Technological Tools for Evidence Integration

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Evidence Integration

At the EPA's National Center for Environmental Assessment (NCEA), we work closely with programs throughout the EPA to integrate web-based and desktop computer tools into the assessment process, facilitating evidence integration for science assessment products. By incorporating in-house and third-party tools, both open source and commercial, activities such as the Integrated Risk Information System (IRIS) and the Integrated Science Assessments (ISA) seek to use the best tools for the job, while remaining flexible enough to improve the evidence integration process.

Current Tools

- Health and Environmental Research Online (HERO): Literature search, categorization, acquisition, archiving. Interoperable with HAWC, Distiller, and SWIFT.
- Health Assessment Workplace Collaborative (HAWC): Study evaluation, data extraction, visualization. Interoperable with HERO, BMDS, and Distiller.
- Benchmark Dose Software (BMDS): Dose-response modelling. Interoperable with HAWC.
- Evidence Partners DistillerSR: Literature screening, data extraction. Interoperable with HERO and HAWC.
- Sciome SWIFT-Review and SWIFT-Active Screener: Literature screening, prioritization, categorization. Interoperable with HERO and HAWC.

New Tools

Evidence Profile Table

Part of HAWC, the Evidence Profile Table offers a summary explanation of evidence integration in a chemical risk assessment. This view creates greater transparency about the body of evidence by illuminating the rationale behind the evidence integration process.

Evidence Profile Table, pictured

New Tools, continued

Evidence Mapping

Integrated with the Health and Environmental Research Online (HERO) database, the Evidence Mapping tool allows researchers to create heat maps to visualize and overlay characteristics (e.g., discipline, exposure, concentration, etc.) of the reviewed literature, making it easy to visualize the available evidence.

Evidence Inventory

The Evidence Inventory tool, hosted within HERO, facilitates data extraction and portrayal by providing researchers a template to collect and categorize data from the relevant literature and then create summary tables of the extracted information. The summary tables are then ready for export into assessment documents, allowing readers to review the evidence behind the chemical risk assessment.

Future Development

- Store data in HERO for repeated use in assessments
- Develop search and reporting capabilities for extracted data
- Through text and concept mining tools, automate the first pass at categorization and tagging
- Visualize the results of automated categorization in Evidence Maps
- Create tighter integration between HERO and HAWC
- Create, improve, and utilize web service APIs for HERO and HAWC to ease integration with third-party software
- Allow web-based data entry for Evidence Inventory
- Integrate Tableau visualization software with HAWC, Distiller, and Evidence Inventory tools
- Integrate Evidence Prime's Pupil automated data extraction software with Distiller, HAWC, and Evidence Inventory tools
- Investigate possible standards for extracted data formats to ease data migrations
- Investigate and implement tools for automated table and graph data extraction
- Work on ontologies for data extraction to make the data more easily searchable
- Employ agile development processes to test and incorporate new and useful tools into the assessment process

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