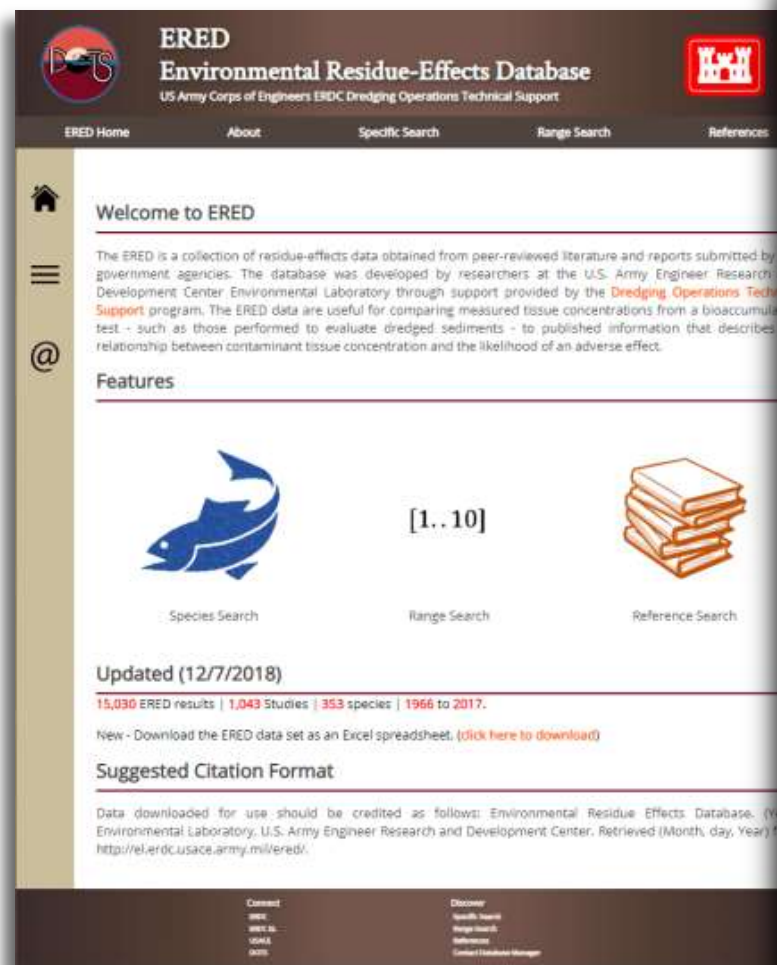
based on your criteria

Going forward...

Particular importance given to residue-response relationships for the following:

1. Metals (Cd, Hg, Se, others on case specific considerations)
2. Organotins
3. PAHs
4. PCBs
5. Pesticides

Questions?



<https://ered.el.erdc.dren.mil>

Search by species, animal group, chemical group, and references on website

Download entire data set for more detailed information