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Out of the blue, lake's a new hue

The change in the lake's color - to a turquoise blue - is caused by a mysterious plume of sediment.

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By Bill Reed
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It's not the Loch Ness Monster, but Lake Michigan has a few mysteries of its own.

Having looked at the lake for decades, John Aslakson knew there was something different as he drove by last week.

"It was like the difference between regular water and Caribbean-blue water," said Aslakson, also a Muskegon city commissioner. "In 40 years of driving past the lake, I've never seen anything like it."

Unlike Nessie sightings, scientists know Aslakson's observation was not an invention of his imagination. The change in the lake's color is caused by a mysterious plume of sediment that has excited researchers and caused lake-watchers to scratch their heads.

The "recurring coastal plume" appears each year for about a month in late winter or early spring, and usually circles southern Lake Michigan from Milwaukee to Grand Haven, said Gary Fahnenstiel, director of the federal government's Lake Michigan Field Station.

After the ice melts, the first big storm kicks sediment up into the water and causes the plume, Fahnenstiel said.

The appearance of the lake's water subtly changes as clay and silt come to dominate the light reflection off the lake, rather than

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algae. Algae typically absorbs more light in the blue range than sediment does. Hence, in a sediment-dominated water system, viewers may perceive a turquoise blue color, Fahnenstiel said.

"I think this is the first time I've seen the recurring coastal plume this far north," Fahnenstiel said.

The plume is unusually large and pronounced this spring. And the timing couldn't be better for scientists.

The large plume coincides with one of the largest Great Lakes studies ever, and much of the research will originate at the Lake Michigan Field Station in Muskegon.

Last fall, the National Science Foundation and National Oceanic and Atmospheric Administration, known as NOAA, launched a five-year, \$13 million study to understand how large storms affect Lake Michigan.

The plume - which is only visible in its entirety from satellite-mounted cameras orbiting 450 miles above Earth - is one focus of this study as government scientists believe it has a "profound impact" on the overall ecology of Lake Michigan.

Known officially as EEGLE (Episodic Events-Great Lakes Experiment) the goal of the study is to understand how major storms affect the movement of contaminants and nutrients in southern Lake Michigan.

The plume is thought to harm some biological systems in the lake. The clay and silt compete with algae for light and nutrients, and probably impede the overall productivity of the water system. But it might also stimulate some components of the food web, Fahnenstiel said.

Scientists from four federal agencies and eight universities began research field trips on southern Lake Michigan in October. They will collect samples in the lake over the next three years and report their findings in the year 2002, federal officials said.

"We will be making a lot of observations and measurements of the lake that have never been made before," said Fahnenstiel, who is working on the project.

Most of the sediment in the plume is believed to be eroded bluff materials from the western shore of Lake Michigan. Scientists believe those materials initially settle into natural reservoirs near the shoreline.

The sediment then wells up from the bottom after ice on the lake melts and powerful storms whip up waves and strong currents that transport the plume across Lake Michigan, federal officials said.

Scientists estimated last year that the plume carries more than 1 million tons of sediment - mostly tiny particles of clay and silt - across the lake. That sediment is believed to be loaded with nutrients, but also contains manmade toxic chemicals carried from land into the lake.

Understanding how the plume affects the lake could change the way government agencies manage everything from polluted lake-bottom sediments to sport-fish populations, Fahnenstiel said.

To study the Lake Michigan plume, scientists will use remote sensing devices stationed in the lake, helicopters, satellite cameras, radar and a fleet of government ships.

Scientists at NOAA first spotted the Lake Michigan plume in 1980 while examining photographs taken by satellite-mounted cameras. A pilot study in 1996 by a team of NOAA and university scientists - who used the services of a Coast Guard helicopter to pluck water samples from frigid Lake Michigan - piqued scientists' interest in the plume.



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