EPA's Web-ICE Toxicity Extrapolation Tool

Protecting the diversity of species from the adverse effects of chemicals is a significant environmental challenge. Information on the effects of chemicals on species is either very limited or lacking entirely, making management and mitigation of environmental contaminants difficult. EPA developed the Web-based Interspecies Correlation Estimation (Web-ICE) tool to allow toxicity extrapolation from standard test organisms to endangered species and other taxa with limited data.

What is Web-ICE?

Web-ICE is an ecotoxicity extrapolation tool developed by the U.S. EPA (www3.epa.gov/webice/). This publically-accessible internet application allows risk assessors from all sectors to estimate chemical toxicity to a diversity of fresh and saltwater invertebrates and fish, birds and mammals, and aquatic plants (algae) that may have limited toxicity data. Web-ICE contains modules for estimating chemical hazard levels for aquatic and terrestrial ecological communities and estimating sensitivity of federally listed aquatic and wildlife taxa. This tool has been extensively peer reviewed and is used by EPA in assessing chemical risks to threatened and endangered species.

Why is Web-ICE important?

Web-ICE is important because it allows a user to determine the hazard level of a chemical for a large range of species without test data. The use of Web-ICE to estimate toxicity to endangered species is particularly important because of the legal requirements to assess risks of new and existing chemicals to federally listed species and the challenges of measuring toxicity directly in listed species. This tool can easily predict toxicity to a wide range of species, limiting the need for laboratory animal testing.

What's new in the revised Web-ICE?

Since its release in 2007, Web-ICE has undergone periodic updates and restructuring to expand species and chemical coverage, and improve functionality in partnership with EPA's Program Offices and Regions. Web-ICE (version 3.3) has a number of important updates, including increased species diversity, a larger range of chemical toxicity data, extensive quality assurance/quality control checks, and an improved approach for determining sensitivity of threatened and endangered species.

What does Web-ICE tell us?

Web-ICE can tell us if a species of concern (i.e., endangered or economically important species) is at risk from a chemical contaminant, even when laboratory data on the species and chemical is lacking. Web-ICE can identify species that may be at a higher risk of impact and target groups for additional studies to better understand a chemical impact. Web-ICE has been extensively peer reviewed through multiple journal publications and technical work groups, demonstrating the technical validity and utility of the tool.

For more information, explore Web-ICE at https://www3.epa.gov/webice/

Web-ICE Team
Mace Barron,
Barron.mace@epa.gov;
Sandy Raimondo,
Raimondo.sandy@epa.gov;

U.S. Environmental Protection Agency, 1 Sabine Island Drive, Gulf Breeze, FL 32561