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GROUND WATER SHORTAGES:

A Story of Net Loss, Shifting Baselines, and Misconceptions

by Fred Akers, South Jersey Group Conservation Chair, and Great Egg Harbor River Administrator



In many places in New Jersey, especially in the coastal plain, freshwater is pumped up from the ground for drinking and other domestic uses. Since we cannot see or test it until it comes out of the pipe, how do we know how much is down there, and whether it will be pure enough for us to use? As we plan for growth, smart or otherwise, we also need to also ask whether there will be enough water for the future.

Currently the NJ Department of Environmental Protection and the US Geological Survey (USGS) are struggling to employ sound science to answer all the questions, establish meaningful water budgets, and ensure the long term availability of groundwater. This also means uncovering and correcting the mistakes of past planning.

In the past, as long as the total rainfall exceeded total natural and human consumption, statewide drinking water supplies were thought to be sustainable. New Jersey's rainfall is fairly abundant at about 45 inches (114 cm) per year, and this amount greatly exceeds that which is consumed by people. Past wisdom accommodated localized water shortages, by assuming that there would be water surpluses elsewhere, and that water could always be pumped from a region of surplus to one of deficit.

So everyone was building happily ever after—until the ground water supply started going critical in parts of Burlington, Gloucester, and Cape May Counties, and other places in the state. Some wells went dry, and from others the water was starting to taste a little too salty. Then it was discovered that in many places we were pumping the water out of the ground far faster than it was being replaced or recharged. In fact, most aquifers have had declining water levels for many years. What happened to the water budget?

With the coming of Governor McGreevey and the Gibson Bill (which is funding a study to locate a sustainable water supply for Cape May County), the sun is beginning to shine on hydrologic science in our state. We are now being told by USGS hydrologists, at public meetings, that the cleanest water that can be pumped with the biggest pumps without impacting the surface hydrology is so deep and so old that it cannot be recharged at anywhere close to the rate of its withdrawal. For example, the 800-Foot Sand aquifer underneath Ocean, Atlantic, and Cape May Counties contains water that is 15,000 years old, and the hydrologic pressure in this aquifer, measured in vertical pressure head, has declined from about 20 feet above sea level in the 1890's to over 100 ft below sea level in some areas today. Pumping, and ocean discharging of sewage effluents, are causing a continual net loss of these prehistoric waters.

The New Jersey Coastal Plain is like a slanted layer cake of alternating layers of porous (water bearing) and non-porous

(confining) soils, and the USGS is now endeavoring to age-date the different water layers to determine their rate of recharge. Even if the recharge in a given aquifer takes a mere 100 years, that may not be fast enough to sustain the existing demand, let alone accommodate more people and more consumptive uses.

Reservoirs and the surface aquifers will be looked to more and more as the best sources of water for human consumption, and to keep the local water budgets in balance, but there are already a myriad of problems that have diverted many big water suppliers to the lower, confined aquifers. Lower aquifers are drought resistant (until they dry up), they are protected from surface pollution sources, and they are not directly affected by high percentages of local impervious surfaces. Their confining layers protect the surface water of ponds and streams and the surface aquifers from being sucked dry.

The current and growing focus on stormwater management and aquifer recharge will be extremely important for the future of our water supplies. But stormwater will not contribute to the lower, confined aquifers unless we pump it down, under pressure, or wait for a few hundred or thousand years for it to get there. In several of the critical water supply areas there were moratoriums on withdrawals, and whereas the water levels have begun to increase in response to the reduced pumpage, they are nowhere near their original levels. The baselines have shifted.

Water conservation is needed—to save as much water as possible through efficient and intelligent use. There are many ways to implement conservation, and these will ultimately require a high level of cooperation between local, regional, and state jurisdictions.

One major consequence of our water shortages is a clear and present danger to all the non-human animal, plant, and other species that constitute the natural ecology. We saw during the 2001-2002 drought how reservoir releases promised to rivers and streams were cut back. As reservoir and river waters are siphoned off for human consumption, discharged pollutants will become more concentrated. The budget decisions for water allocation between man and nature will become much more pressing, and nature will most likely be the loser.

As the Gibson study gets moving and other areas of the state begin serious consideration of long-term water supply, the general public needs to realize the importance of making decisions based on carrying capacity. As we conduct build-out analyses of our communities, we must change zoning densities if the water supply isn't there. If streams or surface aquifers are being polluted, we should add to the stream-buffers and take other remedial steps. Now is the time to scrutinize our water budgets — for our families and for our future. ☺

Facts About Smart Growth MARKET NEEDS VS. HOUSING CHOICE

Supplied by New Jersey Future, our new co-tenants in Trenton

- More than 60 percent of all households in New Jersey have no children under 18, a number that's gradually growing.
- One quarter of all households are single-person households.
- About one quarter of all households contain at least one senior resident, aged 65 or older.
- These markets, each containing millions of people, have limited housing choice in New Jersey. Less than half of all housing available is made up of the attached housing such markets generally prefer, including townhomes and apartments; and most of this stock is concentrated in older urban areas. (Source: U.S. Census)

GIVING 'EM WHAT THEY WANT?

Some builders complain that smart growth will take away the "suburban dream" of New Jerseyans, and interfere with natural market demand.

Census evidence suggests that the opposite is true: today's predominance of sprawling three- and four-bedroom suburban homes doesn't fit New Jersey's large and growing populations of childless households, singles and seniors. Such populations often prefer apartments, condos, townhomes and other types of attached housing - as well as smaller single-family homes in communities where walking and public transit are options.

Such choices are the hallmarks of smart growth. The popularity of these

choices is supported by growing demand and soaring home values in urban places like Hoboken and Jersey City, and suburban communities along the Midtown Direct line.

Unfortunately, more than half of New Jersey's municipalities built no new multi-family housing in the boom decade of the 1990s. Where it was offered, new attached housing was too often located in automobile-dependent complexes, remote from shopping and offices. Rarely, too, are smaller single-family homes built within walking distance of shops, offices and public transit.

It may be that sprawl sells because in too many places, it's all that's available. It's a stretch to say housing is market-driven. Rather, what gets built is determined by local zoning and a host of other government regulations, including those for sewer and water.

Smart growth restores choices that sprawl-inducing zoning has taken away, by drawing public funding, private investment and jobs back into cities, older suburbs and rural communities, and providing a range of housing and transportation choices that can't be matched by any sprawling suburban community.

To receive semi-monthly bulletins from NJ Future, the state's oldest and largest non-profit, non-partisan organization devoted exclusively to Smart Growth, visit the website:

www.njfuture.org ☺

SIERRA CLUB THEATRE OUTING FUNDRAISER

Saturday, October 18, 2003

Come join some of your fellow Sierra Club members for a fun day in New York City. We'll all get to mingle and enjoy a fine lunch in the theatre district, followed by a matinee performance of the new production of *Gypsy*, starring Bernadette Peters.

GYPSY, the consummate show-biz musical suggested by the memoirs of the stripper Gypsy Rose Lee, features original choreography by the late Jerome Robbins, and new choreography by Hairspray's Jerry Mitchell. Academy Award winner Sam Mendes will helm the production. The great music score was written by Jules Styne and Stephen Sondheim, and includes *Some People*, *Let Me Entertain You*, *Together*, *Everything's Coming Up Roses*, and *All I Need Is The Girl*.

At Noon we'll enjoy an Italian lunch at Becco's, on Restaurant Row (W 46th St): choice of salad or grilled vegetables and all you can eat of 3 pastas (pasta primavera, cheese tortellini in a cream or pesto sauce, linguini with broccoli rabe and Italian sausage or meatballs). Choice of two deserts; coffee or tea.

The price of \$150 per person includes lunch and show ticket (normally \$101.25 just for the ticket), as well as a contribution to the New Jersey Chapter. Tickets are limited, and will be assigned on a first come - first served basis.

Contact Ellen Blumenkrantz at eblumenkrantz@hotmail.com or 201-784-8417 to order your tickets.

YOU HAVE MORE TO GIVE THAN YOU KNOW

Maybe you can't make a gift to protect the environment during your lifetime, but you can become a financial hero by remembering the Sierra Club in your will. You can even direct your gift to a special Club program or to the New Jersey Chapter.

For information about making a bequest to the New Jersey Chapter call George Denzer at 609-799-5839.

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