ALLATOONA DAM AND LAKE: A PERSPECTIVE ON HISTORY AND WATER SUPPLY USAGE

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Abstract. Allatoona Dam was one of the first multiple-purpose U.S. Army Corps of Engineers projects completed in the Southeast. Construction occurred in the late 1940's and the project became operational in early 1950. The project has evolved from being in an environment of rural farmland and piedmont forests to being in a suburban area. Because of the proximity of the Lake to the Atlanta metropolitan area, demands on the Lake for water supply will be increasing. Concerns of downstream interests and other project beneficiaries will play a role in how future water supply is developed.

HISTORY

The Allatoona Dam and Lake project was one of the first multiple-purpose federal reservoirs completed in the Southeast. The Corps studied and reported to Congress on various potential projects in the Coosa Basin in the late 1930's. Construction was authorized in August 1941. By December 1941 the initial design of the project was completed and submitted to the Congress. Other events that month were to have a major impact on the eventual development of the project.

World War II delayed the construction of the project until 1946. The construction of Allatoona Dam was one of a number of public works projects hurried to completion after the war to avert a feared post-war depression. Construction was completed in late 1949. Filling of the project began on December 27, 1949. The filling was completed by May 1950.

As has been typical of many water resources projects, the original conceptual designs are much different from the project we know today (U.S. Congress, 1934; U.S. Congress, 1940; U.S. Congress 1941; U.S. Army Corps of Engineers, 1941). A major area of revision was the design levels and storage allocations of the project. These levels are shown in Table 1.

The concept of seasonal flood-control/conservation storage as well as raising the normal summer pool level to 840 feet was adopted in 1956. In 1967, the winter pool level was raised from 820 to 823 feet.

Table 1. Evolution of Pool Levels at Lake Allatoona

	Feet Above Sea Level			
	Original 1940	Complet. 1950	Modif. 1956	Today 1993
Top of Flood Control Pool	855	860	860	860
Top of Conservation Pool				
Summer:	821	835	840	840
Winter:			820	823
Bottom of Conservation Pool	771	800	800	800

WATER SUPPLY AND REALLOCATION

An important use of Lake Allatoona has been to provide water supply. Contracts for water supply were negotiated with the City of Cartersville in 1966 (U. S. Army Corps of Engineers, 1993). Because of water quality problems associated with releases from the deeper portions of the lake, the city derives its releases from a selective withdrawal intake at the face of the dam. In 1963, the Cobb-County Marietta Water Authority located an intake on the Acworth Creek arm of Lake Allatoona. Until the late 1980's these withdrawals were considered insignificant usages of the water resource of Lake Allatoona. But failure to completely fill Lake Allatoona in the drought years of 1986 and 1988 demonstrated the limitation of the resource for all uses including water supply.

An unpublished internal study of several previous historic droughts had shown a yield for the reservoir of about 1000-1200 cfs (650-775 MGD) which includes all releases. The 1986 yield would have been about 750 cfs. This yield is equivalent to the minimum hydropower release (2 hours per day - 5 day per week plus the minimum continuous release of about 270 cfs). To have provided this yield would have resulted in the pool being lowered to elevation 800, the bottom of the conservation pool. The actual experienced yield was about 580 cfs and resulted in a pool level of 821.8 feet above sea level. Some might conclude from this recent drought that there is no "surplus" or allocable water at Lake Allatoona. Certainly in light of the 1980s experience, Lake Allatoona would seem to have limited potential for meeting increased demands. None-the-less, it is likely to fall under greater and greater demands as a water supply source because of its location.

At its winter level of 823 feet, the Lake contains about 120,000 acre-feet of water between elevations 823 and 800 feet. In the western United States, this 120,000 acre-feet of storage would be known as "carry-over" storage which more or less means the water necessary for managing multi-year droughts. The importance of multi-year storage was truly demonstrated in the drought years that occurred in the late 1980's.

The limitations of Allatoona as a water supply source derive not only from the hydrologic limits but also from other factors as well. Allatoona lags not far behind Lake Lanier in lake shore development and recreational lake use. There will be continuing and growing economic and aesthetic benefit to maintaining stable lake levels. Historic beneficiaries, such as hydropower customers, will want to see their level of benefits unreduced. Downstream interests are concerned about water supply usage and what effect the usage would have downstream flow regimes.

It has been difficult to address water supply reallocation in the limited conceptual and legal framework which the Corps seeks to apply. The Corps does not deal in water rights but becomes involved in the whole host of water use issues when it is asked to reallocate storage for water supply.

INNOVATIVE WATER SUPPLY SOLUTIONS

Given the limits of Lake Allatoona, what can be done to manage it as a water supply source in the future? A number of ideas which are emphatically the writer's are given below.

Market Two Classes of Water Supply Storage. One would be permanent year-round or carryover storage which would be a portion of storage below elevation 823 feet. The other class would be seasonal storage which would be a portion of the storage between the levels of 840 and 823 feet. A given water-user would probably be required to purchase segments of both types of storage. Factors which would determine the proportions of storage would be: (1) the seasonality of demand; (2) the elasticity of demand--how much water demand could be reduced during drought-induced water conservation; (3) the amount of risk that a user could assume for shortfalls; and (4) whether there are alternative sources of supply that could meet demands.

Innovative Sources of Supply/Reuse. The Atlanta metropolitan region has a number of present and potential water sources. Although they are all constrained by being located in headwaters areas, there remains some potential that with sufficient infrastructure investment the sources could be integrated so that the hydrologic system potential of the sources could be realized. For example, Lake Lanier has a critical period of several years. Even in winters and springs of drought years the unregulated runoff from the drainage area of the Chattahoochee River downstream of Lake Lanier can often provide all the water needed for the Atlanta Region. This presumes of course that outflow decisions from Lake Lanier can and would be made on a daily basis. If withdrawal facilities allowed this source to be used when available, supplanting withdrawals from lakes, then lakes such as Lanier would have improved refill potentials and enhanced usefulness for water supply and other uses.

Conjunctive Use of New Reservoirs. In addition to the potential for optimizing the use of existing water sources, there are potential developments, such as impoundments upstream of Lake Allatoona or on other tributary streams in the Etowah or Chattahoochee Basin which offer the potential to be conjunctively and systematically used with Allatoona or other Federal lakes.

Large-Scale Water Sources. There have been various suggestions of using such large schemes as tapping the Savannah or Tennessee Rivers or pumping water from groundwater sources in south Georgia. In today's environment of water resources development, these proposals would be contentious to the point of being impossible. Surface water development/reuse using storage facilities such as Lake West Point or Lakes in the upper Altamaha Basin might have long term feasibility.

FUTURE CHALLENGES

Recreational Use. While there may be various operational changes that can be supported by simulation or optimization approaches, any change in project operation will come under a great deal of policy or philosophical scrutiny from a number of viewpoints. One growing group which will be heard is the lakeshore and recreational interest groups. There is tremendous investment in lakeshore homes, marinas, and related facilities. Not only is there an aesthetic dimension to using storage (lowering lake levels) but also there are demonstrable economic impacts of low lake levels. The idea that recreational use of reservoirs is a secondary or incidental benefit has been overcome by the sheer scale of recreational usage and investment.

Interbasin Transfer. It is conceivable and perhaps likely that meeting future water demands will involve trans-basin transfers of water. Trans-basin transfers, although perhaps small, never-the-less will produce considerable controversy and perhaps legal challenges.

Environmental Aspects. A consideration which will determine or influence any decisions about water supply sources will be the environmental aspects. A number of Federal environmental laws and procedures can come into play in water use decisions. The Endangered Species Act is one which is coming to influence decisions more and more. In the Etowah River Basin, the Amber Darter, a small endangered fish, is expected to exist or have habitat. Other species may also be proposed or listed which could influence the outcome of water supply/water use alternatives.

Comprehensive Study. The Corps of Engineers and the states of Alabama, Florida, and Georgia have embarked on a Comprehensive Study of the Alabama-Coosa-Tallapoosa and the Apalachicola-Chattahoochee-Flint River Basin. (U.S. Army Corps of Engineers, 1992) One of the prime issues being addressed in that study is how to best meet future water supply demands in Basins.

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