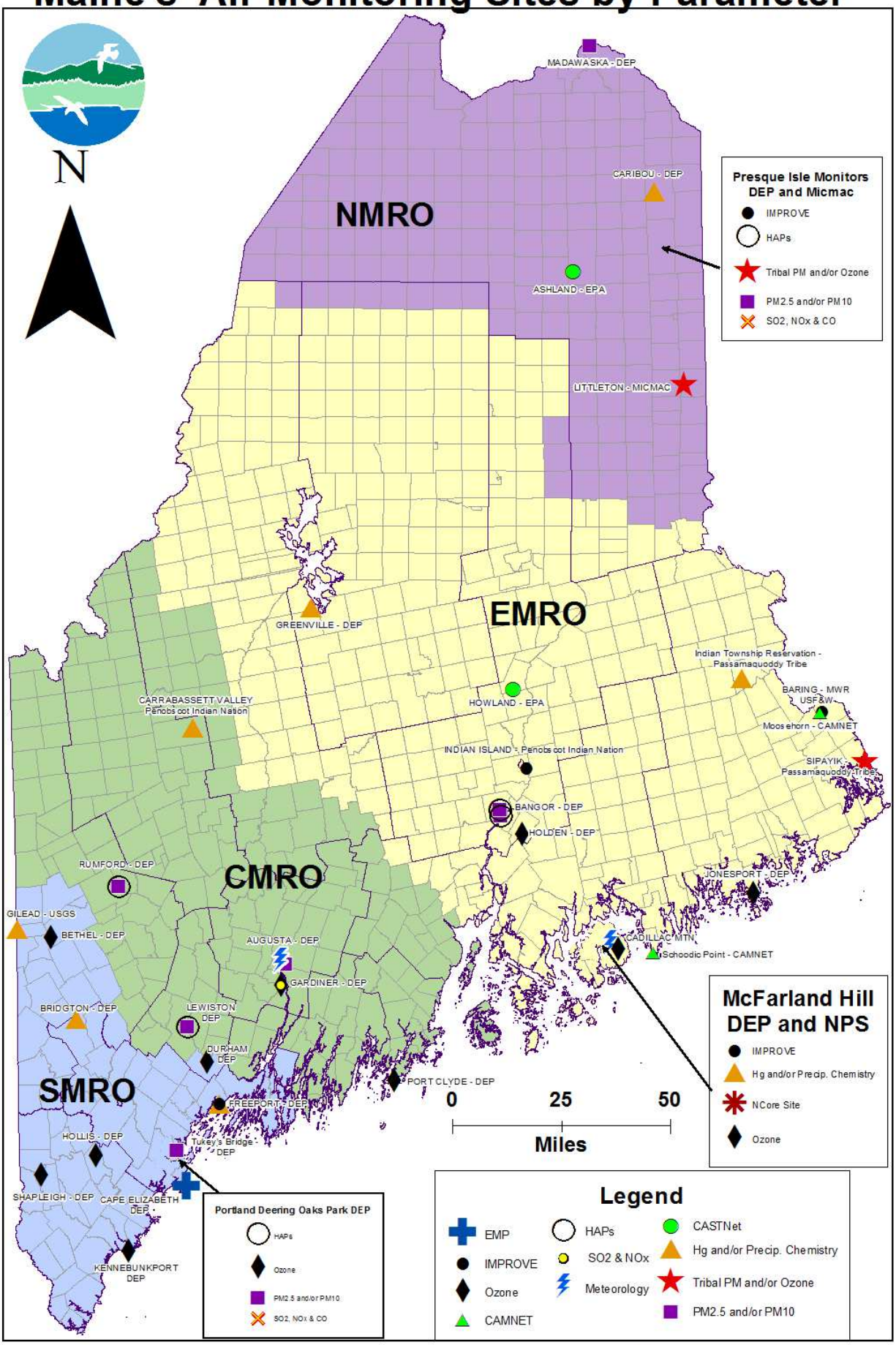
Annual Air Monitoring Plan 2019

Maine Department of Environmental Protection
Bureau of Air Quality
July 20, 2018

Maine's Air Monitoring Sites by Parameter



Data Source MEGIS and MEDEP; updated 1/31/2018

Introduction

The Maine Department of Environmental Protection (DEP) Bureau of Air Quality (BAQ) operates and maintains a network of air samplers in the state to evaluate ambient air quality in Maine. The Code of Federal Regulations (CFR) and the Federal Environmental Protection Agency (EPA) requires state and local agencies to conduct ambient air quality monitoring to determine whether the ambient concentrations of pollutants in the state exceed ambient air quality standards. The State of Maine remains in attainment with all ambient air quality standards. Air quality data also documents trends that may be occurring in the concentrations of these pollutants, supports the Maine DEP in providing background information for the licensing program and, when necessary, the development of pollution control strategies. For many of the monitored pollutants, BAQ maintains an automated polling and reporting technology that provides continuous hourly data to the public and scientific community. These data are also used for timely forecasting of regional air quality conditions for Maine citizens and visitors to the state.

The Maine BAQ has been monitoring air quality in Maine since the DEP was formed in 1972, working in partnership with the EPA to uphold the tenets of the 1970 Clean Air Act and subsequent amendments. The BAQ is responsible for most of the ambient air quality monitors located in Maine. Additional monitoring is conducted by several federal agencies such as the EPA, the National Park Service, the U.S. Fish and Wildlife Service, the U.S. Geological Survey, as well as by several of the Indian tribes in Maine. In 2007, Maine BAQ entered into a Primary Quality Assurance Organization (PQAO) agreement with the Aroostook Band of Micmacs, the Passamaquoddy Tribe at Pleasant Point and the Penobscot Indian Nation in Maine to conduct air monitoring with shared quality assurance plans, practices and procedures.

The air-monitoring program in Maine has evolved as air quality standards have tightened, scientific knowledge has improved, the levels of concern for different pollutants have evolved, and the technology to monitor these pollutants has developed. The DEP initially concentrated resources on neighborhood monitoring of air pollutants, primarily from local sources. As the impact on the ambient environment from local sources was reduced, the state monitoring network began to focus on establishing statewide background levels and improving air quality forecasts.

Maine is a state with many regions of varying topography. Pollutant impacts in one area of the state may be very different from pollutant impacts in another area. Mountain valleys in the western part of the state may experience higher pollution levels at times because of atmospheric inversions, which trap ground-level pollution in the valleys for extended periods, whereas the coastal locations, with higher dispersion of pollutants due to the constant onshore and offshore winds, may not. Aroostook County may record higher particulate levels because of widespread farming operations and the type of soil found in the county. Southern Maine may record higher ozone levels because of air masses originating from other areas of the U.S. Some pollutants monitored may come from the other side of the world, such as particulates from volcanic eruptions, large forest fires, or emissions from less-controlled sources in some of the rapidly developing countries around the world.

The DEP must also deal with changing federal regulations. As more data are collected and more health study results are published, the impacts of various pollutants are reviewed. Pollution standards and controls may need to be updated to reflect revised recommendations. The EPA is required to review the National Ambient Air Quality Standards (NAAQS) every five years. Changing standards may mean the implementation of additional monitoring requirements. A list of the current State and National Ambient Air Quality Standards (NAAQS) is presented below.

National Ambient Air Quality Standards (NAAQS)

from: https://www.epa.gov/criteria-air-pollutants/naaqs-table
(as of July 2018)

The EPA has set National Ambient Air Quality Standards for six principal pollutants, which are called "criteria" air pollutants. The current standards are listed below: million (ppm) by volume, parts per billion (ppb) by volume, and micrograms per cubic meter of air ($\mu g/m^3$).

Pollutant [links to historical tables of NAAQS reviews]		Primary/ Secondary	Averaging Time	Level	Form
Carbon Monoxide (CO)		primary	8 hours	9 ppm	Not to be exceeded more than once per year
			1 hour	35 ppm	
Lead (Pb)		primary and secondary	Rolling 3 month average	0.15 $\mu g/m^3$ (1)	Not to be exceeded
Nitrogen Dioxide (NO_2)		primary	1 hour	100 ppb	98th percentile of 1-hour daily maximum concentrations, averaged over 3 years
		primary and secondary	1 year	53 ppb (2)	Annual Mean
Ozone (O_3)		primary and secondary	8 hours	0.070 ppm (3)	Annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years
Particle Pollution (PM)	$PM_{2.5}$	primary	1 year	12.0 $\mu g/m^3$	annual mean, averaged over 3 years
		secondary	1 year	15.0 $\mu g/m^3$	annual mean, averaged over 3 years
		primary and secondary	24 hours	35 $\mu g/m^3$	98th percentile, averaged over 3 years
	PM_{10}	primary and secondary	24 hours	150 $\mu g/m^3$	Not to be exceeded more than once per year on average over 3 years
Sulfur Dioxide (SO_2)		primary	1 hour	75 ppb (4)	99th percentile of 1-hour daily maximum concentrations, averaged over 3 years
		secondary	3 hours	0.5 ppm	Not to be exceeded more than once per year

(1) In areas designated nonattainment for the Pb standards prior to the promulgation of the current (2008) standards, and for which implementation plans to attain or maintain the current (2008) standards have not been submitted and approved, the previous standards (1.5 µg/m3 as a calendar quarter average) also remain in effect.

(2) The level of the annual NO2 standard is 0.053 ppm. It is shown here in terms of ppb for the purposes of clearer comparison to the 1-hour standard level.

(3) Final rule signed October 1, 2015, and effective December 28, 2015. The previous (2008) O3 standards additionally remain in effect in some areas. Revocation of the previous (2008) O3 standards and transitioning to the current (2015) standards will be addressed in the implementation rule for the current standards.

(4) The previous SO2 standards (0.14 ppm 24-hour and 0.03 ppm annual) will additionally remain in effect in certain areas: (1) any area for which it is not yet 1 year since the effective date of designation under the current (2010) standards, and (2)any area for which an implementation plan providing for attainment of the current (2010) standard has not been submitted and approved and which is designated nonattainment under the previous SO2 standards or is not meeting the requirements of a SIP call under the previous SO2 standards (40 CFR 50.4(3)). A SIP call is an EPA action requiring a state to resubmit all or part of its State Implementation Plan to demonstrate attainment of the required NAAQS.

Network Overview

By July 1st of each year, the DEP is required to submit to the EPA a proposed monitoring plan for the next calendar year. In 2006, the EPA also required states to make their proposed plan available for a 30-day comment period prior to submittal to the EPA. The DEP annual monitoring plan is constantly subject to change as standards are revised, new pollutants of concern are identified, monitoring sites are no longer acceptable to property owners and staffing and budget cuts affect the ability to meet a program objective. Consequently, the monitoring plan proposed in this document is our best effort to project what we will be able to do next year given our current standards, staffing, and budget constraints.

The Maine DEP BAQ monitors air quality as required by the 1970 Clean Air Act and subsequent amendments, the Code of Federal Regulations (CFR), and the Federal Environmental Protection Agency (EPA.) Much of the monitoring effort focuses on the six criteria pollutants: ground level ozone, particulate matter, sulfur dioxide, and nitrogen dioxide, carbon monoxide and lead.

Ozone monitoring continues to be a priority for DEP. Ozone at ground level can trigger a variety of health problems, particularly in young children, the elderly, and those with health problems. It is also harmful to vegetation, buildings and infrastructure. Ground level ozone is not usually emitted directly into the air from any source, but it is created through the presence of sunlight acting on other airborne pollutants like those found in vehicle exhaust, chemical solvents and gasoline vapors. Since the Clean Air Act of 1970, Maine has operated ozone monitoring stations at many locations, each selected to optimize the assessment of ozone levels across the state.

Quantification of fine airborne particulate matter ($PM_{2.5}$) is another major component of the DEP ambient monitoring program. Particulate matter (PM) is the term used for any air borne mixture of solid particles and liquid droplets, such as those found in soot, dust, and smoke. The particles can be large enough, like pollen, to be seen with the unaided eye, while others are so fine that they can only be detected with electron microscopes. Of particular concern are those particles, generally 10 microns in size (PM_{10}) and less, which are inhalable, for they can become lodged in the lungs and even enter directly into the bloodstream. Fine particulate ($PM_{2.5}$) monitoring in Maine has been evolving since 1999 when the program was initially established. The Total Suspended Particulate (TSP) and PM_{10} program in Maine began shortly after the DEP was established in 1972. Recent DEP efforts have focused on introducing more of the continuous $PM_{2.5}$ monitors into the network.

Nitrogen dioxide (NO_2) is one of a group of highly reactive gasses known as "oxides of nitrogen," or "nitrogen oxides (NO_x)." EPA's National Ambient Air Quality Standard uses NO_2 as the term representing the larger group of nitrogen oxides that include NO, NO_2, NO_x, and NO_y. Nitrogen Oxide (NO) is created during the combustion stage of engine and boiler operations. The NO, NO_2, NO_x, and NO_y forms of nitrogen oxides react at different rates in the atmosphere in a process that is dependent on sunlight and temperature. NO_x is measured at ground level while NO_y is the reactive form measured at ten meters above ground level. In addition to contributing to the formation of ground-level ozone and fine particle pollution, the oxides of nitrogen are linked with a number of adverse effects on the respiratory system.

Sulfur dioxide (SO_2) and a group of other sulfur oxides, collectively known as SO_x, are emitted into the atmosphere from the burning of fossil fuels by power plants, industrial facilities, ships, locomotives and heavy equipment. Short-term exposure to SO_2 and SO_x compounds can harm the respiratory system. Children, the elderly, and those with asthma or other breathing troubles are particularly sensitive to these sulfur compounds.

Carbon monoxide (CO) is another harmful gas emitted from combustion processes. Most of this colorless, odorless yet extremely harmful gas comes from mobile sources like cars and trucks and found primarily in the United States in and around large urban areas. CO reduces the amount of oxygen that can be absorbed by the body, particularly the heart and brain. At high concentrations, CO can lead to death.

Lead (Pb) in the atmosphere is emitted as particles - mainly from smelters, ore and metal processing facilities, waste incinerators, public utilities and lead-acid manufactures. Piston aircraft continue to use leaded aviation fuel. Since tetraethyl lead was removed from motor vehicle fuel, the ambient levels of lead in Maine dropped significantly and concentrations are currently at or below minimum detection limits for most Pb monitors.

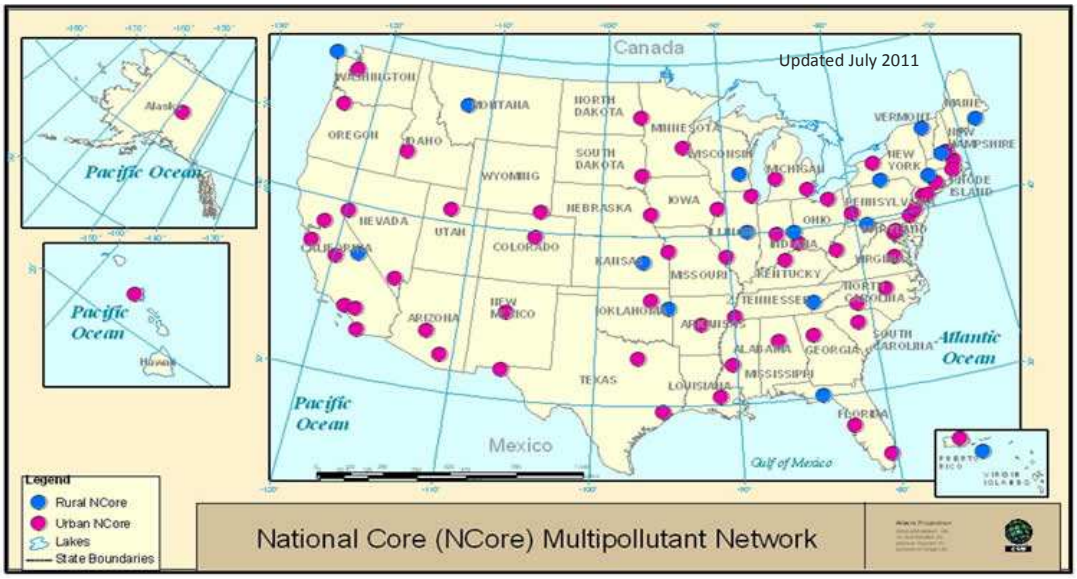
The DEP also tests the ambient air for many, non-criteria, yet hazardous air pollutants (HAPs) in the state. Because of this effort, a priority list of hazardous pollutants has been established and DEP is establishing background concentrations for several of the pollutants on the list. The list is modified as additional data becomes available.

The following section details the individual networks for the various parameters monitored in Maine, any changes that are proposed, and present any identified future needs for monitoring.

Monitoring Networks

Most of the sites in the Maine air-monitoring network are designated as **SLAMS** - State & Local Air Monitoring Stations. The SLAMS in Maine are part of a standardized, national network administered by the EPA in accordance with the Clean Air Act and subsequent Federal Regulations. Every state must monitor for the criteria air pollutants, following strict criteria set by EPA that govern all aspects of the monitoring and reporting process. SLAMS sites must meet all stringent monitor siting requirements and utilize specified equipment types. The pollution monitoring instruments at these sites must be approved by the EPA, and be designated as either Federal Reference Method (FRM) or Federal Equivalence Method (FEM). In addition, SLAM site operators must follow all quality assurance criteria, and must submit detailed quarterly and annual monitoring results to EPA. Data from SLAMS stations are used to determine attainment/nonattainment areas.

Established in 2011, the **NCore** (National Core) network is comprised of a specialized subset of SLAMS sites.



https://www3.epa.gov/ttnamti1/ncorenetworks.html

The purpose of the NCore network, in addition to aiding in the determination of nonattainment/attainment areas, is to provide data to the scientific community, from a specific suite of monitors, that is used to make health and ecosystem assessments, to establish long-term trends for criteria and certain precursor pollutants, and to develop and evaluate pollutant transportation models. The NCore site in Maine, located at McFarland Hill in Acadia National Park, near Bar Harbor, is designated as a rural or background site. At McFarland Hill the following suite of parameters is monitored:

$PM_{2.5}$ speciation	Organic and elemental carbon, major ions and trace metals (24-hour average; every 3rd day); IMPROVE or CSN
$PM_{2.5}$ FRM mass	Filter-based 24 hr. average every 3rd day
Continuous $PM_{2.5}$ mass	1 hour reporting interval; FEM or pre-FEM monitors
$PM_{(10-2.5)}$ mass - aka PM_{coarse}	Filter-based 24 hr. average every 3rd day
Ozone (O_3)	Continuous, capable of trace levels (low ppm)
Carbon monoxide (CO)	Continuous, capable of trace levels (low ppm)
Sulfur dioxide (SO_2)	Continuous, capable of trace levels (low ppb)
Sulfate ion (SO_4)	Continuous, capable of trace levels (low ppm)
Nitrogen oxide (NO)	Continuous, capable of trace levels (low ppb)
Total reactive nitrogen (NO_y)	Continuous, capable of trace levels (low ppb)
Surface meteorology	Continuous wind speed and direction (reported as "Resultant"), temperature, RH

The **CASTNet** (Clean Air Status and Trends Network) is a nationwide monitoring operation that collects air pollutant concentrations to evaluate the effectiveness of national and regional emission control programs, to determine compliance with the National Ambient Air Quality Standards for ozone, and to determine rural trends in ozone, nitrogen and sulfur concentrations. It was established in 1991 as a cooperative program with the EPA, the National Park Service, and state and local partners. CASTNet site locations in Maine are at Ashland, Howland and at Acadia. The data are now incorporated in several regional air quality models. https://www.epa.gov/castnet

RadNet has more than 130 radiation air monitors in 50 states. Maine has two RadNet sites, one in Portland operated by DEP, and one in Orono. https://www.epa.gov/radnet The EPA's Radiation Network runs 24 hours a day, 7 days a week collecting near-real-time measurements of gamma radiation. The RadNet program monitors the nation's air, precipitation and drinking water to track radiation in the environment. Over time, RadNet sample testing and monitoring results show the fluctuations in normal background levels of environmental radiation. The RadNet system will also detect higher than normal radiation levels during a radiological incident.

Gamma radiation comes from many different radioactive elements, both natural and man-made. Able to penetrate several feet of concrete or a few inches of lead, gamma particles can pose a serious health threat inside and outside the body and the radiation can be lethal depending on the amount received. Scientists use the properties of gamma radiation to detect the presence of radioactive elements. RadNet stationary air monitors measure gamma radiation emitted from airborne radioactive particles as they collect on the exposed filters. Tracking gamma radiation over time helps to create a picture of the background (normal) levels and allows EPA scientists to detect anomalies.

The Maine DEP operates other **Special Purpose Monitors** around the State. These are often set at locations to monitor specific pollutants for a period, usually not exceeding two years, to investigate localized complaints, or to reconnoiter a location for a possible long-term site.

The Deering Oaks Park site in Portland is a special long-term special purpose site. It is in a location, determined by the American Lung Association, as being representative of the greater Portland area. Monitoring results at the site are used to provide data useful in tracking relationships between pollutant levels and emergency department visits. Since the Deering Oaks Park location does not meet SLAMS siting requirements, the ozone and nitrogen dioxide data are not used in determining attainment or nonattainment status for criteria pollutants. The information is useful however for other purposes such as air quality forecasting and modeling.

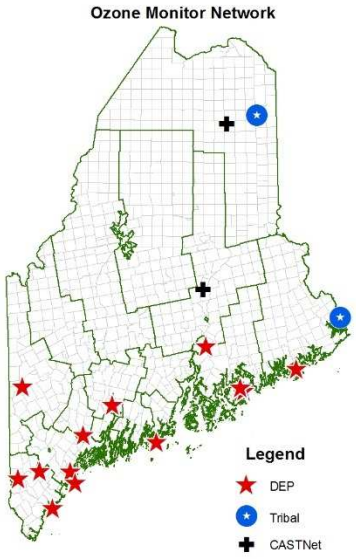
A continuous $PM_{2.5}$ monitor operated as a special purpose monitor at the Carrabassett Valley Town Office from November 2016 to September 6, 2017. The hourly $PM_{2.5}$ values were expected to be helpful in forecasting inversions in the Western Mountains Region of Maine. The reported values were lower than anticipated and data from the long-running Rumford monitoring site provided similar information, so the CVTO site was discontinued.

The EPA, National Park Service, U.S. Fish and Wildlife Service (USFWS) and the U.S. Geological Survey each operate monitoring sites in Maine as part of their respective national networks.

The Aroostook Band of Micmacs, the Passamaquoddy Tribes at Indian Township and Sipayik, and the Penobscot Nation each operate several monitoring sites in Maine. These are independently managed but each tribe has agreed to operate their sites in accordance with Maine DEP Quality Assurance Project Plans.

Other long-term specialized networks including IMPROVE, MDN, CAMNET and PAMS are discussed in more detail below.

Ozone Network



The DEP currently operates ground level ozone monitoring sites throughout the state in accordance with SLAMS network requirements. Three of the Maine DEP sites operate year-round while the remainder are "seasonal sites." The EPA operates two ozone sites, in Ashland and Howland, as part of the CASTNet. The ozone site in Howland is at tree top level and the Portland Deering Oaks site is within a metropolitan setting so the data from these two sites are not used for regulatory purposes. In January 2018, the Penobscot Nation at Indian Island chose to discontinue their ozone monitoring program and focus their efforts into addressing indoor air quality of tribal citizens. Two other ozone sites in Maine are operated by Maine Indian tribes.

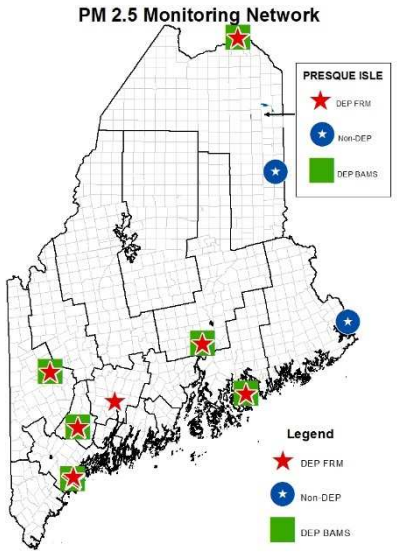
Situating an ozone monitor somewhere on the coast of Maine within the large gap between ozone sites at Cape Elizabeth and Port Clyde remains a BAQ objective. No changes to the existing ozone monitoring network are anticipated in 2019.

Although the federally required ozone season for Maine runs from April through September, most of the Maine sites now operate from the first of March through the first of October, weather permitting. The Maine sites are scattered throughout the state, with most of them situated along the coast and in southern Maine. The highest ozone concentrations tend to occur along the coast because plumes of contaminated air are often transported into the Gulf of Maine from metropolitan areas to the south. These air masses are subsequently blown ashore and

carried inland. In addition to determining attainment/nonattainment status, the ozone sites in Maine collect data that is used by the mapping and forecasting programs to provide the public and scientific community with quality data in a timely fashion and to forecast air quality alerts when necessary.

Ozone Monitoring Site Address	Site Type	Monitoring Objective	Sampling Frequency
Ashland - Loring AFB	CASTNet	Background	Continuous
Bar Harbor - McFarland Hill	NCore & CASTNet	Transport, Background	Continuous
Bar Harbor - Top of Cadillac Mountain	SLAMS	Transport	Continuous - Seasonal
Bethel, Smith Farm Road	SLAMS	Max. Conc., Transport	Continuous - Seasonal
Cape Elizabeth - Two Lights State Park	SLAMS	Transport	Continuous
Durham - Fire Station - Route 9	SLAMS	Max. Concentration	Continuous - Seasonal
Gardiner - Pray Street, Schoolyard	SLAMS	Max. Conc., Transport	Continuous - Seasonal
Holden - Rider Bluff	SLAMS	Max. Conc., Transport	Continuous - Seasonal
Howland - Ameriflux Site	CASTNet	Treetop Canopy Level	Continuous
Jonesport - Public Landing	SLAMS	Max. Concentration	Continuous - Seasonal
Kennebunkport - Parsons Way	SLAMS	Max. Conc., Transport	Continuous - Seasonal
Perry - Pleasant Point/Sipayik, 184 County Road	Tribal	-	Continuous
Port Clyde - Marshall Point Lighthouse	SLAMS	Max. Conc., Transport	Continuous - Seasonal
Portland - Deering Oaks	SPMS	High Pop. Exposure	Continuous
Presque Isle - 8 Northern Road	Tribal	-	Continuous
Shapleigh - Ball Park, West Newfield Road	SLAMS	Max. Conc., Transport	Continuous - Seasonal
West Buxton - Plains Road Fire Dept.	SLAMS	Transport	Continuous - Seasonal

$PM_{2.5}$ Network



In 1999, the DEP began a $PM_{2.5}$ monitoring program, on one day in three or one day in six sampling schedules, using filter-based samplers that met the Federal Reference Method (FRM), with 15 sites started up during the first year of operation. After three years of data collection demonstrated compliance with the $PM_{2.5}$ standard at all the sites, some of the samplers were relocated or modified to collect PM_{10} data. Currently the DEP is monitoring for $PM_{2.5}$ using the filter-based FRM samplers at 11 sites. Continuous FEM $PM_{2.5}$ monitoring is being conducted at three Tribal sites. All the current sites continue to comply with the $PM_{2.5}$ standard yet they remain in operation to gather additional trend data and to document future attainment status. $PM_{2.5}$ filters can be analyzed to determine levels of some of the hazardous air pollutants that are on the priority list.

The DEP initiated continuous monitoring of $PM_{2.5}$ in 2000 using Tapered Element Oscillating Microbalance (TEOM) samplers. The continuous monitors generate hourly average data that is available in near real-time and very useful in helping to forecast air quality. TEOM sites were set up in Bangor, Bar Harbor, Greenville, Lewiston, and Portland. The Passamaquoddy Tribe operates a TEOM monitor in Perry, and the Micmac Tribe operates TEOM monitors in Presque Isle and Littleton. The TEOM models employed in Maine were not an EPA-approved Federal Equivalent Method (FEM), and the DEP did not pursue the required analysis to exclude the use of their data for comparison with the $PM_{2.5}$ standards.

In 2012, the TEOMs were nearing the end of their expected life cycle, so that year the DEP initiated a program to procure new continuous $PM_{2.5}$ monitors known as Beta Attenuation Monitors (BAM). The BAMs are an EPA-approved FEM, so Maine DEP monitors $PM_{2.5}$ NAAQS using both the filter-based FRM and the continuous FEM monitors throughout the state. BAMs replaced the TEOMs in Lewiston, Bangor, and Bar Harbor. The TEOM in Portland remained in operation alongside the new BAM for comparison of methods until the end of June 2015. Initially the BAMs were installed to supplement the filter-based FRM samplers at locations in Madawaska, Presque Isle, and Rumford. In November 2015, a "stand-alone" continuous $PM_{2.5}$ monitor was started up at a special purpose monitoring site in Carrabassett Valley. The DEP determined that the PM data collected at the Carrabassett Valley was not significantly different from the data being collected at Rumford, so the special purpose monitoring project in Carrabassett Valley was shut down in early September 2017.

The continuous, hourly averaged $PM_{2.5}$ record are reported in near real time to both the ME DEP web page and the EPA AirNow web site. Access to this continuous $PM_{2.5}$ data has permitted better forecasting for particulate levels under specific weather conditions for many parts of the state. The Rumford and Carrabassett Valley sites were chosen to meet a long-standing interest in having real-time continuous data from western mountain valley locations. Complex meteorological conditions in Maine's western mountains and the subsequent dispersion of fine particulates like wood smoke are of particular interest to the DEP as it strives to produce better air quality forecasts in a region with few monitors and sparse data. The BAQ is considering the replacement of some the older FRM filter-based samplers with continuous $PM_{2.5}$ monitors for more real-time hourly data, but the BAQ is not yet satisfied with the correlations between continuous and filter based results, especially at the low concentrations often found in the State. As confidence increases and additional continuous monitors are purchased, ME DEP will be able to establish a collocated pair of continuous monitors, and subsequently stand-alone NAAQS compliant continuous $PM_{2.5}$ monitoring sites.

When the Bangor, Kenduskeag Pump Station site was established in 1978, the location was chosen because of the heavy traffic pattern in the area. Changes in road, bridge and highway configurations over the years have resulted in a significant reduction in the number of vehicles encountered at that monitoring site. BAQ staff, working with the Bangor School District established a suite of $PM_{2.5}$ and HAPs monitors on the roof of Mary Snow Elementary School in August 2017. This new site is located about 1.3 miles north of the "historic" monitoring site at the Kenduskeag Pump Station. The BAQ intends to run both monitoring stations for at least one year to establish a relationship between the two sites. At that time, in consultation with EPA staff, the BAQ will decide which of the two sites will remain in operation.

No other $PM_{2.5}$ changes are anticipated for 2019. The following table lists the continuous and filter based sampler sites in Maine.

$PM_{2.5}$ Monitoring Site Address	**Site Type**	**Monitoring Objective**	**Sampling Method and Frequency**
Augusta – Lincoln Street School	SLAMS	200K Pop. Coverage	FRM, every 6 days
Augusta – Lincoln Street School	SLAMS	Collocated	FRM, every 12 days
Bangor – Kenduskeag Pump Station	SLAMS	AQI Forecasting/Mapping	FEM, continuous
Bangor – Kenduskeag Pump Station	SLAMS	200K Pop. Coverage	FRM every 6 days
Bangor – Mary Snow School	SPM	AQI Forecasting/Mapping	FEM, continuous
Bangor – Mary Snow School	SPM	200K Pop. Coverage	FRM every 6 days
Bar Harbor – McFarland Hill	NCore	Transport	FRM, every 3 days
Bar Harbor – McFarland Hill	SLAMS	Mapping	FEM, continuous
Lewiston – Country Kitchen Lot	SLAMS	200K Pop. Coverage	FRM, every 6 days
Lewiston – Country Kitchen Lot	SLAMS	Mapping	FEM, continuous
Madawaska – Public Safety Bldg.	SLAMS	High Pop. Exposure	FRM, every 6 days

$PM_{2.5}$ Monitoring Site Address	Site Type	Monitoring Objective	Sampling Method and Frequency
Madawaska – Public Safety Bldg.	SLAMS	AQI Forecasting/Mapping	FEM, continuous
Littleton	Tribal	Mapping	TEOM, continuous
Perry - Pleasant Point/Sipayik, 184 County Road	Tribal	Mapping	TEOM, continuous
Portland – Deering Oaks	SLAMS	MSA of 200-500K	FEM, continuous
Portland – Deering Oaks	SLAMS	MSA of 200-500K	FEM, every 6 days
Portland – Deering Oaks	SLAMS	Collocated	FEM, every 12 days
Portland – Tukey's Bridge	SLAMS	High Traffic	FRM, every 6 days
Presque Isle – 8 Northern Road	Tribal	Mapping	FEM, continuous
Presque Isle – Regional Office	SLAMS	Background	FRM, every 6 days
Presque Isle – Riverside Street	SLAMS	AQI Forecasting/Mapping	FEM, continuous
Presque Isle – Riverside Street	SLAMS	200K Pop. Coverage	FRM, every 6 days
Rumford – Rumford Avenue	SLAMS	AQI Forecasting/Mapping	FEM, continuous
Rumford – Rumford Avenue	SLAMS	High Pop. Exposure	FRM, every 6 days

200K Pop. – 200,000 Population; AQI – Air Quality Index; MSA – Metropolitan Statistical Area

PM Speciation Network (IMPROVE)

Many stunning and breathtaking vistas at National Parks and Wilderness Areas may be lost or diminished due to the haze formed by air pollutants. These light scattering hazes cause discoloration, loss of texture, and reduced visual range. Recognizing the importance of visual air quality, Congress included legislation in the Clean Air Act to prevent and remedy visibility impairment. To aid in the implementation of this legislation, the Interagency Monitoring of Protected Visual Environments (IMPROVE) program was initiated in 1985. DEP operates one IMPROVE site in Freeport, Maine at Wolfe's Neck Farm. The National Park Service and the U.S. Fish & Wildlife Service operate IMPROVE sites in Maine's designated Class 1 visibility areas in Acadia National Park and Moosehorn Wildlife Refuge, respectively. IMPROVE sites are also operated by the Penobscot and Micmac Tribes in Old Town, Indian Island, and Presque Isle, respectively.

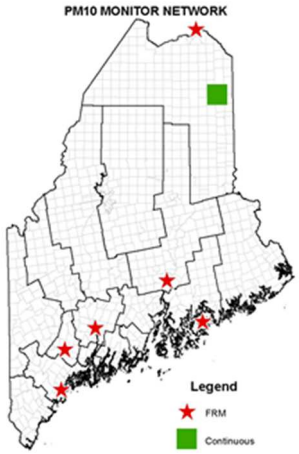
In 2015 the EPA reassessed each of the IMPROVE sites to optimize the Chemical Speciation Network. As a result of that process, the Bridgton site was discontinued on January 1, 2016. The DEP understands the continued value and importance of the IMPROVE network, and if BAQ funds become available, the Bridgeton monitors may be re-installed.

IMPROVE Site Address	Site Type	Monitoring Objective	Sampling Frequency
Bar Harbor – McFarland Hill	NPS/NCore	Regional Haze	Every 3 days
Baring – Moosehorn Wildlife Ref.	USFWS	Regional Haze	Every 3 days
Freeport – Wolfe's Neck Road	SLAMS	Deposition Project	Every 3 days
Indian Island – Penobscot	Tribal	Regional Haze	Every 3 days
Presque Isle – 8 Northern Road	Tribal	Regional Haze	Every 3 days

PM_{10} Network

The DEP operates most of the current filter-based PM_{10} network using the FRM samplers modified with the fine-particle separators removed to collect PM_{10} particles. The dichotomous samplers that collected $PM_{2.5}$ and $PM_{10-2.5}$ (a.k.a., PM_{coarse}), and calculated PM_{10} as the sum of the two parameters were removed in early November 2016 and replaced with new single $PM_{2.5}$ and PM_{10} samplers after a troublesome maintenance history threatened recovery rates.

A continuous PM_{10} TEOM monitor is operated in Presque Isle as part of the control strategy for the historically high PM_{10} levels there. The PM_{10} TEOM provides hourly data used by city officials to determine when high levels are occurring and whether street sweeping or other control strategies need to be implemented.



The current PM_{10} network is comprised of seven sites around the state. All of the sites are currently meeting the PM_{10} NAAQS with no exceedances of the standard having been recorded anywhere during the last several years. The filters collected in the PM_{10} program can be used for the lead monitoring program if needed.

As outlined in the $PM_{2.5}$ section above, the PM_{10} monitoring at Bangor Kenduskeag Pump Station may no longer be representative of the highest concentration of PM_{10} in the city. PM_{10} monitoring began in August 2017 at the Mary Snow Elementary School in Bangor. The BAQ intends to run simultaneous PM_{10} monitoring stations at the Kenduskeag Pump Station and Mary Snow School for at least one year to establish a relationship between the two sites. At that time, in consultation with EPA staff, the BAQ will decide which of the two sites will remain in operation. No other changes are planned for 2019.

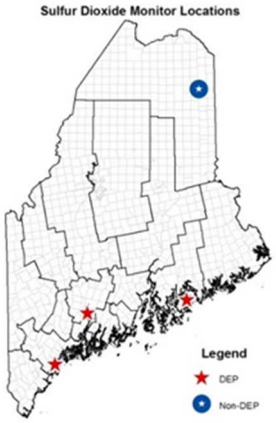
PM_{10} Monitoring Site Address	**Site Type**	**Monitoring Objective**	**Sampling Frequency**
Augusta – Lincoln Street School	SLAMS	Attainment/Nonattainment	FRM, every 6 days
Bangor – Kenduskeag Pump Sta.	SLAMS	Attainment/Nonattainment	FRM, every 6 days
Bar Harbor – McFarland Hill	NCore	Rural Background	FRM, every 3 days
Lewiston – Country Kitchen Lot	SLAMS	Attainment/Nonattainment	FRM, every 6 days
Madawaska – Public Safety Bldg.	SLAMS	Attainment/Nonattainment	FRM, every 6 days
Portland – Tukey's Bridge	SLAMS	Attainment/Nonattainment	FRM, every 6 days
Portland – Tukey's Bridge	SLAMS	Collocated	FRM, every 12 days
Presque Isle – Riverside Street	SLAMS	Attainment/Nonattainment	TEOM, continuous

PM_{Coarse} Network

Required PM_{Coarse}, or $PM_{10-2.5}$ measurements at the NCore site in Bar Harbor are obtained by the difference method. At that site two FRM samplers collect PM_{10} and $PM_{2.5}$ data respectively, and the difference between the two concentrations is reported as $PM_{10-2.5}$. If it becomes required, PM_{Coarse} data, utilizing the difference method, can be calculated from the data collected at sites in Madawaska, Bangor, Augusta, and Portland, where simultaneous PM_{10} and $PM_{2.5}$ data are being collected.

***PM_{Coarse}* Site Address**	**Site Type**	**Monitoring Objective**	**Sampling Frequency**
Bar Harbor – McFarland Hill	NCore	Rural Background	FRM, every 3 days

Sulfur Dioxide Network



The DEP currently operates three long-term monitors for sulfur dioxide (SO_2). Two are trace-level monitors. A required trace-level monitor is located at the NCore site in Bar Harbor and a second one operates as a rural/background site in Gardiner. The third SO_2 monitor is a special purpose sampler located in Portland to track levels in the highest population area of the state as well as to provide urban background data for the air emission licensing program. The Micmac Indian Tribe operates an SO_2 monitor in Presque Isle. No changes in the current long-term SO_2 network are anticipated for 2019.

SO_2 Monitoring Site Address	**Site Type**	**Monitoring Objective**	**Sampling Frequency**
Bar Harbor – McFarland Hill	NCore	Background	Continuous
Gardiner – Pray Street, Schoolyard	SLAMS	Background	Continuous
Portland – Deering Oaks	SPMS	High Pop. Exposure	Continuous
Presque Isle – 8 Northern Road	Tribal	-	Continuous

Nitrogen Oxides Network (NO_2, NOx, NO, NOy)

The DEP currently operates two trace-level NO_2 monitors and two NO_y monitors. The NO_2 monitors are located at the Deering Oaks site in Portland and at the Pray Street School site in Gardiner. The two NO_y monitors are located at the NCore site in Bar Harbor and the Cape Elizabeth PAMS location. The Micmac Tribe also operates a trace-level NO_2 monitor at their site in Presque Isle. There are no other changes in the Nitrogen Oxides Network planned for 2019.

Nitrogen Oxides Network Site Address	**Site Type**	**Monitoring Objective**	**Sampling Frequency**
Portland – Deering Oaks (NO_2)	SPMS	Maximum Concentration, Urban Background	Continuous
Bar Harbor – McFarland Hill (NO_y)	NCore	Transport (trace-level)	Continuous
Cape Elizabeth – Two Lights State Park (NO_y)	PAMS	Transport (trace-level)	Continuous
Gardiner – Pray Street, Schoolyard (NO_2)	SPMS	Background (trace-level)	Continuous
Presque Isle – 8 Northern Road (NO_2)	Tribal	(trace-level)	Continuous

Carbon Monoxide Network

The DEP currently operates two carbon monoxide (CO) monitors. Monitors are located at the NCore site in Bar Harbor (a trace-level) and the Deering Oaks site in Portland. The Micmac Indian Tribe also operates a trace-level CO monitor at their site in Presque Isle. The CO standard has been reviewed, and no change was made in the level or the form of the standard. No changes in the Carbon Monoxide Network are planned for 2019.

Carbon Monoxide Site Address	Site Type	Monitoring Objective	Sampling Frequency
Bar Harbor – McFarland Hill	NCore	Transport	Continuous
Portland – Deering Oaks	SPMs	High Pop. Exposure	Continuous
Presque Isle – 8 Northern Road	Tribal	-	Continuous

Enhanced Monitoring Plan

Regional transport of hazardous air pollutants has been well documented by the two Photochemical Assessment Monitoring Station (PAMS) locations that operated in Maine from 1993 until 2014. The PAMS compounds, known as ozone precursors, measured at these sites play a large role in ozone formation. The data trends from the two sites in Maine helped track the effectiveness of pollution control strategies in upwind states. Both PAMS locations in Maine were initially required by the EPA because of serious non-attainment areas in other states. The Maine PAMS equipment were required to be operational for the June – August period, but historically they were in operation during May and September also. At the end of 2014, the Cadillac Mountain PAMS site in Acadia National Park was shut down after the EPA revised the National PAMS program.

In 2015 Appendix D to Part 58 CFR was revised such that State and local monitoring agencies "are required to collect and report PAMS measurements at each NCore site…in a CBSA (Core-Based Statistical Area) with a population of 1,000,000 or more." The State of Maine is therefore no longer required to participate in the PAMS network. Maine remains within the Eastern U.S. Ozone Transport Region however. The remaining PAMS location at Cape Elizabeth Two Lights State Park (CETL), represents an extreme downwind site for the Greater Connecticut area, which continues to remain in a moderate non-attainment status of the 8-hour ozone standard. The new monitoring regulations for PAMS provide for the collection of an "enhanced" ambient air quality database, which can be used to better characterize the nature and extent of the ozone problem, aid in tracking volatile organic compounds (VOC) and nitrogen oxides (NOx) emission inventory reductions, assess air quality trends, make attainment/non-attainment decisions, and evaluate photochemical grid-model performance.

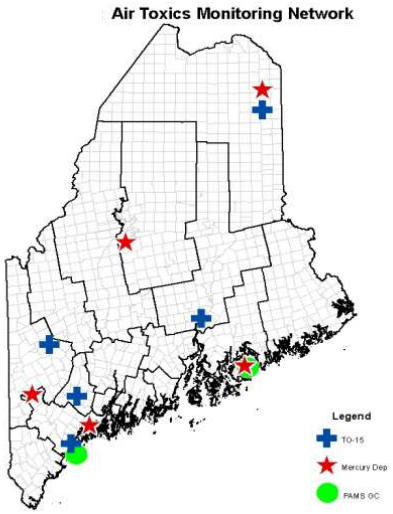
The 2015 Ozone NAAQS regulation requires that all O_3 moderate (and worse) Non-Attainment areas and states in the Ozone Transport Region must develop and implement Enhanced Monitoring Plans that document the need to collect additional data to help determine the distribution of ozone in the state and region. While the State of Maine is not required to participate in future PAMS operations, a Regional Enhanced Monitoring Plan that includes Maine as a contributing partner is under consideration at EPA. The BAQ contends that the continued operation of the Cape Elizabeth site in Maine, as a part of any Enhanced Monitoring Plan, is justified as a means to achieve historical trends, additional information and knowledge about regional ozone formation, and transport. Additionally, ozone data collected at Maine sites in March, a month earlier than the required start of our official ozone season yet coinciding with the official start of the season for New Hampshire, provides critical information about ozone transport in the western region of Maine during the weeks before ozone scrubbing leaves begin to appear on deciduous trees, and should be included in any enhanced ozone monitoring network.

Both the installation of a Pandora spectrometer at CETL (if included in an approved Enhanced Monitoring Plan), and (if funds are available) a Ceilometer site situated somewhere near the NCore site, perhaps along the seawall in Bar Harbor or Southwest Harbor, could be managed with existing Maine DEP staff. The Pandora spectrometer was developed by NASA to measure total columnar concentrations of formaldehyde, ozone, sulfur dioxide, nitrogen dioxide, and water every 80 seconds. Ceilometers use a laser or other light source to determine the height

of a cloud ceiling or cloud base, and can also be used to measure the aerosol concentration within the atmosphere. These two instruments provide insightful information about the chemical mixing and layering of the air column above them which is helpful in furthering our understanding of upper air transport and important elements in the enhanced monitoring network.

Site Address	Site Type	Monitoring Objective	Sampling Frequency
Cape Elizabeth - Two Lights State Park	PAMS	Transport	Continuous - Seasonal

Hazardous Air Pollutants (HAPs) Network

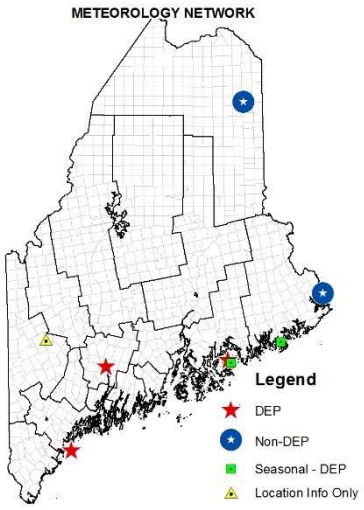


Although not a required monitoring network, the DEP samples for 108 HAPs compounds at six Special Purpose Monitoring Site (SPMS) locations around the state and at the PAMS Site in Cape Elizabeth. The monitoring objective is to document background concentrations around the state and to establish whether there are any trends in the levels of these compounds. Maine monitors for most HAPs compounds using EPA's method TO-15. As detailed in the lead section below, the DEP uses XRF spectroanalysis on randomly selected $PM_{2.5}$ and PM_{10} filters to determine concentrations of several metals designated as HAPs.

As outlined in the $PM_{2.5}$ and PM_{10} sections above, the HAPs monitoring at Bangor Kenduskeag Pump Station may no longer be representative of the highest concentration of hazardous air pollutants in the city. HAPs monitoring began in August 2017 at the Mary Snow Elementary School in Bangor. The BAQ intends to conduct simultaneous HAPs monitoring at the Kenduskeag Pump Station and Mary Snow School for at least one year to establish a relationship between the two sites. At that time, in consultation with EPA staff, the BAQ will decide which of the two sites will remain in operation. No other changes are planned for 2019.

Site Address	Site Type	Monitoring Objective	Sampling Frequency
Bangor – Kenduskeag Pump Sta.	SPMS	Maximum Conc.& Trends	Every 6 days
Bangor – Mary Snow School	SPMS	Maximum Conc.& Trends	Every 6 days
Cape Elizabeth – Two Lights Park	PAMS	Maximum Conc.& Trends	Every 6 days
Lewiston – Country Kitchen Lot	SPMS	Maximum Conc.& Trends	Every 6 days
Portland – 356 State Street	SPMS	Maximum Conc.& Trends	Every 6 days
Presque Isle – Riverside Street	SPMS	Maximum Conc.& Trends	Every 6 days
Rumford – Rumford Avenue	SPMS	Maximum Conc.& Trends	Every 6 days

Meteorological Network

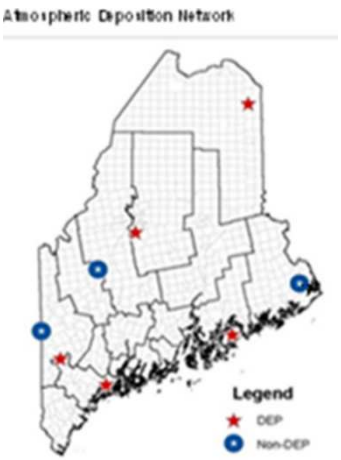


The DEP, and the Passamaquoddy and Micmac tribes fund, operate and maintain year-round meteorological monitoring sites throughout the state to collect data for use in the analysis and evaluation of air pollutant data. Some of these are stand-alone sites, and some are collocated with air pollutant monitoring equipment. All of the sites measure scalar wind speed and direction, resultant wind speed and direction, and sigma theta (an indicator of the amount of variability in the wind direction). A few of the sites collect additional parameters such as relative humidity, barometric pressure, temperature, and solar radiation. State forecasters also have access to NOAA weather data from airport stations and other sites located throughout the state, although not all of these data consist of hourly averages from continuous observations, making data from the DEP sites more desirable.

The Maine DEP BAQ installed meteorological instruments on a tower adjacent to a building near the Public Boat Landing at Jonesport, Maine in 2017. Seasonal wind data there and at the Mt. Cadillac site will augment hourly ozone concentration measurements.

Site Address	Site Type	Monitoring Objective	Sampling Frequency
Augusta – State Airport	SLAMS	Data Analyses & Modeling	Continuous
Bar Harbor – Cadillac Mountain	SLAMS	Transport	Continuous – Seasonal
Bar Harbor – McFarland Hill	NCore	Transport	Continuous
Cape Elizabeth – Two Lights Park	PAMS	Transport	Continuous
Jonesport – Public Boat Landing	SLAMS	Data Analyses & Modeling	Continuous – Seasonal
Presque Isle – 8 Northern Road	Tribal	-	Continuous
Rumford - Rumford Avenue Parking	SLAMS	Data Analyses & Modeling	Continuous
Sipayik – 184 County Road	Tribal	-	Continuous

Atmospheric Deposition Network



There is an extensive atmospheric deposition network in the State of Maine with several sites operated by the Maine DEP. All but two of the sites are part of the National Atmospheric Deposition Program's Mercury Deposition Network (MDN) in addition to being a part of the National Trends Network (NTN) that measures precipitation chemistry. Early in the program, several agencies and organizations participated and provided funds for the operation of these deposition network sites. As funds have diminished and budgets have been cut, the continued operation of some of these sites has been in question. The MDN ad NTN data are valuable to DEP data users, policy makers, and the public, and to various users representing many scientific disciplines, wildlife biologists, water quality specialists, epidemiologists, atmospheric chemists, government regulators, and academic researchers. No changes are proposed for 2019.

Site Address and NADP ID	Site Type	Monitoring Objective	Sampling Frequency
Bar Harbor – McFarland Hill (MDN) ME98	NPS-SPMS	Transport/Trends	Weekly Composite
Bridgton – Upper Ridge Road (NTN and MDN) ME02	SPMS	Transport/Trends	Weekly Composite
Caribou – Airport (NTN and MDN) ME00	SPMS	Transport/Trends	Weekly Composite
Carrabassett Valley – Airport (NTN and MDN) ME04	Tribal	Transport/Trends	Weekly Composite
Freeport – Wolfe's Neck Farm (NTN and MDN) ME96	SPMS	Transport/Trends	Weekly Composite
Gilead – White Mtn. Nat'l. Forest (NTN) ME08	USGS	Transport/Trends	Weekly Composite
Greenville Station (NTN and MDN) ME09	SPMS	Transport/Trends	Weekly Composite
Indian Township (NTN) ME94	Tribal	Transport/Trends	Weekly Composite

Lead Network

In 2008 EPA promulgated a lead (Pb) standard and issued some minimum monitoring requirements to the states. At that time, Maine was going to be required to operate one Pb monitor in the Portland CBSA (Core-based statistical area). The state purchased an X-ray fluorescence (XRF) analyzer to measure lead concentrations from PM_{10} filters. The EPA Pb requirement was subsequently revised to require Pb monitoring at urban NCore sites only. The Bar Harbor NCore site is designated as a rural site, so there is no requirement for Pb monitoring in Maine.

Maine DEP maintains the capability and capacity to analyze particulate filters for Pb and other several other metals that are listed as Hazardous Air Pollutants (HAPs) such as arsenic and chromium. As schedules permit, random selections from archived Maine $PM_{2.5}$ and PM_{10} filters are being analyzed with the XRF to determine what the state background concentrations might be for lead and the other metals.

CamNet

Maine DEP, along with several other state and local agencies, and non-profit organizations, helps support the Northeast States for Coordinated Air Use Management (NESCAUM) operate CamNet - a network of real time visibility cameras situated throughout the Northeast. In Maine, there are two CamNet locations. One is at Schoodic Point with two cameras pointing west towards Acadia National Park on Mount Desert Island. The other site is at Moosehorn National Wildlife Refuge with a single camera pointing northwest between Bailyville, ME and St. Stephen, New Brunswick. Corresponding air quality sensors at each site allow users of CamNet to see the effects of air pollution on visibility. **https://www.hazecam.net/**

Proposed Calendar Year 2019 Network Changes

As usual, the monitoring network proposed for 2019 is an ambitious one and will require a significant effort from Air Bureau staff to accomplish. The program is always subject to adjustment because of staffing changes, budget cuts, and the disposition of landowners who allow the placement of air-monitoring sites on their property. The field monitoring staff continues to look for increased efficiencies, especially through automation and improved remote access to monitors, to optimize DEP resources.

The following changes are being contemplated or are likely to occur:

- The monitoring results at Bangor Kenduskeag Pump Station on Washington Street may no longer be representative of the worst particulate concentrations in the city. Traffic pattern changes in Bangor have reduced traffic flow in the area. A special PM and HAPs study was undertaken in August 2017 on the roof of the Mary Snow Elementary School. After a review of a year's worth of monitoring data from both sites a decision will be made about which site will be continued.

- A special wood smoke survey was conducted during the 2016/2017 winter in Farmington, Maine at the University of Maine at Farmington's Prescott Field. Sampling commenced November 1, 2016 and continued through the end of March 2017. Most of the sampling results have been reviewed. PAH samples have yet to be analyzed and the DEP is awaiting analysis of the PM filters for levoglucosan levels to be conducted by the New Hampshire Department of Environmental Services. A final report is expected to be released in 2018. Future woodsmoke surveys are anticipated but none are planned for the 2019 calendar year.

The monitors operated by the Maine DEP undergo constant review to ensure that the ambient air monitoring network is appropriate to meet monitoring goals, does not contain irrelevant monitoring, and can be accomplished within the available budget. The table below presents the location of each active monitor in the State. Discussions between ME DEP and EPA Region One, working together to maintain the most complete and cost effective ambient air monitoring network in Maine, have been identified several monitors as potential opportunities for resource savings if they are removed from service. In the table, each monitor has been identified as meeting one or more State objective. While there are presently no indications any of the proposed cuts would be necessary for 2019, should budget and staffing issues require cuts in the monitoring program, the table will help to determine the relative importance of each site and assist with the decision process.

Maine Ambient Air Monitoring Locations and Objectives as of 2018.

ID'd as Potential Opportunity for Savings	Site ID	Site	Parameter	Operated by	2018 Monitoring Objective(s)	Longterm/ Historical Trends?	Supports Research/ Special Studies?	Mandated by CFR?	Required by SIP?	Real Time Reporting Value for AirNow?	Values from Nearby Monitor are Different?	Background Air Quality Values for Licensing?
✘	23-001-0011	LCKP	PM2.5	DEP	200K Pop. Coverage	✓						✓
✘	23-001-0011	LCKP	PM2.5 Hrly	DEP	Mapping					✓		✓
✘	23-003-0014	MPSX	PM10	DEP	Attainment/Nonattainment	✓						✓
✘	23-003-0014	MPSB	PM2.5	DEP	High Pop. Exposure	✓						✓
✘	23-003-0014	MPSB	PM2.5 Hrly	DEP	AQI Forecasting/Mapping					✓		✓
✘	23-003-1005	PIBS	PM2.5	DEP	Background	✓						✓
✘	23-003-1011	PIRS	PM2.5	DEP	200K Pop. Coverage	✓						
✘	23-003-1011	PIRS	PM2.5 Hrly	DEP	AQI Forecasting/Mapping					✓		
✘	23-005-0015	PTBXC	PM10	DEP	Collocated			✓				
✘	23-005-0015	PTBXR	PM10	DEP	Attainment/Nonattainment	✓		✓				
✘	23-005-0015	PTB	PM2.5	DEP	High Traffic	✓					✓	
✘	23-005-0029	PDO	CO	DEP	High Pop. Exposure		✓			✓		✓
✘	23-005-0029	PDO	NO2	DEP	Background					✓		✓
✘	23-005-0029	PDO	O3	DEP	High Pop. Exposure	✓	✓			✓		
✘	23-005-0029	PDOC	PM2.5	DEP	Collocated			✓				
✘	23-005-0029	PDO	SO2	DEP	High Pop. Exposure		✓			✓		✓
✘	23-011-0016	ALSSC	PM2.5	DEP	Collocated			✓				
✘	23-011-0016	ALSSR	PM2.5	DEP	200K Pop. Coverage	✓		✓				✓
✘	23-011-2005	GPSS	NO2	DEP	Max. Conc., Urban Background		✓			✓		✓
✘	23-011-2005	GPSS	SO2	DEP	Background		✓			✓		✓
✘	23-017-2011	RRAP	PM2.5	DEP	High Pop. Exposure	✓						✓
✘	23-017-2011	RRAP	PM2.5 Hrly	DEP	AQI Forecasting/Mapping					✓		✓
✘	23-031-0040	SBP	O3	DEP	Max. Conc., Transport	✓	✓			✓	✓	
	23-001-0011	LCKP	HAPs	DEP	Maximum Conc.& Trends	✓	✓					
	23-001-0011	LCKPX	PM10	DEP	Attainment/Nonattainment	✓						✓
	23-001-0014	DFS	O3	DEP	Max. Concentration	✓		✓	✓	✓		
	23-003-1002	Caribou	NADP ME00 MDN/NTN	DEP	Precipitation Chemistry	✓						
	23-003-1011	PIRS	HAPs	DEP	Maximum Conc.& Trends	✓	✓					
	23-003-1011	PIRSX	PM10 Hrly	DEP	Attainment/Nonattainment	✓			✓	✓		✓
	23-005-0029	PDO1	HAPs	DEP	Maximum Conc.& Trends	✓	✓					
	23-005-0029	PDO2	HAPs	DEP	Collocated	✓	✓	✓				
	23-005-0029	PDOR	PM2.5	DEP	MSA of 200-500K	✓					✓	✓
	23-005-0029	PDO	PM2.5 Hrly	DEP	Collocated		✓		✓	✓		✓
	23-005-2003	CETL	HAPs	DEP	Maximum Conc.& Trends	✓	✓					
	23-005-2003	CETL	NOy	DEP	PAMS - EMP Transport	✓	✓					
	23-005-2003	CETL	O3	DEP	Transport	✓		✓		✓		
	23-005-2003	CETL	PAMS	DEP	Transport	✓	✓					
	23-005-9002	Wolfe Neck	IMPROVE	DEP	Regional Haze	✓	✓					
	23-005-9002	Wolfe Neck	NADP ME96 MDN/NTN	DEP	Precipitation Chemistry	✓						
	23-009-0102	Cadillac	O3	DEP	Transport	✓	✓			✓		
	23-009-0103	BHMH	CO	DEP	NCore, Transport			✓		✓		✓
	23-009-0103	BHMH	HAPs	DEP	Max. Conc.& Trends	✓	✓					
	23-009-0103	BHMH	NOy	DEP	NCore, Transport	✓	✓	✓				
	23-009-0103	BHMH	O3	DEP	NCore, Transport, Background	✓		✓	✓	✓		

Of'd as Potential Opportunity for Savings	Site ID	Site	Parameter	Operated by	2018 Monitoring Objective(s)	Longterm/ Historical Trends?	Supports Research/ Special Studies?	Mandated by CFR?	Required by SIP?	Real Time Reporting Value for AirNow?	Values from Nearby Monitor are Different?	Background Air Quality Values for Licensing?
	23-009-0103	BHMHX	PM10	DEP	NCore, Rural Background	✓		✓				✓
	23-009-0103	BHMH	PM2.5	DEP	Ncore, Transport	✓		✓				✓
	23-009-0103	BHMH	PM2.5 Hrly	DEP	NCore, Mapping	✓		✓		✓		
	23-009-0103	BHMH	PMcoarse	DEP	NCore, Rural Background		✓					
	23-009-0103	BHMH	SO2	DEP	NCore, Background			✓		✓		✓
	23-009-0103	BHMH	SO4	DEP	Regional Haze	✓	✓					
	23-011-0016	ALSSX	PM10	DEP	Attainment/Nonattainment	✓						✓
	23-011-2005	GPSS	O3	DEP	Max. Conc., Transport	✓		✓	✓	✓		
	23-013-0004	PCMP	O3	DEP	Max. Conc., Transport	✓			✓	✓		
	23-017-2011	RRAP	HAPs	DEP	Maximum Conc.& Trends	✓	✓					
	23-017-3002	BSFR	O3	DEP	Max. Conc., Transport		✓			✓	✓	
	23-019-0002	BKPSX	PM10	DEP	Attainment/Nonattainment							✓
	23-019-0002	BKPS	PM2.5	DEP	200K Pop. Coverage	✓						✓
	23-019-0002	BKPS	PM2.5 Hrly	DEP	AQI Forecasting/Mapping					✓		✓
	23-019-0017	BMSS	HAPs	DEP	Maximum Conc.& Trends		✓					
	23-019-0017	BMSS	PM2.5	DEP	Max. Conc.		✓					
	23-019-0017	BMSS	PM2.5 Hrly	DEP	Max. Conc. AQI Forecasting		✓			✓		
	23-019-4008	HRB	O3	DEP	Max. Conc., Transport	✓				✓		
	23-021-0001	Greenville	NADP ME09 MDN/NTN	DEP	Precipitation Chemistry	✓						
	23-029-0019	JPL	O3	DEP	Max. Concentration	✓				✓		
	23-031-0038	WBFD	O3	DEP	Transport	✓				✓	✓	
	23-031-2002	KPW	O3	DEP	Max. Conc., Transport	✓		✓	✓	✓		
	23-009-0103	BHMH	IMPROVE	DEP/NPS	Regional Haze	✓	✓		✓			
	n/a	Ashland	O3	CASTNet	Background							
	n/a	Howland	O3	CASTNet	Treetop Canopy Level							
	23-005-0002	Bridgton	NADP ME02 MDN/NTN	LEA	Precipitation Chemistry	✓						
	23-003-1100	PIMM	CO	Tribal	-					✓		✓
	23-003-1100	PIMM	IMPROVE	Tribal	Regional Haze	✓	✓					
	23-003-1100	PIMM	NO2	Tribal	-					✓		✓
	23-003-1100	PIMM	O3	Tribal	-					✓		
	23-003-1100	PIMM	PM2.5 Hrly	Tribal	Mapping					✓		
	23-003-1100	PIMM	SO2	Tribal	-					✓		✓
	23-003-1101	Littleton	PM2.5 Hrly	Tribal	Mapping					✓		
	23-007-2002	Carrabassett	NADP ME04 MDN/NTN	Tribal	Precipitation Chemistry	✓						
	23-019-1100	Indian Island	IMPROVE	Tribal	Regional Haze	✓	✓					
	23-029-0032	Sipayik	O3	Tribal	-					✓		
	23-029-0032	Sipayik	PM2.5 Hrly	Tribal	Mapping					✓		
	n/a	Indian Township	NADP ME94 NTN	Tribal	Precipitation Chemistry	✓						
	n/a	Moosehorn	IMPROVE	USFWS	Regional Haze	✓	✓		✓			
	n/a	Gilliad	NADP ME08 NTN	USGS	Precipitation Chemistry	✓						

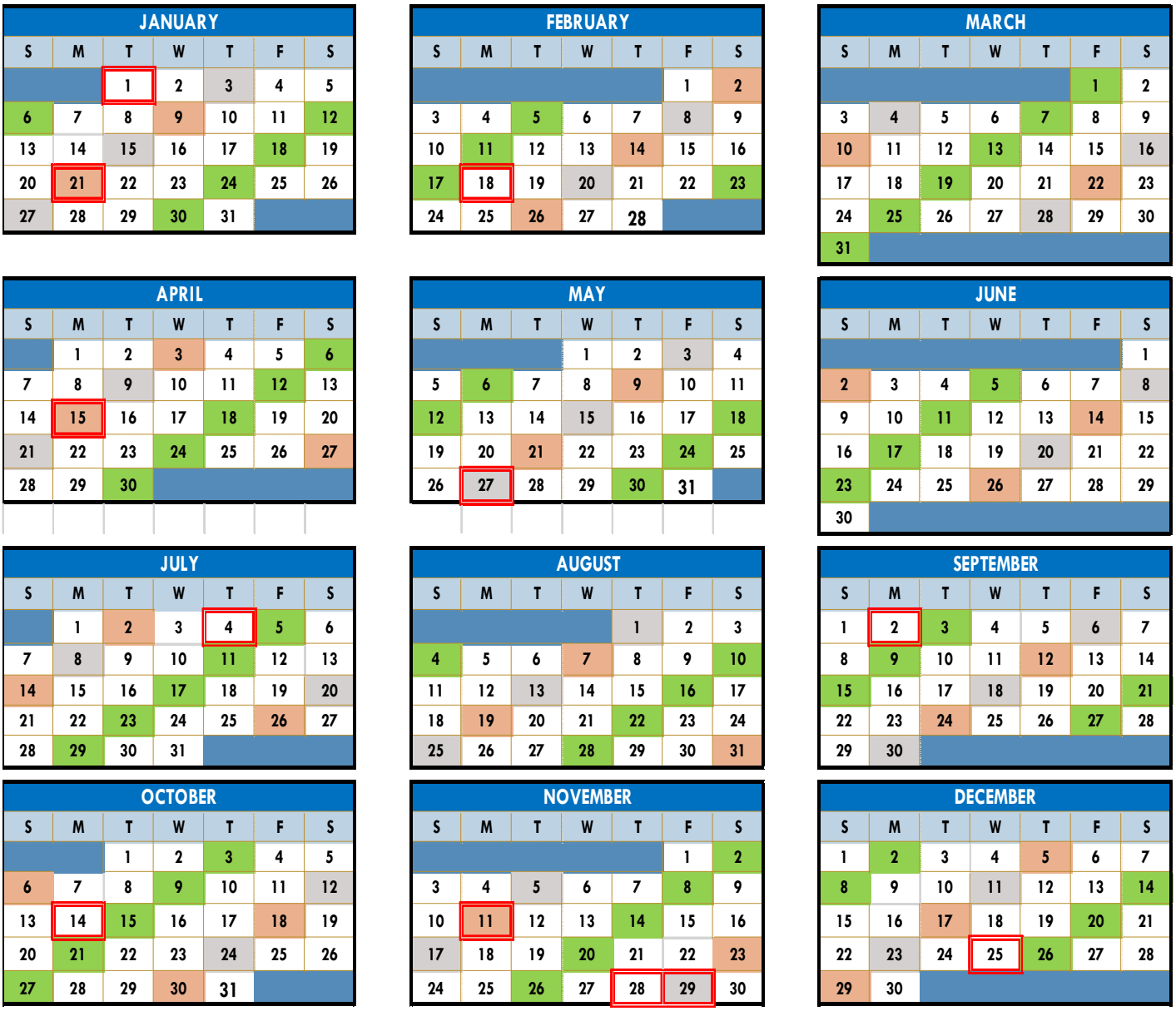
Monitoring Equipment Used by Maine DEP

PARAMETER	INSTRUMENT	METHOD*
Atmospheric Deposition	Aerochem Metrics wet/dry collector	
Barometric Pressure	Climatronics Met One	
Carbon Monoxide	Thermo Model 48C, 48i, 48iTLE Teledyne API Model T300	RFCA-0981-054 RFCA-1093-093
Hazardous Air Pollutants	24 – hour 6 liter sub-ambient canister samplers, designed and built by ME DEP	TO-15
Lead	R&P/Thermo Sequential Model 2025, 2025i R&P/Thermo Single Model 2000, 2000i Spectro XEPOS XRF Spectrometer	
Mercury Deposition	Aerochem Metrics N-CON Wet Deposition collector	
Nitrogen Dioxide	Thermo Model 42C, 42i	RFNA-1289-074
Organic/Elemental Carbon	Sunset Semicontinuous OC/EC Carbon Aerosol Analyzer	
Other Metals such as Arsenic, Chromium, etc.	R&P Sequential Model 2025, 2025i R&P Single Model 2000, 2000i Spectro XEPOS XRF Spectrometer	
Oxides of Nitrogen	Thermo Model 42iY	
Ozone	Thermo Models 49C, 49i Teledyne API Model T400	EQOA-0880-047 EQOA-0992-087
PM 10 Continuous	R&P TEOM Model 1400AB	EQPM-1090-079
PM 10 FRM	R&P/Thermo Sequential Model 2025, 2025i R&P/Thermo Single Model 2000, 2000i	RFPS-1298-127 RFPS-1298-126
PM 2.5 Continuous	MET One BAM Model 1020 Thermo Scientific Model 5030i SHARP	EQPM-0308-170 EQPM-0609-184
PM 2.5 FRM	R&P/Thermo Sequential Model 2025, 2025i R&P/Thermo Single Model 2000, 2000i	RFPS-0498-118 RFPS-1006-145 RFPS-0498-117 RFPS-1006-143
PM Coarse	Difference Method PM10-PM2.5	RFPS-0509-176
PM Speciation	IMPROVE Sampler	
Precipitation	ETI Instrument Systems NOAH IV	
Relative Humidity	Climatronics Met One	
Solar Radiation	Climatronics Met One	
Sulfate Continuous	Thermo Model 5020	
Sulfur Dioxide	Thermo Model 43C, 43C-TLE, 43i, 43i-TLE Teledyne API Model T100	EQSA-0486-060 EQSA-0495-100
Temperature	Climatronics Met One	
Total PAH	Ecochem PAS 2000	
VOC's (PAMS)	Perkin Elmer Clarus 580	
Wind Speed/Direction	Climatronics F460 Met One	

* Designated Reference and Equivalent Methods as of December 17, 2016.

Integrated Sampler Schedule

2019



1 in 12, 1 in 6, and 1 in 3 sample dates

1 in 6, and 1 in 3 sample dates

1 in 6, and 1 in 3 sample dates

1 in 3 sample dates

1 in 3 sample dates

1 in 3 sample dates

State Holiday

See also: https://www3.epa.gov/ttn/amtic/calendar.html

2019 Monitoring Site Information

The following pages present descriptions of the ambient air monitoring sites maintained and operated by both the Maine Department of Environmental Protection Bureau of Air Quality and the Tribal Nations. The following pages present the site descriptions alphabetically by Town – Site Name. This table offers an index to the sites based on AQS Site ID.

AQS Site ID	Town - Site	County	Page #
23-001-0011	**Lewiston – Country Kitchen Parking Lot**	**Androscoggin**	59
23-001-0014	**Durham – Fire Station**	**Androscoggin**	43
23-003-0014	**Madawaska – Public Safety Bldg**	**Aroostook**	61
23-003-1002	**Caribou – Caribou Airport**	**Aroostook**	41
23-003-1008	**Presque Isle – DEP Regional Office**	**Aroostook**	69
23-003-1011	**Presque Isle – Riverside St.**	**Aroostook**	71
23-003-1100	**Micmac Tribe -- Presque Isle Shelter**	**Aroostook**	80
23-003-1101	**Micmac Tribe -- Littleton**	**Aroostook**	78
23-005-0002	**Bridgton**	**Cumberland**	37
23-005-0015	**Portland – Tukey's Bridge**	**Cumberland**	67
23-005-0029	**Portland – Deering Oaks Park**	**Cumberland**	65
23-005-2003	**Cape Elizabeth – Two Lights Park**	**Cumberland**	39
23-005-9002	**Freeport – Wolfes Neck Farm**	**Cumberland**	45
23-009-0102	**Bar Harbor – Cadillac Mountain, Acadia National Park**	**Hancock**	31
23-009-0103	**Bar Harbor – McFarland Hill, Acadia National Park**	**Hancock**	33
23-011-0008	**Augusta – Civil Air Patrol Hanger**	**Kennebec**	23
23-011-0016	**Augusta – Lincoln Street School**	**Kennebec**	25
23-011-2005	**Gardiner – Pray Street, Schoolyard**	**Kennebec**	47
23-013-0004	**Port Clyde – Marshall Point Lighthouse**	**Knox**	63
23-017-2011	**Rumford – Rumford Ave. Parking Lot**	**Oxford**	73
23-017-3002	**Bethel – Smith Farm Road**	**Oxford**	35
23-019-0002	**Bangor – Kenduskeag Pump Station**	**Penobscot**	27
23-019-0017	**Bangor - Mary Snow Elementary School**	**Penobscot**	29
23-019-1100	**Penobscot Nation - Indian Island**	**Penobscot**	86
23-019-4008	**Holden – Rider's Bluff**	**Penobscot**	51
23-021-0001	**Greenville**	**Piscataquis**	49
23-029-0019	**Jonesport – Public Landing**	**Washington**	55
23-029-0032	**Passamaquoddy Tribe -- Perry, Pleasant Point/Sipayik**	**Washington**	84
23-029-None	**Passamaquoddy Tribe -- Indian Township**	**Washington**	82
23-031-0038	**Hollis/West Buxton – Fire Department**	**York**	53
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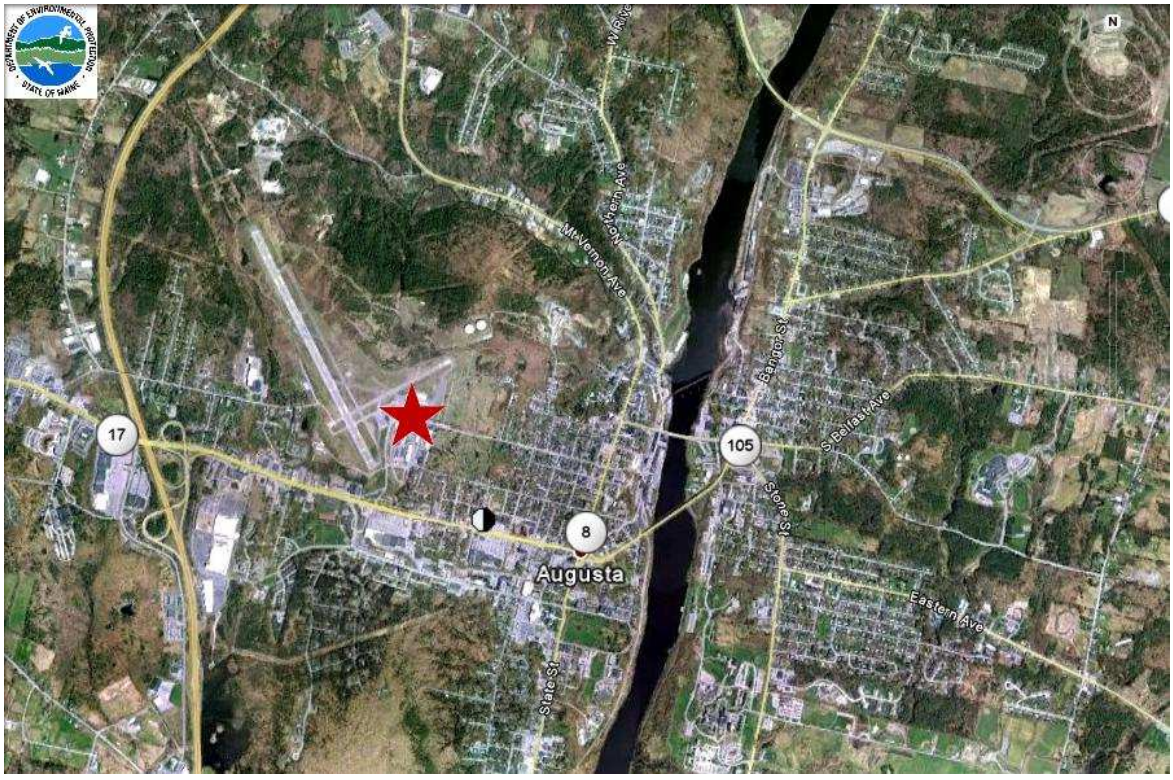
MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION

MONITORING SITES

FOR 2019

Town – Site:	**Augusta – Airport**		
County:	**Kennebec**	Latitude:	**44.3179**
Address:	**Augusta State Airport**	Longitude:	**-69.7919**
AQS Site ID:	**23-011-0008**	Elevation:	**107 Meters**
Spatial Scale:	**Regional**	Year Established:	**1981**
Statistical Area:	**Augusta-Waterville, ME**		



Augusta – Airport
Pollutant and Meteorological Parameters:

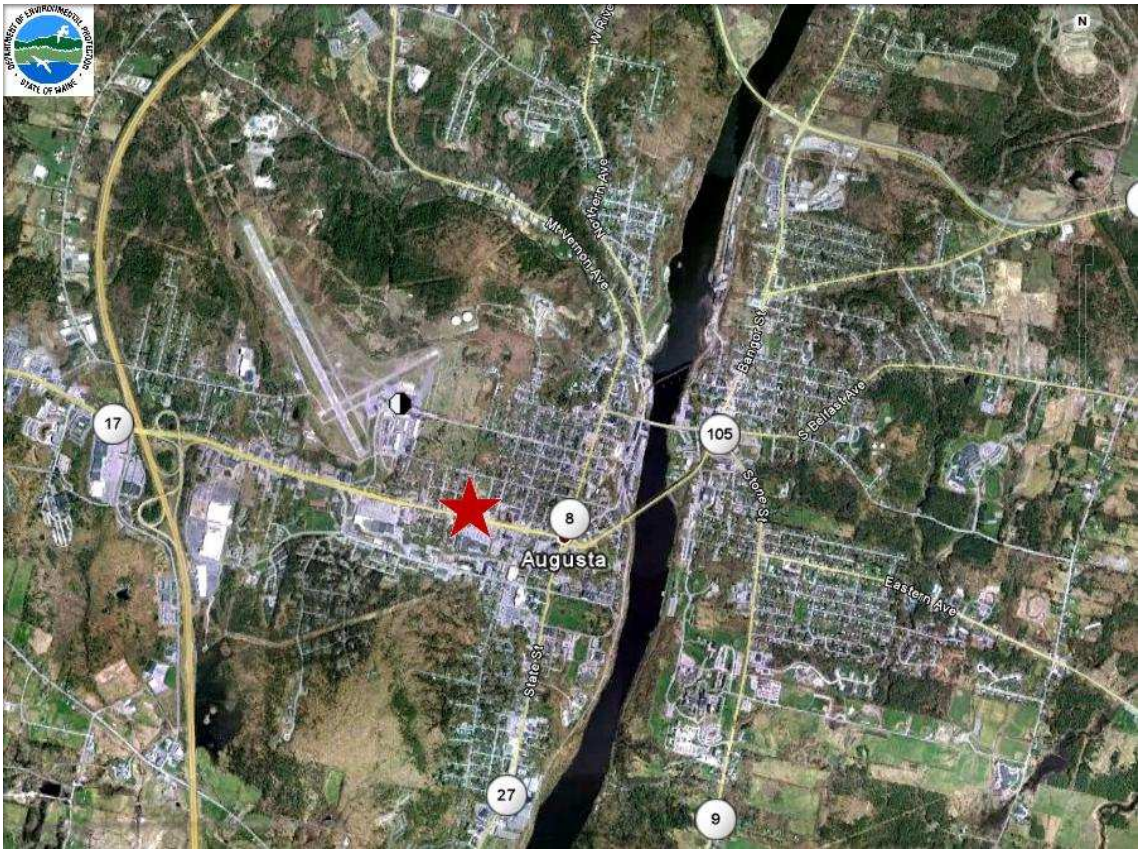
Parameter	Date Began	Date Ended	Parameter	Date Began	Date Ended
PM2.5 - 24 Hr.			SO_2		
PM2.5 - 24 Hr. Colo			Ozone		
PM2.5 Cont.			NOx		
PM10 - 24 Hr.			NOy		
PM10 - 24 Hr. Colo			HAPs		
PM10 Cont.			VOCs (PAMS)		
PM Coarse			Wet Deposition - Mercury		
IMPROVE			Wet Dep. - Precip Chem.		
Cont. OC/EC			Wind Direction/Speed	01/20/1981	
Cont. Sulfate (SO_4)			Outdoor Temperature		
Black Carbon			Bar. Pressure		
Cont. PAH			Relative Humidity		
Lead			Dew point		
CO			Precipitation Amount		
CO_2			Solar Radiation		
Gamma Radiation			UV-b Radiation		

Site Description:
A retractable tower with wind speed and direction sensors is situated on the roof of the Airport Terminal Building at the Augusta State Airport, 0.8 miles NW of the state capitol. The data acquisition equipment and modem are located in the adjacent equipment shed to the west. The 10-meter tower is raised only to the height of the surrounding antennae due to the proximity of the flight line. The tower and equipment were moved to the terminal in October 2015 because the Civil Air Patrol Hanger, where the tower was originally situated, was slated for replacement.

Monitoring Objectives:
Modeling.

Planned changes for 2019:
None.

Town – Site:	**Augusta – Lincoln Street School**		
County:	**Kennebec**	Latitude:	**44.3123**
Address:	**30 Lincoln Street**	Longitude:	**-69.7867**
AQS Site ID:	**23-011-0016**	Elevation:	**71 Meters**
Spatial Scale:	**Neighborhood**	Year Established:	**1999**
Statistical Area:	**Augusta-Waterville, ME**		



Augusta – Lincoln Street School
Pollutant and Meteorological Parameters:

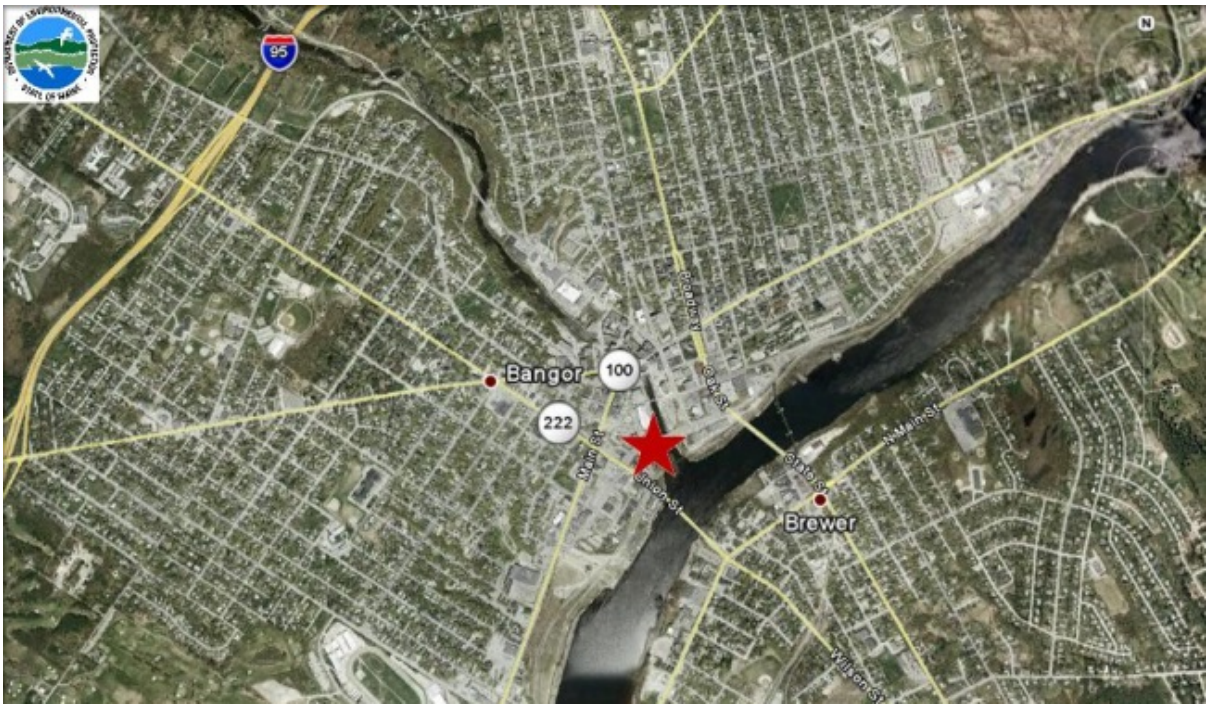
Parameter	Date Began	Date Ended	Parameter	Date Began	Date Ended
PM2.5 - 24 Hr.	01/01/1999		SO_2		
PM2.5 - 24 Hr. Colo	01/01/1999		Ozone		
PM2.5 Cont.			NOx		
PM10 - 24 Hr.	12/02/2002		NOy		
PM10 - 24 Hr. Colo			HAPs		
PM10 Cont.			VOCs (PAMS)		
PM Coarse			Wet Deposition - Mercury		
IMPROVE			Wet Dep. - Precip Chem.		
Cont. OC/EC			Wind Direction/Speed		
Cont. Sulfate (SO_4)			Outdoor Temperature		
Black Carbon			Bar. Pressure		
Cont. PAH			Relative Humidity		
Lead			Dew point		
CO			Precipitation Amount		
CO_2			Solar Radiation		
Gamma Radiation			UV-b Radiation		

Site Description:
Lincoln Street School is located in Augusta just off Western Avenue, 0.4 miles northwest of the state capitol. A wooden platform is situated on the roof of the gymnasium. Particulate monitors are attached to the platform.

Monitoring Objectives:
SLAMS Attainment/Non-Attainment. High Population Exposure.

Planned changes for 2019:
None.

Town – Site:	**Bangor – Kenduskeag Pump Station**		
County:	**Penobscot**	Latitude:	**44.7989**
Address:	**Washington Street**	Longitude:	**-68.7697**
AQS Site ID:	**23-019-0002**	Elevation:	**10 Meters**
Spatial Scale:	**Neighborhood**	Year Established:	**1977**
Statistical Area:	**Bangor, ME**		



Bangor – Kenduskeag Pump Station
Pollutant and Meteorological Parameters:

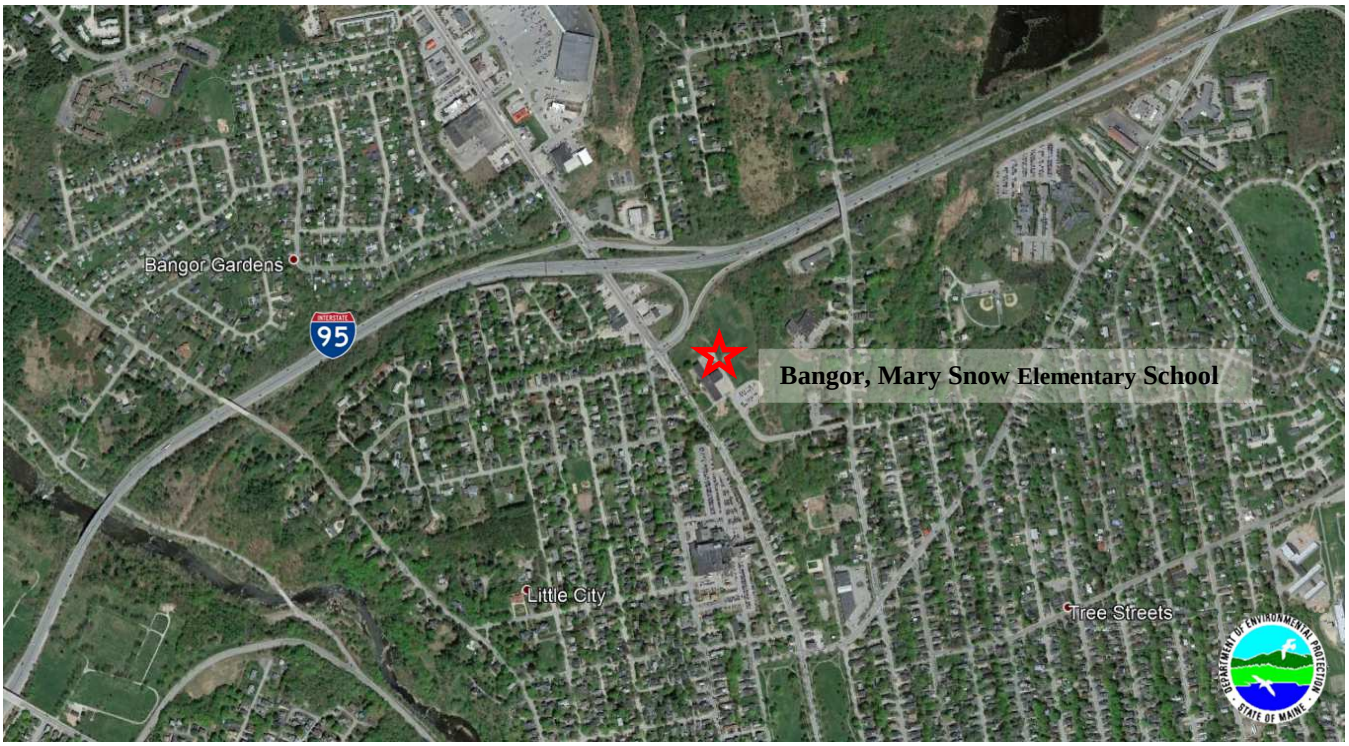
Parameter	Date Began	Date Ended	Parameter	Date Began	Date Ended
PM2.5 - 24 Hr.	1-1-1999		SO_2	1-1-1986	7-1-1987
PM2.5 - 24 Hr. Colo	12-1-1999	12-29-2003	Ozone		
PM2.5 Cont.	1-1-2007		NOx		
PM10 - 24 Hr.	1-1-2003		NOy		
PM10 - 24 Hr. Colo			HAPs	2-12-2004	
PM10 Cont.			VOCs (PAMS)		
PM Coarse	2-7-2014		Wet Deposition - Mercury		
IMPROVE			Wet Dep. - Precip Chem.		
Cont. OC/EC			Wind Direction/Speed		
Cont. Sulfate (SO_4)			Outdoor Temperature		
Black Carbon			Bar. Pressure		
Cont. PAH			Relative Humidity		
Lead	1-1-1978	10-1-1992	Dew point		
CO			Precipitation Amount		
CO_2			Solar Radiation		
Gamma Radiation			UV-b Radiation		

Site Description:
Monitors are located on the roof of a pumping station building for the Bangor treatment plant. It is located on the shore of the Kenduskeag Stream near the Penobscot River and sits in the bowl of downtown Bangor. The site was originally established to help define the extent of the particulate problems in Bangor. The pump station roof was replaced, and a new sampler platform was installed in December 2013. A continuous $PM_{2.5}$ TEOM operated from 1/1/2007 until 12/30/2013. It was replaced with a continuous $PM_{2.5}$ BAM on 1/7/2014 which remains in operation.

Monitoring Objectives:
SLAMS Attainment/Non-Attainment. High Population Exposure. AQI Forecasting and Mapping.

Planned changes for 2019:
Monitoring results at the Kenduskeag pump station on Washington Street in Bangor may no longer be representative of the worst particulate concentrations in the city. Traffic pattern changes in Bangor have reduced traffic flow in the area of the pump station monitoring site and an alternative location for the monitoring equipment is being considered.

Town – Site:	**Bangor – Mary Snow Elementary School**		
County:	**Penobscot**	Latitude:	**44.817398**
Address:	**435 Broadway St.**	Longitude:	**-68.772762**
AQS Site ID:	**23-019-0017**	Elevation:	**54.2 Meters**
Spatial Scale:	**Neighborhood**	Year Established:	**2017**
Statistical Area:	**Bangor, ME**		



Bangor – Mary Snow Elementary School
Pollutant and Meteorological Parameters:

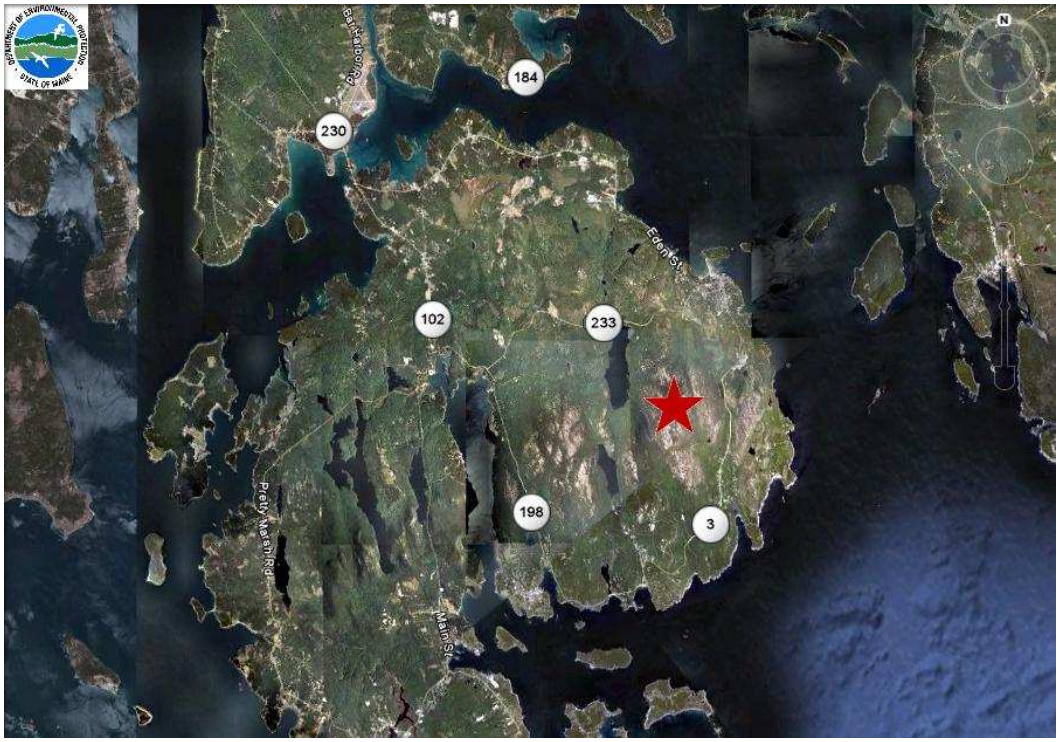
Parameter	Date Began	Date Ended	Parameter	Date Began	Date Ended
PM2.5 - 24 Hr.	10-01-2017		SO_2		
PM2.5 - 24 Hr. Colo			Ozone		
PM2.5 Cont.	10-01-2017		NOx		
PM10 - 24 Hr.	10-01-2017		NOy		
PM10 - 24 Hr. Colo			HAPs	10-01-2017	
PM10 Cont.			VOCs (PAMS)		
PM Coarse	10-01-2017		Wet Deposition - Mercury		
IMPROVE			Wet Dep. - Precip Chem.		
Cont. OC/EC			Wind Direction/Speed	10-01-2017	
Cont. Sulfate (SO_4)			Outdoor Temperature		
Black Carbon			Bar. Pressure		
Cont. PAH			Relative Humidity		
Lead			Dew point		
CO			Precipitation Amount		
CO_2			Solar Radiation		
Gamma Radiation			UV-b Radiation		

Site Description:
Monitors are located on the roof of Mary Snow Elementary School located on Broadway just south of the I 95 interchange in Bangor.

Monitoring Objectives:
Special Purpose monitor for comparison with the SLAMS Attainment/Non-Attainment/High Population Exposure site at Bangor Kenduskeag Pump Station (BKPS). AQI Forecasting and Mapping.

Planned changes for 2019:
Monitoring results at the Kenduskeag pump station on Washington Street in Bangor may no longer be representative of the worst particulate concentrations in the city. Traffic pattern changes in Bangor have reduced traffic flow in the area of the pump station monitoring site and the special purpose monitoring site at Mary Snow Elementary School was established in the Fall of 2017 to collect simultaneous data for comparison with BKPS. Upon completion of at least one year of data collection DEP and EPA will determine which of the two sites will remain in operation.

Town – Site:	**Bar Harbor – Cadillac Mountain, Acadia National Park**		
County:	**Hancock**	Latitude:	**44.3517**
Address:	**Top of Cadillac Mountain**	Longitude:	**-68.2272**
AQS Site ID:	**23-009-0102**	Elevation:	**463 M (1519 ft)**
Spatial Scale:	**Regional**	Year Established:	**1995**
Statistical Area:	**None**		



Bar Harbor – Cadillac Mountain, Acadia National Park
Pollutant and Meteorological Parameters:

Parameter	Date Began	Date Ended	Parameter	Date Began	Date Ended
PM2.5 - 24 Hr.			SO_2		
PM2.5 - 24 Hr. Colo			Ozone	7-25-1995	
PM2.5 Cont.			NOx	4-1-2004	9-30-2007
PM10 - 24 Hr.			NOy	1-1-2008	9-30-2014
PM10 - 24 Hr. Colo			HAPs		
PM10 Cont.			VOCs (PAMS)	5-1-1996	9-30-2014
PM Coarse			Wet Deposition - Mercury		
IMPROVE			Wet Dep. - Precip Chem.		
Cont. OC/EC			Wind Direction/Speed	5-6-1996	
Cont. Sulfate (SO_4)			Outdoor Temperature	4-19-1996	
Black Carbon			Bar. Pressure		
Cont. PAH			Relative Humidity	4-19-1996	
Lead			Dew point		
CO	4-1-2002	10-1-2003	Precipitation Amount		
CO_2			Solar Radiation		
Gamma Radiation			UV-b Radiation		

Site Description:
Located on the top of Cadillac Mountain in Acadia National Park. It is a seasonal ozone site operating during the months of April to October. Ambient parameters are also collected seasonally.

Monitoring Objectives:
Monitoring long-range transport of pollutants on a regional scale.

Planned changes for 2019:
After the removal of the PAMS equipment in the shelter at Cadillac much of the oversized 8' x 16' shelter remained unused. The remaining equipment was moved to one side of the shelter and partitioned off with a temporary partition. This arrangement reduces the amount of temperature-controlled volume inside the shelter and has lowered electrical costs at the site. The DEP plans to replace the existing shelter at Cadillac with an 8'x 8' shelter. This swap will necessitate coordination with the National Park Service. The shelters must be lifted in and out of the monitoring compound with the services of a boom truck, and such a truck will be required when one of the Park's large communication towers at the site is serviced, now anticipated sometime in 2019.

Town – Site:	**Bar Harbor – McFarland Hill, Acadia National Park**		
County:	**Hancock**	Latitude:	**44.3771**
Address:	**Route 233**	Longitude:	**-68.2609**
AQS Site ID:	**23-009-0103**	Elevation:	**156 Meters**
Spatial Scale:	**Regional**	Year Established:	**1998**
Statistical Area:	**None**		

Bar Harbor – McFarland Hill, Acadia National Park
Pollutant and Meteorological Parameters:

Parameter	Date Began	Date Ended	Parameter	Date Began	Date Ended
PM2.5 - 24 Hr.	1-1-1999		SO_2	2-1-2004	
PM2.5 - 24 Hr. Colo			Ozone	2-1-1998	
PM2.5 Cont.	10-1-2003		NOx		
PM10 - 24 Hr.	1-1-2010		NOy	2-1-2004	
PM10 - 24 Hr. Colo			HAPs		
PM10 Cont.			VOCs (PAMS)		
PM Coarse	1-1-2010		Wet Deposition - Mercury	1998	
IMPROVE	3-2-1988		Wet Dep. - Precip Chem.	1998	
Cont. OC/EC	6-29-2004		Wind Direction/Speed	2-1-1998	
Cont. Sulfate (SO_4)	6-26-2004		Outdoor Temperature	2-1-1998	
Black Carbon			Bar. Pressure		
Cont. PAH			Relative Humidity	2-1-1998	
Lead			Dew point		
CO	2-1-2004		Precipitation Amount	2-1-1998	
CO_2			Solar Radiation	2-1-1998	
Gamma Radiation			UV-b Radiation		

Site Description:
Site is located in a field on the side of McFarland Hill in Bar Harbor. Site slopes to the south/southeast with the hill rising to the north. The site was established by the National Park Service but has since grown to include a variety of monitors for EPA programs, special studies such as the Rural Aerosol Intensive Network and most recently has received approval as the NCore site for Maine. A continuous $PM_{2.5}$ TEOM operated from 10/1/2003 until 10/30/2013. It was replaced with a continuous $PM_{2.5}$ BAM on 11/12/2013 which remains in operation.
Monitoring at this site is a joint effort between the NPS and the Maine DEP.

Monitoring Objectives:
Background. NCore Site. Monitoring long-range transport of pollutants on a regional scale.

Planned changes for 2019:
Maine DEP and the National Park Service continue to work cooperatively in moving equipment from the two overcrowded and aging shelters at the location into a new structure that was constructed specifically to meet all current monitoring requirements with some extra capacity for future efforts. The two old shelters will be removed during the summer/fall of 2018.

Town – Site:	**Bethel – Smith Farm Road**		
County:	**Oxford**	Latitude:	**44.377794**
Address:	**Smith Farm Road**	Longitude:	**-70.854697**
AQS Site ID:	**23-017-3002**	Elevation:	**203 Meters**
Spatial Scale:	**Regional**	Year Established:	**2016**
Statistical Area:	**None**		

Bethel – Smith Farm Road
Pollutant and Meteorological Parameters:

Parameter	Date Began	Date Ended	Parameter	Date Began	Date Ended
PM2.5 - 24 Hr.			SO_2		
PM2.5 - 24 Hr. Colo			Ozone	5-12-2016	
PM2.5 Cont.			NOx		
PM10 - 24 Hr.			NOy		
PM10 - 24 Hr. Colo			HAPs		
PM10 Cont.			VOCs (PAMS)		
PM Coarse			Wet Deposition - Mercury		
IMPROVE			Wet Dep. - Precip Chem.		
Cont. OC/EC			Wind Direction/Speed		
Cont. Sulfate (SO_4)			Outdoor Temperature		
Black Carbon			Bar. Pressure		
Cont. PAH			Relative Humidity		
Lead			Dew point		
CO			Precipitation Amount		
CO_2			Solar Radiation		
Gamma Radiation			UV-b Radiation		

Site Description:
The site is located approximately 3.5 miles southwest of Bethel, Maine on Smith Farm Road. The shelter is situated in a field along the power line right of way.

Monitoring Objectives:
SLAMS Attainment/Non-Attainment. Western Mountain Location

Planned changes for 2019:
None.

Town – Site:	**Bridgton**		
County:	**Cumberland**	Latitude:	**44.1074**
Address:	**Upper Ridge Road**	Longitude:	**-70.7290**
AQS Site ID:	**23-005-0002**	Elevation:	**223 meters**
Spatial Scale:	**Regional**	Year Established:	**1980**
Statistical Area:	**Portland-South Portland-Biddeford, ME**		

Bridgton
Pollutant and Meteorological Parameters:

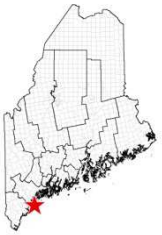
Parameter	Date Began	Date Ended	Parameter	Date Began	Date Ended
PM2.5 - 24 Hr.			SO_2		
PM2.5 - 24 Hr. Colo			Ozone		
PM2.5 Cont.			NOx		
PM10 - 24 Hr.			NOy		
PM10 - 24 Hr. Colo			HAPs		
PM10 Cont.			VOCs (PAMS)		
PM Coarse			Wet Deposition - Mercury	6-3-1997	
IMPROVE	3-14-2001	1/1/2016	Wet Dep. - Precip Chem.	1-1-1980	
Cont. OC/EC			Wind Direction/Speed		
Cont. Sulfate (SO_4)			Outdoor Temperature		
Black Carbon			Bar. Pressure		
Cont. PAH			Relative Humidity		
Lead			Dew point		
CO			Precipitation Amount		
CO_2			Solar Radiation		
Gamma Radiation			UV-b Radiation		

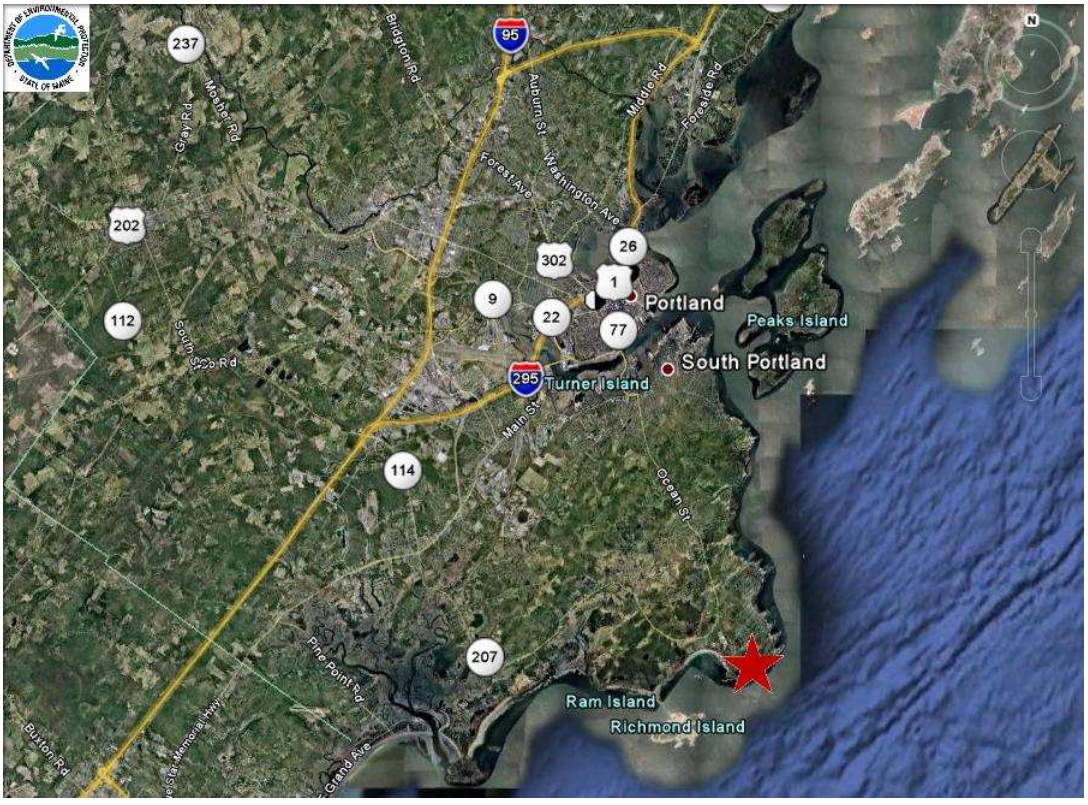
Site Description:
Site is located on a ridge in an open field area just off the Upper Ridge Road.

Monitoring Objectives:
Long-term tracking of deposition. Western Mountain Location

Planned changes for 2019:
IMPROVE monitoring was discontinued at the end of 2015. The BAQ is seeking alternative funding to re-establish IMPROVE monitoring in the future. Nothing planned for 2019.

Town – Site:	**Cape Elizabeth, Two Lights State Park**		
County:	**Cumberland**	Latitude:	**43.5610**
Address:	**Two Lights State Park**	Longitude:	**-70.2073**
AQS Site ID:	**23-005-2003**	Elevation:	**24 meters**
Spatial Scale:	**Regional**	Year Established:	**1981**
Statistical Area:	**Portland-South Portland-Biddeford, ME**		





Cape Elizabeth, Two Lights State Park
Pollutant and Meteorological Parameters:

Parameter	Date Began	Date Ended	Parameter	Date Began	Date Ended
PM2.5 - 24 Hr.	1-1-1999	12-17-2002	SO_2		
PM2.5 - 24 Hr. Colo			Ozone	1-1-1981	
PM2.5 Cont.			NOx	6-9-1993	10-31-1995
PM10 - 24 Hr.			NOy	6-26-1995	
PM10 - 24 Hr. Colo			HAPs	12-6-2013	
PM10 Cont.			VOCs (PAMS)	6-1-1993	
PM Coarse			Wet Deposition - Mercury		
IMPROVE			Wet Dep. - Precip Chem.		
Cont. OC/EC			Wind Direction/Speed	6-25-1985	
Cont. Sulfate (SO_4)			Outdoor Temperature	6-7-1994	
Black Carbon			Bar. Pressure	6-7-1994	
Cont. PAH			Relative Humidity	6-7-1994	
Lead			Dew point		
CO	5-1-2001	10-1-2007	Precipitation Amount		
CO_2			Solar Radiation	6-7-1994	
Gamma Radiation			UV-b Radiation	6-1-1995	

Site Description:
The Cape Elizabeth site is located in an open elevated area in the Two Lights State Park in Cape Elizabeth. With the exception of the ozone and meteorological parameters, this site is normally operated during the ozone season only.

Monitoring Objectives:
Monitoring long-range transport of pollutants on a regional scale.

Planned changes for 2019:
DEP is requesting the EPA to consider this historic PAMS location for inclusion in the National Enhanced Monitoring Plan as it will continue to provide trend data useful in detecting changes within the Ozone Transport Region.

Town – Site:	**Caribou – Caribou Airport**		
County:	**Aroostook**	Latitude:	**46.8683**
Address:	**Caribou Airport**	Longitude:	**-67.9931**
AQS Site ID:	**23-003-1002**	Elevation:	**191 meters**
Spatial Scale:	**Regional**	Year Established:	**1982**
Statistical Area:	**None**		

Caribou – Caribou Airport
Pollutant and Meteorological Parameters:

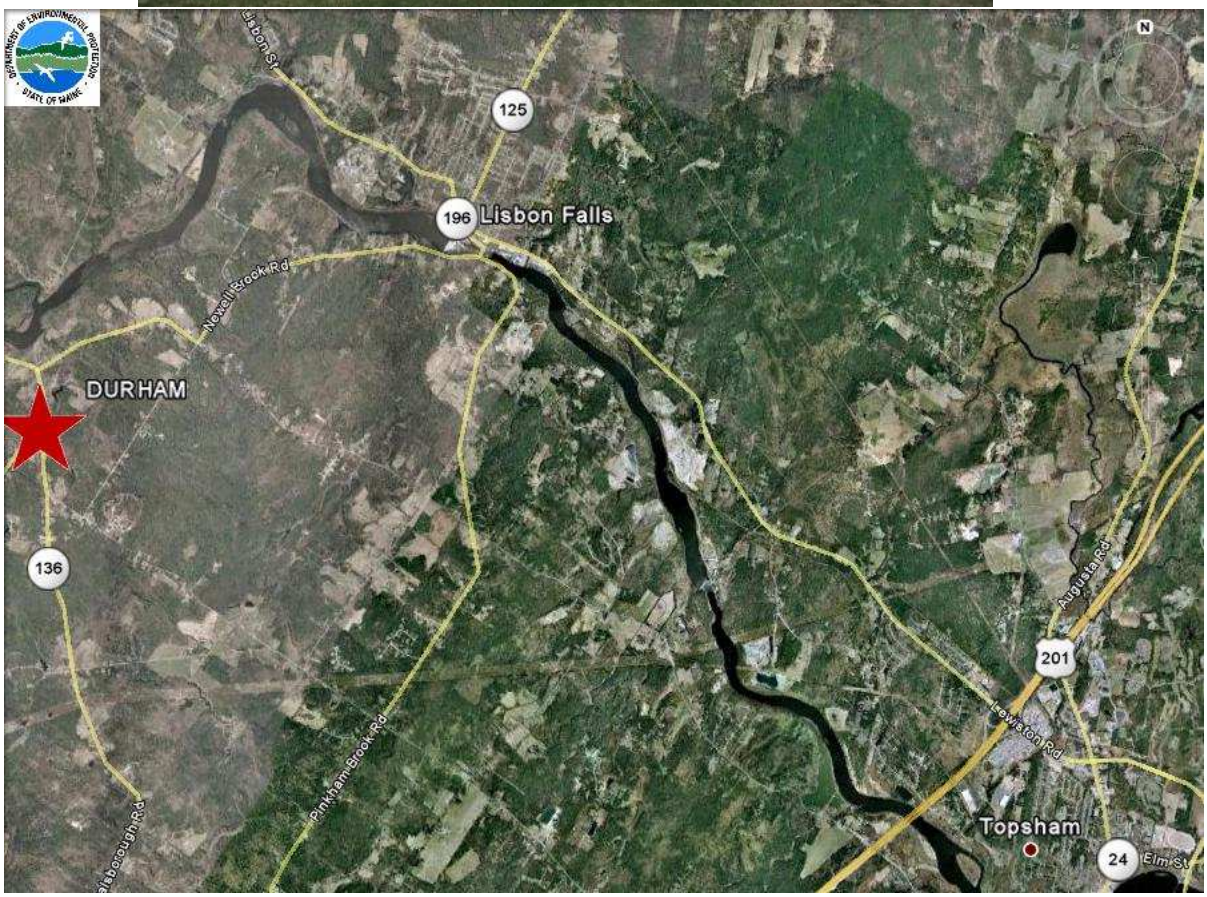
Parameter	Date Began	Date Ended	Parameter	Date Began	Date Ended
PM2.5 - 24 Hr.			SO_2		
PM2.5 - 24 Hr. Colo			Ozone		
PM2.5 Cont.			NOx		
PM10 - 24 Hr.			NOy		
PM10 - 24 Hr. Colo			HAPs		
PM10 Cont.			VOCs (PAMS)		
PM Coarse			Wet Deposition - Mercury		
IMPROVE			Wet Dep. - Precip Chem.	1-1-1982	
Cont. OC/EC			Wind Direction/Speed		
Cont. Sulfate (SO_4)			Outdoor Temperature		
Black Carbon			Bar. Pressure		
Cont. PAH			Relative Humidity		
Lead			Dew point		
CO			Precipitation Amount	1-1-1982	
CO_2			Solar Radiation		
Gamma Radiation			UV-b Radiation		

Site Description:
Site is located in a grassy area inside the fence and off the south end of the runway at Caribou Airport

Monitoring Objectives:
Long-term monitoring of wet deposition chemistry and precipitation amount in northern Maine

Planned changes for 2019:
None.

Town – Site:	**Durham – Fire Station**		
County:	**Androscoggin**	Latitude:	**43.9745**
Address:	**Route 9**	Longitude:	**-70.1249**
AQS Site ID:	**23-001-0014**	Elevation:	**50 meters**
Spatial Scale:	**Regional**	Year Established:	**2004**
Statistical Area:	**Lewiston-Auburn, ME**		



Durham – Fire Station
Pollutant and Meteorological Parameters:

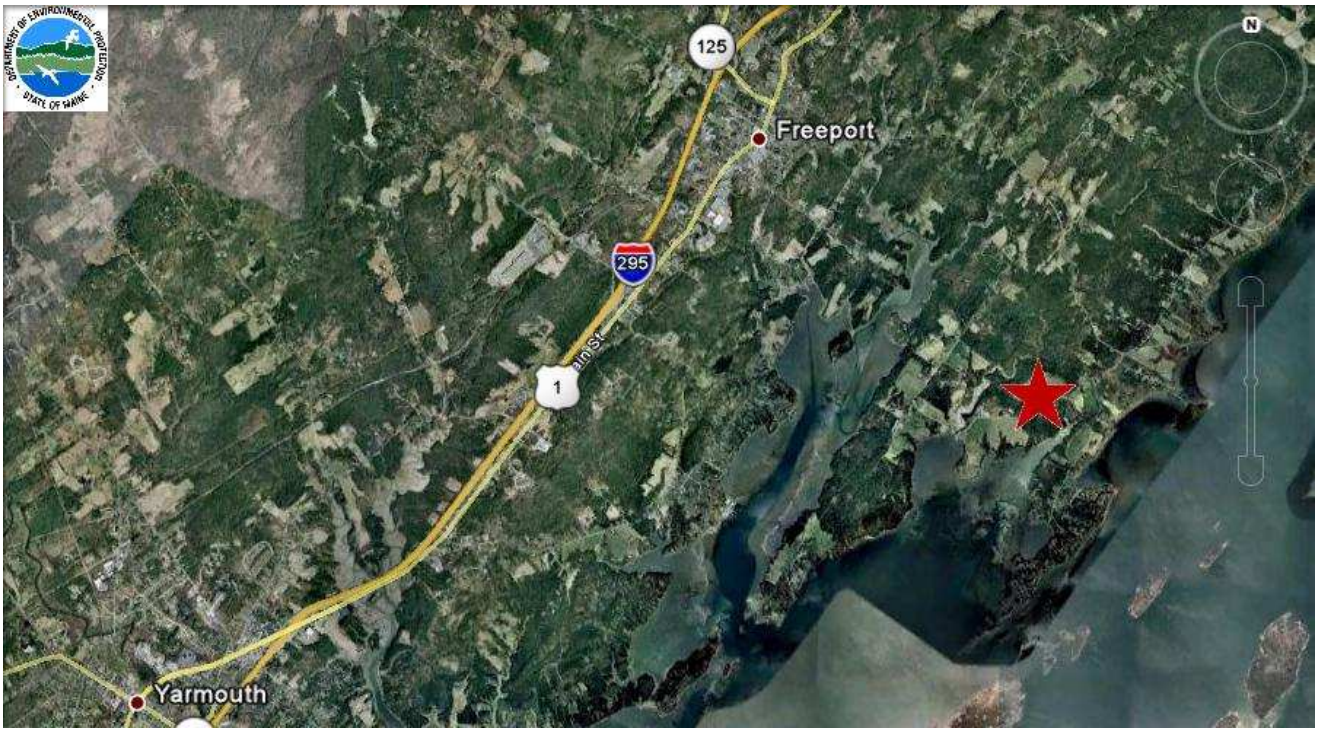
Parameter	Date Began	Date Ended	Parameter	Date Began	Date Ended
PM2.5 - 24 Hr.			SO_2		
PM2.5 - 24 Hr. Colo			Ozone	04/01/2004	
PM2.5 Cont.			NOx		
PM10 - 24 Hr.			NOy		
PM10 - 24 Hr. Colo			HAPs		
PM10 Cont.			VOCs (PAMS)		
PM Coarse			Wet Deposition - Mercury		
IMPROVE			Wet Dep. - Precip Chem.		
Cont. OC/EC			Wind Direction/Speed		
Cont. Sulfate (SO_4)			Outdoor Temperature		
Black Carbon			Bar. Pressure		
Cont. PAH			Relative Humidity		
Lead			Dew point		
CO			Precipitation Amount		
CO_2			Solar Radiation		
Gamma Radiation			UV-b Radiation		

Site Description:
The site is located on the grounds of the Durham Fire Station, 9 ½ miles SE of Lewiston. An ozone monitor is located within an 8'x8'x8' environmentally controlled shelter. The shelter was installed in 2006. During the summers of 2004 and 2005, an ozone monitor was set up temporarily in a corner of the fire station with a probe attached to the roof edge to determine if the location warranted continued monitoring.

Monitoring Objectives:
SLAMS Attainment/Non-Attainment.

Planned changes for 2019:
None.

Town – Site:	**Freeport – Wolfes Neck Farm**		
County:	**Cumberland**	Latitude:	**43.8325**
Address:	**Wolfe's Neck Road**	Longitude:	**-70.0644**
AQS Site ID:	**23-005-9002**	Elevation:	**27 Meters**
Spatial Scale:	**Regional/Neighborhood**	Year Established:	**1998**
Statistical Area:	**Portland-South Portland-Biddeford, ME**		



Freeport – Wolfes Neck Farm
Pollutant and Meteorological Parameters:

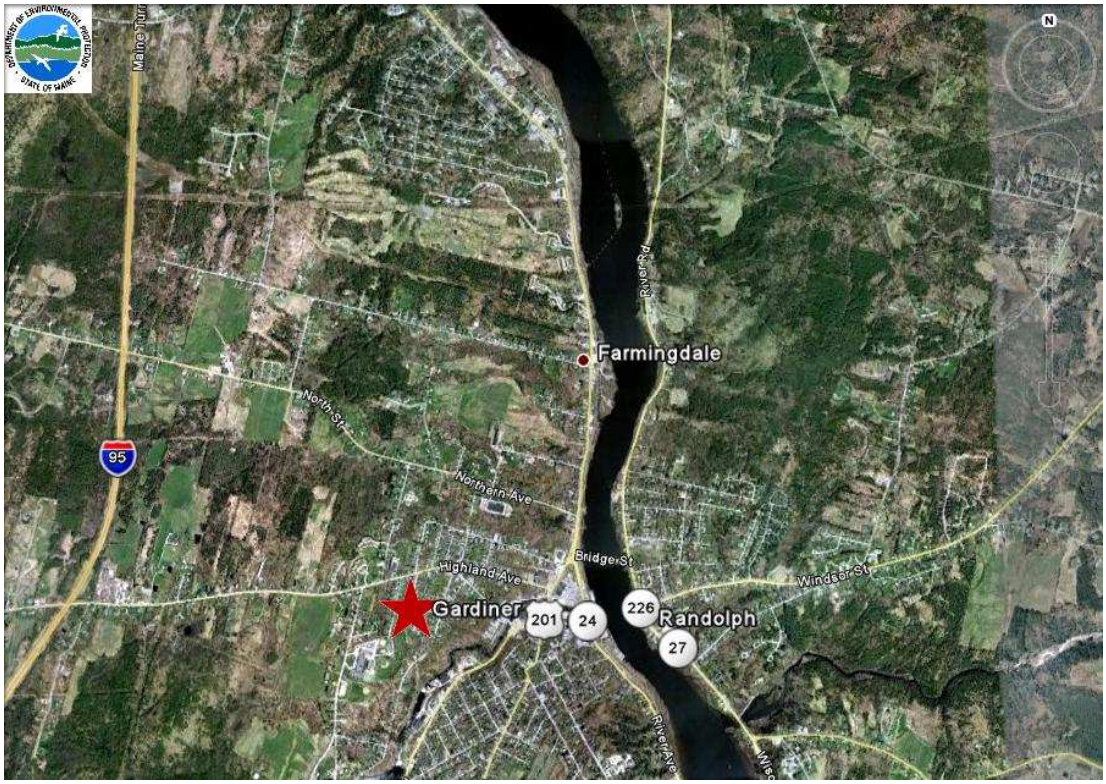
Parameter	Date Began	Date Ended	Parameter	Date Began	Date Ended
PM2.5 - 24 Hr.			SO_2		
PM2.5 - 24 Hr. Colo			Ozone		
PM2.5 Cont.			NOx		
PM10 - 24 Hr.			NOy		
PM10 - 24 Hr. Colo			HAPs		
PM10 Cont.			VOCs (PAMS)		
PM Coarse			Wet Deposition - Mercury	1-7-1998	
IMPROVE	3/14/2001		Wet Dep. - Precip Chem.	1-7-1998	
Cont. OC/EC			Wind Direction/Speed		
Cont. Sulfate (SO_4)			Outdoor Temperature		
Black Carbon			Bar. Pressure		
Cont. PAH			Relative Humidity		
Lead			Dew point		
CO			Precipitation Amount	1-7-1998	
CO_2			Solar Radiation		
Gamma Radiation			UV-b Radiation		

Site Description:
Site is located within a fenced in area in the middle of a large open field used as a pasture by the Wolfe's Neck farm.

Monitoring Objectives:
Long-term monitoring of wet deposition chemistry and precipitation amount in northern Maine**.** IMPROVE Site.

Planned changes for 2019:
None.

Town – Site:	**Gardiner – Pray Street, Schoolyard**		
County:	**Kennebec**	Latitude:	**44.2306**
Address:	**Pray Street**	Longitude:	**-69.7850**
AQS Site ID:	**23-011-2005**	Elevation:	**55 Meters**
Spatial Scale:	**Regional**	Year Established:	**1991**
Statistical Area:	**Augusta-Waterville, ME**		



Gardiner – Pray Street, Schoolyard
Pollutant and Meteorological Parameters:

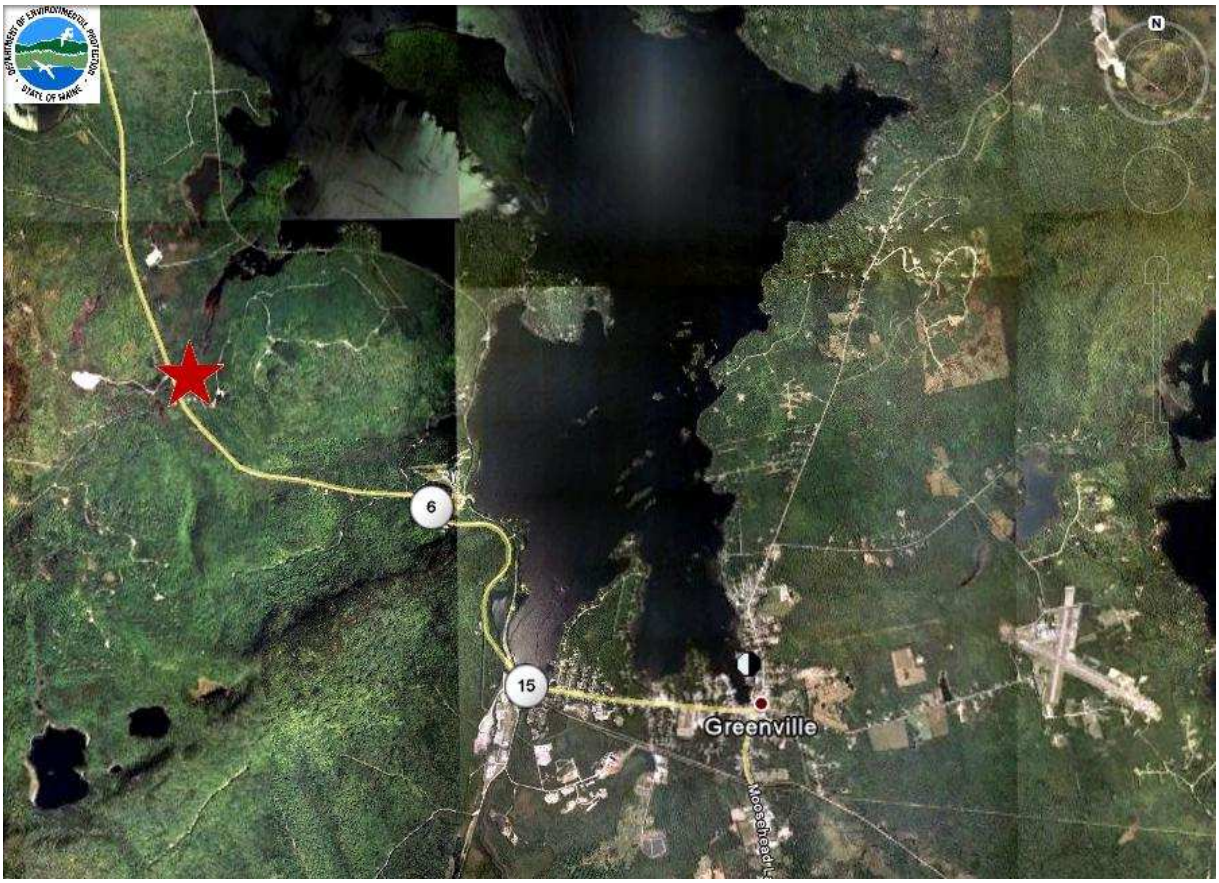
Parameter	Date Began	Date Ended	Parameter	Date Began	Date Ended
PM2.5 - 24 Hr.			SO_2	03/07/2012	
PM2.5 - 24 Hr. Colo			Ozone	04/01/1991	
PM2.5 Cont.			NOx	03/07/2012	
PM10 - 24 Hr.			NOy		
PM10 - 24 Hr. Colo			HAPs		
PM10 Cont.			VOCs (PAMS)		
PM Coarse			Wet Deposition - Mercury		
IMPROVE			Wet Dep. - Precip Chem.		
Cont. OC/EC			Wind Direction/Speed		
Cont. Sulfate (SO_4)			Outdoor Temperature		
Black Carbon			Bar. Pressure		
Cont. PAH			Relative Humidity		
Lead			Dew point		
CO			Precipitation Amount		
CO_2			Solar Radiation		
Gamma Radiation			UV-b Radiation		

Site Description:
The site is located on the north edge of the Gardiner Area High School grounds. The Pray Street Elementary School next door at 14 Pray Street has closed and is now housing a Boys and Girls Club. Monitors are housed in an 8'x8'x8' environmentally controlled shelter, situated outside the fence line of the playing fields. The shelter was replaced in 2006.

Monitoring Objectives:
SLAMS Attainment/Non-Attainment. Monitoring long-range transport of pollutants on a regional scale.

Planned changes for 2019:
In 2019, if there are no disruptions to the data flow, the SO2 and NOx monitoring may be discontinued. These instruments were established to provide background information used in DEP licensing decisions.

Town – Site:	**Greenville**		
County:	**Piscataquis**	Latitude:	**45.4893**
Address:	**Squaw Brook**	Longitude:	**-69.6637**
AQS Site ID:	**23-021-0001**	Elevation:	**339 Meters**
Spatial Scale:	**Regional**	Year Established:	**1980**
Statistical Area:	**None**		



Greenville
Pollutant and Meteorological Parameters:

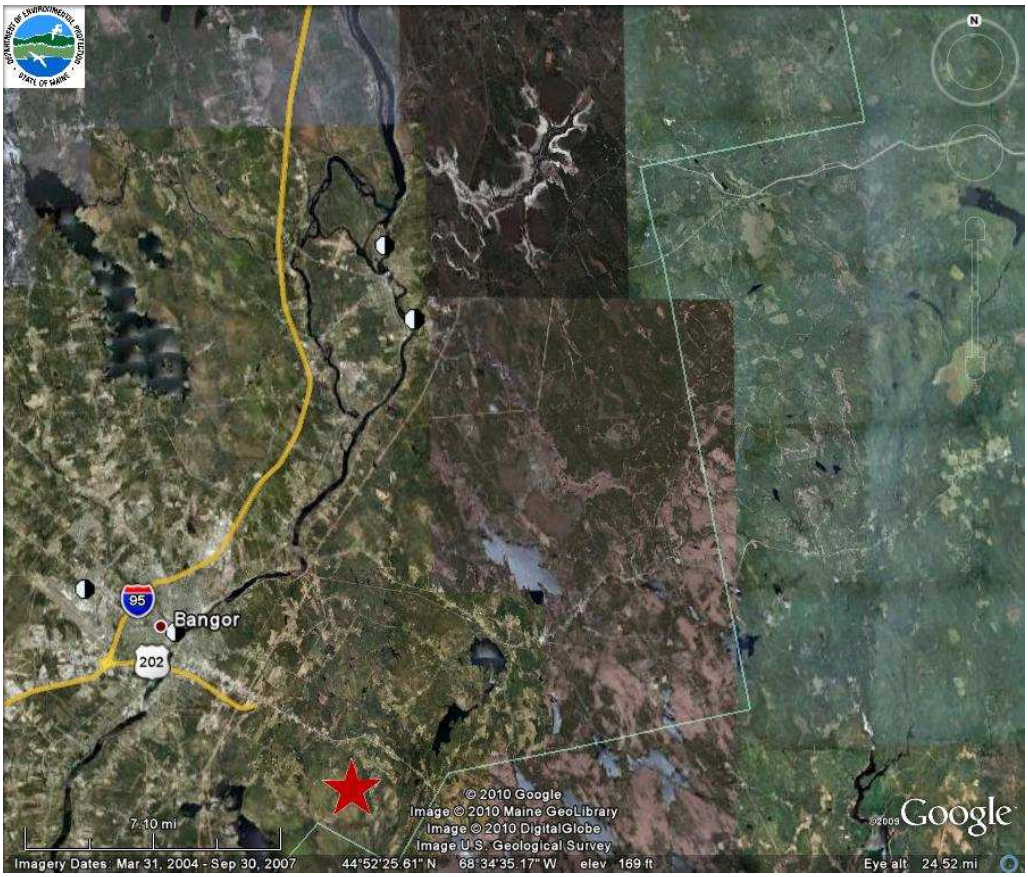
Parameter	Date Began	Date Ended	Parameter	Date Began	Date Ended
PM2.5 - 24 Hr.			SO_2		
PM2.5 - 24 Hr. Colo			Ozone		
PM2.5 Cont.			NOx		
PM10 - 24 Hr.			NOy		
PM10 - 24 Hr. Colo			HAPs		
PM10 Cont.			VOCs (PAMS)		
PM Coarse			Wet Deposition - Mercury	1997	
IMPROVE			Wet Dep. - Precip Chem.	1980	
Cont. OC/EC			Wind Direction/Speed		
Cont. Sulfate (SO_4)			Outdoor Temperature		
Black Carbon			Bar. Pressure		
Cont. PAH			Relative Humidity		
Lead			Dew point		
CO			Precipitation Amount	1980	
CO_2			Solar Radiation		
Gamma Radiation			UV-b Radiation		

Site Description:
Site is located in a small clearing on private property to the northwest of Greenville Junction. This is one of the oldest deposition monitoring sites in the country.

Monitoring Objectives:
Long-term monitoring of wet deposition chemistry and precipitation amount in western Maine

Planned changes for 2019:
None.

Town – Site:	**Holden**		
County:	**Penobscot**	Latitude:	**44.7365**
Address:	**Summit of Rider's Bluff**	Longitude:	**-68.6711**
AQS Site ID:	**23-019-4008**	Elevation:	**250 Meters**
Spatial Scale:	**Regional**	Year Established:	**1993**
Statistical Area:	**Bangor, ME**		



Holden

Pollutant and Meteorological Parameters:

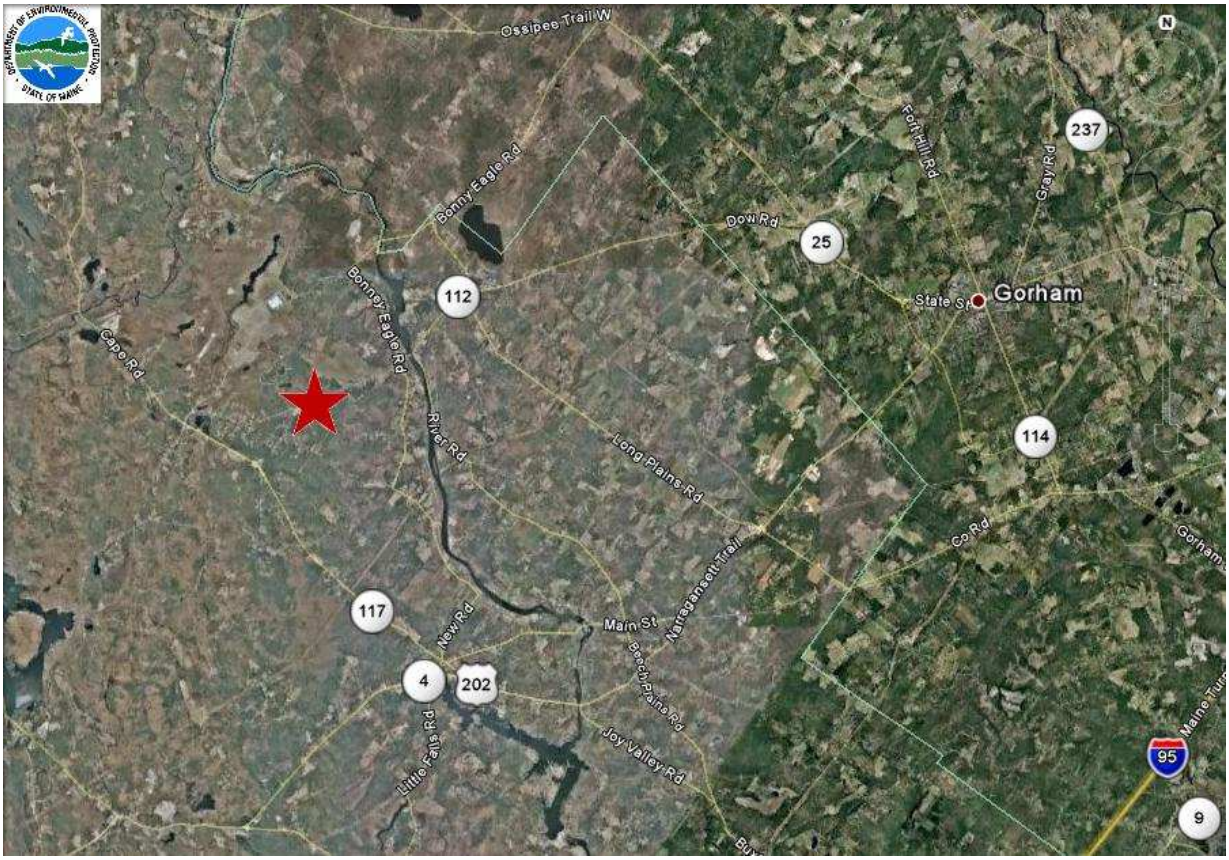
Parameter	Date Began	Date Ended	Parameter	Date Began	Date Ended
PM2.5 - 24 Hr.			SO_2		
PM2.5 - 24 Hr. Colo			Ozone	5-19-1993	
PM2.5 Cont.			NOx		
PM10 - 24 Hr.			NOy		
PM10 - 24 Hr. Colo			HAPs		
PM10 Cont.			VOCs (PAMS)		
PM Coarse			Wet Deposition - Mercury		
IMPROVE			Wet Dep. - Precip Chem.		
Cont. OC/EC			Wind Direction/Speed		
Cont. Sulfate (SO_4)			Outdoor Temperature		
Black Carbon			Bar. Pressure		
Cont. PAH			Relative Humidity		
Lead			Dew point		
CO			Precipitation Amount		
CO_2			Solar Radiation		
Gamma Radiation			UV-b Radiation		

Site Description:
Site is a transmission tower location for a local TV station at the top of a hill in Holden with good exposure in all directions.

Monitoring Objectives:
SLAMS Attainment/Non-Attainment. Monitoring long-range transport of pollutants on a regional scale.

Planned changes for 2019:
None.

Town – Site:	**Hollis/West Buxton – Fire Department**		
County:	**York**	Latitude:	**43.6568**
Address:	**Plains Road**	Longitude:	**-70.6291**
AQS Site ID:	**23-031-0038**	Elevation:	**84 Meters**
Spatial Scale:	**Regional**	Year Established:	**1999**
Statistical Area:	**Portland-South Portland-Biddeford, ME**		



Hollis/West Buxton – Fire Department
Pollutant and Meteorological Parameters:

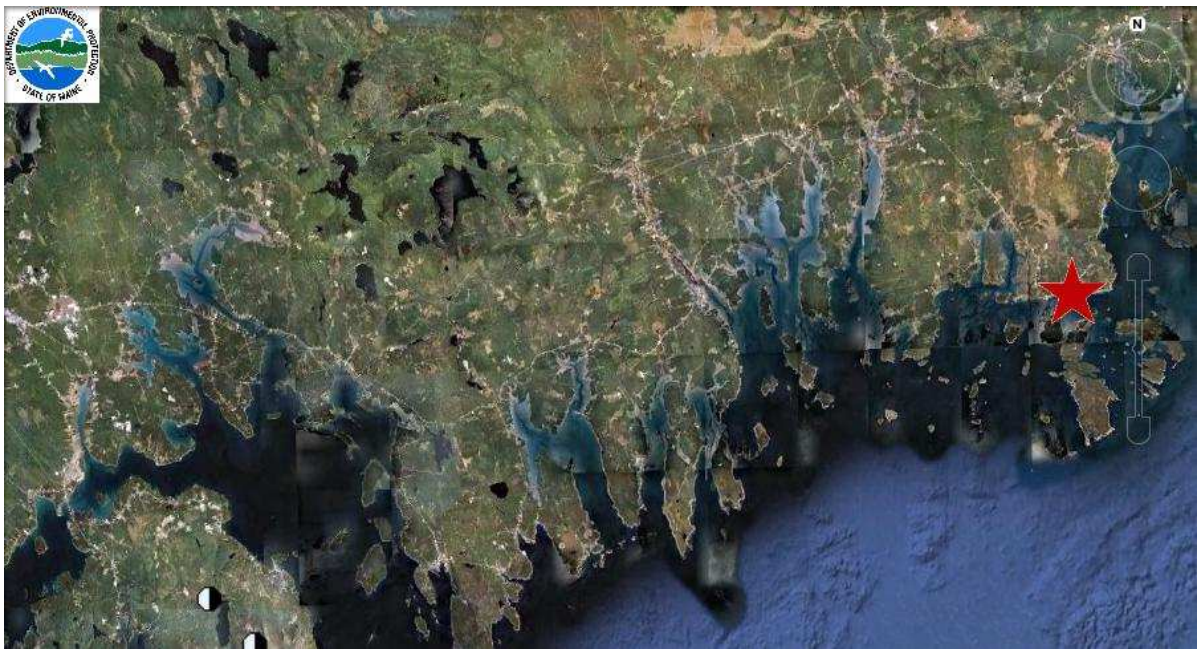
Parameter	Date Began	Date Ended	Parameter	Date Began	Date Ended
PM2.5 - 24 Hr.			SO_2		
PM2.5 - 24 Hr. Colo			Ozone	4-1-1999	
PM2.5 Cont.			NOx		
PM10 - 24 Hr.			NOy		
PM10 - 24 Hr. Colo			HAPs		
PM10 Cont.			VOCs (PAMS)		
PM Coarse			Wet Deposition - Mercury		
IMPROVE			Wet Dep. - Precip Chem.		
Cont. OC/EC			Wind Direction/Speed		
Cont. Sulfate (SO_4)			Outdoor Temperature		
Black Carbon			Bar. Pressure		
Cont. PAH			Relative Humidity		
Lead			Dew point		
CO			Precipitation Amount		
CO_2			Solar Radiation		
Gamma Radiation			UV-b Radiation		

Site Description:
Monitor is located in an 8x8x8 shelter in an open area around the West Buxton Fire Department building.

Monitoring Objectives:
SLAMS Attainment/Non-Attainment. Western Mountain Location. Monitoring long-range transport of pollutants on a regional scale.

Planned changes for 2019:
None.

Town – Site:	**Jonesport – Public Landing**		
County:	**Washington**	Latitude:	**44.5319**
Address:	**Public Landing**	Longitude:	**-67.5959**
AQS Site ID:	**23-029-0019**	Elevation:	**16 Meters**
Spatial Scale:	**Regional**	Year Established:	**1989**
Statistical Area:	**None**		



Jonesport – Public Landing
Pollutant and Meteorological Parameters:

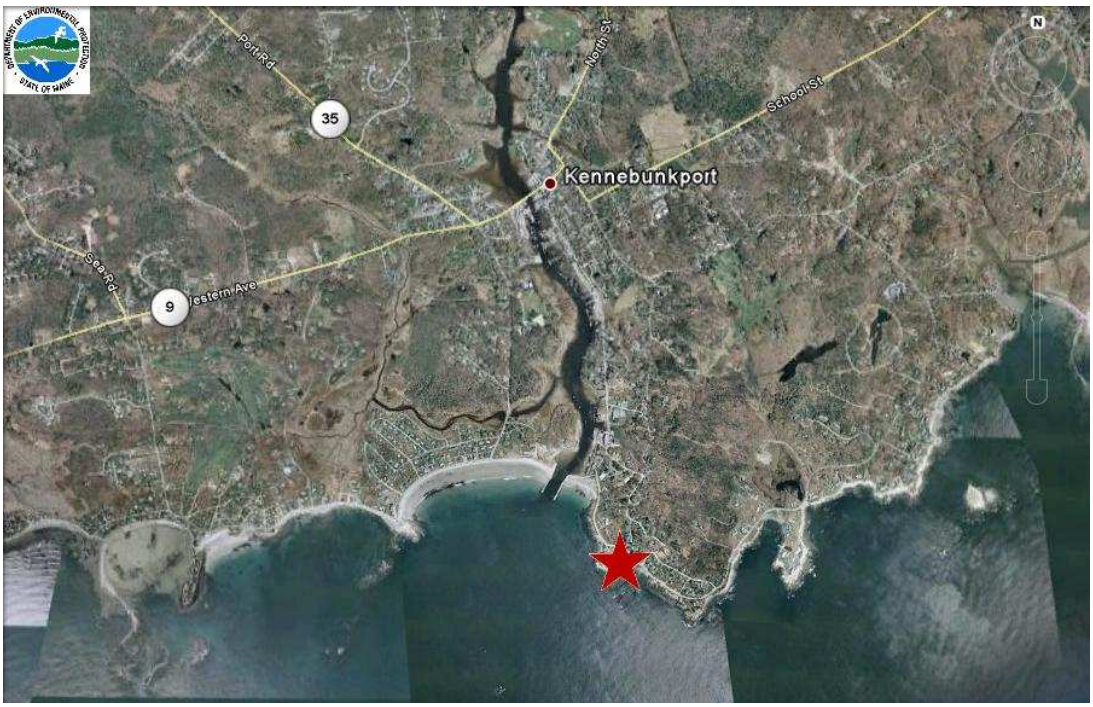
Parameter	Date Began	Date Ended	Parameter	Date Began	Date Ended
PM2.5 - 24 Hr.			SO_2		
PM2.5 - 24 Hr. Colo			Ozone	5-19-1989	
PM2.5 Cont.			NOx		
PM10 - 24 Hr.			NOy		
PM10 - 24 Hr. Colo			HAPs		
PM10 Cont.			VOCs (PAMS)		
PM Coarse			Wet Deposition - Mercury		
IMPROVE			Wet Dep. - Precip Chem.		
Cont. OC/EC			Wind Direction/Speed		
Cont. Sulfate (SO_4)			Outdoor Temperature		
Black Carbon			Bar. Pressure		
Cont. PAH			Relative Humidity		
Lead			Dew point		
CO			Precipitation Amount		
CO_2			Solar Radiation		
Gamma Radiation			UV-b Radiation		

Site Description:
Monitor is located in a town building at the Public Landing in Jonesport.

Monitoring Objectives:
SLAMS Attainment/Non-Attainment.

Planned changes for 2019:
A 10-meter meteorological tower with wind speed and direction sensors was erected during the summer of 2017. Seasonal wind data provide additional information about ozone transport patterns.

Town – Site:	**Kennebunkport – Parson's Way**		
County:	**York**	Latitude:	**43.3431**
Address:	**Ocean Avenue**	Longitude:	**-70.4714**
AQS Site ID:	**23-031-2002**	Elevation:	**6 Meters**
Spatial Scale:	**Regional**	Year Established:	**1983**
Statistical Area:	**Portland-South Portland-Biddeford, ME**		



Kennebunkport – Parson's Way
Pollutant and Meteorological Parameters:

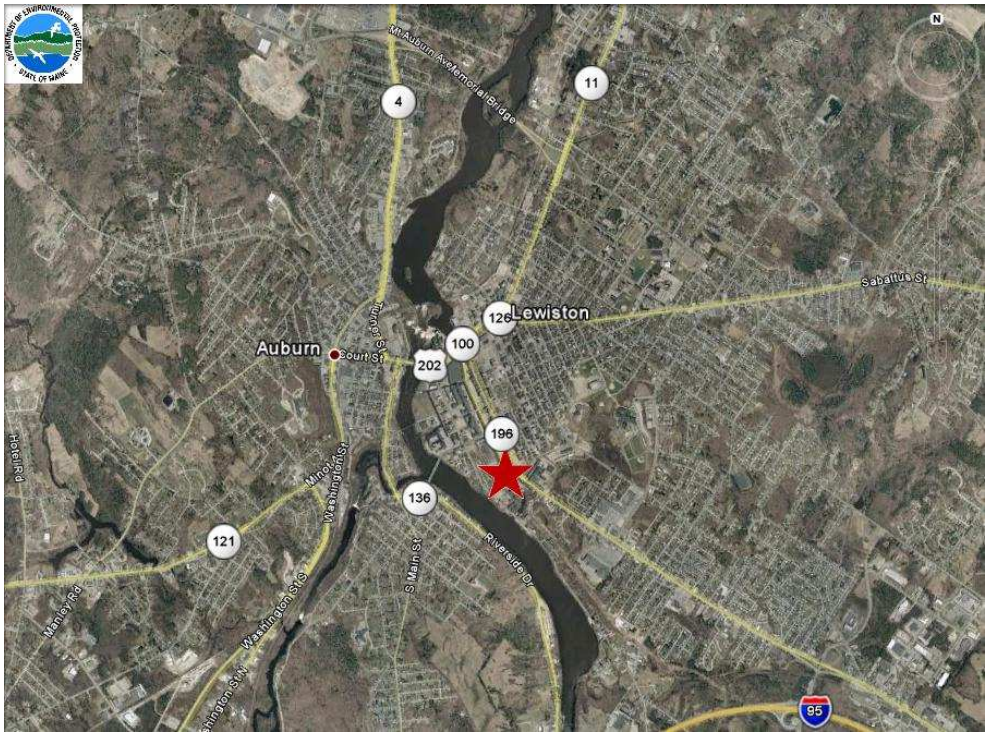
Parameter	Date Began	Date Ended	Parameter	Date Began	Date Ended
PM2.5 - 24 Hr.			SO_2		
PM2.5 - 24 Hr. Colo			Ozone	1-1-1983	
PM2.5 Cont.			NOx	6-1-1990	9-1-1990
PM10 - 24 Hr.			NOy		
PM10 - 24 Hr. Colo			HAPs		
PM10 Cont.			VOCs (PAMS)		
PM Coarse			Wet Deposition - Mercury		
IMPROVE			Wet Dep. - Precip Chem.		
Cont. OC/EC			Wind Direction/Speed		
Cont. Sulfate (SO_4)			Outdoor Temperature		
Black Carbon			Bar. Pressure		
Cont. PAH			Relative Humidity		
Lead			Dew point		
CO			Precipitation Amount		
CO_2			Solar Radiation		
Gamma Radiation			UV-b Radiation		

Site Description:
Site is located on a rocky beach area just off Ocean Avenue. Site has good exposure and has recorded some of the highest ozone concentrations in the state. A wooden 8'x8'x8' structure remains chained to the rocky ledge year-round for convenience at the start-up and shut-down of each ozone season.

Monitoring Objectives:
SLAMS Attainment/Non-Attainment. Monitoring long-range transport of pollutants on a regional scale.

Planned changes for 2019:
None

Town – Site:	**Lewiston – Country Kitchen Parking Lot**		
County:	**Androscoggin**	Latitude:	**44.0894**
Address:	**Canal Street**	Longitude:	**-70.2141**
AQS Site ID:	**23-001-0011**	Elevation:	**50 meters**
Spatial Scale:	**Neighborhood**	Year Established:	**1981**
Statistical Area:	**Lewiston-Auburn ME**		



Lewiston – Country Kitchen Parking Lot
Pollutant and Meteorological Parameters:

Parameter	Date Began	Date Ended	Parameter	Date Began	Date Ended
PM2.5 - 24 Hr.	01/01/1999		SO_2	07/13/1998	12/30/2002
PM2.5 - 24 Hr. Colo			Ozone		
PM2.5 Cont.	01/01/2000		NOx		
PM10 - 24 Hr.	04/01/2004		NOy		
PM10 - 24 Hr. Colo			HAPs	06/14/2004	
PM10 Cont.			VOCs (PAMS)		
PM Coarse			Wet Deposition - Mercury		
IMPROVE			Wet Dep. - Precip Chem.		
Cont. OC/EC			Wind Direction/Speed		
Cont. Sulfate (SO_4)			Outdoor Temperature		
Black Carbon			Bar. Pressure		
Cont. PAH			Relative Humidity		
Lead	06/01/1989	12/31/1993	Dew point		
CO			Precipitation Amount		
CO_2			Solar Radiation		
Gamma Radiation			UV-b Radiation		

Site Description:
The site is located in downtown Lewiston in the parking lot of the Country Kitchen Bakery. An 8'x8'x8' shelter houses electronic monitoring equipment, data acquisition system and modem, in a climate controlled environment, with PM monitors and intakes situated on the roof. A continuous $PM_{2.5}$ TEOM operated from 1/1/2000 until 9/12/2013. It was replaced with a continuous $PM_{2.5}$ BAM on 9/12/2013 which remains in operation.

Monitoring Objectives:
SLAMS Attainment/Non-Attainment. High Population Exposure

Planned changes for 2019:
None.

Town – Site:	**Madawaska – Public Safety Bldg.**		
County:	**Aroostook**	Latitude:	**47.3553**
Address:	**East Maine St.**	Longitude:	**-68.3211**
AQS Site ID:	**23-003-0014**	Elevation:	**177 meters**
Spatial Scale:	**Neighborhood**	Year Established:	**2009**
Statistical Area:	**None**		

Madawaska – Public Safety Bldg.
Pollutant and Meteorological Parameters:

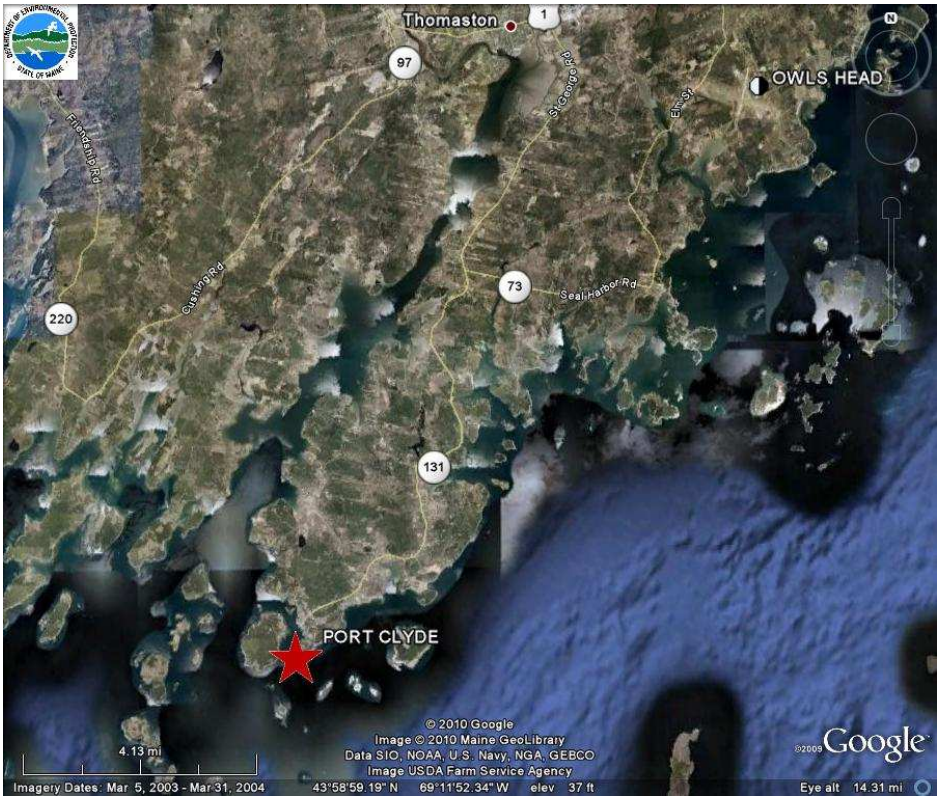
Parameter	Date Began	Date Ended	Parameter	Date Began	Date Ended
PM2.5 - 24 Hr.	8-1-2009		SO_2		
PM2.5 - 24 Hr. Colo			Ozone		
PM2.5 Cont.	1-17-2014		NOx		
PM10 - 24 Hr.	8-1-2009		NOy		
PM10 - 24 Hr. Colo			HAPs		
PM10 Cont.			VOCs (PAMS)		
PM Coarse			Wet Deposition - Mercury		
IMPROVE			Wet Dep. - Precip Chem.		
Cont. OC/EC			Wind Direction/Speed		
Cont. Sulfate (SO_4)			Outdoor Temperature		
Black Carbon			Bar. Pressure		
Cont. PAH			Relative Humidity		
Lead			Dew point		
CO			Precipitation Amount		
CO_2			Solar Radiation		
Gamma Radiation			UV-b Radiation		

Site Description:
Monitoring platform established in 2009 on the roof of the Madawaska Public Service Building.
NOTE: The fire department has hosted big BBQ events on certain holidays and smoke from the grills are quite often detected by the ambient air monitoring equipment.

Monitoring Objectives:
SLAMS Attainment/Non-Attainment.

Planned changes for 2019:
None.

Town – Site:	**Port Clyde – Marshall Point Lighthouse**		
County:	**Knox**	Latitude:	**43.9180**
Address:	**Marshall Point Road**	Longitude:	**-69.2608**
AQS Site ID:	**23-013-0004**	Elevation:	**9 Meters**
Spatial Scale:	**Regional**	Year Established:	**1987**
Statistical Area:	**Rockland, ME**		



Port Clyde – Marshall Point Lighthouse
Pollutant and Meteorological Parameters:

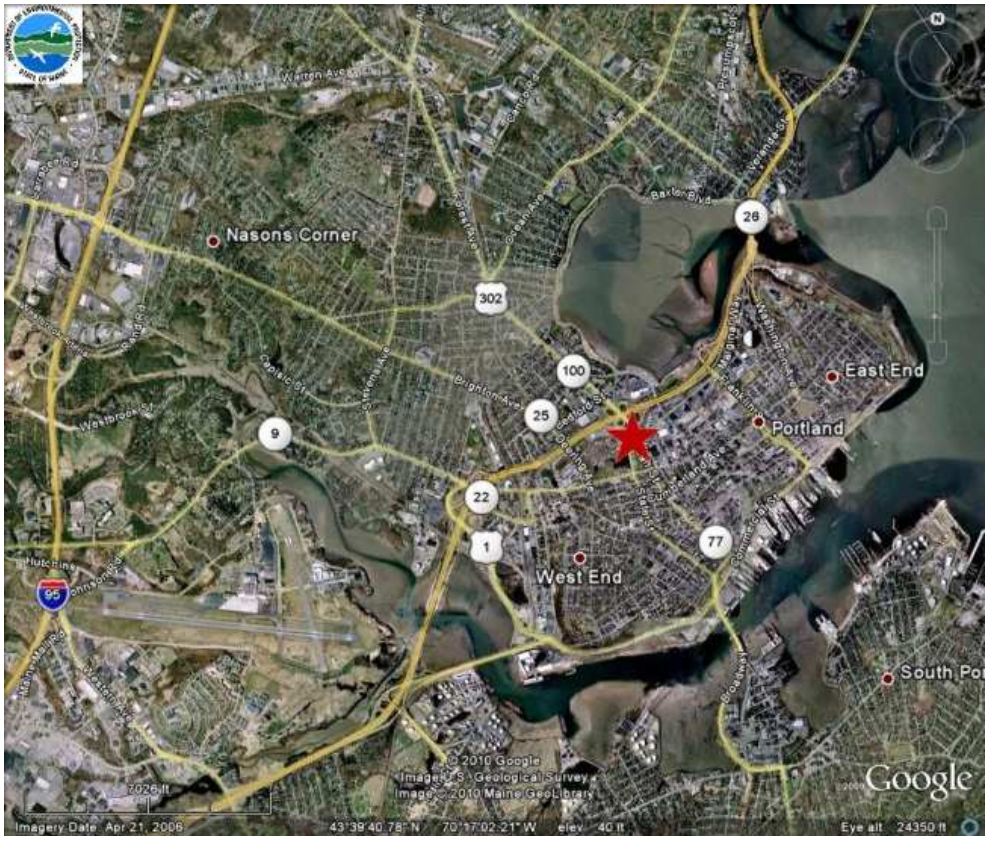
Parameter	Date Began	Date Ended	Parameter	Date Began	Date Ended
PM2.5 - 24 Hr.			SO_2		
PM2.5 - 24 Hr. Colo			Ozone	05/01/1987	
PM2.5 Cont.			NOx		
PM10 - 24 Hr.			NOy		
PM10 - 24 Hr. Colo			HAPs		
PM10 Cont.			VOCs (PAMS)		
PM Coarse			Wet Deposition - Mercury		
IMPROVE			Wet Dep. - Precip Chem.		
Cont. OC/EC			Wind Direction/Speed		
Cont. Sulfate (SO_4)			Outdoor Temperature		
Black Carbon			Bar. Pressure		
Cont. PAH			Relative Humidity		
Lead			Dew point		
CO			Precipitation Amount		
CO_2			Solar Radiation		
Gamma Radiation			UV-b Radiation		

Site Description:
The site is located at Marshall Point on the grounds of the Marshall Point Lighthouse Museum about 14.8 miles southwest of downtown Rockland. An 8'x8'x'8 environmentally controlled shelter houses the monitor, data acquisition equipment and modem.

Monitoring Objectives:
SLAMS Attainment/Non-Attainment. Monitoring long-range transport of pollutants on a regional scale.

Planned changes for 2019:
The 8'x8' monitoring shelter at the site is showing signs of age and needs replacement. The DEP is considering the installation of a wooden structure like the one installed in 2017 at Kennebunkport. Staff from the Marshal Point Lighthouse Museum are planning to construct a replica of the old lighthouse keeper's carriage barn. They have expressed a desire to have the current monitoring shelter removed and have offered a corner of the barn as an alternative. It has yet to be determined whether the room in the barn will be suitable to host the ozone monitoring equipment or whether the DEP will proceed with the new wooden structure at the current monitoring location. Discussions may continue into 2019.

Town – Site:	**Portland – Deering Oaks Park**		
County:	**Cumberland**		
Address:	**356 State St.**	Latitude:	**43.6602**
AQS Site ID:	**23-005-0029**	Longitude:	**-70.2690**
Spatial Scale:	**Neighborhood**	Elevation:	**4 meters**
Statistical Area:	**Portland-South Portland-Biddeford, ME**	Year Established:	**2008**



Portland – Deering Oaks Park
Pollutant and Meteorological Parameters:

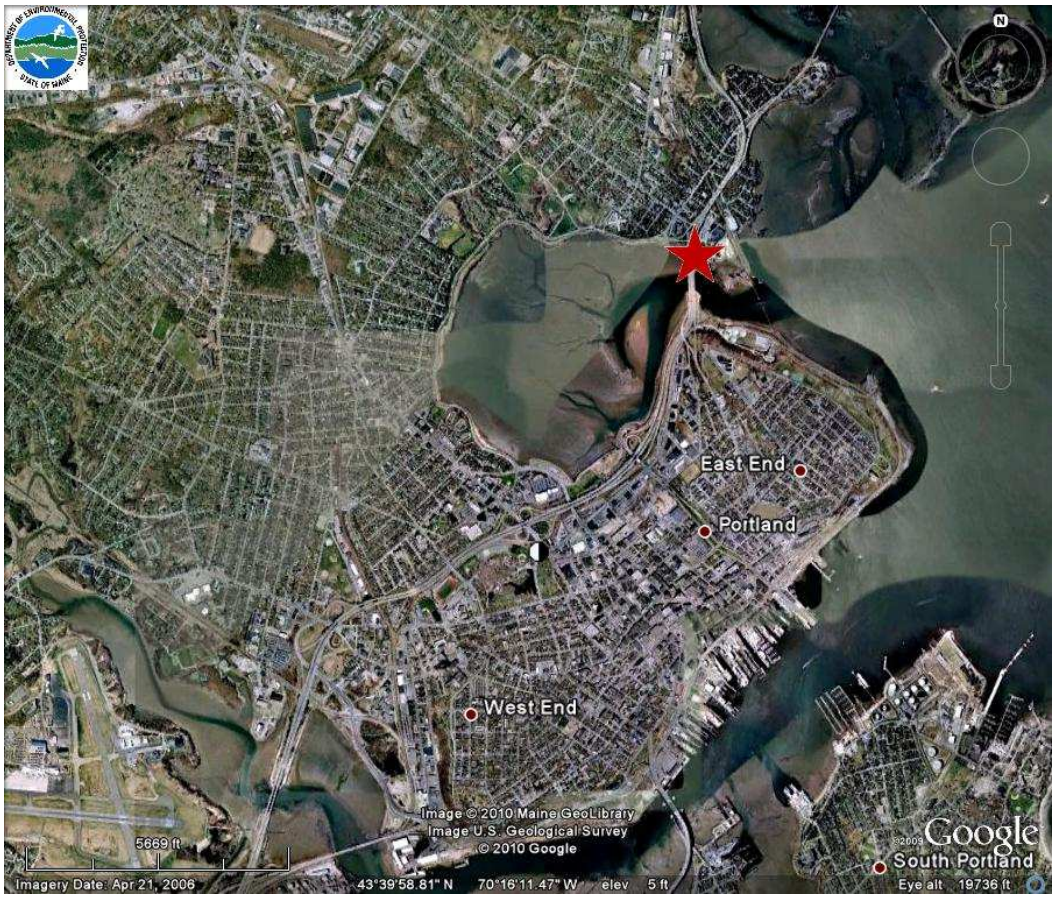
Parameter	Date Began	Date Ended	Parameter	Date Began	Date Ended
PM2.5 - 24 Hr.	1-22-2008		SO_2	1-24-2008	
PM2.5 - 24 Hr. Colo	1-31-2008		Ozone	1-18-2008	
PM2.5 Cont.	1-18-2008		NOx	2-5-2008	
PM10 - 24 Hr.			NOy		
PM10 - 24 Hr. Colo			HAPs	3-14-2009	
PM10 Cont.			VOCs (PAMS)		
PM Coarse			Wet Deposition - Mercury		
IMPROVE			Wet Dep. - Precip Chem.		
Cont. OC/EC			Wind Direction/Speed		
Cont. Sulfate (SO_4)			Outdoor Temperature		
Black Carbon			Bar. Pressure		
Cont. PAH			Relative Humidity		
Lead			Dew point		
CO	5-1-2008		Precipitation Amount		
CO_2			Solar Radiation		
Gamma Radiation	1-29-2009		UV-b Radiation		

Site Description:
The Portland Deering Oaks (PDO) site was established in 2008 to replace the Marginal Way site, which had to be removed to make way for development activity. The site is located in a grassy area of the park near the intersection of Forest Avenue and State Street, and close to an off ramp from I-295. To the west of the site is a wooded area of the park as well as numerous athletic fields. The site does not meet strict EPA siting criteria so sample results are not used for regulatory purposes. The location was chosen in cooperation with the Maine and American Lung Association for use in their health statistics. Annual Average Daily Traffic volume on Forest Avenue is around 46,000.
A continuous $PM_{2.5}$ TEOM operated from 1/18/2008 until 6/30/2015. A continuous $PM_{2.5}$ BAM was installed on 5/7/2013. The two continuous $PM_{2.5}$ monitors operated together for a one year data comparison study. The TEOM was removed 6/20/2015 and the BAM remains in operation.
Gamma radiation measurements obtained at PDO are included in the EPA radiation network, RadNet.

Monitoring Objectives:
High Population Exposure Neighborhood scale monitoring. The ozone and nitrogen dioxide monitors are special purpose, non-regulatory monitors installed at the request of the Maine Bureau of Health.

Planned changes for 2019:
None.

Town – Site:	**Portland – Tukey's Bridge**		
County:	**Cumberland**	Latitude:	**43.6780**
Address:	**Tukey's Bridge (Route 295)**	Longitude:	**-70.2562**
AQS Site ID:	**23-005-0015**	Elevation:	**6 meters**
Spatial Scale:	**Middle/Micro**	Year Established:	**1981**
Statistical Area:	**Portland-South Portland-Biddeford, ME**		



Portland – Tukey's Bridge
Pollutant and Meteorological Parameters:

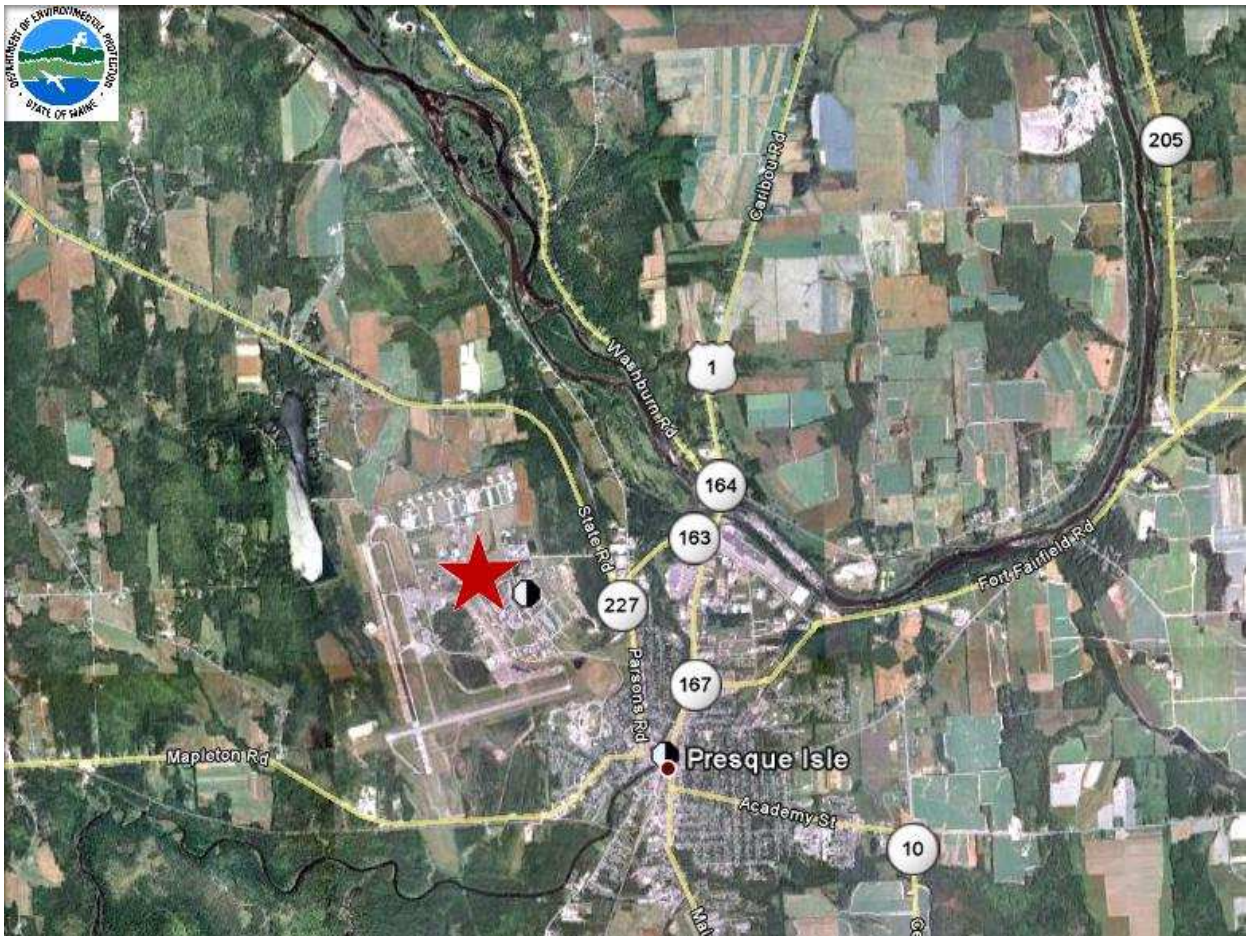
Parameter	Date Began	Date Ended	Parameter	Date Began	Date Ended
PM2.5 - 24 Hr.	1-1-1999		SO_2		
PM2.5 - 24 Hr. Colo			Ozone		
PM2.5 Cont.			NOx		
PM10 - 24 Hr.	2-8-1991		NOy		
PM10 - 24 Hr. Colo	1-9-2003		HAPs		
PM10 Cont.			VOCs (PAMS)		
PM Coarse			Wet Deposition - Mercury		
IMPROVE			Wet Dep. - Precip Chem.		
Cont. OC/EC			Wind Direction/Speed		
Cont. Sulfate (SO_4)			Outdoor Temperature		
Black Carbon			Bar. Pressure		
Cont. PAH			Relative Humidity		
Lead			Dew point		
CO			Precipitation Amount		
CO_2			Solar Radiation		
Gamma Radiation			UV-b Radiation		

Site Description:
Monitors are located on a platform next to I-295/Washington Street. This section of road has some of the highest annual average daily traffic volume in the state.

Monitoring Objectives:
SLAMS Attainment/Non-Attainment. High Traffic Volume**.**

Planned changes for 2019:
Replacement of the monitoring platform was completed December 2015. No changes anticipated in 2018

Town – Site:	**Presque Isle – DEP Regional Office**		
County:	**Aroostook**	Latitude:	**46.6984**
Address:	**528 Central Drive**	Longitude:	**-68.0389**
AQS Site ID:	**23-003-1008**	Elevation:	**158 meters**
Spatial Scale:	**Neighborhood**	Year Established:	**1983**
Statistical Area:	**None**		



Presque Isle – DEP Regional Office
Pollutant and Meteorological Parameters:

Parameter	Date Began	Date Ended	Parameter	Date Began	Date Ended
PM2.5 - 24 Hr.	9-27-2007		SO_2	8-1-1988	9-21-1989
PM2.5 - 24 Hr. Colo			Ozone	8-1-1988	9-21-1989
PM2.5 Cont.			NOx		
PM10 - 24 Hr.	7-1-1989	9-27-2007	NOy		
PM10 - 24 Hr. Colo			HAPs		
PM10 Cont.			VOCs (PAMS)		
PM Coarse			Wet Deposition - Mercury		
IMPROVE			Wet Dep. - Precip Chem.		
Cont. OC/EC			Wind Direction/Speed	2-13-1983	9-21-2016
Cont. Sulfate (SO_4)			Outdoor Temperature		
Black Carbon			Bar. Pressure		
Cont. PAH			Relative Humidity		
Lead			Dew point		
CO			Precipitation Amount		
CO_2			Solar Radiation		
Gamma Radiation			UV-b Radiation		

Site Description:
Suburban background site for monitoring $PM_{2.5}$. The sampler is in a field next to the regional office in Presque Isle.

Monitoring Objectives:
SLAMS Attainment/Non-Attainment. Background Site. Modeling

Planned changes for 2019:
The troublesome $PM_{2.5}$ Sequential Sampler was replaced by a Single Event $PM_{2.5}$ sampler March 5th, 2018.

Town – Site:	**Presque Isle – Riverside Shelter**		
County:	**Aroostook**	Latitude:	**46.6823**
Address:	**Riverside Street**	Longitude:	**-68.0156**
AQS Site ID:	**23-003-1011**	Elevation:	**131 meters**
Spatial Scale:	**Neighborhood**	Year Established:	**1993**
Statistical Area:	**None**		

Presque Isle – Riverside Shelter
Pollutant and Meteorological Parameters:

Parameter	Date Began	Date Ended	Parameter	Date Began	Date Ended
PM2.5 - 24 Hr.	10-1-1997		SO_2	9-19-1994	7-2-1996
PM2.5 - 24 Hr. Colo			Ozone		
PM2.5 Cont.	7-18-2014		NOx		
PM10 - 24 Hr.	9-10-1993	11-2-1998	NOy		
PM10 - 24 Hr. Colo			HAPs	12-14-03	
PM10 Cont.	9-15-1995		VOCs (PAMS)		
PM Coarse			Wet Deposition - Mercury		
IMPROVE			Wet Dep. - Precip Chem.		
Cont. OC/EC			Wind Direction/Speed		
Cont. Sulfate (SO_4)			Outdoor Temperature		
Black Carbon			Bar. Pressure		
Cont. PAH			Relative Humidity		
Lead			Dew point		
CO			Precipitation Amount		
CO_2			Solar Radiation		
Gamma Radiation			UV-b Radiation		

Site Description:
Monitors are located in a parking lot off Main Street in the downtown area of Presque Isle. The site is relatively open, next to the railroad tracks and the Presque Isle Stream**.**

Monitoring Objectives:
SLAMS Attainment/Non-Attainment.

Planned changes for 2019:
None.

Town – Site:	**Rumford – Rumford Ave. Parking Lot**		
County:	**Oxford**	Latitude:	**44.5514**
Address:	**Rumford Ave. Parking Lot**	Longitude:	**-70.5463**
AQS Site ID:	**23-017-2011**	Elevation:	**135 Meters**
Spatial Scale:	**Neighborhood**	Year Established:	**1998**
Statistical Area:	**None**		

Rumford – Rumford Ave. Parking Lot
Pollutant and Meteorological Parameters:

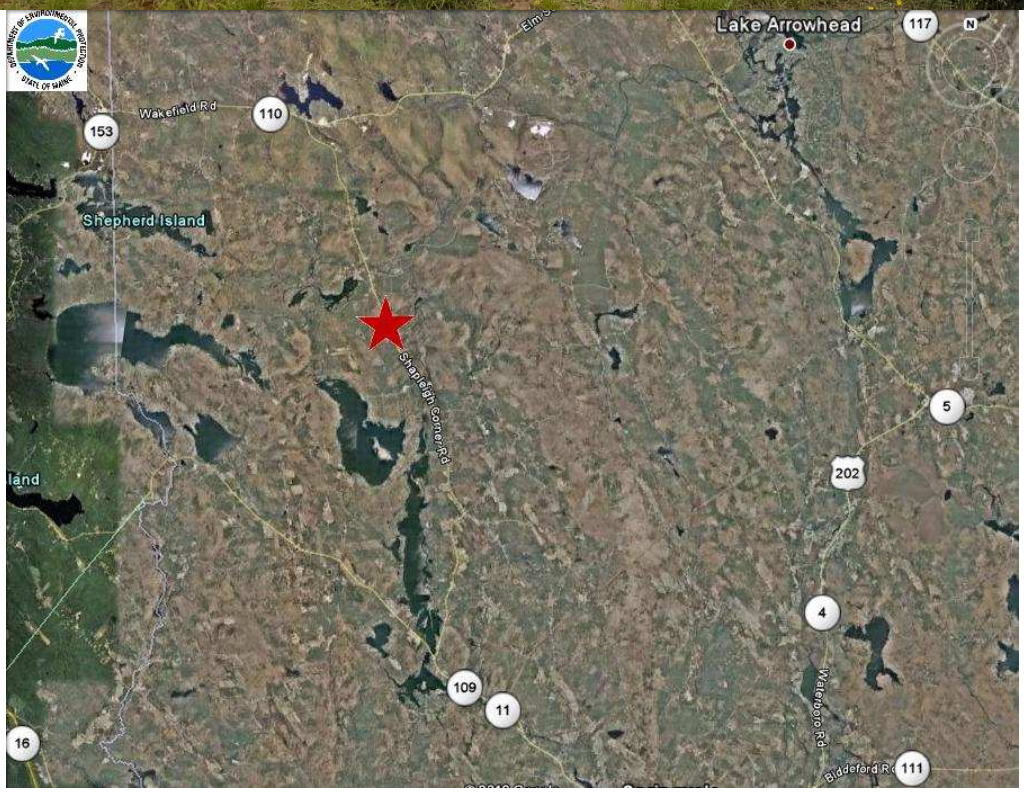
Parameter	Date Began	Date Ended	Parameter	Date Began	Date Ended
PM2.5 - 24 Hr.	12/01/1998		SO_2		
PM2.5 - 24 Hr. Colo			Ozone		
PM2.5 Cont.	10/1/2014		NOx		
PM10 - 24 Hr.			NOy		
PM10 - 24 Hr. Colo			HAPs	07/01/1998	
PM10 Cont.			VOCs (PAMS)		
PM Coarse			Wet Deposition - Mercury		
IMPROVE			Wet Dep. - Precip Chem.		
Cont. OC/EC			Wind Direction/Speed	12/16/2016	
Cont. Sulfate (SO_4)			Outdoor Temperature		
Black Carbon			Bar. Pressure		
Cont. PAH			Relative Humidity		
Lead			Dew point		
CO			Precipitation Amount		
CO_2			Solar Radiation		
Gamma Radiation			UV-b Radiation		

Site Description:
The site is located in a paper mill employees' parking lot off of Rumford Avenue in Rumford, Maine across the street from the Eagles Club and Bingo Parlor. An 8'x8'x8' environmentally controlled shelter houses HAPs sampling equipment, data acquisition system, and a BAM 1020 for continuous $PM_{2.5}$ sampling. A Thermo 2025 PM $_{2.5}$ sampler is located on the roof of the shelter.

Monitoring Objectives:
SLAMS Attainment/Non-Attainment. High Population Exposure. Western Mountain Location.

Planned changes for 2019:
The shelter leaks and needs replacement. A shelter swap may occur in the fall of 2018 or spring of 2019.

Town – Site:	**Shapleigh -- Shapleigh Ball Park**		
County:	**York**	Latitude:	**43.5889**
Address:	**Route 11**	Longitude:	**-70.8773**
AQS Site ID:	**23-031-0040**	Elevation:	**171 Meters**
Spatial Scale:	**Regional**	Year Established:	**2008**
Statistical Area:	**Portland-South Portland-Biddeford, ME**		



Shapleigh -- Shapleigh Ball Park
Pollutant and Meteorological Parameters:

Parameter	Date Began	Date Ended	Parameter	Date Began	Date Ended
PM2.5 - 24 Hr.			SO_2		
PM2.5 - 24 Hr. Colo			Ozone	6-13-2008	
PM2.5 Cont.			NOx		
PM10 - 24 Hr.			NOy		
PM10 - 24 Hr. Colo			HAPs		
PM10 Cont.			VOCs (PAMS)		
PM Coarse			Wet Deposition - Mercury		
IMPROVE			Wet Dep. - Precip Chem.		
Cont. OC/EC			Wind Direction/Speed		
Cont. Sulfate (SO_4)			Outdoor Temperature		
Black Carbon			Bar. Pressure		
Cont. PAH			Relative Humidity		
Lead			Dew point		
CO			Precipitation Amount		
CO_2			Solar Radiation		
Gamma Radiation			UV-b Radiation		

Site Description:
Site is located in an open area surrounding a baseball outfield just off Route 11.

Monitoring Objectives:
SLAMS Attainment/Non-Attainment. Monitoring long-range transport of pollutants on a regional scale.

Planned changes for 2019:
None.

TRIBAL MONITORING SITES

FOR 2019

Tribe – Site Name:	**Micmac Tribe -- Littleton**		
County:	**Aroostook**	Latitude:	**46.228730**
Address:	**198 West Ridge Road**	Longitude:	**-67.82566**
AQS Site ID:	**23-003-1101**	Elevation:	**188 meters**
Spatial Scale:	**Neighborhood**	Year Established:	**2014**
Statistical Area:	**None**		

Micmac Tribe -- Littleton
Pollutant and Meteorological Parameters:

Parameter	Date Began	Date Ended	Parameter	Date Began	Date Ended
PM2.5 - 24 Hr.			SO_2		
PM2.5 - 24 Hr. Colo			Ozone		
PM2.5 Cont.	05-01-2014		NOx		
PM10 - 24 Hr.			NOy		
PM10 - 24 Hr. Colo			HAPs		
PM10 Cont.			VOCs (PAMS)		
PM Coarse			Wet Deposition - Mercury		
IMPROVE			Wet Dep. - Precip Chem.		
Cont. OC/EC			Wind Direction/Speed	05-01-2014	
Cont. Sulfate (SO_4)			Outdoor Temperature	05-01-2014	
Black Carbon			Bar. Pressure		
Cont. PAH			Relative Humidity		
Lead			Dew point		
CO			Precipitation Amount		
CO_2			Solar Radiation		
Gamma Radiation			UV-b Radiation		

Site Description:
The Aroostook Band of Micmacs ambient air monitor site continuously monitors $PM_{2.5}$ and meteorological parameters in Littleton, ME. The PM2.5 CONT. equipment is audited by Maine DEP.

Monitoring Objectives:
Population – Orientated Surveillance

Planned changes for 2019:
None

Tribe – Site Name:	**Micmac Tribe -- Presque Isle Shelter**		
County:	**Aroostook**	Latitude:	**46.6964**
Address:	**8 Northern Road**	Longitude:	**-68.0330**
AQS Site ID:	**23-003-1100**	Elevation:	**165 meters**
Spatial Scale:	**Neighborhood**	Year Established:	**2004**
Statistical Area:	**None**		

Micmac Tribe -- Presque Isle Shelter
Pollutant and Meteorological Parameters:

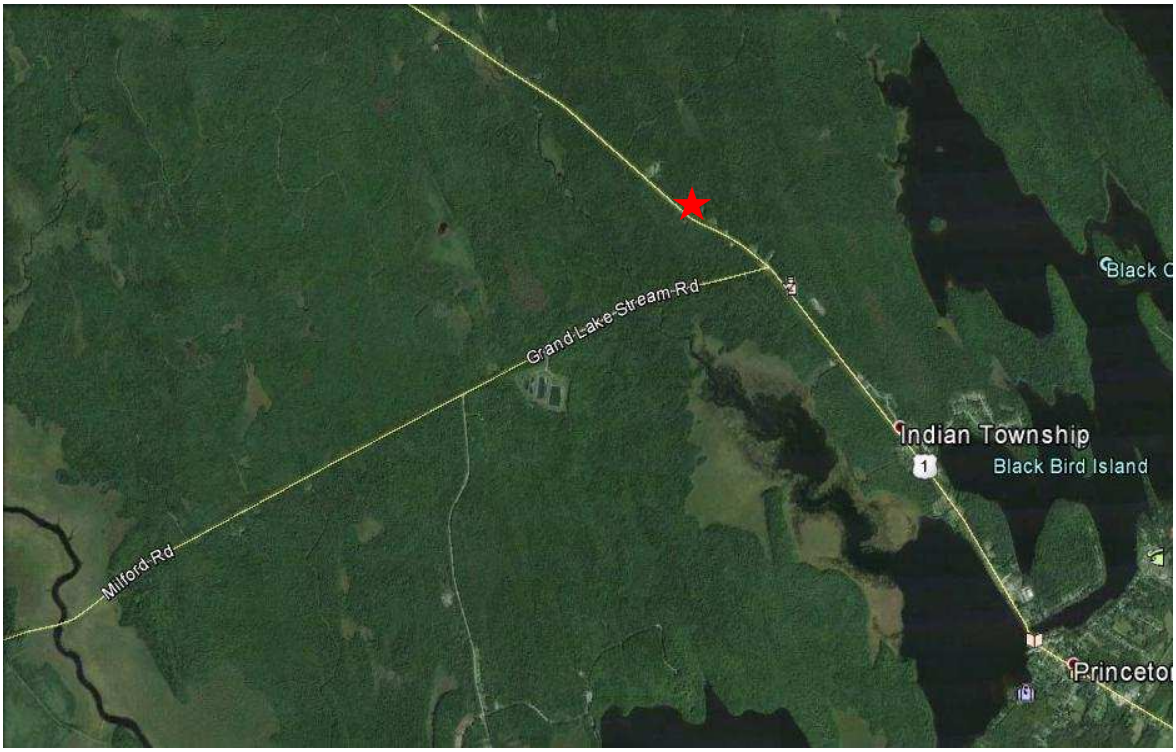
Parameter	Date Began	Date Ended	Parameter	Date Began	Date Ended
PM2.5 - 24 Hr.			SO_2	1-1-2006	
PM2.5 - 24 Hr. Colo			Ozone	1-1-2006	
PM2.5 Cont.	1-1-2006		NOx	1-1-2006	
PM10 - 24 Hr.			NOy		
PM10 - 24 Hr. Colo			HAPs		
PM10 Cont.			VOCs (PAMS)		
PM Coarse			Wet Deposition - Mercury	3-1-2014	
IMPROVE	1-1-2004		Wet Dep. - Precip Chem.		
Cont. OC/EC			Wind Direction/Speed	1-1-2006	
Cont. Sulfate (SO_4)			Outdoor Temperature	1-1-2006	
Black Carbon			Bar. Pressure	1-1-2006	
Cont. PAH			Relative Humidity	1-1-2006	
Lead			Dew point	1-1-2006	
CO	1-1-2006		Precipitation Amount		
CO_2	1-1-2006		Solar Radiation	1-1-2006	
Gamma Radiation			UV-b Radiation		

Site Description:
The Aroostook Band of Micmacs ambient air monitor site continuously monitors ozone, $PM_{2.5}$, carbon monoxide, sulfur dioxide, nitrogen dioxide, carbon dioxide, mercury, and meteorological parameters in Presque Isle, ME. The equipment is audited by Maine DEP.

Monitoring Objectives:
To provide local air quality information to Aroostook Band of Micmacs

Planned changes for 2019:
Not available

Tribe – Site Name:	**Passamaquoddy Tribe -- Indian Township**		
County:	**Washington**	Latitude:	**45.2436**
Address:	**Indian Township**	Longitude:	**-67.6308**
AQS Site ID:	**23-029-XXXX**	Elevation:	**101 meters**
Spatial Scale:	**N/A**	Year Established:	**2013**
Statistical Area:	**None**		



Passamaquoddy Tribe -- Indian Township
Pollutant and Meteorological Parameters:

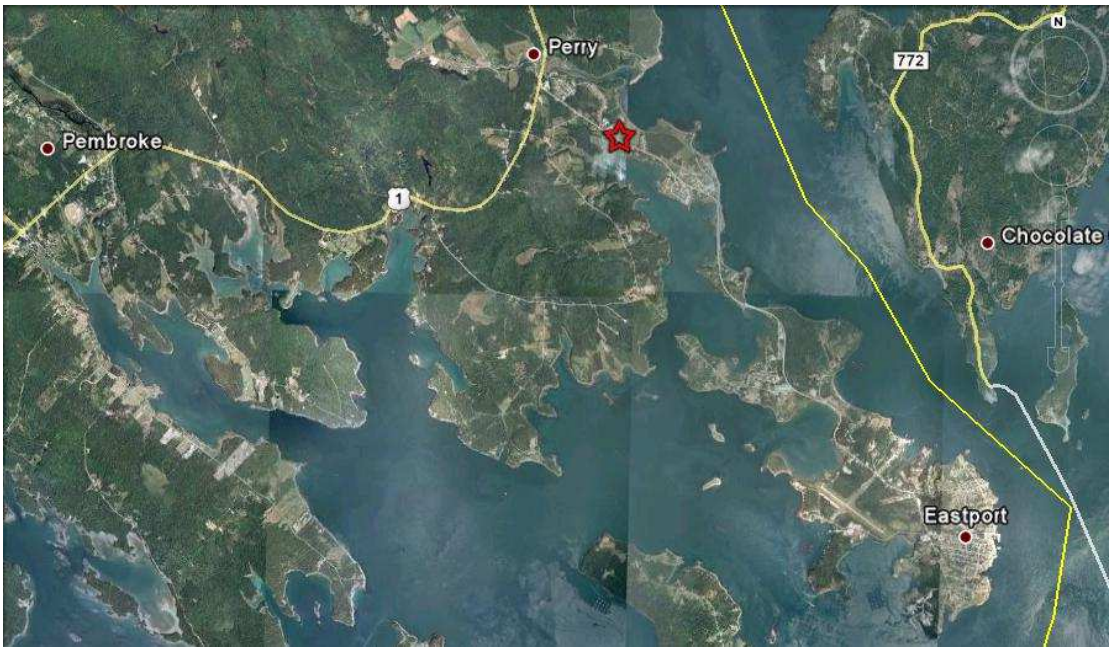
Parameter	Date Began	Date Ended	Parameter	Date Began	Date Ended
PM2.5 - 24 Hr.			SO_2		
PM2.5 - 24 Hr. Colo			Ozone		
PM2.5 Cont.			NOx		
PM10 - 24 Hr.			NOy		
PM10 - 24 Hr. Colo			HAPs		
PM10 Cont.			VOCs (PAMS)		
PM Coarse			Wet Deposition - Mercury		
IMPROVE			Wet Dep. - Precip Chem.	10-3-2013	
Cont. OC/EC			Wind Direction/Speed		
Cont. Sulfate (SO_4)			Outdoor Temperature		
Black Carbon			Bar. Pressure		
Cont. PAH			Relative Humidity		
Lead			Dew point		
CO			Precipitation Amount	10-3-2013	
CO_2			Solar Radiation		
Gamma Radiation			UV-b Radiation		

Site Description:
Not available

Monitoring Objectives:
To provide NADP/NDN data from vicinity of the Passamaquoddy Tribe -- Indian Township

Planned changes for 2019:
As more information about this NADP/NDN site in Maine becomes available, this page will be updated.

Tribe – Site Name:	**Passamaquoddy Tribe– Perry, Pleasant Point/Sipayik**		
County:	**Washington**		
Address:	**184 County Road**	Latitude:	**44.9630**
AQS Site ID:	**23-029-0032**	Longitude:	**-67.0592**
Spatial Scale:	**Regional**	Elevation:	**4 meters**
Statistical Area:	**None**	Year Established:	**2006**



Passamaquoddy Tribe– Perry, Pleasant Point/Sipayik
Pollutant and Meteorological Parameters:

Parameter	Date Began	Date Ended	Parameter	Date Began	Date Ended
PM2.5 - 24 Hr.			SO_2		
PM2.5 - 24 Hr. Colo			Ozone	3-31-2006	
PM2.5 Cont.	12-18-2008		NOx		
PM10 - 24 Hr.			NOy		
PM10 - 24 Hr. Colo			HAPs		
PM10 Cont.			VOCs (PAMS)		
PM Coarse			Wet Deposition - Mercury		
IMPROVE			Wet Dep. - Precip Chem.		
Cont. OC/EC			Wind Direction/Speed	4-20-2005	
Cont. Sulfate (SO_4)			Outdoor Temperature	4-22-2005	
Black Carbon			Bar. Pressure	4-25-2005	
Cont. PAH			Relative Humidity	4-22-2005	
Lead			Dew point		
CO			Precipitation Amount	4-27-2008	
CO_2			Solar Radiation	6-16-2005	
Gamma Radiation			UV-b Radiation	6-16-2005	

Site Description: The site was needed because area monitoring was going to be shut down on the Canadian and American side. Pleasant Point decided to handle the criteria pollutants and running a MET station. Indian Township was going to take on the acid and mercury deposition studies. The Passamaquoddy Tribe wanted to start contributing to the monitoring. The data are polled and used by ME DEP BAQ. The ozone and $PM_{2.5}$ instruments are audited by ME DEP on a quarterly basis. Only the ozone hourly data is uploaded into AQS. The met data is shared with the TREX network and posted on their website.

Monitoring Objectives: The site is to provide pollutant data for modeling and forecasting needs. The site fills a void in the region. Otherwise, there would be a data gap in the area.

Planned changes for 2019: The tribal air program is open to monitoring for other pollutants if resources are available. The air program would like to eventually use newer equipment if available.

Town – Site:	**Penobscot Nation -- Carrabassett Valley – Town Office**		
County:	**Franklin**	Latitude:	**45.080200**
Address:	**1001 Carriage Rd Carrabassett Valley**	Longitude:	**-70.211817**
AQS Site ID:	**23-007-2002**	Elevation:	**264 Meters**
Spatial Scale:	**Western Mountains**	Year Established:	**2015**
Statistical Area:	**None**		

Penobscot Nation -- Carrabassett Valley – Town Office
Pollutant and Meteorological Parameters:

Parameter	Date Began	Date Ended	Parameter	Date Began	Date Ended
PM2.5 - 24 Hr.			SO_2		
PM2.5 - 24 Hr. Colo			Ozone		
PM2.5 Cont.	11-5-2015	9-8-2017	NOx		
PM10 - 24 Hr.			NOy		
PM10 - 24 Hr. Colo			HAPs		
PM10 Cont.			VOCs (PAMS)		
PM Coarse			Wet Deposition - Mercury	2002	
IMPROVE			Wet Dep. - Precip Chem.	2002	
Cont. OC/EC			Wind Direction/Speed		
Cont. Sulfate (SO_4)			Outdoor Temperature		
Black Carbon			Bar. Pressure		
Cont. PAH			Relative Humidity		
Lead			Dew point		
CO			Precipitation Amount		
CO_2			Solar Radiation		
Gamma Radiation			UV-b Radiation		

Site Description:
The ME04 NADP site, located behind the Carrabassett Valley Town Office, Pool and Recreation Area in a clearing at the south end of an airport runway, is operated by the Penobscot Nation. After the special purpose PM2.5 monitoring study was completed in 2017 ME DEP left the 8’ x 8’ shelter available for NADP site operators to store equipment and stage work.

Monitoring Objectives:
Long-term tracking of deposition. Western Mountain Location

Planned changes for 2019:
None.

Tribe – Site Name:	**Penobscot Nation -- Indian Island**		
County:	**Penobscot**	Latitude:	**44.95204**
Address:	**27 Wabanaki Way**	Longitude:	**-68.64768**
AQS Site ID:	**23-019-1100**	Elevation:	**41 meters**
Spatial Scale:	**Regional**	Year Established:	**2006**
Statistical Area:	**None**		

Penobscot Nation -- Indian Island
Pollutant and Meteorological Parameters:

Parameter	Date Began	Date Ended	Parameter	Date Began	Date Ended
PM2.5 - 24 Hr.			SO_2		
PM2.5 - 24 Hr. Colo			Ozone	1-1-2006	1/1/2018
PM2.5 Cont.			NOx		
PM10 - 24 Hr.			NOy		
PM10 - 24 Hr. Colo			HAPs		
PM10 Cont.			VOCs (PAMS)		
PM Coarse			Wet Deposition - Mercury		
IMPROVE	1-14-2006		Wet Dep. - Precip Chem.		
Cont. OC/EC			Wind Direction/Speed	7-2002	1/17/2018
Cont. Sulfate (SO_4)			Outdoor Temperature	7-2002	1/17/2018
Black Carbon			Bar. Pressure	7-2002	1/17/2018
Cont. PAH			Relative Humidity	7-2002	1/17/2018
Lead			Dew point		
CO			Precipitation Amount	7-2002	1/17/2018
CO_2			Solar Radiation	7-2002	1/17/2018
Gamma Radiation			UV-b Radiation		

Site Description: The original IMPROVE Site location, established on 6/27/2001, was located near the Marsh Island Apartments. That location was shut down on 5/29/2006 having been made redundant after 1/14/2006 when the current IMPROVE site was established on Indian Island. After several seasons of contending with failing equipment, all ambient air monitoring at Indian Island, except for the IMPROVE monitoring, was officially discontinued in January 2018. Future monitoring efforts will focus on indoor air quality.

Monitoring Objectives:
IMPROVE and NADP/NDN data plus local ozone concentrations for Penobscot Nation -- Indian Island

Planned changes for 2019:
Not available