EPA's National Fish Tissue Study: A Unique Partnership

2004 National Forum on Contaminants in Fish

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Presentation Overview

- Background
- Study Design
- Accomplishments
- Preliminary Results
- Final Data Analysis
- Future Milestones

A Unique Study

- First national study of contaminant levels in freshwater fish based on a statistical design
- Largest set of chemicals ever studied in fish
- Largest project being conducted under EPA's Persistent, Bioaccumulative, and Toxic (PBT) Pollutants Program

Objective

- *The objective of the National Fish Tissue Study is to estimate the national distribution of the mean levels of selected persistent, bioaccumulative, and toxic chemical residues in fish tissue from lakes and reservoirs in the contiguous United States.*
- Study results will
  - Provide a national baseline for assessing progress of pollution control activities
  - Identify areas that require further investigation

EPA Fish Study Team

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Regional Coordinators

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Phil Crocker, Region 6
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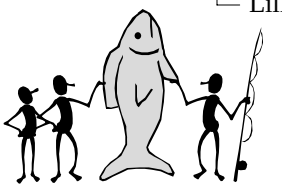


Study Partners

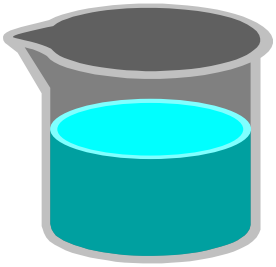
- Extensive national network of partners supporting the National Fish Tissue Study, including:
  - 47 States
  - 3 Tribes
  - 2 Other Federal Agencies
    - National Park Service
    - Tennessee Valley Authority
- Partners participate in the following activities:
  - Lake reconnaissance
  - Fish collection
  - Annual data review

Sampling Design

- Sample 500 lakes and reservoirs in the lower 48 states that were selected according to a statistical sampling design
- Categorize lakes and reservoirs into 6 size ranges
- Collect two 5-fish composites (predator and bottom dweller) from each site
- Apply consistent methods nationwide for sample collection and analysis
- Re-sample 10% of the lakes to evaluate sampling variability

Target Chemicals

- EPA is analyzing the fish tissue for 268 chemicals, including PCB congeners and breakdown products
  - 2 metals (Hg and As [5 forms])
  - 17 dioxins/furans
  - 159 PCB congener measurements
  - 46 pesticides
  - 40 semi-volatile organics (e.g., PAHs)
- EPA recently added analysis of PBDEs for Year 4 samples only

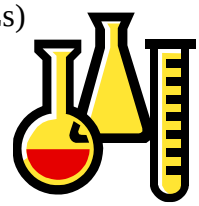


Fish Sampling QA/QC

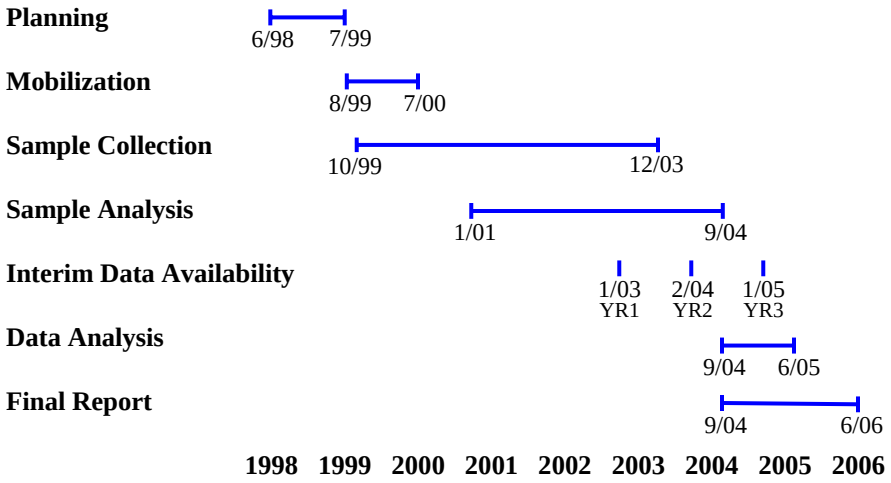
- Consistency in fish collection, handling, and shipping through:
  - Orientation/training of study participants
  - Implementation of detailed SOPs
  - Distribution of identical field sampling materials to all sampling teams
  - Preparation of fish samples in a controlled laboratory environment

Tissue Analysis QA/QC

- Consistency and comparability of fish tissue analysis maintained throughout the study by using:
  - Same standard analytical method for each chemical
  - Same laboratory for each type of analysis
  - Consistent method detection limits (MDLs) and QC acceptance criteria standards
  - Standard data reporting formats and standard process for data quality assessment



Key Fish Study Activities



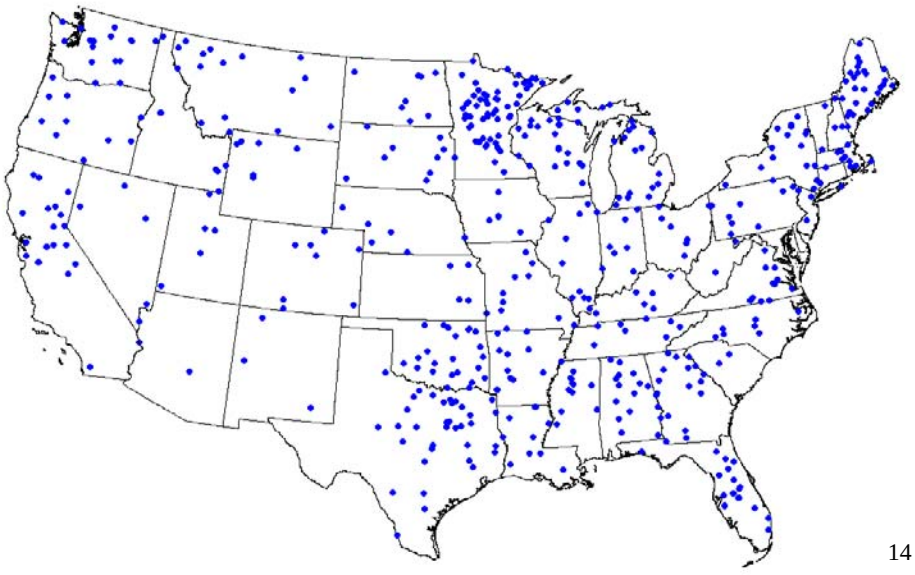
Accomplishments

Planning	•Study design development •Statistical selection of lakes •Target chemical selection
Mobilization	•10 orientation/training workshops •Production of QA Plans and Field Sampling Plan •Mapping and reconnaissance of 900 lakes

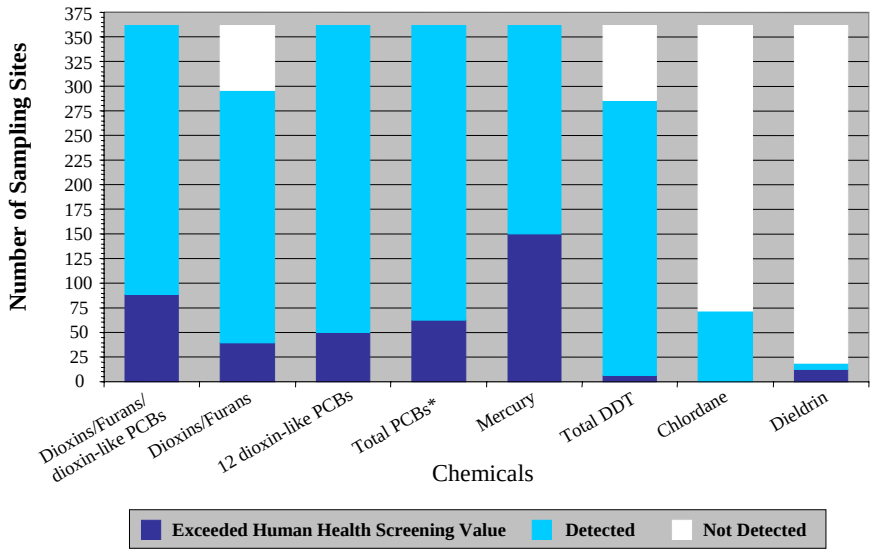
Accomplishments

Fish Sampling & Analysis	•Fish collection at 500 lakes •Chemical analysis of 749 fish samples •Development of annual analytical QA report
Public Outreach	•Development of fish study website (www.epa.gov/waterscience/fishstudy) •Production of data CDs for public release

500 Sampling Locations



Preliminary Data Summary for Predators (Fillet Analysis: Years 1-3)



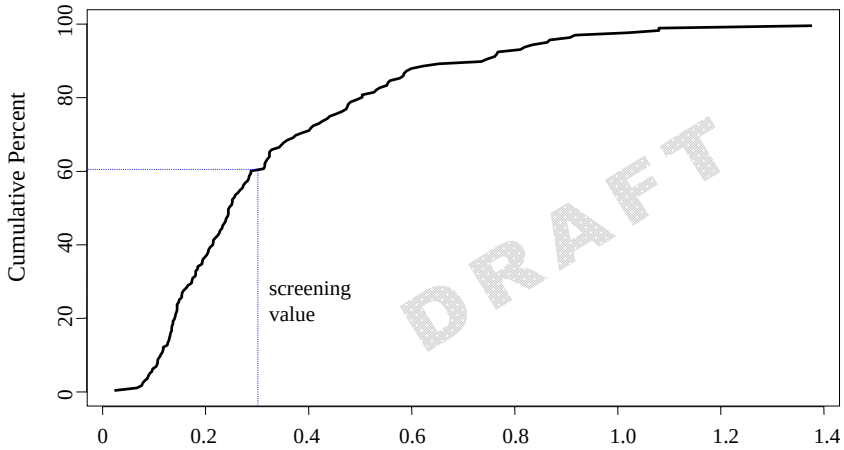
*Zero for non-detected analytes; sum of congeners for PCBs

Data Analysis

- EPA will begin analyzing fish study data once the full 4-year analytical data set is available.
- Data analysis will consist of the following core components:
  - Estimates of national means and percentiles
  - Cumulative frequency distribution plots for chemicals and composite types with sufficient data

Preliminary National Distribution

Example of Cumulative Frequency Distribution of Mercury in 137 Predator Composites (Preliminary, Unweighted Data)



Data Analysis (cont.)

- National maps of chemicals by composite type for mercury, PCBs, and dioxins/furans
- Estimate of sampling variability based on replicate sample data
- Analysis of various sample factors, including:
  - Number of fish in the composite
  - Size effects
  - Species effects

Future Milestones

Short-term (2004)

- Prepare Year 2 data CD for public release
- Analyze Year 4 (2003) fish samples (~200 composites)
- Produce Year 4 Analytical Data QA Report
- Distribute Year 4 data to states/other partners
- Update fish study website

Long-term (2005-2006)

- Prepare Year 3 data CD for public release (2005)
- Complete statistical analysis of 4-year fish tissue data set (2005)
- Submit draft final report for peer review (2005)
- Produce final fish study report (2006)
- Upload data into EPA's STORET (2006)