

RECHARGE AREAS OF THE FLORIDAN AQUIFER IN THE ST JOHNS RIVER WATER MANAGEMENT DISTRICT

Maps of groundwater recharge areas are useful planning tools for groundwater resource management. Groundwater recharge to the Floridan aquifer, as mapped by SJRWMD, is the addition of water to the Floridan aquifer from the overlying surficial aquifer, or the more direct infiltration of rainfall in areas where the surficial sediments are thin or absent and where the limestones of the Floridan aquifer are at or near land surface. The amount of water available as recharge to the Floridan aquifer is that part of rainfall, after losses to runoff and evapotranspiration, which infiltrates through the soil zone to the water table and continues to move downward to underlying aquifer systems.

Soils having high infiltration potential with little or no runoff due to poorly developed surface drainage features are most conducive to recharging groundwater systems. However, most soil borings or other soil information provide data on soil characteristics down to a depth of about five to six feet. To determine recharge to hydrogeologic units below the soil zone, such as the Floridan aquifer, an evaluation of geologic and hydrologic characteristics is needed.

The hydrogeologic characteristics of the surficial, intermediate, and Floridan aquifer systems determine areas and rates of recharge to the Floridan aquifer. The surficial aquifer system extends from the land surface downward to the top of the intermediate confining unit separating the surficial and Floridan aquifer systems. The water table of the surficial aquifer is the upper surface of the zone of saturation. The intermediate confining unit, where present, retards the movement of water between the surficial and Floridan aquifers and confines the Floridan aquifer under artesian conditions. The water level in a well tapping the Floridan aquifer is called the potentiometric level, and this water level can be higher, lower, or at the same elevation as the water table. Vertical movement, or leakage, of water through the confining unit is dependent upon its thickness and hydraulic conductivity.

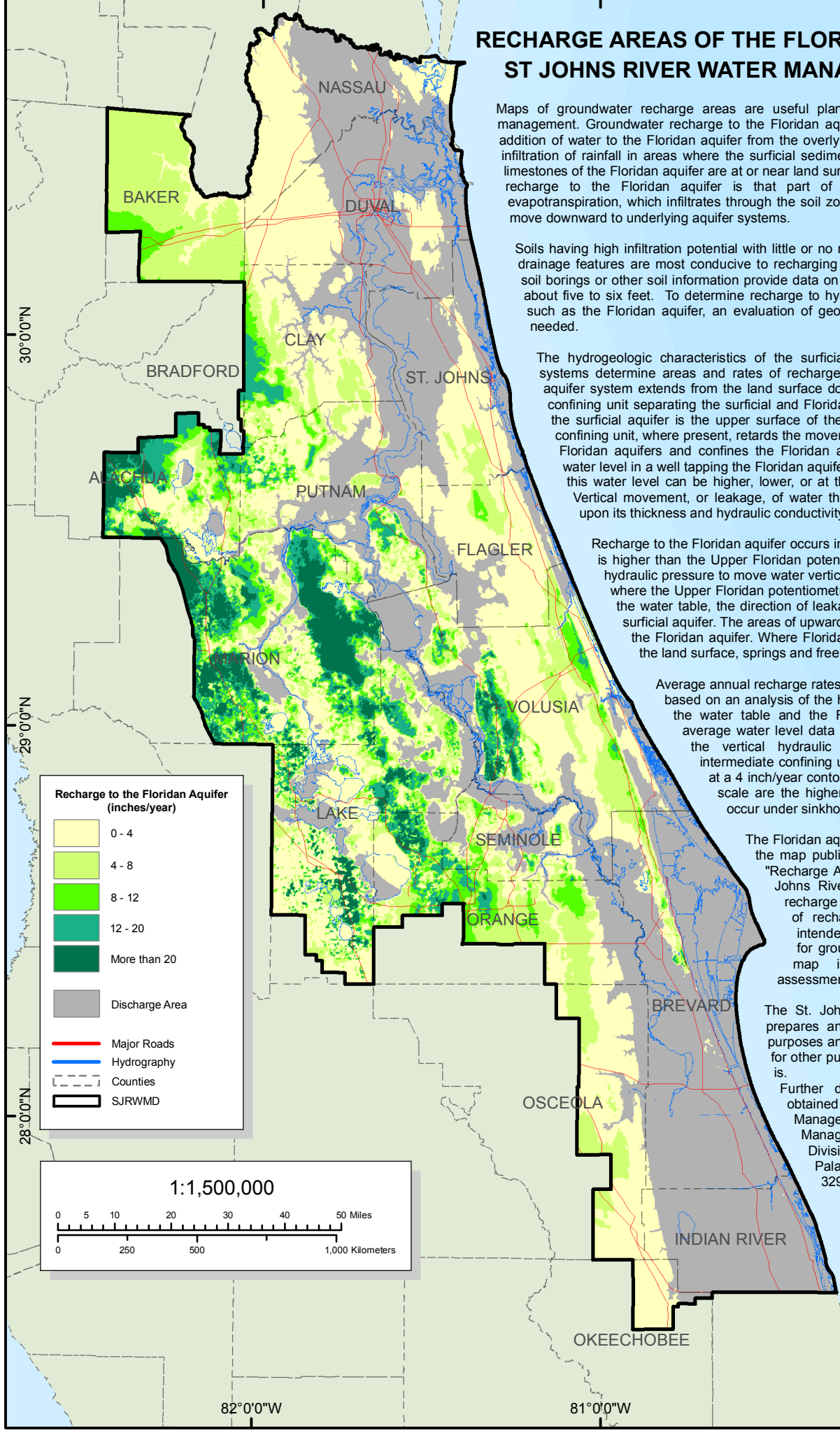
Recharge to the Floridan aquifer occurs in areas where the water table elevation is higher than the Upper Floridan potentiometric elevation, creating downward hydraulic pressure to move water vertically through the confining unit. In areas where the Upper Floridan potentiometric surface is at a higher elevation than the water table, the direction of leakage is upward from the Floridan to the surficial aquifer. The areas of upward leakage define the discharge areas of the Floridan aquifer. Where Floridan potentiometric elevations are above the land surface, springs and free-flowing artesian wells occur.

Average annual recharge rates to the Floridan aquifer were calculated based on an analysis of the hydraulic pressure differences between the water table and the Floridan potentiometric surface (using average water level data from 1998-2004), and on estimates of the vertical hydraulic conductivity and thickness of the intermediate confining unit. The recharge rates were mapped at a 4 inch/year contour interval. Not mapped at this regional scale are the higher localized rates of recharge that may occur under sinkhole lakes.

The Floridan aquifer recharge map is a 2005 update of the map published in Technical Publication SJ93-5, "Recharge Areas of the Floridan Aquifer in the St. Johns River Water Management District." The recharge map provides a regional assessment of recharge to the Floridan aquifer and is intended to be used as a regional planning aid for groundwater resource management. The map is not intended for site-specific assessments.

The St. Johns River Water Management District prepares and uses this information for its own purposes and this information may not be suitable for other purposes. This information is provided as is.

Further documentation of this data can be obtained by contacting: St. Johns River Water Management District, Dept. of Resource Management, Groundwater Programs Division, P.O. Box 1429, 4049 Reid Street, Palatka, Florida 32178-1429, Tel: (386) 329-4500.



Recharge to the Floridan Aquifer (inches/year)

- 0 - 4
- 4 - 8
- 8 - 12
- 12 - 20
- More than 20

Discharge Area
 Major Roads
 Hydrography
 Counties
 SJRWMD

