



STATE OF MAINE
DEPARTMENT OF AGRICULTURE, CONSERVATION AND FORESTRY
BOARD OF PESTICIDES CONTROL
28 STATE HOUSE STATION
AUGUSTA, MAINE 04333

JANET T. MILLS
GOVERNOR

To: Board of Pesticides Control Members
From: Mary Tomlinson, Pesticides Registrar/Water Quality Specialist
RE: Water Quality Program Update for 2018: Penobscot Bay Project
Date: January 7, 2015

The Maine Board of Pesticides Control (BPC) Quality Management Plan was updated and approved by the Environmental Protection Agency (EPA).

In 2014, the BPC was tasked by the Maine Legislature to assess the potential impacts of pesticides on marine invertebrates. The 2014-2015 Gulf of Maine (GOM) Project was implemented and the results indicated pesticides had an unlikely appreciable impact on Maine's lobster fishery. The BPC intended to continue its monitoring effort as resources allowed.

In partial fulfillment of the BPC 2017 GOM report, "Update to the Maine Board of Pesticides Control Assessment Relative to the Risks of Pesticides to Maine Invertebrates", the Penobscot Bay Project was conducted in 2018. This project was limited in scope and focused on seven freshwater streams feeding the Penobscot River to determine the presence or absence of pesticides used in residential areas. The marine waters of Northern Bay, the northern-most reach of the Bagaduce River, was also included due to the opportunity to partner with The Corning School of Ocean Studies, Maine Maritime Academy (MMA) which is studying the declining clam population in the bay.

BPC staff collected nine surface water grab samples from seven locations and nine sediment samples from eight locations in the Bangor region, Castine region, and Bucksport during mid-September. MMA deployed a Polar Organic Chemical Integrative Sampler (POCIS) in Northern Bay, for a total of 22 days, late August into September. Two of the nine sediment samples were collected north of the POCIS site due to limited access to the shore and the need for fine sediments. Site locations and results are displayed in the table below.

Samples were sent to Montana Analytical Laboratory for analysis of pesticides and sediment samples were sent to the University of Maine Analytical Laboratory for analysis of total organic carbon and particle size.

Surface Water Preliminary Results

Surface water grab samples were analyzed for 104 pesticides using the Montana Universal method with a separate analysis required for glyphosate. Eight pesticides were detected in samples from all sites (Table 1). Atrazine and two degradates were the most frequently detected pesticide and all were below the reporting limit. Atrazine and deethyl atrazine were detected in the first Stillwater River sample, but not in the duplicate sample. This is not surprising given that detection limits are 0.0022 and 0.0017 parts per billion (ppb) respectively. Imidacloprid exceeded the chronic Aquatic Life Benchmark (ALB) for invertebrates, 0.01 ppb. This ALB is derived from a life-cycle test with the most sensitive invertebrates (usually with midge, scud, or daphnids). There were no other exceedances.

MEGAN PATTERSON, DIRECTOR
32 BLOSSOM LANE, MARQUARDT BUILDING



PHONE: (207) 287-2731
WWW.THINKFIRSTSPRAYLAST.ORG

Table 1. Surface water grab sample results.

Site	Atrazine ng/g (ppb) RL 0.0022	Deethyl atrazine ng/g (ppb) RL 0.0017	Hydroxy atrazine ng/g (ppb) RL 0.0040	Hexazinone ng/g (ppb) RL 0.0015	Imazapyr ng/g (ppb) RL 0.0035	Imidacloprid ng/g (ppb) RL 0.0018	Metolachlor ESA ng/g (ppb) RL 0.0050	Prometon ng/g (ppb) RL 0.0010
Sucker Brook (Hampden)			Q		0.0036			
Kenduskeag Stream at Gomez Park (Bangor)		Q					0.015	
Kenduskeag Stream at Gomez Park (Bangor) (Blank)								
Mill Stream (Bucksport)				Q				
Penjajawock Stream at Evergreen Woods (Bangor)			Q			Q		
Kenduskeag Stream at Valley Ave. (Bangor)		Q	Q				0.064	
Stillwater River (Orono)	Q	Q						
Stillwater River (Orono) (Duplicate)								
Unnamed stream (Castine)					Q	0.058		0.004 6

RL = Reporting limit

Q = Present at less than reporting limit

The surface water POCIS samples were analyzed for 102 pesticides. Six pesticides were detected (Table 2). Further analysis on these results will be conducted by MMA.

Table 2. POCIS sample results.

Site	Atrazine ng/pocis	Deethyl atrazine ng/pocis	Hexazinone ng/pocis	Metolachlor ESA ng/pocis	Prometon ng/pocis	Simazine ng/pocis
Northern Bay 1	4.5	1.2	0.27	1.4	0.12	0.53
Northern Bay 2	5.4	1.3	0.25	1.9	0.12	0.52
Northern Bay 3	4.7	1.2	0.27	1.7	0.13	0.57

Sediment Preliminary Results

Sediment samples were analyzed for 15 pyrethroids. Bifenthrin was detected in samples from all sites, but only in eight of nine samples (Table 3). Cyfluthrin, cypermethrin, and deltamethrin were only detected in the Stillwater River sample. Pyrethroid detections by site in parts per billion (ppb) are displayed in the table below. Results have not yet been normalized for organic carbon; therefore, results are not comparable from site to site.

Table 3. Sediment sample results.

Site	Bifenthrin (ppb) RL 0.045	Cyfluthrin (ppb) RL 0.20	Cypermethrin (ppb) RL 0.20	Deltamethrin (ppb) RL 0.40
Sucker Brook (Hampden)	0.27	ND	ND	ND
Kenduskeag Stream at Gomez Park (Bangor)	0.81	ND	ND	ND
Mill Stream (Bucksport)	0.33	ND	ND	ND
Penjajawock Stream at Evergreen Woods (Bangor)	0.18	ND	ND	ND
Kenduskeag Stream at Valley Ave. (Bangor)	0.77	ND	ND	ND
Stillwater River (Orono)	0.26	0.31	0.36	0.47
Northern Bay	ND	ND	ND	ND
Northern Bay (duplicate)	0.76	ND	ND	ND
Unnamed stream (Castine)	0.058	ND	ND	ND

RL = Reporting limit

It is important to bear in mind that the data presented here is the raw data and has not been analyzed; therefore, no valid comparisons among sites and no conclusions may be drawn.