Glossary

acrolein: A toxic organic chemical found in vapor form that is used in some industrial processes. It can also be formed when organic matter is burned.

action level: The concentration of a contaminant in fish or shellfish below which there should be negligible risk of deleterious health effects, at a consumption rate of one meal per week.

Ag: Silver

Al: Aluminum

As: Arsenic

ambient water quality: The natural concentration of water quality constituents prior to the mixing of either point or nonpoint source load of contaminants.

anthropogenic: This term pertains to the influence of human activities. For example, anthropogenic sources of water quality impacts include septic systems and treatment plant discharges as well as road and agricultural runoff.

ATAC: Maine Air Toxics Advisory Committee

atmospheric deposition: The process by which airborne pollutants fall to the ground in raindrops, in dust, or due to gravity.

background or baseline reference condition: An environmental condition that is relatively free of industrial and anthropogenic influences. Background or baseline reference levels of toxic chemicals are compared to the results of monitoring (for example, blue mussel tissue monitoring) to assess pollution impacts.

BEAM: Maine DEP's Breathing Easier through Monitoring program

benthic: This term refers to the bottom of a body of water. For example, benthic organisms are bottom-dwellers.

bioaccumulation: The sequestering of toxic chemicals in the tissues of an organism at a higher concentration than the source. Bioaccumulation results from contact with contaminated water or sediment or by consuming prey.

bioindicator: Resident organism that serves as an indicator of environmental contamination.

biomagnification: The increasing concentration of toxics in organisms with each step up the food chain from the lowest to the highest links.

biomarker: An indicator that can be used to measure a biological process.

biosentinel: Resident organism that serves as an indicator of environmental contamination.

biota: The animal and plant life of a given region.

BMP: Best Management Practice. A BMP is a method for preventing or reducing the pollution resulting from an activity. The term originated from rules and regulations in Section 208 of the Clean Water Act.

BOD: Biochemical oxygen demand. This is the amount of oxygen used for biochemical oxidation by a unit volume of water at a given temperature and for a given time. BOD is an index of the degree of organic pollution in water.

body burden: The amount of a chemical present in the body of an organism.

BT: Butyltin

butyltins: Toxic organometallic compounds, i.e., molecules in which metal is bonded to a carbon atom in an organic molecule.

carcinogen, carcinogenic: A substance or agent that can cause or aggravate cancer.

CBEP: Casco Bay Estuary Partnership

Cd: Cadmium

CERCLA: The federal Comprehensive Environmental Response, Compensation, and Liability Act; 42 USC §§ 9601 *et seq.* (1980)

CHLs: Chlordane-related compounds. Chlordane is a pesticide banned in the US.

Clean Air Act: Federal legislation that regulates air pollution; 42 USC. §§ 7401 *et seq.*

Combined Sewer Overflow Control Policy: A national framework for control of combined sewer overflows through the National Pollutant Discharge Elimination System permitting program.

congeners: A chemical term for varying configurations in the same chemical family.

Cr: Chromium

CSO: Combined Sewer Overflow. A combined sewer system collects both stormwater runoff and wastewater in the same pipe where they are usually transported to a treatment plant before discharge to a water body. During heavy rainfall events, the volume of water can exceed the capacity of the sewer system or treatment plant, leading to a CSO in which untreated wastewater is discharged directly to a water body.

Cu: Copper

CWA: The federal Clean Water Act, 33 USC §§ 1251 *et seq.*

DBT: Dibutyl tin

DDT: The pesticide *1,1,1-trichloro-2,2-bis(*p-*chlorophenyl)ethane*, also known as *dichloro-diphenyl-trichloroethane* was the first chlorinated hydrocarbon insecticide. US EPA banned sale and use of DDT in the United States in 1972 due to its persistence in the environment and bioaccumulation in the food chain.

dioxins and furans: Toxic organic chemicals that are formed when organic material is burned in the presence of chlorine. Incineration, pulp paper manufacturing, coal-fired utilities, diesel vehicles and metal smelting are all sources.

DW: Dry weight

emerging contaminants: These contaminants include pharmaceuticals and personal care products (such as antibiotics, steroids, hormones and other endocrine disruptors) and a variety of chemicals such as caffeine, cholesterol, fire retardant and insect repellents which may have or, in some cases, have been shown to have, detrimental effects on aquatic organisms and ecosystems.

endocrine disruptor: A chemical that mimics or disrupts the normal activity of hormones.

epizootic: An epidemic among animals

EPCRA: The federal Emergency Planning and Community Right-to-Know Act; 42 USC §§ 11001 *et seq.*

ERL: Effects Range Low (possible biological effects)

ERM: Effects Range Median (probable biological effects)

estuary: A semi-enclosed coastal water body having a free connection to the open sea and within which seawater is measurably diluted with fresh water.

Fe: Iron

FOCB: Friends of Casco Bay

GOMC: Gulf of Maine Council on the Marine Environment

HAPs: Hazardous air pollutants

hydrophobic: A term that refers to chemicals that do not readily dissolve in water.

heavy metals: Dense metallic elements such as lead, mercury, arsenic, cadmium, silver, nickel, selenium, chromium, zinc, and copper.

Hg: Mercury

high molecular weight PAHs: Polycyclic aromatic hydrocarbons with four or more benzene rings. They result from combustion processes.

indicator organisms: Resident organisms that serve as indicators of environmental contamination.

intertidal zone: Areas between high tide and low tide that are alternately exposed to seawater and air.

in utero: Within the uterus.

in vitro: In cell culture.

Lipophilic: Fat soluble.

LOAEL: Lowest Observed Adverse Effect Level is the lowest exposure level of a stressor at which there are statistically or biologically significant increases in frequency or severity of adverse effects between the exposed organisms and organisms that are not exposed to the stressor.

load, loading: The total amount of a material (pollutant) entering a system from one or multiple sources.

low molecular weight PAHs: Polycyclic aromatic hydrocarbons with three or fewer benzene rings. They are typically derived from weathered petroleum and diesel fuel.

lymphocytes: A type of white blood cell –T and B cells- involved in immune response to foreign substances.

lymphocyte proliferative response: An assay that measures the ability of circulating lymphocytes to respond to foreign substances in cell culture.

lw: lipid weight

Maine DEP: Maine Department of Environmental Protection

MATI: Maine Air Toxics Initiative

MDN: Mercury Deposition Network

MERI: Marine Environmental Research Institute

metabolite: A substance that is the product of biological changes to a chemical.

methyl mercury: A highly toxic organometallic compound. It is the form of mercury that is most easily absorbed and bioaccumulated into organisms.

MPRSA: The federal Marine Protection, Research, and Sanctuaries Act. It is also known as the Ocean Dumping Act; 33 USC §§ 1401 *et seq.*

mobile sources: Sources of air pollution from internal combustion engines that propel cars, trucks, trains, buses, airplanes, ATVs, snowmobiles, boats, etc.

µg/g: micrograms per gram

mutagenic: Causing alteration in the DNA (genes or chromosomes) of an organisms.

neurotoxin: A substance that causes damage to the tissues of the nervous system.

NOAA: National Oceanic and Atmospheric Administration

NADP: The federal National Atmospheric Deposition Program

NATA: National Air Toxics Assessment

ng/g: nannograms per gram

Ni: Nickel

NOAEL: No Observed Adverse Effect Level. This is the highest exposure level of a stressor at which there are no statistically or biologically significant increases in the frequency or severity of adverse effects between the exposed organisms and organisms that are not exposed to the stressor.

nonpoint source: An indirect discharge, not from a pipe or other specific source, such as stormwater runoff.

NPDES: The National Pollutant Discharge Elimination System regulates point source and municipal stormwater discharges to the waters of the United States; 33 USC § 1342.

Oil Pollution Act: Federal legislation that requires facilities that store large quantities of oil to prepare spill plans and adopt measures that prevent spills from reaching waterways; 33 USC §§ 2702 *et seq.*

organometallic: Molecules in which a metal is bonded to a carbon atom in an organic molecule.

oriented strand board: An engineered wood product formed by layered flakes of wood, bonded with wax and resin adhesives.

PAHs: Polycyclic aromatic hydrocarbons. These are toxic organic chemicals that come primarily from combustion of fossil fuels and wood, as well as fuel spills.

parapodia: The paired appendages of segmented marine worms.

Pb: Lead

PBDEs: Polybrominated diphenyl ethers. PDBEs are toxic chemicals widely used as flame retardants.

PCBs: Polychlorinated biphenyls. These are persistent, toxic organic chemicals that were formerly used in electric transformers and capacitors for insulating purposes and in gas pipelines as lubricant. Sale and new uses of PCBs were banned by US EPA in 1979.

PCB conformation: The spatial arrangement of atoms and bonds in a PCB molecule.

pelagic: Relating to or living in the open sea (*i.e.,* offshore not coastal).

PFOS: Perfluorooctanesulfonate. This is a highly persistent toxic chemical widely used as a flame retardant.

pg/g: picograms per gram

pinnipeds: Carnivorous, fur-bearing marine mammals with feet modified as flippers.

planar PCBs: The most toxic conformation of PCBs, based on health effects. They are also referred to as "dioxin-like" compounds.

point source: Any confined or discrete conveyance (such as a pipe) from which pollutants are or may be discharged into a watershed.

POPs: Persistent organic pollutants. Examples are PCBs, dioxins, and DDT.

ppb: parts per billion

ppm: parts per million

Pretreatment Program: A federal program that regulates discharges to publicly owned treatment works; 33 USC §§ 1251 *et seq.*

Pulp and Paper "Cluster Rule": Provides federal air and water emissions standards for the pulp and paper industry that reduce toxic pollution releases and virtually eliminates all dioxin discharges into surface waters.

RCRA: The federal Resource Conservation and Recovery Act; 42 USC §§ 321 *et seq.* .

retinol: Vitamin A.

sentinel or indicator organisms: Resident organisms that serve as indicators of environmental contamination.

sink: A place in the environment where a compound or material collects.

stressor: An ecological stressor is something, such as a chemical, that can potentially cause an adverse effect.

SWAT: Maine DEP's Surface Water Ambient Toxics Monitoring program

TALU: Tiered Aquatic Life Uses. This is a framework that relates the declining health of an aquatic ecosystem to increasing human disturbance along a gradient and associates tiers along the gradient with designated water body uses.

TBT: Tributyltin

TMDL: Total Maximum Daily Load. This is a calculation of the maximum amount of a pollutant that a waterbody can receive and still meet water quality standards, and an allocation of that amount to the pollutant's sources.

tomalley: The organ that serves as a lobster's pancreas and liver, a place where contaminants can accumulate.

trophic level: The position of an organism in the food chain.

TSCA: The federal Toxic Substances Control Act; 15 USC §§ 2601 *et seq.*

TSS: Total Suspended Solids. This is a measure of the suspended solids in wastewater, effluent, or water bodies.

USC: United States Code. This is the codification by subject matter of the general and permanent laws of the United States.

US EPA: United States Environmental Protection Agency

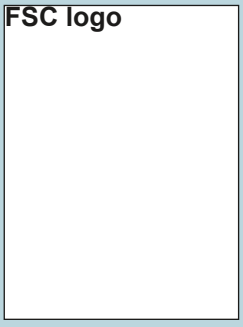
VOCs: Volatile organic compounds. These chemicals produce vapors readily. Gasoline and benzene are examples.

WCV: Wildlife criterion value refers to a derived maximum allowable surface water concentration of a pollutant, such as mercury, that should protect at-risk wildlife at the population level.

wt: weight

ww: wet weight

Zn: Zinc


FSC logo

Acknowledgements

Editor: Diane Gould, US EPA

Design: Ed Geis, Headwaters Writing & Design

Guest Contributing Authors:

Susan Shaw, MERI—Author of Chapter 7
David Wright, Maine DEP—Contributor to Chapters 1 and 9

We would like to thank the following individuals for their invaluable assistance with data collection, editing, figures, tables, photographs, and GIS mapping for *Toxic Pollution in Casco Bay: Sources and Impacts:*

Dan Agro, Mitchell Geographics, Inc.
Deborah Arbique, CBEP
Beverly Bayley-Smith, CBEP
Marcia Bowen, Normandeau Associates
Jennie Bridge, US EPA
Judy Brown, Hubbard Brook Research Foundation
Mary Cerullo, FOCB
Patrick Cloutier, South Portland Water Resource Protection
Mel Coté, US EPA
Matt Craig, CBEP
Chris DeSorbo, BioDiversity Research Institute
Mike Doan, FOCB
Lee Doggett, Maine DEP
Meggan Dwyer, MERI
Kathi Earley, Portland Public Works Department
David Evers, BioDiversity Research Institute
Eric Frohmberg, Maine CDC
Chris Heinig, MER Assessment Corporation
Steve Jones, University of New Hampshire
Don Kale, Maine DEP
Steve Karpiak
Kathy Lambert, Ecologic: Analysis and Communication
Susan Lancey, US EPA
Oksana Lane, BioDiversity Research Institute
Matt Liebman, US EPA
Ginger McMullin, Maine DEP
Peter Milholland, FOCB
Julie Motherwell, Graphics Communications
Barry Mower, Maine DEP
Ethan Nedeau, Biodrawversity
Eric Nelson, US EPA
Barbara Parker, Maine DEP
Joe Payne, Friends of Casco Bay
Dwight Peavey, US EPA
Cathy Richardson, Maine DEP
Doug Sable, Maine DEP
Susan Shaw, MERI
David Sleeper, Hubbard Brook Research Foundation
MaryBeth Smuts, US EPA
Susan Swanton, Maine Marine Trade Association
Jeri Weiss, US EPA
David Wright, Maine DEP
Karen Young, CBEP Director

CBEP Board of Directors

We would also like to thank our Board members for their ongoing support:

Don Card, Maine DMR
Jim Cloutier, City of Portland Councilor-at-Large
Patrick Cloutier, South Portland Water Resource Protection*
Jacki Cohen, Citizen, Board Chair*
Mel Coté, US EPA*
Jean Dyer, Casco Bay Island Development Association
John Egan, Coastal Enterprises Institute
Dusti Faucher, Friends of Presumpscot River
Stewart Fefer, US Fish and Wildlife Service, Gulf of Maine Coastal Program*
Michael Feldman, Citizen*
Ed Gilfillan, Citizen
Paul Hunt, Portland Water District
Jack Kartez, University of Southern Maine Muskie School*
Kathleen Leyden, Maine Coastal Program, Maine State Planning Office
David Littell, Maine DEP
Betty McInnes, Cumberland County Soil and Water Conservation District*
Brooks More, City of Westbrook
Caroline Paras, Greater Portland Council of Governments
Joe Payne, Friends of Casco Bay*
Tom Shyka, Gulf of Maine Ocean Observing System
Steve Timpano, Maine Department of Inland Fisheries and Wildlife
Theresa Wiper, Citizen
Don Witherill, Maine DEP*

**Executive Board member*

www.cascobayestuary.org

Casco Bay Estuary Partnership
USM Muskie School
Portland, Maine 04104-9300
(207) 780-4820

This document has been funded wholly by the United States Environmental Protection Agency under Assistance Agreement #CE98170501 to the University of Southern Maine

ISBN: 939561-36-0

Printed on 50% recycled (25% post-consumer), elemental chlorine-free paper by Spectrum Graphics & Printing, Portland, Maine