Merrymeeting News

Winter 2023 Vol. XXXIII No. 1

The Newsletter of Friends of Merrymeeting Bay • PO Box 233 • Richmond Maine 04357 • 207-666-1118 • www.fomb.org

Friends of Merrymeeting Bay (FOMB) is a 501(c)(3) nonprofit organization. Our mission is to preserve, protect, and improve the unique ecosystems of the Bay through:

Education

Conservation & Stewardship

Research & Advocacy

Member Events

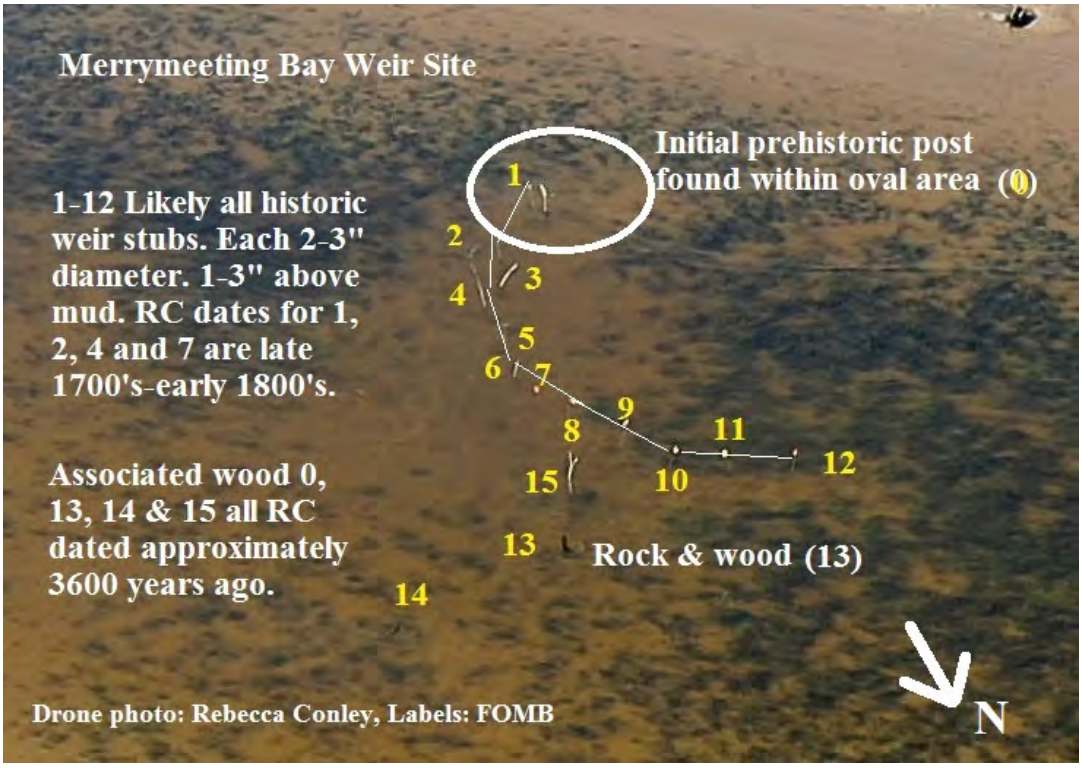
Support comes from members' tax-deductible donations and gifts.

Merrymeeting News is published seasonally and is sent to FOMB members and other friends of the Bay. Article hyperlinks and color images are available in our online edition at www.fomb.org

For more information, contact:

Ed Friedman
Chair
207-666-3372
edfomb@comcast.net

Merrymeeting Bay Weir Update



Drone view of weir

In our Winter 2022 issue on page 2 ("A Fishing Story"), we describe the finding of an apparent prehistoric fishing weir in the Bay. The probable prehistoric age was based on radiocarbon dating of one mostly unearthed post in the immediate vicinity of seven or eight *in situ* protruding post stubs. Our sample yielded a radiocarbon date of approximately 3,600 years before present (3,600BP). That sample (post 0) was taken before the complete remaining structure was found and mapped, so its original location is only approximated. There has been only one other prehistoric wooden weir found in Maine (on an inlet to Sebasticook Lake), which until recently (see FISHBIO article) was considered the oldest structure of its type in North America at about 6,000BP.

Since our initial finding and report, FOMB has conducted further mapping and dating in cooperation with the Maine Historic Preservation Commission. We have now found and mapped 12 post stubs and radiocarbon dating of posts 1, 2, 4, and 7 has yielded historical dates likely from the late 1700s to the early 1800s. Aside from the initial post found at the south end of the formal structure, we also found several associated wooden pieces at the north end, outside of the formal structure of post stubs (1–12). On the aerial drone image these are designated 13, 14, and 15 and all date back to approximately 3,600BP.

So, we appear to have orderly remnants of a historic fishing weir found on the site of a now more scraggly prehistoric structure, likely also a fishing weir, that at one point seemingly spanned most of the guzzle and extended slightly beyond the more recent structure. As Native Americans and colonists all knew, when it came to harvesting

Continued on next page

Merrymeeting Bay Weir Update, continued from page 1

protein on the hoof, paw, or fin, it was all about location, location, and location! Coincident to this local weir update, the adjacent article on worldwide weirs then and now, was published by FISHBIO. We hope you will enjoy the broad perspective it offers.

Ed Friedman

Weir stake #0
Photo: Ed Friedman

Worldwide Weirs: An Ancient Technology Used by Modern Scientists

Reprinted from: FISHBIO Fish Report: January 9, 2023
https://fishbio.com/worldwide-weirs-an-ancient-fishing-technology-used-by-modern-scientists/

As humans evolved, so did their fishing techniques, and one of the earliest of these is the fish weir. A weir is a structure in a stream, bay, or at the edge of a lagoon designed to trap fish. The recent discovery of a particularly ancient weir about 170 feet (52 meters) beneath the sea off the coast of Southeast Alaska has greatly altered our understanding of the historical timeline. The discovery, made by researchers with the Sealaska Heritage Institute, has pushed back the start date on how long humans have been using this technology by thousands of years. This 11,110-year-old structure not only supplies further evidence of the extensive legacy of native people in North America, but also provides historical context for the critically important fisheries management tool that the fish weir is today.

Stone-Age Tech: The Prehistoric Weir

Wooden weir on the United States east coast.
Photo: Shawn Harquail.

Because they were often made of organic materials like wood and reeds, fish weir remains rarely persisted to the modern day, and the weirs that were able to survive the centuries—generally those made of more rugged materials like stone—are challenging to date. Radiocarbon dating can be used to date wooden weirs. For weirs made of noncarbon materials like stone, scientists sometimes use bone piles from adjacent middens to estimate the age of the weir. In the case of the recently discovered weir in Alaska, the researchers used sea level reconstruction to estimate its age.

Prior to the recent discovery of the Alaskan weir, the oldest known weir in North America, dated nearly 6,000 years old, was a wooden structure in Sebasticook, Maine. However, the prehistoric use of fish weirs is not unique to North America. There are 8,000-year-old weirs located in Denmark and the Netherlands, 7,500-year-old weirs in Russia, 6,600-year-old weirs in Australia, and 6,000-year-old weirs in southern Africa. Ancient weirs were also discovered in the southern half of the New World, including a 5,000-year-old series of weirs in Bolivia, and 6,000-year-old stone weirs on an island off the coast of Chile. In addition, some scientists speculate, based on stone structures discovered on the shore of an ancient lake in the Kenya Rift, that the use of weirs may date back to 490,000 years ago, when the ancestors of modern humans roamed the earth. For comparison, the first fish hook wasn't crafted until the Upper Paleolithic time period, about 42,000 years ago.

Continued on next page

Worldwide Weirs, continued from page 2

The shape of these ancient weirs was informed by the ecological knowledge of the people who built them. Some were circular, others were wedge-shaped, and others were concentric circles of posts woven together with basketry. In rivers, weirs were designed to funnel fish as they moved with the river flow and trap them within the structure. Tidal weirs, on the other hand, were often stone walls constructed across low points along a lagoon, allowing fish to swim over the wall during high tide and trapping them once the tide receded. Some consider this method an ancient form of aquaculture, as fish could reside in these tidal weirs for extended periods of time before harvest.

The widespread use of weirs across cultures is demonstrated not only by archaeological findings, but also by the continued use of weirs and traps around the world today. The world's largest tidal weirs still stand off the shore of Taiwan, the longest use of stone weirs predating European contact can be observed on the island of Yap in Micronesia, and arrow traps are still widely used by fishers in the Tonle Sap Lake in Cambodia.

From Maligned to Mandatory—The Weir: After European Contact

The use of weirs as a cultural practice was eliminated by colonial rule in many places, but often not before settlers adopted the practice, causing catastrophic detriment to fish populations. In Alaska, for example, native people used weirs to harvest salmon for thousands of years prior to the arrival of Europeans. But when Alaska became a U.S. territory, fish canneries quickly built weirs spanning the full width of rivers, allowing them to capture entire spawning runs of salmon. The resulting salmon population crashes led the US government to ban full-river weirs in Alaska in 1889 and all stationary fishing gear in 1906. Similarly, the Canadian government in British Columbia passed laws to prohibit fisheries that native people established. The traditional practice of harvesting fish with weirs in Yap in Micronesia was eroded as they passed from Spanish, to Japanese, to German, to American rule.

Stanislaus River fish counting weir in California.

The rivers of Alaska wouldn't see another weir until the Alaska Department of Fish and Game recognized their value for fisheries monitoring in the 1950s. Weirs allowed managers to count returning spawners and provided a means of getting the data needed to make sure management was improving salmon numbers. Fish counting weirs quickly became a vitally important tool for the management of salmon fisheries, and by 2006 had made their way down the Pacific Coast to California. In fact, FISHBIO staff installed the very first fishing counting resistance board weir in California, located in Stanislaus River. Today, scientists rely on the data generated by fish counting weirs to assess changes in salmon populations related to harvest regulations, climatic conditions, dam operation, hatchery stocking practices, and numerous other factors. The information allows managers to make informed decisions on how to manage fisheries sustainably.

Food and Fisheries – The Future of the Weir

After thousands of years, weirs are still in use for their originally intended function: to catch fish to eat. In most cases, traditional methods of building and operating these fishing weirs provided a sustainable means of food production over the centuries. Although many cultural practices related to weir use have been undermined by colonization and globalization, today there are numerous movements to revitalize these ancient, sustainable fishing methods. In British Columbia, for example, there is an ongoing effort to revitalize ancient fish weir practices to promote environmental stewardship and aid in salmon monitoring. Similarly, there is a desire to revive traditional fish trap practices in Micronesia. To sustain fisheries into the future, it may be necessary to look deep into our past and revisit the traditional use of tools like the fish weir.

This article has been slightly edited for the Merrymeeting News.

Friends of Merrymeeting Bay 2022 Accomplishments

Media

Print, TV, internet (over 39): Merrymeeting Bay, Androscoggin upgrade, Chops lawsuit, land protection, PFAS lab study, Bowdoin history project, speaker series, GE salmon, PFAS watershed sampling, etc.

Volunteers

Approximately 1,975 volunteer hours (247 days)

50 volunteers

Membership

450 households

Newsletters (4)

Grants

$2,912 Education

$20,000 Chops/CMP lawsuit

$2,500 PFAS testing

Education

Zoom speaker series (300 registrants)

Bowdoin Central School history/film/theater project (80 students)

Speaker Series broadcasts on community cable TV

Website updates

Conservation and Stewardship

Additional easement work

36-acre conservation easement completed

Continuous landowner outreach

Ongoing easement monitoring

Maintain Pork Pt. field

Control Bowdoinham phragmites

Research

Water-quality monitoring (17 sites)

Shad-counting methodologies (Brunswick Dam)

Prehistoric/historic fish weir

PFAS lab comparison study

PFAS watershed survey

Advocacy (postings, letters, testimony, etc.)

Lower Androscoggin upgrade (passed)

Appeal of Pejepscot Dam Water Quality Cert. issued for Class C

Healthy Rivers/Healthy Gulf promoting safe fish passage

Various national efforts: NEPA, ocean plastics, ESA, climate, etc.

CMP Chops tower lighting: Filed Petition of Certiorari to SCOTUS

PFAS monitoring/detection at former Brunswick Naval Air Station and Androscoggin discharges

EMF health effects

GE Atlantic salmon

CMP Chops tower lighting: Filed/argued Maine Law Court nuisance lawsuit appeal

Predator killing contests

Primary Partners

The Archaeological Conservancy
Maine Coalition to Stop Smart Meters
Maine Historic Preservation Commission
Department of Inland Fisheries and Wildlife
Department of Marine Resources
Bowdoinham Public Library
Maine Land Trust Network
Brunswick Sewage District
Harraseeket Inn
Friends of Sebago Lake
Department of Environmental Protection
Downeast Salmon Federation
Native Fish Coalition
Maine Coast Heritage Trust
Grow L+A
Trout Unlimited, Maine Chapter
Environmental Health Trust
Piti Theatre
Bowdoin Central School
Earthjustice
Patagonia
Save the Colorado
Center for Food Safety
Bath Savings Institution
New England Foundation for the Arts

From the Chair

Continuously evolving and highly transmissible COVID-19 variants in 2022 continued to crimp our in-person education programming, but like the virus, FOMB adapted—both with technology and with a more structured approach to our live programming in area elementary schools. Look for results of our Bowdoin Central School living history theatre project later this spring. In other areas, FOMB moved ahead at full speed petitioning the US Supreme Court to hear our CMP case regarding the Chops towers (with only a 1% chance of being accepted for the docket, we were not accepted, but we had a great case and we tried), conducting a detailed laboratory comparison study for the testing of PFAS chemicals in water, and then completing the first ever PFAS survey of our lower watershed's surface waters.

After years of trying, and with the help of several valuable allies, FOMB was successful in getting a classification upgrade of the lower Androscoggin River that should ensure higher levels of dissolved oxygen and lower levels of bacteria, helping all life using and living in the river. Between the time this bill was signed into law and technically went into effect (90 days after the end of the legislative session), the DEP abused their discretion by issuing a water-quality certificate in the relicensing of Pejepscot dam (in the middle of the upgrade area) allowing continued compliance with Class C conditions for the next 40 years, rather than with the new Class B standards. We are of course appealing this to the Board of Environmental Protection. The appeal and hearing are scheduled for April 6. One of the things members appreciate about us is our unwillingness to back down in the face of adversity when it comes to protecting the environment.

Our popular and well-attended winter speaker series enters its 26th year, and our active land protection continues with the addition of a 36-acre conservation easement along the Kennebec in Bowdoinham and a couple of other easements in progress. We have made great archaeological headway, gaining further details on the Merrymeeting Bay fish weir remnants found a year ago.

Our many enthusiastic volunteers continue detailed water, land, and fish monitoring, education efforts, and assisting with various administrative aspects of FOMB. Your Steering Committee continues strong and engaged. These remain challenging times, not only for winter ice formation but economically, socially, politically, and environmentally. Thank you all for helping us through!

Respectfully submitted,
Ed Friedman, Chair

FOMB Preliminary 2022 Financial Statement

We have not yet received all the information to officially close our books on the prior fiscal year, but the critical numbers are certain, and I am pleased to offer a preliminary summary of FOMB financial results for 2022.

Receipts exceeded expenses by $13,400 last year and key revenue sources + expense drivers are broken out in the schedule below. Total unrestricted liquid assets are approximately $401,000 with an additional $49,500 in restricted stewardship funds for a total of $450,500. Reinforcing our organization's focus on devoting resources towards getting things done, the summary below reveals over 90% of outlays went towards program work, with a bare minimum used for fundraising and administration. FOMB members continue to get a big bang for your buck!

Respectfully submitted,
Vance Stephenson, Treasurer

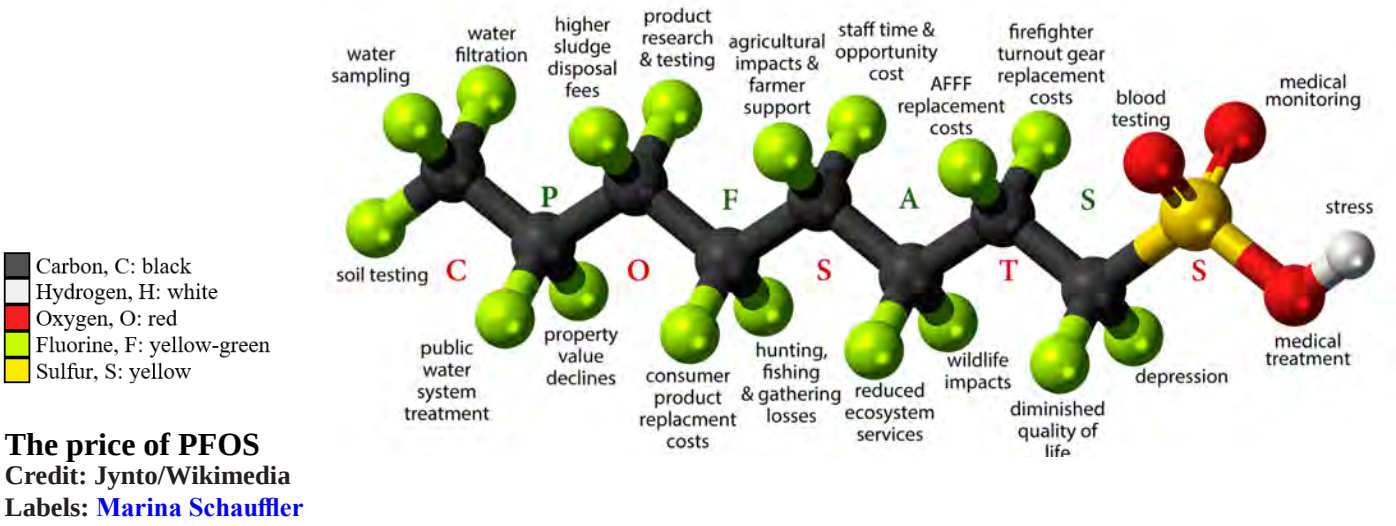
2022 Income $80,700		**2022 Expenses $67,300**	
Membership	35%	Programs	91%
Grants	31%	Administration	5%
Annual Appeal	24%	Membership & Fundraising	4%
Other	10%		

Cash income less cash expense for 2022: $13,400

The PFAS Brunswick Really Needs to Worry about

As a resident of Brunswick, I have been struck by the care and attention the Town of Brunswick is making regarding the concerns for the presence of PFAS in the artificial turf installation proposed by Bowdoin College. However, there is a much greater PFAS problem facing the town that has not been given similar attention.

It is long beyond time for action by the Town of Brunswick to demand the State of Maine end the ongoing, everyday transport of PFAS by the Navy and Midcoast Regional Redevelopment Authority (MRRA) draining north via ground and surface waters into the Androscoggin River and south from Brunswick Landing leading to Mere Creek (aka Mare Brook) and Harpswell Cove. Many citizen efforts to delay residential development at the former air station until this concern has been remediated have been unaddressed by the town, even though the actual PFAS contamination exists and continues to migrate unabated into our storm and surface waters. This is a present and ongoing threat to Brunswick residents and local wildlife.



The price of PFOS
Credit: Jynto/Wikimedia
Labels: Marina Schauffler

While the Brunswick Topsham Water District is taking emergency measures to contend with PFAS chemicals originating from the former base that are contaminating its Jordan Avenue well field, the town has demanded nothing with regard to the PFAS flowing into the Androscoggin River and the stormwater and surface waters at Brunswick Landing flowing into Mere Creek. Recent testing by the Navy shows concentrations of PFOA and PFOS in stormwater above 8,500 nanograms per liter (ng/l). These levels are significantly above Maine's drinking water standard of 20 ng/l for the sum of six PFAS, including PFOA and PFOS. November 29, 2022 Friends of Merrymeeting Bay water samples from a creek mouth draining the north end of Brunswick Landing into the Androscoggin show PFOA levels 5,350 times the EPA health advisory level for drinking water and PFOS levels of nearly 12,000 times the advisory level.

Not only do we have ongoing impacts from the existing PFAS contamination, but MRRA maintains approximately 9,300 gallons of Navy legacy aqueous film forming foam (AFFF) stored in hangers on site, of which approximately 3,000 gallons of AFFF are the older PFOS-based fire retardant. One teacup of an inadvertent spill of this AFFF can contaminate millions of gallons of water posing a significant future threat to the community. Neither MRRA, nor the Town of Brunswick have the ability to address the risk of an exposure of this magnitude, and yet everyone has decided to focus on artificial turf in which the PFAS is at least encapsulated.

In addition to the threat of a catastrophic spill of stockpiled AFFF, high levels of PFAS have been detected at the airport stormwater outfalls. The airport stormwater system is regulated by Maine DEP and according to EPA's website, the stormwater permit issued by DEP has expired. Nevertheless, despite being aware that PFAS levels at the outfalls are more than 100 times Maine's drinking water standard, DEP continues to allow the airport to discharge this polluted stormwater. Recently EPA recommended that states require PFAS monitoring, and in some cases pretreatment, of discharges at airport facilities, but DEP has not implemented these recommendations to date. The State has provided DEP with more than $300 million to address PFAS, yet at the former Brunswick Naval Air Station, the stormwater

Continued on next page

The PFAS Brunswick Really Needs to Worry about, continued from page 6

contamination and off-site transport, some of the worst in the state, remains unaddressed. The Town has demanded nothing of the Navy, MRRA, nor of the state to address these issues.

The Town of Brunswick needs to act and demand immediate removal of the thousands of gallons of legacy AFFF material from the property. Furthermore, the Town needs to require DEP to implement the EPA's recommendations aimed at restricting discharges of PFAS into surface waters of the state, especially on this former military installation in Brunswick, where extremely elevated levels of PFAS are present, have contaminated our public drinking water supply, and are contaminating Harpswell Cove and Merrymeeting Bay. It is time the Town of Brunswick do everything in its power to ensure an end to this present and ongoing PFAS exposure risk and take all action to ensure a future discharge, which will be catastrophic, does not occur.

Josh Katz

Ed. note: This is a slightly edited version of a Letter to the Editor appearing in the Portland Press Herald/Times Record on 1/24/23.
https://www.pressherald.com/2023/01/24/letter-to-the-editor-the-pfas-brunswick-really-needs-to-worry-about/

We Need You! Please Support Our Important Work

FOMB Leadership

Our accomplishments are due to the hard work of dedicated volunteers, especially those who serve on our committees. If you want to get involved and serve, please contact the committee chair or Ed Friedman. We always welcome member input and we'd love for you to join us!

Steering Committee
Ed Friedman, Chair (Bowdoinham)
Vance Stephenson, Treasurer (Beavercreek, OH)
Tom Walling, Secretary (Bowdoinham)
Simon Beirne (Gardiner)
Becky Bowes (Brunswick)
Phil Brzozowski (Brunswick)
Nate Gray (Vassalboro)

Education Committee
Betsy Steen, Co-Chair, 666-3468
Tom Walling, Co-Chair, 666-5837

Conservation and Stewardship Committee
Chair Vacancy

Membership and Fundraising Committee
Nate Gray, Chair, 446-8870

Research and Advocacy Committee
Ed Friedman, Chair, 666-3372

Friends of Merrymeeting Bay · PO Box 233 · Richmond, Maine 04357

Membership Levels

☐ $1,000+ Sturgeon
☐ $750 American Eel
☐ $500 Wild Salmon
☐ $250 Striped Bass
☐ $100 Shad
☐ $50 Alewife
☐ $20 Smelt
☐ Other

Name _____

Address _____

Town/State/Zip _____

Phone _____ Email _____

☐ $7 Enclosed (optional) for a copy of Conservation Options: A Guide for Maine Land Owners [$5 for book, $2 for postage].

☐ Renewal
☐ New Member
☐ Send information about volunteer opportunities
☐ I would like a sticker

Thanks to Rebecca Bowes for newsletter layout.

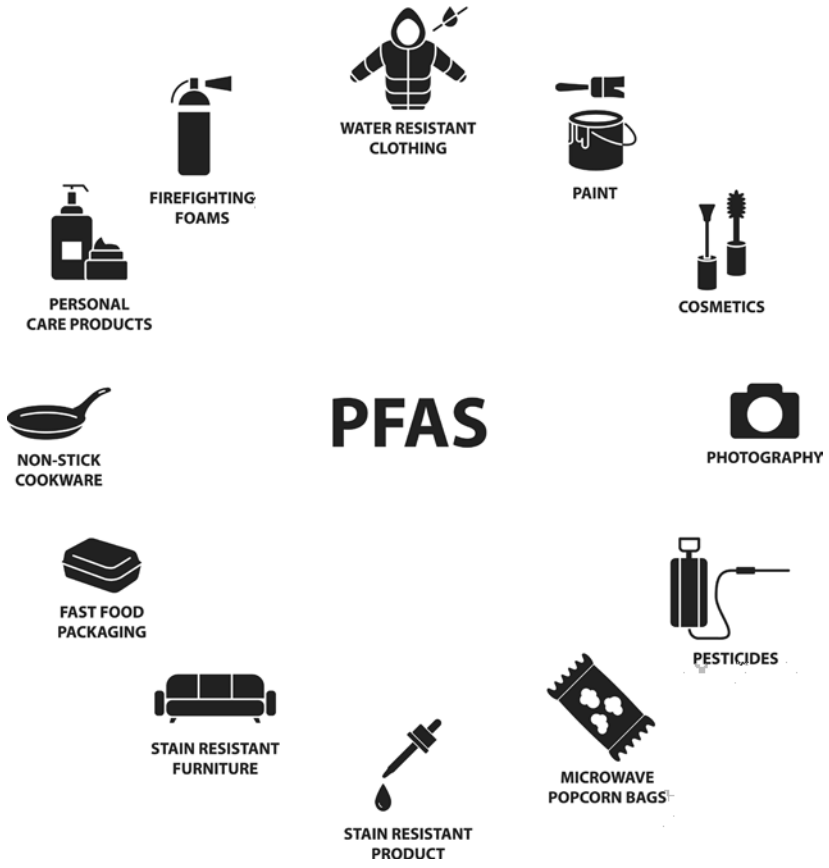
Friends of Merrymeeting Bay
P.O. Box 233
Richmond, ME 04357

Return Service Requested

NON-PROFIT
ORGANIZATION
PAID
PERMIT NO. 1
Dresden, ME

Printed on Genesis Writing. 100% Recycled, 100% post-consumer waste, processed chlorine-free.

PFAS: Forever and everywhere chemicals



Graphic: Shutterstock