

Tribal Natural Resource Contaminant Database Concept Paper

Tribal culture is inextricably rooted in the plant and animal communities that occur within each Tribe's homelands. As a result of this relationship between Tribal culture and natural resources, virtually all of the plants and animals that occur within each Tribe's geographic ranges are utilized for food, medicinal, or spiritual use. However, concerns about the uptake of contaminants by plants and animals have raised important questions about the safety of utilizing these resources.

Much of the recent attention focused on the safety of Tribal utilization of natural resources for food, medicine and spiritual use has been prompted by well-publicized fish consumption advisories, recently collected marine mammal contaminant data, and press releases concerning organic pollutants in agricultural products. While there is a rapidly growing body of data on contaminants in animals, existing contaminant data for plants is relatively sparse. Due to the lack of existing plant contaminant data as compared to animal contaminant data, and because it is likely that a much greater number of plants species are utilized by Tribes in a given geographic area versus the number of animal species that are utilized, it is apparent that a thorough assessment of the occurrence of contaminants in plant species utilized by Tribes is a very daunting task. The enormity of this task is compounded by the large number of contaminants of concern that could potentially be uptaken by each of the plant species utilized by Tribes.

One potentially rich source of existing plant contaminant data are the phytoremediation resources compiled by EP A's Office of Solid Waste and Emergency Response's (OSWER) Technology Innovation Office. EP A has developed the phytoremediation resources (<http://www.epa.gov/tio/download/remed/phytoresgude.pdf>) to demonstrate the capacity of various plant species to accumulate contaminants for the purposes of remediating contaminated sites. Although this effort has been targeted to identify plants that may be useful for extracting contaminants from polluted sites, the information that has been collected could be extremely useful for Tribes who are trying to identify which plants species utilized by their Tribe are capable of or are susceptible to accumulating contaminants.

Another source of plant contaminant data can be found in the Agency for Toxic Substances Disease Registry (ATSDR) Toxicological Profiles that are developed for hazardous substances (<http://www.atsdr.cdc.gov/toxpr02.html>). Although the toxicological profiles primarily review the key literature that describes hazardous substance toxicologic properties, other pertinent literature is presented as well, such as information on environmental fate, bioavailability, food chain bioaccumulation, and general information on exposure levels in environmental media.

In its present form, existing plant contaminant data is loosely organized as a series of literature citations and abstracts which are not conducive to quick and easy review. For the phytoremediation resources and other pertinent information to be most useful to Tribes who are concerned about contaminants in plant species, an on-line (World Wide Web) searchable database of plant species and the contaminants they are capable of uptaking could be established. Tribes could then query the database using the plant species or plant families that are the most important resources utilized by their Tribe.

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Queries could be further refined by specifying a particular contaminant(s) of concern that is known or suspected to be present on or near Tribal lands.

When combined with a general knowledge of the local sources of contaminants (i.e. discharges to water from industrial facilities, air emissions, contaminants known to be present from long-range air deposition, or spills or releases at industrial facilities), and general fate and transport mechanisms for each contaminant, it would be relatively easy for Tribes to quickly determine which plant species that they use are susceptible to contaminant accumulation, or those plant species for which no contaminant uptake information exists. This would then enable Tribes to focus plant sampling and chemical analysis on those plants that are likely to uptake contaminants or those for which no uptake information exists but are located in geographic areas with elevated contaminant concentrations.

A general example of how such an on-line searchable database might be structured can be found at: <http://www.epa.gov/ecotox/>. Although this particular database has been developed to provide a searchable source of information regarding chemicals and ecological risk, the format of the database demonstrates an example of how a searchable database of plant contaminant data could be constructed.

Developing such a database for use by Tribes would provide a valuable tool for Tribal environmental programs to begin to assess contaminant levels in culturally important natural resources and would not compromise Tribal confidentiality concerns because each Tribe would be able to query the database using Tribal specific lists of plants utilized by their particular Tribe.

Eventually, such a database could be modified to incorporate animal species and other plant species as additional research data becomes available. In addition, factors which are determinant of contaminant bioavailability such as pH, soil organic matter content, oxidation state, etc., and plant and animal uptake ratios observed under various environmental conditions could be added to the database to further enable Tribal scientists to identify species and contaminants occurring on their reservations that constitute the greatest concern.

If it appears that there is general support by Tribes for development of a national Tribal natural resource contaminant database, the Tribal-EPA Subsistence Technical Workgroup could recommend that EPA explore development of such a database. Please direct questions, comments, or suggestions concerning potential development of a Tribal natural resources contaminant database to:

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