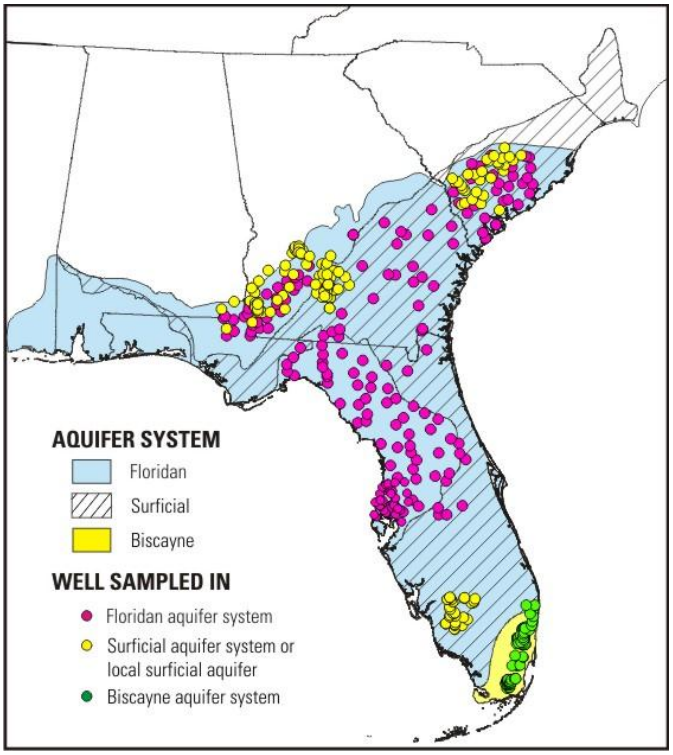
NATIONAL WATER-QUALITY ASSESSMENT PROGRAM

Water Quality in the Floridan, Biscayne, and Surficial Aquifer Systems

The National Water-Quality Assessment (NAWQA) Program of the U.S. Geological Survey is assessing water quality in the Floridan, Biscayne, and surficial aquifer systems. The Floridan aquifer system is the primary source of drinking water for nearly 10 million people and supports water needs for agriculture, industry, and tourism throughout most of the southeastern coastal region. This aquifer contains numerous karst features, such as springs and sinkholes, which allow relatively rapid transport of water and contaminants and increase its vulnerability to contamination.

About 4 million people in the southern tip of Florida rely on public-water supplies from the Biscayne aquifer system. The Biscayne aquifer is part of the overlying surficial system, consisting of highly permeable sand and limestone sediments. These sediments make this "sole source aquifer" particularly vulnerable to contamination. The remaining part of the surficial aquifer system to the north of the Biscayne is also used for public supply and for domestic supplies, but to a lesser extent than the Biscayne.



Goals of this regional study are to better understand sources, movement, and fate of contaminants in these aquifers. Findings will help to improve understanding of ground-water contamination and flow throughout the aquifers, and in particular, how natural features and human activities affect water quality, and why some aquifers are more vulnerable to contamination than others. The information will help local, State, and regional decision makers in source-water protection of this important drinking-water resource. The regional study is based on samples collected in nearly 400 wells, including those used for monitoring, domestic purposes, and public-supply. These wells were sampled from 1994 through 2005 and include analyses for nutrients, major ions, selected pesticides, radon, and volatile organic compounds.

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U.S. Geological Survey

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Floridan and Biscayne aquifer systems included in National Study of Carbonate Aquifers

Ground water in carbonate rocks in the Floridan and Biscayne aquifer systems are also studied as part of a broader NAWQA study of most of the Nation's carbonate aquifer systems. The carbonate aquifers are important sources of drinking water and contain numerous karst features, such as springs and sinkholes, which make these aquifers vulnerable to contamination. Findings from the broader study will provide useful comparisons and enhanced understanding to the current work in the Floridan and Biscayne. This national study is based on samples from more than one thousand wells or springs, including those used for monitoring, domestic purposes, and public-supply. These wells were sampled from 1994 through 2005 and include analyses for nutrients, major ions, radon, and selected pesticides and volatile organic compounds. The published report is:

Lindsey, B.D., Berndt, M.P., Katz, B.G., Ardis, A.F., and Skach, K.A., 2009, Factors affecting water quality in selected carbonate aquifers in the United States, 1993–2005: U.S. Geological Survey Scientific Investigations Report 2008- 5240, 117 p., available at http://pubs.usgs.gov/sir/2008/5240/

PUBLICATIONS—A series of reports on water quality in the Floridan, Biscayne, and surficial aquifer systems have been published, as indicated below.

Berndt, M.P., and Crandall, C.A., 2009, Factors affecting water quality in domestic wells in the Upper Floridan aquifer, Southeastern United States, 1998-2005: U.S. Geological Survey Scientific Investigations Report 2009-5147, 39 p., available at http://pubs.usgs.gov/sir/2009/5147/

Berndt, M.P., Katz, B.G., Lindsey, B.D., Ardis, A.F., and Skach, K. A., 2005, Comparison of water chemistry In spring and well samples from selected carbonate aquifers in the United States, *in* U.S. Geological Survey Karst Interest Group Proceedings, Rapid City, South Dakota, September 12-15, 2005, U.S. Geological Survey Scientific Investigations Report 2005-5160, p. 74-81., available at http://pubs.usgs.gov/sir/2005/5160/PDF/Part2_1.pdf

Bradner, Anne, McPherson, B.F., Miller, R.L., Kish, G., and Bernard, B., 2005, Quality of Ground Water in the Biscayne Aquifer in Miami-Dade, Broward, and Palm Beach Counties, Florida, 1996-1998, with Emphasis on Contaminants: U.S. Geological Survey OFR 2004-1438, 20 p., available at http://pubs.usgs.gov/of/2004/1438/

Katz, B.G., Crandall, C.A., Metz, P.A., McBride, S., and Berndt, M.P., 2007, Chemical characteristics, water sources and pathways, and age distribution of ground water in the contributing recharge area of a Public-Supply Well near Tampa, Florida, 2002-05: U.S. Geological Survey Scientific Investigations Report 2007-5139, 83 p.

Marella, R.L., and Berndt, M.P., 2005, Water withdrawals and trends from the Floridan aquifer system in the southeastern United States, 1950-2000: U.S. Geological Survey Circular 1278, 20 p. ., available at http://pubs.usgs.gov/circ/2005/1278/

Metz, P.A., Delzer, G.C., Berndt, M.P., Crandall, C.A., and Toccalino, P.L., 2006, Anthropogenic organic compounds in ground water and finished water of community water systems in the northern Tampa Bay area, Florida, 2002–04: U.S. Geological Survey Scientific Investigations Report 2006–5267, 48 p., available at http://pubs.usgs.gov/sir/2006/5267/

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USGS Aquifer studies website: http://water.usgs.gov/nawqa/studies/praq/