

# Housatonic River Human Health Risk Assessment

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Housatonic River Initiative  
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Concepts  
Richmond VA Nov 18, 2003

# Issues raised

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- General Comments
- Specific topics:
  - exposure
  - toxicity
  - risk estimates
- Uncertainties, omissions, limitations
- Conclusions

# General Comments

- Relies on a wealth of previous information to estimate health risks
- Well written, easy to understand and follow.
- Uses standard EPA practices and guidelines
- Uses more recent techniques for quantitatively evaluating risks
- The HHRA concludes the contaminants in the Housatonic River pose an unacceptable risk to human health
- Schaghticoke Tribe not addressed in the RA

# Exposure issues

- Sediment levels in CT are not evaluated sufficiently
- CT floodplain is discounted
- Sediment volume and depth is not considered in CT
- Fetal and young children exposures
- Body burdens are higher in the Housatonic region and need to be included in the dose estimates
- Inhalation exposure is largely discounted

# Fish consumption: Subsistence Fishing

- Estimates of consumption, types of food consumed, cooking methods, persons affected, and justice issues.
- No estimates examine the consumption of plants
- No data on other terrestrial animals living in the watershed:
  - Squirrels, raccoon, pheasant, bear, etc.
- Estimates do not include:
  - Catfish, carp, eel, turtles, only minor consideration for amphibians (frogs) consumption

# Phase II fish/waterfowl

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- Higher fish consumption rates need to be included to reflect future uses
- Subsistence fishers and hunters use the river and also collect plants
- Tribal consumption is not included at all
- Limited data on waterfowl and other non-fish wildlife consumption
- Carp are not addressed

# CT Sediments

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- The sediment sampling effort was focused on MA; little sampling in CT.
- The majority of the data (from sediment samples) are from historical samples, obtained by GE, not an independent contractor, and not by EPA or EPA contractor.

# Housatonic River

## Watershed – MA and CT

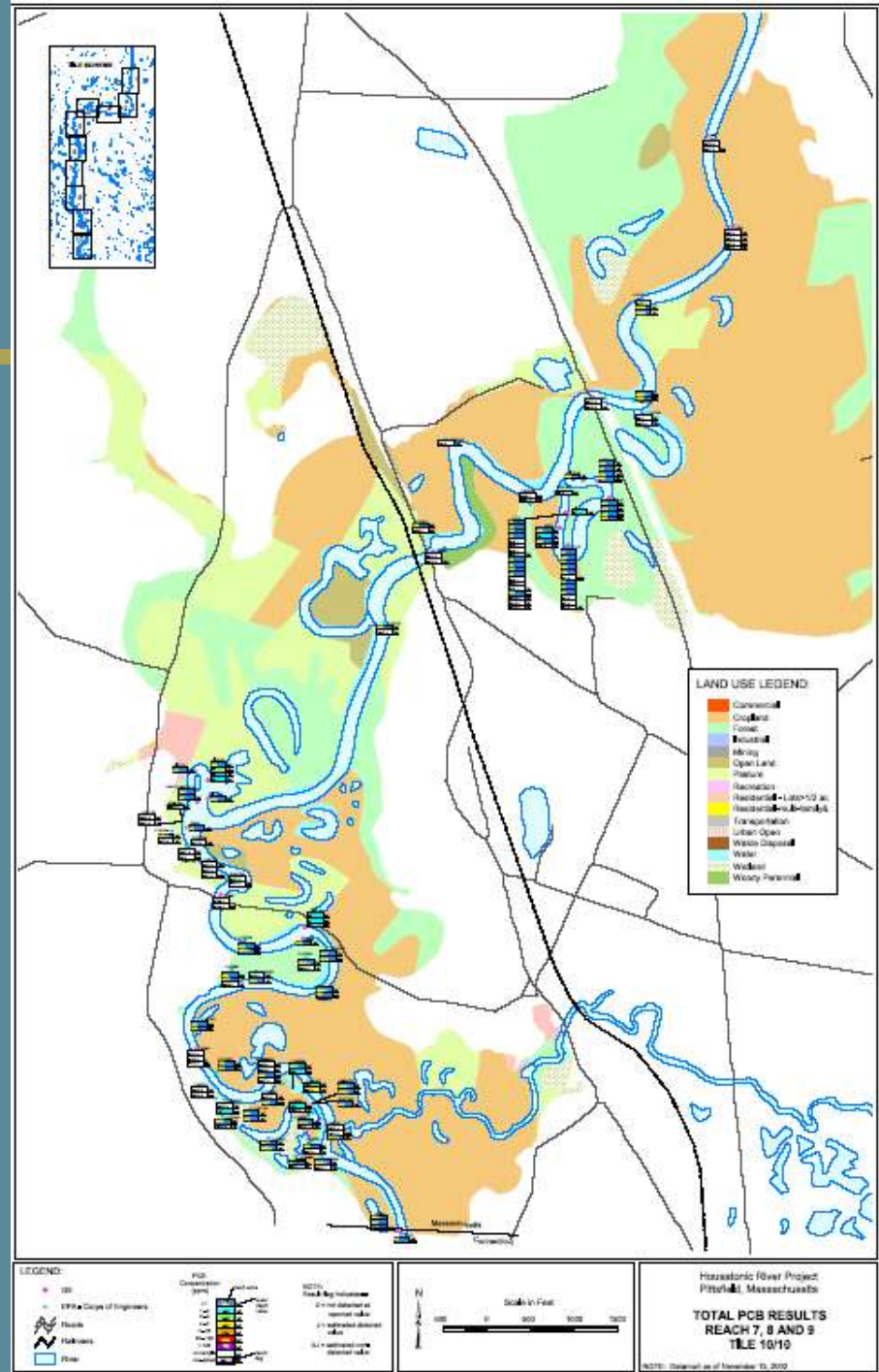
Most of the length of the  
river and the watershed  
lie within Connecticut



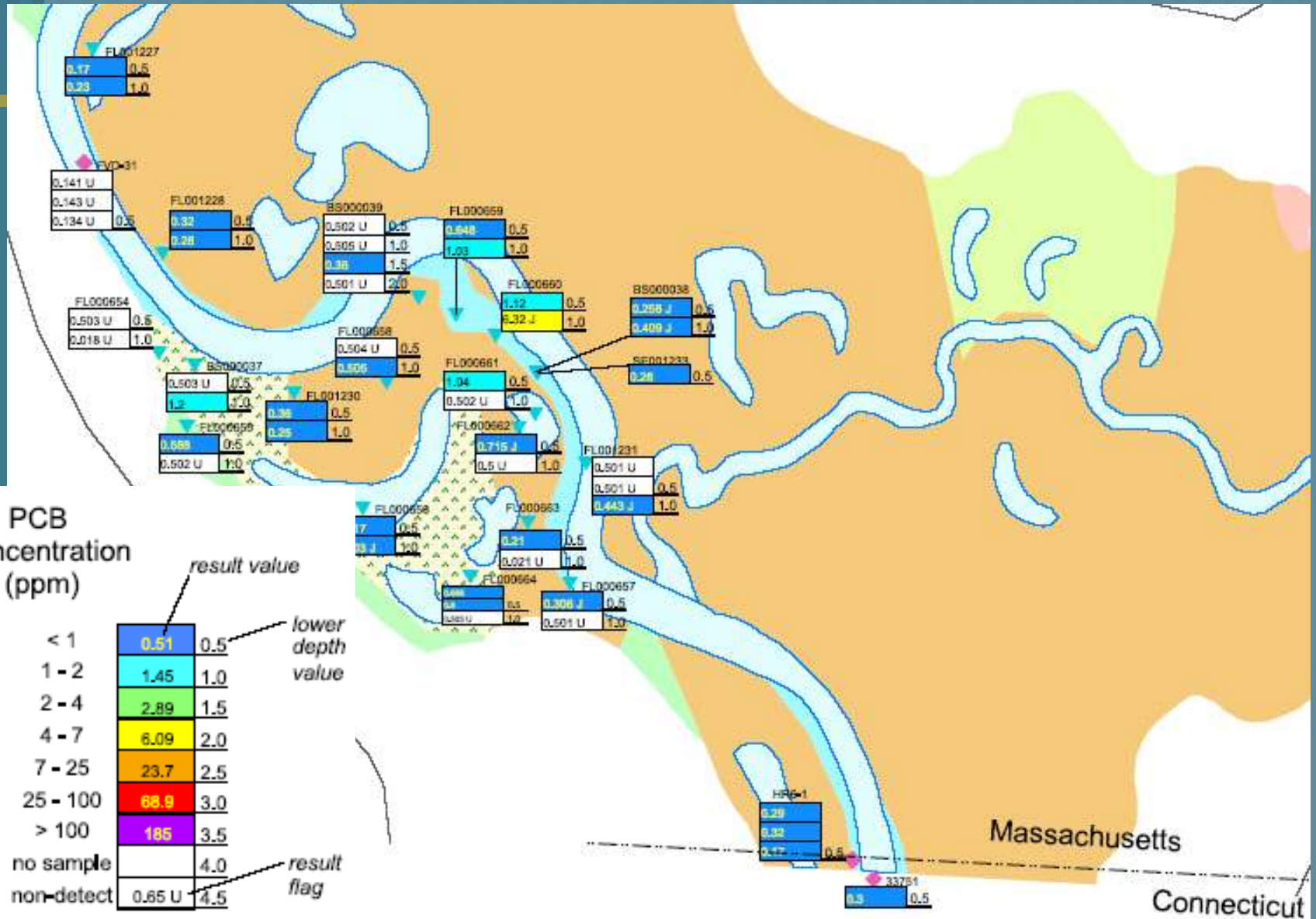


# Lowest Reach of the Housatonic R in MA

showing sediment  
samples and land use  
types – taken from  
the risk assessment



# Selected sediment sample results reach 9 rest of river

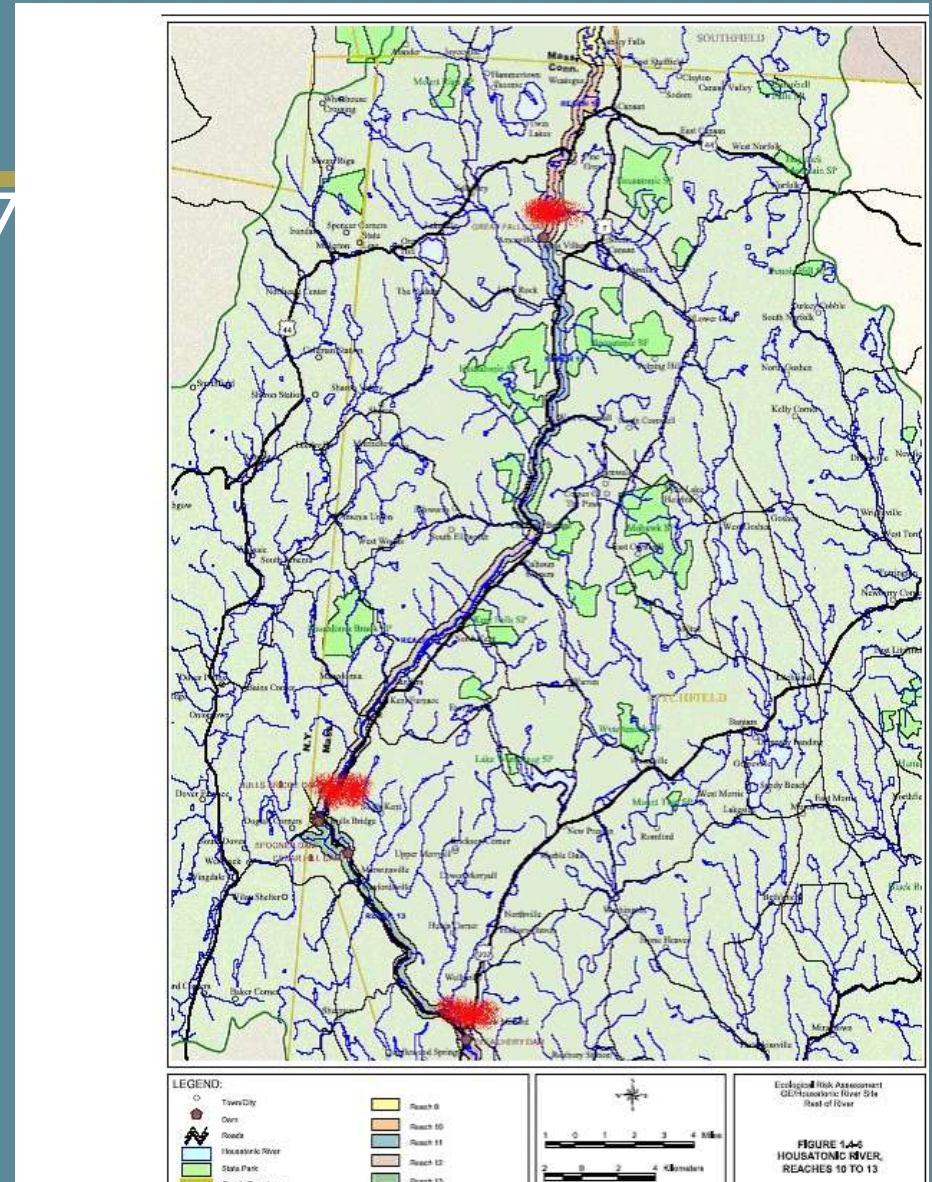


# Upper Housatonic River in CT, showing 3 dams sampled

Great Falls Dam – mile 77

Bulls Bridge Dam – mile 49

Blackberry Dam – mile 39



# Sediment Samples in Connecticut- all years

Year	Number of Samples
1972	2
1973	3
1974	3
1975	3
1976	3
1977	2
1979	1
1980	146
1986	100
1992	147
1998	78
1999	20
2001	44
Total	552

Data obtained from Weston and submitted in comments

# Sediment samples by reach in CT- all years

Reach	Number of Samples
10	80
11	16
12	78
13	41
14	172
15	148
16	17
Total	552

Data obtained from Weston and submitted in comments

## Most recent samples – 2001- by depth

Depth	2001 sampling
feet	No. samples per depth
0-.5	23
0-.25	3
0-.45	1
.5-.75	4
.5-1	6
0-.417	1
0-.834	1
2.5-3	1
2-2.5	1
1-1.5	3
Total	44

2 sediment samples taken behind each of the following 3 dams:

Bull's Bridge

Great Falls

Blackberry

Data obtained from Weston and submitted in comments

Conneticut Floodplain Data		
Location	Year	Comments
Hartford & Oxford	1993	Flooding (flood gates opened wider at Shepaug Dam and the Stevenson Dam) at least 6 inches over flood stage.
Milford & Harford	1996	Flooding (close Route 7 in Milford)
North Canaan, Ledyard, Westbrook, Middlefield, Norwich	1996	Flooding (rain and icemelting) (flooded basements of homes)
Litchfield County	2000	Flood warnings
Stratford	02/2001	Flooding (businesses flooded)
Bulls Bridge to Derby	03/2003	Flood warnings
Falls Village	03/2003	Minor Flooding (1.1 feet above flood stage)
Gaylordsville	03/2003	Flooding (1.3 feet above flood stage)
Stevenson Dam	03/2003	Flooding (1.5 feet above flood stage)
Ashley Falls, Mass to Cornwall Bridge, Ct.	04/2003	Flood warnings
Gaylordsville	04/2003	7-8.7 feet above flood stage

# Toxicity issues

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- Non-cancer effects of dioxin-like compounds, as TEQ are not assessed
- Children and fetal effects are likely greater
- Children more susceptible – EPA new guidelines for cancer risk – reviewed by SAB recommend additional safety
- Current health status of general population and specific groups



# TEQ's

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- Fails to use or estimate cancer risks from TEQ's using the latest information on cancer potency as described in the latest version of the Dioxin Reassessment
- No evaluation of the non-cancer health effects of dioxin-like compounds, expressed as TEQ's.
- Claims that there is no reference dose (RfD) for dioxin

# EPA Draft Dioxin Reassessment

Summarizes the effects of dioxin and related compounds on humans and other animals (X=effect occurs)

<b>Effect/Outcome</b>	<b>humans</b>	<b>other animals</b>
Ah receptor binding	X	X
Enzyme induction	X	X
Acute lethality	no	X
Wasting syndrome	no data	X
Teratogenesis/fetal toxicity, lethality	X	X
Endocrine	X	X
Immunotoxicity	X	X
Carcinogenicity	X	X
Neurotoxicity	X	X
Chloracne	X	X
Porphyria	X	X
Hepatotoxicity	X	X
Edema	no data	X
Testicular atrophy	no data	X
Bone marrow hyperplasia	no data	X

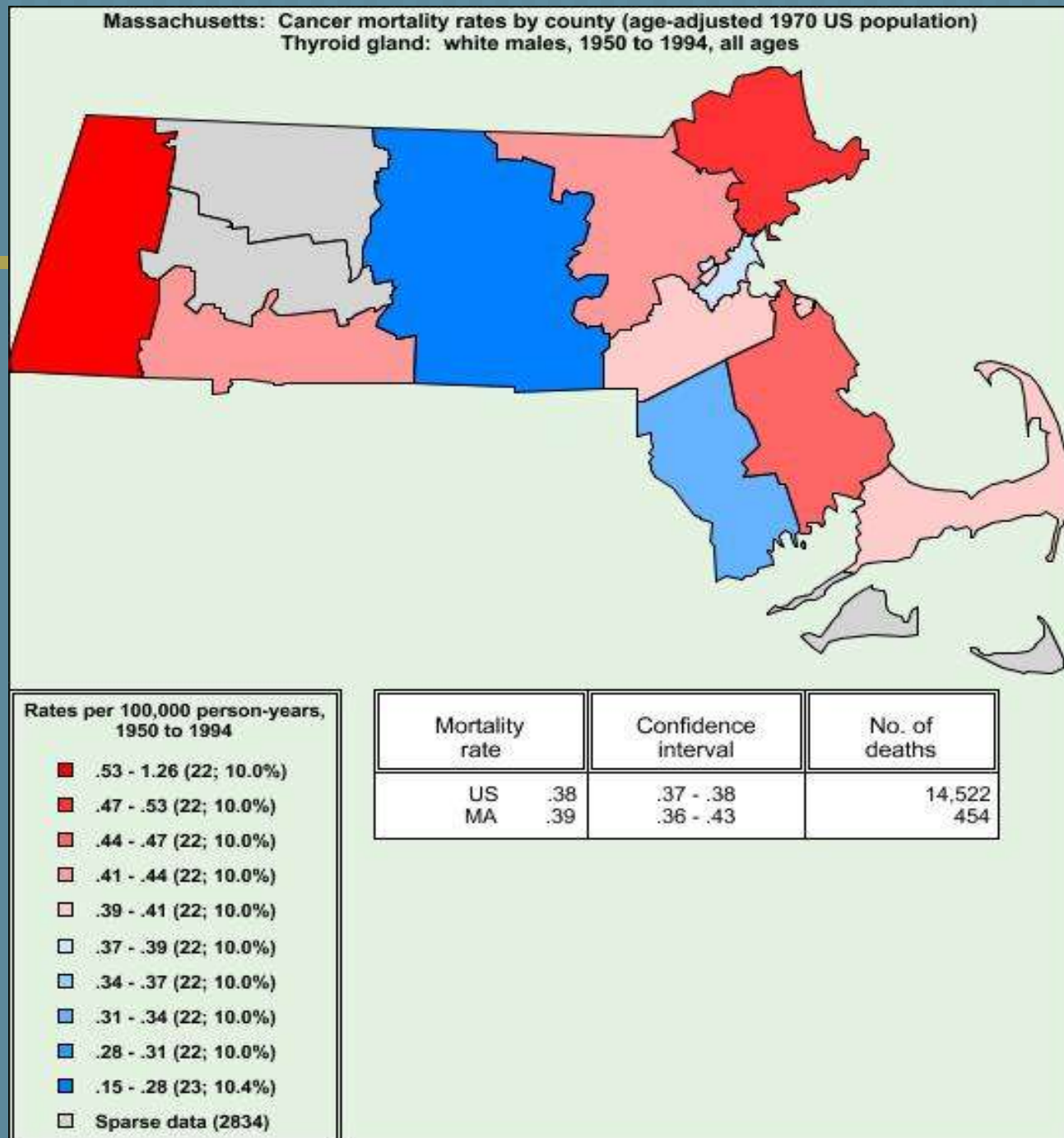
# Risk Estimate Issues

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- Older CSF for dioxin is used – about 10x greater risk for TCDD-like compounds
- Body burdens are higher in the Housatonic region
- EPA needs to compare fish PCB tissue levels from well studied cases
- Does not specifically address the problem with mixtures
- Did not use a formal weight of evidence (WOE) approach

# Cancer mortality

for thyroid gland in MA,  
by County,  
1950-1994, for  
white males



# Tribal Issues

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- EPA ignored the tribal issues in final RA
- Schaghticoke tribe is present as CT recognized tribe
- The RA, work plans call for assessing tribal issues
- There are no results on the tribal exposures, effects, risks or other matters
- Personal communication with the tribe indicates much exposure is omitted

# Specific tribal issues

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- Foods include:
  - Catfish
  - Squirrel
- Cooking methods– baking catfish in mud from the river
- Use of the river

# Uncertainties

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- Monte Carlo analysis helps
- Much uncertainty is not quantified
- Omissions are not quantifiable and are not estimated
- Underestimate of risks – all of the major uncertainties resolve without adding conservative factors

# Uncertainties- omissions

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- Subsistence fish and waterfowl consumption
- Tribal use of the river, watershed
- No agricultural or domestic animals in either the HH or ecological RA
- Few data on waterfowl and many fish
- TEQ's for non-cancer effects of dioxin-like



# Other information to consider

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- Research on PCB's and children (Schantz,2003; Stewart et al., 2003) not included in the IRIS RfD
- Breast cancer in Fox River area
- Combinations of exposures-synergies
- Must complete assessment for the Schaghticoke Tribe before finalizing

# Conclusions

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- HHRA was standard with some new analytical methods
- The omissions make the results not sufficiently protective
- EPA should assume the risks are even greater
- EPA must correct several omissions or deficiencies, but not delay the cleanup