

River System Performance

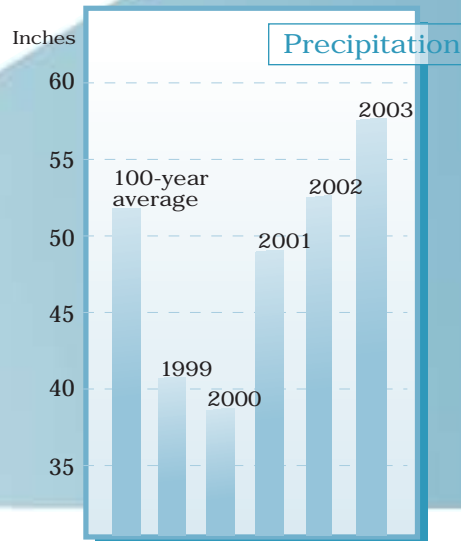
2003



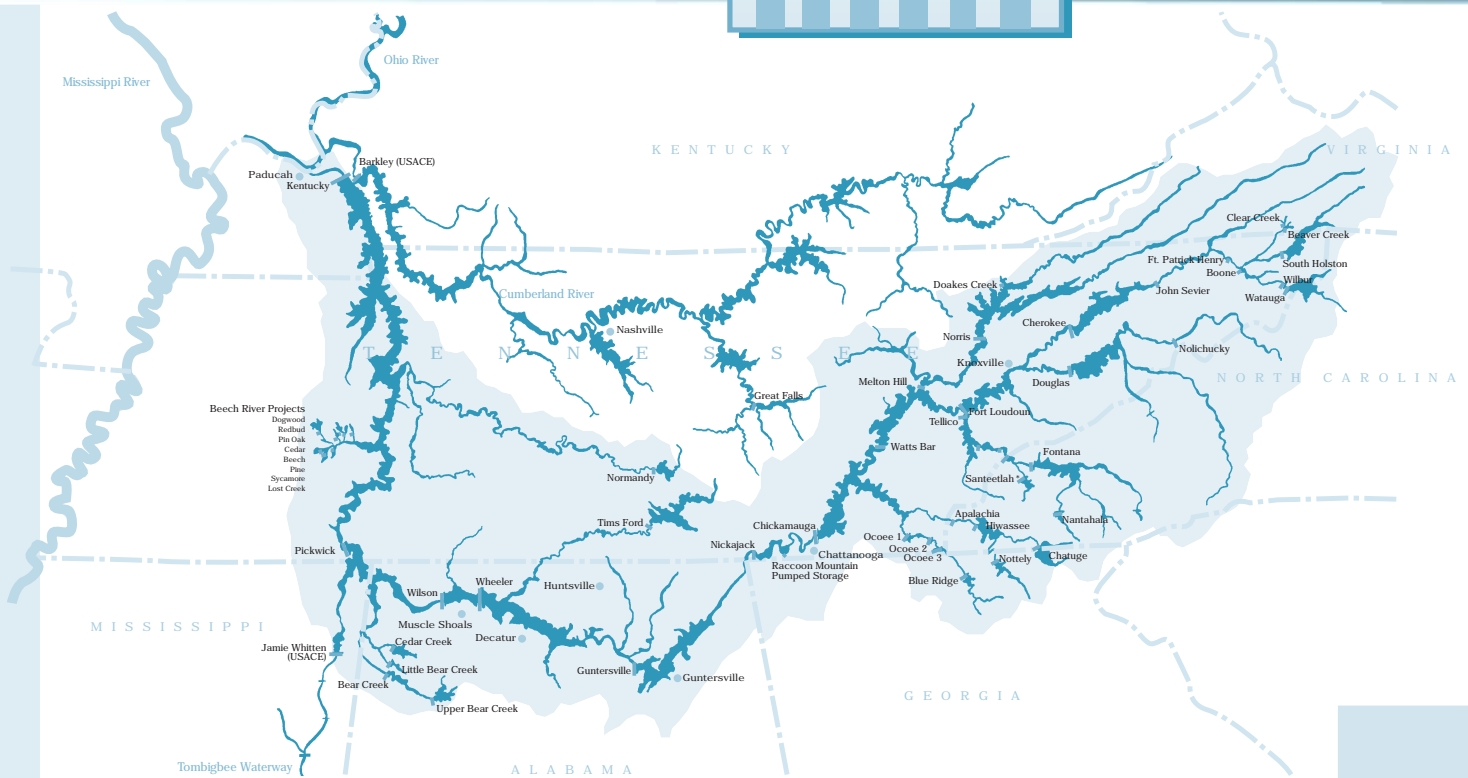
The Tennessee River

For many, it means fishing, swimming, boating, and scenic beauty. But it's also the backbone of a billion-dollar economy—indispensable to the daily lives of millions in the Tennessee Valley. We buy products shipped on the river, and we power our homes with the electricity it produces. We rely on the dams and reservoirs built along its length for flood damage reduction, and we enjoy the recreational opportunities it provides. We count on it being clean enough to provide safe drinking water and a healthy environment for aquatic life.

Year after year, the Tennessee River measures up and—as you'll see in the pages of this annual performance report—2003 was no exception...



The benefits provided by the river in any given year vary depending on the volume of water in the system. After three years of drought and a relatively dry summer in 2002, 2003 was a nice change. Precipitation was 4.8 inches above normal, averaging 55.7 inches across the Valley. Runoff (the amount of water that ends up in the river system after it rains) was even higher: 6.4 inches above normal.



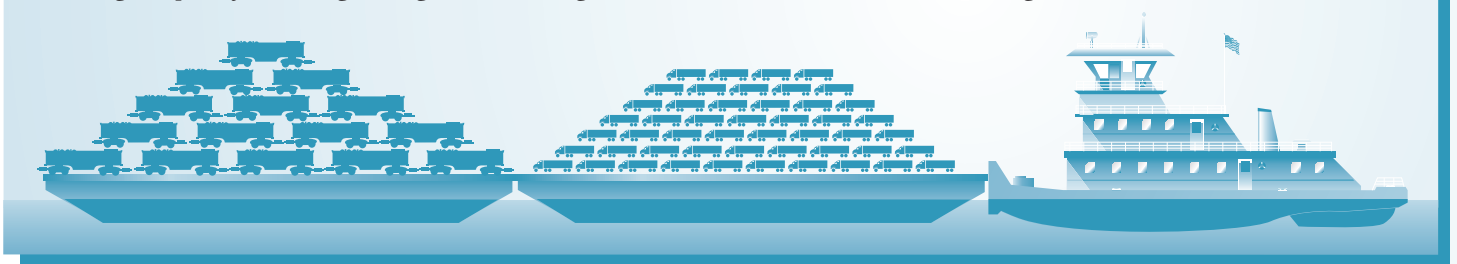
TVA operates an integrated system of 49 dams and reservoirs to provide a wide range of public benefits, including year-round navigation, flood-damage reduction, affordable and reliable electricity, improved water quality, recreational opportunities, and water supply to cool nuclear and fossil power plants and to meet municipal and industrial needs.

Navigation

Nine main and four auxiliary locks on the Tennessee River and one lock on the Clinch River provide passage for some 30,000 barges annually. These barges carry 40–50 million tons of cargo a year, providing a major conduit for industry throughout the Tennessee Valley.

The Valley benefits from low-cost water transportation in many ways. Shippers profit directly, saving an average of \$9.24 a ton, with a total savings to industry of over \$400 million in freight charges. In addition, to compete with water transportation, railroads need to keep rates low, creating another \$500 million in savings for rail users. These savings are passed along to Valley residents in the form of additional employment, increased income, and lower prices—not only for commodities that move by water but also for the intermediate and finished products made with these commodities. For example, grain shipped by barge contributes to the lower cost of bread, flour, chicken, and soft drinks; coal moved by barge contributes to lower power bills; asphalt moved on the waterway means road paving is cheaper; and construction costs are lower when rocks, sand, and gravel are transported by barge. Because so much cargo can fit on one barge, waterway transportation also benefits the environment by reducing fuel consumption and emissions and makes the roads safer by keeping more trucks off the highways. The Tennessee River system also provides passage for some 20,000 recreational vessels each year.

The cargo capacity of a single barge is 15 times greater than one rail car and 60 times greater than one semi-truck.



Recreation

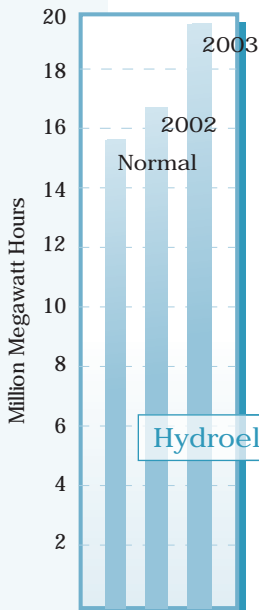
TVA normally begins to fill tributary reservoirs (reservoirs located on tributaries to the Tennessee River) by the middle of March. But the process began a little earlier than usual in 2003—thanks to the heavy rains that fell in late February. March was unusually dry, but above-normal rainfall in April enabled TVA to fill all main-river and tributary reservoirs to full summer pool levels on schedule. Continued wet weather helped TVA maintain excellent reservoir recreational opportunities throughout the summer.

Reservoir levels receive the lion's share of the attention. But the river system also provides other recreational benefits. During 2003, more than 300,000 people took advantage of water releases for paddling and rafting on the Ocoee River alone. TVA also provided special flows for recreation on the Bear Creek Floatway and the Hiwassee, Watauga, and Elk Rivers. Additional recreational benefits resulted from TVA's efforts to stabilize reservoir levels for fish spawning and to enhance aquatic habitat by adding oxygen to the water released through TVA-managed dams and providing a minimum flow of water when hydroturbines are not operating.



In addition, TVA manages 11,000 miles of shoreline and operates some 100 public recreational areas throughout the Tennessee Valley.

Improvements to these areas are ongoing. In 2003, TVA improved five boat ramps, including ramps on Douglas, Kentucky, Guntersville, and Wheeler Reservoirs and below Wilson Dam; installed an RV dump station, paved the gravel road and added a handicapped accessible campsite at Watauga Reservoir; constructed a parking lot at the trail head on the Tellico Reservation; built a handicapped accessible fishing pier in the Danville area of Kentucky Reservoir; built a handicapped accessible restroom on the Melton Hill Reservation; and initiated construction of the Patton Island trail on the Muscle Shoals Reservation and a restroom below Norris Dam.



Hydroelectric Power

TVA's 29 hydropower plants and Raccoon Mountain Pumped-Storage Plant generated about 19.9 million megawatt-hours (MWh) of electricity in 2003—more than in any year since 1997. Pumping operations to return water to the upper reservoir at Raccoon Mountain, scheduled during low-demand hours, consumed about 3.8 million MWh, resulting in a net hydro generation of 16.1 million MWh.

The increased hydro generation was due primarily to rainfall from significant spring storms, which was stored in tributary reservoirs and used very carefully throughout the summer to keep production costs low, meet near-record power demands, and provide much needed cooling water for fossil and nuclear plants.

Hydroelectric Generation

Although hydroelectric power is a relatively small part of TVA's total generation capability—about 11 percent—its value can't be overstated. Hydropower is the least expensive form of electricity available in the TVA system, and it is extremely valuable in meeting rapid increases in electricity demand. This is because hydropower projects can come on-line almost instantaneously. Plus, as an emissions-free, waste-free source of energy, hydropower helps to protect our environment.

Flood-Damage Reduction

Parts of the Tennessee Valley received over 12 inches of rain in about a 48-hour period in early May 2003, putting TVA's reservoir system to the test. The rain fell so hard and so quickly, the river rose almost 17 feet in one day at Chattanooga, cresting at six feet above flood stage—the second highest level since the creation of the TVA reservoir system. Flood storage in TVA-managed reservoirs helped to avert nearly \$440 million in flood damages, system-wide, for this single event.

Averted Flood Damages*

	2003 Averted Damages (in millions)
February	\$37.4
April	2.5
May	439.3
July	.4
November	18.1

Additional flooding occurred in February, April, July, and November, bringing the total flood damages averted for the Tennessee Valley in 2003 to almost \$500 million. An additional \$19 million in damages was averted through the operation of the TVA system along the lower Ohio and Mississippi Rivers.

Since their construction, TVA dams and reservoirs have helped to prevent over \$5 billion in flood damages in the Tennessee Valley and on the lower Ohio and Mississippi Rivers. That's an average annual flood-reduction benefit of about \$209 million (based on 2003 dollars).

*Tennessee Valley

Reservoir Health

Above normal rainfall and runoff in 2003 resulted in higher flows throughout the Tennessee River system, eliminating the almost stagnant conditions observed at times during preceding drought years. Higher flows, in turn, helped to increase dissolved oxygen levels and reduce the amount of algae in reservoirs along the main Tennessee River, benefiting both aquatic life and municipal and industrial water users.

Even in wet years, however, the water "sits" long enough in most tributary reservoirs to allow for algal growth and the subsequent decrease in oxygen supplies associated with its decay. This problem was worse in 2003 because the higher rainfall and runoff washed more nutrients and organic material into the water, increasing the amount of decaying material. To maintain good water quality downstream of tributary dams, TVA stepped up the use of aeration equipment—surface-water pumps, oxygen-injection systems, and other devices to add oxygen to the water—resulting in record oxygen usage.

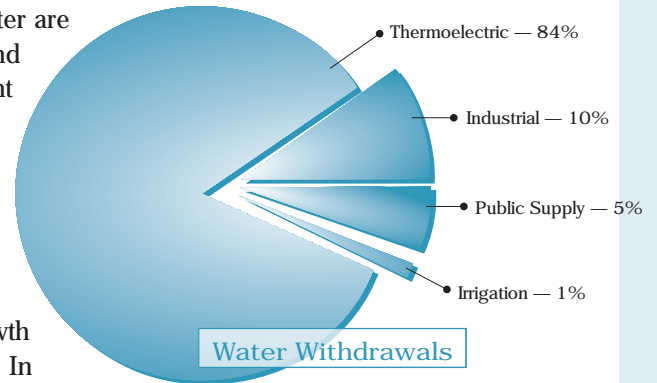
TVA conducts a wide variety of monitoring activities each year to protect reservoir health. In 2003, TVA assessed ecological conditions at over 300 sites on TVA-managed reservoirs, below TVA dams, and on Valley streams; monitored bass populations in 31 reservoirs; checked fecal coliform bacteria levels at more than 135 recreational areas; and worked with State agencies to check fish for toxic contamination. (Log on to www.tva.com for a summary of TVA's monitoring results.)

Water Supply

A recent U.S. Geological Survey study identified the Tennessee River as the most intensively used river in the country. About 12 billion gallons of water are withdrawn every day for public and industrial use, for agriculture, and for generating hydropower and cooling nuclear and fossil power plant components. The river also provides water for navigation, recreation, and habitat for plant and animal life. Consumptive water loss, however, is relatively low. Nearly 95 percent of all water withdrawals are returned to the region's streams, rivers, and reservoirs, including more than 99 percent of cooling water.

By 2030, upward trends in economic development and population growth are expected to increase water demand in the region by 15 percent. In the past two years, TVA received more than 10 requests for new or expanded public water intakes. Water shortages in neighboring areas also may result in requests to transfer more water outside the Valley. The cumulative effect will be increased pressure on the region's reservoirs and water supplies.

TVA works closely with industry and municipal water suppliers to ensure that over 700 water intakes across the Valley are adequately supplied with water. Water quality also plays an important role in the cost of water treatment. To preserve or improve the quality of the Valley's water supplies, TVA provides the minimum flows necessary to assimilate permitted municipal and industrial wastes and participates in partnerships aimed at reducing pollutant impacts from urban and rural land uses.



Special Operations

In addition to the primary purposes for which TVA operates the river system, Valley citizens also receive a variety of benefits from special reservoir operations. This refers to those occasions when reservoir levels are held steady or water-release schedules are modified to accommodate a specific request.

In 2003, TVA responded to over 200 requests—many to support special events and activities across the Valley. Special operations were conducted for Knoxville's "Boomsday" waterfront fireworks celebration and for various boat parades, regattas, and rowing competitions. Other special operations were carried out to help with shoreline clean-ups, to install a water intake for a local utility, to conduct a survey of an endangered plant that grows along the water's edge, to help control mosquito populations, to conduct fisheries research, to support a historical re-enactment, and to facilitate everything from boat-ramp construction to shoreline stabilization.

Valley marinas are encouraged to minimize boating-related pollution through TVA's Clean Marina Initiative. By the end of the 2003 boating season, 24 marinas had achieved the high environmental standards required for clean-marina certification.

Land Use and Watershed Protection

TVA's Watershed Teams work at the grass-roots level to protect and improve water quality by providing technical expertise to help reduce or eliminate nonpoint pollution sources, such as runoff from farms, new construction, and storm-water drains. In 2003, the teams were involved in nearly 50 water-quality-improvement initiatives across the Valley that identified water-quality issues, developed local partnerships to address these problems, and jointly implemented action plans.

Watershed Teams also implement stabilization and revegetation treatments to restore and enhance degraded shoreline. In 2003, 8.8 miles of critically impaired shoreline were stabilized, preventing 14,500 tons of soil from eroding and entering the river system annually. TVA also published fact sheets to assist property owners who want to create an environmentally friendly waterfront, including information on the benefits of using native vegetation; designing a shoreline landscape; understanding and controlling erosion; and selecting, planting, and maintaining native plants. Copies are available at www.tva.com.