

Contact: Rachel Boon

IOWA LAKESIDE LAB ANNUAL REPORT AND FY2018 BUDGET

Actions Requested: (1) Receive the Iowa Lakeside Lab Regent Resource Center Annual Report and (2) approve the FY2018 budget.

Executive Summary: The Iowa Lakeside Lab and Regent Resource Center (Lakeside) is owned by the state of Iowa and operated through the Iowa Board of Regents. Lakeside's 147-acre campus is located on West Okoboji Lake, on Little Miller's Bay. The summer of 2017 continued to see strong university enrollment with numbers that were similar to 2016. Challenges associated with travel by international students prevented enrollment numbers from exceeding 2016. A number of faculty and students engaged in academic research at Lakeside in 2016 and 2017, including through student research embedded in credit courses. Several of these projects are being presented at conferences or published in peer-reviewed journals.

An area of emphasis for Lakeside is creating opportunities for students to earn money during the summer months, while also participating in classes offered on campus. The "Earn to Learn" program is a cooperative effort between the Iowa Department of Natural Resources, the Okoboji Protective Association (OPA) and Lakeside. Lakeside participated in the Governor's STEM Externship program by hiring two teacher externs in the summer of 2017. Extensive community engagement opportunities are provided through Lakeside. Thousands of children, young people and adults attend Lakeside events or provide volunteer hours to meet Lakeside needs.

Finally, Lakeside launched a strategic planning process in summer 2017. The goal of the planning process will be to identify new educational and research opportunities, ensure long-term financial stability (including increased support from outside sources), enhance community engagement, and serve as a focal point for research and education by the Board of Regents universities in the Iowa Great Lakes.

The attached FY2018 budget was reviewed by the Academic and Student Affairs Committee and is recommended for approval.

Attached:

Appendix A-Iowa Lakeside Lab and Regent Resource Center Report to the Council of Provosts and the Iowa Board of Regents 2016-17

Appendix B-Iowa Lakeside Lab and Regent Resource Center FY2018 budget

Iowa Lakeside Lab and Regent Resource Center Report to the Council of Provosts and the Iowa Board of Regents 2016-17



About the Iowa Lakeside Lab and Regent Resource Center

The Iowa Lakeside Lab and Regent Resource Center (Lakeside) is owned by the state of Iowa and operated through the Iowa Board of Regents. Lakeside's 147-acre campus is located on scenic West Okoboji Lake, on Little Miller's Bay. The bay and adjacent natural areas are used as outdoor classrooms for Lakeside's university courses and outreach programs. The campus is open year round, and visitors are welcome to visit during daylight hours.

GROUNDS AND NATURAL AREAS

Lakeside occupies 147 acres, including the entire shoreline of Little Miller's Bay of West Okoboji Lake (see map below). Most of the campus is natural land. The campus is divided into three areas: 1) the Ecological Studies Campus, 2) the Residential Campus, and 3) the Teaching Campus.



- 1) The **Ecological Studies Campus** occupies more than three-fourths of the land mass at Lakeside, including the entire northern portion. The northwest part, long called "The North 40" by faculty and staff, is being restored to prairie. Another 23 acres to the immediate east is reconstructed prairie, planted in 2002-03. A second-growth woods of box elder and other trees separates these areas from West Okoboji Lake and the Residential Campus to the south.
- 2) The **Residential Campus** includes the Lakeside Office, the Facility Manager's residence, faculty and student housing, the bathhouse, the dining hall, and adjacent lawns. A ravine shaded by bur oaks and other trees separates this part of Lakeside Lab from the Teaching Campus to the south.
- 3) The **Teaching Campus** features a high knoll that slopes down to Little Miller's Bay. The Waitt Lab, Mahan Hall, the Library, all laboratories, Tamisiea Cottage, and Main Cottage are located here. The landscape is very naturalistic, with prairie and meadows occupying the higher ground and oak woods/savanna growing near the lake.



Volunteers removing invasive species on the Iowa Lakeside Laboratory grounds. Local volunteers provide nearly 600 hours of service each summer to maintain the natural integrity of the campus. In return, volunteers learn about land management and the local ecology.

For a description of surrounding natural areas and why Dr. Thomas Macbride chose this location initially, please scroll to the end of this report for an excerpt of “The Okoboji Lakeside Laboratory” written by Dr. Macbride.

Organization of this Report

The 2016-17 report is organized into four sections:

- I. Summer College Courses
- II. Academic and Research
- III. Community Engagement
- IV. Future Directions

Of special note are the Young Investigators Project, which has received increased funding from the Iowa Department of Natural Resources and recognition from the Regent Universities and state and national organizations, several new college courses, and research projects of national and international significance.



Students in the aquatic ecology class investigate Little Millers Bay on West Okoboji Lake.

I. Summer College Courses

The summer of 2017 continued to see strong university enrollment with numbers that were similar to 2016. Challenges associated with travel by international students prevented enrollment numbers from exceeding 2016, but we will be working with the Regents universities to address these issues for 2018.

Courses offered this year included Soil Formation, Diatoms, Ecology, Archaeology, Algae, Aquatic Ecology, Fish Ecology, Acoustic Ecology, Ornithology and Lichen Diversity. For the first time, we also offered a course in *Geographic Information Systems* or *GIS*. We were at or near capacity for the majority of the summer. Plans are also underway to include a winter session of the *Advanced Geographic Information*

Systems Applications course (modeling of human and environmental patterns on the Earth's surface) and a winter ecology course in partnership with the University of Iowa.



Lakeside continues to offer unique academic experiences including *College Prep Diatoms* (college credit course for high school students) and the Okoboji Entrepreneurial Institute (OEI). Classes with accelerated credit hour options (1-2 weeks) are increasingly appealing to students with summer jobs or internships and looking to complete a degree in four years. College prep courses at Lakeside give high school students an authentic experience with “hand’s on – mind’s on” research in STEM fields.

The Lakeside Executive Director has been working with academic advisors to identify programmatic gaps that can be addressed using Lakeside more fully in its Regents Resource Center capability – for example, highly specialized classes that are difficult to fill at one institution, but would be viable when drawing enrollment from multiple institutions.

II. Academics and Research

Faculty and Student Research

The summer of 2017 was an active time for research at Lakeside. Betsy Swanner (Iowa State University) received an Iowa Water Center grant with in-kind matching funds from Lakeside to examine the role of micronutrients in harmful algae blooms. Dr. Swanner’s project is supporting two students (Tania Leung, Ph.D. candidate and one undergraduate student). Mary Skopec (Lakeside Executive Director) received a grant from the Okoboji Foundation and Youth in Philanthropy to develop program to monitor harmful algal blooms in the Iowa Great Lakes. Val Cota (Buena Vista University) completed her internship on the first phase of this project and will present her results at the Iowa Academy of Science annual meeting in April. Alyssa Thompson (graduate student working with Lakeside faculty member Kalina Manoylov) successfully completed her research on diatoms and her manuscript has been accepted for publication. Lori Biederman (Iowa State University) continued her work on the impact of nutrients on prairie plants, and Bob Cruden (University of Michigan) continued his research on wetland invertebrates. Lakeside faculty continued their collaboration with Mike Hawkins

and Jonathan Meerbeek (Iowa Department of Natural Resources) to examine the impacts of shoreline restoration on West Lake Okoboji.

An exciting new dimension for student research this summer was the embedding of research into structured classes. Students in the diatom and lichen diversity courses completed research manuscripts as part of the course requirements. Unlike traditional class papers that are only viewed by the instructor, these papers were submitted to academic journals for publication. Four students in the diatom course will be presenting their work at the upcoming North American Diatom Symposium in Ohio.

Alyssa Thompson summarized the student research experience by saying, *“I am pleased to share with you that the work that I conducted at Lakeside Laboratory this summer will be published in the International Journal for Marine Biology and Research! I want to express my greatest gratitude to you and Friends of Lakeside for allowing me to be a visiting researcher. Conducting my research with Kalina on the same campus has really made this experience go a lot smoother. My time at Lakeside exceeded my expectations (yet again) and this opportunity has allowed me to grow more as a researcher, student, and as a person. The environment that is provided at Lakeside cannot be replicated and it allows for perfection concentration and great productivity.”*

Student Internships

An area of emphasis for Lakeside is creating opportunities for students to earn money during the summer months, while also participating in classes offered on campus. The “Earn to Learn” program is a cooperative effort between the Iowa Department of Natural Resources, the Okoboji Protective Association (OPA) and Lakeside. Funding for the program comes primarily from the OPA and includes tuition for one summer class, room and board assistance, and a paid internship. Students in the program are trained by the Iowa DNR to conduct invasive species patrols at local boat ramps and communicate with boaters regarding the need to inspect and clean vessels. This program not only supports students financially, but also provides networking opportunities with future employers.

Support from the Friends of Lakeside Lab provided opportunities for paid internships for students to assist with on-campus educational programs for children, laboratory technicians (in cooperation with the State Hygienic Laboratory), and land management technicians.



Summer Lakeside interns performed a variety of jobs this summer, including organizing sampling equipment for CLAMP (Cooperative Lakes Area Monitoring Program) volunteers.

Summer Externships

Lakeside participated in the Governor's STEM Externship program by hiring two teacher externs in the summer of 2017. Art Hellert (a 7th grade science teacher from Spirit Lake Community Schools) and Marc Benedict (a 7th grade science teacher from Graettinger Terrill Community Schools) spent six weeks analyzing Lakeside water quality data

including data from the GLEON water quality buoy sensors and historical data from 1970 to present. The process of analyzing authentic data will be integrated into the lesson plans for both schools with the goal of extending the curriculum to other middle schools across Iowa.



The GLEON buoy collects water quality data every 10 minutes from multiple depths in West Okoboji Lake. Students and researchers use the data to understand changes in water quality throughout the season.

Science Seminars

A new emphasis for the Science Series in 2017 was to focus the presentations on important natural resource issues for Iowa and the Great Lakes Region. Topics included harmful algae blooms, invasive species, deer management, flooding, walleye populations, oak blight prevention, and the occurrence of mountain lions and wolves. Several of the presentations were standing room only. Speakers and topics included:

- *Bur Oak Blight*, Tom Harrington (Iowa State University)
- *Deer Management*, Larry Stone (Humanities Iowa Speaker Series)

- *Mountain Lions and Wolves in Iowa*; Vince Evelsizer (Iowa Department of Natural Resources)
- *Cedar River Flooding and Diatom Response*; Steven Main (Wartburg College)
- *Archaeological Investigations at Mini Wakan State Park*; John Doershuk (University of Iowa)
- *Harmful Algal Blooms*; Betsy Swanner (Iowa State University)
- *Walleye Fishery Management*; Emily Ball (Iowa State University)
- *Impact of Extreme Events (Drought/Flood) on Iowa Agriculture*; Amy Burgin (University of Kansas)
- *Common Carp Management*; Mike Hawkins (Iowa Department of Natural Resources)
- *Beach Monitoring and Swimming Advisories*; Mary Skopec (Lakeside)
- *Fossil Records of Megafauna in Iowa*; Kata McCarville (Upper Iowa University)
- *Understanding our Environment Using Acoustics*; Alexander Braidwood (Iowa State University).
- *The History of Iowa Lakeside Laboratory*; Jane Shuttleworth (Lakeside)

III. Community Engagement

Young Investigators Project

Young Investigators: Connecting Children with Nature through Project Work (YI) addresses the need in Iowa for a sustainable, nature-based, high-quality professional development training for early childhood educators. YI uses the project approach, a child-centered teaching method, to inspire students to love learning and to develop life-long, healthy connections with nature.

Intended Audience: YI is a high-quality professional development opportunity for early childhood educators focused on utilizing the project approach to integrate nature and the outdoors into their curriculum. The original goal was to include most Northwest Iowa early childhood educators and their administrators, associates and students in the YI training through a series of three cohorts over a five-year period, with each cohort receiving three years of training and coaching. YI has been so well received, it is in multi-year development (Not sure what this means; can it be rephrased?).

Numbers Served: In 2016–2017, YI impacted 153 teachers, administrators and associates and approximately 1,200 students from 39 Northwest Iowa school districts.

Primary Partnerships Vital to the Project: YI is provided by Nature Connections, a partnership of early childhood educators and professionals facilitated by Lakeside with support from the Friends of Lakeside Lab. Additional partners include Prairie Lakes Area Education Agency, Upper Des Moines Opportunity Head Start, Creative Ventures, Northwest Area Education Agency, retired educators, and area naturalists. In 2014, the

Regents Center for Early Developmental Education (based out of the University of Northern Iowa), and Iowa State University early childhood faculty joined our YI partnership.

The Iowa Department of Natural Resources REAP CEP board voted to fully fund our 2016-17 grant request of \$43,356.00 for the fifth year of the YI program facilitated by Lakeside and the Nature Connections team.



College Prep Diatoms provides college credit to high school students.

Summary of Community Engagement

September 2016-August 1, 2017

Young Investigators 2016 - 17

- Multi-year professional development program in Nature – Based Project Approach with follow up classroom coaching
- 153 teachers, associates and administrators
- 39 Northwest Iowa school districts
- 1,200 young learners impacted

School Year Programs: Fall 2016–Spring 2017

- 859 students spring 2017
- 572 students, fall 2016 (lower number reflects time spent on Young Investigators – see above)
- 1431 Total students served (increase from 2015-16)

Summer Camps (each pre K–12 camp capped at 12)

- 8 day camps for age pre K- 9
- 83 students
- 10 camperships (scholarships provided by the Friends of Lakeside Lab)

High School College Prep Diatoms

- 9 students from across Iowa (capped at 10 students)
- Competitive application process
- One or two week course option with one to two college credits earned
- 9 scholarships provided by Friends of Lakeside Lab

Summer Community Engagement and Outreach Programs

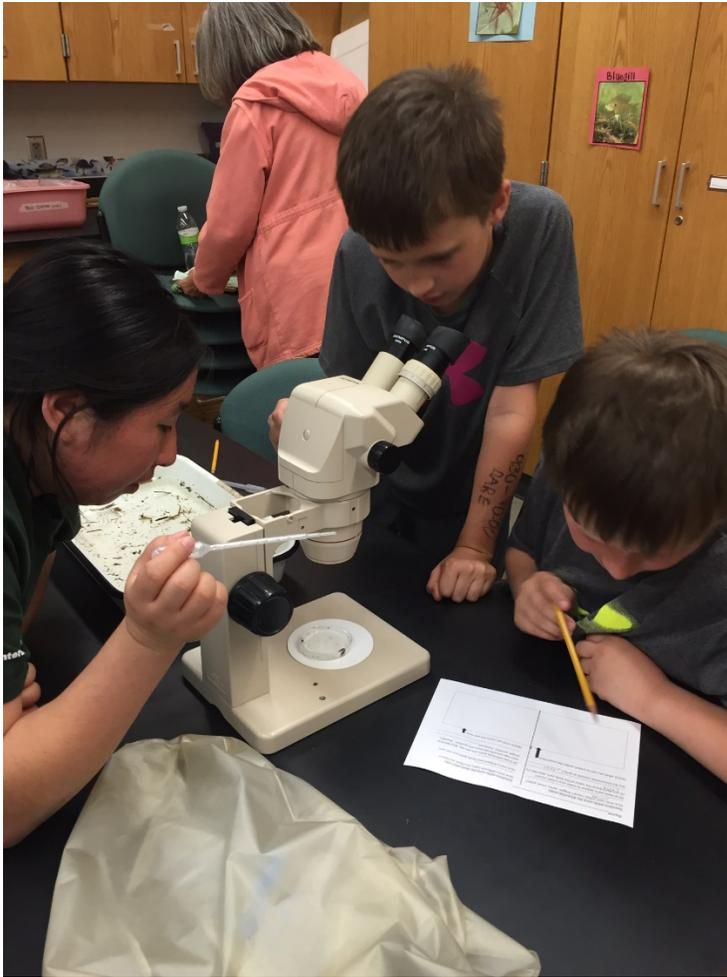
- 250 participants – 8 Wild Wednesdays (family science programs)
- 350 participants – Lakeside Treasure Hike: self-guided nature/literacy hike on Lakeside grounds, local library partnerships
- 13 Science Seminars – 700 served: average attendance of 50-70 students and members of the public
- 4 Lakeside Artist-in-Residence Open House, average attendance of 30 students and members of the public
- Sponsored a post 4th of July concert community cleanup event for Little Miller's Bay

Other Community Engagement

- Service groups (Kinship, YMCA Y Kids, and Church Camp): 160
- Co-organizer for the Prairie Lakes Conference (150 attendees; conference on water quality and land management for the Upper Midwest Region)
- Lakeside Winter Wonders Open House and Soup Fest: 100
- Public writing workshops (4): Lakeside Writer in Residence programs: 20
- Total impacted: Approx. 280
- Lakeside Science Minute – weekly summer radio spots on science topics

Volunteer Programs

- 52 water monitoring (CLAMP) volunteers, 468 hours (approx. 9 hours/volunteer including 2 hour training)
- 30 Coffee and grounds, approx. 560 hours (approx. 10 volunteers/week x 2 hours x 28 weeks)
- 21 School year volunteers: approx. 1020 volunteer hours (12 days x ave 5 hours)
- Total of 2048 volunteer hours
- Total of 103 volunteers
- *Does not include Nature Connections team hours*



Lakeside engages young minds in scientific exploration.

IV. Future Directions

The last strategic plan for Lakeside dates to 2012. While many of the elements of the 2012 plan are still relevant today, it is important to reassess Lakeside's goals and objectives to ensure that they are aligned with the Board of Regent's strategic plan and that they meet the needs of the various stakeholders. The goal of the planning process will be to identify new educational and research opportunities, ensure long-term financial stability (including increased support from outside sources), enhance community engagement, and serve as a focal point for research and education by the Board of Regents universities in the Iowa Great Lakes.

The strategic planning team includes members from each of the three Regent universities and private colleges in Iowa. These team members serve as a crucial liaison between the academic departments on their respective campuses and Lakeside. Rachel Boon is serving as the representative for the Board of Regents in the planning process. The team also includes members from the Friends of Lakeside.

Thus far in the planning process, the team has examined existing enrollment numbers, gaps, and weaknesses in academic programming and identified areas for future enhancement. Potential future directions include adding more experiential learning classes (e.g. the Okoboji Entrepreneurial Institute model where students work closely with potential employers) interdisciplinary classes, blended classes (soil formation plus archaeology, for example) or offering 16 week classes on Lakeside's campus plus on-line or distance learning for additional coursework.

Future strategic planning meetings will delve into community engagement (both in the Iowa Great Lakes community and at a statewide level), funding opportunities, and expanded internship possibilities. The timeline for the strategic planning is currently on a nine-month schedule with completion in March of 2018.



Students develop lifelong friendships at Lakeside.

The Okoboji Lakeside Laboratory

by Thomas H. Macbride

The following material has been drawn from Professor Macbride's article published in the *Proceedings of the Iowa Academy of Science* for 1909. It is an important article for the information it conveys about the new lakeside laboratory's purpose and Macbride's plans for it in the year of its creation.

The establishment of the Okoboji Lakeside Laboratory, founded by the alumni of the State University of Iowa, promises to affect so deeply the future scientific work of our state that some account of its beginning and especially its raison d'être may rightly claim the attention of the Academy. The laboratory has been located on the west shore of Lake Okoboji in Dickinson county for the reasons following:

In the first place the topography of Dickinson county is peculiar, unique. Situated on the western border of the Iowa Wisconsin drift, the region illustrates, as possibly no other equal area in the state, the special characteristics, not only of glacial moraines in general, but in particular the very expression of the Wisconsin moraine. In fact, I think that it must be admitted that the Okoboji lakes and their encompassing hills do indeed form the finest bit of morainic topography to be found on our

(Left) Thomas Huston Macbride, the dreamer whose tireless efforts sustained the laboratory in its first twenty-five years. Just two days before his death in 1934, he completed an article for the *Des Moines Register* describing the laboratory. His support of the research station continues, even from the grave. Recent bequests from his estate will be used in the fall of 1985 to enlarge the laboratory library, construction which will include "pillars [which will] shine among [the] trees . . ." (courtesy Iowa Lakeside Laboratory)

western prairie. . . .

Secondly, the region having Okoboji for its center is, by reason of the peculiar topography just mentioned, the field of a special floral display difficult to illustrate anywhere else within such narrow limits. We have a forest flora and a prairie flora; and neither in this part of the world has ever been adequately studied. It is believed that the fungal flora of the region, for instance, is especially rich and interesting. We have all kinds of habitat conditions, from aquatic to xerophytic. We have deep water, shallow water, but permanent; marshes, springs; and xerophytic [sic] slopes and hill-tops, some so dry as to offer home to the vegetation of the higher western semi-arid plains. The plankton of the lakes is filled with desmids and diatoms and all manner of algal flora, during July and August rich beyond comparison in all that makes up the tide of life for these simple but fascinating forms.

. . . the factors of ecology and distribution are all here, in large part so far, unexplored and certain to interest for centuries generation after generation of Iowa students.

For similar reasons, the fauna of the lake district will reward our constant study. The varied flora, just described, insures a varied fauna. The waters teem with animal life. Probably the protozoa of the whole valley will be found hiding on the vegetation of these [quiet] lakes and pools. Of course, the avian and vertebrate aquatic fauna are rich, and even the terrestrial vertebrates are likely to prove more than commonly worthy of investigation. While this is writing the papers tell of a mountain lion shot in one of the near-by marshy lakes! It is not believed that carnivores of size are likely to abound, not to such extent at least as to warrant a future visit from our nimrodic ex-president, but it is believed that natural science, in all its branches, entomology, ostracology, ornithology, will be greatly enriched by using such opportunity for research as Okoboji may afford.

Appendix B--revised

IOWA LAKESIDE LABS REGENTS RESOURCE CENTER	FY 13 Actual	FY14 Actual	FY15 Actual	FY16 Actual	FY17 Budget	FY17 Actual	FY18 Budget
REVENUE							
Carry forward	\$71,557	\$65,554	-\$9,103	-\$27,569	-\$14,106	-\$14,106	\$35,621
Regent university allocation	\$562,046 ¹	\$573,286	\$625,144 ²	\$592,061	\$592,061	\$592,061	\$592,061
Room and Board	\$56,565 ⁷	\$68,267 ⁷	\$47,516 ⁷	\$63,176	\$56,000	\$66,326	\$65,000
Center revenue	\$80,858	\$68,994	\$101,465	\$107,794	\$105,000	\$87,776	\$93,000
Friends & Other Support	\$44,462 ⁷	\$71,644 ⁷	\$97,248 ⁷	\$88,085	\$101,700	\$89,506	\$103,000
Course Fees	\$1,953	\$3,085	\$0	\$0	\$0	\$0	\$0
TOTAL REVENUE	\$817,440	\$850,830	862,270	823,547	840,655	821,563	888,682
EXPENDITURES							
Salaries and benefits	\$476,899 ¹	\$483,415	\$483,710	\$412,473	\$467,000	\$464,452	\$486,302
Travel and hospitality	\$31,679	\$37,829	\$54,619	\$50,793	\$51,000	\$49,058	\$54,000
Supplies and Other	\$59,421	\$45,301	\$6,830	\$21,044	\$22,000	\$21,519	\$24,000
Utilities	\$45,820	\$53,679	\$49,616	\$47,738	\$50,000	\$53,158	\$55,000
Maintenance and repairs	\$94,817	\$156,992 ³	\$228,224 ⁴	\$235,803 ⁵	\$181,655	\$141,076	\$200,380
Equipment	\$18,513	\$49,698	\$47,991	\$20,066	\$25,000	\$22,108	\$25,000
Marketing	\$4,713	\$2,122	\$493	\$2,046	\$2,000	\$1,373	\$2,000
Tuition Allocation to ISU/UNI	\$0 ⁶	\$0	\$0	\$0	\$0	\$0	\$0
Debt Service	\$0	\$0	\$0				
Scholarship Expense	\$20,024	\$30,896	\$18,356	\$47,690	\$42,000	\$33,198	\$42,000
Operational planning	\$0						
TOTAL EXPENDITURES	\$751,886	\$859,934	889,838	837,653	840,655	785,942	888,682
NET BALANCE	\$65,554	-\$9,103	-\$27,569	-\$14,106	\$0	\$35,621	\$0

¹ Includes 2.5% increase for approved salary increases, additional courses offered in Summer 2013

² Includes one time additional UI funding of \$40,393

³ FY14: Includes cost to move donated house \$18,000 - Forbes

⁴ FY15: Includes \$127,785 costs related to donated house

⁵ FY16: Includes \$ 108,180 costs related to donated house

⁶ Reimbursement to ISU/UNI net with Center revenue, payment in FY13 for previous summer/winter

⁷ Adjusted Friends reimbursement for Room/Board scholarships from Center Revenue (tuition) to Friends Support for FY12-FY15 for comparison to FY16

⁸ FY17: Includes \$74,833 costs related to donated house