Volunteer Lake Monitoring Program

The Lake Beat

Volunteer Lake Monitoring Program

Spring/Summer 2014

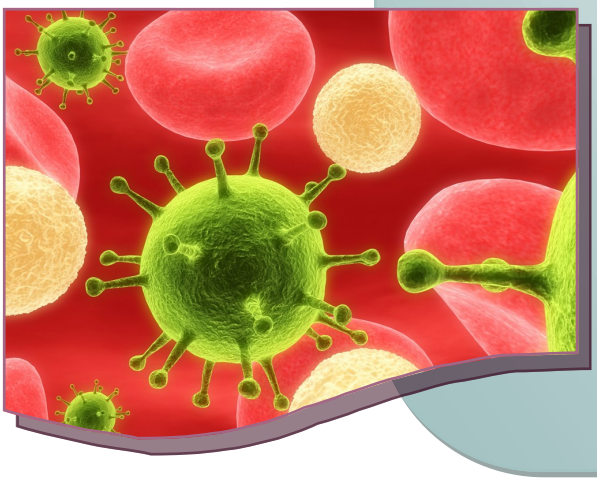
Topics:

Waterborne Pathogens

Photos: public domain via Wikipedia

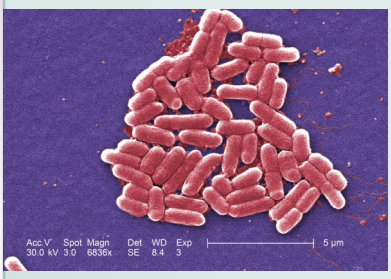
There are many kinds of living things in our lakes, ponds, and reservoirs including fish, plants, insects, reptiles, amphibians, and algae. What most of us don't think about, however, are all of the organisms that we can't see in the water, microorganisms. They are there by the millions in all terrestrial and aquatic ecosystems. Many types are beneficial, functioning as food sources, agents for chemical decomposition, and essential components of the nitrogen cycle. Other microorganisms live in the bodies of animals and aid in digestion. Of the vast number of microorganism species present in the environment, only a small number are human pathogens, typically causing illnesses that affect the digestive system. The source of these harmful pathogens is usually the feces or other wastes of humans and warm-blooded animals.

Detection of high numbers of harmful microorganisms is accomplished through testing for an indicator organism. Such indicator organisms include the fecal coliform bacteria group as a whole, as well as a particular fecal coliform, *Escherichia coli (E. coli)*. The detection of fecal coliforms or *E. coli* indicates that human or animal waste may be present and that other, harmful microorganisms may be present as well. There are three types of microorganisms that can cause illness in human: bacteria, parasites and viruses. Highlighted in the following pages are those that occur most often in Illinois lakes, ponds, and reservoirs



Waterborne Pathogens

Bacteria



Escherichia coli (E. coli)

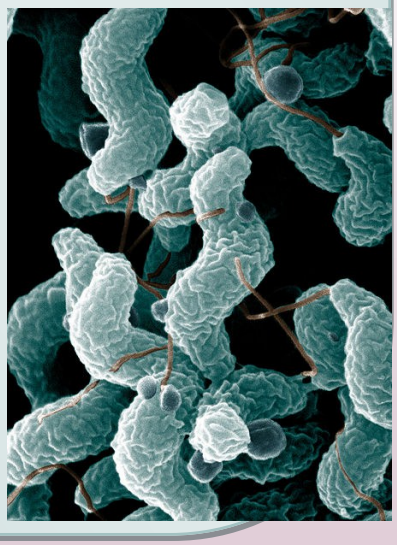
Most strains of *E. coli* are not pathogenic; however, several strains including O157:H7 can cause illness in humans. Typically, *E. coli* illness is transported by consumption of contaminated food, but there are also documented cases of consumption of contaminated water while swimming. One such case occurred at Rock Cut State Park near Rockford in 1995. Twelve children were infected with three hospitalized. Symptoms include bloody diarrhea, abdominal pain, vomiting, and fever that can last from 2 to 8 days.

Listeria monocytogenes

Listeriosis can be a serious disease and is caused by eating food contaminated with *Listeria monocytogenes*. In Illinois, approximately 20 cases of listeriosis are reported annually, and about 25% of the cases die. Symptoms include fever, intense headache, nausea, vomiting, and signs of brain infection.

Salmonella enterica

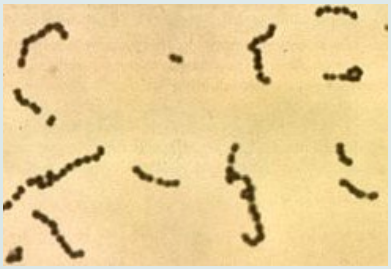
Salmonella causes most of the food-borne illness in the world. In Illinois, about 1,500 to 2,000 cases are reported each year. Symptoms include sudden onset of headache, abdominal pain, diarrhea, nausea, and sometimes vomiting.



***Campylobacter* spp.**

Campylobacter spp. cause 5-14% of all diarrhea worldwide. Chlorination in drinking water will kill Campylobacter. Symptoms are diarrhea, abdominal pain, fever, nausea, and vomiting lasting 2 to 5 days.

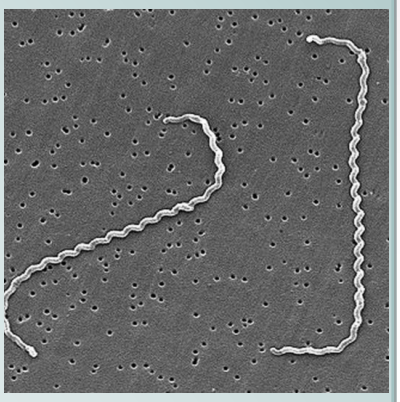
Waterborne Pathogens



***Streptococcus* spp.**

Streptococcus pneumonia causes pneumonia. Pneumonia is the leading cause of death in infants, the elderly, and those who have a weakened lower respiratory tract. Symptoms of Group A *Streptococcus* can cause sore throat, skin infection, scarlet fever, septicemia, pneumonia, and tonsillitis.

***Leptospira* spp.**



Leptospirosis is spread mainly by contact with water or soil contaminated by the urine of infected animals. It occurs worldwide in both urban and rural areas. It is often misdiagnosed as encephalitis, meningitis, or influenza. Symptoms include sudden onset of fever, severe headache, chills, muscle aches, vomiting, and sometimes jaundice, red eyes, abdominal pain, rash, or diarrhea. If left untreated, kidney damage, meningitis, liver failure, and respiratory distress can develop.

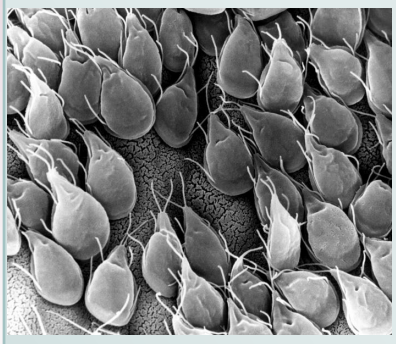
Shigella Sonnei

Shigella sonnei causes shigellosis. Every year, about 18,000 cases are reported in the U.S., 1,300 in Illinois. Shigellosis is common in areas where hygiene is poor. Children, especially toddlers from 2 to 4 year of age, are the most likely to get shigellosis. Symptoms are diarrhea, fever, and stomach cramps typically lasting 5 to 7 days.

***Vibrio cholerae, Salmonella typhi,* and *Legionella pneumaphilia*.** These bacteria cause Cholera, Typhoid fever and Legionnaires' disease, respectively. These are of lesser concern in Illinois, likely due to proper sewage treatment throughout the state, as well as the standards and treatment of surface water as a drinking water source.

Waterborne Pathogens

Parasites

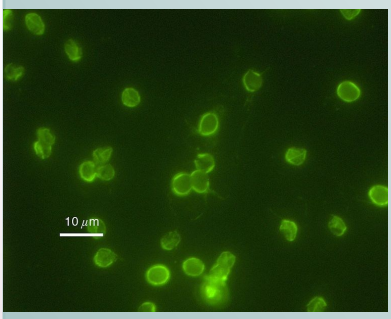


Giardia lamblia

Giardia lamblia is a common cause of *traveler's diarrhea*. It is highly contagious and may be life threatening to those with compromised immune systems. Symptoms are chronic diarrhea, abdominal cramps, bloating, fatigue, and weight loss.

***Schistosoma* spp (larvae stage)**

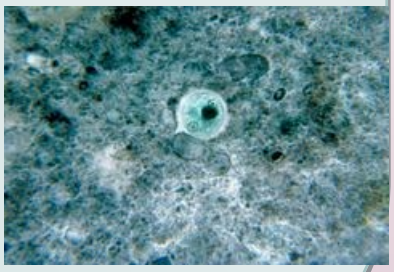
The host species of this schistosome are ordinarily waterfowl, aquatic mammals, and snails. When the larvae penetrates the skin of a human, it is unable to complete its life cycle and the human immune system rapidly kills it. It can be treated with the same lotions used for mosquito bites and other itching rashes. Symptoms are caused by the larvae of certain schistosoma of birds and mammals inadvertently penetrating human skin and causing skin irritation known as "swimmer's itch." Symptoms include tingling, burning, or itching of the skin within minutes or days after exposure. In some people, the allergic reaction may be more widespread, with itching and rash produced over much of the body. Itching may last up to a week or more but will gradually go away.



Cryptosporidium parvum

Recognized as one of the most common causes of waterborne illness in the US, mild infections are common and are a source of infections to others. *Cryptosporidium* is protected by an outer shell that allows it to survive for long periods outside the body and makes it resistant to chlorine disinfection. Symptoms of a serious infection include diarrhea, cramping, and abdominal pain: symptoms last fewer than 30 days in healthy patients.

Entamoeba histolytica

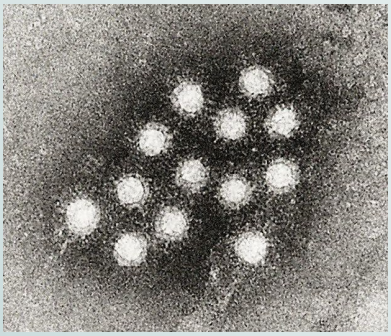


This picture shows the cyst form of *entamoeba* which aids survival through the stomach. Symptoms include abdominal discomfort, fatigue, weight loss, diarrhea, and gas pains.

Waterborne Pathogens

Viruses

The presence of these viruses in water indicates pollution from human sewage. When in cool water and bottom sediment, some viruses are so hardy that they can remain to cause infection for weeks. When compared to bacteria, viruses also have the ability to live longer and cause symptoms at lower densities.

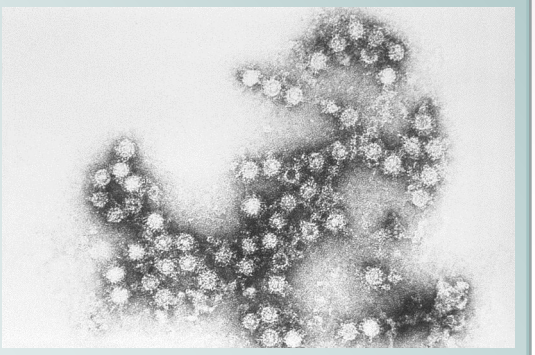


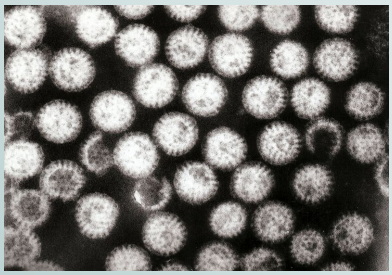
Hepatitus A Virus

Symptoms: Liver infection

Coxsackie

Symptoms: Meningitis





Rotavirus and Norwalk

Symptoms: Sever diarrhea

Promote Healthy Swimming

Everyone can promote healthy swimming by following some common sense actions to help keep pathogenic microorganisms from getting into a pool or beach water.

- ⇒ Don't swim when you have diarrhea.
- ⇒ Don't allow water to enter your mouth and avoid swallowing water if it does.
- ⇒ Take a shower before swimming and wash your hands after using the toilet or changing diapers.
- ⇒ Take kids on bathroom breaks and check diapers frequently.
- ⇒ Change diapers in a bathroom and not at beach- or pool-side.
- ⇒ Wash children thoroughly with soap and water before swimming.

Further information: Illinois Department of Public Health – 217/782-5830.

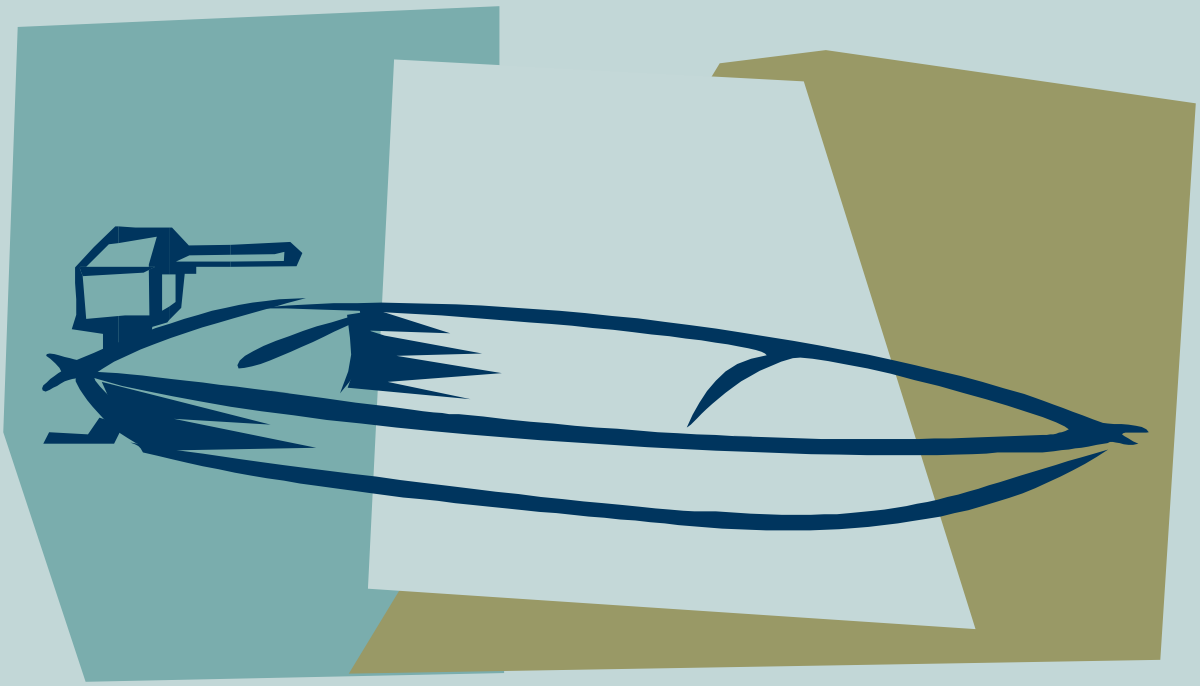
Home Page: www.idph.state.il.us/

Help Stop the Spread!

Follow this checklist against aquatic exotics:

If you are a water recreationist, boater, angler, water skier, sailor, or canoeist, there are some important things you can do to help prevent the spread of aquatic exotic species.

- Don't transport water, animals, or plants from one lake or river to another.
- Never dump live fish from one body of water to another.
- Remove plants and animals from your boat, trailer, and accessory equipment (anchors, centerboards, trailer hitch, wheels, rollers, cables, and axles) before leaving the water access area.
- Drain live-wells, bilge water, and transom wells before leaving the water access area.
- Empty bait buckets on land, not in the water. Never dip your bait buckets in one lake if it has water in it from another.
- Wash boats, tackle, downriggers, and trailers with hot water as soon as possible. Flush water through motor's cooling system and any other parts that may have been exposed to lake or river water. If possible, let everything dry for three days (hot water and drying will kill zebra mussel larvae).
- Learn what these organisms look like. Don't purchase exotic species as bait or for ornamental plantings. If you suspect a new infestation of an exotic plant or animal, report it to Illinois EPA's Lake Unit (217/782-3362), Illinois DNR's Division of Natural Heritage (217/785-8774), Illinois DNR's Natural History Survey at the Havana Field Station (309/543-6000) or the Lake Michigan Biological Station (847/872-6877).
- Consult with the Illinois EPA's Lakes Unit or your local Illinois DNR district fishery biologist for guidance before you try to control or eradicate an exotic "pest." Remember, exotic species thrive on disturbance. Do-it-yourself control treatments often make matters worse and can harm native species!



Welcome Tyler Carpenter to the VLMP Coordination Team!

My name is **Tyler Carpenter**, and I am the new Southern Regional Coordinator for the Volunteer Lake Monitoring Program. Since moving to Carbondale in November of last year, I have acquainted myself with the area by exploring the various recreational activities it has to offer. My hobbies include golfing, playing guitar, and rooting for the Pittsburgh Pirates.

Since taking the position of Regional Planner at the Greater Egypt Regional Planning & Development Commission, I have been actively involved in projects that involve water quality. The VLMP has given me an opportunity to meet and train many of the volunteers that make this program work so well.

I am a graduate of West Virginia University with a Bachelor's degree in Geography. I believe my background in GIS and natural resources will assist me in future projects with Greater Egypt.

~ Tyler Carpenter, Greater Egypt

The Lake

In spring of youth it was my lot
To haunt of the wide world a spot
The which I could not love the less-
So lovely was the loneliness
Of a wild lake, with black rock bound,
And the tall pines that towered around.

But when the Night had thrown her pall
Upon that spot, as upon all,
And the mystic wind went by
Murmuring in melody-
Then-ah then I would awake
To the terror of the lone lake.

Yet that terror was not fright,
But a tremulous delight-
A feeling not the jewelled mine
Could teach or bribe me to define-
Nor Love-although the Love were thine.

Death was in that poisonous wave,
And in its gulf a fitting grave
For him who thence could solace bring
To his lone imagining-
Whose solitary soul could make
An Eden of that dim lake.

~ Edgar Allan Poe (1809-1849)

Harmful Algal Bloom (HAB)

Contact EPA.HAB@illinois.gov

&

your regional VLMP coordinator

Remember

If you find Hydrilla or any new exotic species in your lake, contact your regional VLMP coordinator.

Regional Coordinators:

VLMP Statewide Contacts

Greg Ratliff, IEPA, Springfield, 217-782-3362 & greg.ratliff@illinois.gov

Northern Coordinator

Holly Hudson, CMAP, Chicago, 312-454-0400 & hhudson@cmap.illinois.gov

Lake County Coordinator

Mike Adam, LCHD, Libertyville, 847-377-3002 & madam@lakecountyil.gov

Southern Coordinator

Tyler Carpenter, GERPDC, Marion, 618-997-9351 & tylercarpenter@greateregypt.org

www.epa.state.il.us/water/conservation/vlmp

Lake Education Assistance Program

(LEAP) Grants

This Illinois EPA LEAP grant program provides funding (up to $500 per application period) for lake and lake watershed related educational field trips, seminars, workshops, projects, or activities. Projects and activities must have stated goals, involve the lake or its watershed, and provide education to teachers, students, organizations or the community. LEAP is a reimbursement grant, therefore, costs will be reimbursed following completion and documentation of projects, activity, etc. Application deadlines are September 30 and January 31. Only one application per school or organization for each application period will be accepted.

For more information, visit http://www.epa.state.il.us/water/conservation/leap.html.

~Greg Ratliff, LEAP Contact