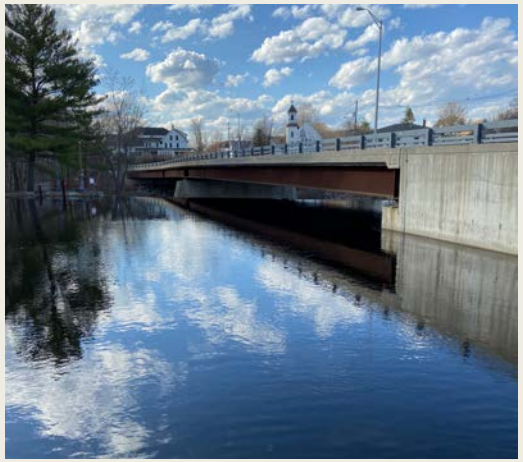
The Saco River Corridor Commission

Report
Government Evaluation Act
January 10, 2022

Little Ossipee River
Waterboro, Maine



Ossipee River
Porter, Maine

Upper Saco River Region
Fryeburg, Maine.

Lower Saco River Region, estuarine/marine waters, Saco and Biddeford, Maine.

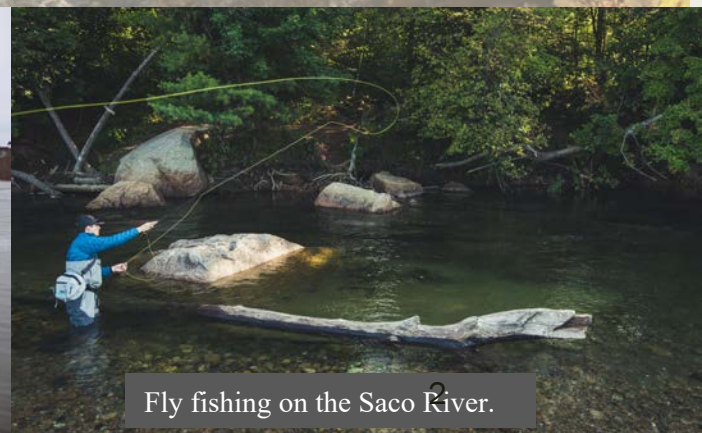
M.R.S. Title 38 §951.
Purpose;
Preservation of the Saco River Corridor

The legislature finds that the Saco, Ossipee and Little Ossipee Rivers are largely unspoiled by intensive or poorly planned commercial, industrial or residential development; that existing water quality on the inland portions of these rivers is extremely high; that these rivers and their associated wetlands constitute an important present and future source of drinking water; that they support large and diverse aquatic populations; and that they are heavily used for fishing, swimming, canoeing, camping and other forms of outdoor recreation. [Therefore] it is the purpose of this chapter to preserve existing water quality, prevent the diminution of water supplies…and to protect the public health, safety and general welfare by creating the Saco River Corridor, established in Title 38 section 953…by regulating the use of land and water within this area.

Swimmers on the Saco River. Fryeburg.

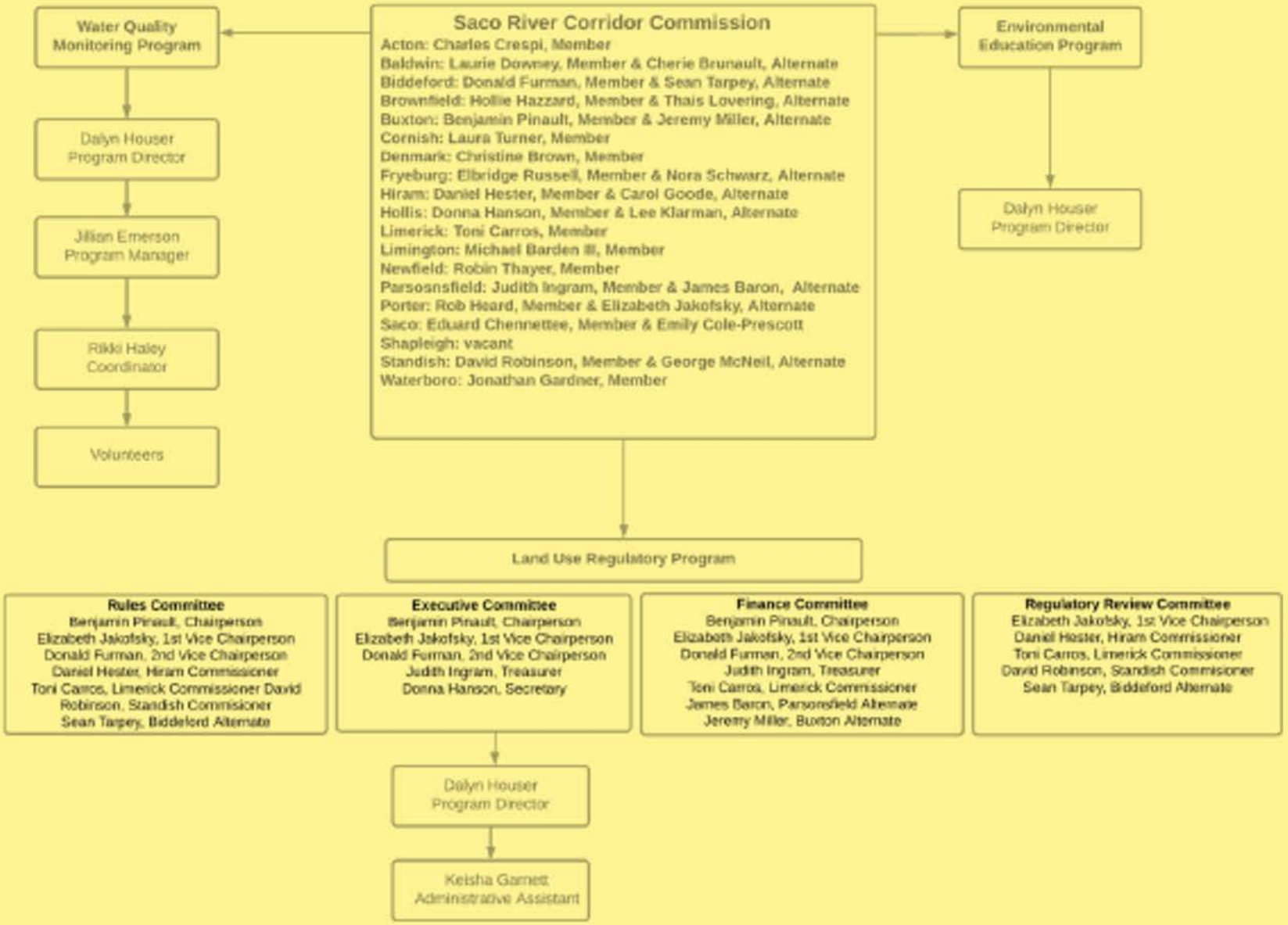
Campsite on the banks of the Saco River.

Public boat launch. Estuarine waters. Saco River.



Fly fishing on the Saco River.

Saco River Corridor Commission Organizational Units and Programs



Land-Use Regulatory Program

(slides #4-12)

<u>The Priorities of the Land Use Regulatory Program</u>:

1. To ensure the quality of reservoir drinking water.

2. To ensure the visually scenic character and tourist economy of the corridor.

3. To ensure each town has the information necessary to make informed decisions.

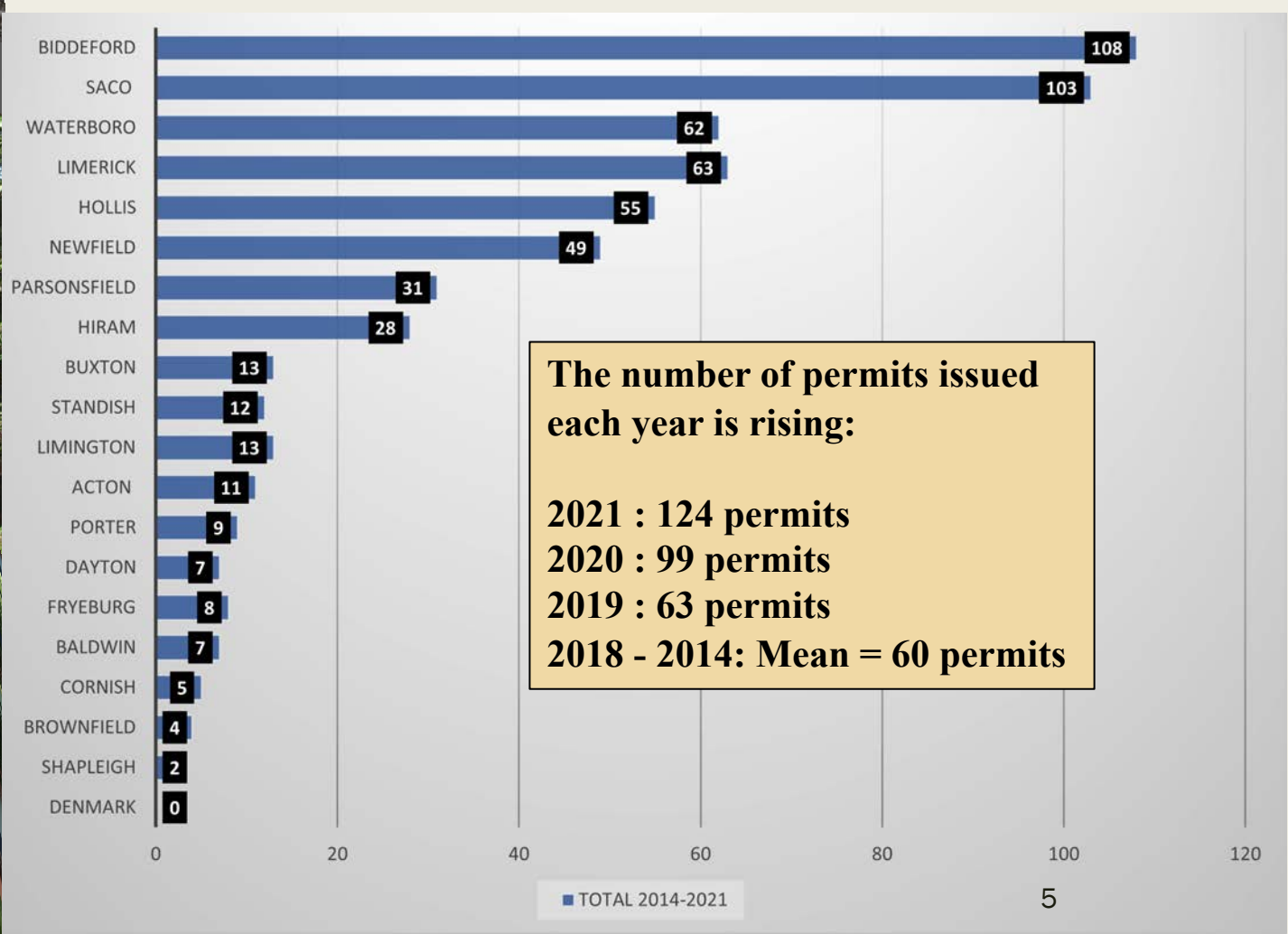
4. To ensure, conserve, and protect the unique and exceptional natural resources of the corridor.

Saco River Corridor Commission
Permits Issued between 2014-2021

Site visit for proposed new home.

Proposed demolition for elevated house.

City of Biddeford parking garage.



The number of permits issued each year is rising:

2021 : 124 permits
2020 : 99 permits
2019 : 63 permits
2018 - 2014: Mean = 60 permits

Slide 6: Items from one subdivision application.

Saco River Corridor Commission

"Communities Working Together To Protect Our Rivers"

COMMISSION ORDER
IN THE MATTER OF

CDL, LLC P.O. BOX 147 FRYEBURG, ME 04037 APPLICATION #01-042	SACO RIVER CORRIDOR ACT FINDINGS OF FACT AND ORDER

The Saco River Corridor Commission, created by the Maine State Legislature in the Saco River Corridor Act, Title 38 M.R.S.A. Section 951, et. seq., hereinafter referred to as the "Act," at a

3. Limiting Condition: Due to soil permeability, the Commission required that all septic systems be shallow and within the B horizon layer to avoid any potential contamination to the groundwater table on the permit.

2. John Boland, the SRCC Compliance Evaluator, on a site visit for a subdivision application in the corridor. -Fryeburg, Maine.

4. Site Plan/Certified Survey

Parsonsfield Sokokis Solar Project

A 4.2-megawatt Solar Facility

Parsonsfield, Maine

Application to the

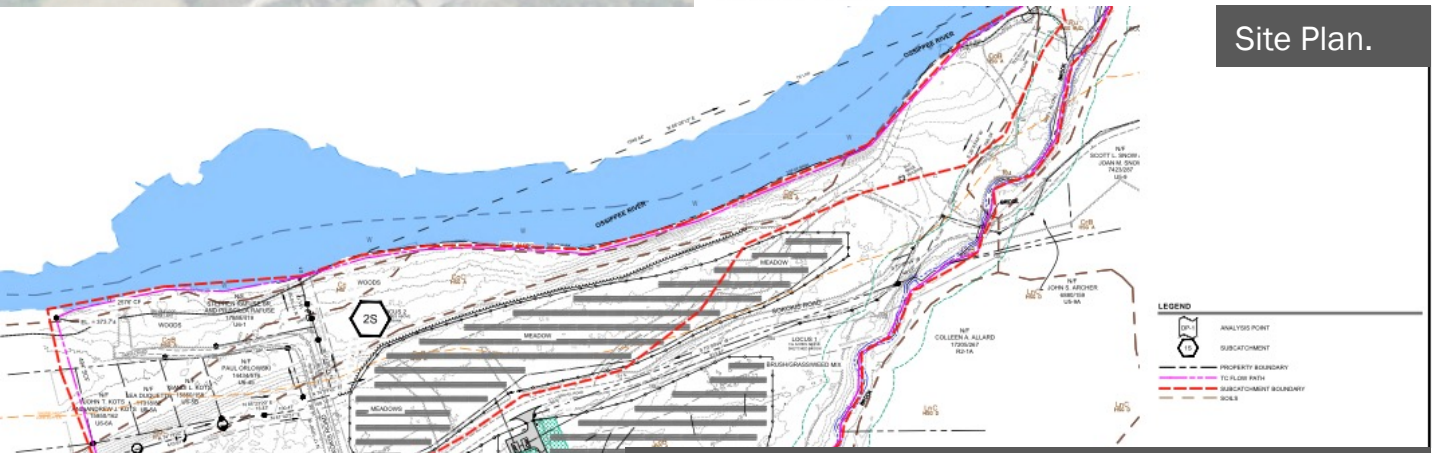
Saco River Corridor Commission

August 5, 2020

Site Visit with notes from Commissioner.

1405 - Behind Toni is where Sokokis Road descends a slope to where the camp lots are near the river. Beyond the road is the land of camp lot owners; the back boundary of their lots is about 300 ft from the river. Beyond about 400 ft from the river there will be clearing of trees that are near the landfill. The camp lot owners have expressed concern that this clearing may cause more noise and dust to reach the camp lots from the race track that is to west of the landfill.

Site Plan.



Commissioners and citizens site visit.

Saco River Corridor Commission

"Communities Working Together To Protect Our Rivers"

COMMISSION ORDER
IN THE MATTER OF

PARSONSFIELD SOKOKIS SOLAR I, LLC 66 YORK STREET, 5TH FLOOR JERSEY CITY, NJ 07302 APPLICATION #07-158	SACO RIVER CORRIDOR ACT FINDINGS OF FACT AND ORDER

The Saco River Corridor Commission, created by the Maine State Legislature in the Saco River Corridor Act, Title 38 M.R.S.A. Section 951, et. seq., hereinafter referred to as the "Act," at a meeting held on August 26, 2020 via Zoom Webinar, and after a review of the application and supporting documents makes the following findings of fact:

PROJECT DESCRIPTION

1. The applicant is seeking a permit to construct a 4.2 megawatt ground mounted solar project, to include approximately 13,390 solar panels, on fixed, post and ballast supported racks; seven foot security fencing; inverters; transformers; an access road; and wire and utility poles, to be located partially within the Corridor. No part of the infrastructure is to be located any closer than 100 feet from the normal high water line of the Ossipee River.

SITE LOCATION/DESCRIPTION

2. Location: Lot #02, (Map #R02) and Lot #10, (Map #U05), on Sokokis Road in Parsonsfield, Maine.
3. The lot has 2,185 feet of frontage on the Ossipee River.
4. The majority of this project is proposed within the General Development District, with a small portion of the project proposed in the Limited Residential District.
5. The proposed location of the closest fencing will be 100 feet from the Ossipee River.
6. The proposed location of the closest solar panel will be 112 feet from the Ossipee River.
7. The proposed location of the equipment pad will be 445 feet from the Ossipee River.
8. There is a minimal area of the 100-year Floodplain along the shoreline.

OTHER

9. The project is proposed to be located on a town-owned landfill and on previously developed (in the past) lands off Sokokis Road. Portions of the Project are also on town-owned lands that formerly housed the Industrial Box and Lumber Mill, an EPA-registered Brownfield site that was remediated in the mid-2000s, through the Maine Department of Environmental Protection's Voluntary Response Action Program (VRAP).

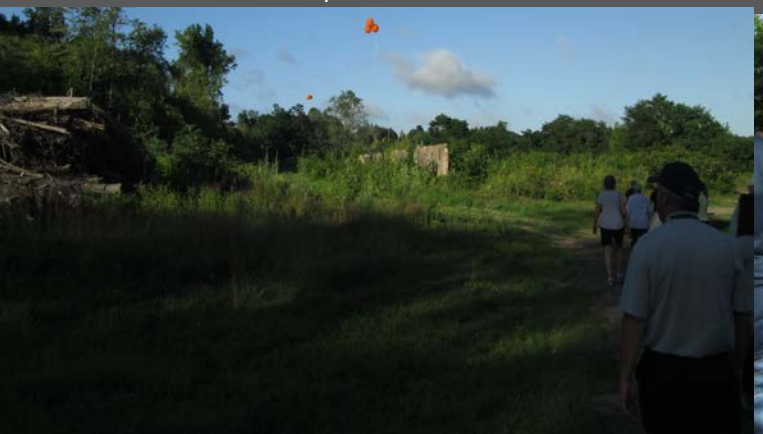
P.O. Box 283 - Cornish, Maine 04020-0283 - (207) 625-8123 Fax (207) 625-7050 Email: srcc@srcc-maine.org

Permit Application #19-377. "The Waters" at Saco Island East

To meet its standards the Commission required shorter buildings, additional trees, other improvements, and a public walk for Saco's citizens. The Commission received 40 letters of public comment on the project and held a public site walk to allow public participation.

Site Plan.

Site visit with Commissioners and concerned citizens. The height of the proposed buildings was demonstrated with balloons due to visual impact concerns.



Existing Site.

Visual rendering of the project provided to the Commission.

SRCC Outcome: Before withdrawn, the Water's plan left hundreds of existing trees, decreased the marina and building heights, and lessened the negative environmental impacts on the estuary's fishing, boating, and recreational activities.

Permit Application for development on Saco Island East, #19-424. Approved by the SRCC on May 26, 2021.

The site plan shows the SRCC required increases in the number of trees ensuring adequate vegetative coverage for water quality protection. The SRCC also required development of a vegetative plan with the York County Soil & Water Conservation District to limit negative environmental impacts.

Site Plan

Saco Island Invasive Management Plan

Vegetation Management Plan.

Black Locust

This tree species dominates the buffer zone on the property. It is a nitrogen fixer which changes the soil nutrient availability making it favorable for other non-native invasive species to become established, even after it has been removed. It reproduces by seed and suckers and is a fast-growing tree growing up to 100' in height. Suckers create clonal stands. Seeds can persist in soil for a long time. It has pairs of thorns along trunk and stems.

Alternate leaves are 8-12" long and are pinnately compound with oval leaflets up to 1" wide and 2" long. Color of these leaflets are blue-green, with lighter undersides. Flowers appear in mid-June and are 1" wide pea-like flowers in 8" long racemes that hang in large numbers from the branches.

Above: Paired thorns on black locust branch, Leslie J. Mehrhoff, University of Connecticut, Bugwood.org
Below: Black locust leaves, Robert Vidéki, Doronicum Kft., Bugwood.org

Recommendation:

Though it is categorized as highly invasive and would be a priority species for removal, due to its location and frequency within the vegetative buffer, it is recommended to leave the large mature trees alone. Removal will create soil disturbance and increase soil instability resulting in erosion. It is recommended that any new sprouts be managed along the road where the buffer will be enlarged by plantings. Landscaping plans should address removal outside the buffer to protect these new plantings and landscaping.

Management: Cut and remove suckers. Make sure they are properly disposed. Chemical cut stump application is an option where pulling is not appropriate.

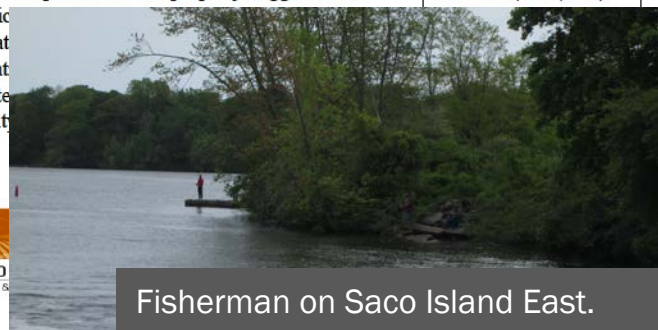
Japanese Knotweed *(Fallopia japonica)*

This herbaceous perennial grows in large colonies of 1"-2" diameter hollow stems that die back in the fall. The vigorous root system can travel 20 feet or more. Roots can damage concrete, pavement, and as they mature create erosion as it breaks up the soil. Leaves: Simple, alternate, entire, flat at base and abruptly tapering to pointed tip, ~6" long and 3-4" wide. It reproduces through seeds but most often through stem fragments and rhizomes along the root system.

Above: F. japonica emergent stems (MNAP, 2020) Below: F.japonica stems with leaves and flowers (MNAP, 2020)

Recommendation:

Japanese knotweed was observed in just a few small patches on the property. Aggressive control is recommended as it is possible to eradic
recommended to remove all of its vegetative mat
possible and dispose of properly. Chemical treat
injection will be effective at killing the root syste
applied as new stems appear. Due to its proximit
foliar spray.



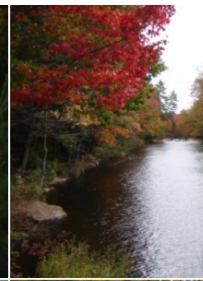
Fisherman on Saco Island East.

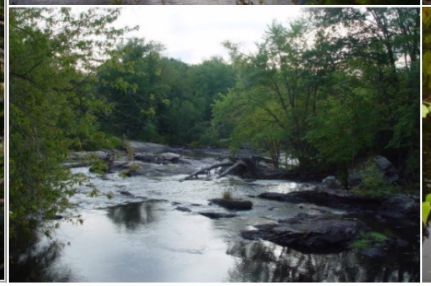
Applications > 07 Parsonsfield > **07-158 Sokokis Solar**

Name	Application ID				
00SRCC App - Parsonsfield Sokokis Solar Pr...	07-158				
07-158 Parsonsfield Sokokis Solar permit or...	07-158				
07-158 Solar IP.pdf	07-158				
Abutter concerns Fries.pdf	07-158	Parsonsfield	R02 and U05	2 and 10	Active
Abutter concerns Michaud and Pelham.pdf	07-158	Parsonsfield	R02 and U05	2 and 10	Active
Attachment 1 Site Plans.pdf	07-158	Parsonsfield	R02 and U05	2 and 10	Active
Attachment 2 Approx Clearing Areas.pdf	07-158	Parsonsfield	R02 and U05	2 and 10	Active
Attachment 3 Photos.pdf	07-158	Parsonsfield	R02 and U05	2 and 10	Active
Attachment 4 Certificate of Mailing.pdf	07-158	Parso			
Attachment 5 Parsonsfield SPR EXHIBITS.pdf	07-158	Parso			
Box Shop Speedway 1.PDF	07-158	Parso			
Box Shop Speedway 2.PDF	07-158	Parso			
Eaton-Pad-mounted-Transformer-Brochure...	07-158	Parso			

Temperature (C)

In November 2021, the SRCC digitized its database of every application ever filed. The digitized database includes pictures and at least 6-7 other components of the application.





Enforcement Actions/Resolution of Violations of the Saco River Corridor Act

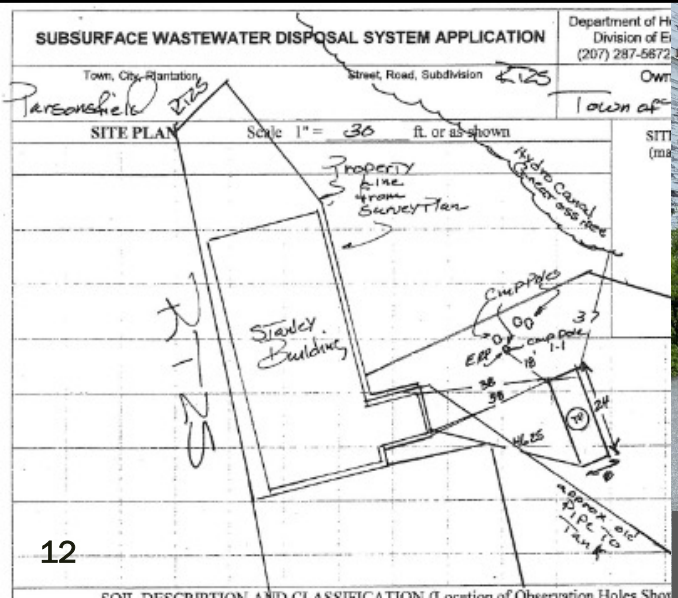
From 2014-2021, the Commission fined violators $33,600 that went into the State of Maine General Fund. The Commission prioritizes environmental remediation efforts, such as revegetation plans, and reserves fines for egregious violations.

Ossipee River and the Robinson Mill. Parsonsfield, Maine.

Year	CFUs	Rating
2016	56.34	Fair
2017	56.34	Fair
2018	54.54	Fair
2019	59.48	Approaching Class B standards
2020	34.07	Good
2021	55.54	Fair

Maine state *E. coli* standard for Class B waters is below 64 CFU.

The SRCC's WQM Data from Sample Site O8, downriver of the Robinson Mill in Parsonsfield, served as an indicator of potential issues with *E. coli*. The data together with the SRCC's land-use regulatory program helped foster a resolution of a potential threat to water quality and the town's drinking water supply.



Site Visit with Parsonsfield Commissioner and Town Selectmen and Code Enforcement Officer.

Saco River Corridor Commission

"Communities Working Together To Protect Our Rivers"

Town of Parsonsfield
634 North Road
Parsonsfield, ME 04047

April 16, 2020

Certified Mail: 7019 1120 0000 9513 6524

RE: Use of Overboard Discharge System at Robinson Mill Complex

Dear Leadership of the Town of Parsonsfield:

It has been brought to the attention of the Saco River Corridor Commission (Commission) that there are septic tanks, potentially connected to an unlicensed overboard discharge (OBD) system, currently in use on the Town's property at 10 Mill Street in Parsonsfield (Map/Lot U04-007), the site of the Robinson Mill complex.

In 2015, the Parsonsfield Code Enforcement Officer, Mr. David Bower, sent a letter to Mr. Collins, owner of the Stanley Building LLC, notifying him that he should provide a plan for a legal septic system by the date of July 30, 2015, or be forced to disconnect from the OBD, discontinue any operation that uses the sewage discharge, and have the water turned off at the building. It is Mr. Bowers' understanding that the sand-filter OBD system has fallen into disrepair. The Commission is unaware of any action taken to remedy this situation. It is unclear whether the septic holding tanks on site are being pumped out as needed, or whether they are close to being full. The Commission's records do not reflect whether the system is still discharging wastewater into the river, or whether the holding tanks have been sealed off from the OBD sand-filter system. The holding tanks are within 60-100 feet of the Ossipee River. Please provide the Commission with up to date information on the condition of the holding tanks, the amount of wastewater in them, and whether they are currently discharging to the river.

Water Quality Monitoring Program

(slides #13-19)

<u>The Priorities of the “RIVERS” Water Quality Monitoring Program</u>:

1) Generally characterize water quality and gather baseline data.

2) Understand the general condition of water in each designated area of the river.

3) Test to determine if degraded water quality exists.

4) Decide what further testing/actions or further investigation is needed to diagnose and solve problems.

5) Broaden the understanding of water quality in the community through outreach and education.

Saco River. North Conway, New Hampshire.

Hiram Commissioner and Limerick WQM Volunteer and monitoring sites in their towns in 2021.

Sample Site 07-1, Porter Covered Bridge. Ossipee River.

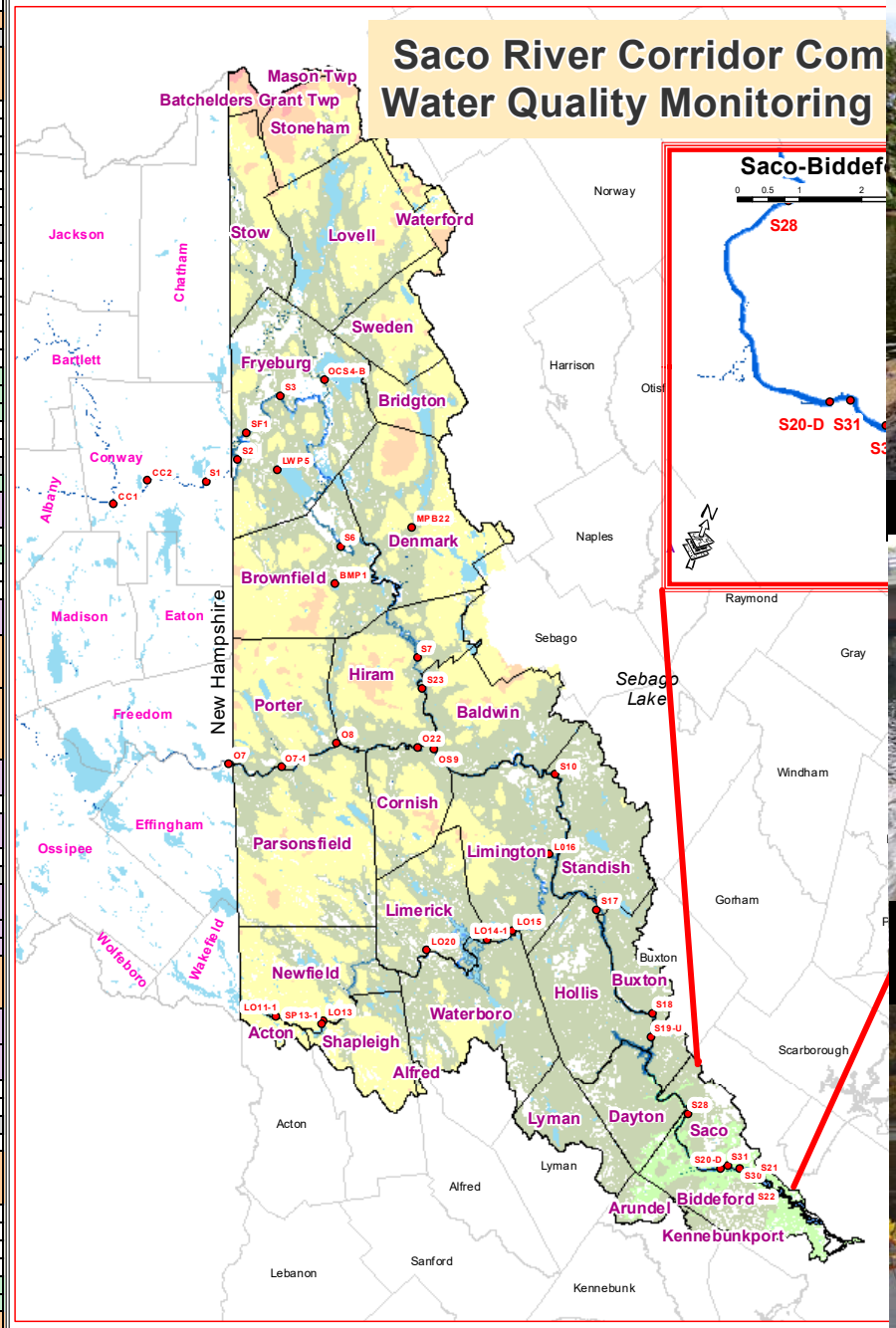
2022 Proposed Testing Season Schedule

Testing Day	Site	Sampling for Lab	Description	Volunteer A	Stream gage Sites/"Full Suite"
Monday					
	CC1	pH**	Davis Park, NH **(USGS Conway Streamgage)**	Rikki Haley	*ALK (Alkalinity), TP, PO4, NO3+NO2, TDN, Anions (ex. Cl-), Cations, SiO2 (Silica), & DOC (Dissolved Organic Carbon)*
	CC2	pH	Police Station Landing in Carroll Country, NH	Rikki Haley	
	S1	pH	ME/NH border in Conway, NH	Rikki Haley	
SWIM	S2	ALK, *E. coli* (SWIM 6/21-Labor Day)	Weston's Beach, Fryeburg	Rikki Haley	
	SF1	*E.coli*	Swan Falls, Fryeburg	Rikki Haley	
SWIM	S3	*E. coli* (SWIM 6/21-Labor Day)	Canal Bridge Beach, Fryeburg	Rikki Haley	
	OCS4-B	ALK, PO4 (1X/mth), NO3+NO2, TDN	Old Course Downstream of Hemlock Bridge	Rikki Haley	
Tuesday					
SWIM	S4	*E.coli*, SWIM (6/21-Labor Day)	Walker's Bridge Landing	Rikki Haley	
	LWP5	TP (1X/mo), NO3+NO2, TDN, *E. coli*	Lovewell Pond, Burdich Street, Pepi Lane	Rikki Haley	
	MPB22	pH	Moose Pond Brook--Below Moose Pond	Rikki Haley	
	S6	*E.coli*	Woodland Acres Campground, Rt. 160 Bridge	Rikki Haley	
SWIM	BMP	*E. coli*, SWIM (swim lessons)	Burnt Meadow Pond at boat launch	Rikki Haley	
SWIM ONLY	LP1	*E. coli*	Long Pond swimming beach	Dalyn Houser	
SWIM ONLY	SPEC	*E. coli* (Swim lessons)	Spec Pond swimming beach	Dalyn Houser	
SWIM ONLY	SP21	*E. coli* (Swim lessons)	Sand Pond, Baldwin	Rikki Haley	*New Recreation Site*
SWIM ONLY	S-BER1	*E. coli*	Bonny Eagle Recreation Area, Limington	Rikki Haley	*New Recreation Site*
SWIM ONLY	S-PP1	*E. coli*	Pleasant Point Park, Biddeford	Rikki Haley	*New Recreation Site*
SWIM ONLY	S31 RP	*E.coli* (2)	Rotary Park swimming beach	Rikki Haley	
Wednesday					
	S19-J	pH	Skelton Dam Boat Launch	Rikki Haley	*New Site*
	S19-U	ALK, TP**, *E. coli*	Above Skelton Dam--Indian Cellar Preserve	Rikki Haley	**JE--TP changed to twice monthly due to declining levels of E. coli
	S18	*E. coli*	Above Bar Mills Dam, Buxton	Rikki Haley	
	S29	TP, NO3+NO2, TDN, *E. coli*	West Buxton Bridge off Boom Rd	Rikki Haley	*New Site*
	O7	pH	ME/NH Border, Effingham, NH (GMCG)	Rikki Haley	
	O7-1	*E. coli*	Covered Bridge off Route 25 in Porter	Rikki Haley	
	O8	TP (1x/mo)**, *E. coli*, NH4	Down river of Kezar Falls village in Parsonsfield	Rikki Haley	**JE--TP addition due to declining levels of E. coli
	OS9	*E. coli* **	Cornish Station--Rt. 5 **(USGS Streamgage)**	Laurie Downey	*ALK (Alkalinity), TP, PO4, NO3+NO2, TDN, Anions (ex. Cl-), Cations, SiO2 (Silica), & DOC (Dissolved Organic Carbon)*
	O22	TP**, PO4**, NO3+NO2, TDN, *E. coli* **	Bridge at Bridge St-- Cornish/Hiram	Laurie Downey	*ALK (Alkalinity), Anions (ex. Cl-), Cations, SiO2 (Silica), & DOC (Dissolved Organic Carbon)* **JE--TP & PO4 twice monthly due to declining levels**
	S10	TP (1x/mo)**, *E. coli*	Off Route 11 in Standish	David + James Robinson	**JE--TP addition due to declining levels of E. coli
	S23	*E. coli*	Below Hiram Dam Falls in Hiram	Dan Hester	
	S7	TP (1x/mo)**, *E. coli*	Camp Hiawatha	Dan Hester	**JE--TP addition due to declining levels of E. coli
Thursday					
	LO11-1	TP (1x/mo)**, PO4 (1x/mo), *E. coli*	Beside Balch Lake Dam in Newfield	Julie Venell	**JE--TP changed to twice monthly due to concerning TP values
	LO13	*E. coli* **	Below Shapleigh Pond in Shapleigh	Julie Venell	**JE--E. coli (discontinued 2020)
	SP13-1	*E. coli* **	Shapleigh Pond	Julie Venell	**JE--E. coli (discontinued 2020)
	LO14-1	TP, *E. coli*	Below Lake Arrowhead Dam	Toni Carros	*ALK (Alkalinity), PO4, NO3+NO2, TDN, Anions (ex. Cl-), Cations, SiO2 (Silica), & DOC (Dissolved Organic Carbon)*
	LO15	ALK, TP (1x/mo)**	Below Lake Arrowhead off Route 117 in Limington	Toni Carros	**JE--TP addition due to periodically low DO levels
	L016	TP (1x/mo), PO4**, NO3+NO2, TDN	Little Ossipee --Hardscrabble Road, Limington	Michael Barden	**JE--PO4 changed to twice monthly due to consistently high levels of PO4
	L020	ALK	Off Foss Road in Limerick	Dennis Carignan	
Friday					
	S17	*E. coli*	Bonny Eagle Island in Hollis	George McNeil	
	S28	TP, PO4, NO3+NO2, TDN, *E. coli*	Route 5 into Saco, bridge by campground	Rikki Haley	*ALK (Alkalinity), Anions (ex. Cl-), Cations, SiO2 (Silica), & DOC (Dissolved Organic Carbon)*
	S20-D	TP, PO4, NO3+NO2, TDN	Rotary Park Public Boat Lanuch	Rikki Haley	
	S30	TP,PO4, NO3+NO2, TDN, *E.coli*	Irving St Boat Launch, Biddeford	Rikki Haley	
	S22	ALK,TP, PO4, NO3+NO2, TDN, *Enterococcus*	Rumery's Boatyard, Water St., Biddeford	Rikki Haley	
	S21	ALK, TP, PO4, NO3+NO2, TDN, *Enterococcus*	Front St Boat Launch, Saco	Rikki Haley	
	S32	ALK, TP, PO4, NO3+NO2, TDN, *Enterococcus*	Marston's Marina, Saco	Rikki Haley	*New Site*
	S33	ALK, TP, PO4, NO3+NO2, TDN, *Enterococcus*	Marblehead Boat Launch	Rikki Haley	*New Site*
	S34	ALK, TP, PO4, NO3+NO2, TDN, *Enterococcus*	Camp Ellis Pier **(Tidal Portion Streamgage)**	Rikki Haley	*Anions (ex. Cl-), Cations, SiO2 (Silica), & DOC (Dissolved Organic Carbon)*

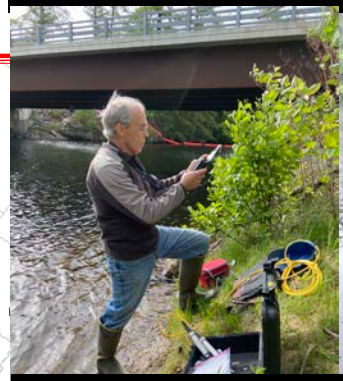
Swim-ability begins June 21, 2022

BMP, LP1, SPEC, SP21--Swim lessons

JILL EMERSON (WATER QUALITY PROGRAM MANAGER) PARAMETER RECOMMENDATIONS

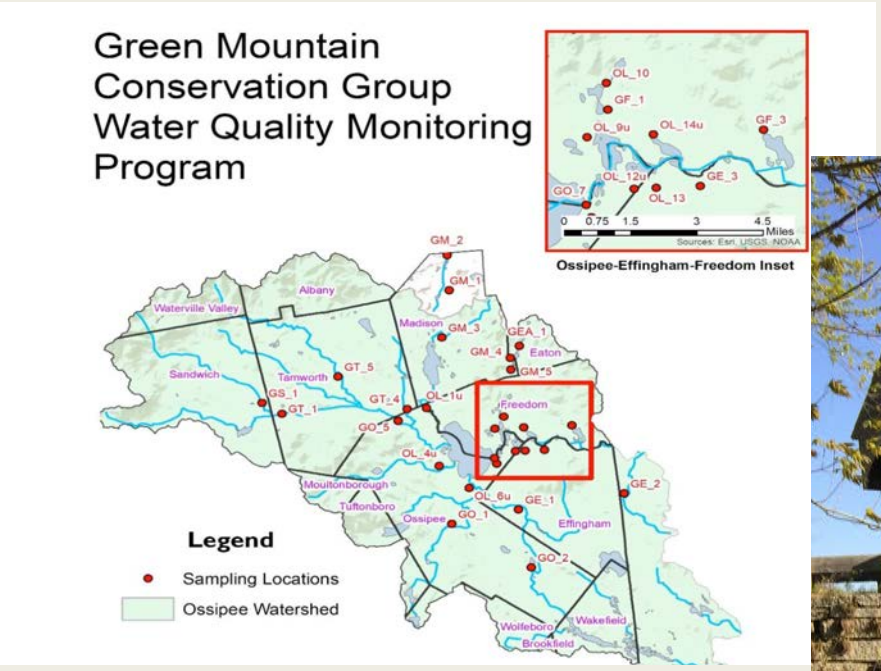


Site CC1, North Conway, New Hampshire



SRCC Standish and Acton Commissioners monitoring sites in their towns in 2021.

Site OS9, Cornish, Maine. Saco River near the confluence with the Ossipee River



Saco Lake at Crawford Notch. White Mountain National Forest, New Hampshire. The source of the Saco River.

Site OCS4-B: Hemlock Bridge, the Old Course Saco River. Fryeburg, Maine.

Site 07: Ossipee River, Effingham, New Hampshire. (Green Mountain Conservation Group Headquarters). Volunteers and Staff prepare for the sampling season with annual training sessions.

SRCC Staff and Volunteers at Canal Bridge Beach, Fryeburg Maine *Sample Site (S3)

Site S30: Irving Street Boat Launch on Saco River. Saco, Maine. Lower freshwater region.

2022 Swim-ability Sites

Site Code	Site Photo	Sampling for Lab	Description
S2		ALK, *E. coli* (SWIM 6/21-Labor Day)	Weston's Beach, Fryeburg
S3		*E. coli* (SWIM 6/21-Labor Day)	Canal Bridge Beach, Fryeburg
S4		*E.coli*, SWIM (6/21-Labor Day)	Walker's Bridge Landing
BMP		*E. coli*, SWIM (swim lessons)	Burnt Meadow Pond at boat launch
LP1		*E. coli*	Long Pond swimming beach
SPEC		*E. coli* (Swim lessons)	Spec Pond Swimming Beach
SP21	**Photos Coming Soon**	*E. coli* (Swim lessons)	Sand Pond, Baldwin

Site S23: Hiram Falls Dam. Hiram, Maine. Saco River.

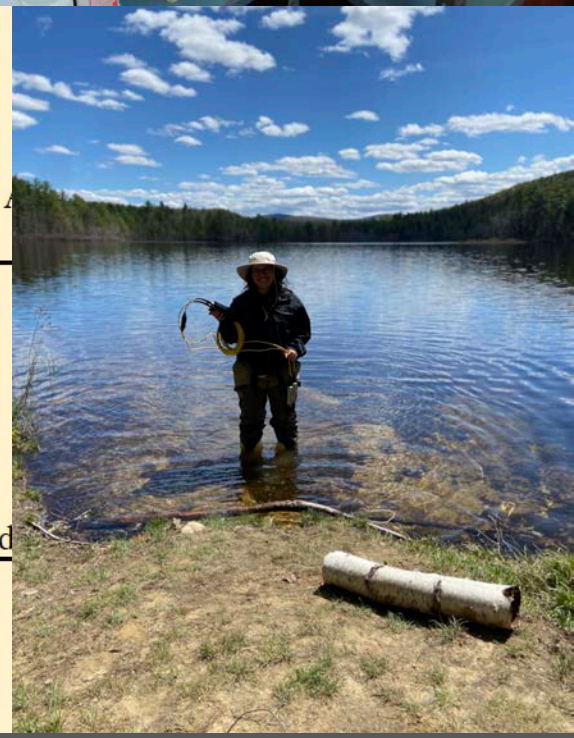
The SRCC monitors popular recreational sites in the corridor on a weekly basis during the summer months for public safety. In 2022, the SRCC will add 4 new sites to the "Swim-ability" program.

SRCC New *E. coli* Monitoring Equipment- IDEXX Colilert Tray System for "in-house" rapid response bacteria monitoring will allow the SRCC to sample for *E. coli* at almost all Corridor sample sites, tributary streams to the Saco, Ossipee, or Little Ossipee Rivers, or other waterbodies within the Corridor. This equipment will allow the SRCC autonomy over our sample results, leading to faster rapid response sampling when *E. coli* or Enterococcus exceed safe levels. Results are obtained within 24 hours.

Baldwin Commissioner samples at Site 0S9 in Cornish, Maine. Saco River.

Above the Bar Mills Dam. Hollis, Maine. Saco River.

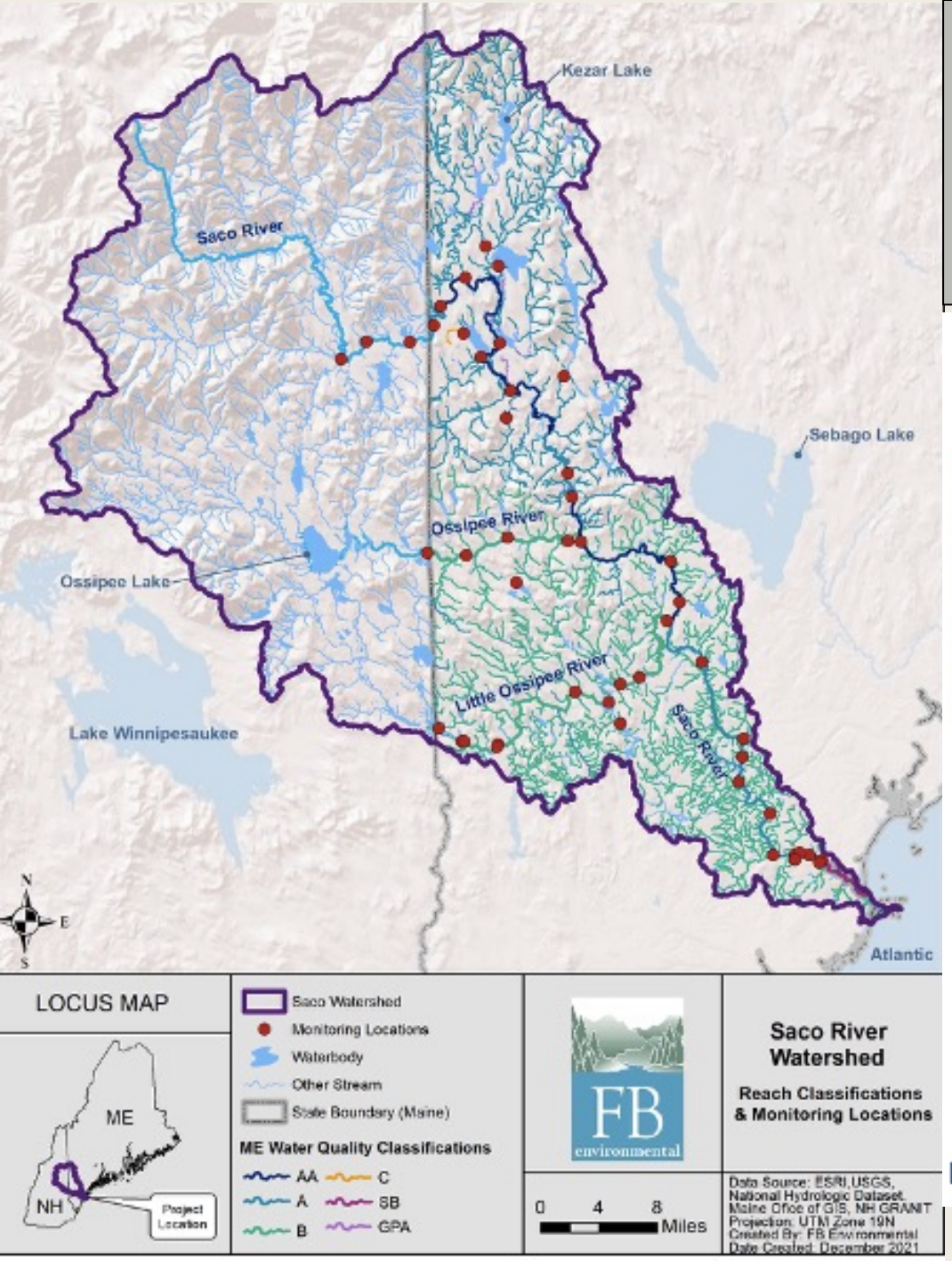
S-BER1		*E. coli*	Bonny Eagle Recreation A Limington
S-PP1		*E. coli*	Pleasant Point Park, Bidd
S31 RP		*E.coli* (2)	Rotary Park Swimming

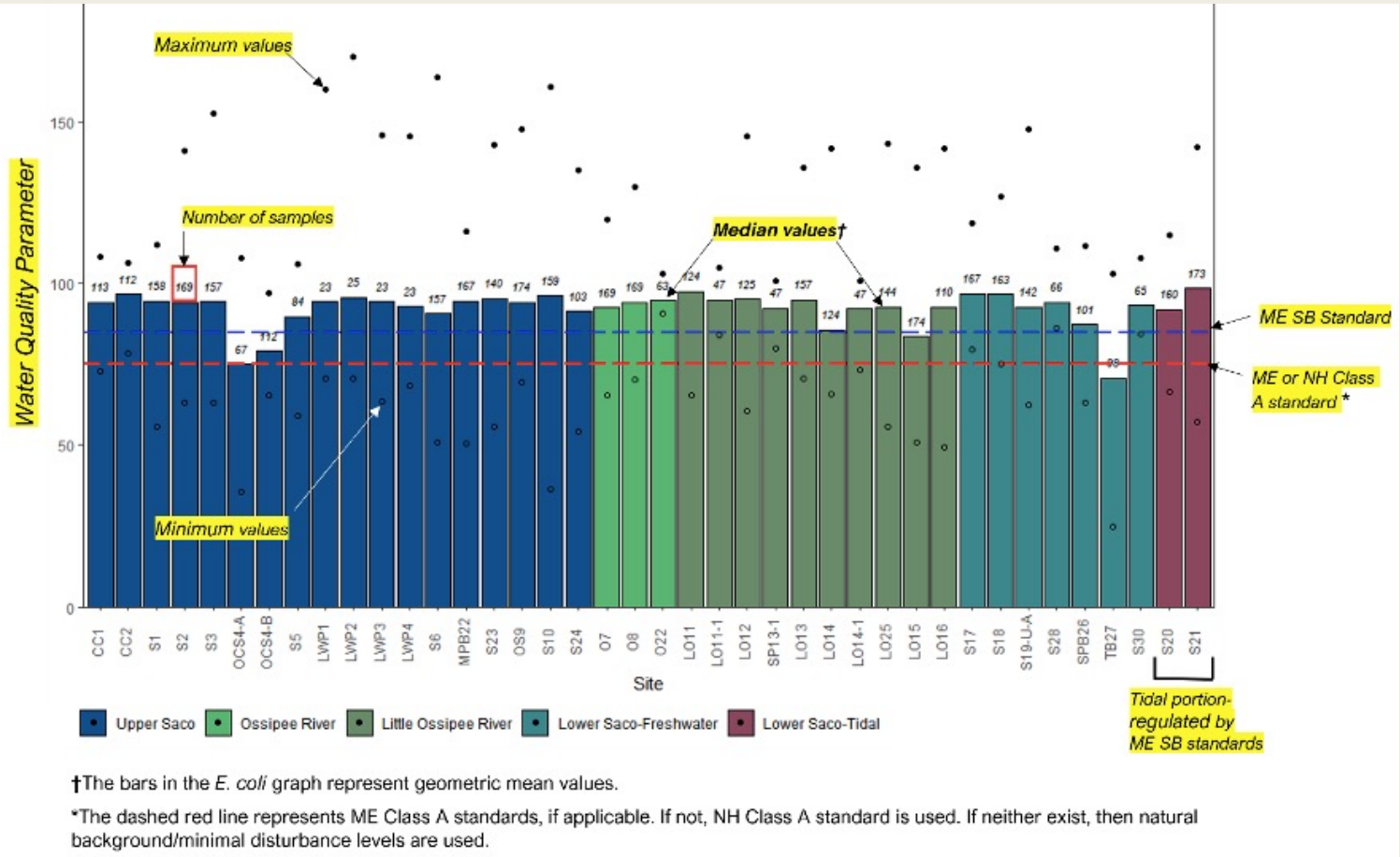


SRCC WQM Coordinator, Rikki, samples at BMP: Burnt Meadow Pond. Brownfield, Maine.

SRCC 2020 Water Quality Trend Analysis prepared by FB Environmental

-analysis of all SRCC water quality data (including over 52 sample sites) for improving or degrading water quality trends from 2001-2020.





†The bars in the *E. coli* graph represent geometric mean values.

*The dashed red line represents ME Class A standards, if applicable. If not, NH Class A standard is used. If neither exist, then natural background/minimal disturbance levels are used.

Figure 8. Example figure to guide interpretation of water quality summary figures for parameters.

According to the Mann-Kendall trend analysis, 6 sites had significant increasing trends (degrading water quality) in temperature. These sites are noted in Table 4. Significant degrading water quality trends (increasing acidity) in pH are noted in Table 3. These analyses were performed for all collected SRCC data from a period of 2001-2020.

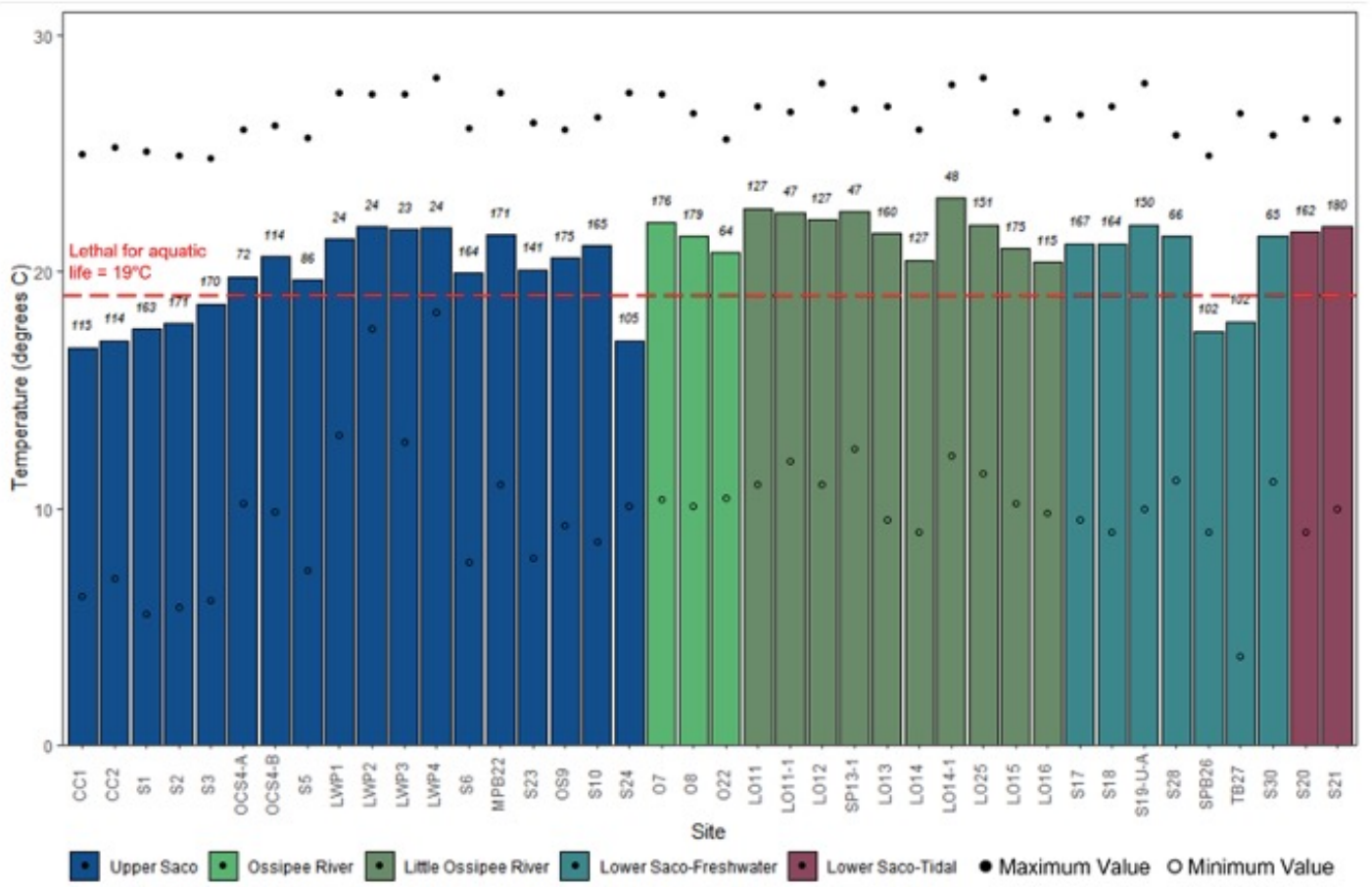


Figure 11. Summary of temperature values for all sites. Height of bar represents median value for site (number of samples above bar). Filled circles are maximum values; empty circles are minimum values.

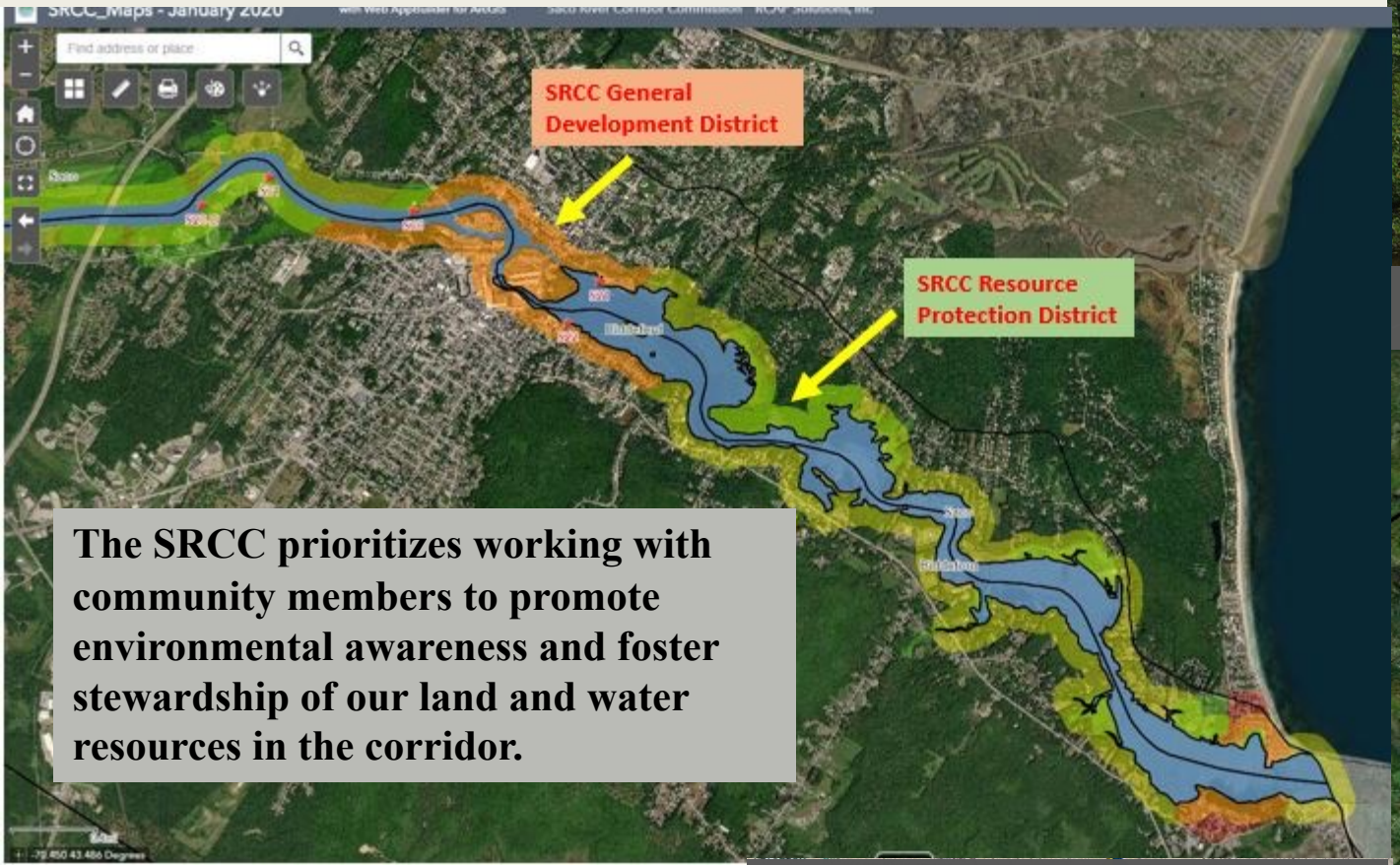
Table 3. List of the SRCC monitoring sites with significant degrading water quality trends (increasing acidity) in pH over the study period. The sites are listed in order of smallest to largest significant p-value.

Site	Location	Median (pH)	P-value
OS9	Cornish Station	6.78	0.001
S20	The Saco River at South Street in Biddeford	6.80	0.002
S1	The Saco River at Saco Pines Landing	6.73	0.003
S10	The Saco River off Route 11	6.80	0.003
S21	The Saco River at the public boat launch, Front Street, Saco	6.81	0.004
MPB22	Moose Pond Brook below Moose Pond	6.72	0.005
LO15	The Little Ossipee River at Doles Ridge Road	6.84	0.008
LO13	The Little Ossipee River below Shapleigh Pond	6.94	0.019
S19-U-A	Skeleton Head Pond Dam	6.79	0.019
LWP1	Lovewell Pond at Wards Beach	6.61	0.027
SP13-1	The Shapleigh Pond Boat Launch	6.71	0.027
S18	The Saco River above Bar Mills Dam	6.85	0.034
S2	Weston's Beach	6.67	0.042

Table 4. List of the SRCC monitoring sites with significant degrading water quality trends (increasing) in temperature over the study period. The sites are listed in order of smallest to largest significant p-value. Median temperature values denoted in red are greater than the "lethal for aquatic life" threshold (19°C).

Site	Location	Median (° C)	P-value
LO25	Little Ossipee Pond	22	0.001
CC2	The Saco River at Redstone, Conway	17.1	0.003
LO16	The Little Ossipee at Hardscrabble Road	20.4	0.024
CC1	The Saco River at Davis Park in Conway	16.8	0.029
TB27	Thatcher Brook, Biddeford	17.9	0.029
S6	The Maine State Landing on the Saco River downstream of the Brownfield Bog	19.95	0.049

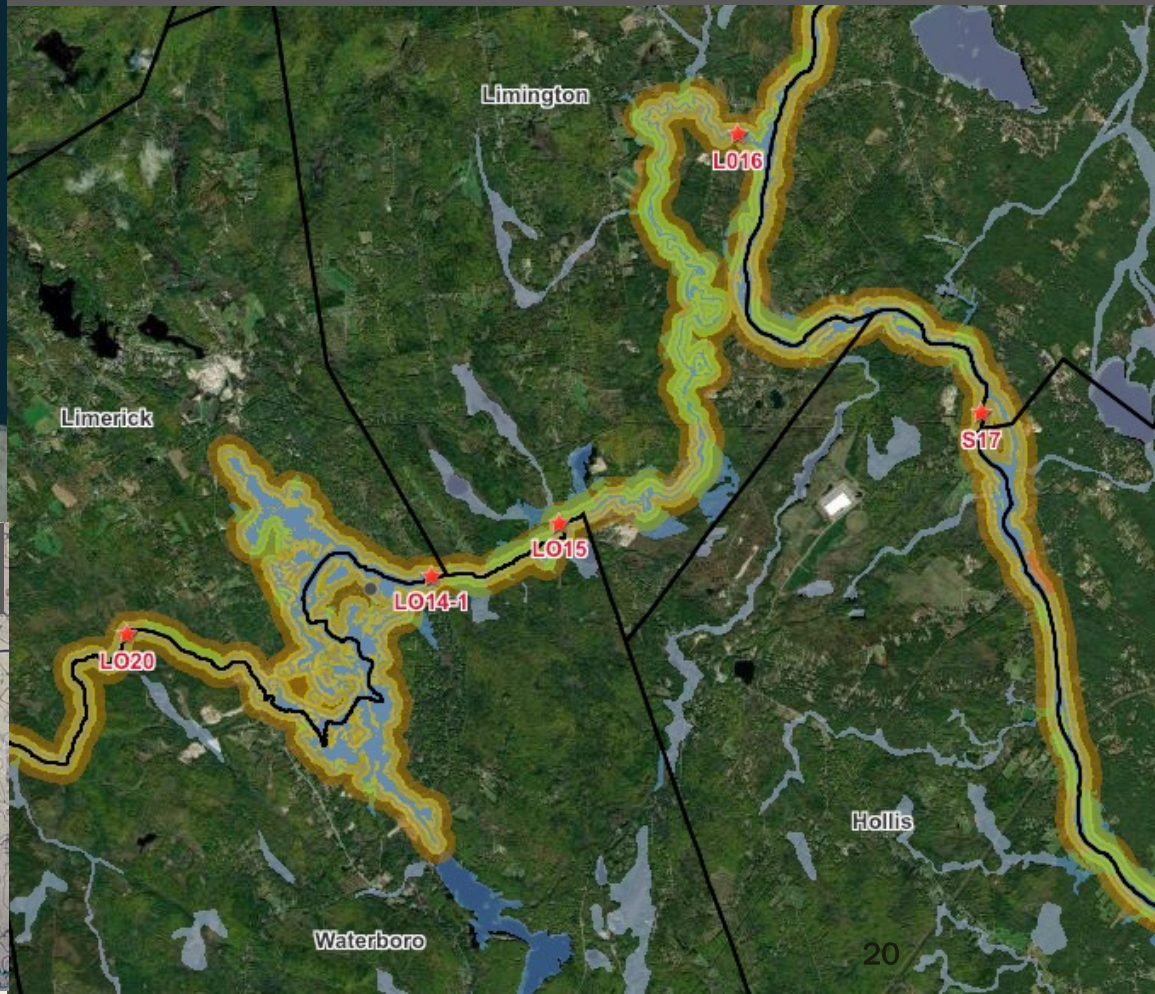
Environmental Education Program (slides #20-27)



The SRCC prioritizes working with community members to promote environmental awareness and foster stewardship of our land and water resources in the corridor.

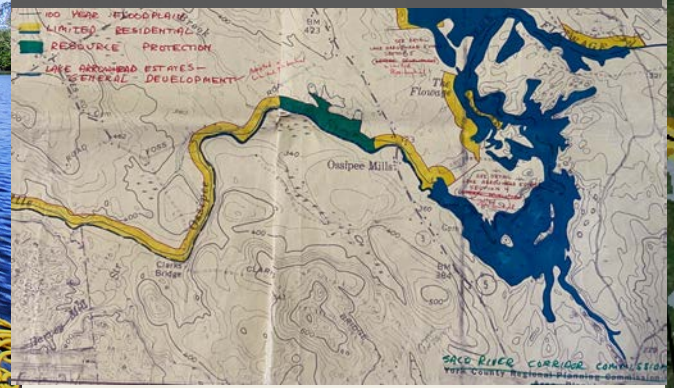
Site L014-1 Below Lake Arrowhead Dam. Limerick, Maine. Little Ossipee River.

Site L016 Hardscrabble Road, Limington, Maine. Little Ossipee River.



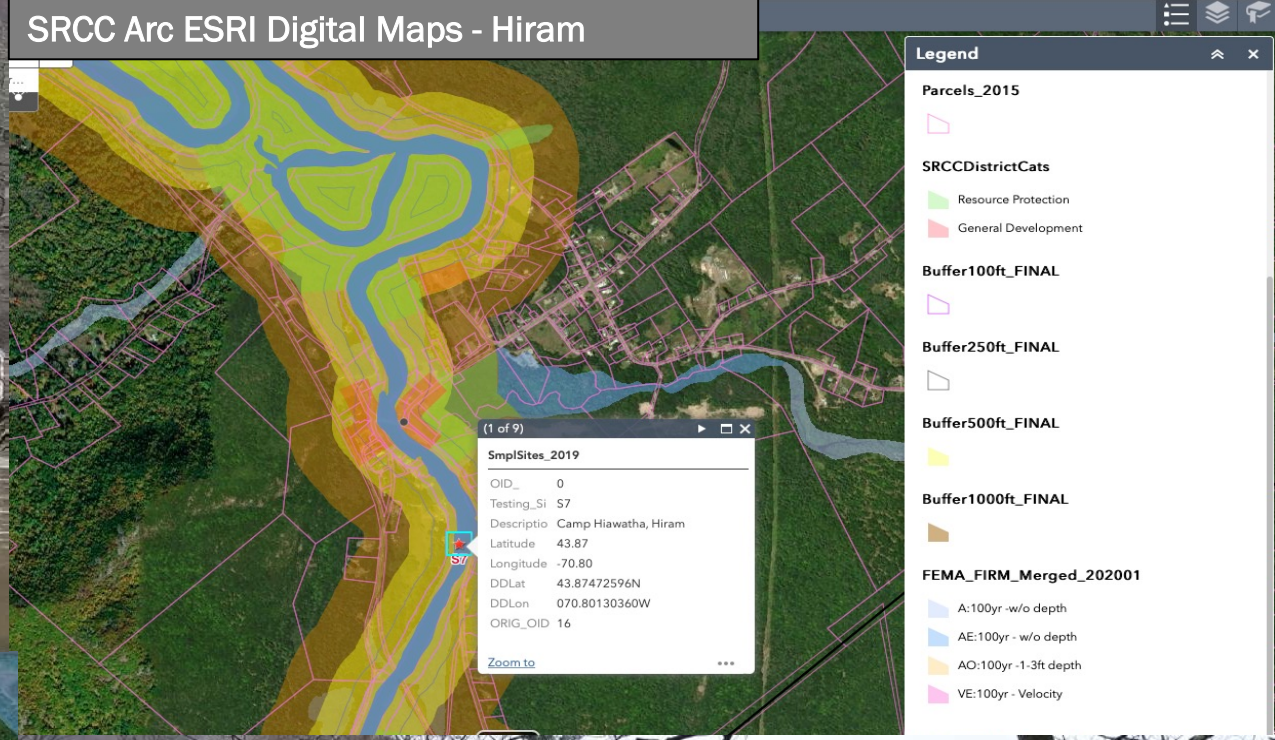
Site S21 Front Street Public Boat Launch on Saco River. Saco, Maine. Estuarine/marine waters.

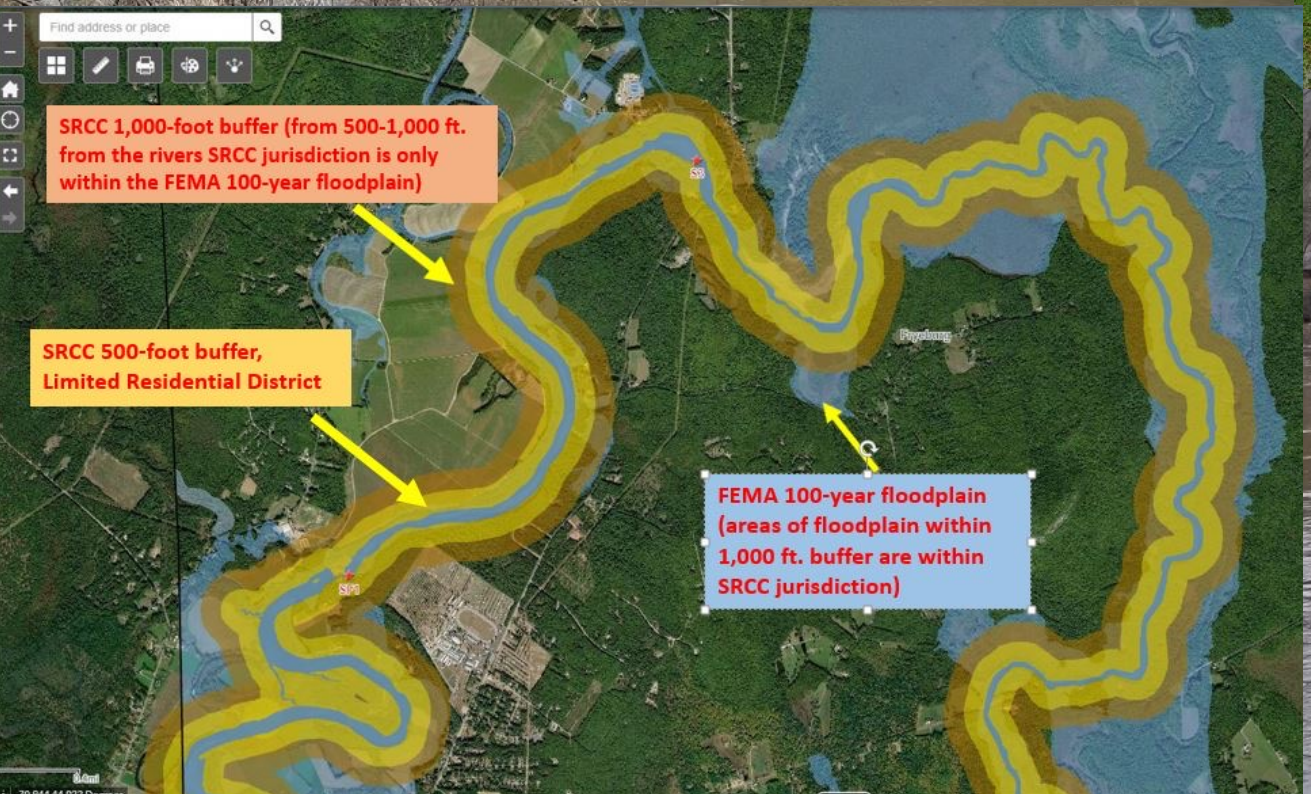
The maps on this page replaced the SRCC Paper Maps



Saco River. Hiram, Maine. Minor Flood. Spring 2019.

SRCC Arc ESRI Digital Maps - Hiram



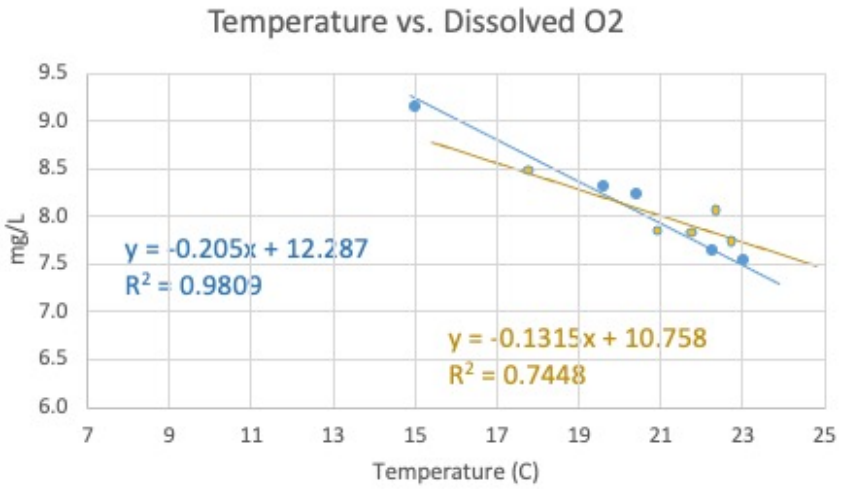


Saco River. Hiram, Maine. Minor Flood. Spring 2019.

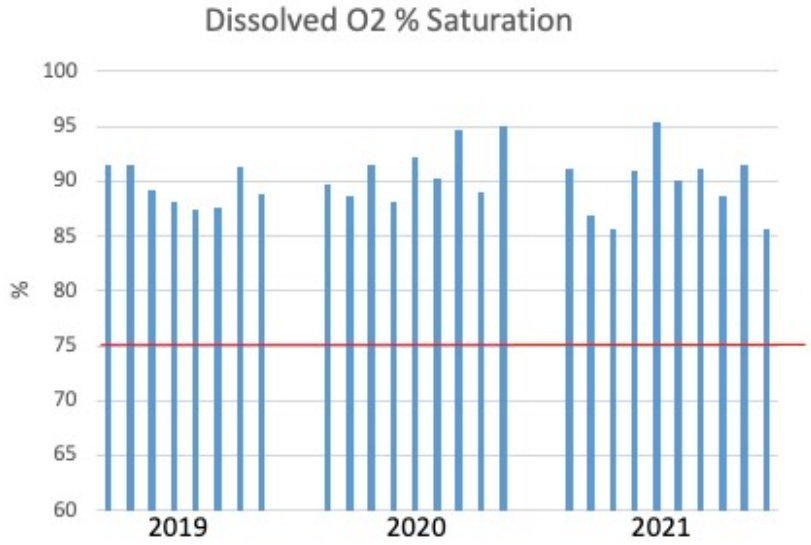
*SRCC Annual Town Data Analysis Reports (provided to each town for all active sample sites)

LO16- Little Ossipee River off Hardscrabble Road, Limington

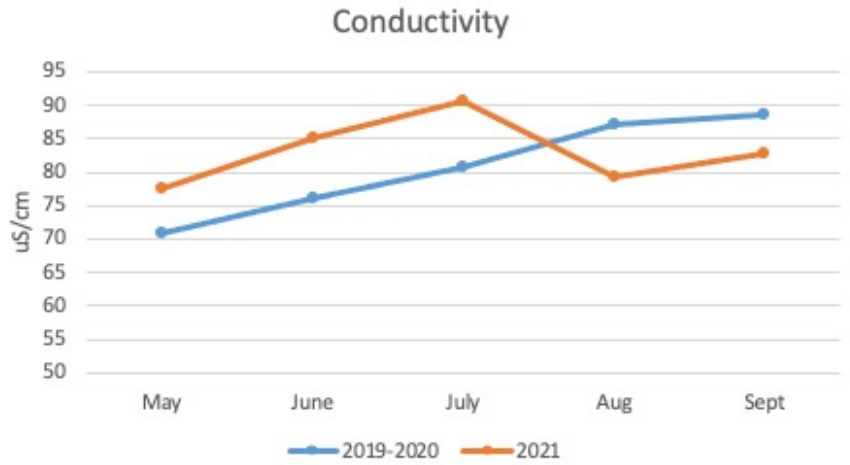
Monitoring began in 2019



Dissolved Oxygen (DO) has an inverse relationship with temperature: as temperature increases DO decreases. The R^2 values from 2021 (orange) show a slightly worse value compared to combined 2019-2020 values (blue). This is attributed to having lower water temperatures in July 2021 (1 degree lower from previous years)



Maine State DO standard for Class AA waters is above 75% during the months SRCC tests.



As water levels decrease over the summer, conductivity levels tend to increase. It is not because the salt level increases, but rather the water level decreases so the salt is more concentrated. With the high amount of rain fall, we never saw values rise.

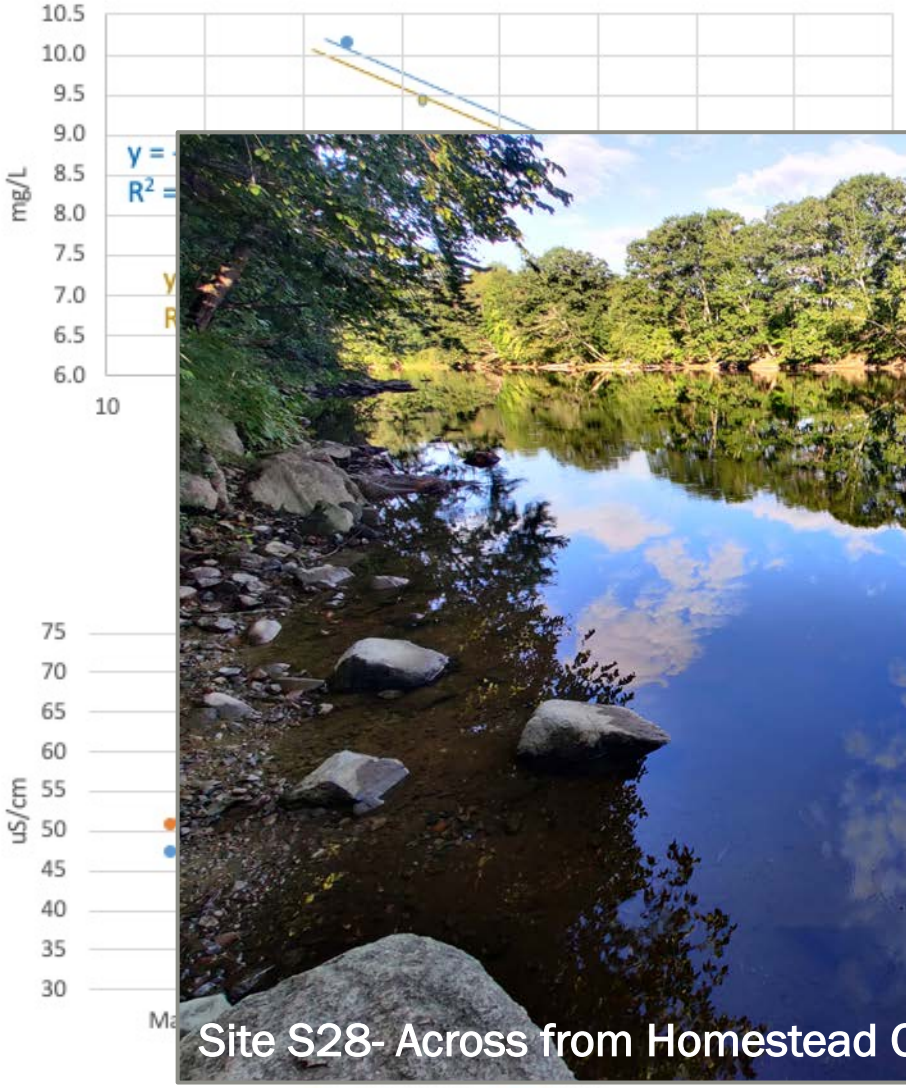
Parameter	Result
Turbidity	Within appropriate levels
pH	Within appropriate levels
TP	Within appropriate levels
TDN	Within appropriate levels
NO3/NO2	Within appropriate levels
PO4	Above recommended levels

There currently are not enough monitoring years to determine trends, however results from 2019-2021 show levels within appropriate ranges for turbidity and pH. TP began being monitored in 2020 and levels are within appropriate levels. TDN, NO3/NO2, and PO4 began being monitored in 2021; TDN and NO3/NO2 are within appropriate levels, PO4 is exceeds appropriate levels.

S28- Across Route 5 Bridge from Homestead Campground, Saco

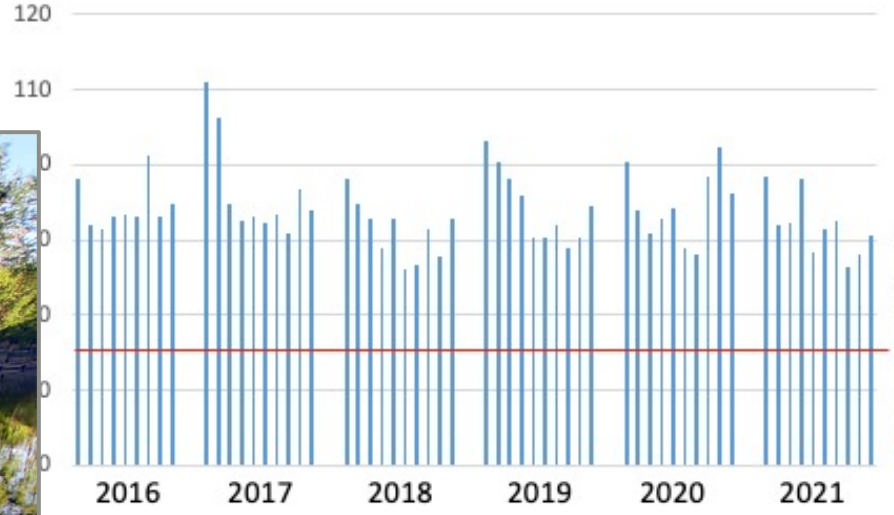
Monitored since 2013

Temperature vs. Dissolved O2



Dissolved Oxygen (DO) has an

Dissolved O2 % Saturation



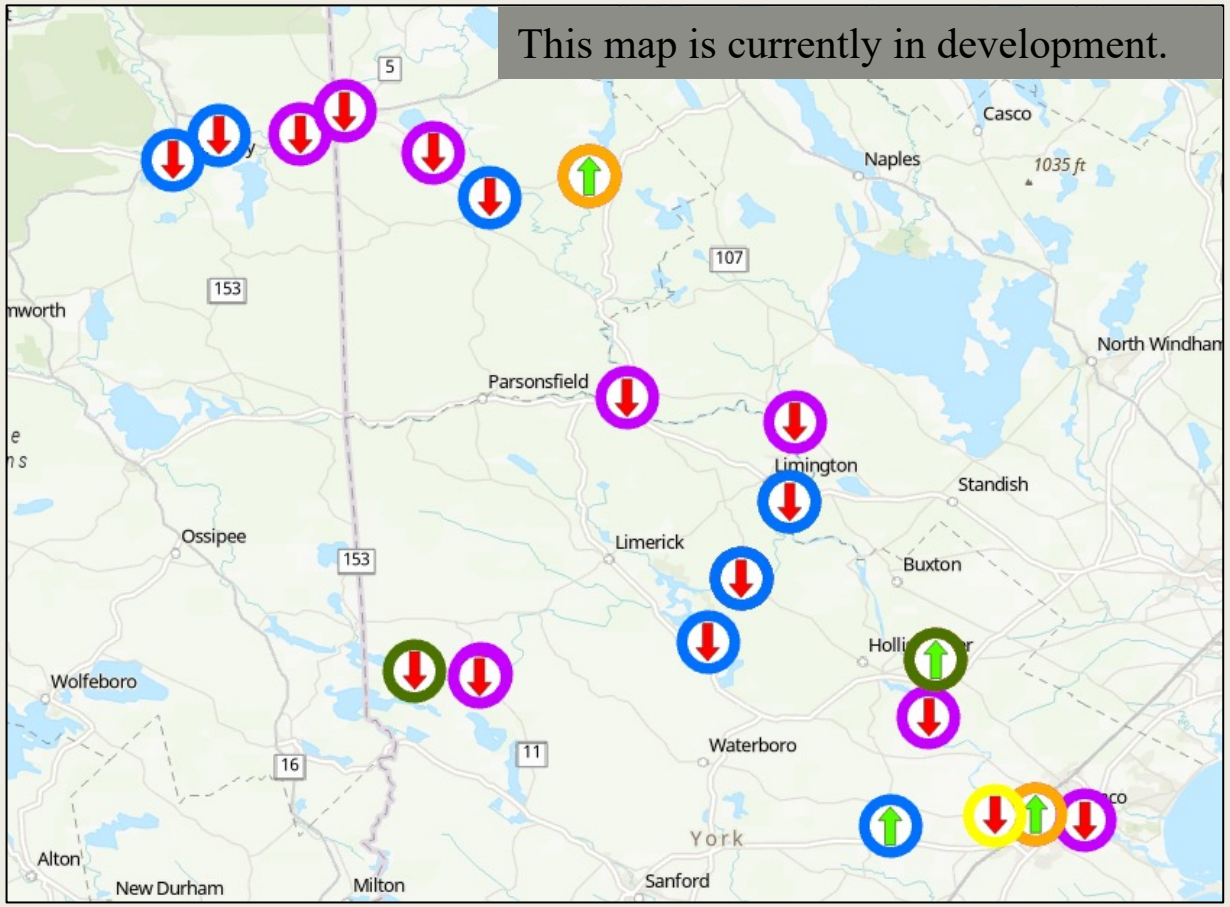
Maine State DO standard for Class AA waters is above 75% during the months SRCC tests.

Parameter	Trend	Explanation
pH	Stable	No significant trends; data show low variability
Turbidity	Stable	No significant trends; data show moderate variability
TDN	Low	Within acceptable limits
TKN	Stable	No significant trends; data show moderate variability
TP	Stable	No significant trends; data show low variability
NO3/NO2	Low	Within acceptable limits
PO4	Slightly high	Slightly above acceptable limits

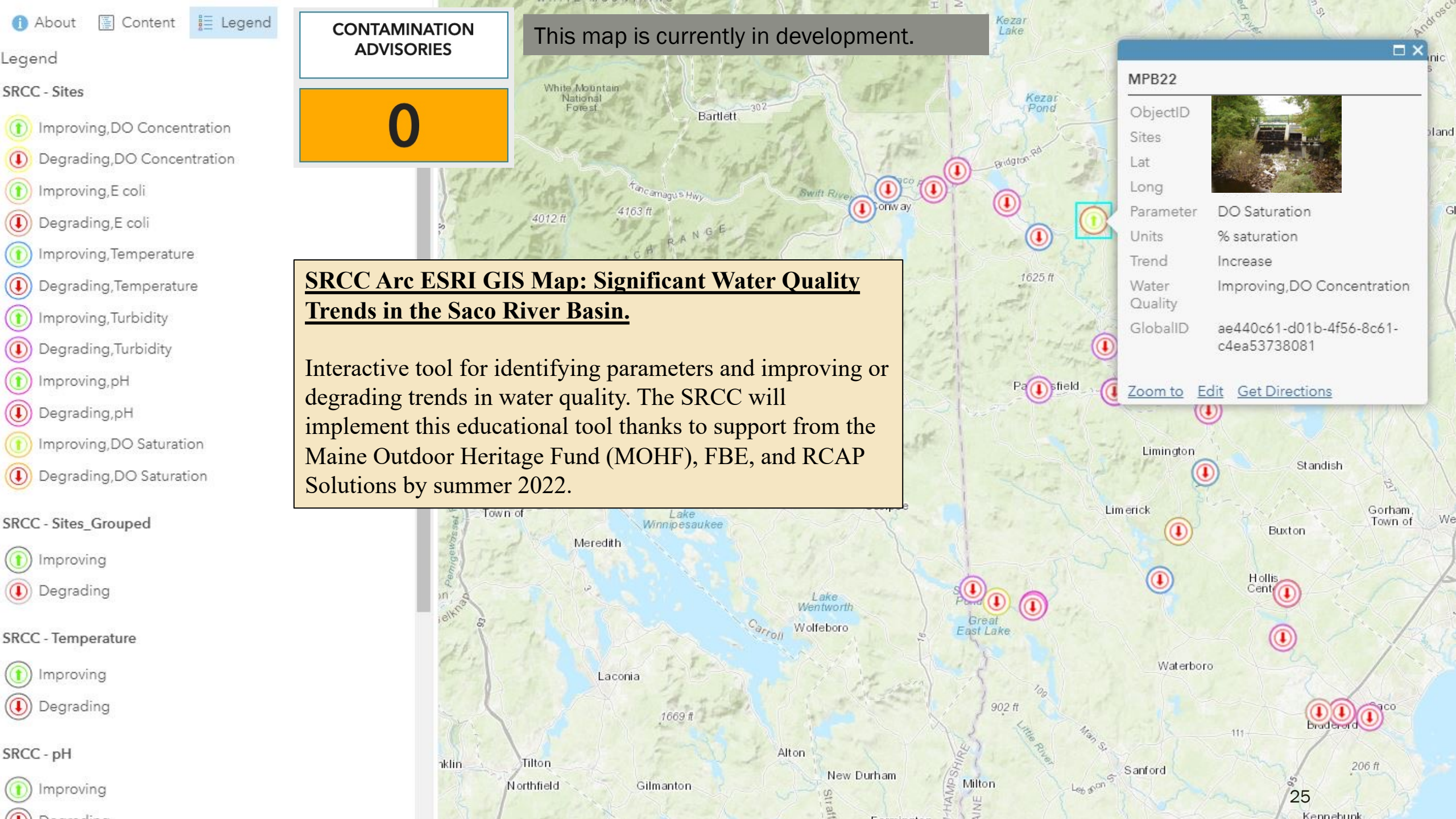
Trends observed in pH, turbidty, and TP from 2016-2021 show stable levels within appropriate ranges. TDN, NO3/NO2, and PO4 sampling began in 2021 so no trend can be determined.

As water levels decrease over the summer, conductivity levels tend to increase. It is not because the salt level increases, but rather the water level decreases so the salt is more concentrated. With the higher rainfall this summer, we did not see that late season spike.

The SRCC provides yearly analysis to corridor towns on improving or declining water quality conditions for every parameter sampled. The table includes trends identified in the 2021 WQM sampling season and explanations for the impact to water quality conditions.



Site	Municipality	Parameter	Trend	Explanation	Intended Action
LO11-1	Newfield	**TP** (Total Phosphorus)	*Degrading*	Decreasing trend over last two seasons	Increase TP testing frequency by 50%
LO11-1	Newfield	**PO4** (Orthophosphate)	*Degrading*	Above acceptable limits for 2021	Increase PO4 testing frequency by 50%
O22	Cornish	**PO4** (Orthophosphate)	*Degrading*	Slightly above EPA standards (PO4 EPA limit is 10ug/L; O22 median is 12ug/L)	Increase PO4 testing frequency by 50%, Sample for TP
S19-U	Hollis	***E. coli***	*Degrading*	Geomean for 2021 was close to being over the standards for Class B waters	Implement TP sampling at this site location
S28	Saco	**PO4** (Orthophosphate)	*Slighty High*	Slightly above acceptable limts	Increase PO4 testing frequency by 50%
S28	Saco	***E. coli***	*Degrading*	Geomean for 2021 was close to being over the standards for Class B waters	Increase TP testing frequency by 50%
S7	Hiram	***E. coli***	*Degrading*	Levels increased significantly comparative to previous years	Implement TP sampling at this site location
S10	Hiram	***E. coli***	*Degrading*	Highest geomean in 2021 compared to the previous 6 years	Implement TP sampling at this site location
LO16	Limington	**PO4** (Orthophosphate)	*High*	Above recommended levels	Increase PO4 testing frequency by 50%
SP22	Limington	**PO4** (Orthophosphate)	*High*	Above recommended levels	Increase PO4 testing frequency by 50%
O8	Kezar Falls	***E. coli***	*Degrading*	Approaching Class B Standards	Implement TP sampling at this site location
LO15	Limington/Waterboro	**Dissolved Oxygen**	*Degrading*	Periodic levels of DO below Class AA standards	Implement TP sampling at this site location
S21	Saco	***Enterococcus***	*High*	Above acceptable limits for 2021	Implement TP sampling at this site location. **Further Investgation required to determine cause**
S30	Biddeford	***E. coli***	*High*	Well above acceptable limits-- Highest geomean on record for this site	Implement TP sampling at this site location. **Further Investgation required to determine cause**
S31 RP / S20-D	Biddeford	***E. coli***	*High*	Well above acceptable limits-- Highest geomean on record for this site	Implement TP sampling at this site location. **Further Investgation required to determine cause**
WQ analysis for 2021 is ongoing					


About
Content
Legend
Legend
SRCC - Sites
Improving,DO Concentration
Degrading,DO Concentration
Improving,E coli
Degrading,E coli
Improving,Temperature
Degrading,Temperature
Improving,Turbidity
Degrading,Turbidity
Improving,pH
Degrading,pH
Improving,DO Saturation
Degrading,DO Saturation
SRCC - Sites_Grouped
Improving
Degrading
SRCC - Temperature
Improving
Degrading
SRCC - pH
Improving
CONTAMINATION ADVISORIES
0
This map is currently in development.
MPB22
ObjectID
Sites
Lat
Long
Parameter
DO Saturation
Units
% saturation
Trend
Increase
Water Quality
Improving,DO Concentration
GlobalID
ae440c61-d01b-4f56-8c61-c4ea53738081
Zoom to
Edit
Get Directions
SRCC Arc ESRI GIS Map: Significant Water Quality Trends in the Saco River Basin.
Interactive tool for identifying parameters and improving or degrading trends in water quality. The SRCC will implement this educational tool thanks to support from the Maine Outdoor Heritage Fund (MOHF), FBE, and RCAP Solutions by summer 2022.
White Mountain National Forest
Bartlett
Kezar Lake
Kezar Pond
Bridgton Rd
Swift River
Conway
Kancamagus Hwy
4012 ft
4163 ft
1625 ft
Limington
Standish
Limerick
Buxton
Gorham, Town of
Hollis
Waterboro
Sanford
Lake Winnipesaukee
Meredith
Lake Wentworth
Wolfeboro
Great East Lake
Laconia
1669 ft
902 ft
Alton
New Durham
Milton
Tilton
Northfield
Gilmanton
Little River
Main St
206 ft
Saco
Bradeford
Kennebunk

Wading into our Waters: 19 years of citizen science water quality monitoring in the Saco River Basin

Trent Millum and Jillian Emerson| Green Mountain Conservation Group| Effingham, NH 03882| www.gmcg.org | water2@gmcg.org

Introduction

- Water is a vital resource on earth that connects every individual on the planet.
- The composition of surface or underground waters is highly dependent on environmental factors: geology, topography, meteorology, hydrology, and biology. [1]
- Water quality is also heavily impacted by human intervention: discharge of domestic and urban waste, spreading chemicals onto land surfaces, spreading salt onto paved roads, etc. [1]
- NH and ME classify waterbodies into categories (A and B for NH; AA, A, B, or C for ME) and set surface water quality standards for select parameters which aid in the interpretation of stream monitoring results. [2,3]
- The Saco River Basin includes several large waterbodies, abundant groundwater resources, and its principal stream the Saco River which provides drinking water to an estimated 250,000 people,[4] making this watershed's resources vital to monitor and protect.
- The Regional Interstate Volunteers for the Ecosystems and Rivers of Saco (R.I.V.E.R.S.) program is a joint watershed citizen-science monitoring program established by the Green Mountain Conservation Group (GMCG) in NH and the Saco River Corridor Commission (SRCC) in ME.
- The R.I.V.E.R.S. program was established in 2002 and has now collected over 19 years of water quality data and counting. Long-term water quality monitoring programs are essential for assessing variations over space and time in water quality.
- Overall, results demonstrate high water quality in the Saco River Basin with a few emerging threats including road salt impact and decreasing dissolved oxygen.

Site Description

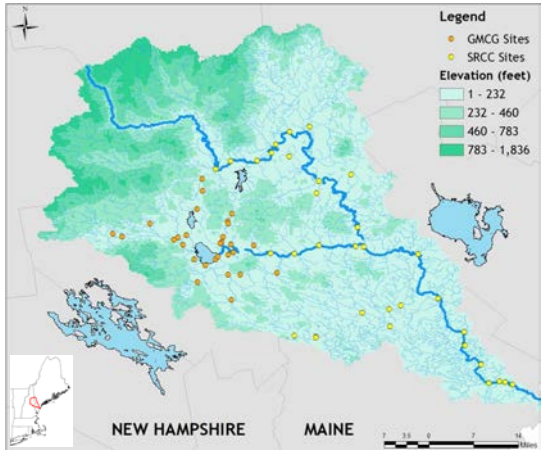


Figure 1. Map of the Saco River Basin and sampling site locations in New Hampshire and Maine

- The Saco River Basin occupies 1700 square miles in southwestern Maine and eastern New Hampshire. 876 square miles are located in New Hampshire and 823 square miles are located in Maine, encompassing 26 towns across the two states.
- 78% of the watershed is forested while only 5% is considered developed land giving it the capacity to support a wide diversity of life and clean waters.
- Volunteers for GMCG sample 29 stream sites in NH and volunteers for SRCC sample 36 stream sites in ME.

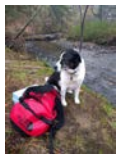


Figure 2. Cherished volunteers collect data at R.I.V.E.R.S. sites.

Methods

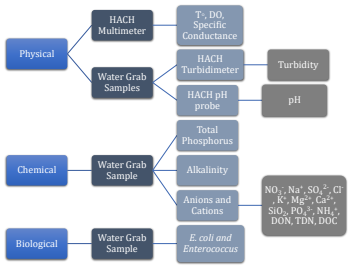


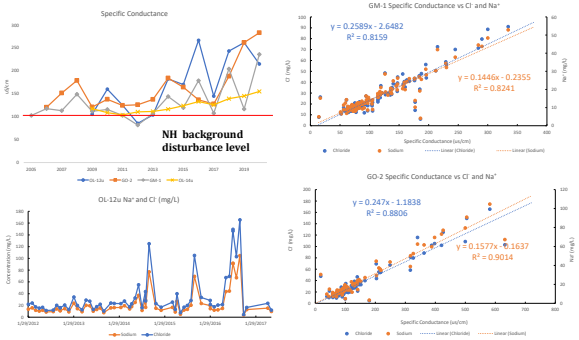
Figure 3. Representation of the various processes used to collect and analyze water quality data.

Table 1. Data collection summary

Frequency	Parameters	Sites
Bi-weekly	Specific conductance, dissolved oxygen (DO), temperature, pH, and turbidity	65
Monthly	Total phosphorus (TP)	35
Monthly (GMCG)	Anions and cations, total dissolved nitrogen (TDN), dissolved organic carbon (DOC), dissolved organic nitrogen (DON)	10
Monthly (SRCC)	Phosphate, total Kjeldahl nitrogen (TKN), alkalinity, *E. coli*	varies

Results and Discussion

New Hampshire



Figures 4a, 4b, 4c, and 4d. Specific conductance demonstrates an increasing trend at 85% of NH sites including 3 that are correlated with increases in sodium and chloride as well, indicating road salt pollution.

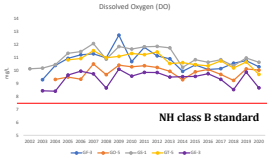


Figure 5. Dissolved oxygen mean values at 5 sites in 5 different towns demonstrate excellent water quality with values consistently above the NH class B standard of 7.5 mg/L.

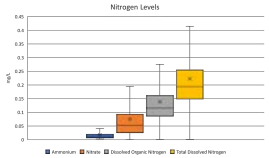


Figure 6. Data from 4 different nitrogen parameters across 10 sites demonstrates high water quality with values below existing NH or EPA standards.

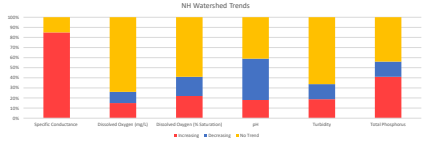
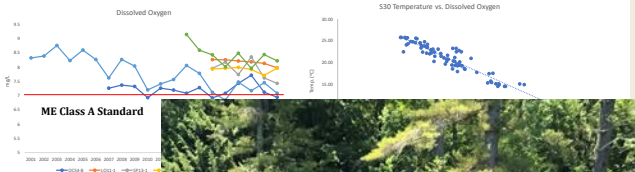


Figure 7. Mann-Kendall statistical trend results for stream sites in New Hampshire.

Maine



Figures 8a and 8b. DO val… standard (8a) and DO vs te…

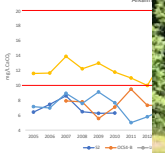


Figure 9. Alkalinity values … Maine demonstrating the l… of the major rivers in the S…

Figure

- The data show incre… sites showed values… 4a).
- Increases in specifi… correlate with incre… likely cause of specif…
- Dissolved oxygen thr… values at most site… dissolved oxygen is … life.
- Nitrogen levels were… These results are c… forested with little a…
- Dissolved oxygen va… water quality trend. … mg/L standard (Figu…
- Temperature increas… decrease in dissolve…
- Alkalinity across si… indicating streams … decreasing pH trend… acidic bedrock unde…
- Geometric mean per… CFU/100mL ME sta… (Figure 10).

- Overall, water quali… emerging over the … increasing road salt… sites in ME with diss…

The authors thank past water qualit… University of New Hampshire (UNH… Newton (Smith College); AmeriCorp… to, The Royal Little Foundation, UNH… Foundation, NH Charitable Foundati… monitoring volunteers.

References

[1]Roy R. An Introduction to water quality analysis. ESSENCE – International Journal for Environmental Rehabilitation and Conservation. 2018;5(1):94-100.
[2] Environmental Protection Agency. Chapter Env-Wq 1700. Surface Water Quality Regulations. EPA; 2015.
[3]Maine's Water Quality Standards. Water Quality Standards Page, Maine Department of Environmental Protection. https://www.maine.gov/dep/water/wqs/. Accessed March 10, 2021.
[4] Saco Watershed. Acton Wakefield Watersheds Alliance.
[5]Massachusetts Water Watch Partnership. UMass Amherst. https://www.umass.edu/mwwp/protocols/rivers/ph_alkalinity_river.html. Accessed March 10, 2021.

SRCC Staff member, Rachelle sampling in the Ossipee River as part of an educational program for middle school students.

Recent and ongoing Collaborations with other Agencies

- The U.S. Environmental Protection Agency (EPA)
- NOAA Maine Water Utility Climate Adaptation Project
- The Maine Department of Environmental Protection (MEDEP)
- Maine Outdoor Heritage Fund
- New Hampshire Department of Environmental Services (NHDES)
- Saco Bay Climate Adaptation Advisory Committee
- Climate Ready Coast- Southern Maine Planning & Development Commission
- Resources for Communities and People (RCAP) Solutions
- Corridor municipalities and surrounding towns
- Ossipee Aquifer Advisory Committee
- Saco Headwaters Alliance (SHA)
- Green Mountain Conservation Group (GMGC)
- York County Soil & Water Conservation District (YCSWCD)
- York County Invasive Aquatic Species Project
- University of Maine
- Francis Small Heritage Trust
- Saco Salmon Restoration Alliance Hatchery
- Saco River Recreational Council (SRCC)
- Forest Bell Environmental (FBE) Associates
- Lake Arrowhead Community (LAC)
- Sacopee Valley Middle School

Rulemaking Changes to the Commission's Performance Standards:

Revised through the process and requirements of the Maine Administrative Procedure Act in July 2019:

Chapter 102: Standard Conditions of Approval.
Chapter 107: Performance Standards Governing Expansions of Existing Nonconforming Uses, Including Structures.

Saco River Corridor Commission proposes rule changes

journaltribune.com/articles/front-page/saco-river-corridor-commission-proposes-rule-changes/

| March 07, 2019 March 7, 2019

Buildings line the Saco River in the Biddeford Mill District. The Saco River Corridor Commission is considering changes to its regulations. LIZ GOTTHELF/Journal Tribune

The **Regulatory Review Committee** is developing changes to the performance standards below and is working with the office of the Attorney General to ensure the standards are in alignment with other relevant state standards.

- Chapter 101: Regulations for the Processing of Applications for Permits, Variances, or Certificates of Compliance.
- Chapter 103: Standards to Address the Environmental Factors.
- Chapter 104: Performance Standards for Multi-Unit Residential Dwellings, Including Condominium and Cluster Development.
- Chapter 107: Performance Standards Governing Expansions of Existing Nonconforming Uses, Including Structures.

Saco River Corridor Commission continues to review proposed regulation changes

journaltribune.com/articles/front-page/saco-river-corridor-commission-continues-to-review-proposed-regulation-changes/

| April 05, 2019 April 5, 2019

A view of the Saco River between Saco and Biddeford, as seen in February. LIZ GOTTHELF/Journal Tribune

The SRCC Commissioners, Staff, and Volunteers took all photographs included in this presentation. The presentation includes images from the SRCC's ESRI Arc GIS mapping system and permit application process.

Office number: 207-625-8123

Contact email: dalyn@srcc-maine.org

Office Location: 81 Maple St. Cornish, Maine.