Introduction

Lago de Cidra is a reservoir located on the island of Puerto Rico. The reservoir was constructed on the Cidra drainage area, located in the municipalities of Cidra and Bayamón. Its construction began in 1946 and was completed in 1949. The reservoir has a storage capacity of 386 million cubic meters and covers an area of 4.5 square kilometers. The spillway elevation is 403.00 meters above mean sea level.

The Lago de Cidra reservoir is used for irrigation, hydropower generation, and flood control. It is part of the Río de Bayamón drainage basin, which includes the Río Sabana and Quebrada Prieta branches.

Method of Survey and Analysis

The field techniques and bathymetric data collection procedures used in the 2007 survey were similar to those used in the November 1997 survey. However, the 2007 survey was conducted with GPS-equipped survey units interfacing with depth sounders to generate a survey grid that was used to create a TIN (triangulated irregular network) model of the reservoir bottom.

The TIN model was used to generate a 3D bathymetric map for the November 1997 and August 2007 surveys. The storage capacity of the reservoir was calculated by using the GIS software to compute the volume of water above the spillway elevation.

Summary and Conclusions

The Lago de Cidra storage capacity was 386 million cubic meters, with a spillway elevation of 403.00 meters above mean sea level. The reservoir volume decreased from 5.76 million cubic meters in November 1997 to 5.63 million cubic meters by August 2007. The capacity loss due to sedimentation was about 130,000 cubic meters between 1997 and 2007, representing a sediment accumulation rate of about 13,000 cubic meters per square kilometer per year.

The sedimentation survey conducted in 2007 showed that sediment accumulation in the Río Sabana and Quebrada Prieta branches has decreased from 768 cubic meters per square kilometer per year between 1946 and 1997 to 666 cubic meters per square kilometer per year since 2007. The inter-survey capacity loss rate due to sedimentation was 0.23 percent per year, which is similar to the value of 0.27 percent per year estimated from the November 1997 survey.

Although the reservoir has undergone some sedimentation, the water levels and storage capacity have remained relatively stable. The reservoir continues to play an important role in the hydrological cycle of the region, providing irrigation and hydropower benefits to the local community.

References Cited
