

SLPID

2022 WINTER NEWSLETTER



SLPID, PO Box 2551, Malta, NY 12020 | www.SLPIDNY.gov

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HARVESTER UPDATE

Whether it is seen as good or bad, aquatic vegetation (lake weed) is a part of lake living. During the summer, the aquatic weed harvesting team is very busy on the lake with the operation of three aquatic weed harvesters. The harvesting operation is for cutting specific pathways to deep water for recreational users. As the summer continues, the increase in warmer weather and sunshine promotes more weed growth. The aquatic weed harvesters cut up to 15 truckloads or 20-25 tons a day. The weeds are cut and loaded onto a conveyor belt with minimal fall-off. The harvesters cut, leaving a band, and then return to pick up any fragments left behind. This is the best strategy that is followed in New York State to ensure there is minimal spread. The aquatic harvesters have the least impact on fish and other aquatic wildlife in the lake, assuring an eco-friendly future. The vegetation is then trucked off to nearby farms and used for compost.

The 2022 season yielded a total of 836 truckloads of vegetation and nutrients removed from Saratoga Lake. The cutting period was from June 15-September 29th. SLPID is grateful for the property owners who support the management of the Harvesting Department with take-out spots and the farms that accept the material for composting.



Taking Care of Saratoga Lake in the WINTER

PROPERTY OWNERS IN THE SARATOGA LAKE WATERSHED

How can you improve and maintain the health of Saratoga Lake in the winter?

Property owners living within the Saratoga Lake Watershed have a direct impact on the health of Saratoga Lake. Because the Saratoga Lake Watershed is so large, it is important that all property owners within the watershed understand how their actions directly and indirectly influence the lake. Steps that protect the lake can also be beneficial to your home and your safety. Below are some suggestions and requirements for maintaining and improving Saratoga Lake quality in the winter.



MINIMIZE RUNOFF OF ROAD SALT

WHY: In the winter, road salt is a major cause of nutrient runoff. Runoff of road salt into the lake causes dead zones. Dead zones are areas that are depleted of oxygen and cannot sustain life.

DO:

- Leave a buffer of grass, hedges or native flowers between the lakefront and your lawn. This will reduce runoff into the lake.
- Reduce impermeable surfaces with natural walkways and permeable or gravel driveways and patios.

DON'T:

- Plow snow from driveways and roadways onto lake ice or lake shore.
- Use excess salt on driveways and walkways.
- Build concrete patios and walkways along the shoreline.

PROPERLY DISPOSE OF CHRISTMAS TREES

WHY: As trees dry out, they become more likely to be fire hazards. Christmas tree mulch can be used as an erosion barrier for lake shoreline management.

DO:

- Recycle your Christmas tree. Clean the tree of all ornaments and cut the tree into 4 ft. portions. The Saratoga County Public Works Department organizes tree removals. Check their website to see where trees can be dropped off. Several towns within Saratoga County also collect trees from curbside.
- Repurpose your Christmas tree. Parts of your tree can be used as decoration, to build a birdhouse, to enhance a pond, to create coasters or to make mulch.

DON'T:

- Recycle your tree by leaving it on the lake ice.
- Recycle by dumping or anchoring it to the lake bottom.
- Recycle a tree larger than 7 ft. without cutting it into smaller pieces.
- Recycle a tree without removing all ornaments.
- Leave a tree in your home to rot. It is a fire hazard and can make a mess.

BE AWARE OF ECOLOGICAL CHANGES IN THE LAKE

WHY: Ecological changes occur in the winter as parts of the lake turn to ice. Cold temperatures slow the metabolism of aquatic life reducing rates of photosynthesis and respiration. Life is sustained however due to the properties of water molecules that make ice less dense than water. Thus, ice floats on the top of the lake. This allows aquatic organisms to remain alive below the ice.

DO:

- Adhere to fishing regulations specific to ice fishing. On Saratoga Lake, there is a special restriction on Sunfish in the winter. They can be caught at any size and the daily limit is 15 fish.
- Beware of changing weather conditions.

BE CAUTIOUS AROUND SNOWPLOWS

WHY: Snowplows are used to make roads safer. However, because snowplows are so large and because snowplow drivers often have low visibility, people should be cautious around them.

DO:

- Place your garbage can in your driveway 4 inches from the white line. Garbage cans can become projectiles when a snowplow comes through.
- When you are driving, give the snowplow space and slow down. The driver may not be able to see your car. "Beeps" signal the truck is backing up.

DON'T:

- Allow kids to play or build tunnels next to the road.
- Crowd the plow while driving.
- Pass the plow on the right. Plows push snow to the right shoulder, and many are equipped with a wing plow a 6-8 foot extension on the right-hand side of the plow.



2022 Saratoga Lake TEMPERATURE STUDIES

Introduction

In 2022 the Saratoga Lake Protection and Improvement District (SLPID) began a program of temperature monitoring to fill gaps in our knowledge of the temperature and dissolve oxygen profiles in Saratoga Lake.

The research plan for the next 2-5 years will be to monitor the temperature profiles at the South deepwater zone near Snake Hill (65 feet or 14m) and the Center of the lake deep water zone or North site (100 feet or 28 m) during the summer months. In the winter there will be a string of temperature recorders at the Center of the lake and a dissolve oxygen recorder. This string of devices will provide continuous temperature data recording and a single point of recording of dissolve oxygen (DO). The DO recording device is expensive so a single unit will be used in 2022-2023, and supplement in the future. This will fill a gap in knowledge concerning DO during the winter months. As a part of the Citizen Statewide Lake Assessment Program (CSLAP) volunteers using a SLPID Temperature dissolve oxygen and conductivity meter data recorder collect vertical profiles on the lake at both the North and South deepwater locations. Vertical temperature dissolve oxygen profiles have been collected on a regular basis since 1998. Obtaining continuous temperature vertical profiles will provide added information on lake temperature variation, stability, and insight on water circulation in Saratoga Lake.

Past Work

Saratoga Lake is a dimictic lake which is fully mixes twice annually in the fall once water has cool off and in the spring after ice off. The fall mixing is fits into a normal common pattern of lake mixing. However, over the last ten years as more detail temperature profile monitoring has become readily available the stability of vertical temperature is being reconsidered. The spring mixing event has not been monitored frequently since it is necessary to obtain through the ice measurements and immediately after ice off measurements.

Following ice-off temperature, the vertical profile is the same from top to bottom. As the air temperature warms, temperatures slowly increase at the lake's surface. This continues during the entire spring and summer. In June, the zone of water known as the metalimnion experiences rapid water temperature changes resulting in a thermocline formation. Figure 1 below illustrates the normal thermal profiles zones found in a dimictic lake. The water below the thermocline will not circulate until fall turn-over when the lake cools to the deepwater temperature. At that point, the lake is in the isothermal stage and will then re-mix or turnover. The deepwater is isolated from the atmospheric air and is cut off from oxygen. Within the metalimnion, the water does not mix with the water above epilimnion or the water below hypolimnion (deep water zone). The concentration of DO is an indicator of the complex chemistry of the deep-water zones related to phosphorus and iron. Dissolved oxygen is typically depleted in the deep-water holes in July and August. This occurs after thermal stratification has become strong due to dramatic temperature changes in the metalimnion. As oxygen is depleted, phosphorus is released from sediments and, when the lake - mixes or overturns in September or October, this nutrient input may cause or sustain late-season algal blooms. As the lake warms, the area of oxygen depletion grows, and more phosphorus is re-generated.



2022 Saratoga Lake - Temperature Studies cont.

Until recently the conceptual model of a dimictic lake was that little mixing took place between the temperature zones in a lake. With more lakes collecting detail temperature profiles it is understood that the zones are more dynamic and temperatures shifts do occur.

The first set of temperature profiles were collected between August to the middle of October and demonstrated that the lake mixing occurred at the end of September and the first days of October in the South deepwater area at Snake Hill.

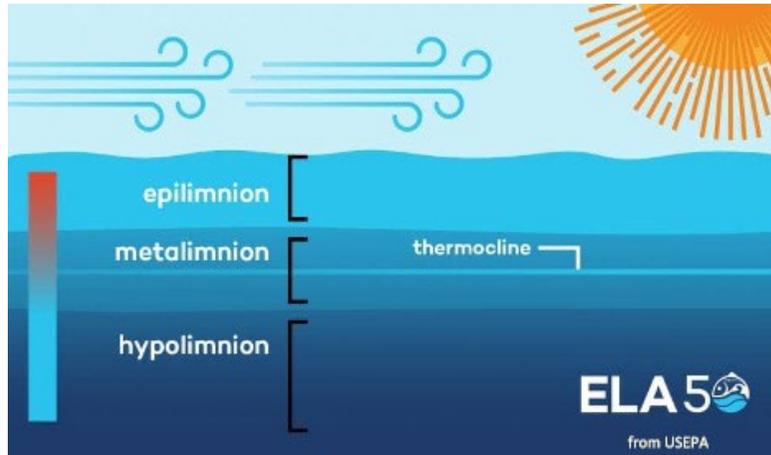


Figure 2 shows temperature change during that time period for three depths in the water column as horizontal lines. When all horizontal line meets the lake has become isothermal (nearly equal temperatures at all depths) and mixing will occur.

The lake mixing occurred following the HABs event in September, this indicates that nutrient regeneration from full mixing did not contribute to the HABs event. With more temperature data collection, it may reveal if metalimnion mixing is contributing to HABs events.

Similar profile data is being developed for the Central deepwater area.

The continuous collection of water temperature does show that the profile is not static, and that in the South deepwater area near Snake Hill there is greater temperature variation at the same depth. **Figure 3** the orange line shows that temperatures at a depth of 10m varied 0.2-9 °C on given days between September 13, to September 24,2022 at the south deepwater zone while at the North site there was slight variation in temperature.

Figure 2

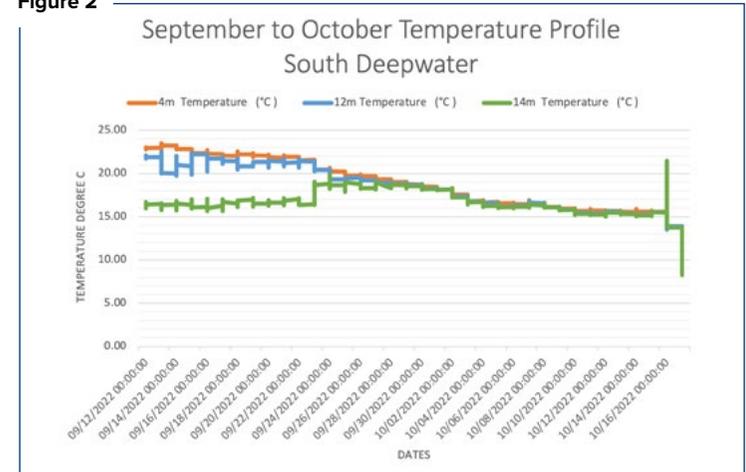
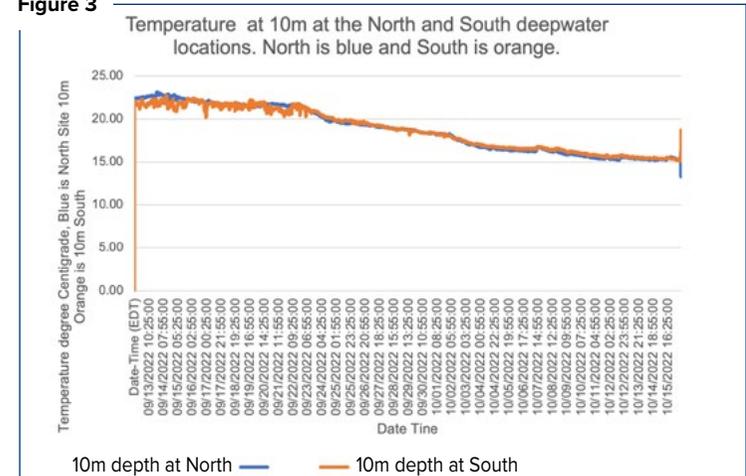


Figure 3



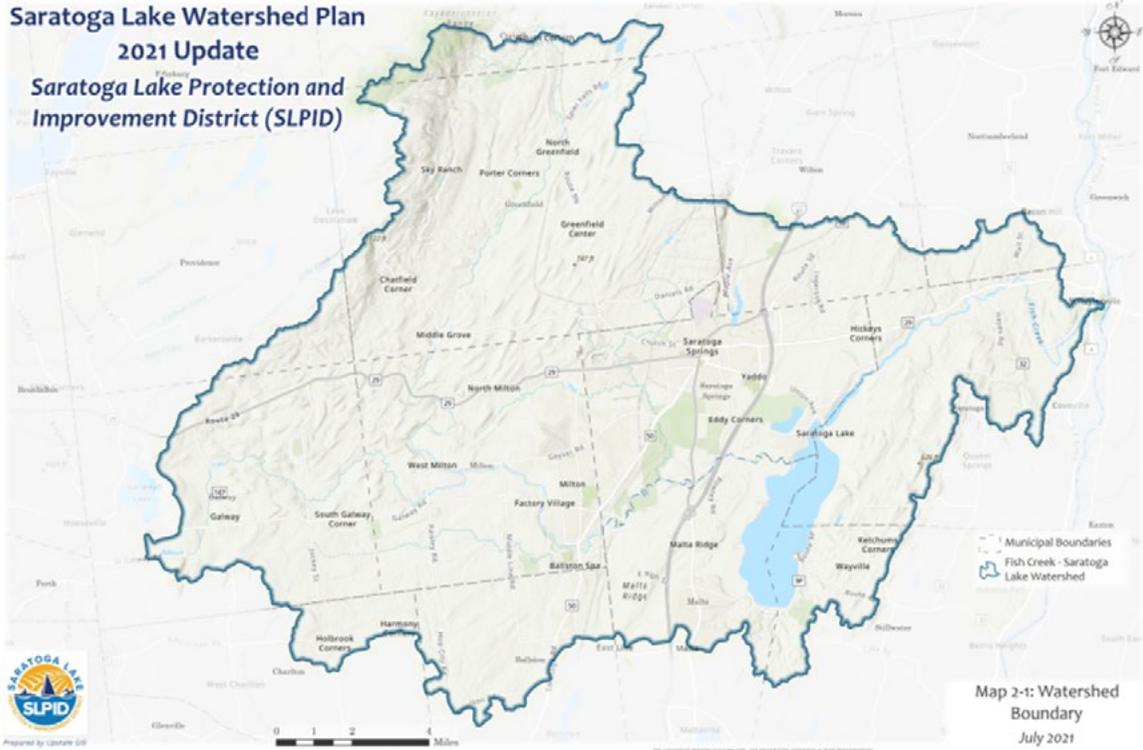
During the coming months additional review of the temperature profile data will be completed.



Saratoga Lake

THE VAST WATERSHED

Saratoga Lake Watershed Plan 2021 Update Saratoga Lake Protection and Improvement District (SLPID)



The Saratoga Lake watershed covers a 244-square-mile area representing nearly one-third of Saratoga County. As a result, land use activities throughout the watershed directly impact water quality in Saratoga Lake.

Saratoga Lake is in the eastern part of Saratoga County. The lake is approximately 4.5 miles (7.2 km) long, about 1.5 miles (2.4 km) wide at its widest point, and about 95 feet (29 m) deep.

The lake is bordered by the city of Saratoga Springs on the northwest, the town of Malta on the southwest, the town of Stillwater on the southeast, and the town of Saratoga on the northeast.

NY Route 9P runs along the lake's southern end and eastern side and then crosses its outlet in the north.

The lake's primary source is Kaydeross Creek, which enters the lake from the northwest, and the outlet is Fish Creek, which exits the lake from the north and flows into the Hudson River at Schuylerville.



2022 SARATOGA LAKE BOAT SUMMARY

ON-LAKE BOATING ANNUAL CENSUS

SLPID has been actively monitoring the number and type of boats actively using Saratoga Lake since 2016. The 2022 lake wide boat census was conducted on Saratoga Lake on Sunday, July 3, 2022, from 1:15 -2:45 pm in sunny 80-degree weather with a light breeze. The annual boat count is typically conducted on a fair-weather weekend day in July before track season started. 2021 was the exception due to poor weather on July weekends. Table 1, “On-Lake Boat Count Summary by Zone,” shows total numbers of boats by type and activity for the last seven seasons.

For consistent counting purposes, the lake was divided into 7 geographic zones. Boats were counted by category: active (motorized), anchored (motorized), and non-motorized (all types). Boats moored or parked at private or commercial docks were not counted as part of this effort but are reported below as a separate effort. See the charts on the next few pages.



ON-LAKE BOAT COUNT SUMMARY BY ZONE 2016 – 2022

ZONE	LOCATION	TOTAL BOATS COUNTED						
		2016	2017	2018	2019	2020	2021	2022
1	Browns Beach to Snake Hill	24	37	29	25	36	25	110
2	Snake Hill to Maple Shade	73	33	25	43	53	22	46
3	Maple Shade to Cedar Bluffs	16	23	7	15	17	17	22
4A/4B	Cedar Bluffs & Kayaderosseras Creek to 9P Bridge	46	67	66	71	39	75	37
5	9P Bridge to SLPID Boundary	6	31	22	33	94	21	49
6	Kayaderosseras Creek to Riley Cove	128	112	131	110	181	55	195
7	Riley Cove to Stony Point	49	65	62	44	107	255	84
	TOTAL	342	368	342	341	527	470	543



TOTAL BOAT COUNT COMPARISON 2016 - 2022

2016	2017	2018	2019	2020	2021	2022	7-Year Average
342	368	338	341	527	258	543	388



ON-LAKE BOAT DISTRIBUTION BY ZONE 2016 - 2022

ZONE	LOCATION	Active Motorized Boats (Includes jet skis)				Anchored Motorized Boats				Non-Motorized (Kayaks, Canoes, SUPs, Sailboats)			
		2016	2018	2020	2022	2016	2018	2020	2022	2016	2018	2020	2022
1	Browns Beach to Snake Hill	12	15	16	71	1	13	7	32	11	1	13	7
2	Snake Hill to Maple Shade	57	12	9	24	0	12	43	20	16	1	1	2
3	Maple Shade to Cedar Bluffs	14	6	9	10	1	0	8	12	1	1	0	0
4A/4B	Cedar Bluffs & Kayaderosseras Creek to 9P Bridge	31	57	27	28	1	3	9	3	14	6	3	6
5	9P Bridge to SLPID Boundary	5	10	67	45	1	8	13	0	0	4	14	4
6	Kayaderosseras Creek to Riley Cove	37	16	39	63	88	101	137	124	3	14	5	8
7	Riley Cove to Stony Point	25	33	34	27	14	19	58	17	10	10	15	40
	TOTAL	181	149	201	268	106	156	275	208	55	37	51	67



At-Dock and On-Land Boat Counts

In 2000, SLPID began an annual boat count of the number of boats that are inactive and docked in the water or dry-docked at both commercial marinas and residential properties. On weekdays the counts are conducted when boat traffic is light, with most resident boats inactive. The information presented in Table 4 below estimates there were 1,937 “resident motorboats” on Saratoga Lake in 2022. This represents a decrease of 325 motorboats over 2021. Approximately 57% were located at commercial marinas and 43% at private properties. About 421 fewer nonmotorized boats were counted over the count performed in 2021

AT-DOCK & ON-LAND BOAT COUNT SUMMARY 2020-2022

	Commercial			Private			Total		
	2020	2021	2022	2020	2021	2022	2020	2021	2022
Motorized	1,014	1,126	1,113	912	1,136	824	1,926	2,262	1,937
Motorboats	985	1,072	1,077	686	759	643	1,671	1,831	1,720
Jet Skis	29	54	36	226	377	181	255	431	217
Non-Motorized	356	679	448	533	654	460	889	1,333	924
Kayaks	130	345	173	272	380	300	402	725	473
Canoes	20	61	10	56	49	17	76	110	27
Sailboats	122	150	121	27	37	14	149	187	135
SUPs etc.	84	123	144	178	188	129	262	311	273

AT-DOCK & ON-LAND BOAT COUNT SUMMARY BY MUNICIPALITY 2022

	Commercial	Private	Total		Commercial	Private	Total
TOWN OF SARATOGA				TOWN OF MALTA			
Motorized	502	260	762	Motorized	132	267	399
Motorboats	484	172	656	Motorboats	131	242	373
Jet Skis	18	88	106	Jet Skis	1	25	26
Non-Motorized	169	134	303	Non-Motorized	141	144	285
TOWN OF STILLWATER				CITY OF SARATOGA SPRINGS			
Motorized	144	251	395	Motorized	335	46	381
Motorboats	135	191	326	Motorboats	327	38	365
Jet Skis	9	60	69	Jet Skis	8	8	16
Non-Motorized	33	187	220	Non-Motorized	71	45	116

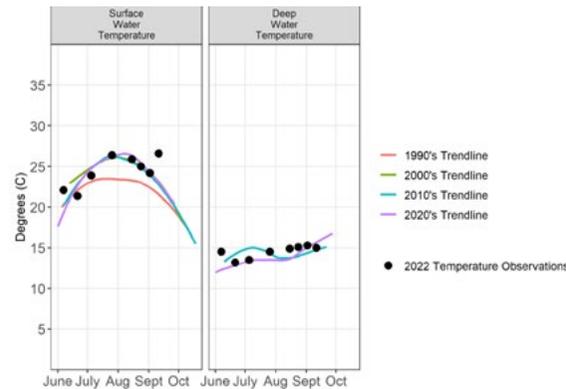


Saratoga Lake FIELD DATA

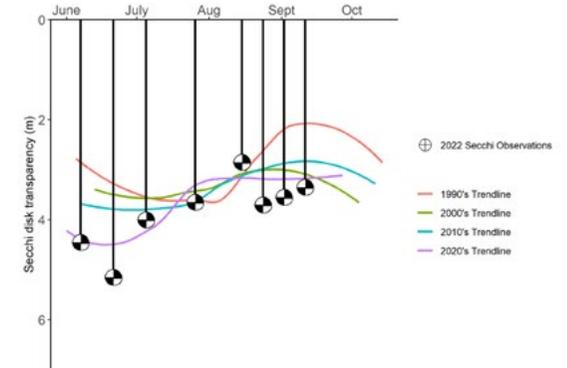
This year's field data compared to decades

Previous decadal trends are shown compared to 2022 field data. Trend lines are created by averaging previous years together, if applicable. Compared to previous years, aquatic plant coverage was less favorable in 2022. Surface water temperature, deep water temperature, water quality evaluation and recreational evaluation in 2022 were similar to previous years. There is insufficient data to identify trends in the other field data parameters. Further analysis will be available in the annual report available next spring.

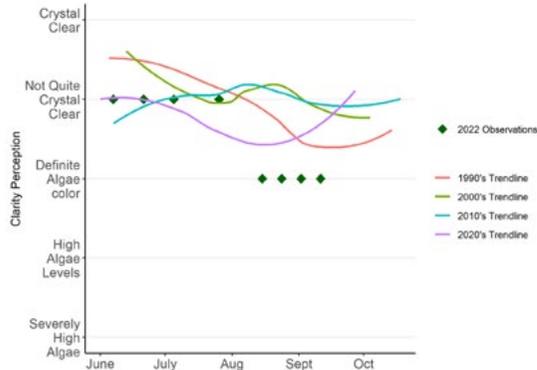
Water Temperature



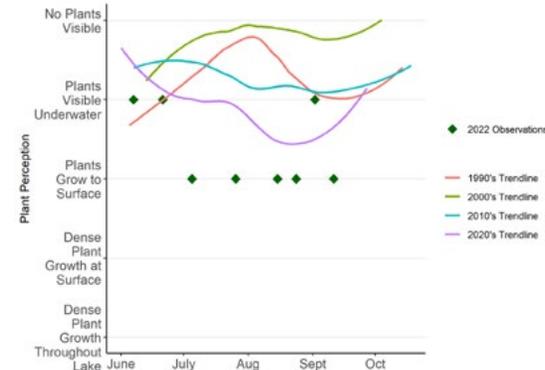
Water Clarity



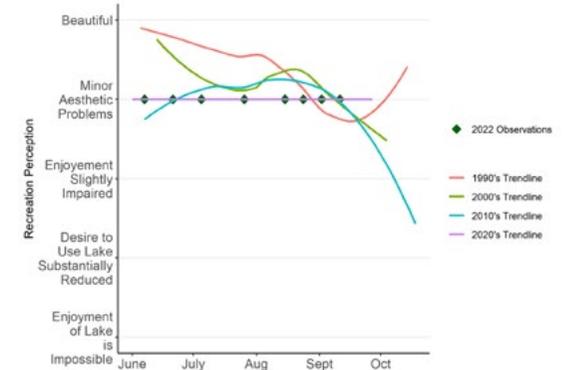
Lake Perception - Clarity



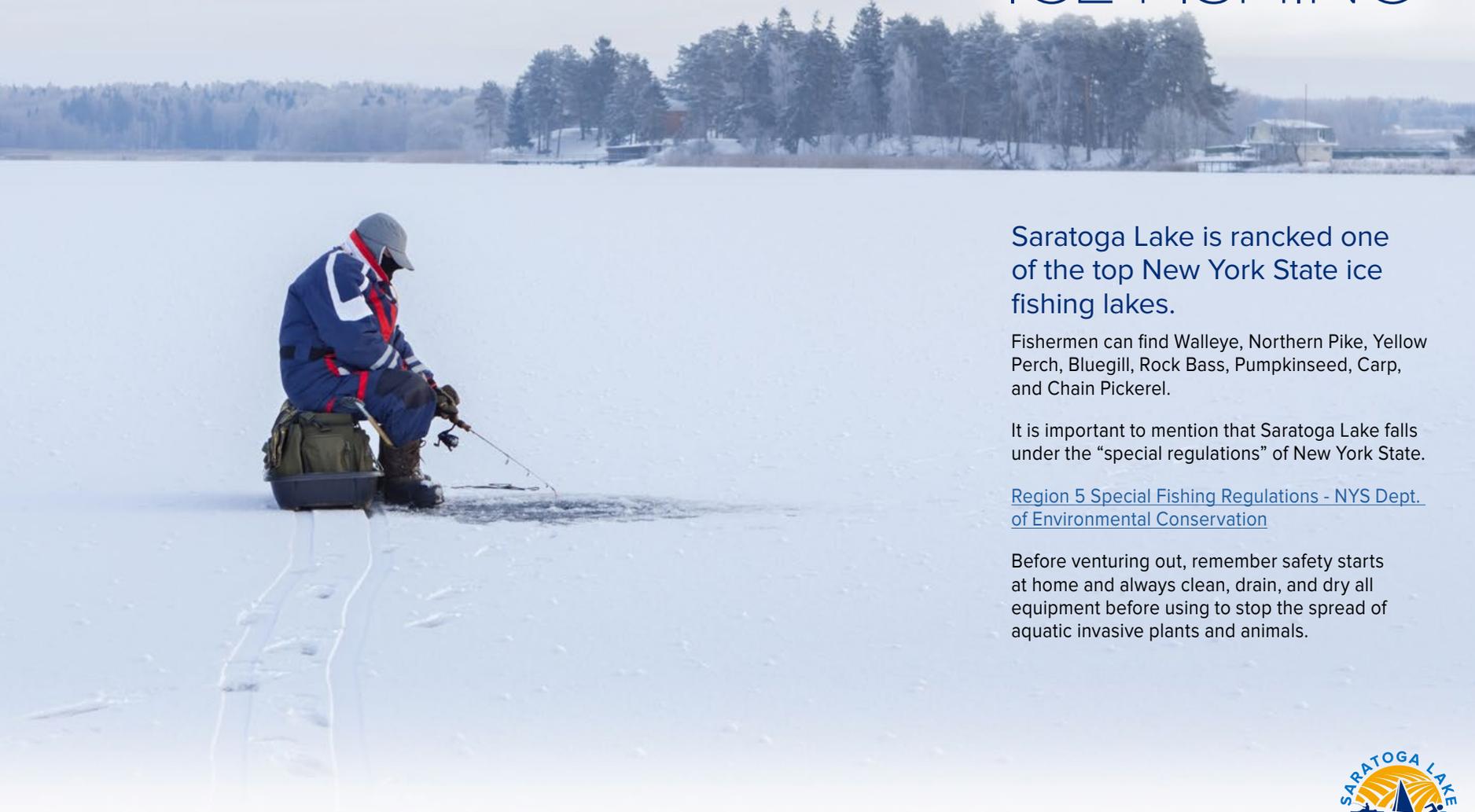
Lake Perception - Plants



Lake Perception - Recreation



Saratoga Lake ICE FISHING



Saratoga Lake is ranked one of the top New York State ice fishing lakes.

Fishermen can find Walleye, Northern Pike, Yellow Perch, Bluegill, Rock Bass, Pumpkinseed, Carp, and Chain Pickerel.

It is important to mention that Saratoga Lake falls under the “special regulations” of New York State.

[Region 5 Special Fishing Regulations - NYS Dept. of Environmental Conservation](#)

Before venturing out, remember safety starts at home and always clean, drain, and dry all equipment before using to stop the spread of aquatic invasive plants and animals.





from Saratoga Lake Protection & Improvement District

HAPPY HOLIDAYS!

If you have any questions or concerns or to view Saratoga Lake information,
Please Visit slpidny.gov

Call – 518-223-3252 or Email – cconnolly@slpidny.gov

