



# TRANSITIONS



State Hygienic Laboratory at the University of Iowa



Dear friends,

This annual report provides an opportunity to review both the challenges and achievements of the past year. Frankly, this past year provided us with an ample supply of both. In the span of 12 months, we met a surge in water testing after historic flooding, responded to the outbreak of a new virus that evolved into a pandemic and were forced to cut our budget to survive the worst economic conditions since the Great Depression. Nevertheless, these events only worked to strengthen our resolve to see that the Hygienic Laboratory continues to meet the many unpredictable environmental and public health challenges Iowa will face.

The report also allows me to acknowledge the work of the dedicated professionals at the Hygienic Laboratory. On a routine basis, I witness a strong commitment to service for Iowa and see an extraordinary level of expertise and innovation in pursuit of the Lab's mission. Too often, because the work of these professionals is done for other agencies of government, much of what they do is invisible to the public. Few Iowans remember that we were one of the first public health laboratories in the nation to be verified by the Centers for Disease Control and Prevention to conduct novel H1N1 testing. This ability allowed the state health department to more quickly track the course of this disease as it emerged. Fewer know we continue to monitor this disease for any change in form which might be more virulent. While a good number of Iowans probably know that we do newborn testing to identify health concerns for newborns, most are not aware that we are also working at a regional level with other bordering states to ensure that this lifesaving newborn screening is sustained even during emergencies. Likewise, few know that we are one of a handful of environmental laboratories in the United States that tests for emerging contaminants, including pharmaceuticals, in surface and drinking water.

This document also provides a hint of the future. By this time next year, the Hygienic Laboratory will be in its new home on the UI Research Park in Coralville. As a result of our move from a converted tuberculosis hospital into space designed specifically for laboratory practice, we will be able to operate more efficiently and collaboratively. The new facility's open architecture will give us the ability to expand or contract our various services based upon demand whether it is caused by a disease outbreak or another agency's request. We will also be better able to partner with our University, College and state colleagues in better service, cutting edge translational research, and vital workforce development.

As we end the first decade of the 21st century, we note that the scope and significance of the Lab's work has been steadily increasing in the face of new and emerging health threats from disease, environmental conditions and a better understanding of genetic pre-dispositions to certain health effects. Moreover, we are mindful of the economic uncertainties and public health workforce shortages that remain ahead.

In times of need, Iowans have always pulled together and we want to maintain that tradition. Through our facilities in Iowa City, Ankeny and at West Okoboji, we are reaching out for new partnerships in service, research and workforce development. This report summarizes that outreach. I invite you to explore the many endeavors of Iowa's public health and environmental laboratory highlighted within, and to join us in our efforts in creating a healthier Iowa.

Sincerely,

Christopher G. Atchison, Director  
 University Hygienic Laboratory  
 UI Associate Dean of Public Health Practice

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## YEAR AT A GLANCE

### JULY

Dr. Mike Pentella, associate director, and Jon DeMartino, writer/creative consultant, create "Lab Biosafety: Avoiding Laboratory Acquired Infections." This online interactive course promoting laboratory safety premiered on The Upper Midwest Center for Public Health Preparedness Learning Management System.

### AUGUST

The new partnership between the Iowa Lakeside Laboratory Regent Resource Center and the Hygienic Laboratory marks its one-year anniversary during Aug. 1 ceremonies at the Laboratory in Milford, Iowa. Through this partnership, the renovated Bovbjerg Water Chemistry Laboratory was reopened on the shore of West Lake Okoboji to provide testing and analysis for drinking water, wastewater and surface water.



### SEPTEMBER

A new state law requiring children entering kindergarten to be tested for blood lead levels takes effect on Sept. 3. Families must show that children have been tested for the presence of lead, which can cause neurological problems and learning disabilities.

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# Laboratory responds to outbreak of novel H1N1

For six weeks in the late spring, the University Hygienic Laboratory was an integral part of the response to the outbreak of novel influenza A H1N1 (swine-like) that continued for months to come. This public health emergency captured the nation's attention and tested the preparedness of clinical laboratories and public health agencies throughout the United States.

By April 23, the new virus had caused 62 deaths in Mexico and had been confirmed in six people in California and two in Texas. This influenza virus was determined to be genetically unique, and therefore had the potential for widespread infection. The next day, a small group of Hygienic Laboratory staff met to prepare for a surge in testing that was expected soon in Iowa. The following week, the first two cases were found in Iowa.

During the initial surge in testing that began on April 27, the Hygienic Laboratory rapidly increased its testing volume to meet the demands of the epidemic, while still conducting routine infectious disease and environmental testing.



Microbiologist Jeff Benfer conducts novel H1N1 testing.

On May 6, the Hygienic Laboratory successfully completed the Centers for Disease Control and Prevention verification process to conduct molecular confirmatory testing using a process known as real-time RT-PCR for novel H1N1. The Laboratory was one of the first state public health laboratories in the nation to conduct confirmatory testing outside of CDC.

While some staff prepared for the technical aspects of testing, others pitched in to fill the demand created by a dramatic rise in test requests. Some helped assemble nearly 5,000

sample collection tubes and specimen collection kits that were sent to physicians and clinics across the state. Other employees manned the call center established to respond to novel H1N1 testing questions. All told, in two weeks time, the Hygienic Laboratory staff logged 2,654 hours directly in response to the outbreak and rapidly tested more than 1,400 specimens sent from physicians across the state.

A series of events helped prepare the Hygienic Laboratory for the novel H1N1 pandemic. In 2008, the Laboratory worked with the CDC and the Association of Public Health Laboratories (APHL) to measure the effectiveness of the method that would be used to test for novel H1N1. The Hygienic Laboratory had been performing molecular testing for influenza since 2005, and, for the previous three years, had partnered with the CDC on their real-time RT-PCR assay that was approved by the Food and Drug Administration in September 2008.

"We understood the performance characteristics of this test and had two certified instruments in-house, so we were able to rapidly start performing testing for the novel H1N1 virus," said Lucy DesJardin, Ph.D., program manager for molecular research and development. "This test was made available by the FDA and utilizes the same reagents and instruments as the seasonal influenza test."

Two key reasons for the successful response to the outbreak were recent additions to

the Hygienic Laboratory staff. Jeremi Mullins and Brock Neil, Ph.D., are Emerging Infectious Disease fellows who came to the Hygienic Laboratory within the last year through funding from the CDC and APHL. They worked with other staff to perform testing and validate the use of a high throughput nucleic acid extractor, known as "the robot" to expedite testing.



Hygienic Laboratory staff at work in the Incident Command Center during the initial outbreak of novel H1N1.

Unlike the influenza seasons of prior years, the novel H1N1 influenza virus continued to be active during the summer and into the following months. The actual impact of novel H1N1, however, may not be fully measured until after the end of the 2009-2010 influenza season.

## Remaining vigilant

Preparedness is generally associated with first responders and emergency management. Few realize that a state laboratory regularly responds to crisis events that affect both the environment and the public's health.

In addition to routine testing, the Hygienic Laboratory conducts tests in response to major disease outbreaks as well as natural or man-made environmental disasters. The threat of these emergencies requires flexibility on the part of staff members who often assist beyond their regular areas of expertise.

A look at the recent past shows some of the major environmental and public health incidents that required a sustained heightened level of response by the Hygienic Laboratory:

- 2009 - Novel H1N1 influenza
- 2008 - Floods of historic levels in Iowa
- 2007 - Lead in toys
- 2006 - Mumps outbreak
- 2005-2007 - Post-Katrina newborn screening for Louisiana

## YEAR AT A GLANCE

### OCTOBER

The University Hygienic Laboratory is one of six public health laboratories in the nation to participate in the validation of a new test that the U.S. Food and Drug Administration approved for the rapid detection of influenza virus.

### NOVEMBER

Students from West Branch Middle School calling themselves "Team Dead Weight" work with staff at the Ankeny laboratory to test how lead leaches from wheel weights into the environment. Dead Weight went on to win the Siemens "We Can Change the World Challenge," presented their findings at the United Nations and were part of a successful petition for the Environmental Protection Agency to consider changing its rules to ban the use of lead in the manufacture of wheel weights.



### DECEMBER

A grant from the Association of Public Health Laboratories funds an interactive, DVD-based game to help recruit staff in the public health laboratory system. "Did You See That?" combines science-based questions with video clips of Hygienic Laboratory staff members discussing their career paths.

# Farewell, old friend

A state health laboratory with its beginnings in 1904 and a tuberculosis hospital built in 1917—during the 1970s, these two came together as the University Hygienic Laboratory. Formerly known as the State Bacteriological Laboratory and later as the State Hygienic Laboratory, the Hygienic Laboratory moved throughout the years from various (and multiple) locations in downtown Iowa City to finally consolidate itself at Oakdale Hall in a semi-rural area outside of nearby Coralville.

Oakdale Hall was built in stages beginning in 1917 to house tuberculosis patients from across Iowa at a time before antibiotics, when the only “cure” for the disease was fresh air, good food and rest. The red brick sanitarium’s five sections stretched from east to west with many large windows – one for each room- along its three stories to supply the fresh air and light thought to help cure tuberculosis. A solarium on top of one of the sections and concrete sidewalks along the south side of the building provided places for the patients to sit in the sun. A dairy and gardens provided fresh food for the patients.

The building changed dramatically throughout the years. Additions to the south created a courtyard where the concrete sidewalks still provided a sunning place. In 1937 an administrative wing was added to the west. An auditorium to provide entertainment for the patients, who often lived at Oakdale for several years while taking the cure, was built in 1951.

As the years went by, the introduction of antibiotics for the treatment of tuberculosis caused the number of patients at the Oakdale Medical Facility to drop. In 1965, the Iowa General Assembly transferred Oakdale

Hospital and its campus to the State Board of Regents and the University of Iowa.

Meanwhile, the State Hygienic Laboratory was growing. From its beginnings in 1904 with three staff members located on the third floor of the new medical laboratory building (now the old Biology Building on the east side of the University of Iowa campus), the laboratory added responsibilities and staff. In 1927 and 1928 the lab, now grown to more than 20 staff members, moved in two steps to the new Medical Laboratories building, west of the river and close to the UI Hospital.

According to Dr. Irving H. Borts, director from 1943 to 1964, the lab was allocated enough space in Med Labs to last 50 years. In 1963, however, sections of the lab began expanding into four frame houses – the Annex – on the bluff above the Iowa River where the Law School now stands. The laboratory sections temporarily housed in the Annex included Virology, Occupational Health, Air Quality and Health Physics.

In 1971, the Hygienic Laboratory began its migration to Oakdale Hall when the mycobacteriology section of the lab was moved there to be closer to the tuberculosis patients. Three years later, the 1974 annual report refers to the lack of adequate physical facilities and that “44 percent of our Iowa City staff are located in annex facilities that are either six blocks or eight miles from the main laboratory complex.”

The renovation of Oakdale Hall began in the late 1970s. The Hygienic Laboratory moved staff from the Med Labs building first, keeping staff in the four frame houses of the Annex until more laboratory areas could be renovated. By 1986, the move was finally completed with the relocation of the Virology laboratories to the Oakdale Hall.

Twenty years later, in 2006, the UI announced that a new Hygienic Laboratory building would be constructed on the corner of Oakdale Blvd. and Highway 965 in Coralville in what is now known as the UI Research Park. And, next spring, the University Hygienic Laboratory will leave behind Oakdale Hall to move into its new, state-of-the-art home.



Top: Oakdale Hall prior to construction of the south wing

Middle: Laboratory staff at work in the old Biology Building in 1916

Bottom: Patients resting in Oakdale Hall

## YEAR AT A GLANCE JANUARY

Commercial grade peanut butter is identified as the likely source of an outbreak of *Salmonella* Typhimurium that ultimately sickened 714 people in 46 states, and may have contributed to nine deaths. Within the next three months, the Hygienic Laboratory confirms three cases in Iowa.



## FEBRUARY

The Iowa Maternal Screening Program begins providing women across the state with access to one of the safest and most effective methods to screen for Down syndrome and open neural tube defects with the addition of the Iowa Maternal Integrated Screen to testing conducted at the Laboratory.



## MARCH

More than 680 pathologists, residents, students and laboratory scientists from throughout the country take part in the CLIA (Clinical Laboratory Improvement Amendment) training session. Sites that conduct testing of clinical specimens for diagnosis, treatment or prevention of disease are required to obtain a CLIA certificate and are periodically inspected. Nancy Grove and Kristi Rotzoll conduct these CLIA visits for the state of Iowa.

# Extending the reach times 99

There are at least 99 reasons for the Hygienic Laboratory's education and outreach programs: residents in each of Iowa's 99 counties can enjoy learning experiences that target people of nearly every age in diverse locations.

As specified in Iowa Code, the Hygienic Laboratory provides consultative and training services for its environmental and public health partners in the state. This charge is mirrored in the University of Iowa mission and reflected in the Laboratory's core values as stated in the Strategic Plan.

During the past year, thousands participated in Hygienic Laboratory educational activities, from classes that deliver hands-on science over the Iowa Communications Network, to specialized training that helps scientists safely conduct testing.

## Education and Training for Professionals:

New to the educational lineup is a series of web-based courses presented in collaboration with the Upper Midwest Center for Public Health Preparedness at the University of Iowa. From the Prepare Iowa Learning Management System ([prepareiowa.com](http://prepareiowa.com)), three interactive classes lead participants through the basics of the public health laboratory system, how to avoid laboratory-acquired infections and proper handling of agents of bioterrorism.

Laboratory training goes on the road across Iowa each year with the "Fall Forum," which teaches preparedness issues related to testing for diseases and other unknown substances. Hygienic Laboratory staff also present the "Bioterrorism Preparedness Wet Workshop" to give staff in hospitals and clinics experience in handling specimens and collection protocols. Other safety and preparedness courses this past year included "Biosafety and Biosecurity for Clinical Labs" and a Hazmat seminar for first responders.



Shannon O'Neil from the VA Hospital of Central Iowa and Mike Olesen from Skiff Medical Center in Newton take part in a Hygienic Laboratory Bioterrorism Preparedness Wet Workshop.

Many of the courses are conducted in collaboration with other state and local agencies. The Hygienic Laboratory's Environmental Microbiology staff conducts the "Food Inspector Microbiology" course for the Department of Inspections and Appeals. The Iowa Department of Public Health and the Hygienic Laboratory team for an annual influenza update for health care professionals, laboratory scientists, and school and childcare workers. The two agencies, along with the Iowa Family Planning Council and Development Systems, collaborate for the Iowa Infertility Prevention Project to assist health care providers with information related to the causes of infertility.

Also drawing large audiences each year are the Environmental Laboratory Symposium for wastewater and water operators, and the Clinical Laboratory Improvement Amendment (CLIA) national training for those conducting testing of clinical specimens for diagnosis, treatment and prevention of disease.



Mike Schueller provides insight into the job of a limnologist as part of a DVD-based game called "Did You See That?"

## Student Outreach:

The Hygienic Laboratory continues to expand its outreach activities for all Iowa students. A new computer-based game called "Did You See That? Pathways to a Career in the Public Health Laboratory" gives a glimpse into the wide array of jobs in laboratory science. This unique game was funded by the Association of Public Health Laboratories and the Centers for Disease Control and Prevention. These two agencies also fund the Emerging Infectious Disease Fellowship Program. Each year the Hygienic Laboratory participates in this fellowship program by training and preparing scientists from across the country for laboratory careers.

Recipients of the Student Grant program can learn about how Iowa's public health and environmental laboratory conducts testing while developing a science project for school. Hygienic Laboratory scientists work with teachers to mentor junior high school and high school students.

As part of the Iowa Public Television K-12 Connections series, Laboratory staff also teaches students from kindergarten through grade 12 about environmental public health. These courses are taught over the Iowa Communications Network and include interactive components to promote participation.

College-age students work alongside their Laboratory counterparts to gain professional experience in their fields of study as part of the "Passport" internships program. Scientists, journalists, chemists and business students have all interned at the Hygienic Laboratory since Passport began in 2007.

Education, training and outreach are all integral parts of the Laboratory's commitment to a healthier Iowa. By sustaining perennial programs and developing novel applications, environmental and public health knowledge extends to every corner of the state. That's at least 99 reasons for learning.



Student Grant recipient Rachel Schnebbe watches chemist Shea McDowell prepare a water sample for radon testing.

# YEAR AT A GLANCE

## APRIL

The first specimens arrive at the Laboratory for novel H1N1 influenza testing. Because this is a new strain of the virus, initial rule-out testing is performed at the Laboratory and confirmatory testing is initially only performed by the Centers for Disease Control and Prevention.



## MAY

The Hygienic Laboratory successfully completes the CDC's verification process to conduct confirmatory testing for novel H1N1. The Hygienic Laboratory is one of the first state public health laboratories to conduct confirmatory testing for this new strain of the H1N1 virus.

## JUNE

The Department of Natural Resources, KCRG Channel 9 and the Hygienic Laboratory collaborate to examine water quality in the Cedar River and Coralville Reservoir one year after the devastating floods of 2008 that reached historic levels. "Even though thousands of chemicals seeped into the water during last year's flood, most have now floated down to the Mississippi River and out of our area," Channel 9 reports.

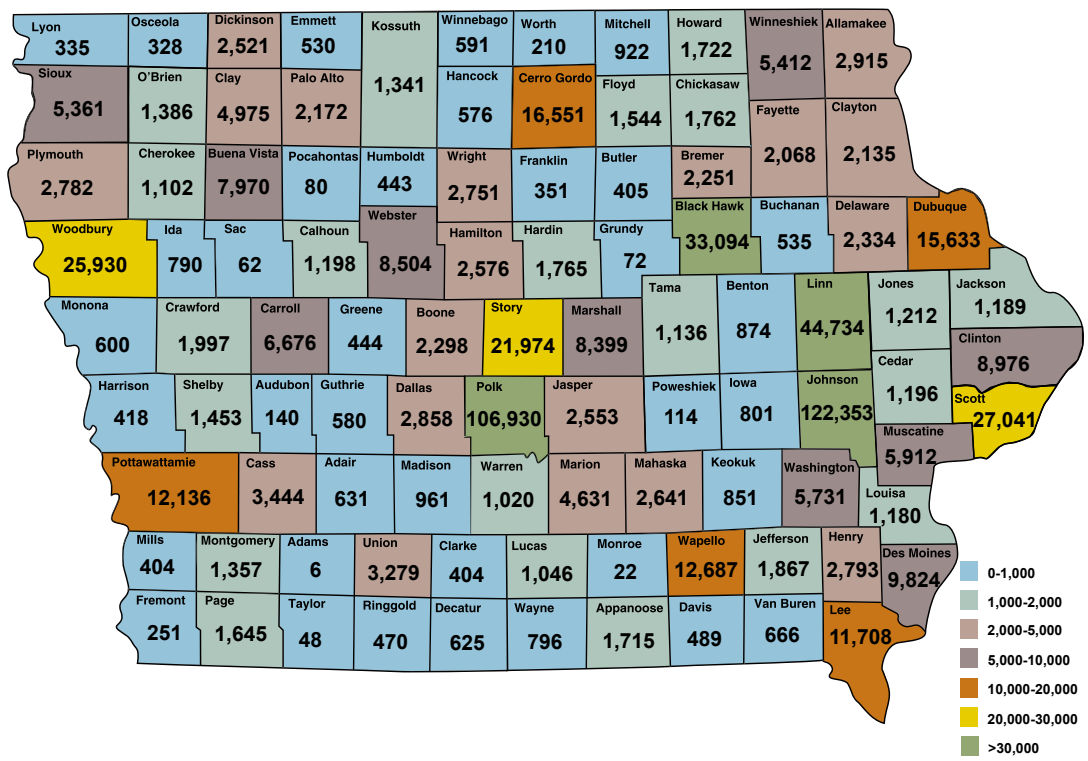


Number* of tests performed statewide by the Hygienic Laboratory in FY09	
Environmental	145,187
Infectious Disease**	144,652
Newborn	474,093
Maternal Screening	14,716
Blood Lead	30,031
Private Well	24,663
<b>TOTAL TESTS PERFORMED IN FY09 = 833,342</b>	

\*Reflects approximation

\*\*Includes testing performed at no charge for public health significance

### Total Hygienic Laboratory Tests Performed in FY 2009



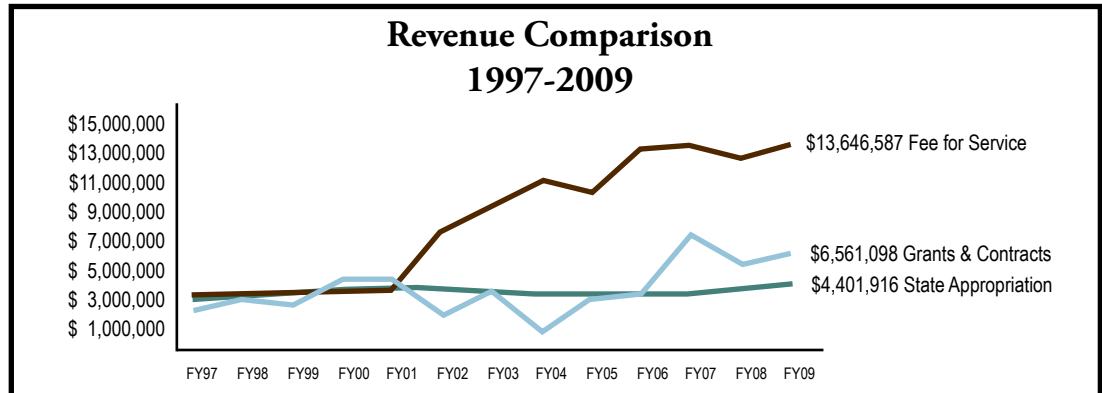
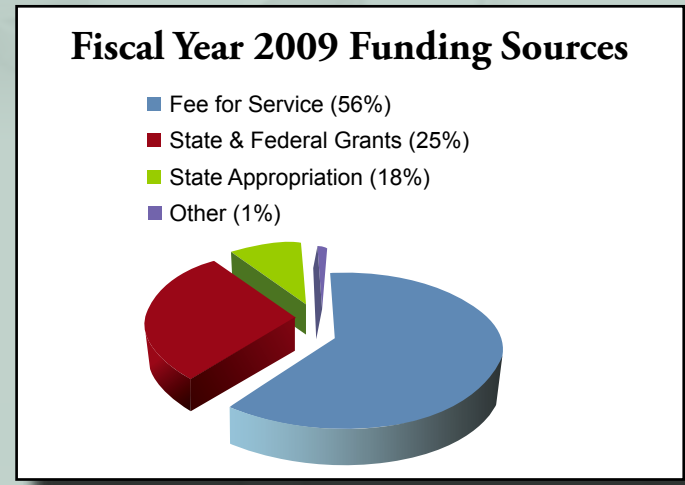
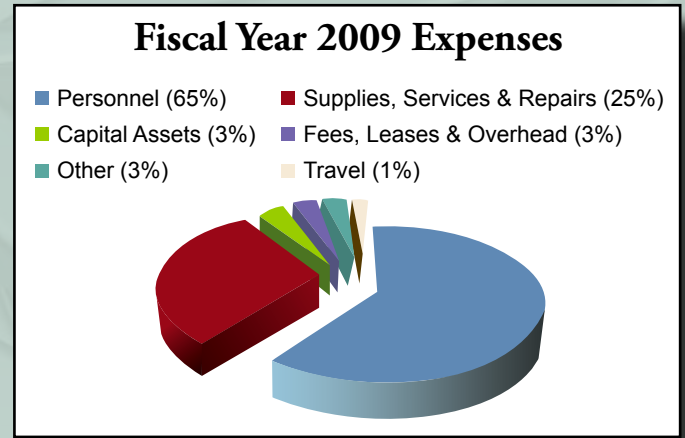
## State Hygienic Laboratory at the University of Iowa FISCAL YEAR 2009 FINANCIAL REPORT

Assets	FY2009	FY2008
Current (Cash & Accounts Receivable)	\$4,898,929	\$4,342,072
Fixed, Net of Depreciation	\$3,400,318	\$3,579,589
<b>Total Assets</b>	<b>\$8,299,247</b>	<b>\$7,921,661</b>

Liabilities and Fund Balance	FY2009	FY2008
Current (Salaries, Leases & Accounts Payable)	\$1,571,972	\$1,599,181
Fund Balance – Grants, Contracts, Restricted Funds	\$3,330,426	\$2,747,664
Fund Balance – Net Investment in Equipment	\$3,396,849	\$3,574,816
<b>Total Liabilities and Fund Balance</b>	<b>\$8,299,247</b>	<b>\$7,921,661</b>

### Statement of expenses for the year ended June 30, 2009 (with comparative statement for the year ended June 30, 2008)

Personnel	\$15,504,319	\$14,702,520
Supplies, Services & Repairs	\$ 5,935,125	\$ 6,067,426
Capital Assets	\$ 804,861	\$ 400,741
Fees, Leases & Overhead	\$ 795,406	\$ 722,526
Other	\$ 743,787	\$ 667,697
Travel	\$ 243,341	\$ 368,344
<b>Total Expenses</b>	<b>\$24,026,839</b>	<b>\$22,929,254</b>



### Notable Events and Projects

- 1997 State appropriation represented 35 percent of revenue
- 2001 Environmental Testing Expansion, and Epidemiology and Laboratory Capacity Grant
- 2002 First year of CDC Preparedness Grant
- 2006 First year of Newborn Screening in Louisiana
- 2009 State appropriation represents 18 percent of revenue



IOWA CITY



LAKESIDE LAB



ANKENY