

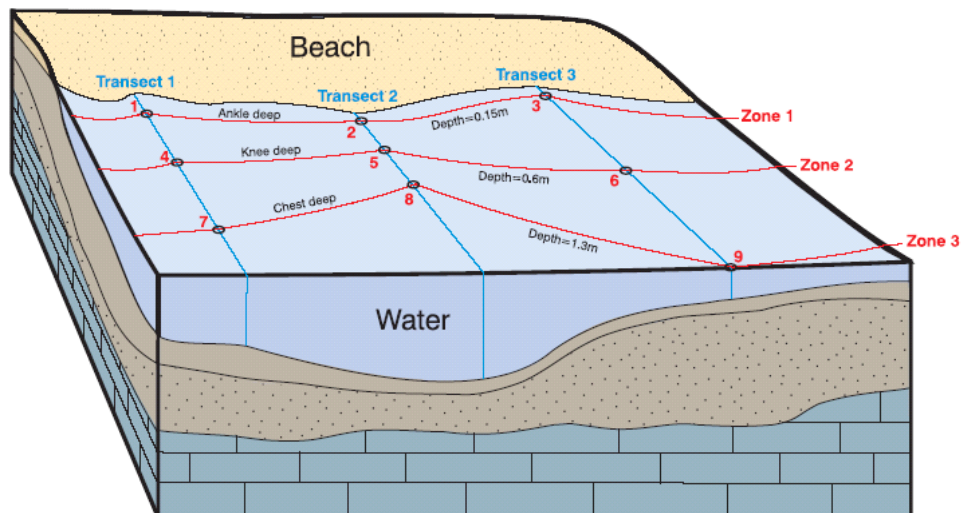
Summary of Harmful Algal Bloom Illness Surveillance Program - A Cooperative Program between the Iowa Department of Public Health and Iowa Department of Natural Resources

Since 2008, the Iowa Department of Public Health and the Iowa Department of Natural Resources have been involved in a harmful algal bloom illness surveillance program. This program involves the routine monitoring of water within the beach areas of State of Iowa recreational areas for microcystin toxin within harmful algal blooms and the attempt to capture human and animal illnesses that are associated with exposure to elevated levels of microcystin toxin. The following paragraphs summarize the program and the responsibilities of each agency.

Routine Monitoring Completed by Iowa Department of Natural Resources

Water samples are collected from 38-state owned beaches at least once a week between Memorial Day and Labor Day. Samples are collected from nine sampling points consisting of three transects along the beach (center and two ends) at three water depths (ankle-, knee-, and chest-deep) as shown in the figure below. Samples in ankle deep water are collected as surface grabs, while the samples and knee and chest-deep are collected at a depth of six inches.

Figure 1 — Block Diagram of Beach Composite Sampling Points.



In the event that the sampling point falls within the middle of an algal mat, field personnel disturb the water as a swimmer would for 10 seconds and then collected the sample. Water from the nine sampling points is gently homogenized within a larger composite bottle.

The composited water samples are analyzed by the IDNR. For the purposes of protecting public health analysis are completed for total microcystins, not just dissolved microcystins. For this reason, toxins are extracted from the algal cells in a 15 ml aliquot using an ultra low temperature freeze/thaw process, consisting of three cycles. Levels of toxin within the processed samples are determined by the ELISA method (Enzyme-Linked Immuno Sorbent Assay).

In addition to the collection of water samples for determination of total microcystins, other environmental data is collected during the sampling events. The pH, temperature, dissolved oxygen content, and turbidity is measured in the field for each composite sample obtained.

The action level for total microcystins is 20 µg/L. If composite water sample results are greater than 20 µg/L then a warning sign is posted at the beach location by IDNR personnel. The following text is included within the warning sign:

“ Concentrations of toxins produced by blue-green algae currently exceed acceptable guidelines for recreational use. Until Further Notice:

- Swimming is strongly discouraged.
- Do not drink lake water.
- Keep children and pets away from the water.
- Clean fish well and discard guts.
- Avoid areas of concentrated algae when boating”

In addition, the IDPH is notified of the exceedance to the action level and IDPH personnel take additional action as described in the paragraphs below.

Public Health Notification and Illness Surveillance Completed by Iowa Department of Public Health

For the past four years the Iowa Department of Public Health has designated suspected or confirmed exposures to microcystin (blue-green algal poisoning) as a reportable disease in Iowa. With this requirement all Iowa health care providers and public, private, and hospital laboratories are required to report by the next business day any suspected or confirmed cases of exposure to microcystin to the department’s notification hotline.

When results of exceedances to the 20 µg/L action level for total microcystin have been reported by the IDNR, the IDPH implements a notification to local public health partners through its Health Alert Network (HAN). The HAN links state and local public health agencies, hospitals, laboratories, community health centers, community first-responders, and other federal, state, and local partners. Through the HAN important and timely health information can be communicated to appropriate people and agencies throughout the state. The notification that is submitted through the HAN includes that location of the exceedance to the total microcystin action level and requests that suspected or confirmed cases of

exposure to microcystin (blue-green algal poisoning) be reported to the Iowa Department of Public Health. In addition to notification through the HAN, the IDPH also notifies the Iowa Department of Agriculture and Land Stewardship veterinarian and the Iowa Veterinary Medical Association to alert veterinarians on their networks a request that suspected cases of microcystin poisoning in animals be reported to the IDPH.

Information is collected on each suspected case of microcystin poisoning that is reported to the IDPH. Suspected cases of microcystin poisoning can be determined by looking at the symptoms of the individual exposed and their exposure history. The Iowa Department of Public Health looks at the following symptoms as indicating possible microcystin poisoning:

- Rash, hives, or skin blisters (especially on the lips and under swimsuits).
- Gastrointestinal symptoms such as stomach pain, nausea, vomiting, diarrhea, severe headaches, and fever.
- Runny eyes and nose, cough, and sore throat, pleuritic pain, asthma-like symptoms, or allergic reactions.
- Exposure to large amount of microcystin can cause liver damage (elevated gamma glutamyl transpeptidase).

The following criteria are used to designate a suspected case as a potentially confirmed case of microcystin poisoning:

- Gastrointestinal symptoms, or
- Respiratory symptoms, or
- Dermal symptoms, or
- Elevated serum GGT (gamma glutamyl transpeptidase)
- AND history of exposure to a water body with elevated microcystin levels within 7 days of onset of the symptoms.

The following paragraphs include a summary of the human and animal suspected cases of exposure to microcystin toxin and lessons learned from each year of illness surveillance.

2008-2009 Human and Animal Illness Report

Three suspected human exposures were reported to IDPH. Two of these reports came in from local public health workers and one was self-reported. Skin rash was the primary symptom reported in all three instances. None of the cases were confirmed. No cases of animal exposure were reported.

During this first year, the experience collecting human and animal health data related to HABs was limited. The IDPH successfully used the Iowa Health Alert Network and an email notification system to

alert health care providers and veterinarians about potential HAB related illnesses. The IDPH adopted a harmful algal bloom-related illness surveillance form which guides our telephone interviews with providers and patients. It is helpful to have a health professional to conduct the interviews, to help define and prompt recollection of symptoms.

Health care providers may not be collecting the amount of detail we are asking them to report; for example, time and length of exposure. The IDPH found that personal follow up with patients is needed to provide us with the level of detail needed for our program. The IDPH will continue to work with our state and local partners and use the Iowa Health Alert Network system to notify health care providers about potential HAB related illnesses.

2009-2010 Human and Animal Illness Report

Five cases of suspected human exposures were reported to IDPH. Four of these reports came in from local public health workers and one was self-reported. Skin irritation and rash was the primary symptoms reported for all five cases of suspected human exposures. Fever was present in one of the human exposure cases. None of the cases were confirmed.

Three cases of suspected animal cases were reported. One case was a dog which had symptoms of weakness, inability to walk, diarrhea, vomiting, and low body temperature. These symptoms subsided after 24 hours. Another case was a dog which had symptoms of lethargy, fever, rapid breathing, and tremors. These symptoms also subsided within 24 hours. The remaining suspected case was a cow that was observed dead a short time after exposure to a lake that had experienced an algal bloom. These three cases were not confirmed.

During this second year, the IDPH was able to increase the amount of human and animal health data that was collected. It was felt that after the second year of requiring the reporting of suspected exposures to algal blooms, local health care providers and veterinarians were more aware of the need to report to the IDPH. The improvements to the surveillance forms provided by the CDC have been helpful in obtaining more of the information that is needed to input to the HABISS database. The ability for individuals to contact the IDNR through the department web site has provided an additional avenue for reporting suspected exposures.

2010-2011 Human and Animal Illness Report

Fourteen cases of suspected human exposures were reported to IDPH. Nine of these cases were reported by health care providers, four of these cases were self-reported, and one case was reported by a local county public health office. In 2011, five of the cases had skin irritation and rash as the primary symptoms associated with the suspected exposure to harmful algal blooms; and 9 of the cases had gastrointestinal issues (stomach pain, cramping, diarrhea, gas, vomiting, sore throat, and sores in mouth) as the primary symptoms associated with the suspected exposure to harmful algal blooms. This high number of gastrointestinal issues associated with exposure to harmful algal blooms was somewhat unexpected. Normally, skin irritation and rash is the more common symptom associated with recreational exposure to harmful algal blooms.

During 2011 there were no cases of animal exposure to harmful algal blooms reported to the IDPH. In most years there are several cases of suspected animal exposure to harmful algal blooms reported in the state of Iowa.

During this third year of the program, the IDPH was able to increase the amount of human and animal health data that was collected. It was felt that after the third year of requiring the reporting of suspected exposures to algal blooms, local health care providers and veterinarians continue to more aware of the need to report to the IDPH. The improvements to the surveillance forms provided by the CDC continue to be helpful in obtaining more of the information that is needed to input to the HABISS database. The ability for individuals to contact the IDNR and IDPH through the department web site has provided an additional avenue for reporting suspected exposures.

2011-2012 Human and Animal Illness Report

There were just two cases of suspected human exposures reported to IDPH during the 2012 algal bloom season. One of the cases was a 5-year old male who was suspected of being exposed to elevated levels of microcystin toxin in a lake for about 8 hours. This child was only dermally exposed and experienced a rash that lasted about 3 weeks. The other case was a 21-year old female who was suspected of being exposed to elevated levels of microcystin toxin for only one-half hour. This person was orally and dermally exposed and experienced a sore throat that lasted about one week; and also experienced fatigue, fever, headache, loss of appetite, nasal congestion, nausea, joint pain, and dizziness that lasted for several days. There were fewer reported cases of suspected exposure to microcystin toxin during 2012 then there were in 2011, although there were about the same number of incidences of elevated microcystin toxin levels in 2012 when compared to 2011.

During 2012 there were no cases of animal exposure to harmful algal blooms reported to the IDPH. In most years there are several cases of suspected animal exposure to harmful algal blooms reported in the state of Iowa.

During this fourth year of the program, the amount of human and animal health data that was collected went down dramatically (from 14 human cases of exposure to 2 human cases of exposure). At this time we are uncertain if the additional efforts in educating the public and posting notices at public recreational areas have contributed to this reduction in cases. The Iowa Health Alert Network continues to be an efficient avenue of getting health information out to local county health and to local health care providers.