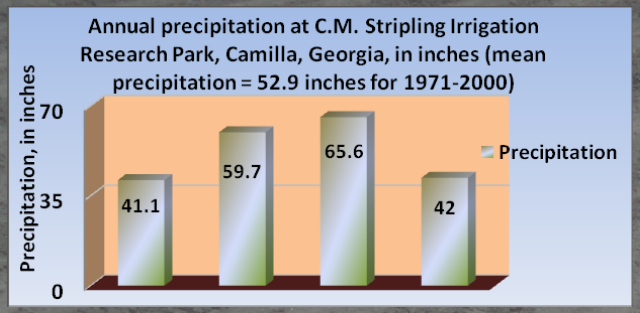
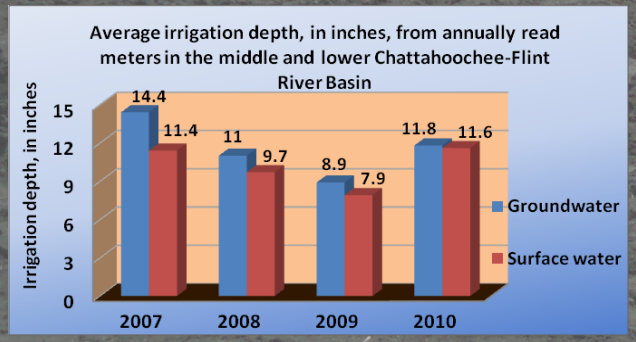
## Metering Progress

The first agricultural region to be supplied with water meters was the middle and lower Chattahoochee-Flint River Basin, consisting of nine subbasins. More than 4,300 meters were installed in time to measure water use at the start of the 2007 growing season. Meter installation continued elsewhere in the agricultural fields of Georgia through 2010. Four years of metered data collected here during 2007–2010 demonstrate how farmers rely on irrigation to meet crop demands for water during dry growing seasons (see charts below).

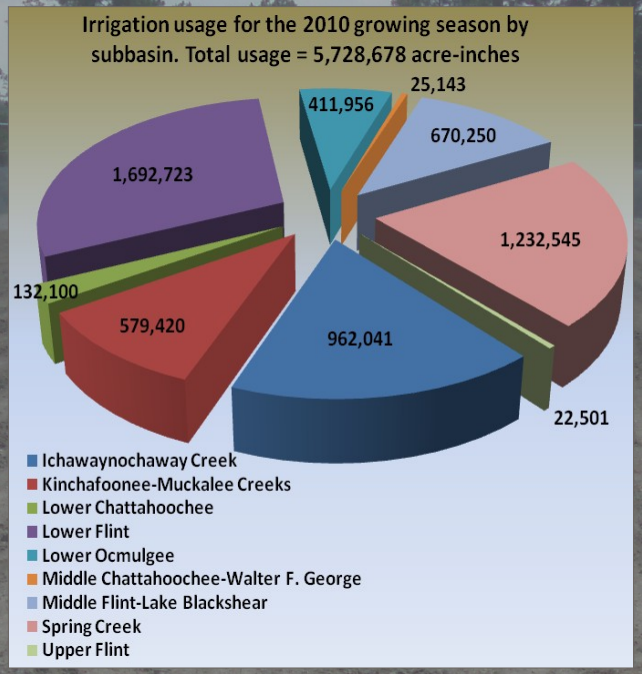
Farmers offset rainfall deficits during the dry years 2007 and 2010 with increased irrigation, compared with less irrigation applied during 2008 and 2009, when rainfall exceeded normal amounts for the region (annual precipitation data from Georgia Automated Environmental Monitoring Network , 2011; mean precipitation value for 1971–2000 from Southeast Regional Climate Center, 2011).




## Sizing up Irrigation Water Use in the Middle and Lower Chattahoochee-Flint River Basin

Irrigation depth and usage varied across the subbasins and counties of the middle and lower Chattahoochee-Flint River Basin (see charts on this page) because of differences in crops planted, soil type, local rainfall amounts, surface-water availability, and aquifer yield.

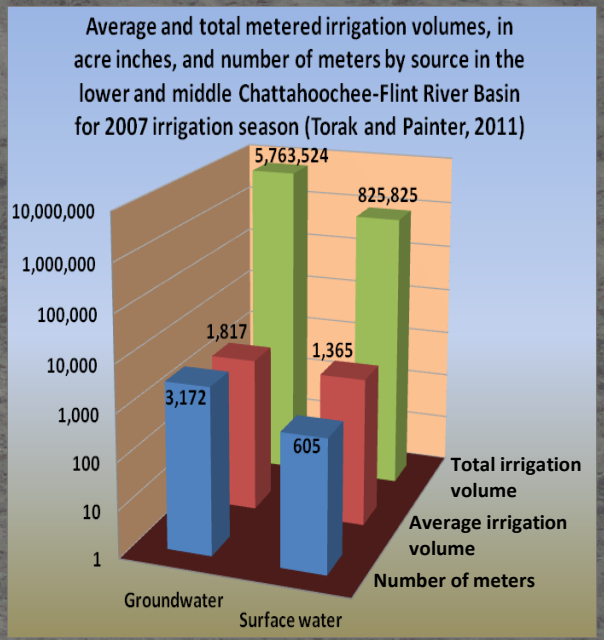



On average, farmers applied about one-third more groundwater than surface water per metered irrigation system, owing to the higher capacity of groundwater irrigation systems than surface water (see chart to right). Metered groundwater systems outnumbered that of surface water by five to one. Therefore, groundwater supplied almost seven times more irrigation volume to fields than surface water.

## Space-Age Technology for Down-to-Earth Irrigation Metering

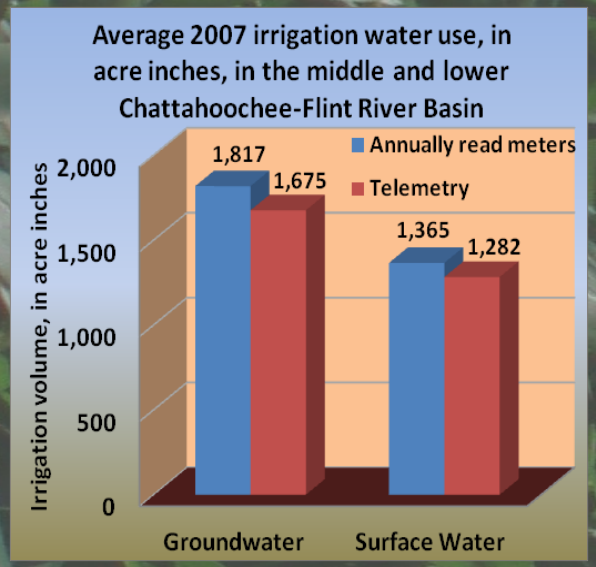
The Georgia Soil and Water Conservation Commission has equipped 198 meter locations statewide with satellite data transmitting (telemetry) capability (see photo to left). Irrigation water use and precipitation data are communicated by satellite twice daily from each telemetered site and are reported to GSWCC via internet. The telemetered data help farmers track daily, monthly, and seasonal patterns of irrigation, and enable GSWCC, farmers, and water managers to assess water use in near real time. By comparison, the more numerous, annually-read meters provide an understanding of irrigation patterns and variability within a region, such as a subbasin or county.

A comparison of average water use at telemetered sites to the average obtained from the annually read meters in the middle and lower Chattahoochee-Flint River Basin indicates that the telemetry represents irrigation water use quite well (see bar graph, top of opposite page to right). Twice-daily telemetry and annually read meters each serve their purpose in providing vital field-to-field information about near real-time and seasonal irrigation practices.



## Irrigation Patterns and Trends

Statistical analysis of annually read meter data in the middle and lower Chattahoochee-Flint River Basin indicates a distinct geographic pattern of increased irrigation from low volume in the northwestern parts of the basin (blue and yellow dots on maps to the right, from Torak and Painter, 2011), to high volume (red dots) in the southeast. Although irrigation by surface water (streams) follows this northwest-to-southeast increasing usage pattern, about halfway through the basin in this direction, surface-water sources are almost completely replaced by groundwater (wells and well-to-pond systems). Most likely, this is because wells can be installed to tap the reliable and highly productive Upper Floridan Aquifer conveniently where needed (at the field) instead of laying pipe to pump water from the nearest stream, which also might contain little or no flow during severe drought conditions.

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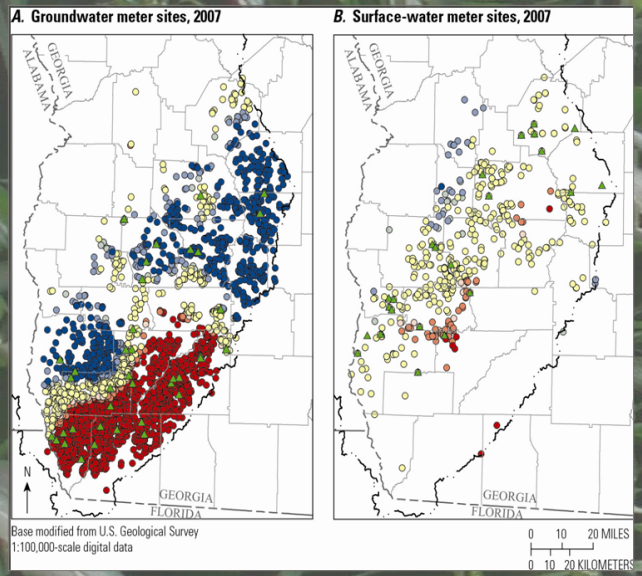
## On the Horizon for the Metering Program

Continued research and analysis into the patterns and distribution of irrigation water use derived from the meter data will provide farmers and water managers with an important tool to assess Georgia's future water needs. Anticipated results will improve the representative nature of the telemetry network, report on analyses of meter data for other agricultural regions in Georgia (in addition to the middle and lower Chattahoochee-Flint River Basin), and identify relations between metered water use and variations in crop and soil type, local rainfall, and water availability.

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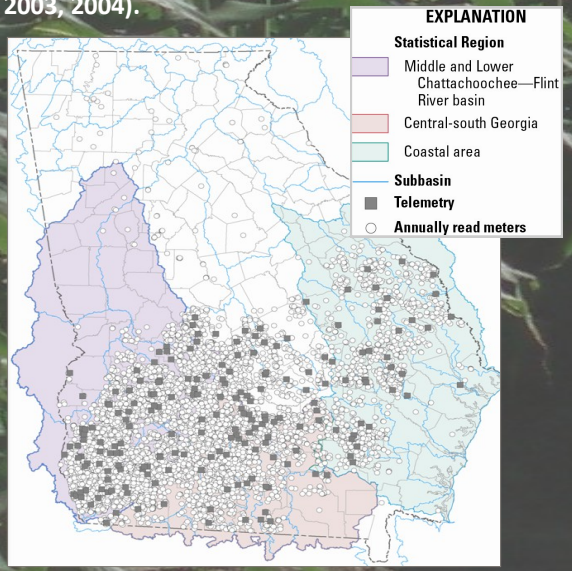
USGS science for a changing world

GSWCC

# The Georgia Agricultural Water Conservation and Metering Program Summary 2004–2010

Since the winter of 2003-2004, the Georgia Soil and Water Conservation Commission (GSWCC) has installed more than 10,000 water meters on agricultural irrigation systems in Georgia (see figure to right). Mandated by Georgia House Bill 579, signed into law on June 4, 2003, GSWCC is responsible for "*implementing a program of measuring farm uses of water in order to obtain clear and accurate information on the patterns and amounts of such use, which information is essential to proper management of water resources by the state and useful to farmers for improving the efficiency and effectiveness of their use of water*" (Georgia General Assembly, 2003, 2004).




GSWCC has been engaged in cooperative research with the U.S. Geological Survey since 2008 to analyze metered irrigation water use data as part of the USGS mission to provide "*reliable, impartial, and timely information that is needed to understand the nation's water resources*" (U.S. Geological Survey, 2011).