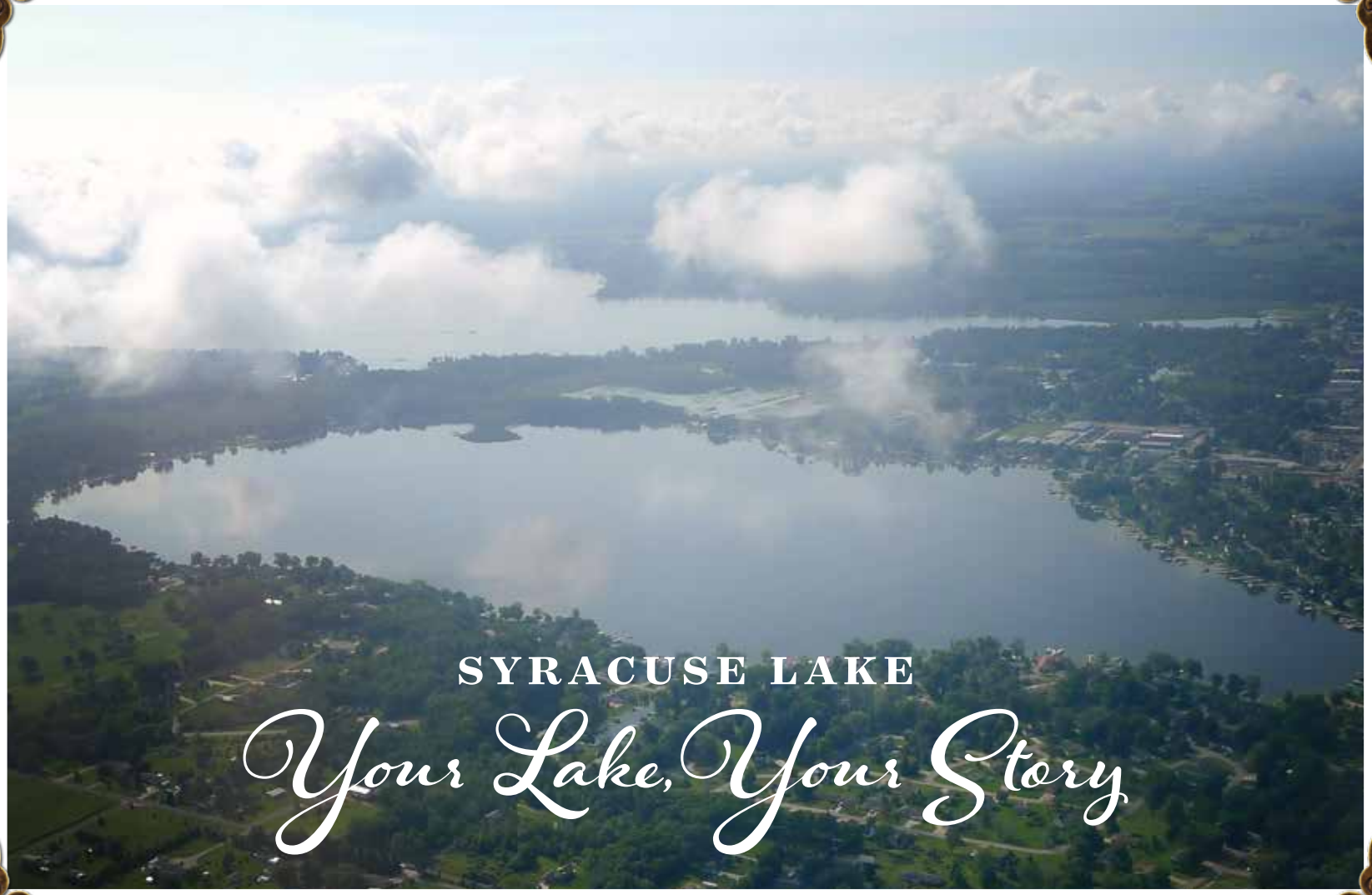


SYRACUSE LAKE

Your Lake, Your Story

LILLY CENTER FOR LAKES & STREAMS™

GRACE COLLEGE

Syracuse Lake

LAKE SIZE: 414 acres

WATERSHED SIZE: 24,498 acres

MAX DEPTH: 34 feet

AVERAGE DEPTH: 13 feet

INLETS: Lake Wawasee from the south

OUTLETS: Turkey Creek to the west

ACCESS: .25 mi E on SR13 on Medusa St. in Syracuse; Handicap accessible

RECREATION: Boat, Fish, Swim at Public Beaches at Lakeside Park on north shore of lake and at Hoy's Beach on Henry St. on northwest shore

LAKE BOTTOM: Clay, Muck, Sand

BEST FISHING: Largemouth Bass, Bluegill, Redear, Northern Pike

SYRACUSE LAKE:

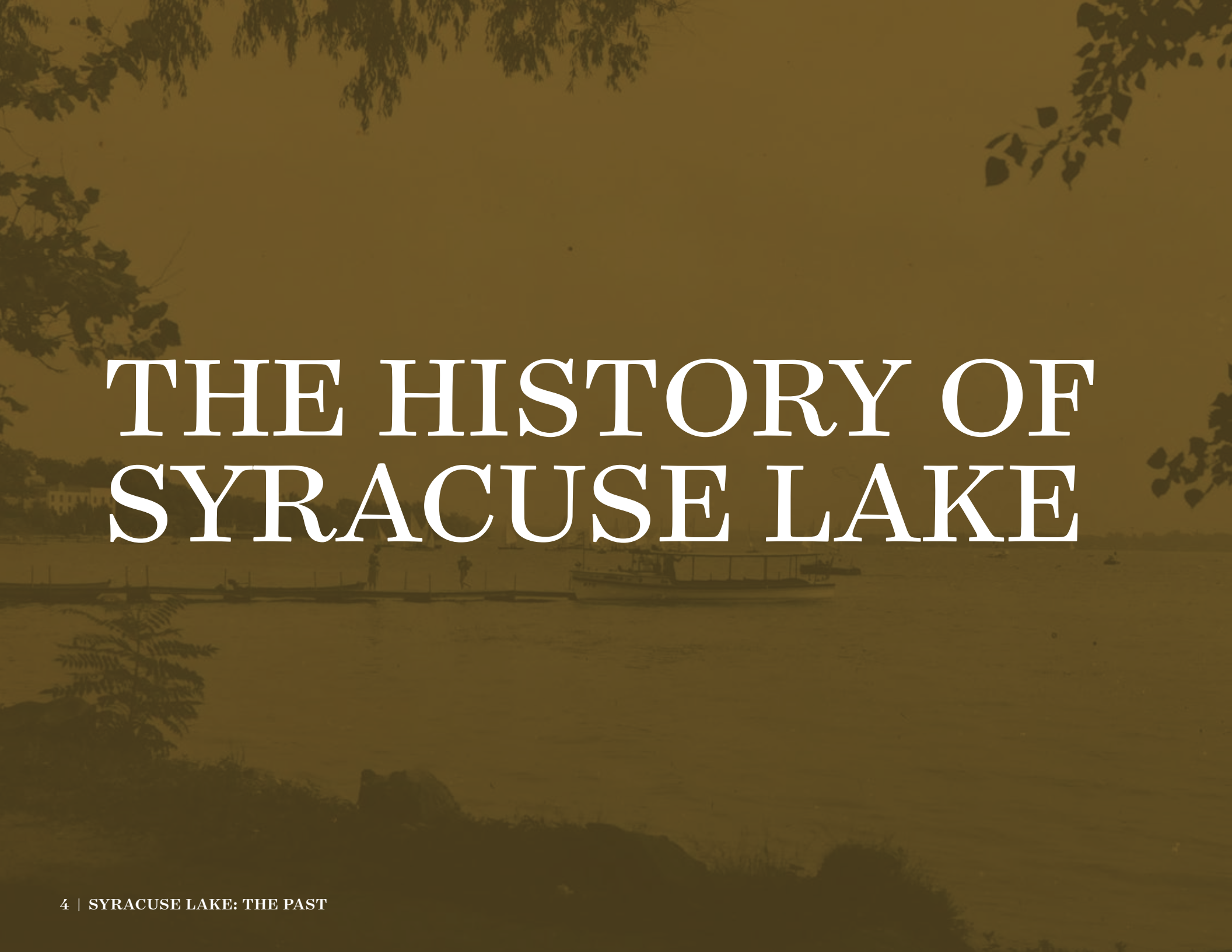
Past, Present & Future

Since glaciers first formed this lake, the health of Syracuse Lake has been of importance to the surrounding residents, businesses, families, and even the economy. Understanding the past of Syracuse Lake helps in guiding present and future research. Trends on local lakes assist in providing context for years past as well as years to come. Each lake is different with a story and rhythm of its own. Families on Syracuse Lake, whether they have visited the lake for one summer or for one century, have shaped this lake just as it has shaped them. And now you have the power to leave a legacy for a healthy Syracuse Lake for future generations.

Our Study:

The Lilly Center for Lakes & Streams has been closely studying local lakes since 2007. However, lakes in Kosciusko County have a wonderful heritage of scientific research going back to 1875. Understanding the health of local lakes in the context of their history can assist in guiding future research and actions. As we investigated the past and the present of local lakes, we researched and collected data on water clarity, nutrients, dissolved oxygen and other parameters. This is a summary of our results and research specific to your home: Syracuse Lake. Past data was collected only from university and government sources during the months of July and August. Both past and present research uses data collected in open water above the deepest point in the lake. This research and its publication was funded by the K21 Health Foundation, Kosciusko County Convention Recreation and Visitors Commission, Grace College and private donors.

Table of Contents



THE HISTORY OF SYRACUSE LAKE

How the Lake Was Formed

Syracuse Lake is a glacial lake. It was formed by the movement of glaciers which retreated from the land and left behind large deposits of ice and glacial material. These deposits left depressions in the land and as they melted they created large pools of water, or glacial lakes. This and other natural Kosciusko County lakes are glacial lakes. The nearby Great Lakes are the largest glacial lakes in the world.

THE TURN OF THE CENTURY

Until the start of the 1900s, Indiana lakes had not yet been widely viewed as subjects for research.

Syracuse Lake is south of the town of Syracuse, which used to be a station on the Baltimore, Pittsburgh and Chicago railroad. Throughout the 1900s, businesses were established on this and other surrounding lakes to make them a vacationer's paradise. Syracuse Lake, formerly "Nine-mile Lake," was so named as it measured nine miles from its north to south points.

RESEARCH ON SYRACUSE LAKE

Through the Decades

1875: Indiana Geological Survey examines and collects data on lakes in Kosciusko County, including Nine-mile Lake (Syracuse Lake).

1896–1902: The Indiana University Biological Station collects temperature profiles and algae species data. Student room and board costs are $1.25-$3.00 per week.

1946–1948: Indiana Department of Conservation studies Syracuse Lake for general hydrology, background history, ice thickness data, and temperature profiles.

1900s | 1910s | 1920s | 1930s | 1940s | 1950s

1973: EPA conducts lakes survey to collect temperature and dissolved oxygen profiles.

2007–PRESENT: Grace College's Lilly Center for Lakes & Streams collects data on Secchi depth, temperature profiles, dissolved oxygen profiles, nutrients, algae toxins and algae counts on Syracuse Lake.

1960s | 1970s | 1980s | 1990s | 2000s | 2010s

1996–PRESENT: Volunteers collect Secchi depth and nutrient data on Syracuse Lake as part of Indiana University volunteer program.

1994, 2000, 2003, 2006, 2010, 2015: Indiana University Clean Lakes Program collects data on Secchi depth, nutrients, and algae counts.

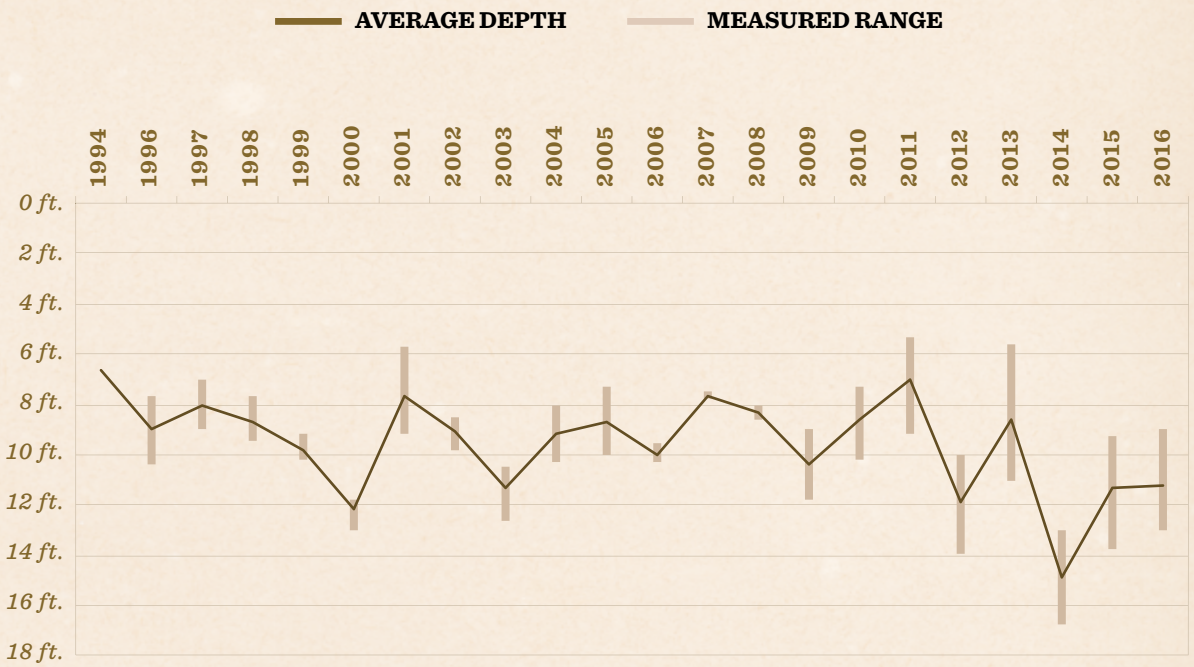
Water Clarity

The first Secchi disk was created in 1865 by Father Pietro Angelo Secchi, who was the pope's scientific adviser. Secchi had been asked to create a new and reliable transparency instrument to measure water clarity, so he created an all-white disk which could be lowered into water to measure clarity depth. On April 20, 1865, the first Secchi disk was lowered by Secchi from the papal stream yacht into the Mediterranean Sea.[1] To read more about the Secchi disk and the importance of measuring water clarity, see page 18.

Water Clarity Pioneer
Father Pietro Angelo Secchi

HISTORY OF WATER CLARITY

IN SYRACUSE LAKE

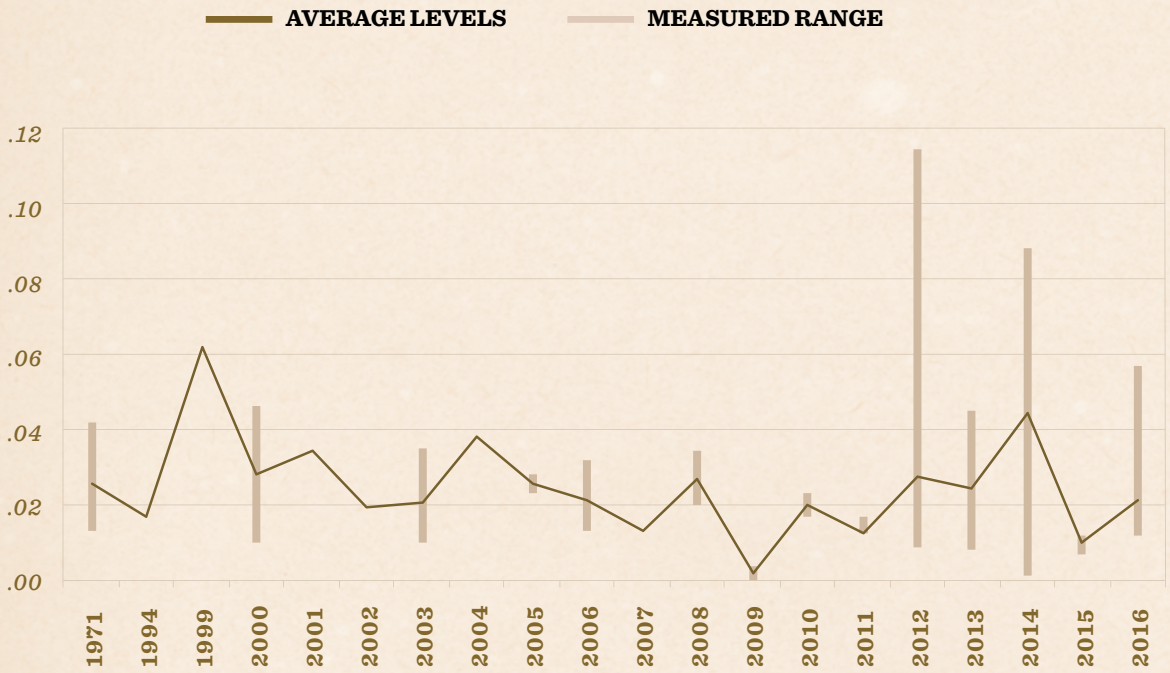


DATA SUMMARY:

Water clarity for July and August in Syracuse Lake shows an overall increase over the last 20 years. Water clarity decreases during certain years could be due to more algae growth as a result of increased nutrient (phosphorus and nitrogen) levels. Increases in water clarity are likely due to less algae which could be the result of less nutrients or high populations of invasive zebra mussels which eat some types of algae.

HISTORY OF PHOSPHORUS LEVELS

IN SYRACUSE LAKE



DATA SUMMARY:

Syracuse Lake total phosphorus levels in July and August suggest a potential increasing trend over the past 45 years. Over this time period, surface water phosphorus levels ranged from 0 to 0.11 mg/L; most of these levels are above the Environmental Protection Agency recommended guidelines.

Phosphorus Levels

The Experimental Lakes Area (ELA) in Ontario, Canada is a laboratory of 58 small lakes and their watersheds. They are unaffected by the influence of humans because they have been set aside for scientific research.[2]

One of the issues the ELA has had a profound impact on is the understanding of eutrophication, or the process leading to over-productive lakes. In 1974, Dr. David William Schindler found that eutrophication occurs in large part due to land runoff and much of the algae growth which occurs in lakes is primarily as a result of phosphorus rather than nitrogen or carbon.[2]

Water Temp.

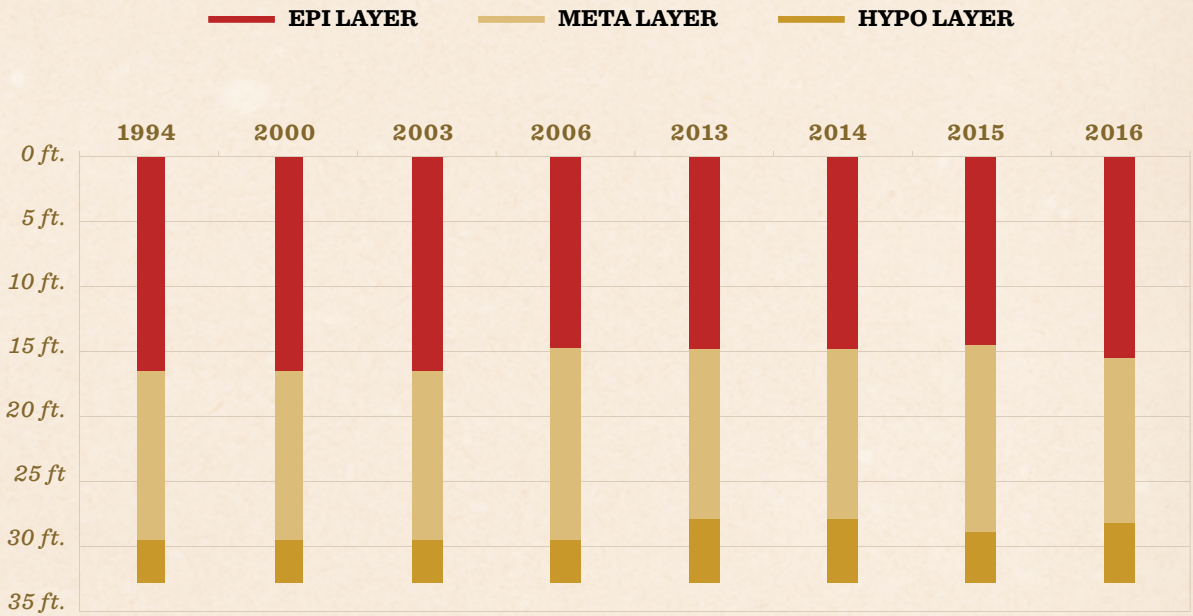
EPILIMNION LEVEL: The surface layer of a lake. This layer is the warmest and mixes from recreational activity and wind blowing across the lake surface.

METALIMNION LEVEL: The layer of water between the epilimnion and the hypolimnion. Water temperature changes quickly from warm to cold within this zone.

HYPOLIMNION LEVEL: The bottom layer of water in a lake which is colder than the top layers. This layer is isolated from rest of the lake all summer and most of the fall, so it stays cold. Oxygen from the other two layers cannot come down into this layer.

HISTORY OF WATER TEMPERATURE

IN SYRACUSE LAKE

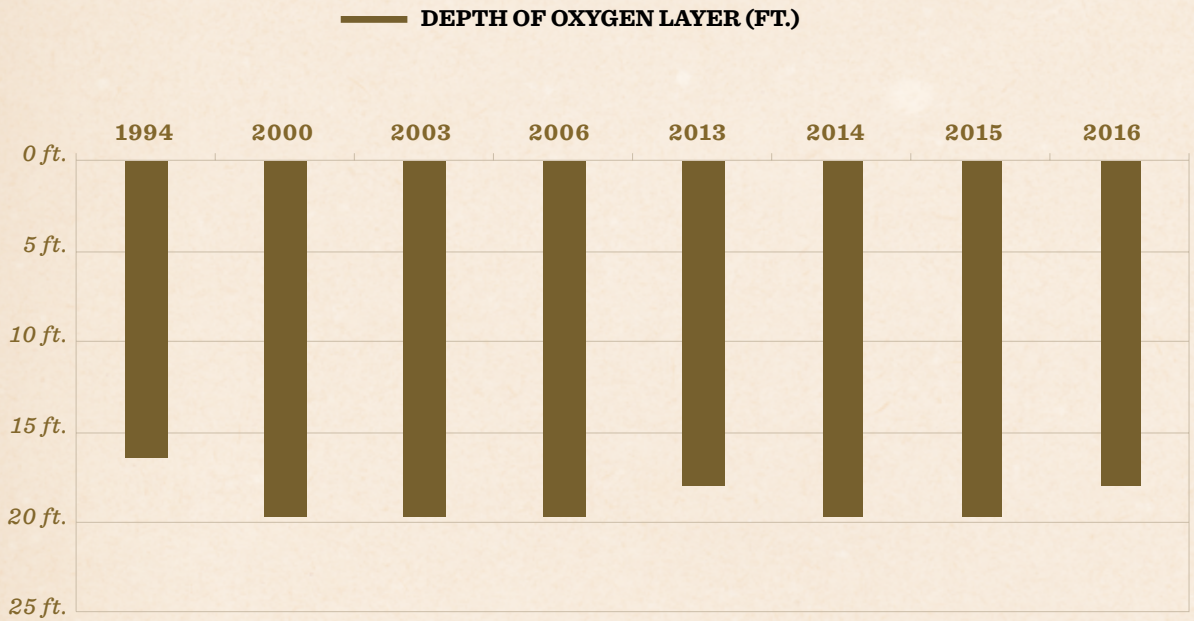


DATA SUMMARY:

Syracuse Lake water temperature layers do not show any obvious trends over the past 20 years. Over this time period, surface water (epilimnion) temperatures range from 74° to 85° F for July and August while water at the bottom of the lake ranges from 57° to 65° F. You may have noticed this colder water layer at some time yourself if you have ever dived down deep into the lake.

HISTORY OF DISSOLVED OXYGEN LEVELS

IN SYRACUSE LAKE



DATA SUMMARY:

The oxygen layer depth in Syracuse Lake does not show any obvious trends over the last 20 years during July and August. A thinner oxygen layer limits the space that fish can live and forces fish to a warmer surface water layer. Some fish cannot survive in warmer water such that certain fish might now be unable to survive in Syracuse Lake though they may have historically.

Dissolved Oxygen

Dissolved oxygen is the major factor that determines where organisms can survive in an aquatic system. During the summer, many lakes become layered based on temperature — and the bottom layer is often depleted of oxygen. This is because of chemical reactions that occur when dead plants decay on the bottom. Since the layers do not mix in the summer, the lake is not able to replenish its oxygen through mixing of lake waters. Oxygen depletion also occurs in the winter when surface ice keeps oxygen from entering the water from the air above.

Before dissolved oxygen sensors were developed, scientists used the Winkler method to measure dissolved oxygen in lakes and streams. The Winkler method is a technique which uses "titration," or the addition of chemical reagents, to determine dissolved oxygen presence. In this method, water is added to a sample bottle and a series of reagents are added. These reagents make an acidic compound, to which the titrating compound is added to neutralize the mixture. The mixture eventually changes colors indicating the dissolved oxygen concentration.[3]

A Legacy on the Lake

Fran, her husband Larry, and their family have lived on Syracuse Lake's Eastshore Drive for 23 years. Her three children were raised on the lake and she explained, "It's been more than a beautiful fresh water lake in Indiana, it's been an amazing front yard to our home. Syracuse Lake has provided many great experiences for us, our family and our friends. We are grateful to have this spot in God's beautiful creation."

Syracuse Lake is part of the identity of the community, Fran explained, and the local economy "...is built on the recreational opportunities it provides." For this reason, Fran and her family value the health of the lake and the local streams. She continued, "If we lost the vitality of our lake it would be devastating to the recreational enjoyment of the lake and the local economy would suffer. If the lake died the community would lose its identity and suffer greatly. We are stewards of this place so we must keep it healthy for us and for all the wildlife that depends on the lake for life."

Syracuse Lake is built on the recreational opportunities it provides.

Fran and her family enjoy the lake so much that they remodeled their home with the intention of making it a comfortable place for all visitors to the lake. She said, "We appreciate the traditions and ongoing activities associated with Syracuse Lake and we wanted our kids to enjoy them too."

Fran joined the Syracuse Lake Association (SLA) board and during the summer she does water testing for Indiana Clean Lakes studies. Larry drove the barges out to the middle of the lake for the 4th of July fireworks for 10 years. Larry also has a unique legacy on the lake as a family "doc," helping many of his patients with injuries on the lake. "We still smile to think about the time he got a call from a friend in the water with a pulled muscle from skiing. Larry got on the Sea Doo and made a house call!" Fran explained.

Larry's parents, Dale and Lois Allen, bought a home on Northshore Drive in 1958. His dad was also involved in SLA and served as president. Larry's family hosted many people from all over the country at Syracuse Lake and their home is still enjoyed by the family. Dale also served on the Turkey Creek Sewer Board and worked to preserve the quality of water in the local community. One of Larry's fondest memories is of the excitement and thrill of the 4th of July festivities.

Some of Larry and Fran's favorite memories on Syracuse Lake are those that take place outside of the summer months. They shared that about 15 years ago, Syracuse Lake experienced a "perfect freeze," making the ice smooth and clear. Because the ice was like glass, they could see the bottom of the lake perfectly and would ice skate to stumps in the southeast corner of the lake. Plants could be seen swaying in the current underneath and they even saw a few hearty fish swimming by. Another memory they shared was when their oldest child graduated from 8th grade they had a party on the lake and, with their family's boat and her grandpa's boat, the family managed to get 28 kids tubing on the lake-- some for the first time!

The Allen family hopes that the lake is preserved for recreational activities for the coming generations. They also shared their hope that Syracuse Lake is a healthy refuge to the many native plants and animals that also call it home. In the future, they wish that "...people can still watch a beautiful sunrise or sunset over the lake, or from their boat and respect the beautiful gift we've been given."

SYRACUSE LAKE TODAY

The Lilly Center for Lakes & Streams at Grace College samples streams which flow into Syracuse Lake biweekly year round, even in the most brutal of weather conditions. Additionally, the Lilly Center samples the lake weekly during the summer to gain a better understanding of the lake's condition during the months it is most active.

The data collected and presented in the following section is a summary of our results specific to your home: Syracuse Lake.

An Economic Force

Kosciusko County lakes and streams not only contribute to the natural beauty and historical richness of our community, but also largely contribute to our county's current economy.

In fact, the Lilly Center for Lakes & Streams estimates that Kosciusko County lakes contribute approximately $313 million to the county's economy annually. Understanding the impact of our lakes on the economy is an important part of Syracuse Lake's story now and into the future. Essentially, the health of Syracuse Lake can directly affect the health and success of the economy.

KOSCIUSKO COUNTY LAKES CONTRIBUTE OVER

$313 MILLION ANNUALLY

TO OUR LOCAL ECONOMY.

LAKE RELATED BUSINESS
$147,661,000

- AUTO & GAS: $64,548,000
- FOOD & DINING: $44,142,000
- CONSTRUCTION: $17,039,000
- OTHER: $21,932,000
  - Home Care
  - Lodging
  - Professional Services
  - Health & Medical Care
  - Entertainment
  - Real Estate
  - Youth Services
  - Specialty Business

LAKE SPECIFIC BUSINESS
$150,722,000

- BOAT SALES: $15,650,000
- BOAT MANUFACTURING: $103,000,000
- MARINAS: $18,194,000
- OTHER: $13,878,000
  - Bait & Tackle
  - Boat Repair
  - Recreation Equipment
  - Pier Installation

PROPERTY TAX
- $15,000,000

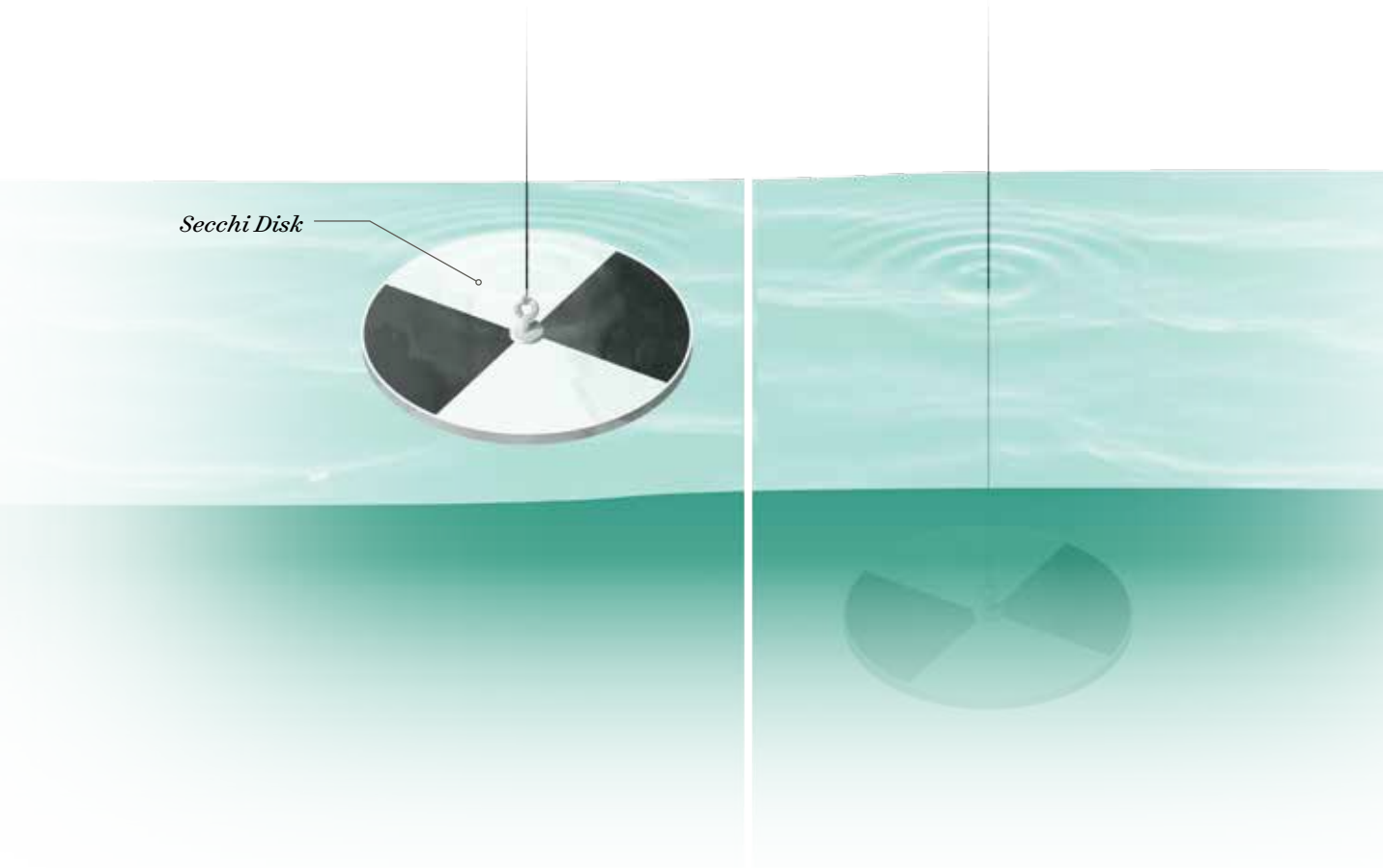
Water Clarity

A MEASURE OF HOW FAR DOWN LIGHT PENETRATES THROUGH WATER

Today, we still measure water clarity using a Secchi disk, but why is consistent measurement of water clarity important? Measuring water clarity is the first step in assessing the health of a lake. A clear lake is generally a healthy lake, but murky water is a sign that something may be wrong — such as too much sediment, pollution or an overgrowth of algae. Once the clarity of water is assessed, it is important to conduct more tests to find out what is affecting the lake's water.

HOW IS WATER CLARITY MEASURED?

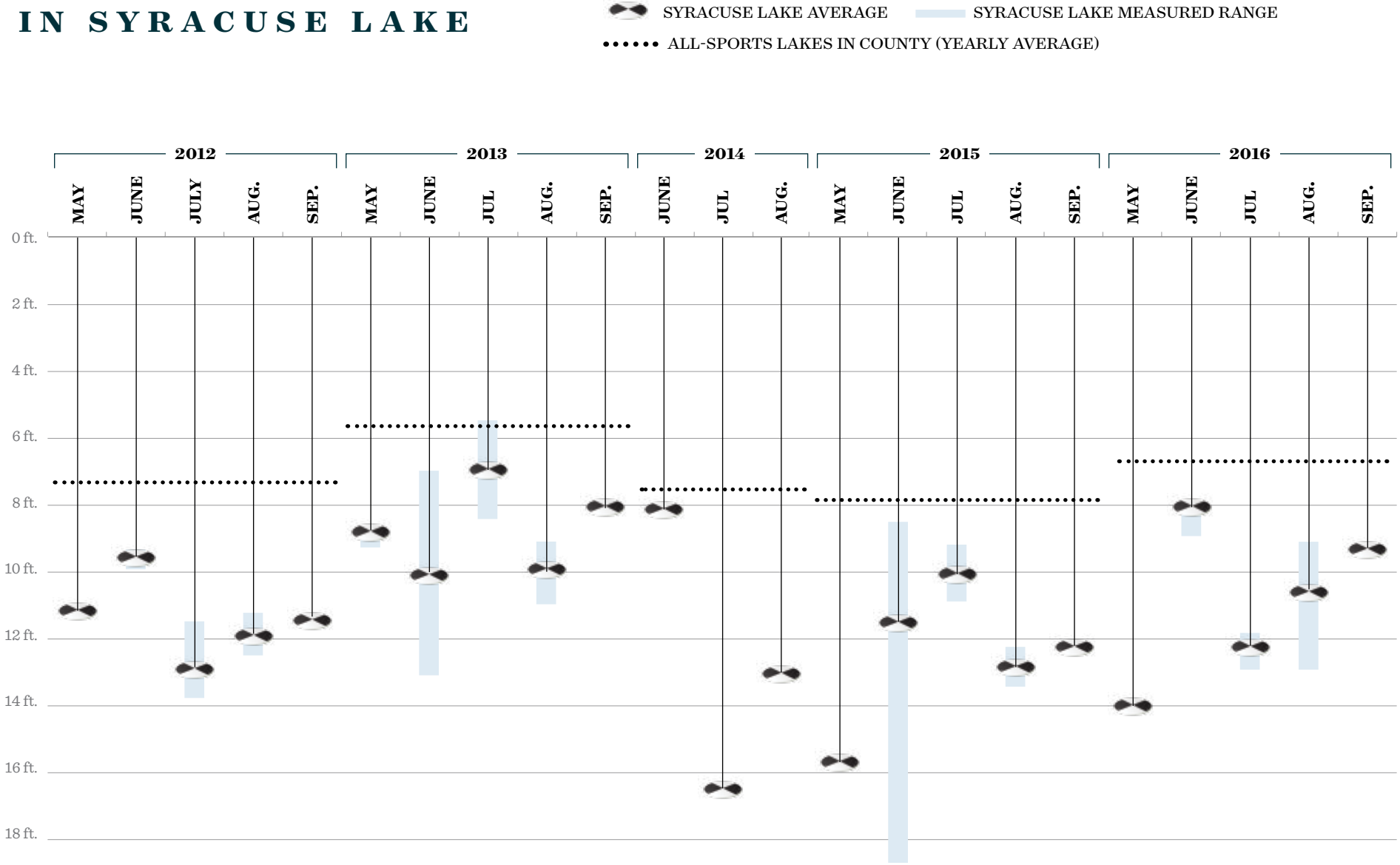
Water clarity is measured with a tool called a Secchi disk. A Secchi disk is a frisbee-sized metal disk that is painted with a black and white pattern. The disk is attached to a string and lowered into the lake water until the black and white pattern is no longer visually distinct. The depth of the disk is recorded as a measure of the water's clarity.



Current Water Clarity

IN SYRACUSE LAKE

DATA SUMMARY: Syracuse Lake's water clarity was typically lowest in June before improving toward the end of the summer. However, the highest recorded water clarity in the last five years was in early June of 2015. Syracuse Lake's water clarity was consistently higher than other all-sports lakes in the county.



Nutrients

SOLUBLE MINERALS THAT PLANTS NEED TO GROW

TOO MUCH OF A GOOD THING: Nutrients are good for lawns and gardens. But when they enter the lake in the form of fertilizers, human and animal waste, or yard waste, they make aquatic plants and algae grow too much. Two of the most important nutrients to study are phosphorus and nitrogen. They are responsible for a majority of weed and algae growth in the lake.

NUTRIENTS, PLANTS AND ALGAE

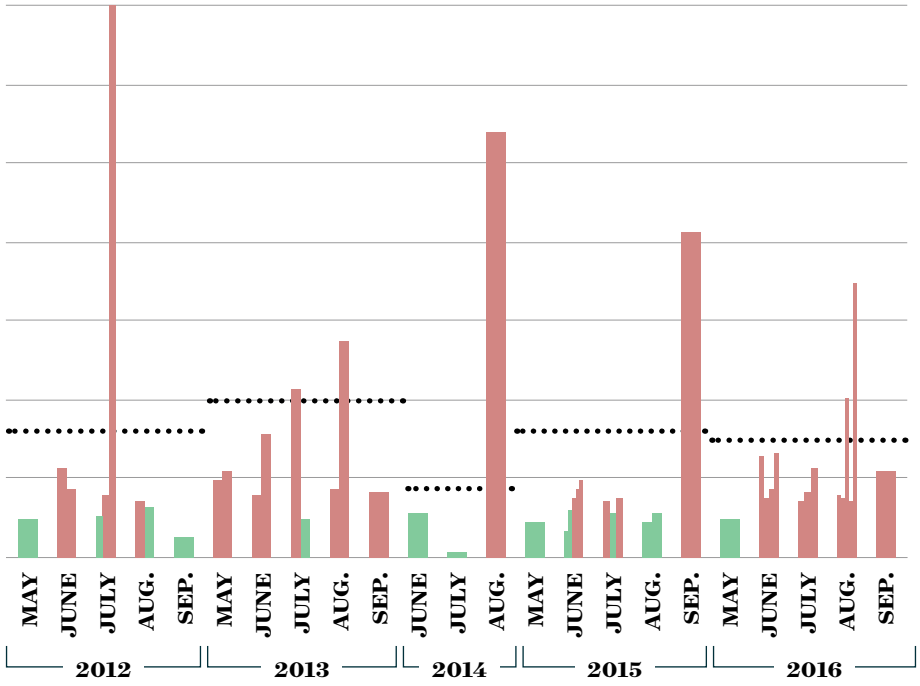
The figure below shows how nutrients affect a lake's plant life

Current Nutrient Levels

IN SYRACUSE LAKE

DATA SUMMARY: Both phosphorus and nitrogen levels in Syracuse Lake were usually above the Environmental Protection Agency recommended guidelines. Overall, the highest phosphorus and nitrogen levels occurred later in the summer. Syracuse Lake's phosphorus and nitrogen levels were typically lower than other all-sports lakes in the county.

SYRACUSE LAKE ····· ALL-SPORTS LAKES IN COUNTY (YEARLY AVERAGE)



PHOSPHORUS LEVELS IN SYRACUSE LAKE

Good Levels Bad Levels

NITROGEN LEVELS IN SYRACUSE LAKE

Good Levels Bad Levels

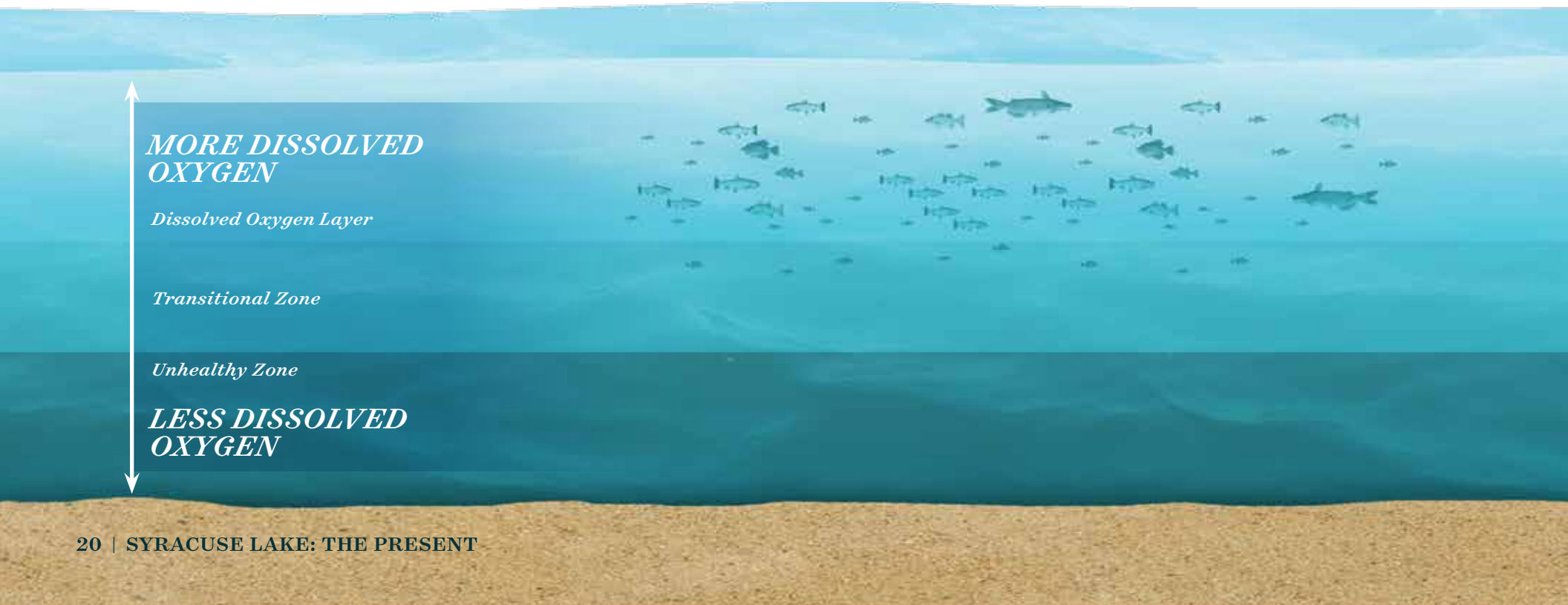
Dissolved Oxygen

GASEOUS OXYGEN IN WATER AND AVAILABLE TO AQUATIC ORGANISMS FOR RESPIRATION

THE EFFECTS OF DISSOLVED OXYGEN: Dissolved oxygen is the major factor that determines where organisms can survive in an aquatic system. During the summer, many lakes become layered based on temperature — and the bottom layer is often depleted of oxygen. This is because of chemical reactions that occur when dead plants decay on the bottom. Since this layer does not mix with the other layers, it is not able to replenish its oxygen through mixing of lake waters. Oxygen depletion also occurs in the winter when surface ice keeps oxygen from entering the water from the air above.

DISSOLVED OXYGEN LAYER

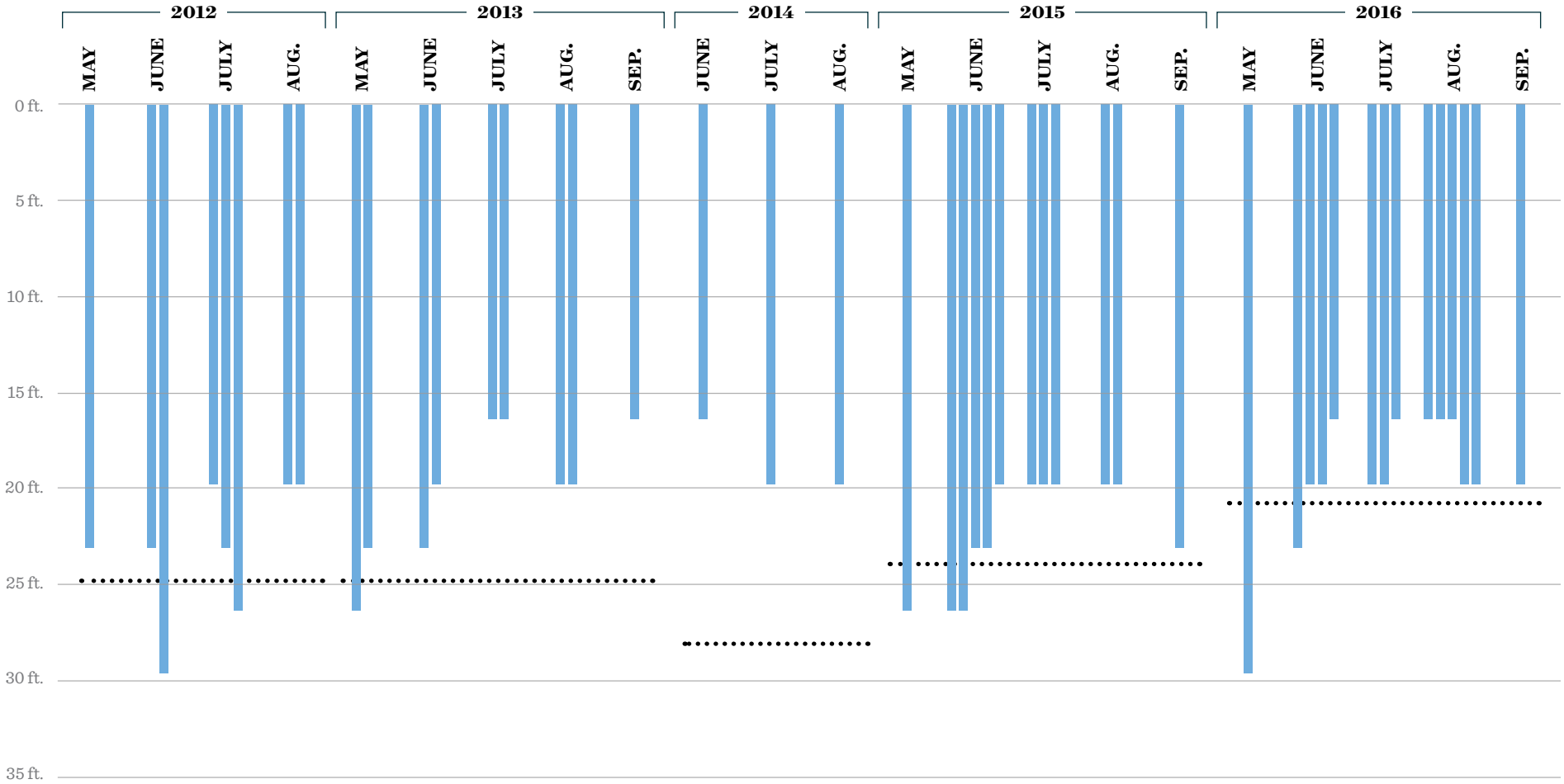
The figure below shows how far down fish and other aquatic species have enough oxygen to survive



Current Dissolved Oxygen Levels

IN SYRACUSE LAKE

DATA SUMMARY: Syracuse Lake's oxygen layer was often thinnest in the middle of the summer, squeezing fish into a smaller space and forcing them into warmer water. The oxygen layer varied among all-sports lakes in the county, but Syracuse Lake's oxygen layer was usually thinner likely due to it being relatively shallow.



Blue-Green Algae

ALSO CYANOBACTERIA; A SPECIFIC GROUP OF MICROSCOPIC ORGANISMS THAT TYPICALLY LIVE IN WATER AND USE LIGHT FOR PHOTOSYNTHESIS

WHY ANALYZE ALGAE? You have probably seen green or brown "scum" on the surface of the lake before. That is most likely algae. Algae can also be mixed down into the water, changing the color of the lake. Our research focused specifically on blue-green algae because it is the type of freshwater algae capable of producing health-threatening toxins.

WHAT IS BLUE-GREEN ALGAE? A type of algae distinguishable from other algae by its paint-like or "pea soup" appearance. This algae is actually a kind of bacteria that is often blue-green in color but can also be blue, green, reddish-purple or brown.

HEALTH RISKS BASED ON BLUE-GREEN ALGAE LEVELS

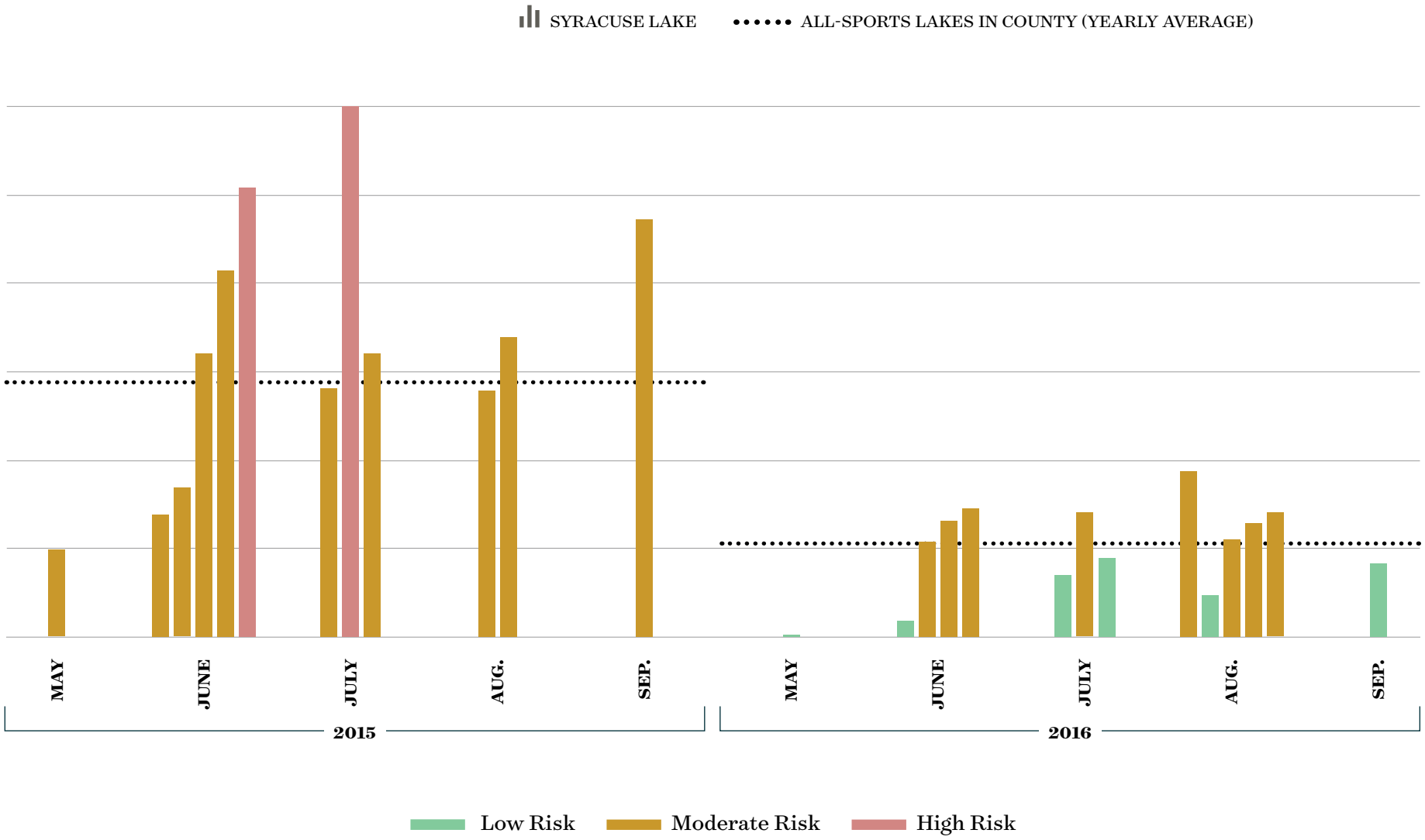
For recreational waters as outlined by the World Health Organization

	LOW RISK LEVELS	MODERATE RISK LEVELS	HIGH RISK LEVELS
Possible Health Problems	Short-term adverse health outcomes, e.g. skin irritations, gastrointestinal illness	Potential for long-term illness with some cyanobacterial species Short-term adverse health outcomes, e.g. skin irritations, gastrointestinal illness	Potential for acute poisoning Potential for long-term illness with some cyanobacterial species Short-term adverse health outcomes, e.g. skin irritations, gastrointestinal illness
Typical Actions	Post on-site risk advisory signs Inform relevant authorities	Watch for scums or conditions conducive to scums Discourage swimming and further investigate hazard Post on-site risk advisory signs Inform relevant authorities	Immediate action to control contact with scums; possible prohibition of swimming and other water contact activities Public health follow-up investigation Inform public and relevant authorities

Current Algae Levels

IN SYRACUSE LAKE

DATA SUMMARY: Blue-green algae populations in Syracuse Lake were often above human health guidelines even though the microcystin toxin levels sometimes remained low at those same times (see toxins on next page). Algae levels were in the "high risk" zone twice and in the "moderate risk" zone 18 times in the last two years. Algae levels were substantially lower in 2016 showing the variability in blue-green algae populations. Syracuse Lake's algae levels were similar to other all-sports lakes studied in the county.



Microcystin Toxin

A COMMON TOXIN PRODUCED BY BLUE-GREEN ALGAE THAT PRIMARILY TARGETS THE LIVER BUT IS ALSO A SKIN, EYE AND THROAT IRRITANT

BLUE-GREEN ALGAE AND TOXIN LEVELS: In addition to measuring the amount of blue-green algae in the lake, we also measured toxins produced by the algae. Both measurements are important because it is not yet understood what causes blue-green algae to release toxins – although our research planned for this summer on Syracuse Lake will likely give us more clues. A lake may have a lot of blue-green algae but not much toxin. The ratio of blue-green algae to toxin is not consistent, so it is important to investigate both.

WHAT IS MICROCYSTIN? Microcystin is the most commonly studied toxin produced by blue-green algae. At high levels, microcystin can cause a variety of health problems (see chart below).

HEALTH RISKS BASED ON MICROCYSTIN LEVELS

For recreational waters as outlined by the World Health Organization

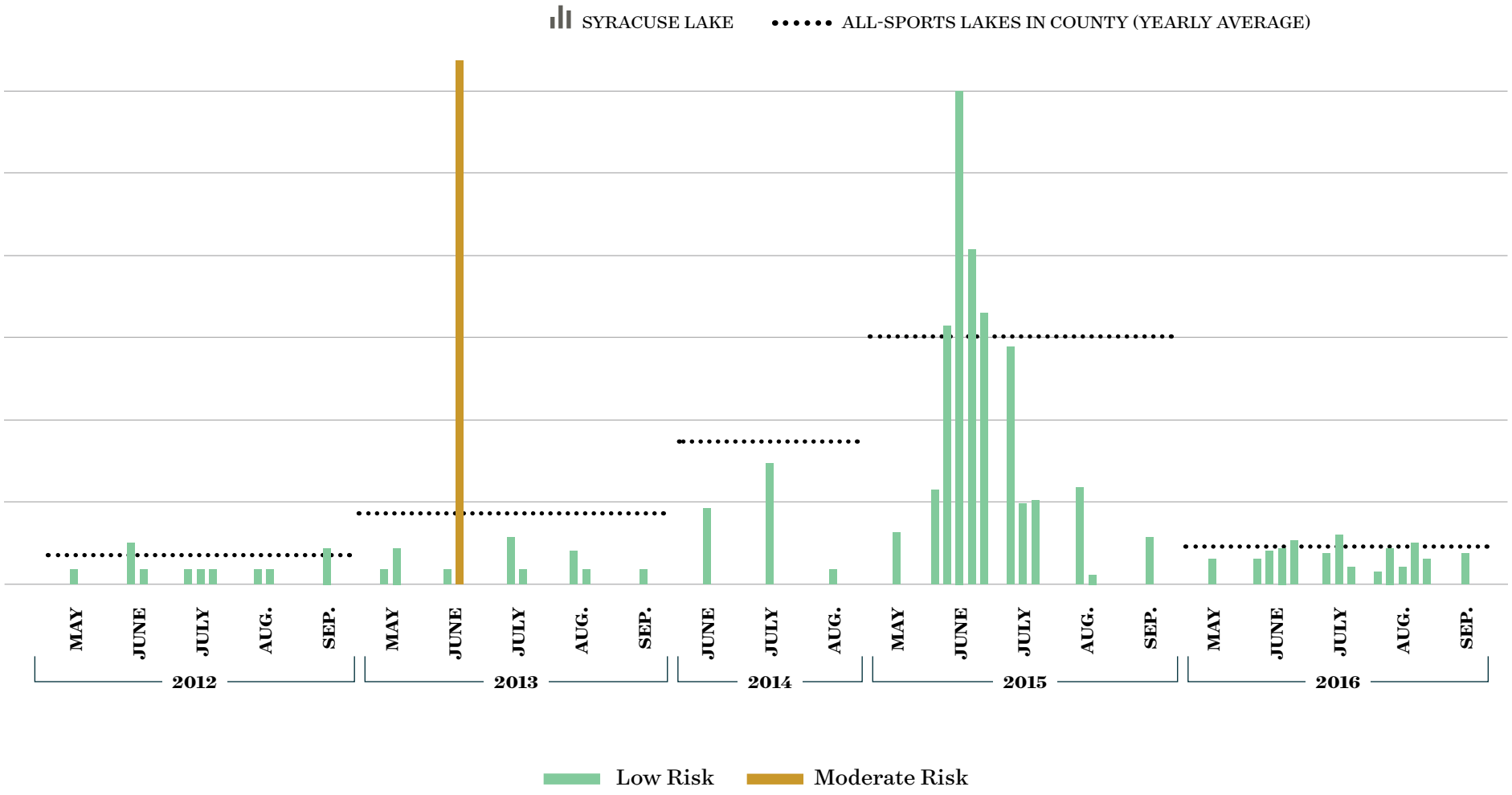
	LOW RISK LEVELS	MODERATE RISK LEVELS	HIGH RISK LEVELS
Possible Health Problems	Short-term adverse health outcomes, e.g. skin irritations, gastrointestinal illness	Potential for long-term illness Short-term adverse health outcomes, e.g. skin irritations, gastrointestinal illness	Potential for acute poisoning Potential for long-term illness Short-term adverse health outcomes, e.g. skin irritation, gastrointestinal illness
Typical Actions	Post on-site risk advisory signs Inform relevant authorities	Watch for scums or conditions conducive to scums Discourage swimming and further investigate hazard Post on-site risk advisory signs Inform relevant authorities	Immediate action to control contact with scums; possible prohibition of swimming and other water contact activities Public health follow-up investigation Inform public and relevant authorities

Sometimes blue-green algae can produce toxins

Current Toxin Levels

IN SYRACUSE LAKE

DATA SUMMARY: While Syracuse Lake microcystin toxin levels were highly variable over the last five years, levels were typically in the "low risk" zone. Syracuse Lake's microcystin levels were generally lower than other all-sports lakes in the county. Even though Syracuse Lake's microcystin toxin levels were consistently below guidelines for human health, there is strong potential for future risk. The lake's blue-green algae numbers suggest that under the right conditions, such as high nutrient levels and warm temperatures, blue-green algae could produce microcystin toxin levels above human health guidelines in Syracuse Lake.



Why the Data Matters

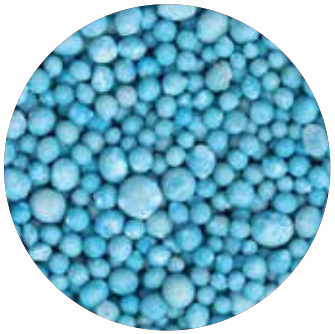
Syracuse Lake has a story which includes a strong research heritage stretching back over 140 years. Though this previous research was limited and sporadic, pairing it with recent research from the Lilly Center allows us to explore some possible trends in our lakes. For Syracuse Lake, these trends show us some progress and reason for hope for the future, but they also show challenges that require more focused and strategic action:

WATER CLARITY

Past trends over the last 20 years show improvement in water clarity for Syracuse Lake. Water clarity increases are likely due to less algae, potentially from high populations of invasive zebra mussels that eat some types of algae. Syracuse Lake's water clarity is consistently higher than other popular lakes in the county.

OXYGEN LEVELS

Past trends over the last 20 years show no apparent overall changes in the oxygen layer of Syracuse Lake. Thinner oxygen layers limit the space in which fish can live and can lead to more available nutrients which encourage more algae and weed growth. Currently, fish can survive in about the top 53% of Syracuse Lake's total depth during the summer.



PHOSPHORUS LEVELS

Past trends over the last 45 years suggest a potential increase in phosphorus levels. Past and current phosphorus and nitrogen levels were typically above recommended guidelines, encouraging excess weed and algae growth in Syracuse Lake.

BLUE-GREEN ALGAE

Blue-green algae populations in Syracuse Lake are often above human health guidelines even though algae toxin levels have generally remained low. Syracuse Lake's algae toxin levels were usually lower than other popular lakes in the county. High blue-green algae populations suggest there is still strong potential for future risk.

Some of these measures show signs of hope, while others encourage us to work even harder toward a cleaner Syracuse Lake. The Lilly Center's current research now makes county lakes, once studied sporadically and inconsistently, the most thoroughly studied in the state allowing future strategic actions based on science.

Making Syracuse Lake the Best it Can Be

Becky Fox is a familiar face to many on Syracuse Lake. She has served as president of Syracuse Lake Association since 2006 along with nine other board members. Becky grew up on Lake Wawasee as her parents purchased a lake home in the 1940s. She enjoyed living on Lake Wawasee until 1989 when she and her husband purchased a condo on Lake Wawasee where they lived for 13 years. In 2001, they moved to Syracuse Lake.

Becky loves living on Syracuse Lake because its smaller size means that the lake is not as rough and windy, provides more of a community atmosphere due to its close proximity to the town, and is nearby the Community Center at Lakeside Park where many events take place.

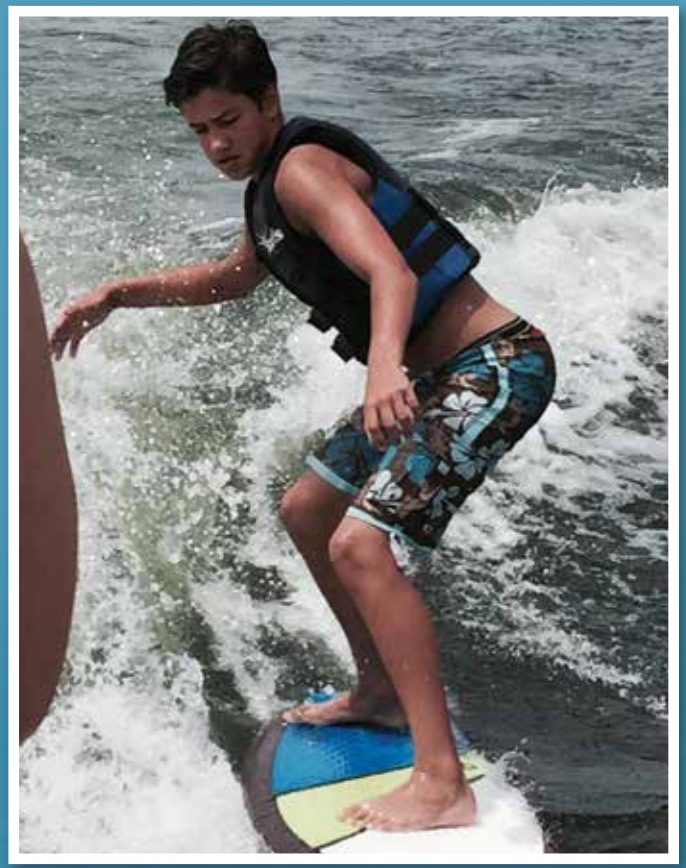
Becky explained that about half of the residents on Syracuse Lake are on city water and city sewer and that Mud Lake, between Lake Wawasee and Syracuse Lake, is a natural filtering system for the water flowing into Syracuse Lake. While these factors contribute to a cleaner Syracuse Lake, Becky believes that local property values will always be affected by the choices made by lake residents. Children, adults, local wildlife, and fish swim in the waters of Syracuse Lake, so a healthy lake is important to the local community, Becky believes.

Becky's work with Syracuse Lake Association educates lake residents about best practices to make Syracuse Lake cleaner. She shared, "We are diligent in making sure the lake is sprayed each summer for starry stonewort, milfoil and any other needed treatment after being tested. We have newsletters and a directory which give residents information on how to, and how not to, treat the lake." Some of the practices Becky mentioned which can help keep local lakes clean is using no phosphorous fertilizers, and not dumping leaves or grass clippings into the lake.

Local property values will always be affected by the choices made by lake residents.

Some of Becky's favorite memories are those spent enjoying the sunrises and calm water on Syracuse Lake. She also enjoys Memorial Day, "...when everyone emerges from their permanent homes to open their lake homes to begin the summer season. It is a tradition that my family always comes to celebrate this holiday as well as my birthday!" she shared.

Many years from now, Becky hopes that a mixture of old cottages as well as new cottages will characterize Syracuse Lake in addition to clean water, widespread use of the trail that encircles the lake, music in the park, continued use of the public pier, and enjoyment of water sports. Her ideal Syracuse Lake has beautiful trees still blooming on the properties along it, with white piers and rockers sitting by the water, and fireworks still booming on the 4th of July.




MICHIGAN STATE

THE FUTURE OF SYRACUSE LAKE

At the Lilly Center for Lakes & Streams, we are increasing our momentum with cutting edge research and groundbreaking education. We are also increasing collaboration with local groups to make sure these trends reflect the positive work of so many organizations, community groups, and individuals who have been the bright spots in the lake's story.

THE LILLY CENTER FOR LAKES & STREAMS IS DEDICATED TO MAKING SYRACUSE LAKE CLEAN, HEALTHY, SAFE AND BEAUTIFUL

WE HAVE THE EXPERTISE AND TOOLS TO CONDUCT GUIDING RESEARCH.

Led by a professor of freshwater science, outfitted with the necessary equipment, and growing to meet continuing community need the Lilly Center can perform high-quality research at a local level, focusing on the lakes and streams of Kosciusko County.

WE HAVE THE CAPACITY AND COMPETENCY TO PROVIDE RESOURCES.

Our website is a clearinghouse of data, tools and other resources pertaining to Kosciusko County lakes and streams. Our offices house educational and scientific resources we make available to local communities and our facilities are continuing to expand. And now, the Lilly Center's presence in the community is supported into the future by our growing endowment fund.

WE HAVE THE BACKGROUND AND TALENT TO ENGAGE AND EDUCATE RESIDENTS.

Our staff is experienced at national and local levels with operating K-12 and community outreach programs. Our Grace College student interns and volunteers give us the personnel we need to effectively and efficiently conduct our education programs.

WE HAVE THE INFRASTRUCTURE AND POSITIONING TO LEAD COLLABORATIVE EFFORTS AMONG LOCAL ORGANIZATIONS.

Our expanding Grace College facilities accommodate meetings, workshops and other gatherings. With countywide perspective we help create working partnerships and facilitate exchanges of knowledge and expertise.

WE WANT OUR LAKES AND STREAMS TO BE SOMETHING WE CAN ALL BE PROUD OF, TO BE CLEAN, HEALTHY, SAFE AND BEAUTIFUL.

By supporting the Lilly Center for Lakes & Streams you're ensuring that every effort is being made to make the lakes and streams of Kosciusko County cleaner now and into the future through ongoing research, education, and collaboration.

Preparing for the Future

In 2015, the Lilly Center for Lakes & Streams established an endowment fund for the purpose of establishing the Lilly Center as a permanent entity in the county for groundbreaking research, community and K-12 education, and effective collaboration. Funds contributed to the endowment sustain our efforts for the health of our economy, for the health of our communities, and for the health of your children and grandchildren.

The response and support for this endowment project has been astounding. We have received gifts and pledges from individuals, businesses and organizations which have helped us raise over $5M to be set aside in an endowment fund to provide ongoing support for the Lilly Center into the future.

Furthermore, this spring, Grace College's Lilly Center for Lakes & Streams announced its change in name. The new name acknowledges the substantial leadership gifts for the Lilly Center's endowment that were secured from Lilly Endowment, Inc. as well as from the Lilly Family through the Ruth Lilly Philanthropic Foundation.

The Lilly Center for Lakes & Streams is honored to be affiliated with the Lilly Family and their legacy of research involvement on local lakes. The Lilly Family's influence in a legacy of research excellence with Kosciusko County lakes is unmatched in our region. The Lilly Center for Lakes & Streams is committed to excellence in all our efforts to ensure that our local lakes continue to be among the most thoroughly studied in the state for generations to come.

LILLY CENTER FOR LAKES & STREAMS™ GRACE COLLEGE

COLLABORATING TO MAKE KOSCIUSKO COUNTY LAKES CLEANER

Syracuse Lake is best served as the following organizations continue to grow in partnership and make an important impact in their unique areas of expertise:

SYRACUSE LAKE ASSOCIATION, INC. Syracuse Lake Association works to "...foster and encourage such improvement, development, maintenance, and beautification of Syracuse Lake and the surrounding area, as will make it a more attractive, enjoyable, and pleasant place to live or to visit..." For more information, call (574) 457-5300.

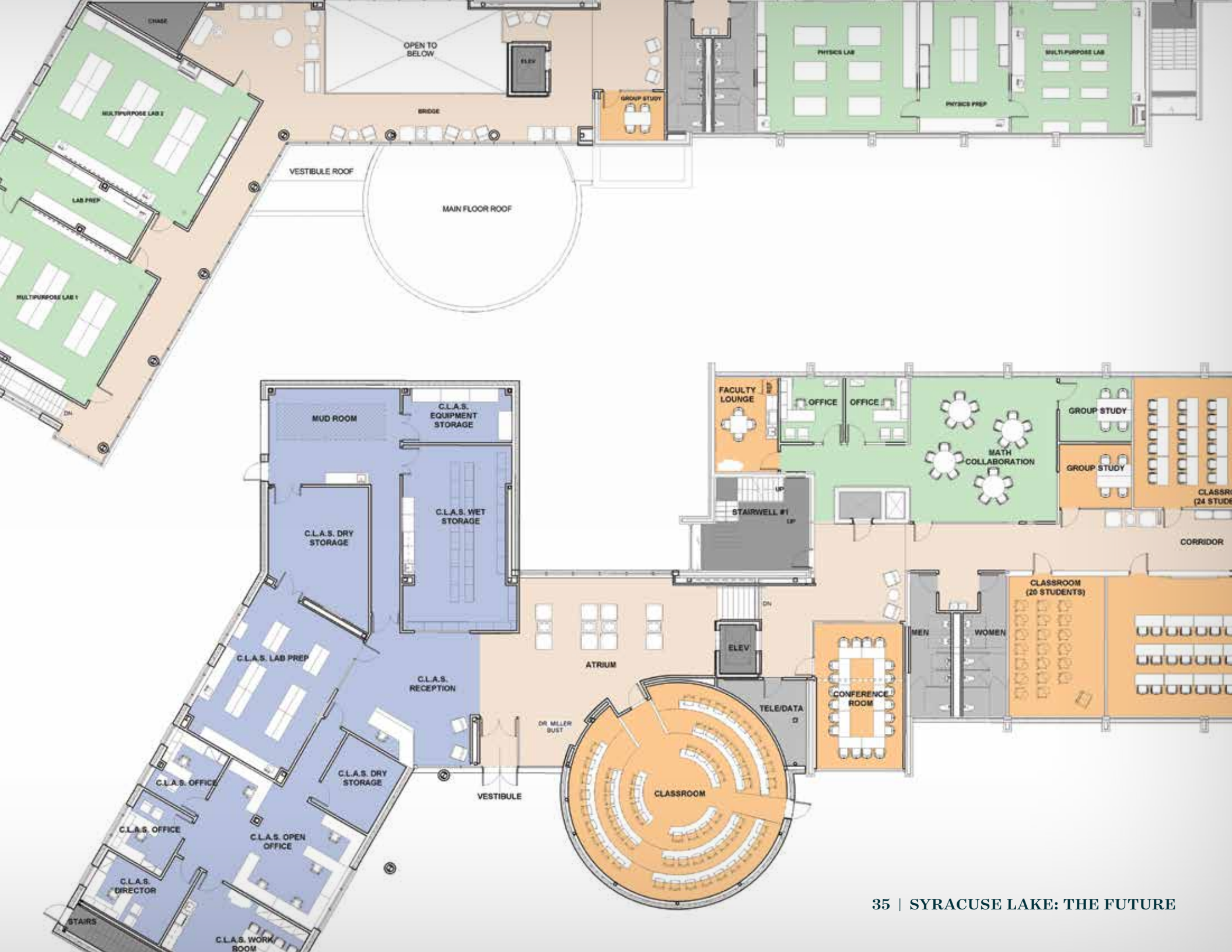
WAWASEE AREA CONSERVANCY FOUNDATION Established in 1991, WACF works "...to anticipate, seek out and resolve threats to the water quality in the Wawasee area watershed. The Foundation is dedicated to promoting education, encouraging best management practices to reduce erosion and acquiring wetlands and endangered shoreline areas." For more information, visit wacf.com.

LILLY CENTER FOR LAKES & STREAMS AT GRACE COLLEGE Established in 2007, the Lilly Center for Lakes & Streams is dedicated to conducting research, providing lake and stream education, and collaborating with other groups to make Syracuse Lake and other county lakes clean, healthy, safe and beautiful. For more information, visit lakes.grace.edu.

New Facilities

The Lilly Center for Lakes & Streams has experienced great growth in programming, research, staff, and community involvement over the last decade. New facilities will feature state-of-the-art laboratory space, community and educational resources, increased storage space which will allow for program expansions, and collaborative office space.

The Lilly Center for Lakes & Streams is looking forward to the construction of new facilities. Grace College is beginning construction on a new science facility: the Dr. Dane A. Miller Science Complex this summer. With major funding by Dr. Dane and Mary Louise Miller, Zimmer Biomet, K21 Health Foundation, and friends of Grace College, the new facility will include specifically designed and dedicated space for the Lilly Center. This space will help the Lilly Center increase its impact in the community.


CHASE
OPEN TO BELOW
ELEV
BRIDGE
GROUP STUDY
PHYSICS LAB
PHYSICS PREP
MULTI-PURPOSE LAB
MULTIPURPOSE LAB 2
LAB PREP
MULTIPURPOSE LAB 1
VESTIBULE ROOF
MAIN FLOOR ROOF
DN
MUD ROOM
C.L.A.S. EQUIPMENT STORAGE
C.L.A.S. WET STORAGE
C.L.A.S. DRY STORAGE
C.L.A.S. LAB PREP
C.L.A.S. RECEPTION
C.L.A.S. OFFICE
C.L.A.S. DRY STORAGE
C.L.A.S. OFFICE
C.L.A.S. OPEN OFFICE
C.L.A.S. DIRECTOR
STAIRS
C.L.A.S. WORK ROOM
VESTIBULE
DR. MILLER BUST
ATRIUM
ELEV
TELE/DATA
CLASSROOM
FACULTY LOUNGE
OFFICE
OFFICE
MATH COLLABORATION
GROUP STUDY
GROUP STUDY
UP
STAIRWELL #1
UP
CONFERENCE ROOM
MEN
WOMEN
CLASSROOM (20 STUDENTS)
CORRIDOR

SYRACUSE LAKE HAS A GREAT STORY. NOW IT IS YOUR TURN TO HELP WRITE THE NEXT CHAPTER.

Syracuse Lake and other Kosciusko County lakes have shaped not only our local landscape, but each of our lives. Our endowment fund is one way to ensure that these resources are always studied, monitored, and never forgotten. But, making and keeping them clean is up to you.

Making our lakes and streams cleaner is more important than ever. The health of our lakes is directly linked to the health of the local economy, the health of your children and grandchildren, and the health of our greater community.

Endowment funds ensure the Lilly Center's presence, but ensuring continual program growth in areas of groundbreaking research, K-12 and community education, and collaboration with partner groups can only be accomplished through your ongoing support.

What you can do to help:

REDUCE FERTILIZER USAGE ON YOUR LAWN AND GARDEN

(especially close to the lake) to save yourself some money and keep extra nutrients out of Syracuse Lake. If you want to know exactly how much nutrients your lawn or garden needs, the Lilly Center for Lakes & Streams can help you with soil testing resources.

ADD BEAUTIFUL VEGETATION ALONG YOUR SHORELINE

to filter out nutrients as water carries them toward the lake. Native plants (those plants that occur naturally in our region) are best because they cut down on your maintenance costs and provide the best filtration. The Lilly Center for Lakes & Streams has information to help you get started.

AVOID YARD WASTE ENTERING THE LAKE.

Leaves, grass clippings or other yard waste have nutrients which increase algae growth, reduce water clarity and lead to less oxygen for fish. Use this yard waste as compost in your garden to further reduce your fertilizer use or have it removed from your property. If you would like to start composting and need some direction, the Lilly Center for Lakes & Streams can help.

EXPAND COLLABORATIVE RELATIONSHIPS AND PROJECTS WITH NON-LAKE RESIDENTS.

Water flows downhill, so neighborhoods, industries, farmers and businesses in areas surrounding Syracuse Lake all influence the lake. Your support and participation has allowed the Lilly Center for Lakes & Streams to pursue these efforts, and we look forward to working with you to expand them.

PROVIDE FINANCIAL SUPPORT

toward research to solve the identified challenges facing Syracuse Lake. The Lilly Center samples inflowing and outflowing streams and can use this data to start quantifying nutrient sources. This will help us navigate future efforts toward efficiently reducing these nutrient sources. Your financial support helps us pursue strategic actions based on science.

ENGAGE OUR LAKE NEIGHBORS AND OUR NON-LAKE COMMUNITY MEMBERS

in educational programs that inform them about how to best take care of Syracuse Lake. You might consider helping as a volunteer for the Northern Indiana Lakes Festival or financially supporting one of our K-12 programs.

Protecting Syracuse Lake for Future Generations

Nate Shoemaker has grown up around a lake his entire life.

Nate grew up on Little Tippy, a self-described "North Webster boy," and had always planned to move away from the Kosciusko County area, until he realized "...how truly special of an area we have."

Nate's experiences on Syracuse Lake began 25 years ago when he started wake boarding with friends. Now, Syracuse Lake is home to Krista, Nate, and their four children. The family will spend their 16th summer on Syracuse Lake this year. Syracuse Lake is, "the hub of entertainment for our family," Nate explained.

As for the community, Nate shared that, "The lakes in general bring a lot of work for people in my industry." He mentioned that the lakes area is, "a place you're proud to live in." For this reason, Nate believes that it is important to take care of local lakes: "Understanding the cycle of the lakes and how they eventually die, the longer we can hold this process off, the better."

Nate is on the Syracuse Lake Association board and recommends that all lake residents get involved in the lake association. Through SLA, Nate has educated himself about things that go on behind the scenes at his lake and he's learned about what other groups, like the Lilly Center for Lakes & Streams are doing around local lakes. Another way Nate is spreading enjoyment of lakes is through offering kite boarding lessons, "I want to share the love I have for the lake with other people," he shared.

I want to share the love I have for the lake with other people

Nate mentioned that his favorite memory on the lake occurred when he was young and, after not having spent a large amount of time around boats, he helped free a boat prop from a tightly wrapped ski rope. "Any time you're out in the water... it changes your perspective on life and changes your mood," Nate explained, "It's like a different world."

This is something Nate and Krista hope their children experience as well. Nate said that his kids are "water bugs" and the moment ice floats away from the shore of Syracuse Lake in the spring, his children jump into the lake and even ride the piers out into the water.

Years from now, Nate and Krista hope that the lake is much the same, with increased community involvement.

It's time to make a difference.

If you would like to support the Lilly Center for Lakes & Streams in our efforts to make your lake clean, healthy, safe and beautiful through groundbreaking research, K-12 and community education, and collaboration, you may enclose your donation in the envelope included. All gifts are tax-deductible and 100% of funds go directly to the Lilly Center to support our work.

Interested in making a difference in your lake for future generations? Call us at 574-372-5100 x6445 to talk to us about planned and estate giving options.

DONATE ONLINE

Would you like for your gift to start making a difference in your lake's health right away? Just visit our website and click "Donate Now".

lakes.grace.edu

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