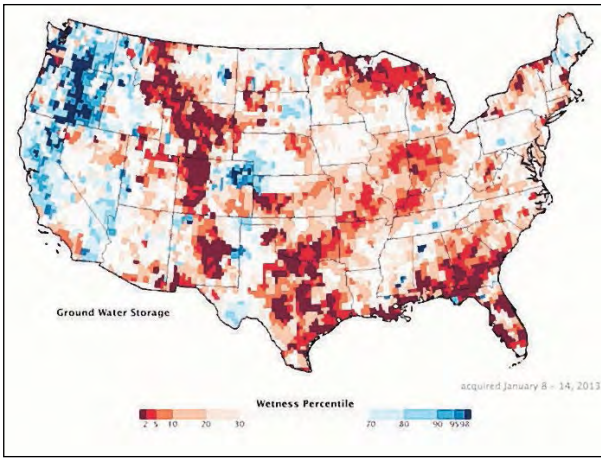




Reconnect with your environment

Learn about environmental issues, their affect on your community and actions for your involvement.



NASA

Using data from NASA's Gravity Recovery and Climate Experiment satellites, this map shows low U.S. groundwater levels in 2013.

NASA map shows depleted aquifers

By ANNA McCARTNEY
Contributing writer

Diverting water from the Great Lakes to areas facing water shortages is clearly not the answer.

Too much of the surrounding region of the Great Lakes is at risk from diminished groundwater levels. The available water for people and wildlife is disappearing because it is being used and abused faster than it can be replenished or restored. Unsustainable growth and development without adequate water-use planning has played a major role in vanishing water resources.

The map above was constructed from NASA satellite data between Jan. 8 and Jan. 14, 2013. It shows groundwater levels of the Great Lakes region

and other areas of the U.S. are dangerously low. While not as low as some areas of the Southeast or West, much of the Great Lakes region remains below the 1948-2009 average. Average levels are denoted by white space on the maps, while above-average is blue and below-average appears red.

These depleted aquifers can also cause rivers to dry up and lake levels to fall to unacceptable lows. Understanding these water cycle connections must guide water-use decisions to avert bankrupting the Great Lakes water budget.

ANNA McCARTNEY, a communications and education specialist for Pennsylvania Sea Grant, can be reached by e-mail at axm40@psu.edu.



SMITHSONIAN

To provide a sustainable resource for present and future generations, the eight states and two Canadian provinces that rely on Great Lakes water adopted a historic legally binding Great Lakes Compact in 2008 to protect the lakes, rivers, streams and groundwater that feed them.

Checks without balances

Great Lakes system can't afford so many water withdrawals

By ANNA McCARTNEY
Contributing writer

The Great Lakes may give the impression they are water-rich but they are like a finite and exhaustible shared bank account that could go bust.

There are plenty of examples of bankrupt water budgets and ecological disasters in regions that once had sufficient and even plentiful water. Why?

No one was there to certify that withdrawals did not exceed deposits. There were no plans to control the insatiable demand for water that grew exponentially to meet the demands of a population that went from 2.5 billion to more than 7 billion in just 61 years.

Water withdrawals from aquifers, lakes, rivers and reservoirs continued to increase but the amount of water did not. Without an accurate bookkeeping system to alert users about how much could safely be removed, depletion occurred before the accounts could be restored.

There were no collaborative plans in place to protect the Aral Sea, the Colorado River, the Ogallala Aquifer and other communities that are now water-challenged, such as Waukesha, Wis. A positive balance could have been maintained to protect ecosystem services and future generations but instead, unsustainable withdrawals resulted in depletion and deteriorated water quality.

Overpumping, climate change and drought have left communities like Waukesha with depleted aquifers. These communities, which sit just outside the basin, and others farther away see the Great Lakes as the answer to their water woes.

But with historic low Great Lakes water levels already damaging ecosystems and threatening

shipping, is it wise to grant exceptions to tap the Great Lakes?

The impacts of existing diversions on lake levels may seem minor, but they already alter the natural flow of the Great Lakes. Furthermore water returned from diversions may be of a lesser quality. That's why in 2008 the eight states and two Canadian provinces that rely on Great Lakes water adopted a legally binding Great Lakes Compact to protect the lakes, rivers, streams and groundwater that feed them.

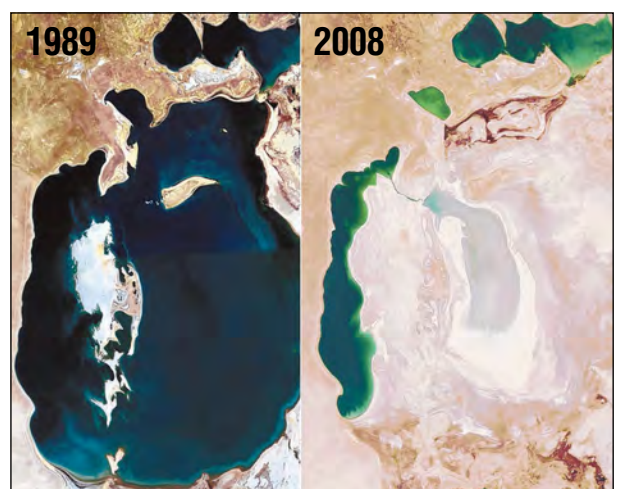
They banned the diversion of water, with some limited exceptions, and set standards for water use and conservation within the basin. What they did not know then is how much warmer the water in the lakes would become or how ice cover would diminish in winter. They didn't know that evaporation would increase or that precipitation patterns would be altered, with drought more common.

They also could not have imagined how alarmingly fast uncontrolled groundwater resources would be depleted to support agriculture, industry and unrestrained development in surrounding communities. Neither did they envision new withdrawals for unconventional gas extraction which are not returned to the system.

To defend a sustainable Great Lakes ecosystem, Great Lakes states and Canada must heed the science and maintain strict water budgets. But citizens too need to be involved in taking action to conserve and preserve the Great Lakes.

Coming next week: Water conservation.

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WIKIMEDIA COMMONS

Water diversions for growing cotton and wheat caused the Aral Sea to shrink to one-tenth its original size in just a few decades. The sea was once the fourth-largest lake in the world, larger than Lakes Erie and Ontario combined.



USGS

Waukesha, Wis., is the first city not in the Great Lakes Watershed to test the Great Lakes Compact by requesting Great Lakes water to replace its overused depleted groundwater source.



JONATHAN WATERMAN/Contributed photo

The Colorado River has dipped to an all-time low because human water withdrawals exceed deposits. This jeopardizes the economy, the wildlife, the people and the very landscape of this vast region.



CONTRIBUTED PHOTO

Fairview students collected trash from Trout Run and recorded data that will be added to the PA Lake Erie International Coastal Cleanup results.

Students pick up trash near Fairview school

By ANNA McCARTNEY
Contributing writer

Fairview High School students led by teacher Rebecca Turner are Great Lakes Great Stewards. They are one of nine Erie County groups participating in the PA Sea Grant/NOAA BWET project that involves students in service learning.

Students recently collected 47 pounds of trash near their school as part of the International Coastal Cleanup and recorded the data to understand the problem caused by trash that makes its way to area waterways. Below are some of their comments:

"The ICC is something everyone should and can do." — **Julianna Anderson**

"It was an eye opening experience to see how much our water can be polluted by so many things that are easy to dispose. It isn't

hard to throw away garbage or recycle, so everyone should do it." — **Sara Pursell**

"I feel like I have helped to improve the life of animals and anything that lives in the surrounding environment." — **Travis Chorney**

"We picked up a great amount of trash. There were some things that I didn't expect, like soccer balls and trash cans. We got to work in groups, so that was a plus. I will pick up trash whenever I can from now on. This was a great experience." — **Nina Miller**

"It is shocking to find all that trash. I wish we could go back and get the larger items." — **Dominic Colao**

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Protecting Lake Erie will take smart planning and cooperation between the local municipalities, states and countries that share its life-sustaining resources. Share your thoughts to convince communities to work together on a lake-wide plan to avoid economic and environmental disasters like the Aral Sea. Send them to axm40@psu.edu for possible publication in the "your space" feature.

