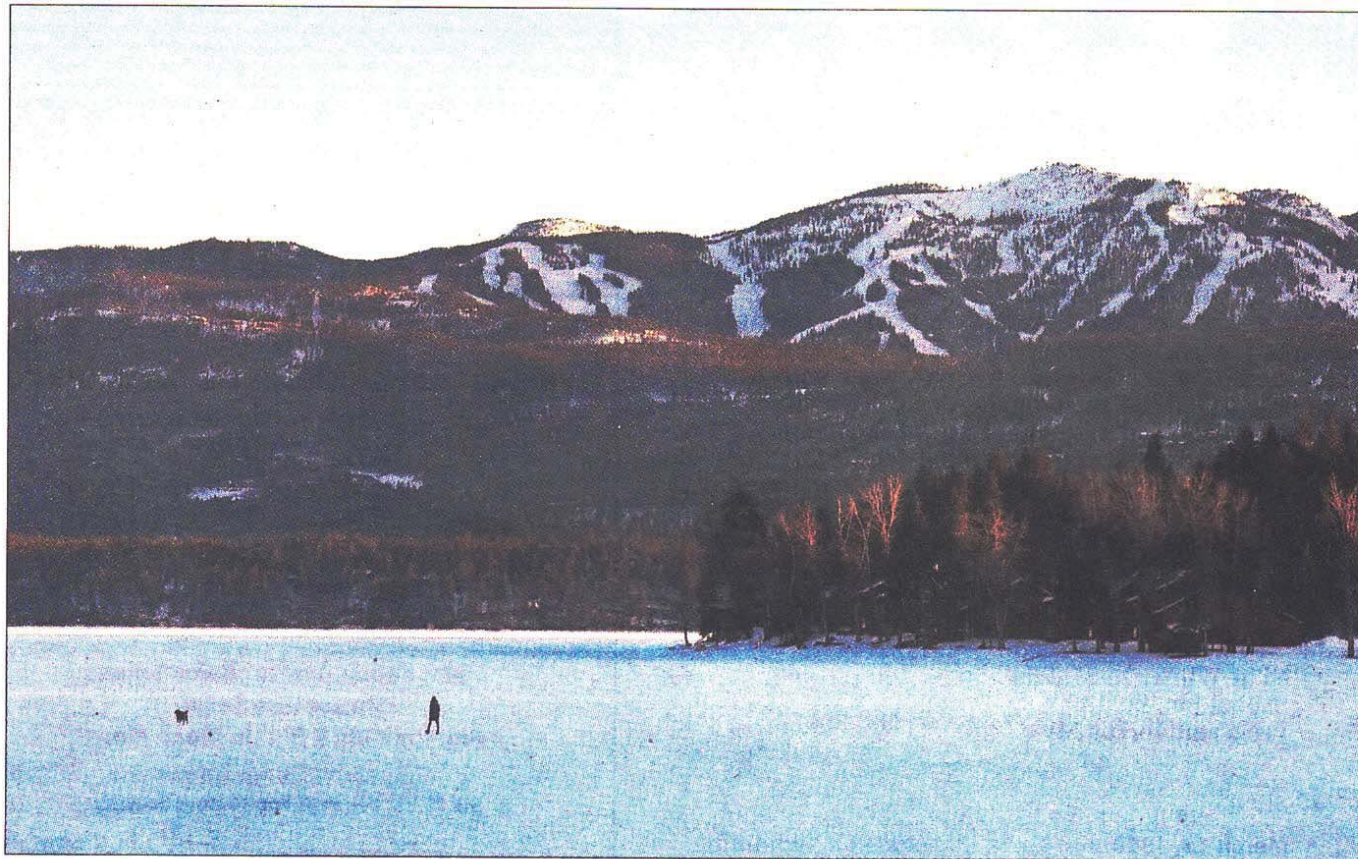


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A person and dog walk across a frozen Whitefish Lake on Tuesday morning as light begins to hit Big Mountain. (Heidi Desch/Whitefish Pilot)

EXAMINING A CHANGING WORLD

Professionals discuss influences on environment during lakes conference

By HEIDI DESCH
Whitefish Pilot

A changing environment was a reoccurring theme during the inaugural Montana Lakes Conference last week in Whitefish.

Whether changes are the result of climate change or other human influences, several speakers during the conference at The Lodge at Whitefish Lake touched on what they are seeing in Montana, around the country or globally.

Organized by the Whitefish Lake Institute, the conference drew a diverse group of professionals

exchange information, scientific advancements and management strategies regarding healthy lake and reservoir ecosystems.

Mike Koopal, executive director of WLI, opened the conference pointing out that Montana has 5,547 ponds, lakes and reservoirs.

"Lakes play a very prominent role in our state," he said. "Lakes are really under studied related to the ecosystem services they provide. We really need to understand the relationship to watershed function and their own general complex systems."

Jim Elser, director of the Flathead Lake Biological Station at Yellow Bay, on Thursday morning said generally lakes in Western Montana are retaining high water quality.

Though he noted that lakes in the United States are getting murkier and browner that's not the case here.

"There is a tendency on average that lakes are more rich in phosphorous and they have gotten

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browner," he said.

"Western mountain lakes are pretty stable," he said. "We're not losing blue lakes — that's good news."

As a limnologist, Elser studies freshwater lakes and streams with much of his focus devoted to Flathead Lake. He said wastewater treatment improvements have helped reduce levels of phosphorous in Flathead Lake, though levels of nitrogen haven't changed. Phosphorous encourages algal growth, and in imbalance of the ratio phosphorous and nitrogen can have a negative impact on zooplankton in the lake.

He likened the change in the food web of the lake to that of the zooplankton subsisting on a diet of doughnuts and noting it's an issue he'd like to study further.

"Unlike many lakes in the world our water clarity is not deteriorating," he said. "We're doing a good job with the advancement of wastewater plants around the basin."

He added that continuing to use septic tanks around lakes is not good, noting that "there's a lot of other technology out there" that can be used.

"The lakes in western Montana remain of very high quality," he said. "We want to keep them that way. How do we do that as more people

come here and there are impacts from climate change?"

Looking to research happening outside the state, Geoffrey Schladow, director of the Tahoe Environmental Research Center, presented on efforts to protect Lake Tahoe's water quality following the effects of increased development in recent decades, along with impacts of climate change.

The Lake Tahoe basin has seen development spurred on by the 1960 Olympics at Squaw Valley as the beauty of the area was broadcast to the world, he noted.

The lake has lost about 33 feet of transparency during the last 30 years, according to the research center, and thick growth of attached algae now coat the shoreline rocks in the spring as the lake has responded to increased nutrient loading from the streams, atmosphere and groundwater.

Schladow said there have been efforts to protect the lake from septic pollution through a sewer system and wastewater treatment plant and other measures.

"Despite the best efforts of sewage removal and land planning the clarity of the lake had gotten worse," he said.

Research is also trying to determine the effect mysis shrimp has had on lake zooplankton and water clarity, he noted. Mysis shrimp was deliberately introduced to

Lake Tahoe in the mid-20th century to provide a food source for fish in the lake.

He pointed to the discovery that the temporary absence of the shrimp in the Emerald Bay area of Lake Tahoe appears to be connected to the return of zooplankton in the same area, which ate the algae leading to the improvement in water clarity. Eventually the shrimp returned to Emerald Bay and the clarity went back to where it was before.

Last year researchers began a two-year project to remove mysis shrimp from Lake Tahoe. They hope to answer the question if it is possible to harvest the shrimp to restore water clarity.

Mysis shrimp were introduced in the 1960s and 1970s to several lakes in northwestern Montana including Whitefish Lake. Mysis eventually migrated downstream to populate Flathead Lake. Non-native lake trout benefited from the introduction, while it has caused the decline of other fish populations.

Schladow also noted that climate change could have effects on Lake Tahoe including a decrease in the mixing of the lake causing a decrease in oxygen levels and triggering a release of available phosphorus and nitrogen. The Tahoe Environmental Research Center recorded surface water temperatures in July 2017 that were the warmest ever recorded.

Examining climate

change impacts, global climate strategist Edward Cameron said climate change is more than an environmental challenge, it's a human issue with far-reaching implications.

"This is not about nature — polar bears and ice caps — this is about humans and how we are going to live going forward," he said.

He points out that the impacts of climate change are being seen now with wildfires in the west, an increase in tick-borne diseases in the eastern U.S. and an increase in extreme weather events like hurricanes.

One of the architects of the Paris climate accord, Cameron says that greenhouse gas emissions emitted into the atmosphere have caused climate change and changes to the ecosystem, but he's pointed in his perspective that the impacts to focus on should be those to society.

Cameron said the cumulative global cost of climate change related impacts is calculated to be between \$2 trillion and \$4 trillion by 2030.

"There's many ways we could be spending that money on a prosperous society, but instead we're spending it on wildfires and hurricanes."

Cameron advocates for those working in the climate community to make information more accessible, for public contracts to be granted to low emissions companies, and for citizens to reduce their own emissions and vote for and advocate to politicians who seek solutions to climate change.

"If you're living in a home that's not insulated you drive an SUV and eat beef five times per week then you're part of the problem," he said. "If you want to be serious about climate change you have

to be serious about being a citizen — you have to vote, protest and bring solutions to politicians. Despite the evidence of climate change, Cameron is quick to note that he remains optimistic for the future.

"Human activities have caused global climate change," he said. "But human ingenuity innovation and humility are going to contribute to helping us not only manage climate risk, but also build a low-carbon climate resilient and inclusive economy."