Dioxins and PCBs in Galveston Bay

Linda Broach, Ph.D.

TCEQ – Houston Region

Sept 17, 2013

WATER QUALITY PROCESS



SET USES & STANDARDS





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Parameters:		Cinquis.	Sear Suprace First Land
PCBs in edible tioner		24	269
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LIST

PLAN

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	2012 Texas Integrated R	teport: Asse	ssment	Res	ults fe
SEGED 2422B Double	Bayon West Fork (unclassified	water body)			
AUID 2422B_01 E	rom the Trimity Bay confluence to Belto	n Road			
USE Aquatic Life Use	Permore	AND THE PARK	AUGIT East Door	east	Mone
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LIST OF IMPAIRED WATERS 303(d)

SegID: 2422B	Double Bayou West Fork (unclassified water body) From the Trinity Bay confluence to Belton Road in Cha	mbers County	
Parameter(s)		<u>Category</u>	Year Segment First Listed
bacteria 2422B_01	From the Trinity Bay confluence to Belton Road	5c	2006
Parameter(s)		<u>Category</u>	Year Segment First Listed
depressed dissolv 2422B_01	ved oxygen From the Trinity Bay confluence to Belton Road	5b	2004
Parameter(s)		<u>Category</u>	Year Segment First Listed
dioxin in edible t	From the Trinity Bay confluence to Belton Road	5a	2010
Parameter(s)		<u>Category</u>	Year Segment First Listed
PCBs in edible ti	From the Trinity Bay confluence to Belton Road	5a	2010

SegID: 2422D Double Bayou East Fork (unclassified water body) From the Trinity Bay confluence to a point 2.6 km (1.6 mi) upstream of SH 65			
Parameter(s)		<u>Category</u>	Year Segment First Listed
dioxin in edible to 2422D_01	From the Trinity Bay confluence to a point 2.6 km (1.	5a 6 mi) upstream of SH 65	2010
Parameter(s)		<u>Category</u>	Year Segment First Listed
PCBs in edible ti 2422D_01	From the Trinity Bay confluence to a point 2.6 km (1.	5a 6 mi) upstream of SH 65	2010

Galveston Bay Estuary (Map 2) Brazoria, Chambers, Galveston, and Harris Counties ADV-50 Issued June 26, 2013 Rescinding ADV-20 and ADV-35 Chambers See the Galveston Bay Estuary Harris Map 1 for Advisory Details Trinity Bay Galveston Brazori

Advisory Area:

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

Advisory Area	Contaminants of Concern	Species	Women of Child Bearing Age and Children < 12	Women Past Child Bearing Age and Adult men
(6)33	Dioxins and PCBs	All species of catfish	DO NOT EAT	1 meal/month ¹

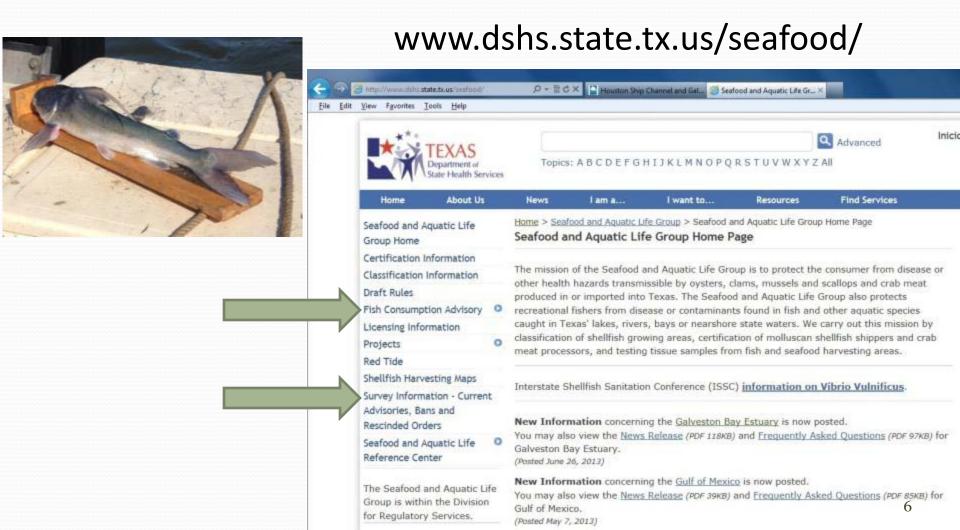
¹ A meal is eight ounces of fish.

Fish Advisory: Galveston Bay

Entire bay – all species of catfish no more than 1 meal/month except children and women of childbearing age who should not consume any catfish from Galveston Bay

Galveston Bay Estuary (Map 1) - Houston Ship Channel, San Jacinto River, and Upper Galveston Bay **Chambers and Harris Counties** ADV-49 and ADV-50 Issued June 26, 2013 Rescinding ADV-3, ADV-20, and ADV-35 Lake Houston Advisory Area: The Houston Ship Channel and all contiguous waters north of the Fred Hartman Bridge, State Highway 146 including the San Jacinto River below the Lake Houston Dam Upper Galveston Bay and all contiguous waters north of a line from Red Bluff Point to Five-Mile Cut Marker to Houston Point San Jacinto River 565 Harris Chambers **Houston Ship Channel Houston Point** Women of Child Bearing Age Women Past Child Bearing Advisory Area Contaminants of Concern Species and Children < 12 Age and Adult men Dioxins, organochlorine 1 meal/month1 All species of fish and blue crab DO NOT EAT pesticides, and PCBs All species of catfish, spotted Dioxins and PCBs 1 meal/month DO NOT EAT seatrout, and blue crab A meal is eight ounces of fish. Five-Mile Cut Marker **Red Bluff Point**

Texas Department of State Health Services (TDSHS)

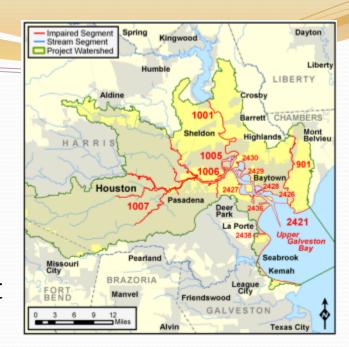


PCBs & DIOXINS in FISH TISSUE

- 1) TDSHS issues advisory based on:
 - Levels in fish tissue
 - Calculations of levels that might have a health effect
 - Long-term consumption
- 2) TCEQ lists waterbody as not meeting water quality standards if it has a consumption advisory from TDSHS
- 3) TCEQ then develops a plan to improve the water quality (in this case - fish tissue concentrations)

TCEQ PLAN: TMDL

 Houston Ship Channel and Galveston Bay: A TMDL Project for Dioxin



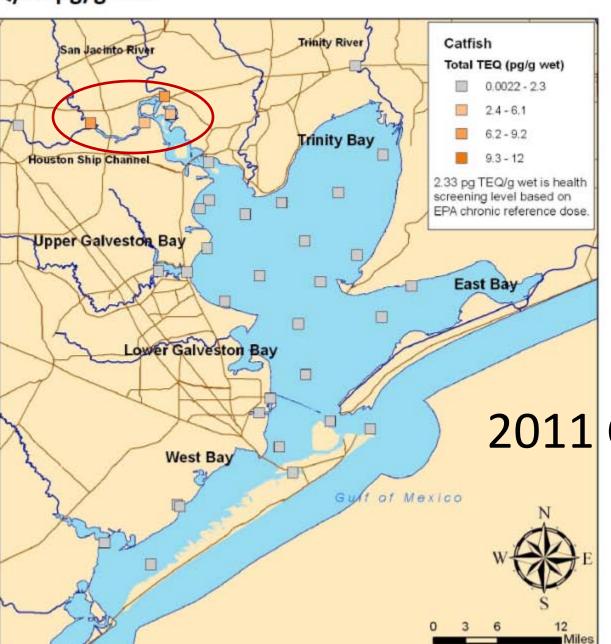
- Started in 2002
- Houston Ship Channel and Upper Galveston Bay: A TMDL Project for PCBs in Fish Tissue
 - Started in 2006
- Both involve extensive sampling of fish tissue, water, and sediment

DIOXIN

- Polychlorinated dibenzodioxins (PCDD) and Polychlorinated dibenzofurans (PCDF)
- Unintentional byproduct of some chemical manufacturing, paper bleaching, and combustion
- TDSHS Tissue Screening Level 2.33 ppt
- Exposure is mostly through diet
- Health effects on reproduction, development, immune system, or cancer

Catfish Samples for 2378-TCDD <u>Toxic Equivalency</u> (TEQ) as pg/g wet

DIOXINS



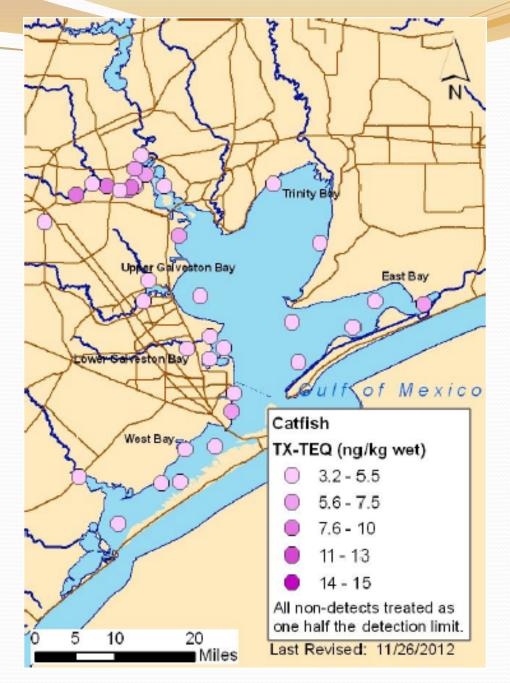
2.33 pg/g wet TEQ represents the Texas Dept State Health Service non-cancer health screening level.

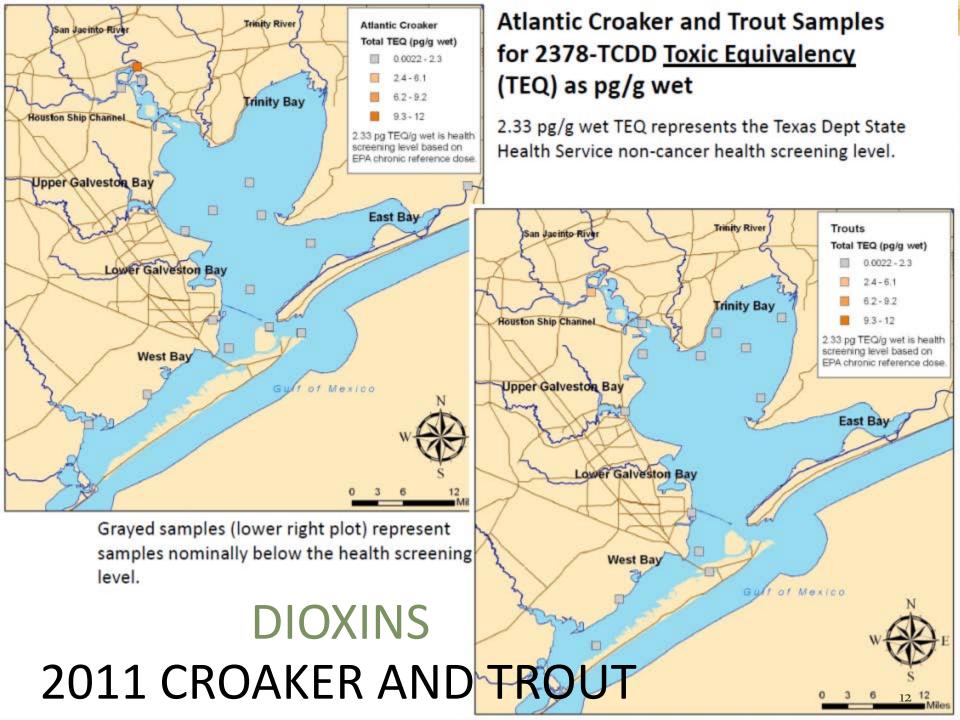
2011 CATFISH

DIOXINS

2012 Catfish

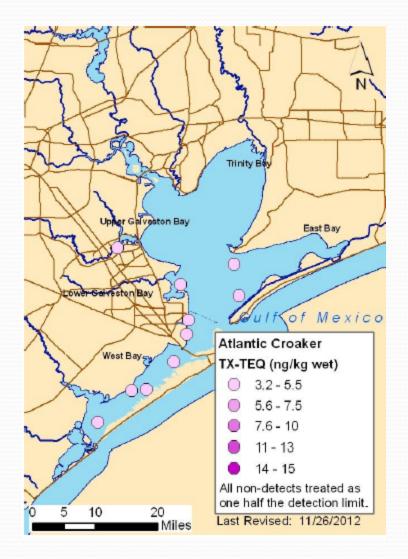
Higher in Houston Ship Channel

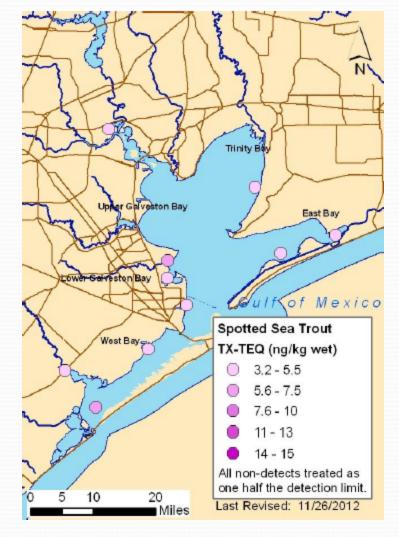






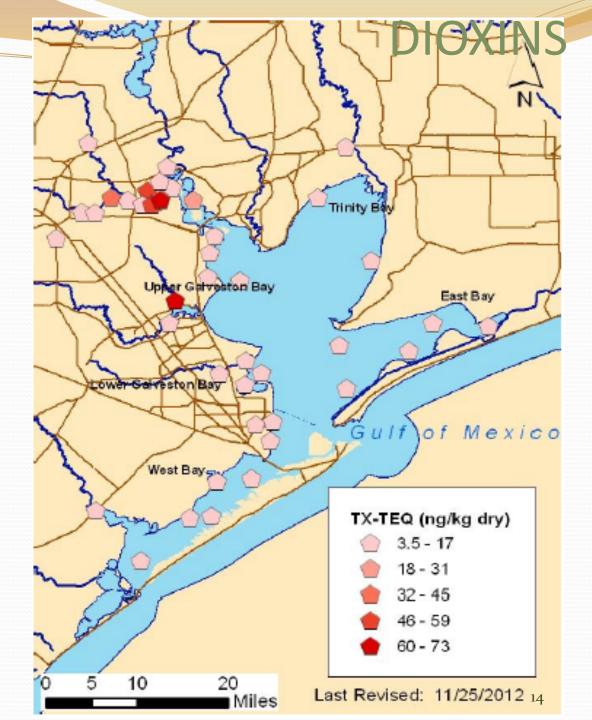
2012 Croaker and Trout





SEDIMENT DIOXIN

Houston Ship Channel



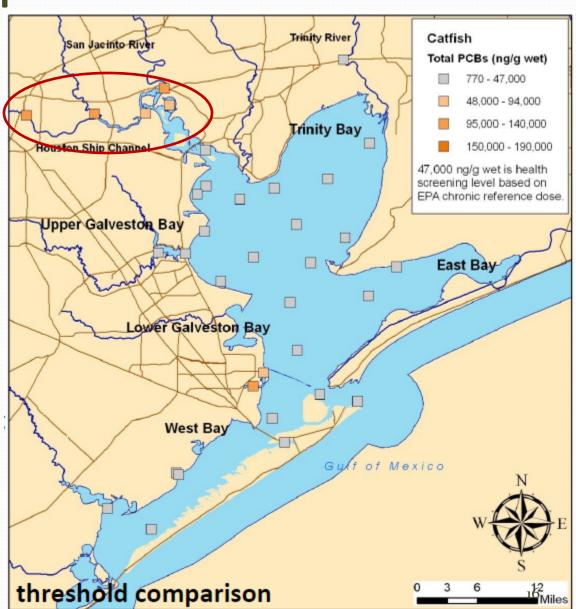
PCBs = Polychlorinated Biphenyls

- Used for electrical transformers, and in plastics, paints, and oils
- Manufacture in US stopped in 1979
- Effects on reproduction, immune system, cancer, or other serious health effects
- TDSHS Tissue Screening Level 47 ppm

2011 Catfish

PCBs

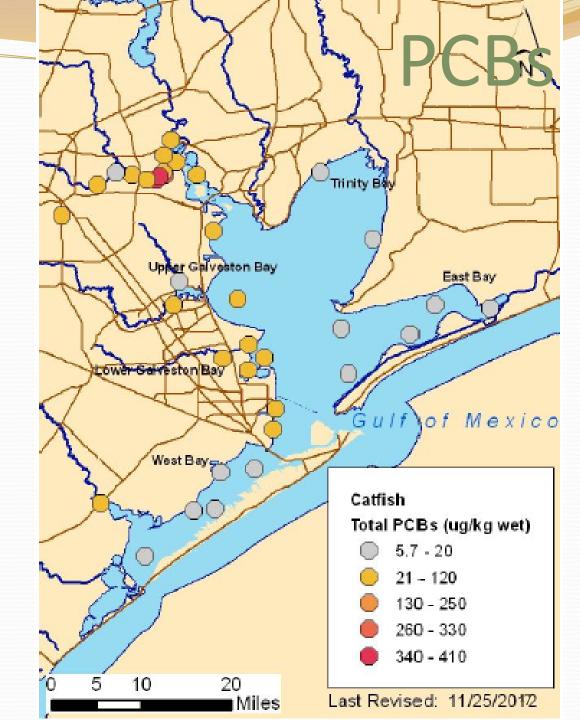
Screening Level is 47 ppm (47,000 ng/g)



2012 DATA

CATFISH TISSUE

Screening Level is 47 ppm



2011 Croaker

PCBs



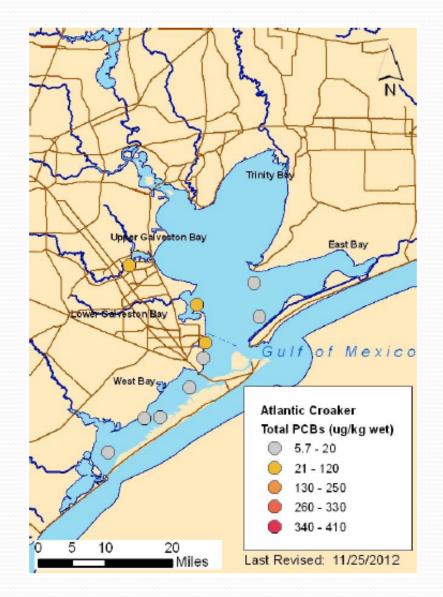
2011 Trout

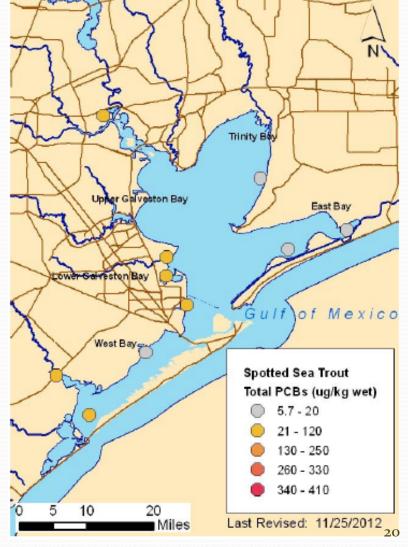




2012 Croaker and Trout

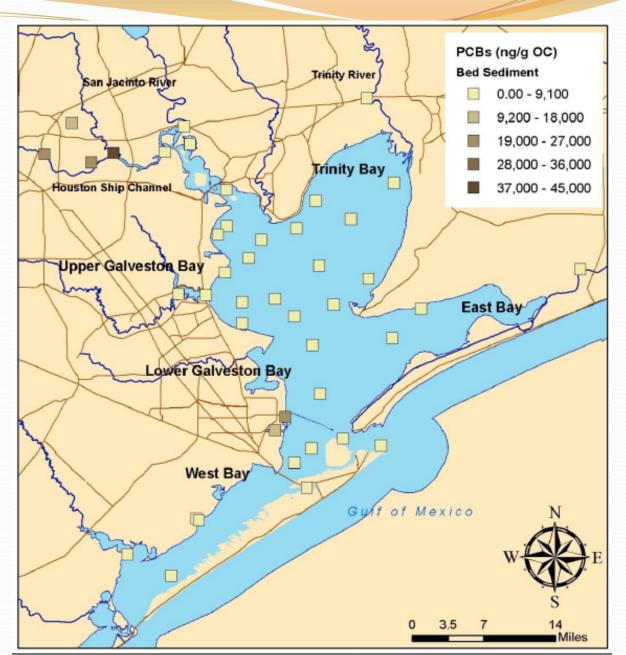






SEDIMENT PCBs

Houston Ship Channel



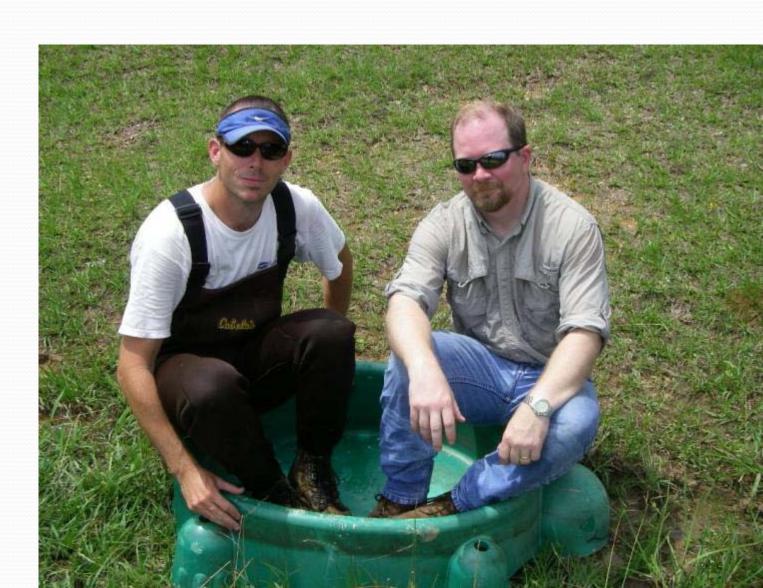
Summary

- Catfish Tissue in Galveston Bay may be contaminated
 - TDSHS advisory is to eat < 1 meal per month, except children and women of childbearing age, who should eat no catfish from the bay
 - Other species are OK
- Most of the contamination is in the HSC sediments and it is transferred up the food chain to the fish
- A project is under way to figure out how to address the sediment contamination so that the fish concentrations will be reduced
 - No actions in the Double Bayou watershed will affect the fish tissue, but you can participate in the larger Galveston Bay project as a stakeholder

HSC Dioxin/PCB Project

- More information on that TMDL project available at
 - http://www.tceq.texas.gov/waterquality/tmdl/nav/tmdl projectname.html
 - http://www.h-gac.com/community/water/tmdl/hsc-ugb/default.aspx
 - Handouts at back of room
- Data discussed here was collected as part of Dioxin/PCB TMDL project for the Houston Ship Channel by Dr. Hanadi Rifai of University of Houston

QUESTIONS?



Contact Information:

LINDA BROACH
713-767-3579
Linda.broach@tceq.texas.gov