MULTI-YEAR DROUGHT IN APALACHICOLA-CHATTAHOOCHEE-FLINT RIVER BASIN

Memphis Vaughan, Jr.

AUTHOR: Hydraulic Engineer, U.S. Army Corps of Engineers, Mobile District, P.O. Box 2288, Mobile, AL 36628-0001.
REFERENCE: Proceedings of the 2001 Georgia Water Resources Conference, held March 26-27, 2001, at the University of Georgia. Kathryn J. Hatcher, editor, Institute of Ecology, the University of Georgia, Athens, Georgia.

Abstract. A multi-year drought has existed in the southeastern United States and has been particularly extreme in the Apalachicola-Chattahoochee-Flint (ACF) River basin. Drought conditions have caused major impacts to navigation, recreation, water supply, hydropower and water quality in the basin.

The drought that began in late 1998 and extended into 2001 has further highlighted the importance of water resource management among the three states, Georgia, Alabama, and Florida and the Corps of Engineers that may impact long-term decisions in the region. The Corps of Engineers has utilized lessons learned during the 80's droughts to manage the resources in the basin during the current drought.

INTRODUCTION

Drought conditions have existed in the Apalachicola-Chattahoochee-Flint (ACF) River basin since early summer of 1998 when the La Nina phenomenon began to have effects on the rainfall in the southeast. While El Nino caused above normal rainfall across the basin in early 1998, La Nina had the opposite effect from the summer of 1998 until late 2000.

While the other basins within the Mobile District were affected by the drought, the ACF basin had been impacted significantly within the last three years. Rainfall has been below normal at most of the rainfall stations within the basin and consequently the resulting inflows into the lakes have been well before the historical averages. The drought began to show its effects initially in the upper basin beginning in the summer of 1998 when the average local inflow for the July-December period was 59% and 43% of normal at Buford and West Point respectively.

As shown in Figure 1, the entire basin was experiencing the effects of the drought and the total basin inflow for the ACF system averaged about 49%

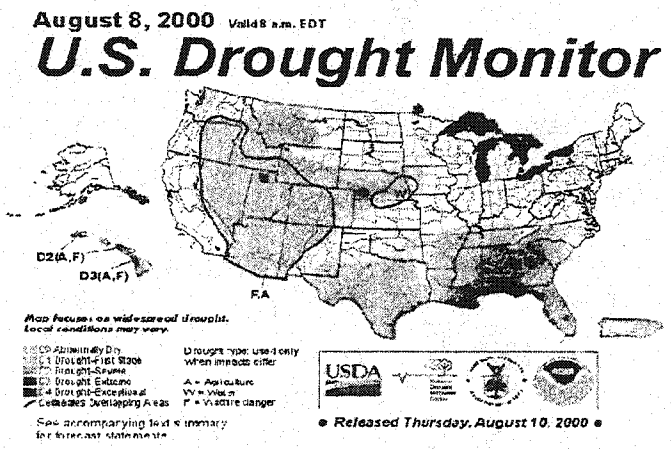

Figure 1.

of normal in 1999. Conditions remained below normal into 2000 and the inflows were only 43% of normal in for the entire year. Figure 2 compares the total ACF basin local inflows to the historical average.

Management of the ACF system during this drought involved the balancing of the multiple purposes of the system to equitably meet the needs of all the users. The four major dams have among their purposes flood control, hydropower, recreation, navigation, water supply and water quality.

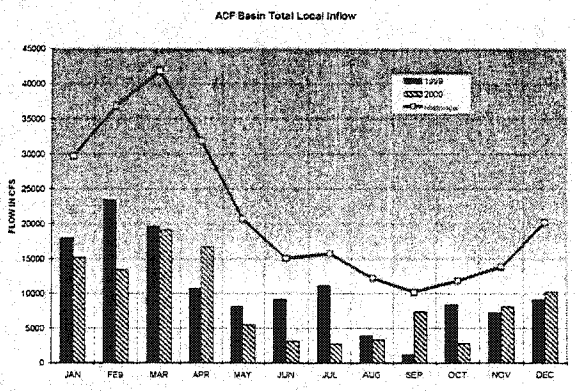

Figure 2.

OPERATION FOR NAVIGATION

Typically, when low water conditions exist, the Corps will scale back its releases for navigation and limit the amount of navigation windows that might occur during a year. Since 1998, the Corps held only a few navigation windows since there was not adequate water in the system. This helped to maintain some storage in the upstream lakes for recreation and water supply but it put a severe burden on the navigational users on the system. They were faced with other means of getting their product to their customer and it hampered the promotion of the system to future users.

Over the years, due to deteriorating conditions on the Apalachicola River and the lack of adequate disposal sites for dredging, it has become necessary to utilize navigation windows in order to meet the needs of shippers on the system. Navigation windows are typically 10-day periods where the river is held at a specified level guaranteeing shippers a pre-determined depth and adequate lead-time to move onto the system. Prior to the windows, the flows on the Apalachicola River are reduced and the water is stored in the upstream projects of Walter F. George and West Point to be utilized during the windows.

In early April 2000 at the request of shippers, a navigation window was scheduled for late April-early May. The reasons were: (1) to take advantage of the flows that were existing in the basin at the time; (2) it was the most opportune time for most of the shippers to meet their delivery schedules; and (3) there had been just one navigation window (February 2000) since August of 1999.

The timing was critical since it appeared that there would not be another chance for a navigation window until the fall. Rainfall predictions indicated that there was the possibility of additional rainfall within the 10-day period leading up to the window's commencement date.

OPERATION FOR MINIMUM FLOW

As the drought conditions persisted into the summer of 2000, the lakes at West Point, W. F. George and Seminole remained near their minimum levels and water was then taken from storage at Lanier. Lanier, up until that time had not been utilized for navigation since the latter part of 1998 and only met the minimum flow needs of the immediate metro Atlanta area. Without adequate storage in the downstream lakes, the storage in Lanier was now used to maintain the minimum flow requirement of 5000 cfs on the lower ACF system. The 5000 cfs flow as outlined in the Corps' Water Control Plan as the minimum flow needed to maintain the intakes at Gulf Power's Plant Schulz, which was a few miles downstream of Woodruff Dam and it would also satisfy the minimum environmental needs along the Apalachicola River.

A proposal by the Corps of Engineers to consider reducing the flow below 5000 cfs in August as means of reducing the draw on the storage in Lanier. Lake level projections at that indicated that if the basin received the historically minimum monthly inflows, Lanier would reach a new record low level and would not completely refill by the following summer. This proposal was met with concern and disapproval by the fish and wildlife interests in Florida. The U. S. Fish and Wildlife Service felt the reduction would have a serious impact to the endangered mussels in the Apalachicola River and that cutting below 5000 cfs would necessitate formal consultation under the Endangered Species Act (ESA).

Others felt the reduction would also have a deleterious effect on the oysters in Apalachicola Bay. The time dictated by the ESA process made it impossible to implement in the remainder of 2000. Subsequently, rainfall in August and September relieved the pressure on using the storage in Lanier and conditions improved enough to allow a continuation of the 5000 cfs minimum.

During this time, the state of Georgia had implemented conservation measures for the entire state that were put in place to minimize municipal water usage. Industries along the basis were given notice by the Corps to take the necessary steps to reduce their water supply needs.

OPERATION FOR HYDROPOWER

In late 1998, it was determined that if the low water conditions did not improve, the Southeastern Power Administration (SEPA) would consider purchasing replacement energy during the winter and spring of 1999 while energy rates were lower than that anticipated for the summer months. This would allow the lakes to be maintained higher and allow storage to be available during the peak summer demand period. This proactive effort by SEPA started in 1999 and has continued into 2001. SEPA's purchases will more than likely continue until all lakes in the system have refilled and the drought has ended.

SPECIAL NAVIGATION SHIPMENT

Rainfall conditions during the fall and winter periods of 2000 did not improve substantially and it became evident that a proposed special navigation shipment in December by the Southern Nuclear Operating

Company (SNOC) may be in jeopardy and may have to be delayed until early 2001. The SNOC expressed a need to have the shipment of there 360 ton generators delivered to the plant in order to have the generators online before peak summer demand occurred or the region could face significant adverse impacts, including possible interrupted service, higher prices and transmission problems.

There was concern by upstream interests that with Lake Lanier near record low levels, another navigation window in December would ultimately require additional storage to be taken from Lake Lanier despite assurances from the Corps that the special shipment period, which was shorter than typical windows and planned specifically for SNOC, would not have an impact on Lake Lanier since winter rains would replenish the water taken from George and Seminole. Several meetings were held with Corps officials, SNOC, basin stakeholders and the congressional interests to discuss delaying the shipment but the ultimately the decision was made to make the shipment in mid-December. The shipment was successfully made and rainfall in the basin during the shipment period provided adequate water to replenish the water that was taken from storage at George and Woodruff.

CONCLUSION

At the time of this paper, rainfall conditions in the ACF basin have yet to return to normal conditions although the lower basin has started to receive the rains common during the January period. Lake Lanier is still 15 feet below its summer level of elevation 1071. Since it contains approximately half of the usable storage on the system, the operation of the entire basin hinges on whether it refills or not. Until it completely refills, there will continue to be strong opposition to the utilization of navigation windows on the system unless natural high flows exist on the Apalachicola River. The Corps of Engineers, with input from the stakeholders, is currently reviewing its navigation policy to better manage navigation windows during the summer and fall months.

The outcome from the Alabama-Coosa-Tallapoosa/Apalachicola-Chattahoochee-Flint Comprehensive Study may also have a major impact on how the Corps manages its lakes and river system during periods of drought. Hopefully, lessons learned during the 1998-2001 drought will serve as guide for future generations to use when faced with drought.