

Crystal Lake Park District  
Annual Lake Meeting Minutes  
10-30-17 7:00pm

Park District Board Members:

Commissioner Debbie Gallagher, Commissioner Larry Wheeler, Commissioner Shawn Zimmerman

Park District Staff:

Jason Herbster, Executive Director

Ann Viger, Director of Planning and Development

Debra Oldham, Superintendent of Business Services

Erik Jakubowski, Superintendent of Park Services

Anne Sandor, Recording Secretary

Public: Sign in sheets are attached.

Annual Lake Meeting Presentation:

Executive Director Herbster introduced the Lake Management team of Hey and Associates, Inc.; Jeremy Husnik and Vince Mosca. The Lake Management Team presented a power point presentation of the 2017 Annual State of the Lake Report for Crystal Lake. Highlights of the presentation included surface runoff, groundwater and hydrology monitoring, lake levels, water quality, weed control and aquatic vegetation.

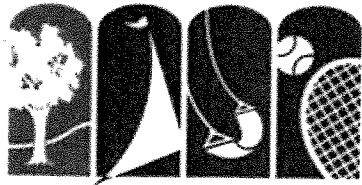
A recommendation was made to schedule a meeting to discuss weed control with the west bay residents, park district staff and Hey and Associates, Inc.

A request was made to post the water quality monitoring results, non-native plant list and the IDNR fish survey on the Park District website.

A suggestion was to hand pick the invasive species of aquatic plants instead of treating them with chemicals.

A copy of the presentation is attached and will be posted on the Park District website for public viewing.

Mr. Robert Kirschner, Chicago Botanic Gardens Curator of Aquatic Plants and Urban Lake Studies and Director of Restoration Ecology, gave a presentation on creating lake shore line landscapes. He highlighted ideas of aesthetics, erosion control and habitat enhancement. This presentation and more information on lake shore line erosion control and habitat enhancement, can be found at [www.cbqshoreline.org](http://www.cbqshoreline.org).

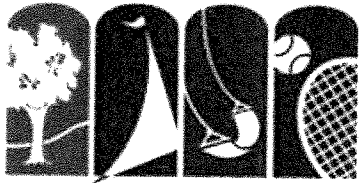


CRYSTAL LAKE PARK DISTRICT

# Board Meeting Sign-In Sheet

Annual Lake Meeting  
Date: October 30, 2017

PLEASE PRINT NAME	ADDRESS PHONE	COMPANY AFFILIATION	Wish to Speak	
			Y	N
RON ORIST	925 North Shore Dr			
Josli Loyer	877 North Shore Dr			
BOB BUELL	179 EDGEWATER			
PETER GATC	358 GREENVIEW DR. 815-207-5675			
NATALIE & WILLIAM WALDRON	137 EDGEWATER			
FRED FITZPATRICK	"649" Woodland Dr			
Rhonda & Jim Nissen	546 S. Shore			
Erica Rezella	152 Gwentfield 815-207-5675			
Charles Hightower	164 Edgewood Ave. 815-207-0354 60014			
Alex Sykes	4800 WILLOW C LADY			
James & Sally TAYLOR	Loch Lomond			X
Dwight DALTON	573 TAMARISK W.			X
Margaret Rosney	113 Edgewater Dr. CL			X
Cliff HUNN	139 EDGEWATER DR CL			X
TOM SEPKA	6413 HIGH LINE RD CL			X
MIKE MONTES	1364 AMBERWOOD DR			
ERIC WALLIN	1163 N. Shore Dr			
Linda Franzen	207 Edgewater			X
Cherie + Bill Battella	4208 EAST DR			X
JOE LAMONICA	1155 N. Shore			X
TOM MILLER	7409 CHRISTOPHER RD			X
Noah Wan	777 Oak Ct			X
Bill Norris	1035 North Shore Drive			
Jim Loyer	877 North Shore Dr			X



CRYSTAL LAKE PARK DISTRICT

# Board Meeting Sign-In Sheet

Annual Lake Meeting  
Date: October 30, 2017

PLEASE PRINT NAME	ADDRESS PHONE	COMPANY AFFILIATION	Wish to Speak	
			Y	N
Jeremy Husvik	262-366-5879	Hey's Assoc.		
Jeanne Trepow	815 382 9050	-		✓
DAN TREPOTW	"	-		✓
JOHN ANDREASIK	815-788-8386	RESIDENT		
Ned + Judi Zeman	312-607-3533	Resident		✓
J. LARRY LANE	351 HAROLD			✓
DAN Diamond	222 Dole Ave			✓
MICHAEL MANNING	222 Dole Ave			✓
Mike Stewart	992 Ascot Dr.	Resident		✓
Jane Rude	370 S. Shore Dr.			✓
Matt Foster	903 N. Shore Dr.			
James Phillips	907 N. Shore Dr.			✓
Robin Bled		Resident		
STEVE BARNETT	1180 S. SHORE D	RESIDENT	?	
Bill Waschke	1001 N Shore A			
MIKE MAGNUSON	100 W. WOODSTOCK	CITY OF CL.		
JIM DIVITA	159 EDGEWATER DR.			
Timothy P O'Neil	137 Mansfield Ave	CL		✓
Dave Hsu	135 Decker			
FRANK BACON	1127 Autumn Dr			✓
FRANK HUSKIN TER	996 N SHORE RR			
Lawrie Obermeier	147 Edgewater 815 459-6405	CL		✓
John M. Damm	105 PARKVIEW CT	CL		
Frank Hsu	131 Babbsen	CL 60014		✓





CRYSTAL LAKE PARK DISTRICT



**Crystal Lake Park Board of Commissioners  
ANNUAL LAKE MEETING AGENDA  
Monday, October 30, 2017 - 7:00 PM  
PARK PLACE 406 W. WOODSTOCK STREET**

*The mission of the Crystal Lake Park District is to enhance the lives of our residents by providing programs, services, facilities and open spaces that safely promote health, recreation and community in an environmentally and fiscally responsible manner.*

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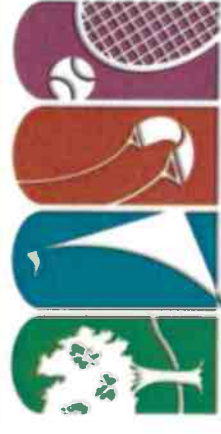
- I. Call to Order
- II. Roll Call
- III. Pledge of Allegiance
- IV. Approval of Agenda
- V. State of the Lake Presentation  
Jeremy Husnik & Vince Mosca Hey and Associates, Inc.
- VI. Creating Lakeshore Landscapes  
Bob Kirschner, Chicago Botanic Garden Curator of Aquatic Plant and Urban Lake Studies and Director of Restoration Ecology
- VII. Adjourn [www.cbgs shoreline.org](http://www.cbgs shoreline.org)

# **CRYSTAL LAKE 2017 ANNUAL MEETING**

Prepared By:

*Hey and Associates, Inc.*

Presented for:

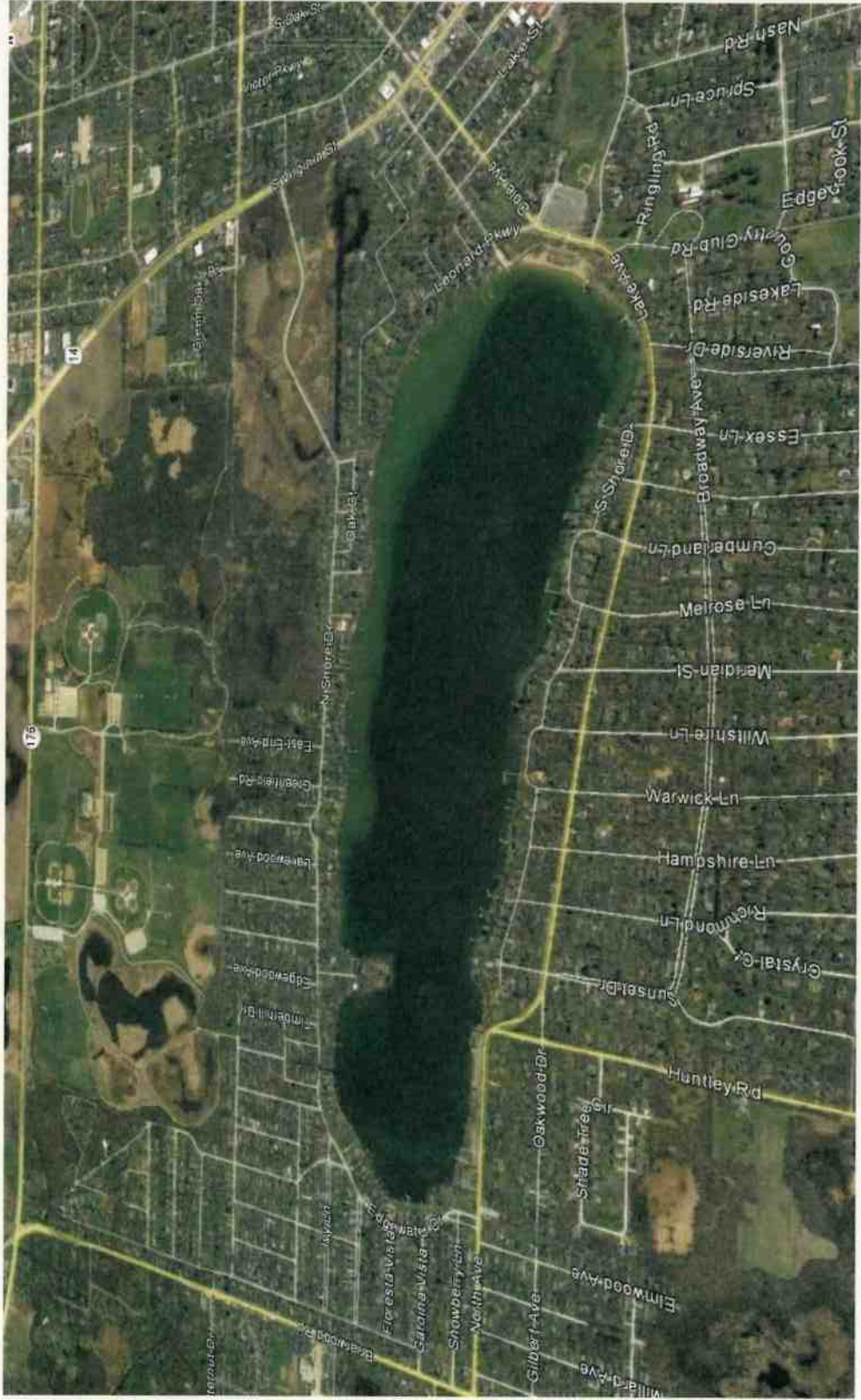


CRYSTAL LAKE PARK DISTRICT

October 30, 2017

*Hey and Associates, Inc.*

# ANNUAL STATE OF THE LAKE REPORT



Hey and Associates, Inc.

# PRESENTERS

**Vincent Mosca**

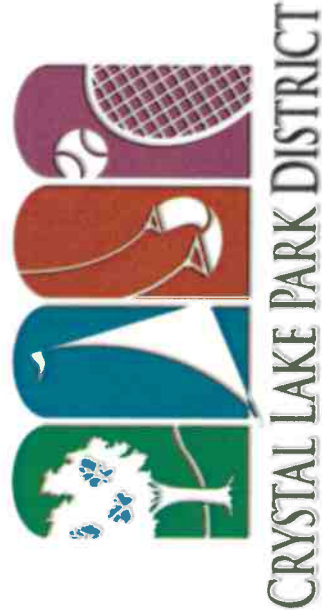
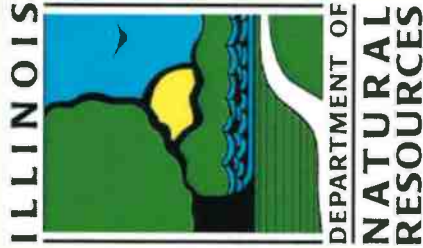
**Jeremy Husnik**

*Hey and Associates, Inc.*





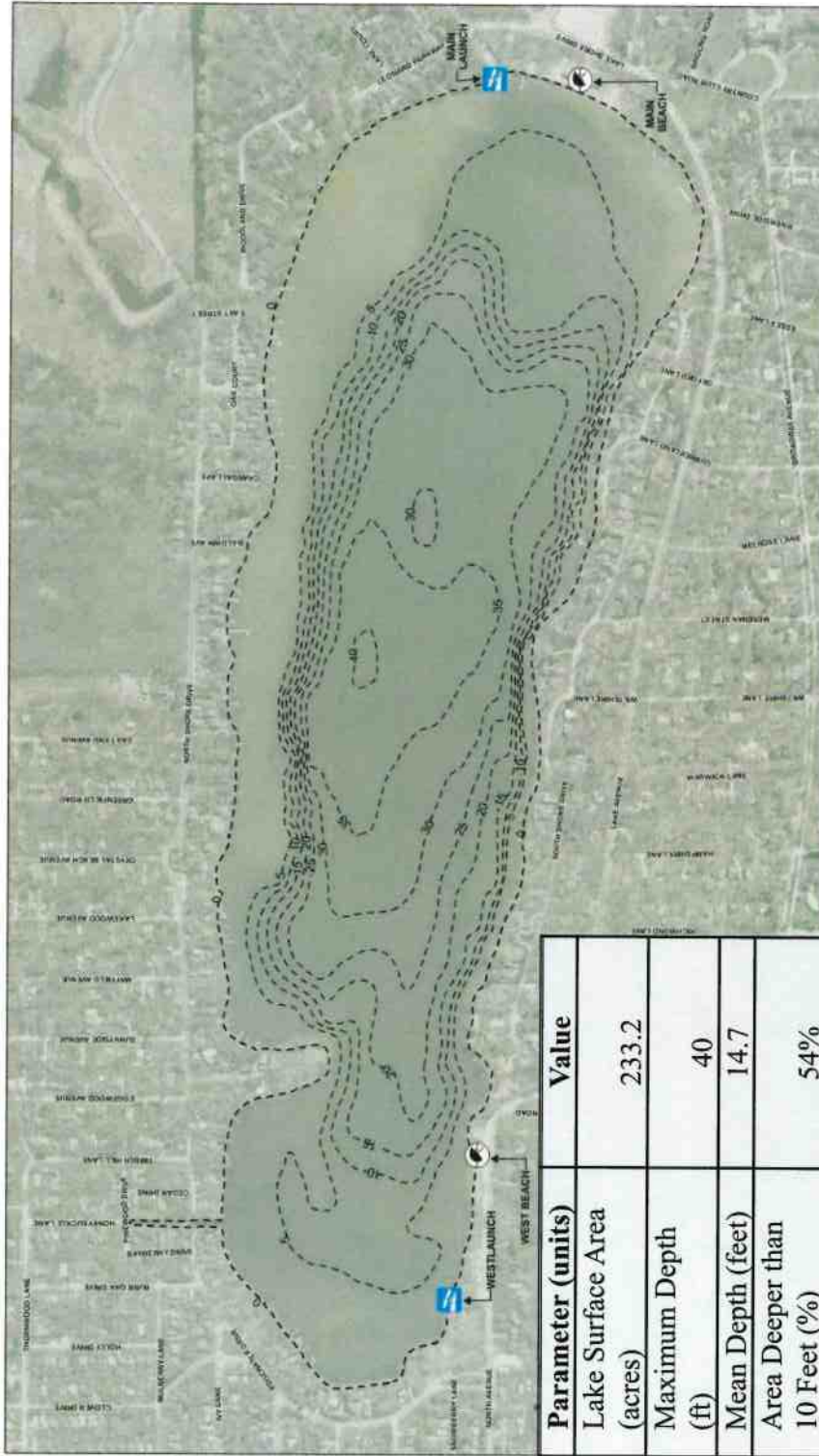
# PROJECT PARTNERS



# ANNUAL STATE OF THE LAKE REPORT

- Introduction
- Lake Levels
- Water Quality
- Aquatic Vegetation
- Fishery
- Question and Answer

# LAKE BATHYMETRY



Parameter (units)	Value
Lake Surface Area (acres)	233.2
Maximum Depth (ft)	40
Mean Depth (feet)	14.7
Area Deeper than 10 Feet (%)	54%

Prepared by: **Hey and Associates, Inc.**  
 5000 West 10th Street, Suite 100, Denver, CO 80202  
 Phone: (303) 751-1111  
 www.heyand.com

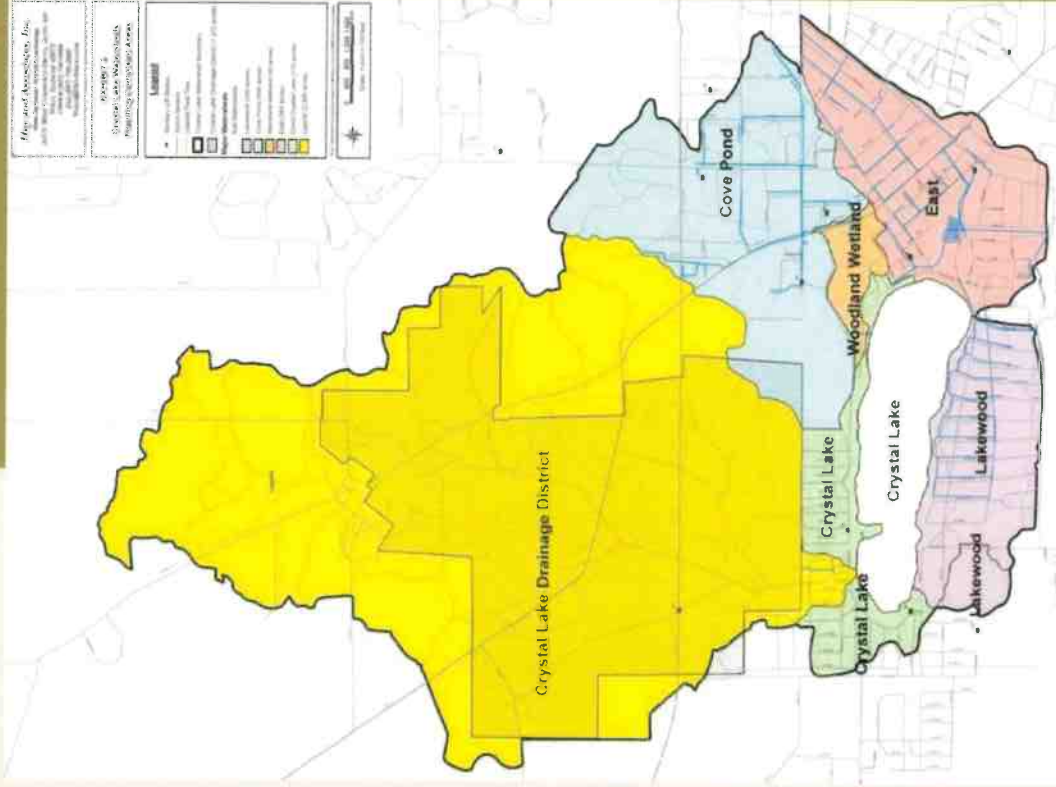
Client: **Crystal Lake Park District**  
 10000 East 1st Avenue, Suite 100, Denver, CO 80231  
 Phone: (303) 751-1111  
 www.crylakelake.com

Project: **Bathymetric Survey of Crystal Lake**

Date: \_\_\_\_\_  
 Scale: \_\_\_\_\_  
 Interval: \_\_\_\_\_

# CRYSTAL LAKE WATERSHED

Name	Drainage Area (acres)
Lippold Watershed	2,400
Cove Pond and Woodland Wetland	640
Direct Drainage Area	190
Lake Surface Area	233
<b>Total</b>	<b>3,463</b>



# LAKE LEVELS



**Stilling Well**



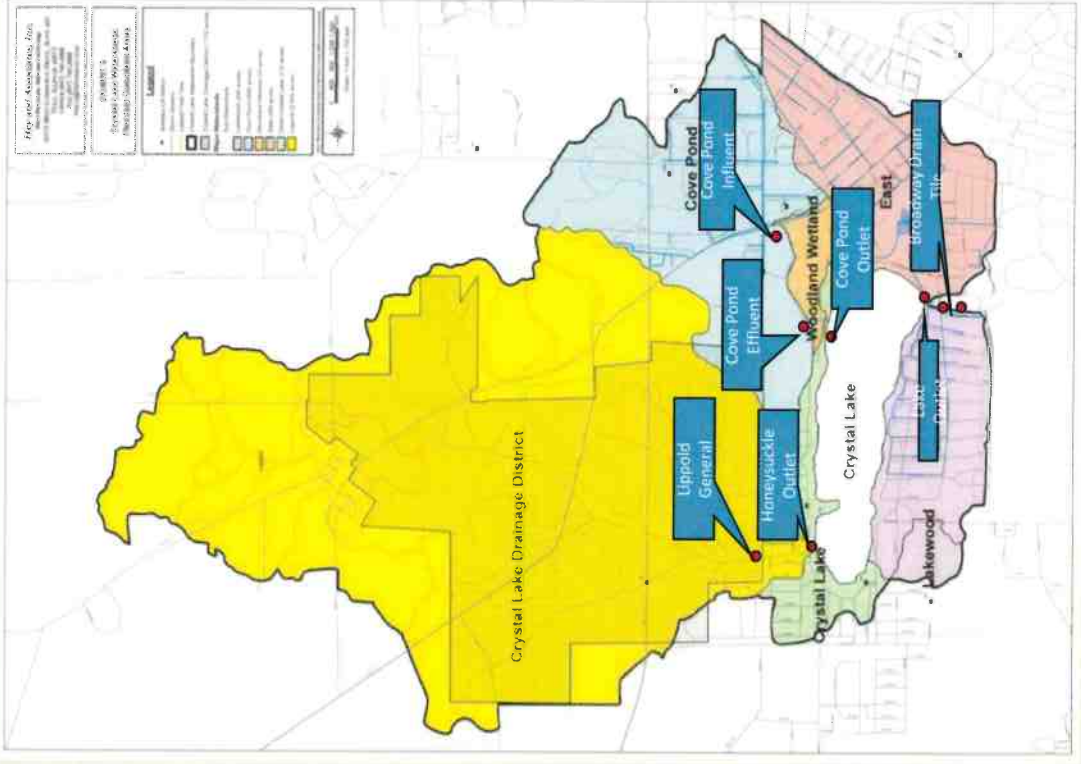
**Staff Gauge**

Lake Level at West (data adjusted using barometric logger data)  
09/01/15 to 10/08/17

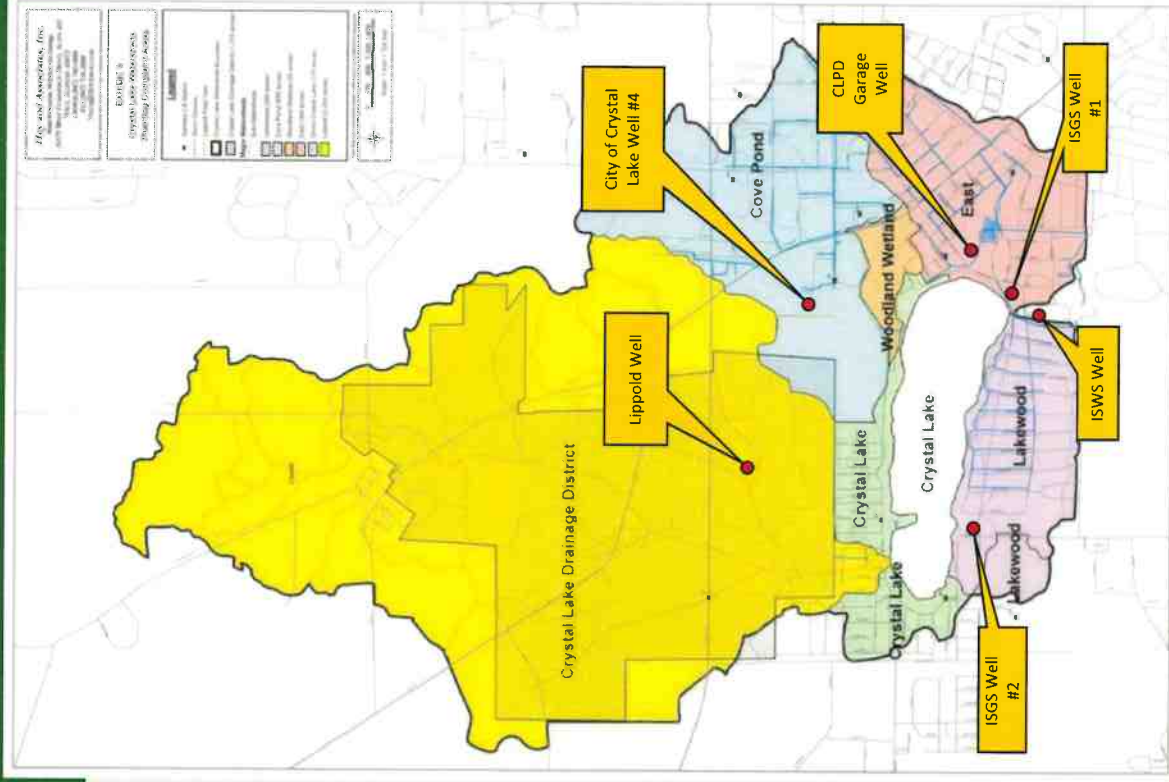
Date	Time	Level	Temp (cell lns: 885.79 in 2015-17)	Water Surface Elevation	Comments
2391	4/23/2017	6.00.00	5.65	55.36	891.44
2392	4/23/2017	13.00.00	5.61	55.33	891.40
2393	4/23/2017	18.00.00	5.61	55.36	891.40
2394	4/24/2017	0.00.00	5.62	55.43	891.41
2395	4/24/2017	6.00.00	5.63	55.53	891.42
2396	4/24/2017	12.00.00	5.61	55.65	891.40
2397	4/24/2017	18.00.00	5.60	55.85	891.39
2398	4/25/2017	0.00.00	5.60	56.09	891.39
2399	4/25/2017	6.00.00	5.60	56.31	891.39
2400	4/25/2017	12.00.00	5.59	56.52	891.38
2401	4/25/2017	18.00.00	5.59	56.75	891.38
2402	4/26/2017	0.00.00	5.58	57.01	891.38
2403	4/26/2017	6.00.00	5.58	57.28	891.37
2404	4/26/2017	12.00.00	5.57	57.56	891.36
2405	4/26/2017	18.00.00	5.57	57.89	891.35
2406	4/27/2017	0.00.00	5.60	58.27	891.39
2407	4/27/2017	6.00.00	5.66	58.63	891.44
2408	4/27/2017	12.00.00	5.64	58.99	891.43
2409	4/27/2017	18.00.00	5.64	59.20	891.43
2410	4/28/2017	0.00.00	5.64	59.50	891.43
2411	4/28/2017	6.00.00	5.65	59.55	891.44
2412	4/28/2017	12.00.00	5.61	59.39	891.40
2413	4/28/2017	18.00.00	5.61	59.18	891.40
2414	4/29/2017	0.00.00	5.62	58.99	891.41
2415	4/29/2017	6.00.00	5.61	58.75	891.40
2416	4/29/2017	12.00.00	5.61	58.45	891.40
2417	4/29/2017	18.00.00	5.60	58.15	891.47
2418	4/30/2017	0.00.00	5.69	57.80	891.46

**Calculated Data Set**

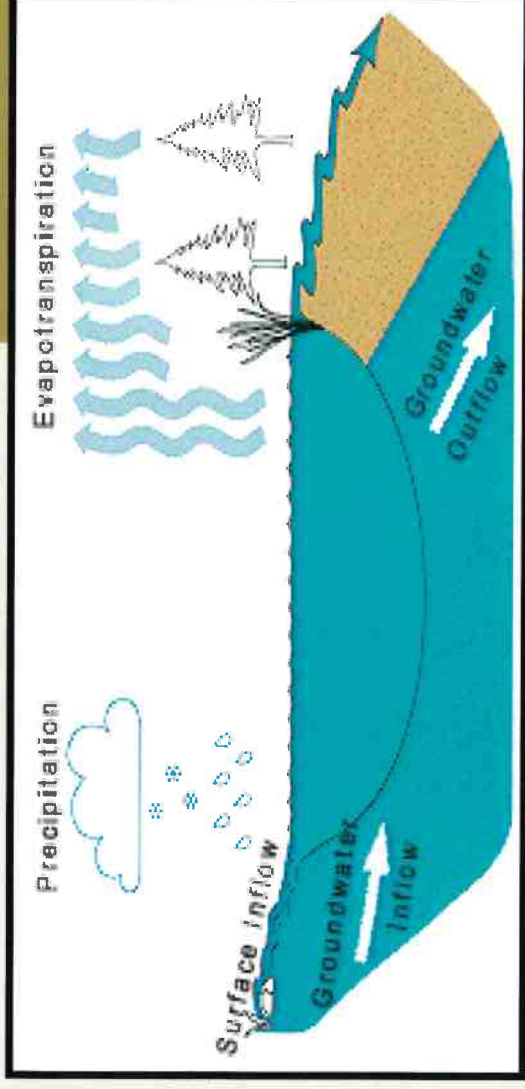
# CLPD SURFACE RUNOFF MONITORING



# CLPD GROUNDWATER MONITORING WELLS



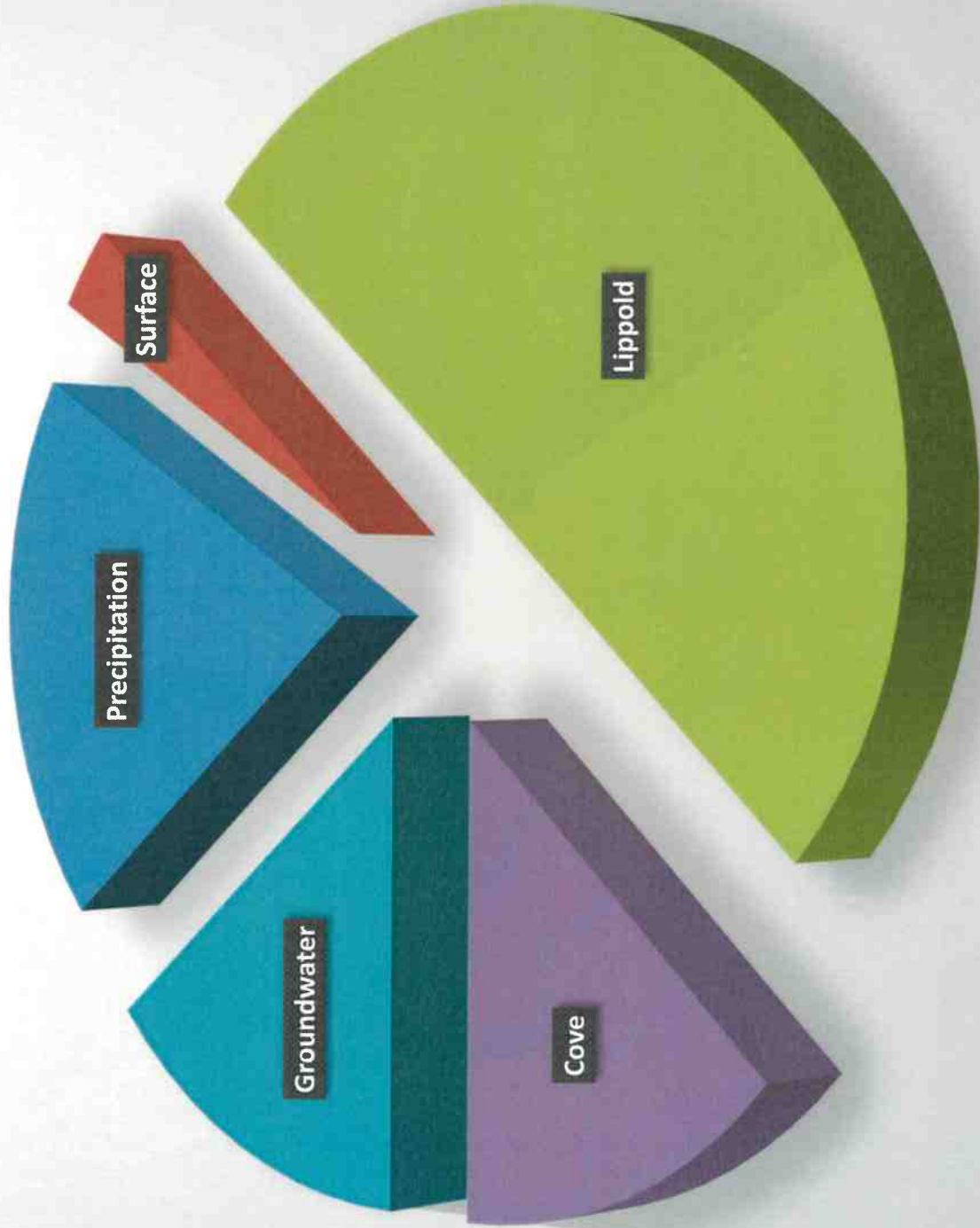
# HYDROLOGY MONITORING



- Water Budget
  - Inputs – Outputs = Change in lake level
- Where does Crystal Lake get its water and where does it go?

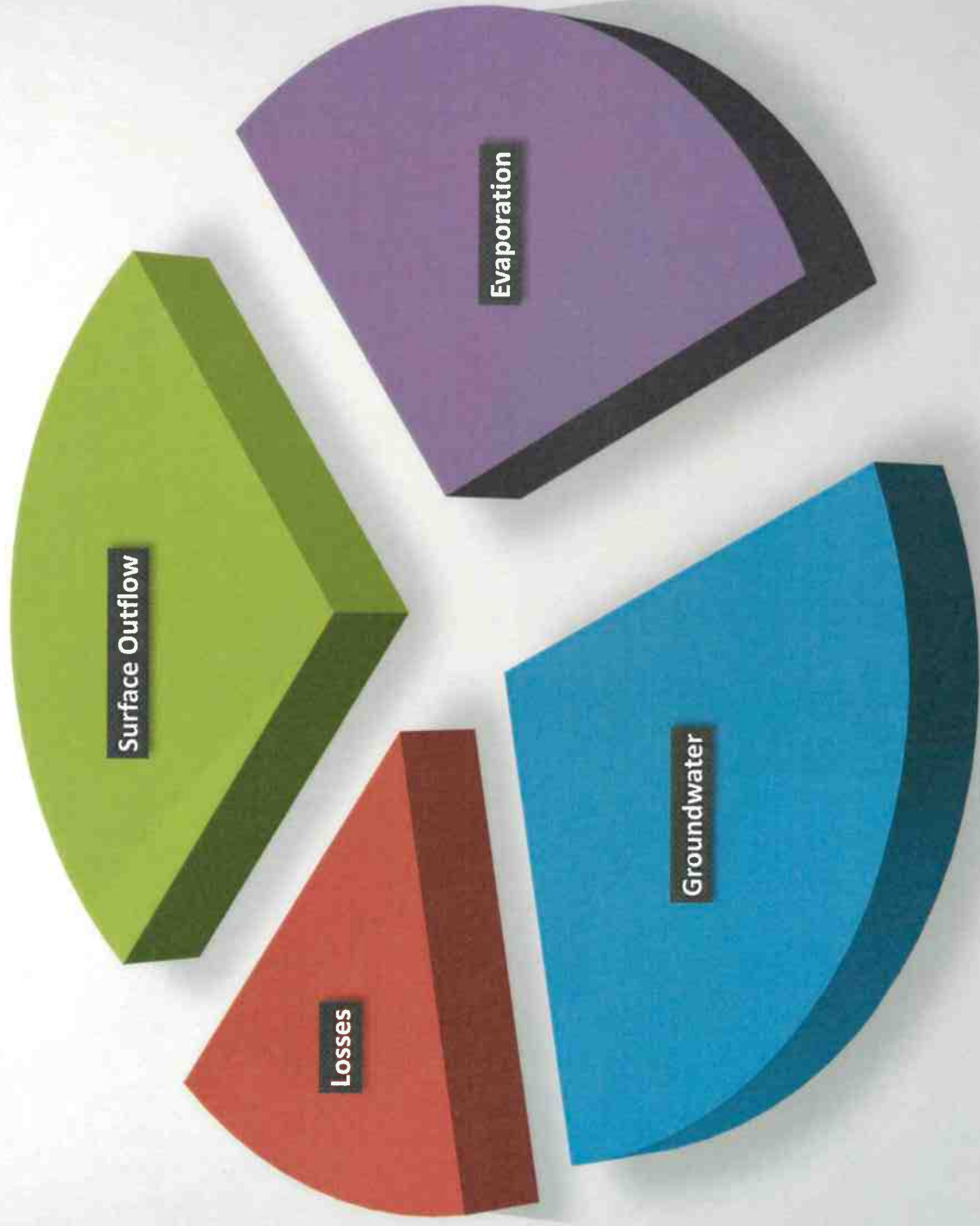


# HYDROLOGY - WATER INPUTS



*Not representative of calculated data*

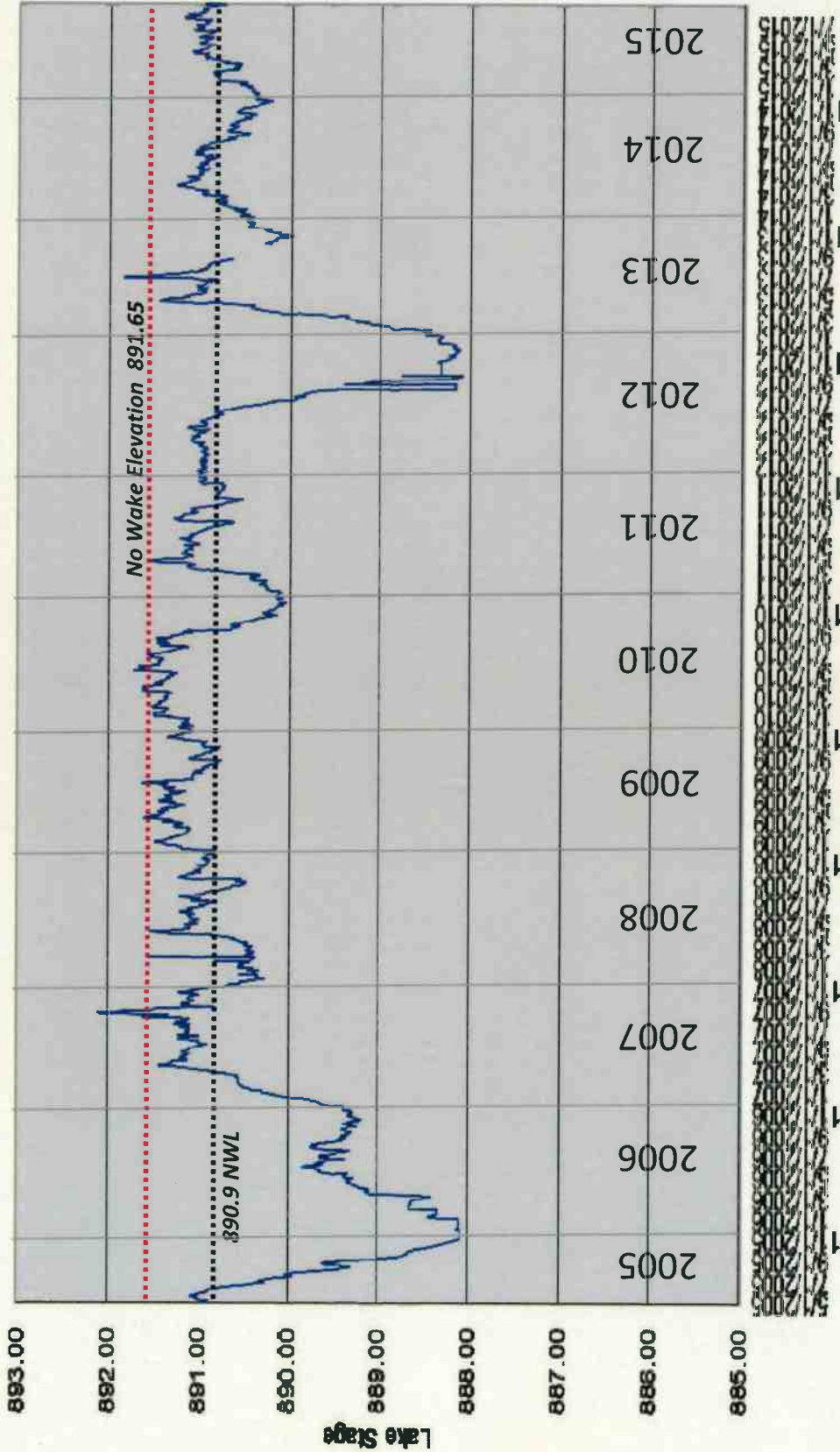
# HYDROLOGY - WATER OUTPUTS



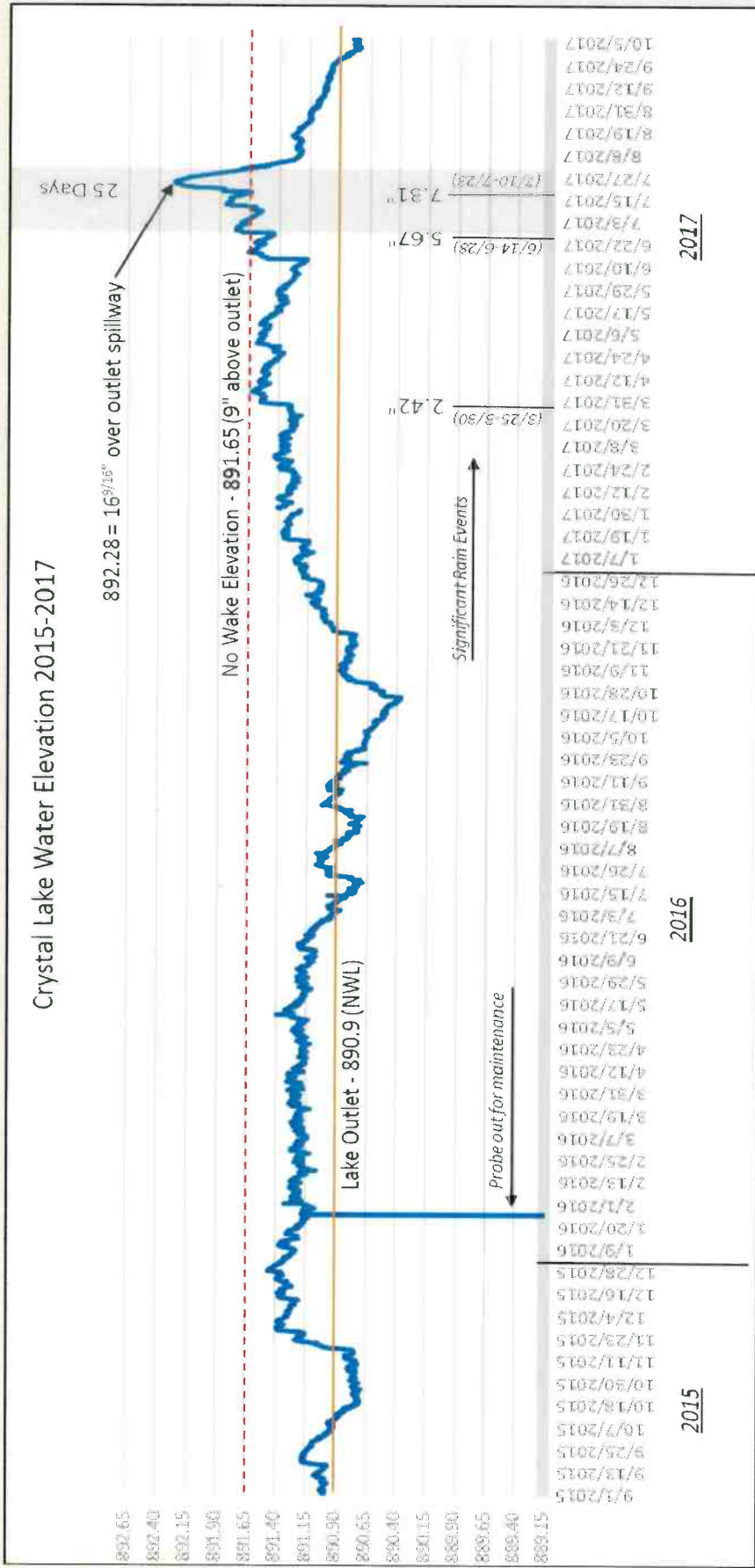
*Not representative of calculated data*

# CRYSTAL LAKE MEASURED LAKE LEVEL 2005 - 2015


Crystal Lake Measured Lake Level



# CRYSTAL LAKE MEASURED LAKE LEVEL 2015 - 2017



# CRYSTAL LAKE POLLUTANT SOURCES

- Phosphorus inputs to the lake are most important
- Algal growth limited by available phosphorus
  - Overall, very little phosphorous stays in the water column due to high concentrations of calcium (Ca)
- Principal phosphorous inputs are Lippold and Cove Pond 
- Combination of natural and legacy sources



# CITY OF CRYSTAL LAKE WATER QUALITY MONITORING SITES

## City Sampling Locations:

- A. Lake
- B. Crystal Creek
- C. Sod
- D. Lippold Park Eff.
- E. Lippold Park Inf.
- F. Lippold Park West
- G. Lippold Park Center
- H. Lippold Park East
- I. Cove Pond Infl.
- J. Cove Pond Eff.



# IN-LAKE WATER QUALITY



*Hey and Associates, Inc.*





# IN-LAKE WATER QUALITY MONITORING RESULTS

- Temperature
- Dissolved Oxygen
- Water Chemistry
- Clarity (Secchi Disk)



# NUTRIENT / CLARITY RELATIONSHIPS



Total Phosphorus



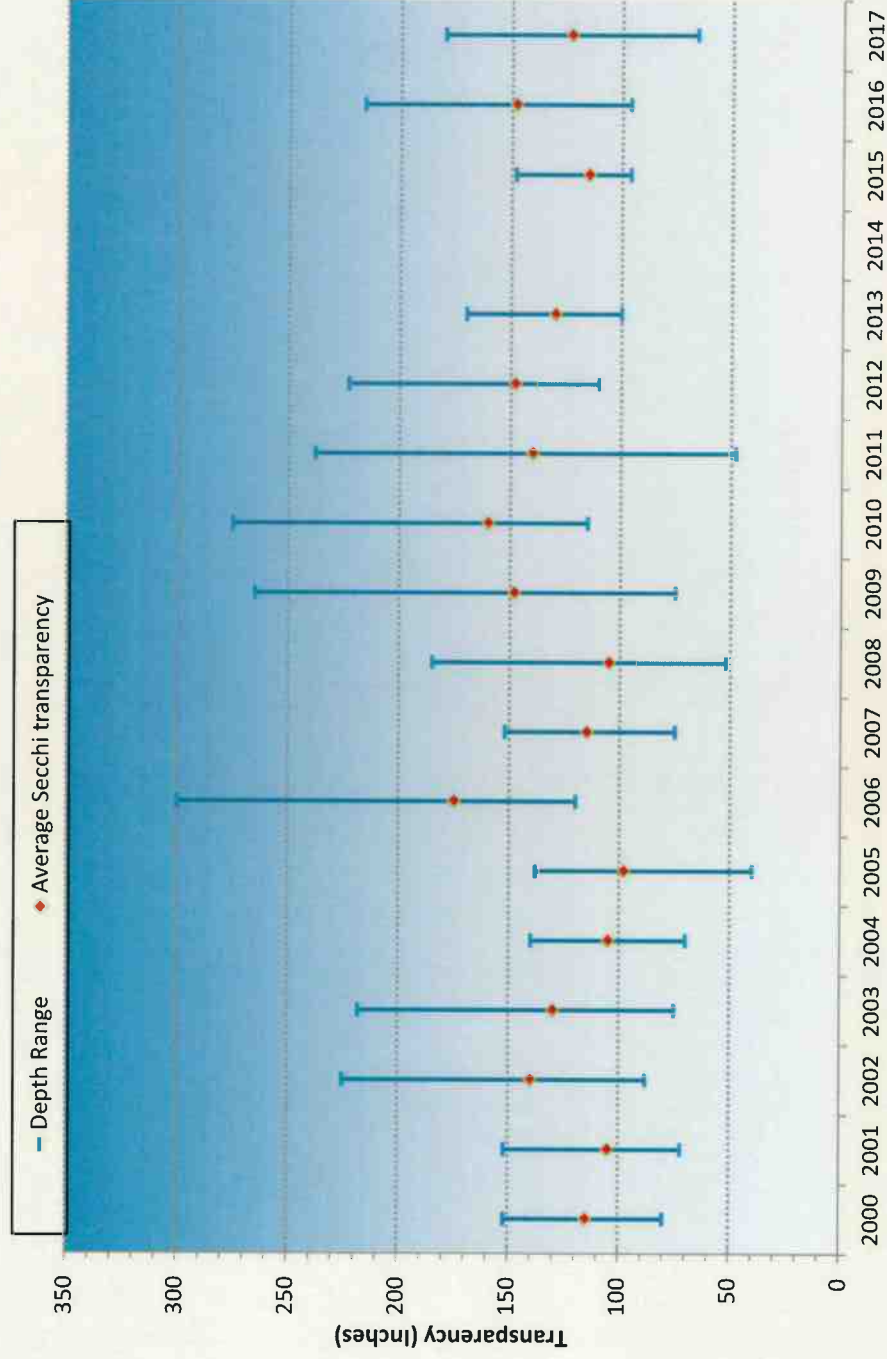
Algae  
(Chlorophyll a)



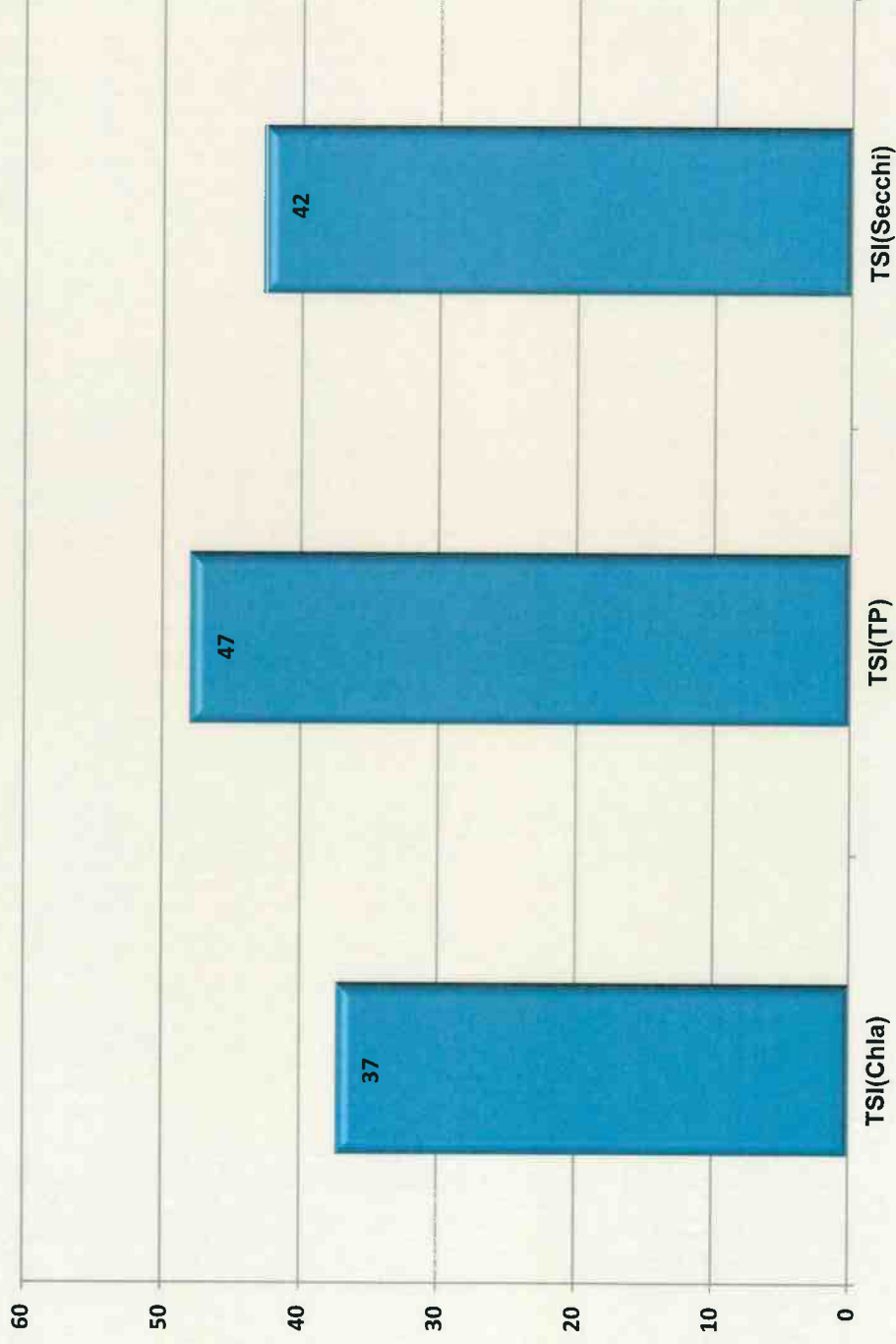
Water Clarity  
(Secchi Disk)

# MONITORING RESULTS: SECCHI DISK

Annual Secchi Transparency (Average, Maximum, & Minimum)  
Representative Site Only

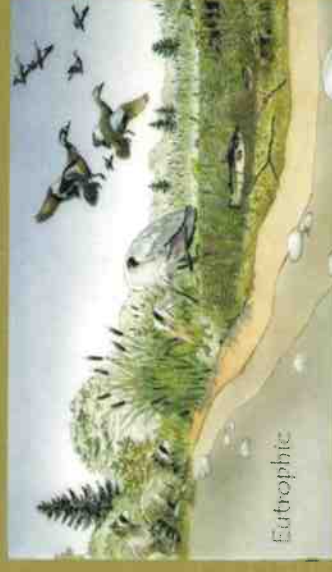


# MONITORING RESULTS 2017: CARLSON TROPHIC STATE INDEX (TSI)

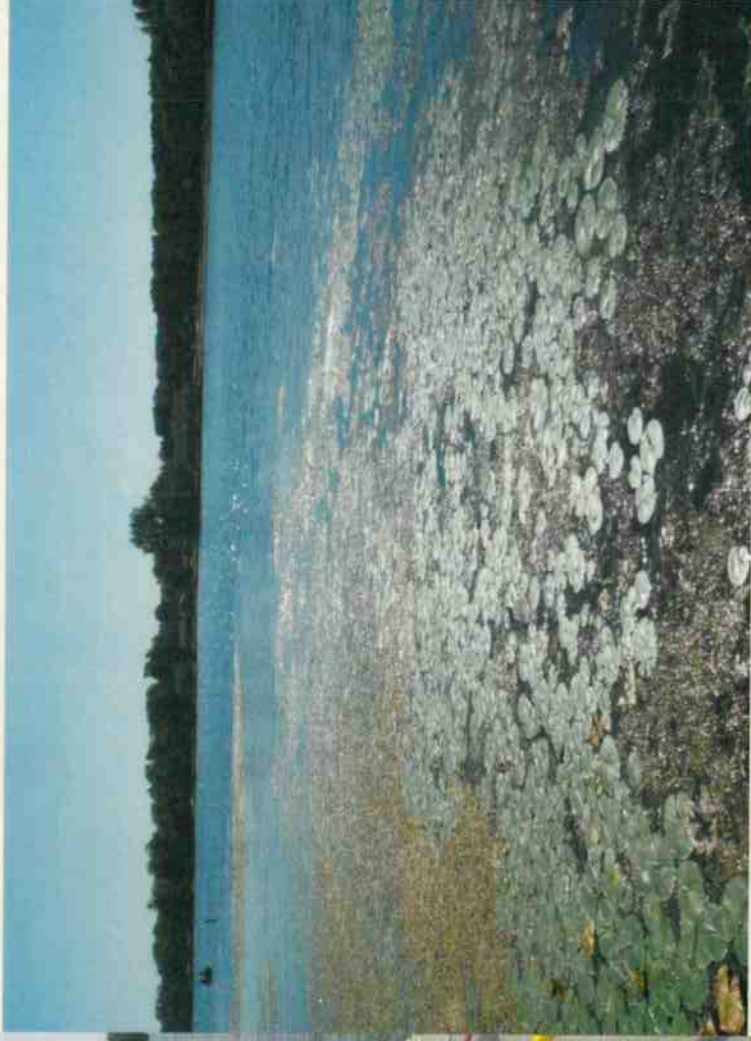


# WHAT DO TSI RESULTS MEAN?

- Crystal Lake is Mesotrophic
  - Water is relatively clear
  - Moderately productive
  - Hypolimnion is anoxic in summer
    - Free of oxygen below the thermocline
    - Subject to spring and fall turnovers
- Conclusion... the lake continues to be in excellent health



# AQUATIC VEGETATION



# AQUATIC PLANT SURVEY LOCATIONS



37 Transects = 222 survey locations

# AQUATIC PLANT STATISTICS BY YEAR

Year	# Species Lake-wide	# Native Species Lake-wide	Overall Frequency Occurrence (%)
2006	10	7	88.4
2007	14	11	94.7
2008	14	7	90.1
2009	9	5	93.5
2010	11	7	82.9
2011	13	10	89.4
2012	8	6	92.6
2013	11	8	96.8
2014	11	8	96.9
2015	11	8	97.0
2016	11	8	95.0
2017	12	9	96.6



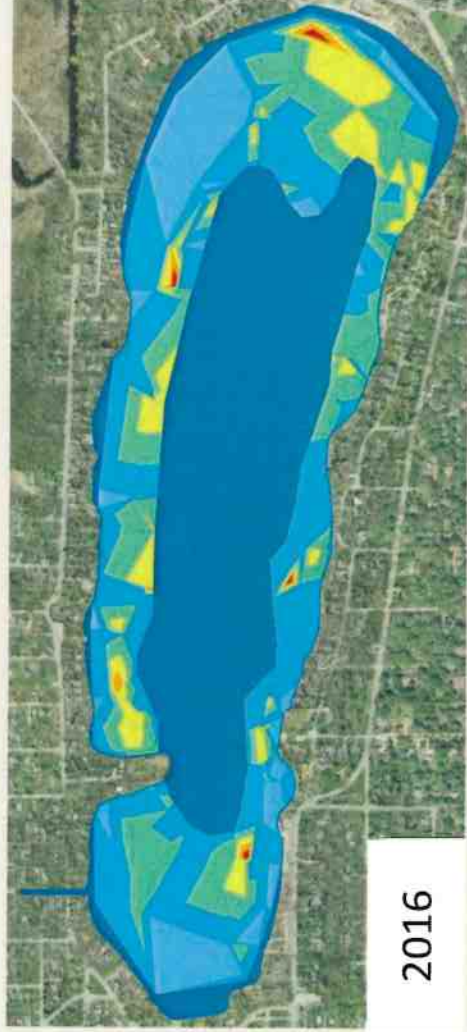
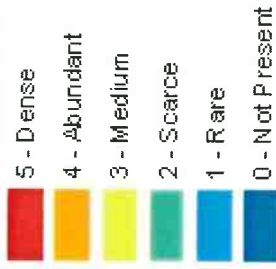
# NON-NATIVE VEGETATION 2016



2016

June

## Plant Density Key



2016

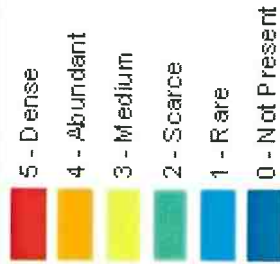
August

# NON-NATIVE VEGETATION 2017

June



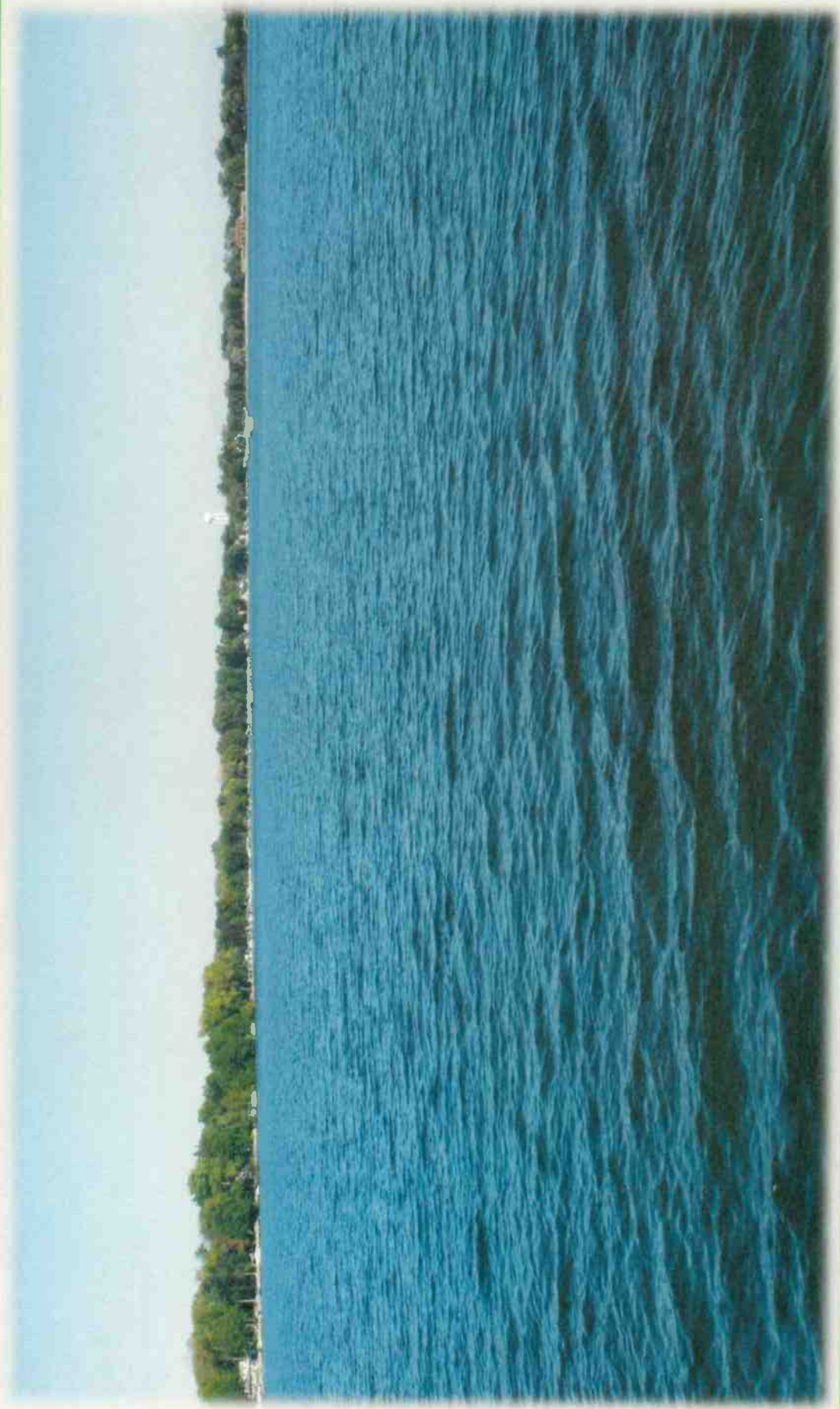
Plant Density Key



October



# AQUATIC PLANT MANAGEMENT IN 2017



*Hey and Associates, Inc.*

# VEGETATION TYPES



**Native**



**Non-native**

# HYBRID WATERMILFOIL

- Hybrid Watermilfoil
  - Samples taken from West Bay and the north side at Mid-lake in 2014
  - Sent in for genetic testing...Positive results
  - Adjusted product and application rates for effective control

## Advanced Identification

Eurasian	Hybrid	Northern
Typically – 4 Leaves per node 14 Leaflets (6-16) per node	Genetic analysis	< 14 Leaflets



BUILDING STRONG<sup>®</sup>

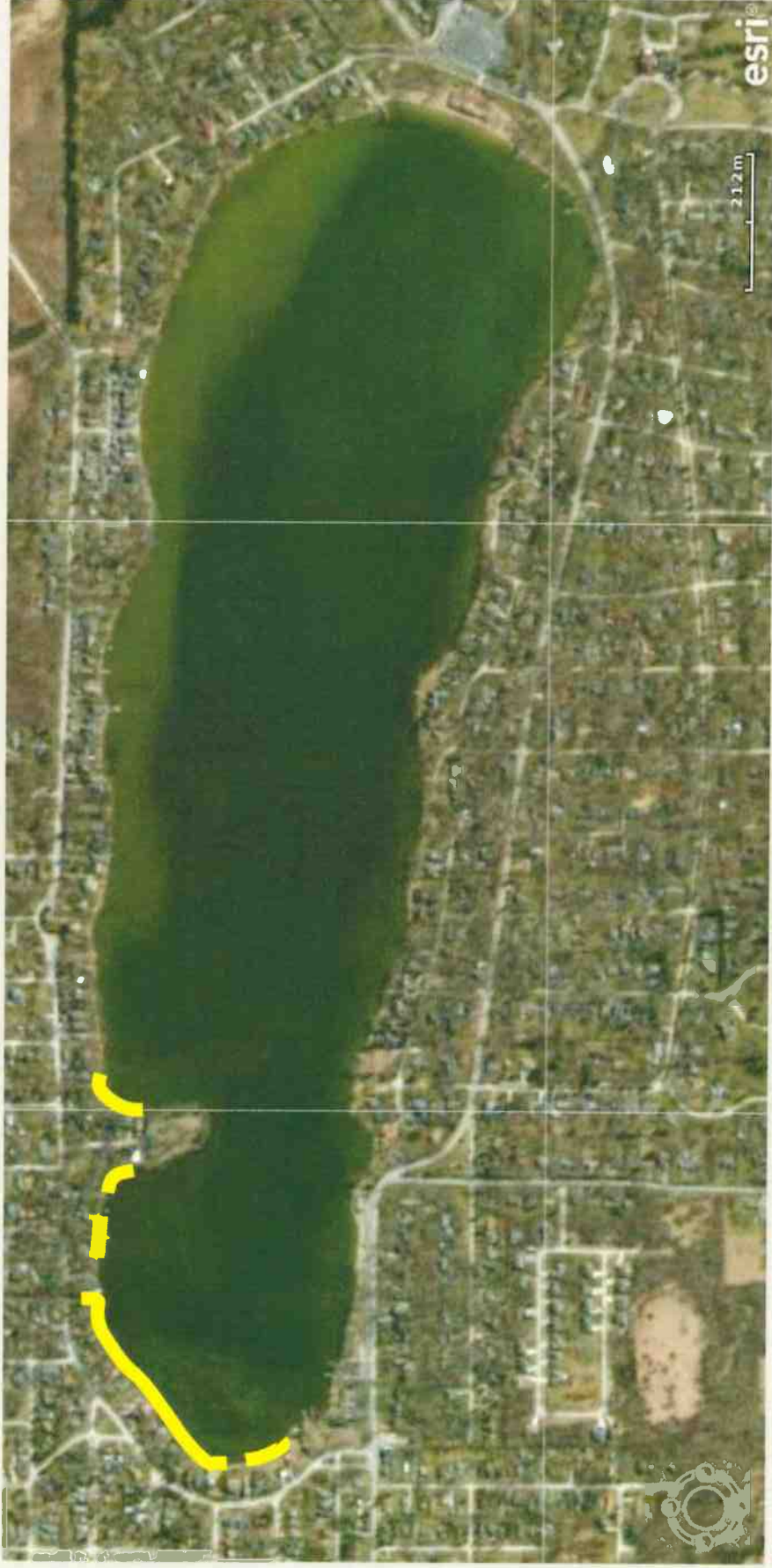
# BEACH TREATMENT LOCATIONS



# TREATMENT OF NON-NATIVE SPECIES (MILFOIL)



# IN-PIER TREATMENTS (PRIVATE)





# EELGRASS REMOVAL IN WEST BAY



- Removed nearly 50,000 pounds of floating eelgrass over two visits



Before



After

# 2018 STRATEGY

- Non-selective treatment of public beaches for all aquatic plants prior to beach opening in mid May
- Ongoing assessment of an aquatic vegetation mechanical harvesting program in the West Bay
- Continue to treat non-native plants throughout the growing season and as needed in additional areas of the lake not previously treated
- Ongoing Eelgrass management in West Bay in select areas – from shoreline to approx. 60 feet out

# CRYSTAL LAKE FISHING PROGRAM

Last fish survey conducted in 2013 by IDNR

- Maintain and promote emergent vegetation on shorelines
- Promote structural habitat features for lake bottom

Maintain fish stocking program:

Largemouth bass – discontinue unless decline shows in next survey

Smallmouth bass – every other year

Black crappie – every 2-3 years

Yellow perch – every 2-3 years

Northern pike – every other year

Muskellunge – every 3 years

Walleye – annually

Channel catfish – every 2-3 years

Emerald shiners – as needed

Rainbow trout – special events

- Work with IDNR staff to update fish survey data in 2018



# Q & A



*Hey and Associates, Inc.*