

Groundwater Resources & Existing Land Uses On The South Fork

This map illustrates several key points regarding local groundwater. The largest known contamination problems are associated with a golf course (pesticides), an industrial site (solvents), the town landfills (solvents), and farming practices (pesticides). Smaller contamination points are widespread; many of these are related to fuel spills and leaking fuel storage tanks.

Farmland and golf courses (colored brown on the map) comprise one of the largest land uses above our deepest freshwater deposits. These two land uses need to be addressed in a new groundwater protection plan. Years ago, East Hampton's Water Recharge Overlay District was established "...to ensure the continued sufficiency and purity of the Town's irreplaceable groundwater supply..." However, despite the best of intentions, this district does not address the potential impacts of farming, golf courses and (in certain areas) commercial-industrial development. Presently, its regulations are limited to clearing restrictions that, in theory, limit both the amount of landscaped areas and application of pesticides and fertilizers. In practice, the restrictions do nothing to prevent the application of pesticides and fertilizers that can leach into the groundwater and pollute the drinking water below. Southampton's Aquifer Protection Overlay District includes farmland in the district. However, farmland is still exempt from the protection measures, and the application of pesticides by homeowners is not addressed.

KEY Figure 2. Existing Land Use, Overlay Districts and Location of Specific Groundwater Resources on the South Fork.

Existing Land Uses	
Vacant	Protected Natural Areas
Residential	Non-Residential (Commercial, Industrial, Institutions, etc.)
Farmland, Recreation Areas, Golf Courses	

Deepest Groundwater Deposits (From USGS Water Supply Paper 2073)	
On the South Fork (350-650 feet thick)	In the Montauk Area (150 feet thick)
In North Haven (50 feet thick)	

- Public Water Supply Well Site
- Known Points of Groundwater Contamination or Toxic Spills (e.g. landfills, fuel spills, leaking storage tanks)
- Town of East Hampton Water Recharge Overlay District
- Town of Southampton Aquifer Protection Overlay District
- Groundwater Divide (position approximate, therefore shown as a 0.5 mile-wide band)
- Direction of Groundwater Flow

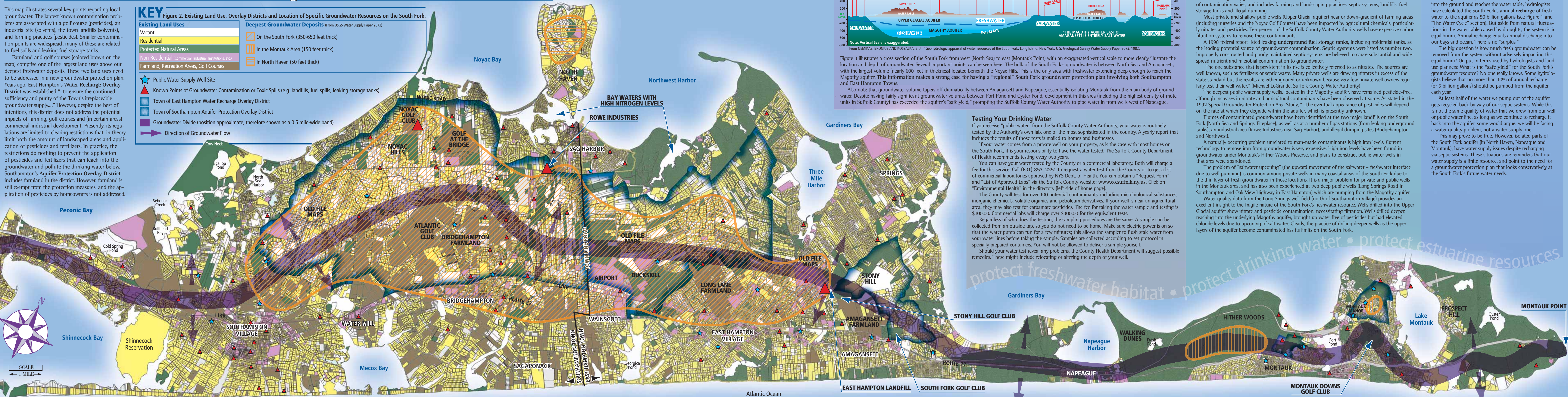


Figure 3. West-East Cross Section of the South Fork

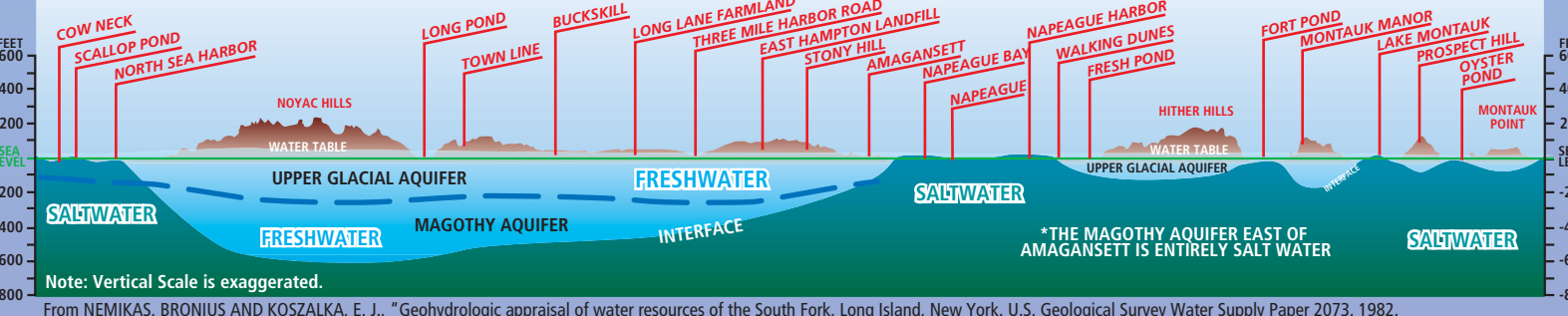


Figure 3 illustrates a cross section of the South Fork from west (North Sea) to east (Montauk Point) with an exaggerated vertical scale to more clearly illustrate the location and depth of groundwater. Several important points can be seen here. The bulk of the South Fork's groundwater is between North Sea and Amagansett, with the largest volume (nearly 600 feet in thickness) located beneath the Noyac Hills. This is the only area with freshwater extending deep enough to reach the Magothy aquifer. This information makes a strong case for having a "regional" South Fork groundwater protection plan involving both Southampton and East Hampton Towns.

Also note that groundwater volume tapers off dramatically between Amagansett and Napeague, essentially isolating Montauk from the main body of groundwater. Despite having fairly significant groundwater volumes between Fort Pond and Oyster Pond, development in this area (including the highest density of motel units in Suffolk County) has exceeded the aquifer's "safe yield," prompting the Suffolk County Water Authority to pipe water in from wells west of Napeague.

Testing Your Drinking Water

If you receive "public water" from the Suffolk County Water Authority, your water is routinely tested by the Authority's own lab, one of the most sophisticated in the country. A yearly report that includes the results of those tests is mailed to homes and businesses.

If your water comes from a private well on your property, as is the case with most homes on the South Fork, it is your responsibility to have the water tested. The Suffolk County Department of Health recommends testing every two years.

You can have your water tested by the County or a commercial laboratory. Both will charge a fee for this service. Call (631) 853-2251 to request a water test from the County or to get a list of commercial laboratories approved by NYS Dept. of Health. You can obtain a "Request Form" and "List of Approved Labs" via the Suffolk County website: www.co.suffolk.ny.us. Click on "Environmental Health" in the directory (left side of home page).

The County will test for over 100 potential contaminants, including microbiological substances, inorganic chemicals, volatile organics and petroleum derivatives. If your well is near an agricultural area, they may also test for carbamate pesticides. The fee for taking the water sample and testing is \$100.00. Commercial labs will charge over \$300.00 for the equivalent tests.

Regardless of who does the testing, the sampling procedures are the same. A sample can be collected from an outside tap, so you do not need to be home. Make sure electric power is on so that the water pump can run for a few minutes; this allows the sampler to flush stale water from your water lines before taking the sample. Samples are collected according to set protocol in specially prepared containers. You will not be allowed to deliver a sample yourself.

Should your water test reveal any problems, the County Health Department will suggest possible remedies. These might include relocating or altering the depth of your well.

Water Quality

As noted on Figure 1, groundwater has been contaminated in many areas of the South Fork. The source of contamination varies, and includes farming and landscaping practices, septic systems, landfills, fuel storage tanks and illegal dumping.

Most private and shallow public wells (Upper Glacial aquifer) near or down-gradient of farming areas (including nurseries and the Noyac Golf Course) have been impacted by agricultural chemicals, particularly nitrates and pesticides. Ten percent of the Suffolk County Water Authority wells have expensive carbon filtration systems to remove these contaminants.

A 1998 federal report listed leaking underground fuel storage tanks, including residential tanks, as the leading potential source of groundwater contamination. Septic systems were listed as number two. Improperly constructed and poorly maintained septic systems are believed to cause substantial and widespread nutrient and microbial contamination to groundwater.

"The one substance that is persistent in its rise is collectively referred to as nitrates. The sources are well known, such as fertilizers or septic waste. Many private wells are drawing nitrates in excess of the state standard but the results are either ignored or unknown because very few private well owners regularly test their well water." (Michael LoGrande, Suffolk County Water Authority)

The deepest public water supply wells, located in the Magothy aquifer, have remained pesticide-free, although increases in nitrate and agricultural contaminants have been observed at some. As stated in the 1992 Special Groundwater Protection Area Study, "...the eventual appearance of pesticides will depend on the rate at which they degrade within the aquifer, which is presently unknown."

Plumes of contaminated groundwater have been identified at the two major landfills on the South Fork (North Sea and Springs-Fireplace), as well as at a number of gas stations (from leaking underground tanks), an industrial area (Rowe Industries near Sag Harbor), and illegal dumping sites (Bridgehampton and Northwest).

A naturally occurring problem unrelated to man-made contaminants is high iron levels. Current technology to remove iron from groundwater is very expensive. High iron levels have been found in groundwater under Montauk's Hither Woods Preserve, and plans to construct public water wells in that area were abandoned.

The problem of "saltwater upconing" (the upward movement of the saltwater - freshwater interface due to well pumping) is common among private wells in many coastal areas of the South Fork due to the thin layer of fresh groundwater in those locations. It is a major problem for private and public wells in the Montauk area, and has also been experienced at two deep public wells (Long Springs Road in Southampton and Oak View Highway in East Hampton) which are pumping from the Magothy aquifer.

Water quality data from the Long Springs well field (north of Southampton Village) provides an excellent insight to the fragile nature of the South Fork's freshwater resource. Wells drilled into the Upper Glacial aquifer show nitrate and pesticide contamination, necessitating filtration. Wells drilled deeper, reaching into the underlying Magothy aquifer, brought up water free of pesticides but had elevated chloride levels due to upconing of salt water. Clearly, the practice of drilling deeper wells as the upper layers of the aquifer become contaminated has its limits on the South Fork.

Water Quantity & Safe Yield

Estimating that nearly half of our annual precipitation sinks into the ground and reaches the water table, hydrologists have calculated the South Fork's annual recharge of freshwater to the aquifer as 50 billion gallons (see Figure 1 and "The Water Cycle" section). But aside from natural fluctuations in the water table caused by droughts, the system is in equilibrium. Annual recharge equals annual discharge into our bays and ocean. There is no "surplus."

The big question is how much fresh groundwater can be removed from the system without adversely impacting this equilibrium? Or, put in terms used by hydrologists and land use planners: What is the "safe yield" for the South Fork's groundwater resource? No one really knows. Some hydrologists believe that no more than 10% of annual recharge (or 5 billion gallons) should be pumped from the aquifer each year.

At least half of the water we pump out of the aquifer gets recycled back by way of our septic systems. While this is not the same quality of water that we drew from our well or public water line, as long as we continue to recharge it back into the aquifer, some would argue, we will be facing a water quality problem, not a water supply one.

This may prove to be true. However, isolated parts of the South Fork aquifer (in North Haven, Napeague and Montauk), have water supply issues despite recharging via septic systems. These situations are reminders that our water supply is a finite resource, and point to the need for a groundwater protection plan that looks conservatively at the South Fork's future water needs.

protect freshwater habitat • protect drinking water • protect estuarine resources