Harmful Algal Bloom (HAB) Advisory Guidance

Version 1.0

Prepared by

NMED Surface Water Quality Bureau

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Introduction

Purpose

The New Mexico Environment Department (NMED) Surface Water Quality Bureau (SWQB) in collaboration with the New Mexico Department of Health (NMDOH), resource management agencies, and other stakeholders have developed a Harmful Algal Blooms (HABs) Advisory Program for New Mexico to inform collaborators and the public when HAB are present in New Mexico surface waters so they can make informed decisions to protect public and animal health. This HAB Advisory Guidance provides NMED, NMDOH, resource management agencies, and other cooperators with procedural guidelines should a HAB be suspected in surface waters in New Mexico. The plan also outlines the process should an HAB be identified in a public drinking water supply and information on reporting potential HAB-related illnesses. Publicly accessible lakes and reservoirs used for recreation are the primary focus of this plan and NM's HAB Advisory Program at this time because these waterbodies are the most likely to be associated with exposure of people or animals to cyanotoxins or other cyanobacteria-related irritants via water contact, accidental ingestion, or inhalation. Information in this plan can also be used for other surface waters where HABs occur. The plan will be reviewed at least annually by NMED SWQB and will be updated as new information on this emerging contaminant is determined and becomes available. When changes affect the scope, implementation, or outcome of HAB advisories, this guidance document will be revised accordingly.

Background and HAB Ecology

Cyanobacteria are naturally occurring important components of the aquatic environment. Cyanobacteria is commonly referred to as blue-green algae since cyanobacteria appear and function similarly to algae; however, cyanobacteria are not true algae. Under normal conditions, cyanobacteria are present in the water column or attached to surfaces at low levels.

HABs occur when dense concentrations of certain cyanobacteria capable of producing cyanotoxins that can have serious health consequences for humans, pets, and livestock quickly form, and can rapidly become toxic when these cyanotoxins are released into the water column when cells rupture or die. Other consequences of HABs include but are not limited to food web alterations and ecological dead zones (e.g., fish kills); ecotourism and property value losses; and negative impacts on drinking water supplies, agriculture, and wildlife (Carmichael 1992, Fawell et al. 1993, WHO 1999, WHO 2021).

When HABs occur, cyanobacteria typically become visibly abundant and form dense brown, tan, green, red, pink, or blue-green colonies. Blooms on or in the water may look like spilled paint,

grass clippings, scums, or turbid water. Mat-forming HABs may occur on rocks, sediment, wood, aquatic vegetation, or artificial material, along with algae, microbes, and inorganic material.

Cyanotoxins can be produced by both planktonic (e.g., drifting or moving along in the water column) and mat-forming HABs (connected to the substrate). Many factors, including excess nutrients, sunlight, wind, flow, and temperature contribute to the formation of planktonic HABs. Although HABs can occur at any time, they are more likely to occur in late summer and early fall when temperatures are warm, water levels have stabilized, nutrients have been assimilated, and primary productivity increases. HABs may occur in some lakes and reservoirs following turn-over when nutrients are released from the bottom as cooler water is brought toward the surface. Shallow lakes and reservoirs with long residence times or elevated concentrations of nutrients have an increased likelihood of blooms. Mat-forming blooms are most common in wadable streams and rivers, but can also be found in lakes, reservoirs, and hot springs (CA NCRWCB 2022).

Exposure Routes and Health Effects

General health effects caused by exposure to toxic algae vary according to the type of toxin, the level of exposure, and the type of exposure (dermal, inhalation, and incidental ingestion).

Human symptoms include:

- skin irritation
- stomach cramps
- rashes
- kidney / liver damage
- fever
- sore throat
- headaches
- muscle / joint pain
- diarrhea
- neurotoxic effects
- hives
- nausea / vomiting
- increased asthma symptoms
- allergic reactions such as rhinitis (stuffy / runny nose)

Animals, especially dogs, may experience poisoning. Symptoms of pet poisoning include swelling of mouth, ear, or udder, vomiting, seizures, rashes, disorientation, staggering, inactivity, etc. and in extreme cases, sudden collapse and death (EPA 2019). See Appendix A for more information on pets and livestock.

There is inadequate evidence at this time to determine whether these toxins from algae cause cancer or other long term illness in humans or pets. See Appendix A for how thresholds were determined.

Advisory Guidance Thresholds

One objective of this plan is to identify cyanobacteria and cyanotoxin thresholds that will be used to inform the public and cooperators when human health risks may be present based on the presence of a HAB and the presence of cyanotoxin concentrations that exceed recreational thresholds (see Appendix A for additional details regarding how these thresholds were determined). This information can then be used by the public and cooperators to take appropriate precautions to protect the health of people and animals. Such actions may include, but are not limited to, avoiding areas with blooms, limiting access to waterbodies, cleaning fish properly, and conducting additional monitoring of public water supplies.

Table 1 details advisory guidance thresholds for recreational waters affected by HABs for three advisory levels – HAB WATCH, HAB WARNING, and HAB DANGER

Table 1. Advisory Status and Thresholds

	HAB WATCH	HAB WARNING	HAB DANGER
Toxigenic cyanobacteria cell density (cells/mL)[1,2,3]	Visual indication of HAB Presence (Determination by NMED based on photo and/or laboratory analysis)	>100,000 (determined by laboratory analysis)	none
Microcystins (µg/L) [1,2,3,4]	≥0.1	>8	>2,000
Cylindrospermopsin (µg/L) [3,4]	≥0.04	>15	none
Anatoxin-a (µg/L)[3,4,5,6]	≥0.1	>15	>90
Saxitoxins (µg/L) [3,5,7]	≥0.02	>8	>75

[1] WHO 2003
[2] WHO 2021
[3] USEPA 2019a
[4] Based on contract laboratory Reporting Limits used by NMED
[5] OHA 2021
[6]CWQMC 2016
[7] EFSA 2009

	HAB WATCH	HAB WARNING	HAB DANGER
Health risks	Low Risk, but Potential for risk level to quickly increase	Potential for long-term illness	Potential for acute poisoning Potential for long-term illness
		Short-term effects (e.g., skin and eye irritation, nausea, vomiting, diarrhea)	Short-term effects (e.g., skin and eye irritation, nausea, vomiting, diarrhea)
Recommended actions (NMED and resource managers)	Issue WATCH advisory to avoid primary contact recreation where HABs are observed	Issue WARNING advisory to avoid primary contact recreation	Issue DANGER advisory to avoid primary contact recreation
	Post WATCH signs	Post WARNING signs	Post DANGER signs
	Sampling recommended at least once every 2 weeks	Sampling recommended at least once every two weeks	Consider CLOSURE Sampling recommended at least once every two weeks

Table 2. Advisory Status and Recommendations for Recreationists

HAB WATCH
A **HAB WATCH** advisory means there is evidence that a harmful algal bloom is developing.
• As always, do not drink untreated surface water or get it in your mouth. • Avoid algae blooms while swimming and wading. Swimming is not recommended near visible blooms. • Supervise and keep pets away from both water and shoreline algae and rinse them with clean water if contact occurs. • Rinse fish with clean water prior to cooking thoroughly and eat only the fillet portion.

Table 2. Advisory Status and Recommendations for Recreationists (cont.)

HABWARNING
A **HAB WARNING** advisory usually means measured values exceed thresholds established by the NMED in a waterbody or portion of a waterbody. This is a strong indication that a harmful algal bloom is present.
• Do not drink the water or get it in your mouth • Do not swim or water ski. • Adults should avoid algae blooms while wading. • Supervise children and prevent them from entering the lake or playing near algae deposited on the shoreline. • Keep dogs or other animals away. • Avoid areas of algae when boating or paddleboarding. • Use caution when fishing because the effects of HAB toxins on fish are not well understood. If you choose to fish, rinse fish with clean water prior to cooking thoroughly and eat only the fillet portion.

HAB DANGER
A **HAB DANGER** advisory means measured values greatly exceed thresholds established by the NMED in a waterbody or portion of a waterbody. This usually means the bloom has become very large and/or high levels of dangerous toxins have been measured. A portion or the entire waterbody may be temporarily closed by the resource manager as part of the HAB DANGER Advisory.
• Do not drink water or get it in your mouth • Do not swim, wade, paddleboard, boat, or water ski • Keep dogs or other animals away. • Eating fish at these toxin levels is not recommended because the effects of HAB toxins in fish are not well understood. If you choose to fish, rinse fish with clean water prior to cooking thoroughly and eat only the fillet portion.

Advisory Guidance Process

The following procedures have been developed for notifying the resource managers and the public of recreation risks in surface waters associated with HABs. New Mexico's HAB response strategy is based on four steps: 1) Surveillance, Reporting and Preliminary Screening; 2) Data Collection; 3) Determining Advisories and Updating the HAB Advisory Map; and 4) Lifting Advisories

Step 1: Surveillance, Reporting and Preliminary Screening

One of the most important aspects of HAB surveillance is the recreating public. To maximize public participation in the advisory program as well as HABs reporting, NMED and cooperators should inform and educate the public about HABs and the advisory program. NMED may issue a press release at the beginning of the HABs season to remind the public of the upcoming season, the health risks associated with HABs, and how to identify and report HABs and HAB-related illnesses. NMED, DOH and cooperating agencies should work to inform the public of the adverse health effects associated with HABs and how to identify and report a suspected bloom and any cases of human or animal illness or death. Useful information about HABs, how to identify them, and what to do in the event of a HAB can be found on the NMED HAB Advisory webpage. In the event of a public health notification or closure, NMED, DOH and cooperating agencies should coordinate to ensure that information is disseminated via signs, press releases, videos, websites, social media, and other public forums.

NMED, DOH and all cooperators encourage anyone experiencing symptoms possibly related to a HAB event to call the New Mexico Poison and Drug Information Center at 1-800-222-1222. The Poison Information Center coordinates reported HAB cases with DOH to be reported to the EPA One Health Harmful Algal Blooms System (OHHABS). OHHABS is a collaborative network between state and federal partners and provides electronic reporting by state and local health departments via the National Outbreak Reporting System (NORS), case studies of HAB-related illness surveillance, and support from the Great Lakes Restoration Initiative that uses OHHABS data to inform their restoration objectives. More information and resources can be found on the OHHABS website. DOH will review the information and relay illness reports to NMED so follow-up monitoring can occur.

> To report a bloom, the public and resource managers should use EPA's bloomWatch app. BloomWatch is a participatory science app that allows users to find and report potential cyanobacteria blooms in water bodies. The data users provide help NMED and EPA track and manage water quality to protect public health and the environment from harmful blooms. NMED encourages everyone to download and review how to use the bloomWatch app to report suspected harmful algal blooms.

Waterbodies with heavy recreational use, particularly those with swimming beaches or those that are frequently used for swimming and similar water contact activities, should be visually inspected by management agencies weekly during periods of high recreational use (approximately May through November). Some priority lakes identified by NMED are routinely monitored, generally monthly, during the HAB season (approximately mid-July through November). Visual inspection should generally occur through observations by resource management agencies (e.g., New Mexico State Parks, National Park Service, New Mexico Wildlife Department, United States Forest Service, Bureau of Land Management, US Army Corps of Engineers, Bureau of Reclamation, United States Fish and Wildlife Service) as well as NMED, municipalities, and other cooperators.

Field tests are optional but may provide preliminary information on the potential health risks of a suspected HAB as well as the type of laboratory analysis that should be conducted. Once reported to NMED, suspected HABs can be evaluated by NMED or a cooperator using jar and/or stick tests to determine whether cyanobacteria are present (see procedures as well as safety protocols in NMED's HABs SOP 13.2 for procedure). Cooperators can also use field test strips (e.g., Abraxis Strip Test®) to test for cyanotoxins. Samplers should follow test strip protocols provided in their purchased test kit. Field test strips, jar and/or stick test will be used to prioritize sampling by NMED SWQB and cannot be used to determine exceedances of HAB WARNING and HAB DANGER thresholds.

Resource constraints may limit the number of lakes and reservoirs that can be inspected on a routine basis by resource management agencies, and the public may not consistently report suspected blooms. Therefore, NMED will use Cyanobacteria Assessment Network (CyAN) and EPA's HAB Forecasts satellite imagery can detect HABs due to the unique spectral signature of cyanobacteria. Although EPA is actively working to improve resolution, for lakes and reservoirs to be considered resolvable by CyAN, they currently must meet a minimum size requirement (300 by 300 meters) at this time. According to EPA, this size threshold results in approximately 14 New Mexico waterbodies that can be monitored remotely by NMED. NMED will analyze imagery for these waterbodies using screening metrics that determine the areal extent of blooms and bloom persistence over time. NMED may also use CyAN imagery to determine if smaller lakes and reservoirs should be investigated.

Step 2: Water Quality Data Collection

NMED SWQB will schedule a sampling event ASAP as resources allow as detailed in respective HABs and priority lake Sampling and Analysis Plans (SAPs) and SWQB's HABs Standard Operating Procedure (SOP) 13.2. NMED will take photos and collect water samples for cyanotoxin analysis as well as cyanobacteria identification and enumeration as resources allow. Total microcystins,

will generally be evaluated during all sampling events. Cylindrospermopsin and other cyanotoxins will be evaluated when they may be elevated and as resources allow.

NMED does not provide analytical support for private waterbodies unless there is a public health concern associated with the waterbody. If other entities or landowners are interested in having samples analyzed, a list of common laboratories that analyze cyanobacteria and cyanotoxins can be found on EPA's website: https://www.epa.gov/cyanohabs/laboratories-analyze-cyanobacteria-and-cyanotoxins.

Step 3: Determining Advisories and Public Notification Steps

NMED will utilize available data that meets the NMED SWQB quality assurance requirements to determine where to issue advisories based on exceedances of advisory thresholds. The public health notification process includes (1) updating New Mexico's HABs Advisory Map, (2) posting signs at the waterbody, and (3) optional additional public outreach via press releases or social media.

All current advisories will be available on the HABs Advisory Map. Additional information related to extent of the current advisory will be identified on the map. NMED encourages cooperators and recreationists to visit the webpage for the most up-to-date information.

When NMED Issues HAB Advisories, NMED will work with the resource managers on a public information campaign including signage at the waterbody. NMED will not always be able to post signage in a timely manner. It is expected for resource managers and cooperators to post the necessary signage whenever possible. NMED will share signage files for agencies to print and post. NMED will also work with resource managers to procure and distribute more durable signage where necessary.

Once an advisory has been issued for a waterbody, NMED and resource management agencies will continue to monitor the location, extent, and severity of HABs to provide the most up-to-date information to recreationists. NMED will discontinue routine monthly monitoring at the end of November. In circumstances where data indicates that an advisory should be changed (such as elevating a **HAB WATCH** to a **HAB WARNING** or lifting an advisory), the public health notification (e.g., map, listserv notice, etc.) will be updated accordingly. Resource management agencies should also ensure that any human illnesses or animal deaths have been reported to DOH.

Step 4: Lifting and Discontinuing Advisories

HAB WATCH will be lifted if there is evidence that a bloom has fully dissipated at a waterbody, as indicated laboratory cyanobacteria toxin analyses and/or cyanobacteria identification**. HAB WARNING** and **HAB DANGER** will be downgraded to the appropriate status if cyanotoxin concentrations from two consecutive sampling events at the site, separated by at least 1 week (i.e., 7 days, 168 hours), are below the applicable **HAB Advisory** thresholds. Any advisories that have not yet lifted will be lifted on November 30th due to winter conditions unless current toxin levels indicate otherwise. HABs can pop up anytime and anywhere, therefore it is best to always exercise caution; when in doubt stay out.

Once confirmed, NMED will change the waterbody status, or it will be removed from the Current Advisory tab on the NMED's HABs advisory Map. Cooperators and the public are encouraged to check the New Mexico HABs Advisory Map for information on sampling results and advisory status. Resource management agencies should continue to observe the waterbody and report new cyanobacterial blooms if they appear.

Contact information

Report a bloom: bloomWatch app

Immediate health concerns: New Mexico Poison Information Center: 1-800-222-1222

Animal illness info:

ASPCA Poison Control: 1-888-426-4435

Pet Poison Helpline: 1-855-764-7661

New Mexico Environment Department Surface Water Quality Bureau:

https://www.env.nm.gov/surface-water-quality/habs/

swqmonitoring@env.nm.gov

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Appendix A: Rationale for Selected Thresholds

Cyanotoxin Thresholds

In May 2019, the US Environmental Protection Agency (EPA) released *Recommended Human Health Recreational Ambient Water Quality Criteria or Swimming Advisories for Microcystins and Cylindrospermopsin* that states and authorized tribes can consider for inclusion as water quality criteria for the protection of primary contact recreation and/or for issuing public health advisories (USEPA 2019a). The recommended cyanotoxin thresholds are 8 µg/L total microcystins and 15 µg/L cylindrospermopsin**.** These recommendations are based on incidental ingestion by children while swimming since children represent the most vulnerable age group due to their extended periods of water play as well as the quantity of water they typically ingest during water play. The recommendations were derived from peer-reviewed scientific literature and criteria methodologies in EPA's Exposure Factors Handbook (2011). Thresholds were only developed for microcystin and cylindrospermopsin since these toxins have sufficient toxicological data. Sampling in New Mexico primarily targets microcystins and cylindrospermopsin as these are the two cyanotoxins that EPA has established recommended recreational criteria that are also in New Mexico's Water Quality Standards (20.6.4.900.D New Mexico Administrative Code, USEPA, 2019b).

EPA has not released recommended criteria for any other cyanotoxins. The program may expand to include other cyanotoxins as additional guidance, data, and understanding of the impacts of varying levels of these cyanotoxins become available. NMED will use the EPA recommended thresholds of **8 µg/L total microcystins and 15 µg/L cylindrospermopsin for the HAB WARNING** advisory; NMED will also use the same thresholds for anatoxin and saxitoxin established in Colorado by the Colorado Department of Public Health and Environment: **15 µg/L anatoxin** and **8 µg/L saxitoxin**. NMED will use Utah Department of Environmental Quality's established "Danger Advisory" threshold for New Mexico's **HAB DANGER** thresholds: **2000 µg/L total microcystins**, **90 µg/L anatoxin**, and **75 µg/L saxitoxin**. New Mexico's **HAB WATCH**

thresholds are based off of MDLs for analytical methods utilized by NMED; these are : **0.1 µg/L total microcystins,** 0**.04 µg/L cylindrospermospin**, 0**.1 µg/L anatoxin**, and 0**.02 µg/L saxitoxin**.

Thresholds included in this plan will be updated as additional cyanobacteria and cyanotoxin data are collected in New Mexico surface waters and new scientific information becomes available.

Cyanobacteria Thresholds

This plan also identifies potentially harmful levels of cyanobacteria because there may be risks associated with direct contact with cyanobacteria cells themselves, regardless of whether they can produce known cyanotoxins (USEPA 2019a). In addition, cyanobacteria may quickly transition from not producing cyanotoxins to producing cyanotoxins, and some genera of cyanobacteria can produce different toxins at different times, some of which may not be documented (Otten and Paerl 2015).

The type of cyanotoxins present in a waterbody depend on the species/genera of cyanobacteria, though some species/genera can produce multiple types of toxins. Moreover, toxigenic cyanobacteria, or those cyanobacteria with genes that allow for cyanotoxin production, may only produce cyanotoxins under certain environmental conditions. A list of toxigenic cyanobacteria and the cyanotoxins they can produce are listed in Table 3.

These cyanotoxins are categorized by their primary mode of action: dermatoxins (i.e., skin irritants), hepatotoxins (i.e., affect liver function), and neurotoxins (i.e., affect central nervous system).

Table 1. Wyoming DEQ Chart of Cyanobacteria and Associated Cyanotoxins

Cyanobacteria Genera	Type		Dermatoxins			Hepatotoxins			Neurotoxins				
	Plank-tonic	Mat-forming	APL	LPS	LYN	CYL	MC	NOD	ATX	BMAA	GTX	NEO	SAX
Anabaena	X	X		X		X	X		X	X		X	X
Anabaenopsis	X			X			X						
Aphanizomenon	X			X		X	X		X	X		X	X
Aphanocapsa	X	X		X			X						
Aphanothece	X	X											
Calothrix	X	X					X						
Chroococcus	X	X											
Coelomoron	X	X											
Coelosphaerium		X					X						
Cyanodictyon	X							X					
Cylindrospermopsis	X	X		X		X			X	X			X
Cylindrospermum		X							X				X
Dolichospermum (prev. Anabaena)	X					X	X		X	X	X	X	X
Geitlerinema		X					X		X				X
Gloeotrichia	X			X			X						
Heteroleibleinia	X	X											
Leptolyngbya		X					X						
Limnothrix		X					X						X
Lyngbya		X	X	X	X	X				X			X
Merismopedia	X	X					X						
Microcoleus (prev. Phormidium)		X				X	X		X				X
Microcystis	X			X			X			X			
Nodularia	X	X		X			X	X		X			
Nostoc	X	X		X			X	X	X				
Oscillatoria	X	X	X	X	X	X	X		X	X			X
Phormidium		X				X	X		X				X
Planktothrix	X	X					X		X				X
Planktolyngbya	X			X									
Pseudanabaena	X	X		X			X		X				
Raphidiopsis	X					X			X				X
Schizothrix		X	X										
Spirulina		X					X			X			
Synechococcus	X			X			X		X	X			
Synechocystis	X						X						
Tolypothrix	X						X						
Woronichinia	X						X		X				

Toxin abbreviations are as follows: APL, aplysiatoxins; LPS, lipopolysaccharides; LYN, lyngbyatoxin-a; CYL, cylindrospermopsins; MC, microcystins; NOD, nodularins; ATX, anatoxins; BMAA, β-N-methylamino-L-alanine; GTX, guanitoxin; NEO, neosaxitoxins; SAX, saxitoxins.

When released from cyanobacteria cells, cyanotoxins are colorless and may remain in the water column after a bloom has dissipated. Studies have shown cyanotoxins persist anywhere from five days to several months in water and up to six months in dry scum (USEPA 2019a). The rate at which cyanotoxins are removed depends on environmental factors such as water pH and temperature, ultraviolet degradation, the presence of particulate matter, water depth, and bacterial breakdown (USGS 2008 USEPA 2019a). Studies have also shown that certain strains of

microcystin can remain in sediments for months or, conversely, bypass sediments and enter groundwater. Cyanotoxins and cyanobacteria can also flow downstream from lakes and reservoirs for indeterminate distances (Yang et al. 2016, USEPA 2019a).

Planktonic Blooms

Planktonic blooms, most often found in lakes and reservoirs in New Mexico, are characterized by cyanobacteria cells suspended in the water column, floating on the water surface, or aggregated on shorelines. Since planktonic blooms pose the greatest health risk to recreators exposed through direct contact with cyanobacteria dispersed in the water column or floating on the water surface, planktonic blooms are most commonly sampled via surface grab samples.

For planktonic blooms, **HAB WARNING** advisories are issued when cyanobacteria cell densities exceed **100,000 cells/mL**. This cell density was selected after reviewing scientific studies utilized by other state agencies and health organizations (Graham et al. 2009, Farrer et al. 2015). The cell density threshold was chosen after reviewing World Health Organization (WHO 1999) guidelines and represents the level at which acute health effects transition from low to moderate risk (Table 4). Any combination of cyanobacteria taxa found in a planktonic bloom can trigger a bloom advisory due to the high risk of dermal contact and inhalation presented by these types of blooms. **HAB WATCH** advisories will be issued on a case-by-case basis by NMED after evaluating all available evidence including photos, satellite data, preliminary testing, and laboratory analysis that indicate the presence of a developing HAB.

Table 2. World Health Organization guidelines for cyanobacterial bloom characterization (Graham et al. 2009)

Relative Probability of Acute Health Effects	Cyanobacteria[1] (cells/mL)	Microcystin-LR[2] (μg/L)	Chlorophyll-*a*[3] (μg/L)
Low	< 20,000	< 10	< 10
Moderate	20,000-100,000	10-20	10-50
High	100,000-10,000,000	20-2,000	50-5,000
Very High	>10,000,000	>2,000	>5,000

Cyanotoxins are emerging contaminants and while the advisory plan aims to protect public health, more research is needed to understand all of the risks posed by HABs. Specific areas of research include fish consumption, inhalation of aerosolized particles, and health effects on animals.

Mat-Forming Blooms

Not enough data has been collected on Mat-Forming Blooms in New Mexico to currently include these in the response plan. The public is encouraged to visit the NMED HABs webpage for resources to help identify these and avoid them whenever possible. NMED SWQB is currently exploring adding Benthic HABs to the HABs Advisory Program and will be modeled after Utah DEQ's methodology.

Other Health Risks

Cyanotoxins are emerging contaminants and while the advisory plan aims to protect public health, more research is needed to understand all the risks posed by HABs. Specific areas of research include fish consumption, inhalation of aerosolized particles, and health effects on animals.

Fish Consumption

At this time, there is insufficient information to determine the risk of consuming fish caught in waters with a HAB. Studies have shown that toxins mainly accumulate in the liver and viscera of fish, and small amounts of microcystin has been detected in the fillet (Vasconcelos 1999, de Magalhaes et al. 2001, Kann 2008, WA DOE 2010, Kann et al. 2011). At a minimum, organs and skin should be removed and discarded, and fillets rinsed with clean water prior to cooking or freezing fillets. Caution should be taken with shellfish as cyanotoxins have been shown to accumulate in edible tissue (Vasconcelos 1999).

Pets and Livestock

Currently, there is insufficient information to determine the risk HABs pose to animals. It is suspected but not confirmed that dog deaths due to cyanotoxins have occurred in New Mexico. Oregon has established recreational use values for cyanotoxins and dogs that are much lower than the EPA recommended criteria for humans. NMED recommends never letting animals near water that is suspected of a HAB as they are likely to ingest the water or cyanobacteria causing the bloom. Please see the NMDOH HABs and Animals Fact Sheet for more information.

Aerosols

Currently, there is insufficient information to determine the risk aerosolized HABs pose to the public. It is suspected that cyanotoxins can become aerosolized especially with churning wave action and boating or waterskiing and it is possible that the aerosols could be transported for miles. Please see the Great Lakes HABs Collaborative fact sheet about HAB toxins in air for more information.