

# CRYSTAL RIVER/KINGS BAY FACT SHEET

November 30, 2004

## Background

Crystal River/Kings Bay is a complex network of more than 30 springs. The discharge from this first magnitude spring system accounts for 99 percent of the fresh water entering the 600-acre Kings Bay. Crystal River/Kings Bay is Florida's second largest springs system, discharging more than 975 cubic feet of water per second. Crystal River, which emerges from the northwest end of Kings Bay, travels westward approximately six miles before entering the Gulf of Mexico.

### *Land-Use Changes and Impacts*

Extensive dredge-and-fill activities beginning in the 1960s altered much of Kings Bay and portions of the Crystal River shorelines. Numerous sea walls and dead-end canal systems were created to provide residential and commercial boat access. These activities changed water circulation and reduced the amount of natural wetlands. From 1970 to 2000, the population of Citrus County grew from 19,196 to 118,085. Currently, nearly 40 percent of the contributing Crystal River/Kings Bay watershed/springshed is urbanized.

Recognizing the need to provide some protection of the waters, the state designated Crystal River/Kings Bay as an Outstanding Florida Water in 1983. In 1989, the Southwest Florida Water Management District (District) designated the area as a Surface Water Improvement and Management (SWIM) Priority Water Body. A SWIM Plan was developed to identify management issues and actions necessary to restore and protect Crystal River/Kings Bay.

## Actions

### *Nutrient Management*

Overall, nutrient levels in Kings Bay are considered low compared to springs systems in more developed areas of the Springs Coast region. However, current nutrient levels are probably higher than levels before human development. Spring discharge, wastewater effluent, septic tank leaching and stormwater runoff were identified in 1990 as major sources of nutrients by the Florida Department of Environmental Regulation and the District.

In 1992, the City of Crystal River (City) stopped discharging effluent from the wastewater treatment plant into Kings Bay, which removed the second largest contributor of nutrients to the bay. Studies identified the largest contributor of nutrients to the bay as spring discharge, containing residential and golf course turf fertilizers and septic tank leachate. These nutrient sources continue to be addressed through stormwater improvement projects and connection of residences to the City's sanitary sewer system.

Additional District projects to identify nitrate "hot spots," prioritize stormwater sub-basins, remove debris from local sinkholes and increase public awareness are scheduled from 2005 to 2008.

### *Wildlife*

In 1991, copper and other inorganic pollutants in bay sediments were analyzed to learn what, if any, health risks manatees faced from eating



plants grown in the affected sediments. The analysis showed that the elevated copper levels in the sediments were not high enough to harm the manatees and the other tested pollutants were below levels of concern. In 1994, the United States Fish and Wildlife Service analyzed mercury levels in largemouth bass in the Crystal River National Wildlife Refuge. Although not deadly to fish, the mercury could hurt birds feeding on them. Current advisories, issued by the Florida Department of Health, recommend that women of child-bearing age and young children avoid eating largemouth bass caught in Crystal River/Kings Bay and advise others to limit consumption to one fish per week.



Source:  
Carl Donohue

### ***Aquatic Plants***

The increase of exotic aquatic plants has long been an issue in the bay. Beginning around 1960, three nuisance aquatic plants have been introduced to Crystal River/Kings Bay: Hydrilla, Eurasian milfoil and Lyngbya.

In the past 14 years, the District has funded several diagnostic studies and restoration projects to address aquatic plant management. Much has been learned from the studies, including:

- Rooted aquatic plants help improve water clarity and reduce the presence of Lyngbya.
- Saltwater influxes from the Gulf reduce quantities of Lyngbya and Hydrilla.
- Removing Lyngbya mats does not encourage re-growth of desired plant species like tape grass.
- Large-scale replantings of native plants will not likely succeed due to manatee grazing.

The District is currently funding a project to monitor and map aquatic plants in Kings Bay; anticipated for completion in 2006.

### ***Water Clarity and Sediments***

Historically, crystal-clear water was a defining characteristic of the bay; however, substantial declines in water clarity have reportedly occurred since the 1980s. Studies that evaluated water clarity and sediments in Kings Bay, from 1989 to 2004, have provided the following information:

- In 1993, sediments were determined to be shallow and fine-grained and moderate in nutrient levels.
- Water clarity measured in 2003–2004 ranged from 4.8 to 75 feet and was not significantly lower than it was 10 years earlier. Clarity is significantly higher near springs than other areas of the bay.
- Open-water areas of the bay were flushed relatively quickly and flushing times were affected by spring discharge.
- Factors affecting water clarity included dead and living microscopic plants.
- Removal of sediments around Hunters Spring and Tarpon Hole did not result in long-term improvement in water clarity.

Future District projects include an evaluation of changes in bay sediments since 1993 and an effort to identify sources of chlorophyll in the bay. These projects, scheduled for initiation in 2005 and 2006, respectively, will determine if sediments have increased in thickness or become more silty since 1993; if sediments are a source of nutrients to the bay; and which species of algae in the bay is most common (and most likely to affect water clarity).

### ***Partnering With Residents***

The District recognizes the importance of community education to help address future water quality in the area. A community education program will be conducted in 2005–2006. This program will provide information and incentives to area residents and business owners to encourage people to adopt behaviors that protect area water resources. The ultimate goal is to minimize further water quality impacts that result from commercial and homeowner activities.