

# Lower Mystic Fish Advisory Project

Presentation to the Mystic River Watershed Initiative Science Forum

Boston Logan International

May 5<sup>th</sup>, 2017

My

ambridge

**Patrick Herron** 

Rafael Mares



### <u>The Problem</u>



- A fish advisory exists for the freshwater upper section of the Mystic River, which advises anglers to catch and release only.
- The Lower Mystic is subject to the general fish advisory for Boston Harbor—based on sampling in Quincy Bay and not updated since 1988.
- Residents of municipalities in the Lower Mystic Watershed continue to fish without up-todate and reliable information.

## The Background

### A long history of industrialization.



### Tobin Bridge and Chelsea Creek



### Tanker at Mystic River pier, Everett (1972)



Top: MyRWA Bottom: Digital Commonwe









## **The Laboratory Analysis**



With guidance from project partners, these specimens were analyzed using a standard protocol related to sample selection, filleting, and homogenization. Tests were conducted at Alpha Analytical Labs in Mansfield, Massachusetts.



The strategy for preparing tissue for analysis had to be adapted to the variety of fish/animal forms within the study (Table 1).



Fish composites were analyzed for lipid content, pesticides, PCB Aroclors and metals (Ag, As, Ba, Cd, Cr, Hg, Pb, Sn).



# Table 1. Tissue collection preparationSpeciesPreparationGreen crabProcessed wholeSkate sp.Meat sliced away from cartilageStriped sea robinFillet, no skinRainbow smeltHead, viscera, scales removed, rest of body processedWinter flounderSkinless filletsWhite perchFillet, no skinAmerican eelHead, skin and viscera removedOyster - MysticMeat only

Table 2. Chemicals quantified in fish tissue samples								
Total Metals	Pesticides	Pesticides (cont.)						
Arsenic	alpha-BHC	Mirex						
Barium	beta-BHC	Toxaphene						
Cadmium	delta-BHC	Aldrin						
Chromium	gamma-BHC (Lindane)	Heptachlor						
Lead	Hexachlorobenzene	Heptachlor epoxide (B)						
Mercury	4,4'-DDD	Dieldrin						
Selenium	2,4'-DDD	Endrin						
Silver	2,4'-DDE	Endosulfan I						
Tin	4,4'-DDE	Endosulfan II						
	2,4'-DDT	trans-Nonachlor						
Polychlorinated	4,4'-DDT	cis-Nonachlor						
Biphenyls (PCBs)	Endrin aldehyde	Oxychlordane						
Quantified as Aroclors	Endosulfan sulfate	gamma-Chlordane						
	Endrin ketone	alpha-Chlordane						
	Pesticides	Chlordane						
	Methoxychlor							

# <u>The Contaminants</u>

### <u>The Health Assessment</u>

Table 5. Levels of containmants measured in fish and oyster tissue										
Species	Arsenic (Total) mg/kg	PCBs (Total) μg/kg	DDT (Total) µg/kg	Dieldrin µg/kg						
SV value	0.03	20	117.0	2.50						
White perch	0.50	172	2.8	0.48						
Striped sea robin	3.88	123	3.7	<0.37						
American eel	0.84	3720	145.2	42.30						
Green crab	2.58	224	4.9	3.98						
Rainbow smelt	0.65	231	8.4	4.40						
Skate	4.91	<16	0.6	<0.39						
Winter flounder	2.23	177	4.7	3.39						
Oyster	0.93	85.5	3.2	<.384						

	White perch	Striped sea robin	American eel	Green crab	Rainbow smelt	Skate sp.	Winter flounder	Oyster	
Adults (assuming 30 year exposure period and ½ pound fish meals)	5	3	<1	3	4	3	3	6	
Women of Childbearing Age**	<5	<3	<1	<3	<4	<3	<3	<6	
Children (assuming 5 year exposure period and ½ pound fish meals	3	1	<1	1	2	2	2	3	
*These rates are based on the fish tissue data shown in Table 3. ** Inadequate data are available to provide specific recommendation.									
Boston University School of Public Healt									





## The Conclusion

Efforts are underway with the Massachusetts Department of Public Health to create a new, specific, and comprehensive fish advisory that will inform local residents which fish species are safe to eat, as well as encourage them to utilize the river as a resource.



### The Collaboration



Rafael Mares Vice President and Program Director, Healthy Communities and Environmental Justice



Roseann Bongiovanni Executive Director

Maria Belen Power Associate Executive Director



Patrick Herron Executive Director



Anamarija Frankić Founding Director Green Harbors Project





Chris Marchi Former Director of Community Building and Environment

## The Acknowledgments



Boston University School of Public Health

Wendy Heiger-Bernays, PhD Associate Professor of Environmental Health

Madeleine Scammell, DSc Assistant Professor of Environmental Health

Donna Vorhees, ScD Cassie Huang, MPH



This project was funded in part by the Massachusetts Environmental Trust.



Mike Celona Chief Water Toxics Unit Environmental Toxicology Program Bureau of Environmental Health

Marc Nascarella Director Environmental Toxicology Program Bureau of Environmental Health



Todd Callaghan Coastal and Marine Scientist



Richard Chase Data & Assessment Coordinator Water Quality Assessment & Data Management

> The Chelsea Boyz Ever Ramos

conme

DILIBOR OF MARINE FISHER

Benjamin Gahagan Diadromous Fish Biologist

### For Additional Information

conservation law foundation

Rafael Mares Vice President and Program Director, Healthy Communities and Environmental Justice

62 Summer Street Boston, MA 02110

CIT

**P**: 617-850-1739 **E**: <u>rmares@clf.org</u> Patrick Herron Executive Director

20 Academy Street # 306, Arlington, MA 02476

MyRWA

**P**: (781) 316-3438 **E**: <u>Patrick@mysticriver.org</u>