

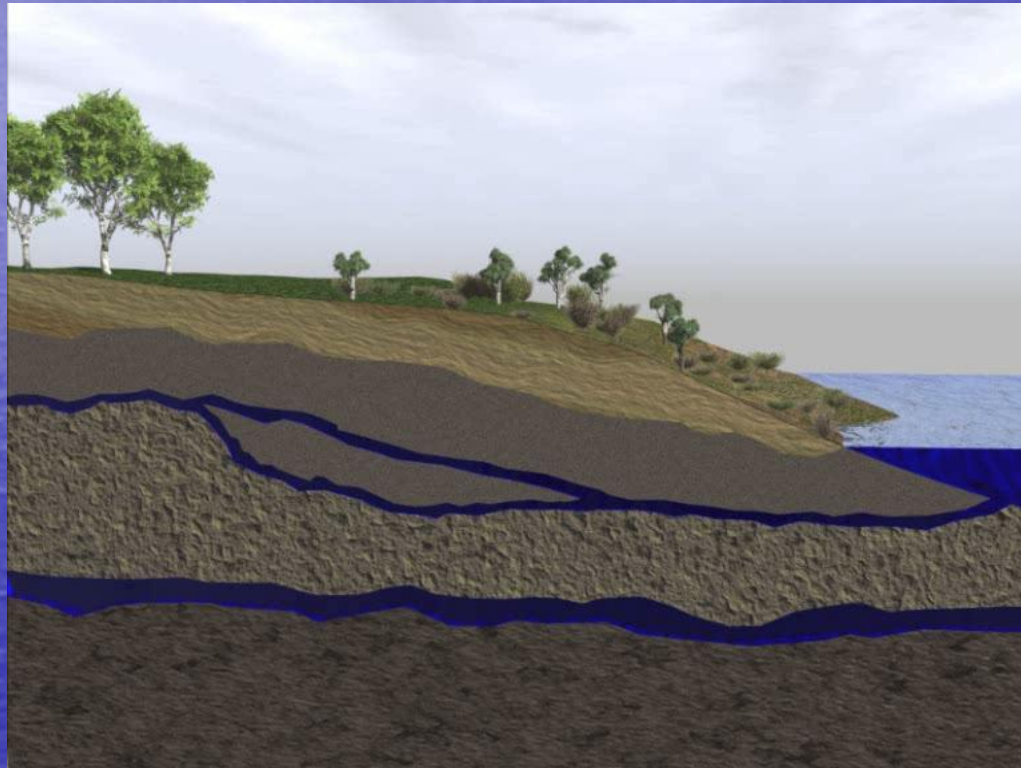
# Breaking the Barrier



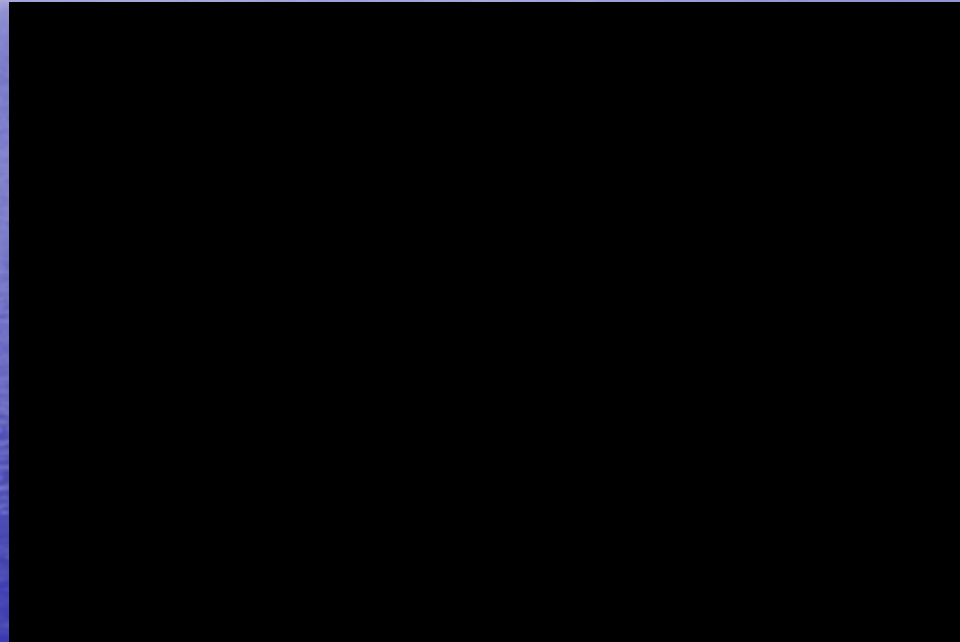
# Onsite vs. Offsite

What Homeowners/Taxpayers  
need to know

# The cycle of water



# The Status of Water in America

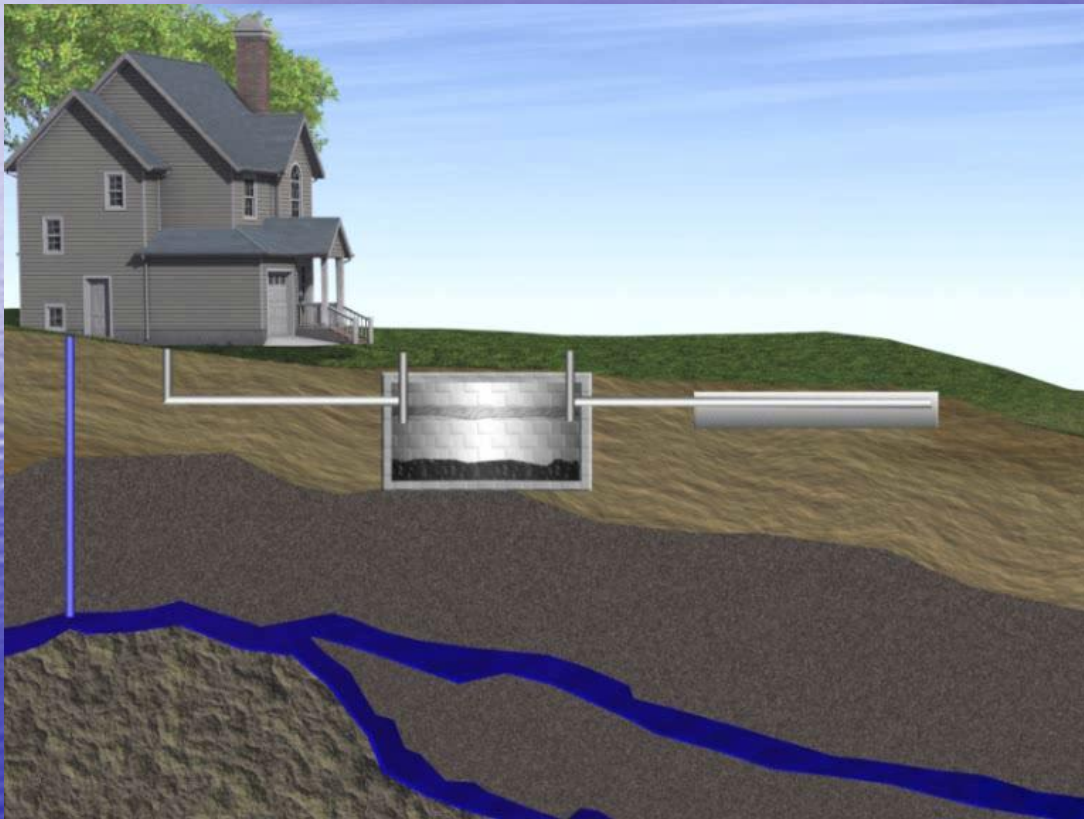


# The cycle of surface water use



From the north end Minneapolis, MN takes 57 million gallons of water out of the Mississippi everyday, treats it, then sends it throughout the city. After use is sent to the sewage facility at the southern end where it is discharged back into the river.

# The cycle of groundwater use



Water is drawn by a well, used, then sent to the septic system where most is returned to the source

# Another example of groundwater use



Groundwater is extracted from one point and delivered to multiple locations but still returned to the aquifer via onsite systems

# This is how the cycle is broken



Water is still being drawn from the aquifer however now it is being discharged to a river, and all rivers flow to the ocean



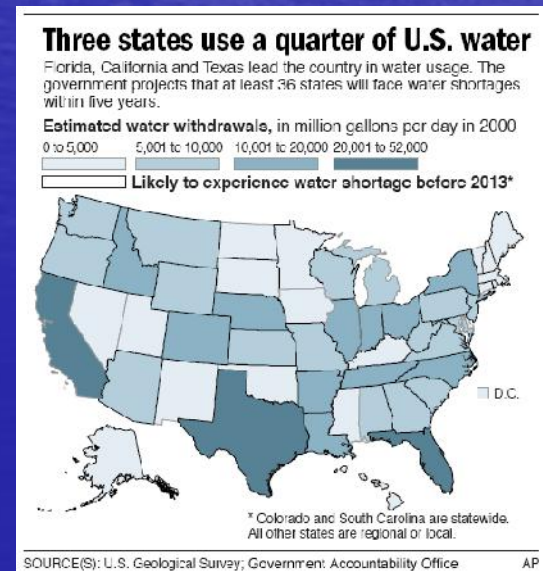
# Crisis feared as U.S. water supplies dry up

## Government projects at least 36 states will face shortages within five years

**AP** Associated Press

WEST PALM BEACH, Fla. - An epic drought in Georgia threatens the water supply for millions. Florida doesn't have nearly enough water for its expected population boom. The Great Lakes are shrinking. Upstate New York's reservoirs have dropped to record lows. And in the West, the Sierra Nevada snowpack is melting faster each year. Across America, the picture is critically clear — the nation's freshwater supplies can no longer quench its thirst. The government projects that at least 36 states will face water shortages within five years because of a combination of rising temperatures, drought, population growth, urban sprawl, waste and excess.

"Is it a crisis? If we don't do some decent water planning, it could be," said Jack Hoffbuhr, executive director of the Denver-based American Water Works Association. Water managers will need to take bold steps to keep taps flowing, including conservation, recycling, desalination and stricter controls on development.





The community of White Bear Lake may be on the forefront of a trend. But, in this case, that's not necessarily good news. Turtle Lake in Shoreview, Birch Lake in White Bear Lake, and Mann, Sunset and South School Section lakes in Washington County, have all experienced similar water-level drops in the last decade.

- This is a statewide issue...something we will be facing for a long time to come."
- A study by the United States Geological Survey (USGS) has identified increased groundwater pumping by area communities as the primary cause...
- State Sen. Roger Chamberlain of White Bear Lake, says, "This is not a water shortage issue... the issue is proper management...where we get our water from, and what we do with it when we're done."

## CivE Seniors Find Likely Cause for Why White Bear Lake is so Low

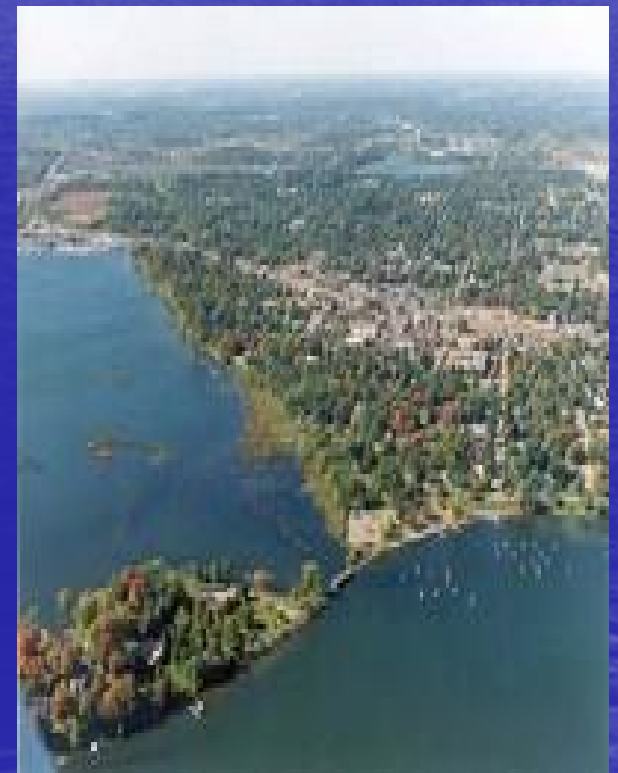
June 24, 2011

From the shores of White Bear Lake the problem is obvious. Waterlines in some areas are now 100 yards from where they once were. The lake is a local hot-spot for recreation, so this water level drop has residents and lake-dwellers very concerned. The sinking water level was first observed by White Bear Lake residents approximately eight years ago. Measurements show the lake depth has dropped a total of five feet and lost more than a quarter of its volume. Officials have considered a number of competing theories explaining the drop, but no single idea could be considered the most likely, until now.

Two senior undergraduate students in the Department of Civil Engineering have identified the likely cause and disproven two other competing explanations in the process. Students Erik Brenna and Joe Fox investigated the mystery as part of an independent research project for the class CE 4180.

"Our main conclusion was that White Bear Lake is down because the Prairie du Chien - Jordan aquifer is down," explained Brenna. They speculate that 20 years of municipal water pumping has taken its toll on the aquifer and reduced its underground water level. White Bear Lake helps to recharge the aquifer, which means the lake level will fall when the aquifer is running low.

In an intriguing twist, the study also introduced the young researchers to the political snarls often associated with water management projects. "We have gotten a negative reaction from a few people who don't want us to say anything negative about municipal pumping," said Fox. "A lot of cities across the metro area rely on the Prairie du Chien - Jordan aquifer for their drinking water and saying that this pumping is a problem is a huge political issue."



## Pricey -- \$600 million -- solutions for thirsty White Bear Lake



In a draft report the Metropolitan Council outlined options for augmenting White Bear Lake with water from the Mississippi River. White Bear Lake, which has lost one-fourth of its volume over the past decade, the Met Council also has begun several other region-wide studies to explore ways to restore balance to water sources and ease pressure on the aquifers.

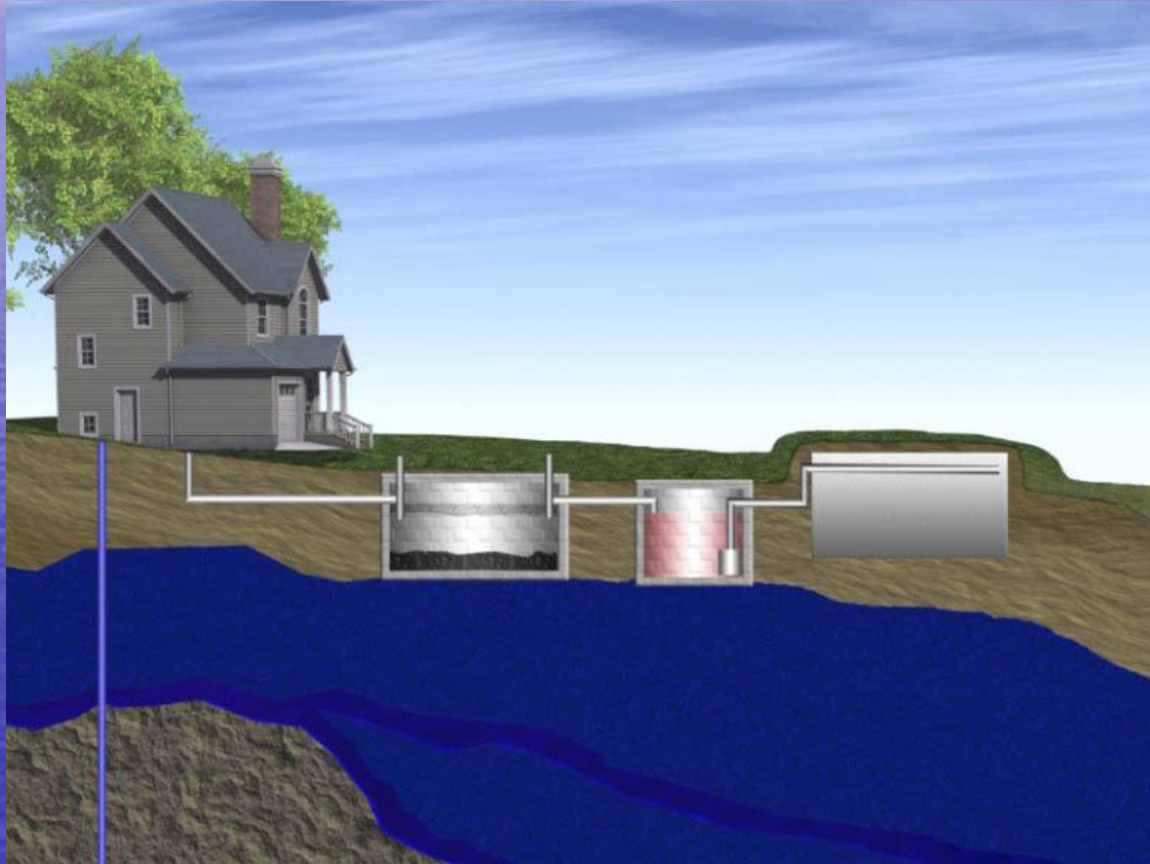
The proposals, and their estimated price tags:

- Expand St. Paul's water system to deliver treated water from the Mississippi River directly to northeast metro communities. That option would be the most expensive at \$623 million.
- Build a water treatment plant at Vadnais Lake to receive water from the Mississippi to distribute to surrounding communities...the cost, \$610 million.
- Pump filtered water, about 2 billion gallons a year, from the Mississippi to White Bear Lake by way of the chain of nearby lakes. Because the Mississippi River and Vadnais Lake have zebra mussels, this proposal also would require a filtration system, bringing the cost to \$50 million.
- Merely augmenting White Bear Lake, the draft report cautions, offers no guarantee that lake levels could be maintained once they are restored, or that other nearby lakes and aquifers would benefit.

We Can Wait for it to Break and  
Pay to Fix it, or Deal with it Now



Not every site is perfect



# Advantages of large scale treatment plants

- They allow for dense packed development
- They encourage industrial and commercial development
- Take the “failure” out of your yard

# The disadvantages of large scale treatment plants

- They allow for dense packed development
- They encourage industrial and commercial development
- Take the “failure” out of your yard (and move it downstream)
- They are expensive



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## Oak Island sewer project cost sky rockets, residents want answers

*Posted: Oct 07, 2011 4:04 PM CDT Friday, October 7, 2011 5:04 PM EST Updated: Oct 11, 2011 5:30 PM CDT Tuesday, October 11, 2011 6:30 PM EST*

By: Veronica Macias - [bio](#) | [email](#)

**BRUNSWICK COUNTY, NC (WECT) – Residents in Oak Island want to know why the cost of a sewer project that was estimated to cost \$67 million skyrocketed to more than \$150 million, not including interest.**

Mayor Betty Wallace said the State's Bureau of Investigation may be stepping in to find the answer to their question. She said residents aren't satisfied with the explanations they've received from the town manager.

Wallace explained there are phases in the project that nearly doubled in cost. Residents are having a hard time wrapping their head around why a system that was **estimated in 2004 to cost a grand total of roughly \$61 million ended up at \$280 million including interest.**



# The Long-term Financial Effects

- High dollar development (increases your property value)
- Increased population
- Increased lake/road traffic
- Increased needs for more police/fire
- Build/expand schools

All of these “improvements” increase your property taxes

# They can deplete water supplies



Every month we send 2.2 trillion gallons of groundwater down rivers to the ocean

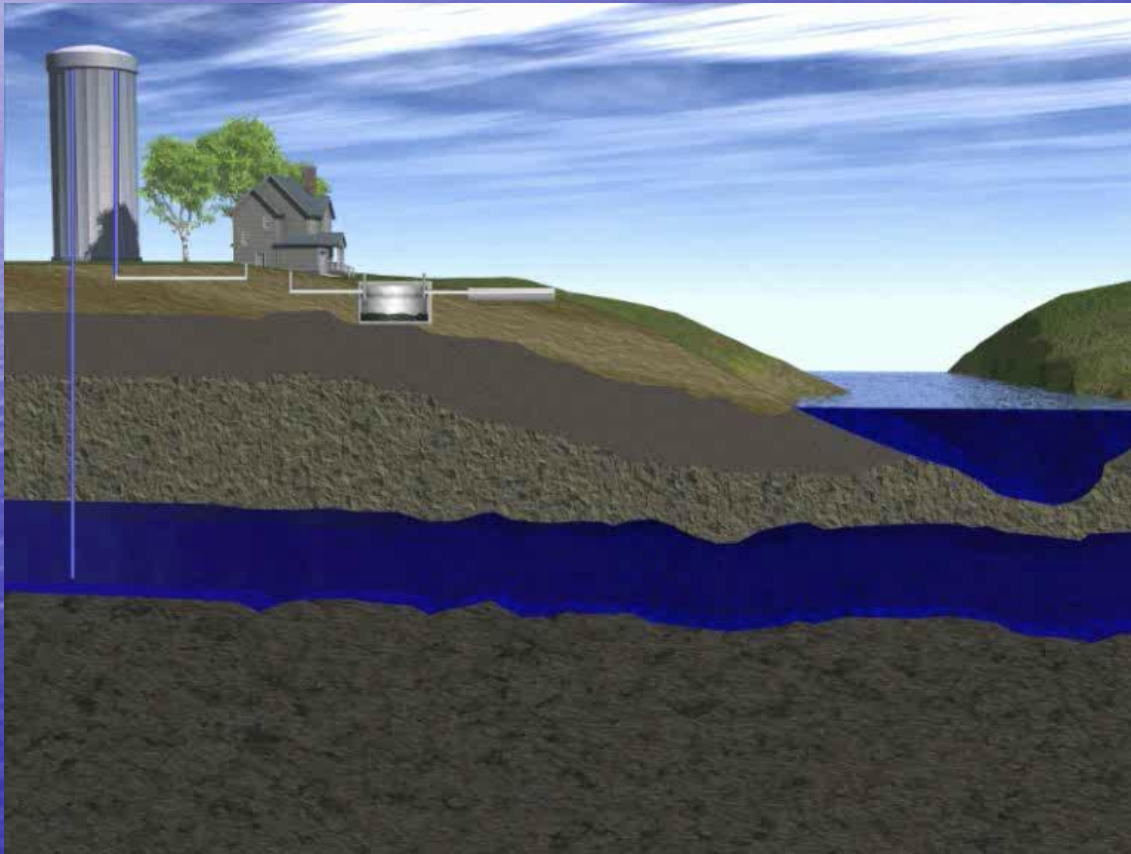
# The disadvantages of on-sites

- They need to be properly designed/installed
- They need to be used properly
- They need to be maintained

# Advantages of on-sites

- More economical (install and operate)
- Better treatment when properly designed
- Can last indefinitely
- Encourages better water/chemical usage
- Discourages over development
- Less damage when they fail
- Easy to identify failures and correct
- Re-charge local water supplies

# SEPTIC SYSTEMS KEEP WATER LOCAL BY PUTTING IT BACK WHERE IT CAME FROM



# Government Grants

- Government grants often come with stipulations that can make the project far more expensive
- Public and private foundation grants can be available to citizens