An aerial photograph of Grand Lake, Oklahoma, showing a large metal structure in the water and a forested shoreline. The water is a deep green color, and the shoreline is covered in dense green trees. Several small boats are visible near the shore. The text is overlaid on the top half of the image.

# Lake Managers Perspective: Harmful Algal Blooms

(Photo taken: July 2011, Grand Lake, Oklahoma)

***23<sup>rd</sup> Annual Oklahoma Clean Lakes and  
Watersheds Conference  
April 2, 2014***

# Lake Managers Perspective

(Long-Term Economic Benefits and Ecosystems Services)

- How Do We Mitigate/Prevent HAB's

- How Do We Address Active Bloom
  - Health & Public Safety
  - Monitoring
  - Economic/Rec Impacts



*Ada Evening News: July 21, 2011*

## Heat wave fosters toxic algae in touristy lakes

OKLAHOMA CITY (AP) — A prolonged heat wave in the central U.S. has fostered the growth of a dangerous form of algae in lakes and ponds, threatening swimmers and livestock and scaring away tourists during the busy summer season. Blue-green algae are actually bacteria that produce toxins harmful to humans and livestock. It flourishes in warm, stagnant, sunlit water, and this year's heat wave combined with Oklahoma's worst drought since the Dust Bowl have created what one water official called a "perfect storm" for its growth. Officials have issued a series of warnings, telling boaters and swimmers at lakes in northeast Oklahoma, southern Kansas and Nebraska to avoid contact with the toxic gunk. The issue attracted national attention earlier this month when Oklahoma Sen. James Inhofe blamed a respiratory illness on a swim in Grand Lake in Ketchum Hollow. The bad publicity has had dire consequences for some businesses in Oklahoma where tourism is the third largest industry with an estimated annual impact of \$6.2 billion. Oklahoma's numerous lakes are a "huge economic engine" driving that industry, said Leslie Blair, a spokeswoman for the Department of Tourism and Recreation. Problems on Grand Lake have subsided, the Grand River Dam Authority said. Advisories remained in effect Wednesday for portions of Keystone, Fort Gibson and Eufaula lakes in Oklahoma, Marion and Big Hill lakes in Kansas, and Willow Creek Lake in northeast Nebraska.

## Public warned of algae at Bernice

### Staff Reports

An Oklahoma Department of Environmental Quality (DEQ) recommendation to temporarily avoid body contact with water at Bernice State Park is prompting the Grand River Dam Authority to remind lake enthusiasts to take extra precaution on Grand Lake this summer. The state park is putting up signage to notify the public.

DEQ made the recommendation after the GRDA Ecosystems Management's water lab confirmed blue green algae (BGA) was in the waters near the park, and in portions of Horse Creek and the back of Duck Creek.

BGA are microscopic organisms that are naturally

present in lakes and streams, usually in low numbers. However, the algae can become abundant in shallow, warm water that receives heavy sunlight. While most BGA are not toxic, toxins can be produced in some algae blooms. Results of the tests of BGA water samples taken by the GRDA Ecosystems Management Department will not be available until early next week. However, as a precaution DEQ made its recommendation to avoid body contact.

GRDA joins with the DEQ in urging lake users to practice caution and use common sense when

See, *ALGAE*, page 9



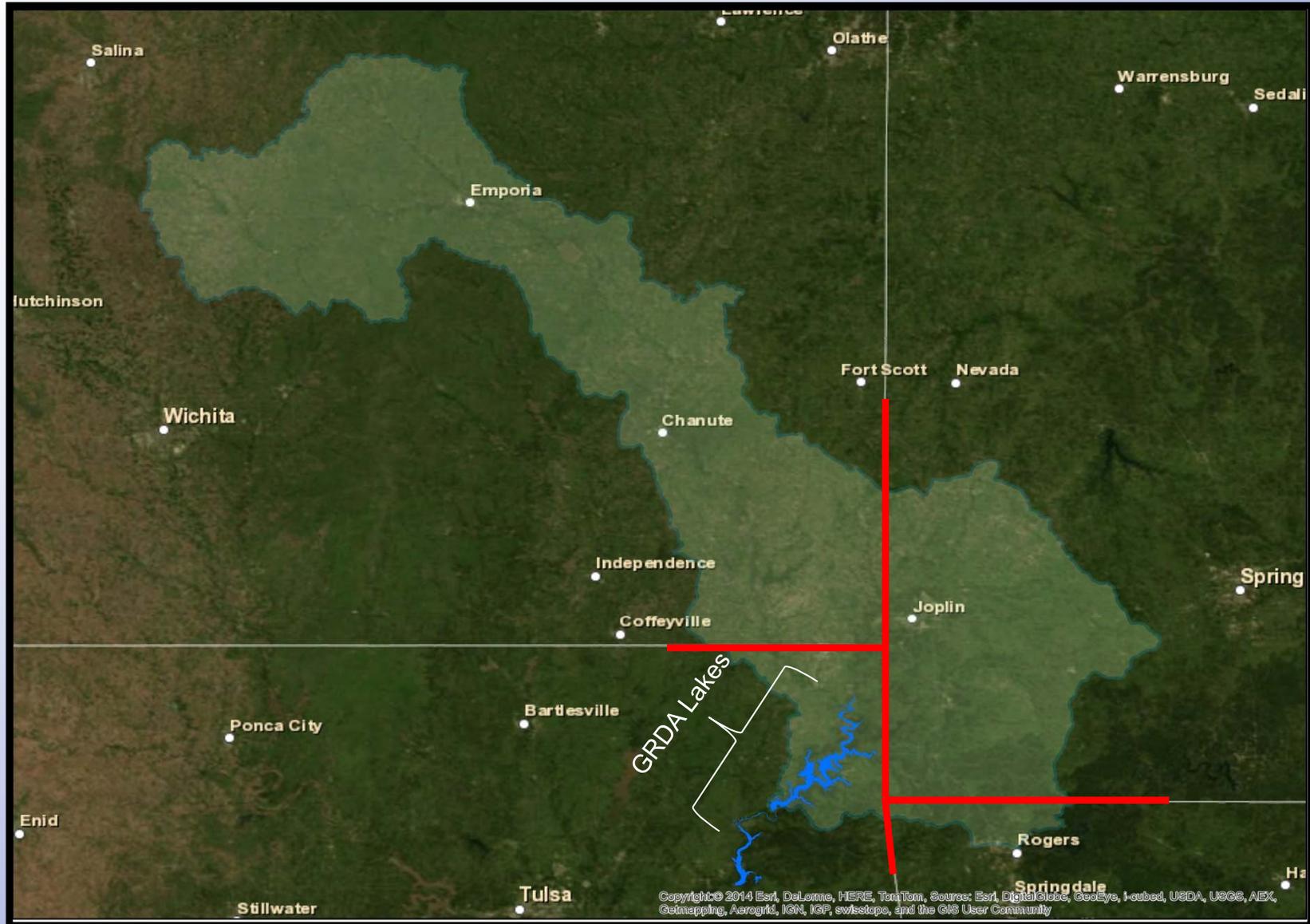
Courtesy Photo

This blue green algae has appeared near Bernice State Park.

*Grove Sun: June 28, 2011*

# Mitigate/Prevent

(Grand Lake Watershed)



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# Monitoring

The screenshot displays a web browser window with the URL <http://www.grda.com/advisory-map/>. The page features the GRDA logo and a navigation menu with links for About, Electric, Lake Information, Purchasing, News, Jobs Listing, and LMS. The main content is titled "Water Quality Map" and shows a satellite-style map of the Delaware region. The map is overlaid with numerous monitoring stations, represented by green 'X' markers and blue/red circular icons. Key locations labeled on the map include Fairland, Afton, Delaware, Grove, Ketchum, Disney, Spavinaw, Salina, Locust Grove, and others. Two large lakes, Oologah Lake and Lake Eucha, are also visible. The map is powered by Esri, with a copyright notice for 2014. A small text box at the bottom left of the map area reads "FILED UNDER: SAFETY". The browser's taskbar at the bottom shows various application icons and the system clock indicating 1:43 PM on 3/31/2014.

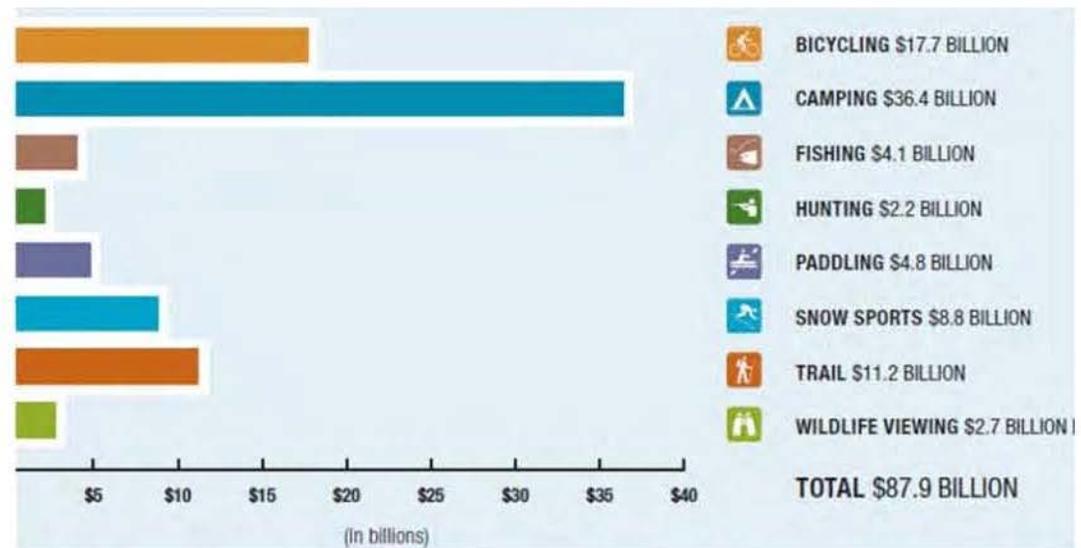
# Lake Managers Perspective

## (Long-Term Economic Benefits and Ecosystems Services)

### Recreation and tourism

Recreation and tourism are billion-dollar industries in the United States. According to the American Sportfishing Association, there are over 30 million anglers in the U.S., generating over one million jobs and over \$45 billion in retail sales annually. Healthy intact ecosystems are essential to the viability of both commercial and recreational fishing. More people in the U.S. fish (30 million) than play golf (24.2 million) or play tennis (10.2 million).

In a 2003 study, the Outdoor Industry Foundation found that the outdoor recreation economy contributed \$730 billion annually to the economy, supported 6.5 million jobs and generated \$88 billion in state and federal tax revenues. Wildlife watchers in The Chesapeake Bay region spend about \$3 billion annually on trip-related expenses and equipment; this estimate does not include job creation and multiplier effects from these activities. Rural areas near forest land and other types of open space often depend on tourist spending to help support their local economies. Outdoor recreation and eco-tourism are large economic forces whose foundation rely on the maintenance of healthy watersheds and the protection of open space.



Federal and state tax revenues generated by recreational activity  
*Outdoor Industry Foundation 2003*

**More people in the United States fish (30 million) than play golf (24.2 million)  
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