



# PCBs and Dioxin in the Galveston Bay System

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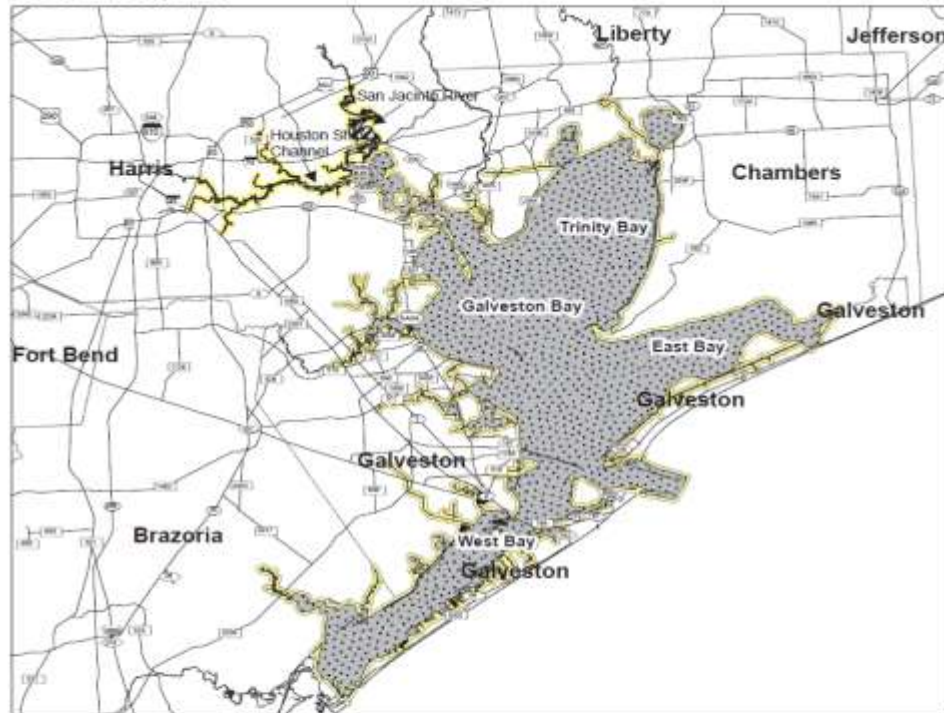
# Advisories in HSC and Galveston Bay

## Houston Ship Channel and Galveston Bay

Brazoria, Chambers, Galveston, and Harris Counties

ADV-20 Issued October 9, 2001

ADV-35 Issued July 8, 2008



### Advisory Areas:

#### Houston Ship Channel

The Houston Ship Channel upstream of the Lynchburg Ferry crossing and all contiguous waters, including the San Jacinto River below the U.S. Highway 90 bridge.

#### Galveston Bay

Galveston Bay including Chocolate Bay, East Bay, Trinity Bay, and West Bay and contiguous waters

### Contaminants of Concern:

Dioxin, organochlorine pesticides, and PCBs

Dioxin and PCBs

### Species Affected:

All species of fish

All catfish species and spotted seatrout

### Consumption Advice:

Persons should limit consumption of all species of fish from this area to no more than one eight-ounce meal per month. Women who are nursing, pregnant, or who may become pregnant and children under 12 should not consume any species of fish from these waters.

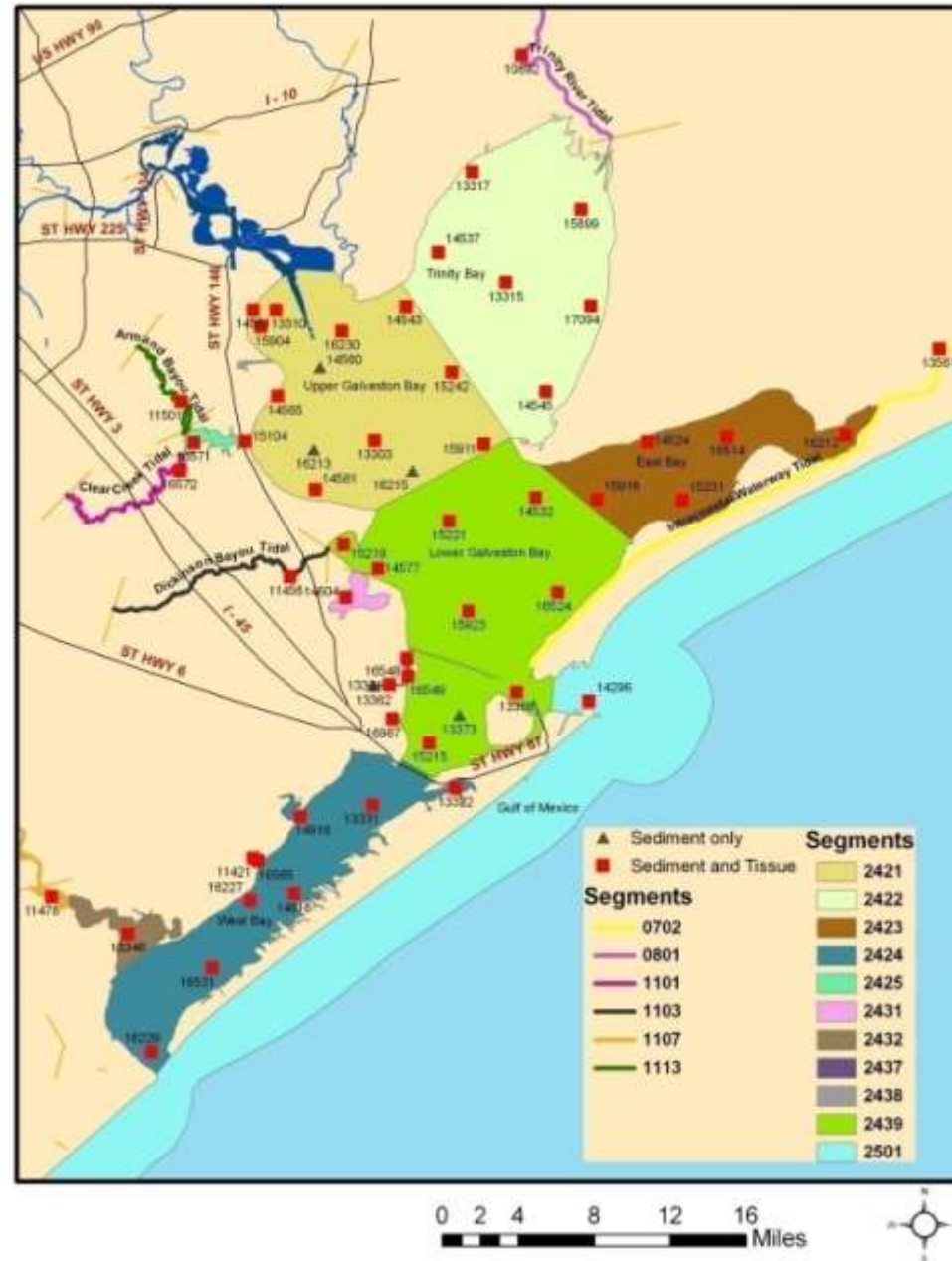
Persons should limit consumption of catfish and spotted seatrout from this area to no more than one eight-ounce meal per month. Women who are nursing, pregnant, or who may become pregnant and children under 12 should not consume catfish or spotted seatrout.



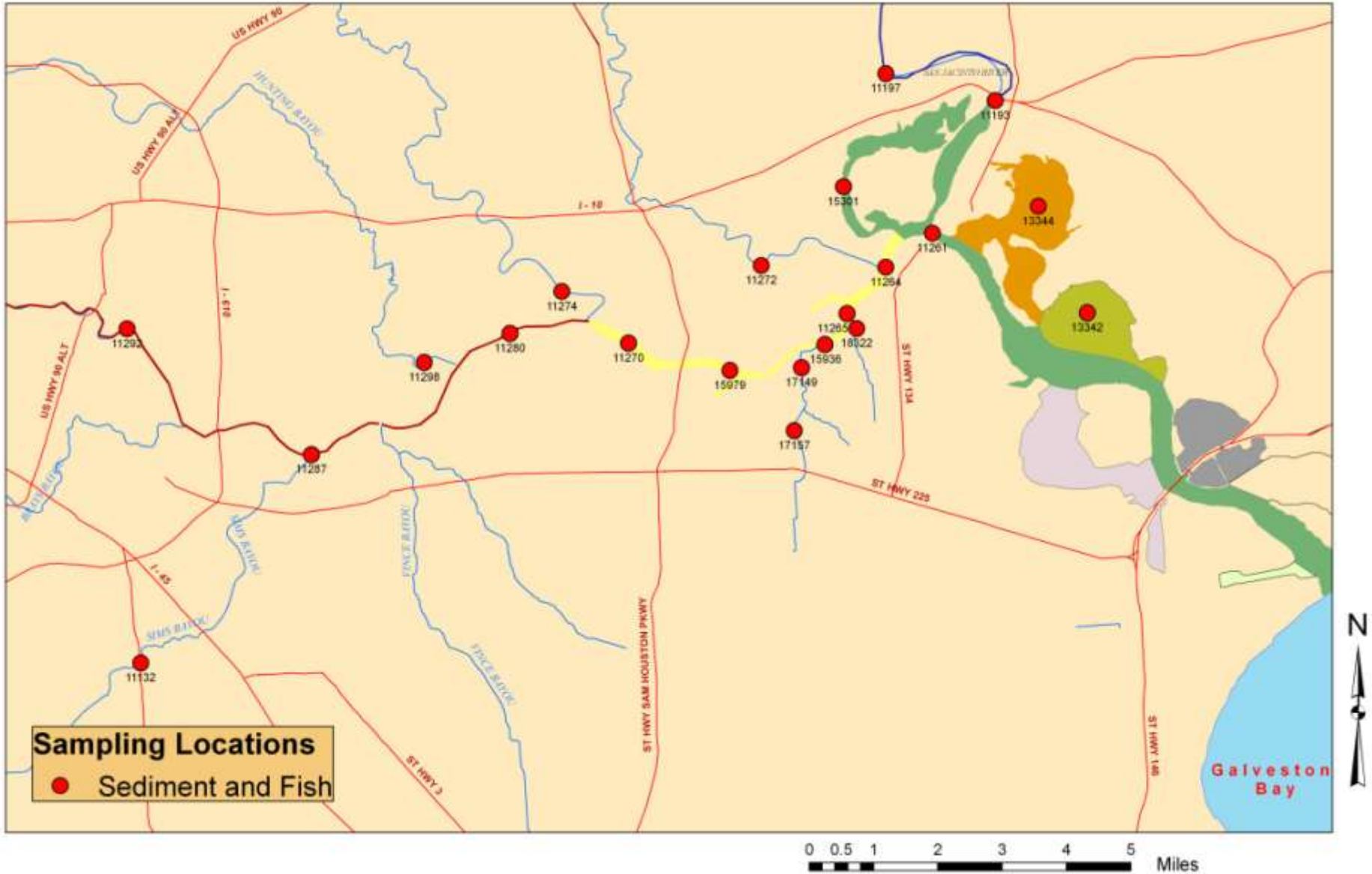
- Consumption limited to 1-8 oz meal per month but none for women who are nursing or pregnant or who plan to be pregnant and children under 12
- All fish species in HSC and catfish/spotted seatrout in the Bay



# Proposed Sediment and Fish Sampling in GBS



# Proposed Sediment and Fish Sampling in HSC





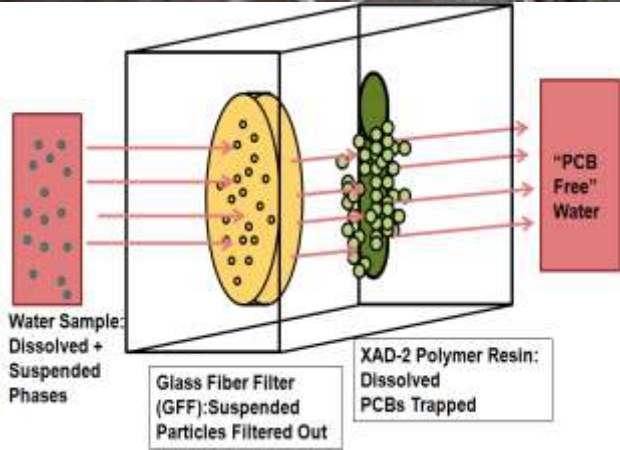


# Media Sampling Methods

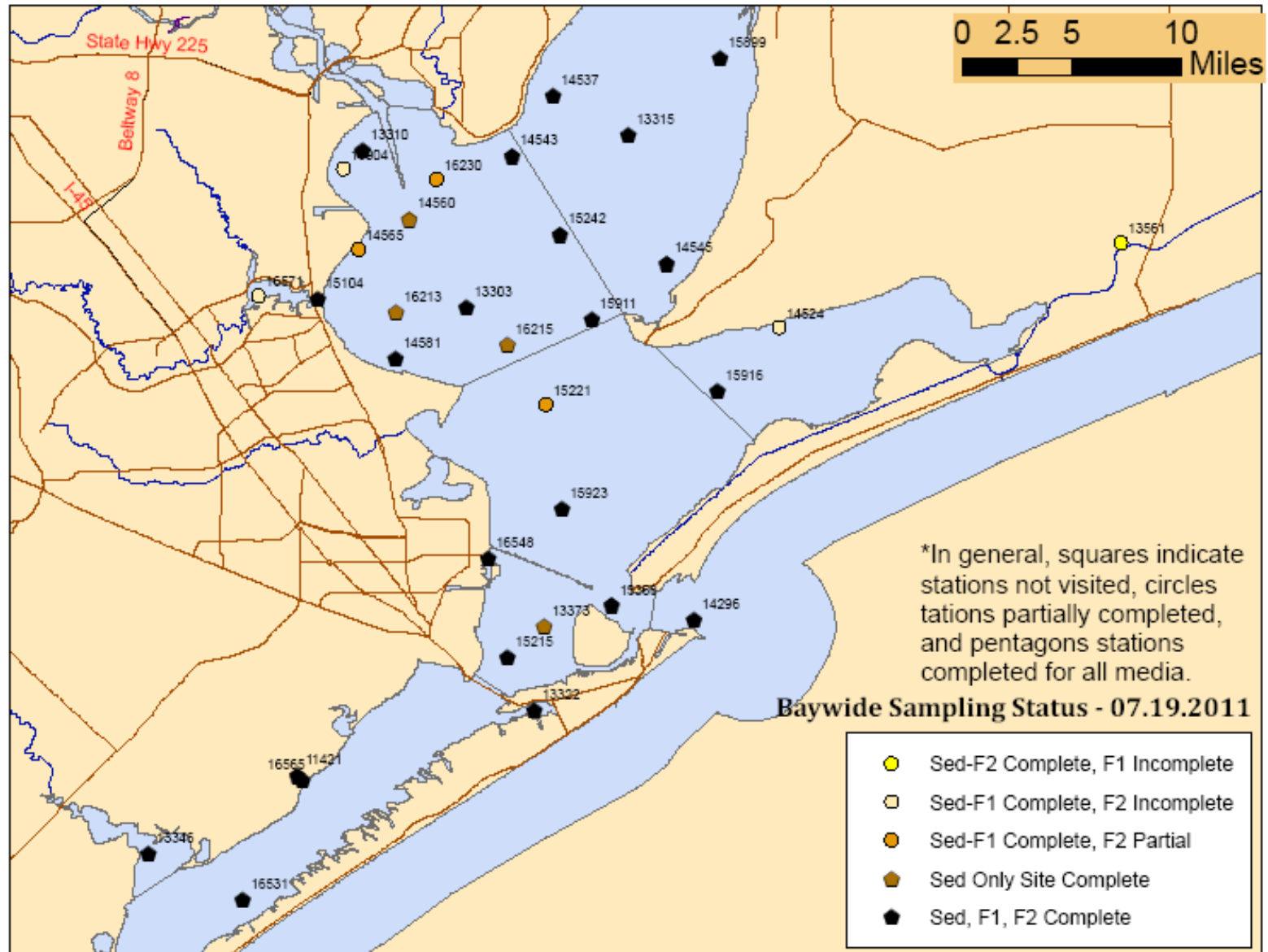
**Water**

**Sediment**

**Tissue**



# Sampling as of July 31, 2011

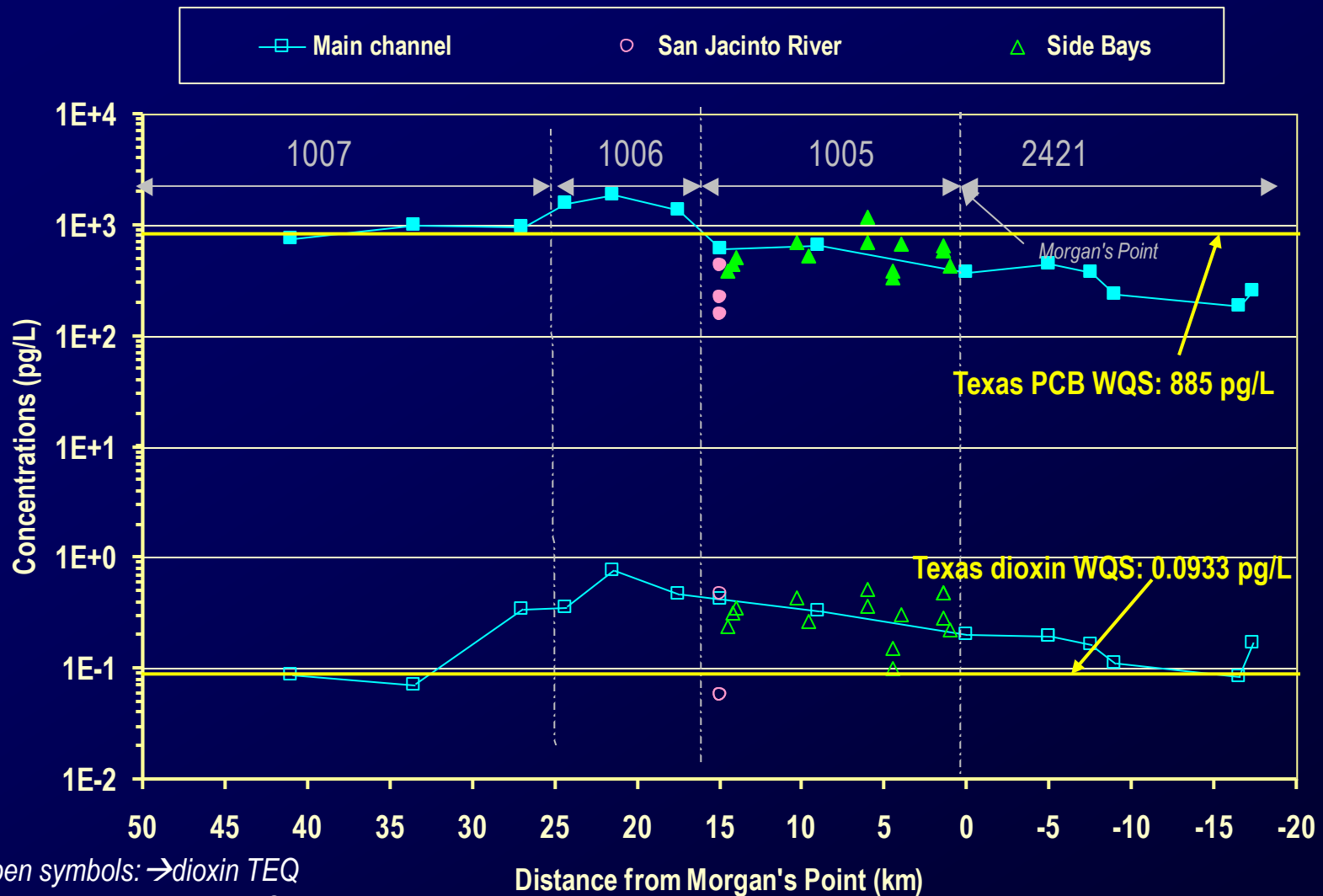




**Dioxin and PCB Data  
2002-2005**



# PCB and dioxin in water profiles

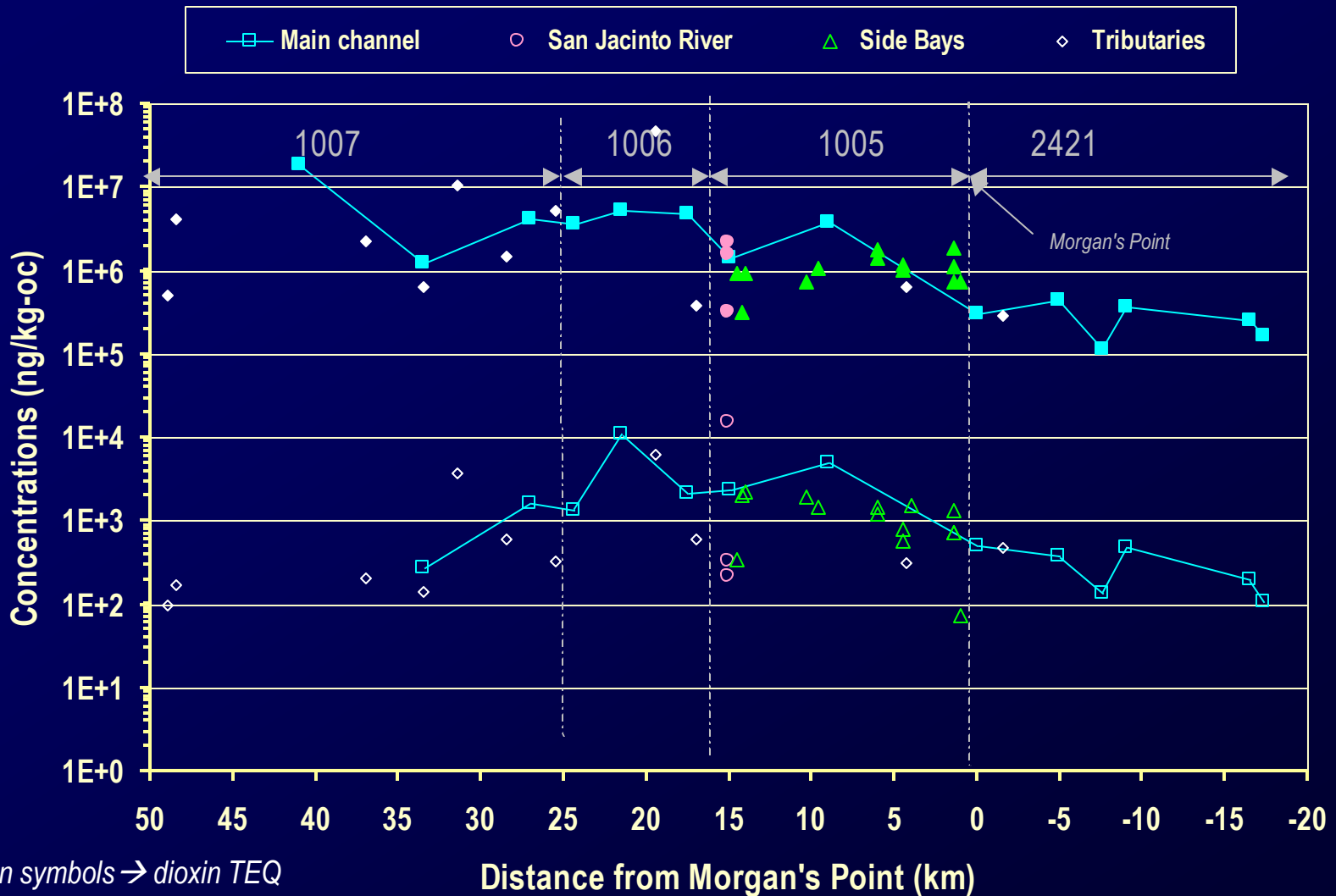


Open symbols: → dioxin TEQ

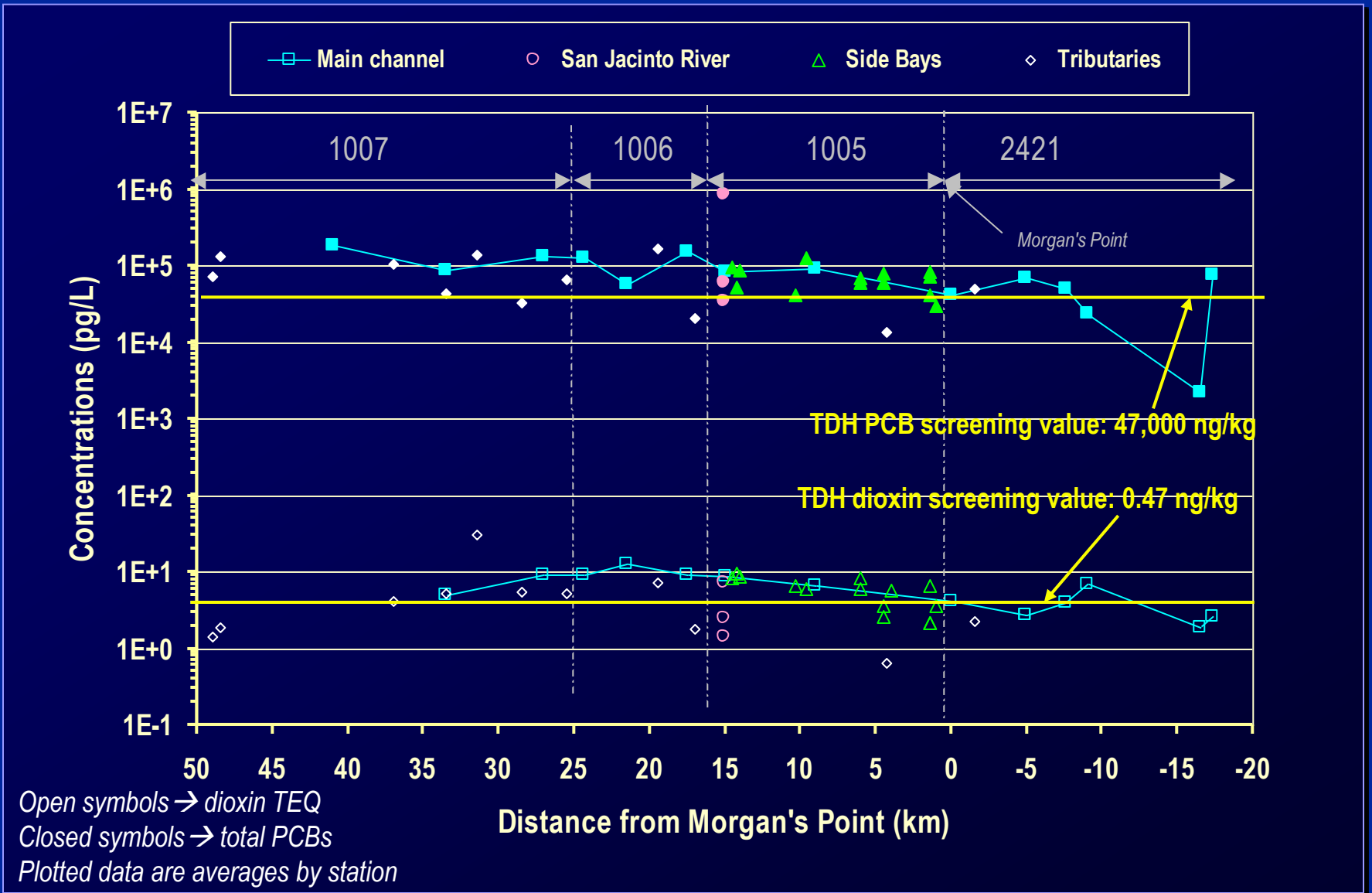
Closed symbols → total PCBs

Plotted data are averages by station

# PCB and dioxin in sediment-oc profiles

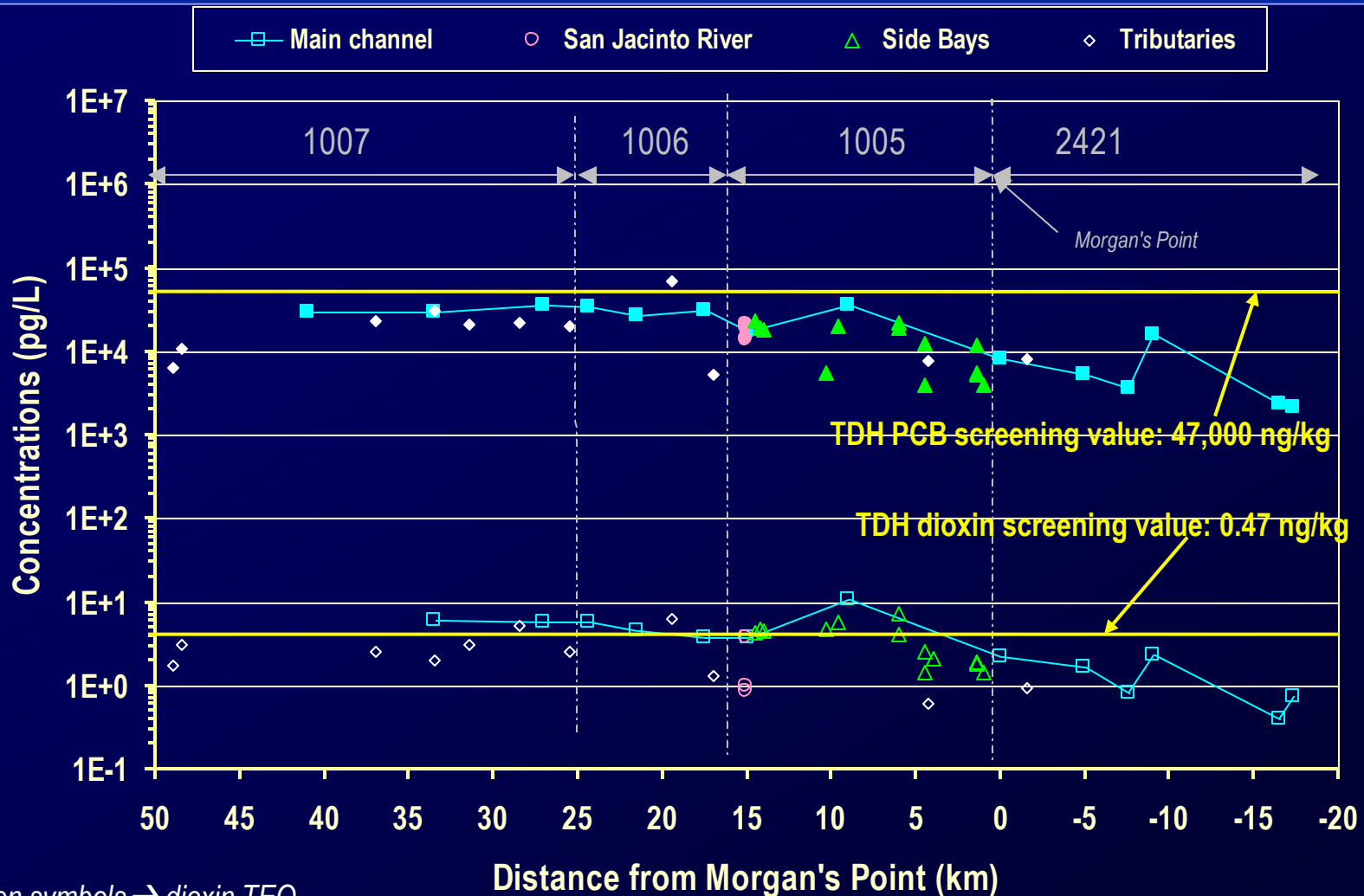


# PCB and dioxin in catfish profiles





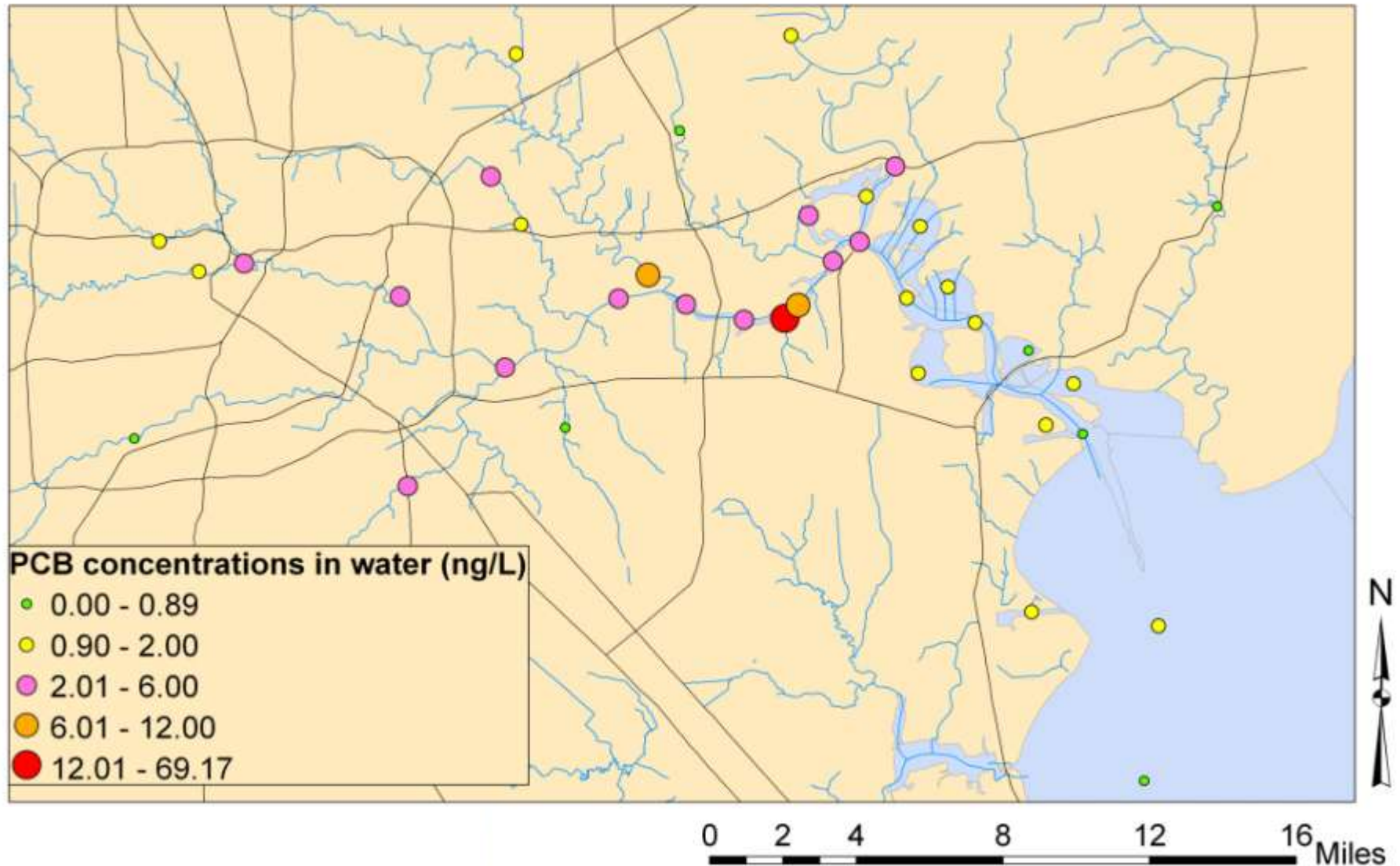
# PCB and dioxin in crab profiles



Open symbols → dioxin TEQ  
 Closed symbols → total PCBs  
 Plotted data are averages by station

# **2008-2009 PCB Data**

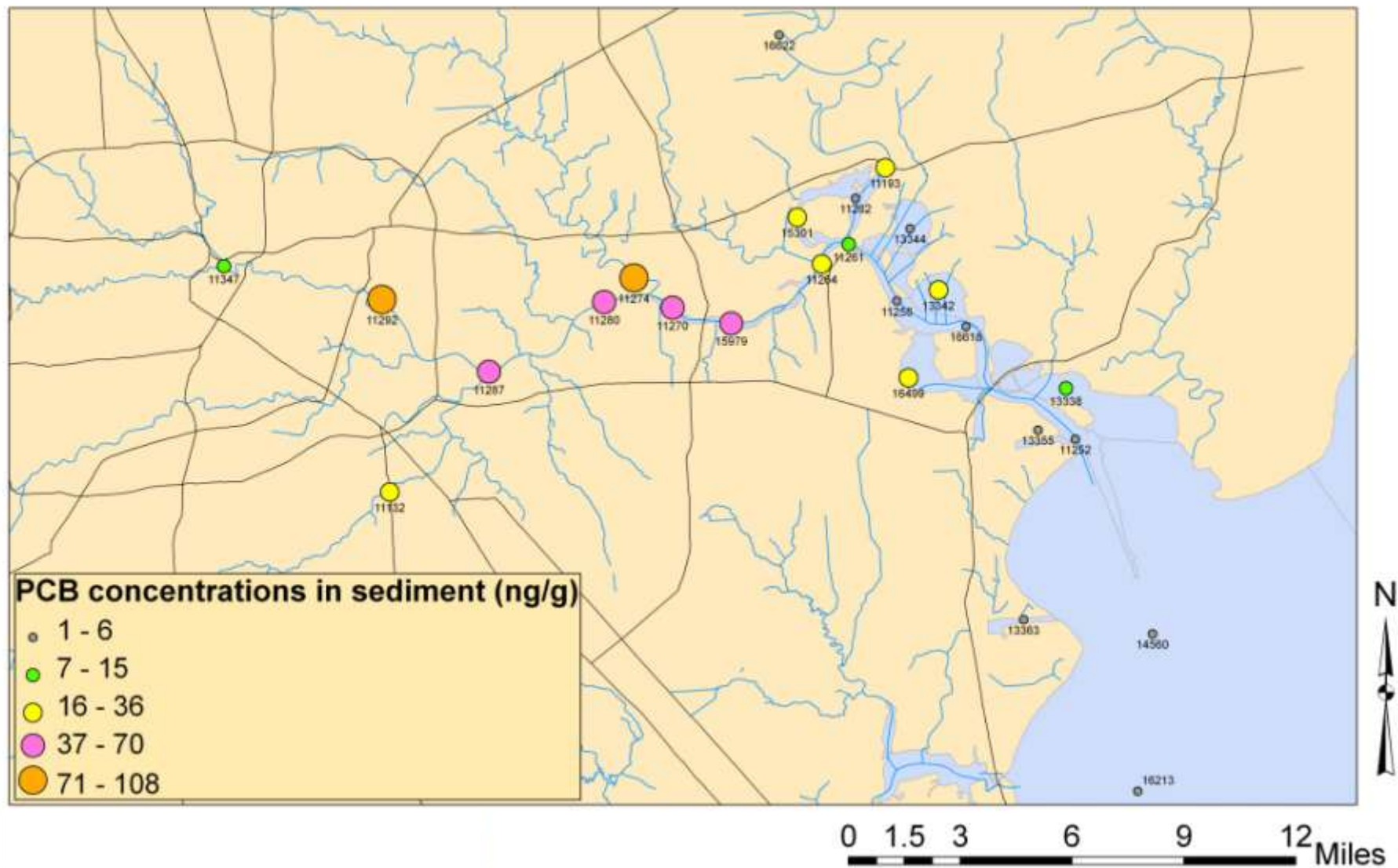
# PCB Concentrations in Water (2008)



\* PCB concentrations calculated as sum of 209 congeners; non-detects assumed as ½ MDL

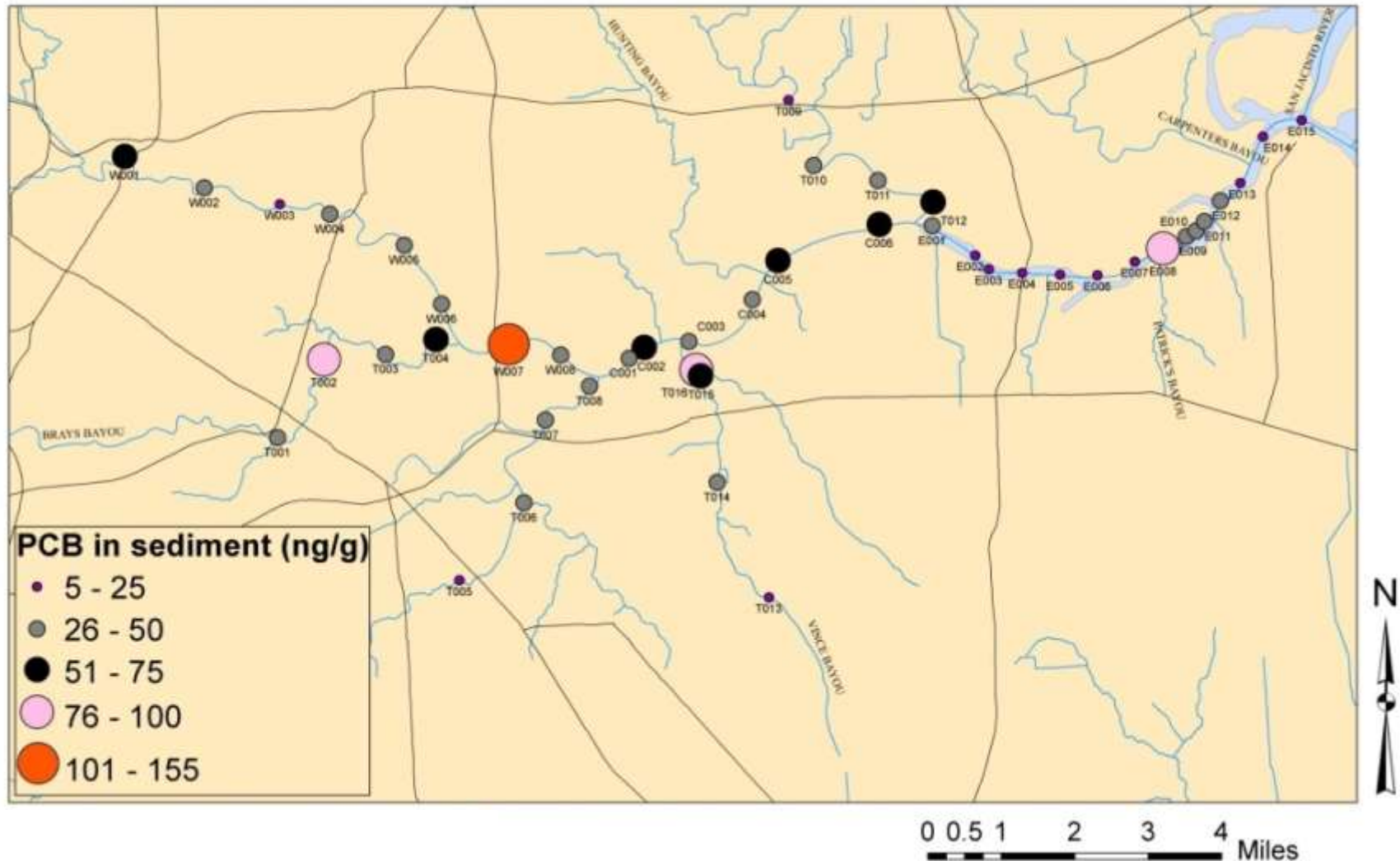


# PCB Concentrations in Sediment (2008)



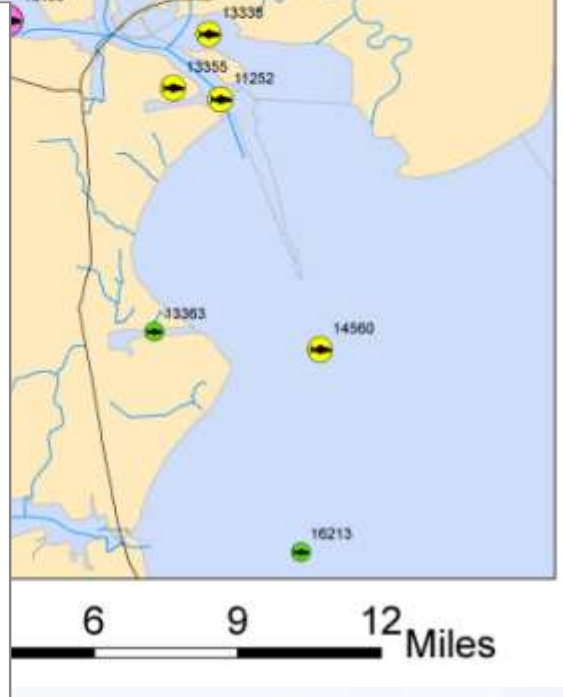
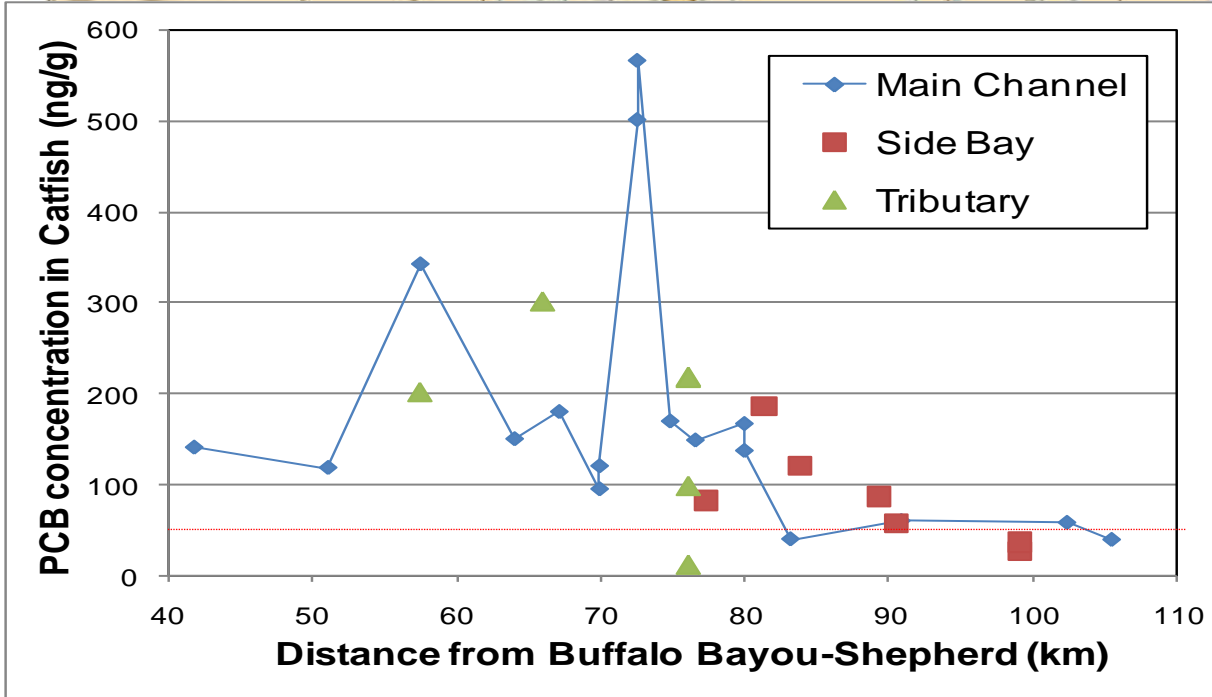
\* PCB concentrations calculated as sum of 209 congeners; non-detects assumed as ½ MDL

# PCB Concentrations in Sediment (Intensive Sediment Sampling 2008)



\* PCB concentrations calculated as sum of 43 congeners (McFarland and Clarke, 1989); non-detects assumed as ½ MDL

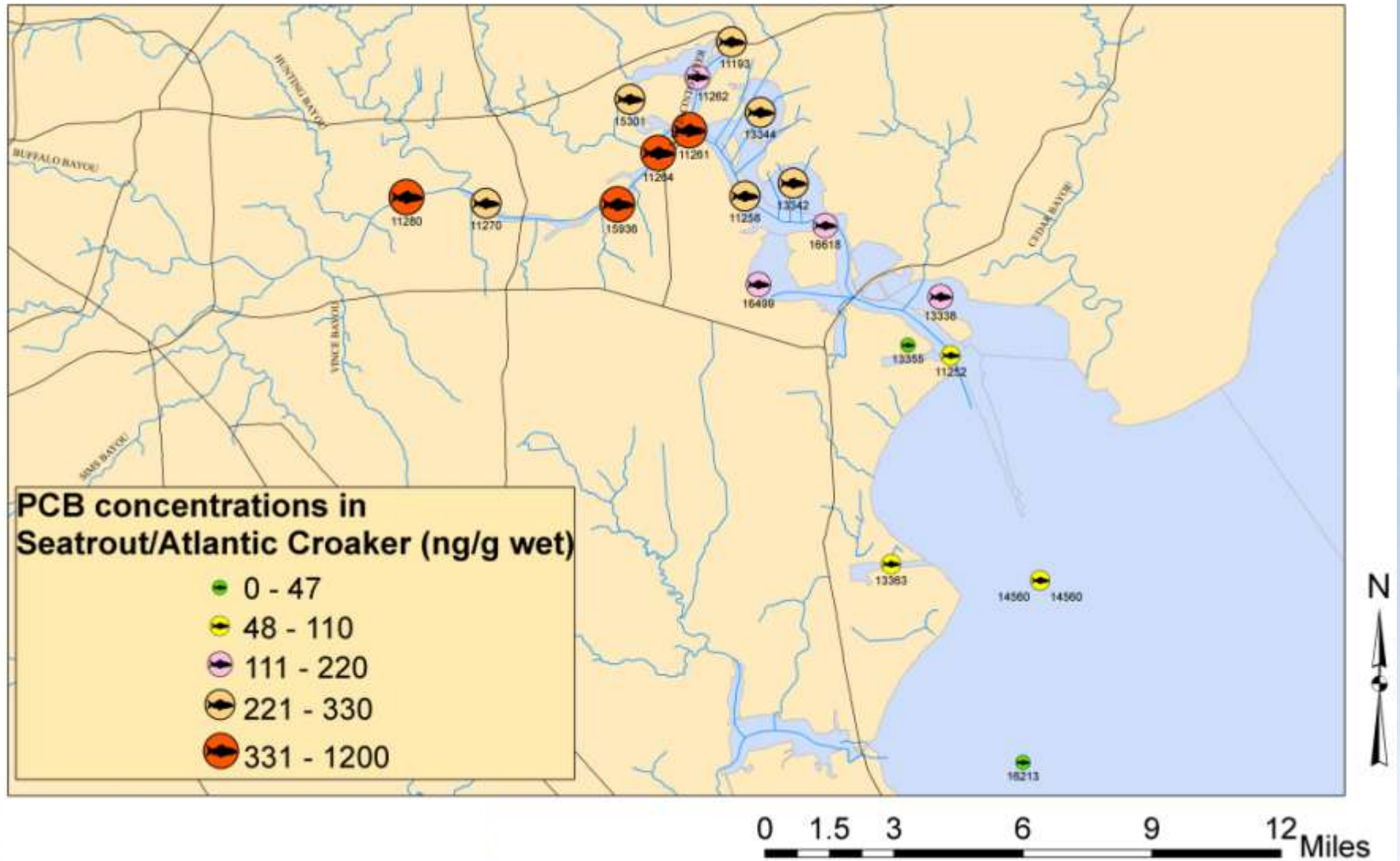
# PCB Concentrations in Catfish (2008)



\* PCB concentrations calculated as sum of 209 congeners; non-detects assumed as 1/2 MDL

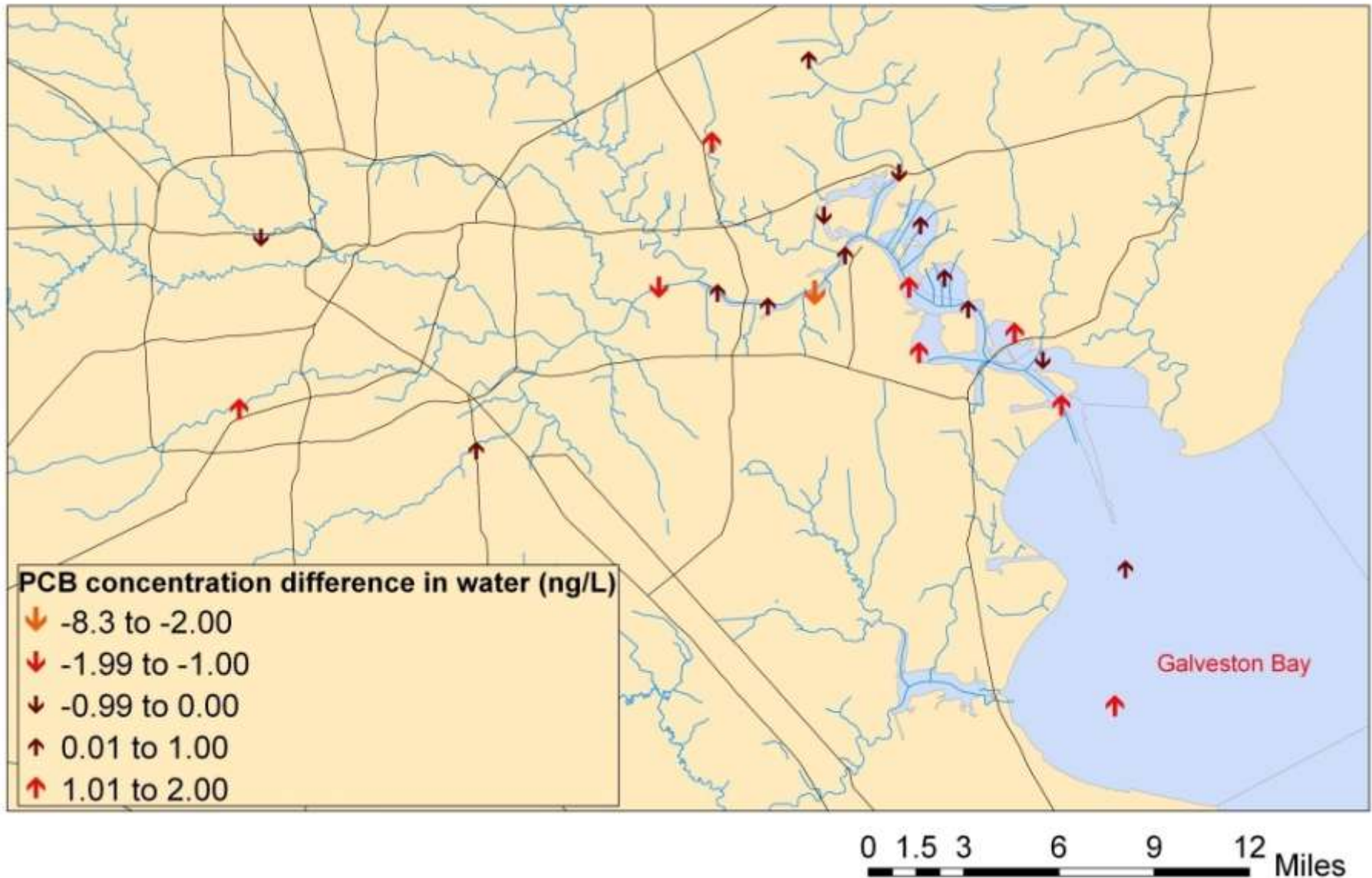


# PCB Concentrations in Seatrout/Atlantic Croaker (2008)



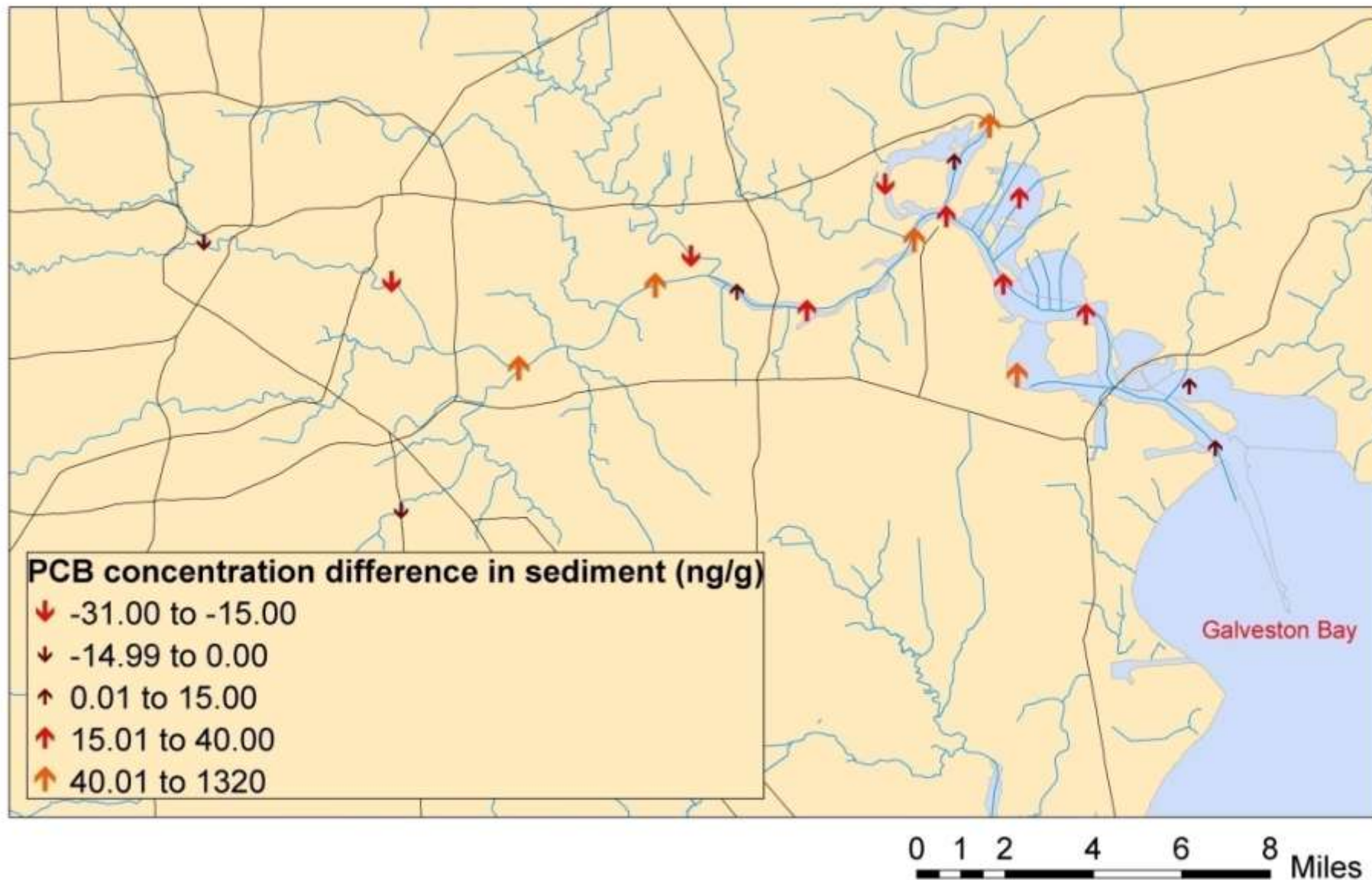
\* PCB concentrations calculated as sum of 209 congeners; non-detects assumed as ½ MDL

# PCB Water Concentration (2008 vs 2009)



\* All concentrations based on 1/2 detection limit for non-detects and  $\Sigma 209$  congeners.

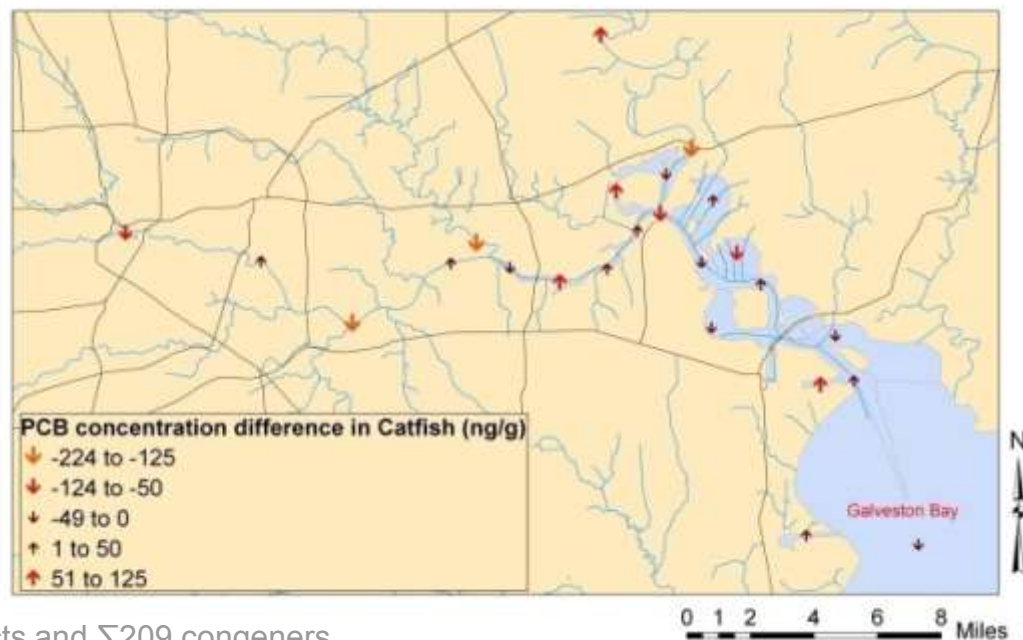
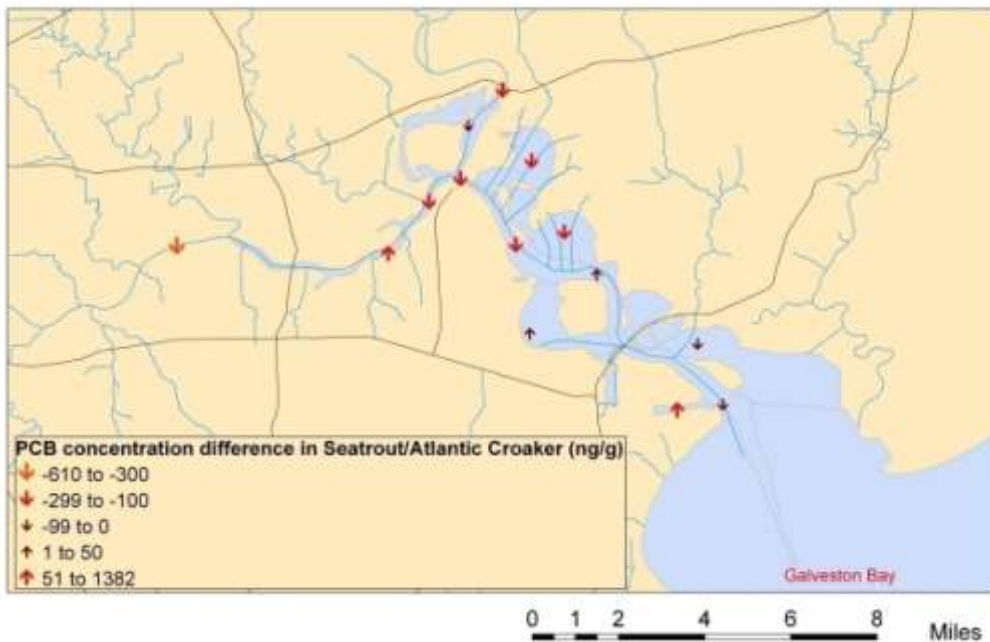
# Sediment PCB Concentration (2008 vs 2009)



\* All concentrations based on 1/2 detection limit for non-detects and  $\Sigma 209$  congeners.



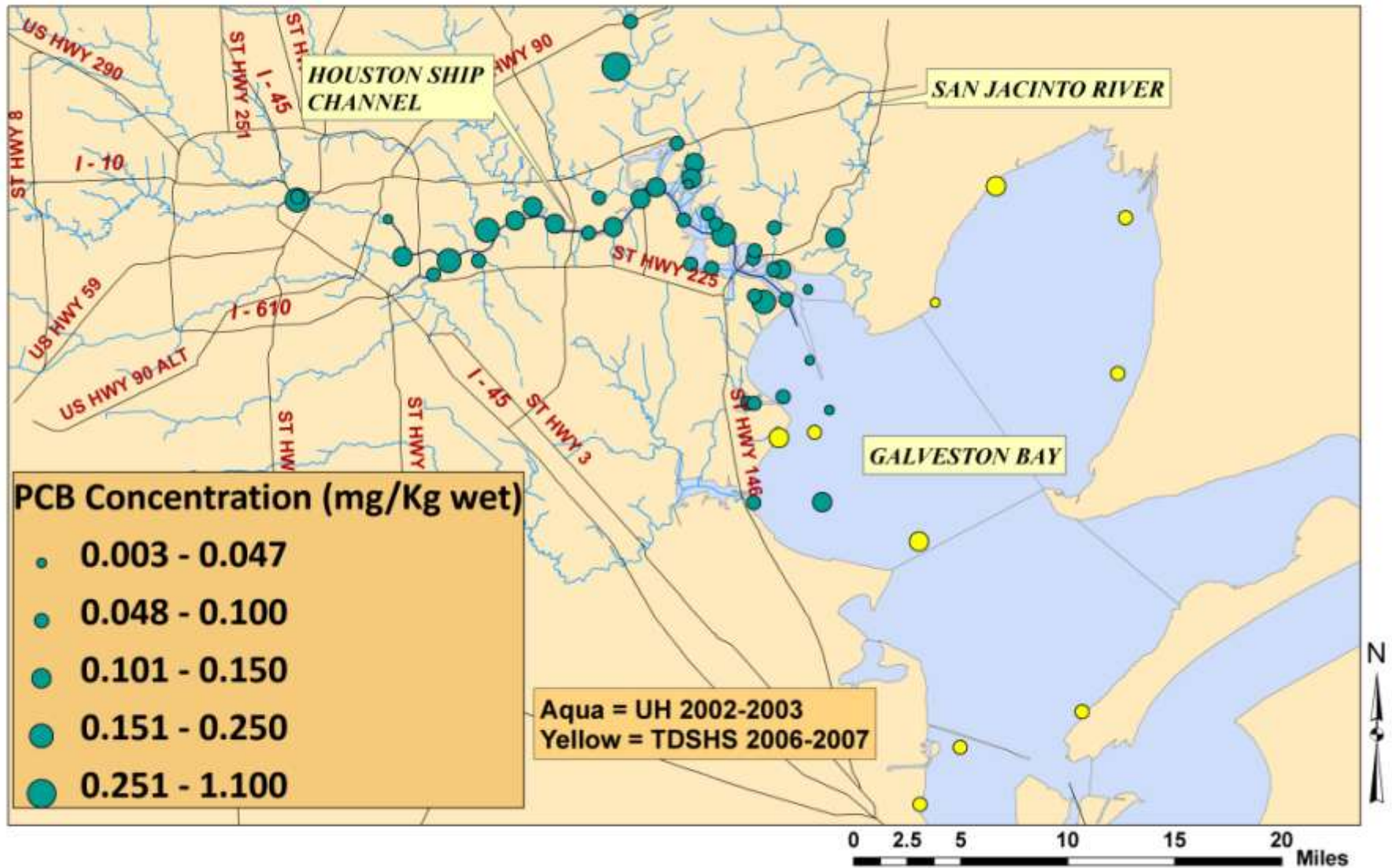
# Tissue PCB Concentration (2008 vs 2009)



\* All concentrations based on 1/2 detection limit for non-detects and  $\Sigma 209$  congeners.

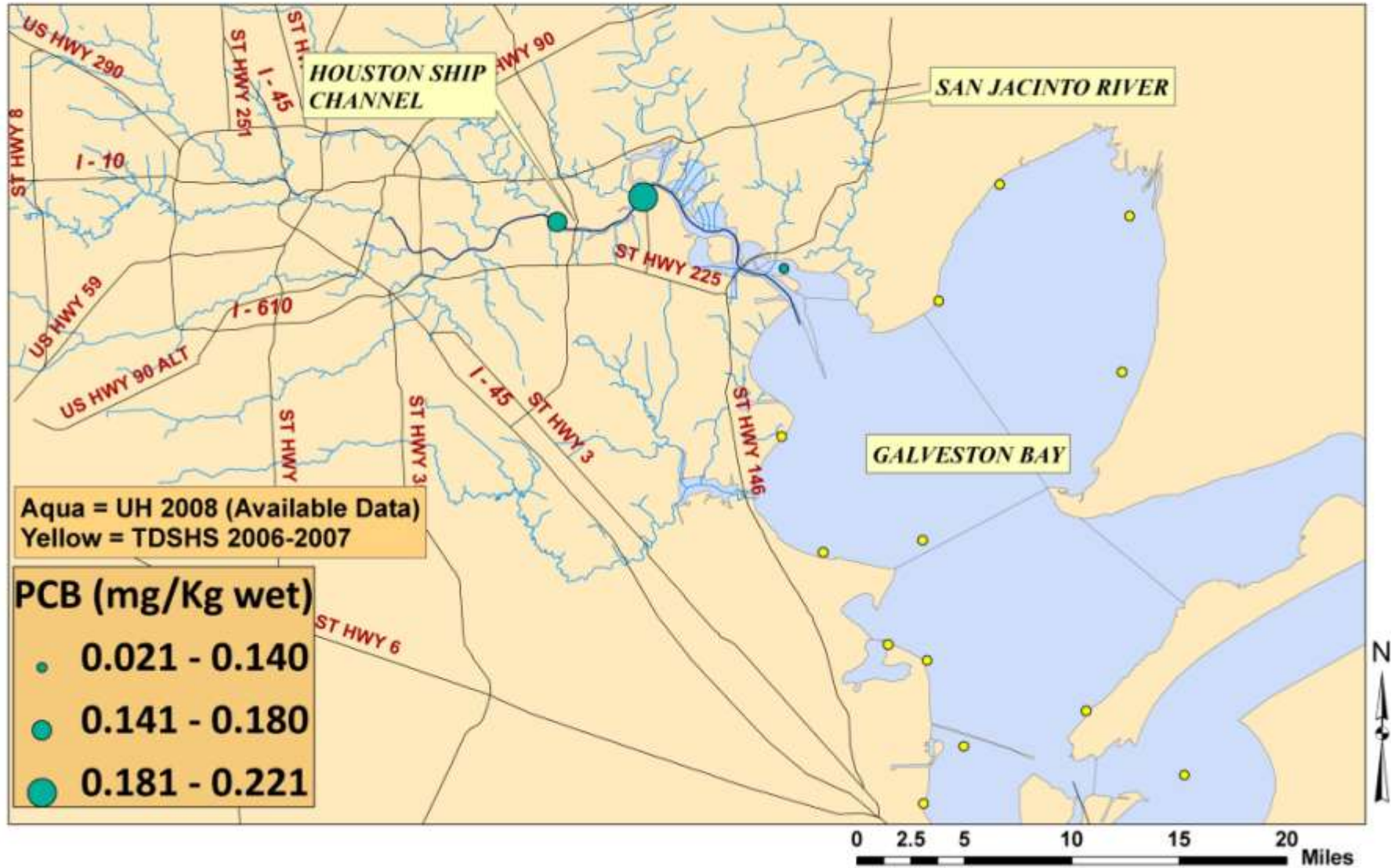


# UH 2008 Catfish PCB Comparison



- UH catfish species collected in order of Hardhead > Blue > Gafftopsail > Channel
- PCB concentration = sum of 43 congeners in McFarland and Clarke (1989)

# UH 2008 Speckled Trout PCB Comparison



- PCB concentration = sum of 43 congeners in McFarland and Clarke (1989)





# TMDL for PCBs in HSC and Upper Galveston Bay

- Snapshot of current levels in sediment, tissue and water in 2012
- Model development and application
  - RMA2 + WASP used for dioxin TMDL
  - Calibration and validation with 02-03, 08, 09 and 2012 datasets



# TMDL for Dioxins in HSC System

- Revise TMDL to address comments
- Calculate sediment cleanup targets by congener and segment to achieve water quality standard