

Throughout the ages, healthy flowing rivers have been the cradle of civilization, from the Egyptians on the Nile to early Chinese societies on the Yellow and Yangtze rivers, from Native Americans on the Mississippi to modern-day communities on rivers across the globe. Humankind has—and will—always rely on the flow of fresh water for drinking, fishing, agriculture, transportation, industry and recreation.

But history and science have taught us that the relationship between rivers and humans is a precarious balancing act. If rivers are to endure as a sustainable resource, we must ensure healthy **instream flows—the amount of flowing fresh water necessary to support the seasonal needs of natural communities, while providing for the long term well-being of human communities.**

Southerners depend on healthy, abundant freshwater supplies. Water from rivers, streams and wetlands irrigate our crops, nourish our bodies, fuel our electrical power, drive our industry, sustain our natural resources and provide a multitude of recreational opportunities. While freshwater systems are common sights across the Southern landscape, fresh water is a finite resource. To ensure enough water remains to sustain future generations of Southerners, we—scientists, water managers, policymakers, government officials and citizens—must work together to restore and protect instream flows, the essence of a healthy functioning river system.

The Southern United States is a national and global center of freshwater biodiversity.

- The Southern U.S. has more rivers than anywhere else in the country and more than most places in the world.
- The Southern U.S. boasts the richest fish diversity (686 species) and highest number of native fish species in North America north of Mexico.
- Ninety-one percent of all mussels and 61 percent of all freshwater snails in the U.S. are found in this region. It is estimated that southern freshwater crustaceans, including both cave and surface dwellers, are the most diverse in the United States.
- The South has the greatest length of rivers and greatest expanse of bottomland hardwood wetlands of any other region in the nation.
- Southern U.S. rivers include spring-fed rivers that are intimately linked to major limestone aquifers and caves, blackwater rivers linked to swamplands and other wetland systems, and coastal plain rivers with broad floodplain forests that provide corridors for migrating fish to travel from estuaries to their inland spawning areas.
- From eastern Oklahoma and Texas to Virginia and Florida, the rivers of the Southern U.S. represent a richly diverse range of river types and habitats that flow from the mountains to the sea, temperate to subtropical regions, and across ancient sea beds to recently formed deltas.

Healthy river systems with clean, abundant flowing water are an essential resource providing irreplaceable services to people and nature.

- Southern rivers provide important recreational and commercial fisheries, supply drinking water and hydropower, nourish farmland and serve as transportation corridors.
 - Rivers need naturally flowing water—with seasonal highs and lows—to recharge underground aquifers that supply much of our drinking and irrigation water.
 - Comment- the statement above seems a bit confusing in that most people think of rivers as being fed by aquifers, and not the converse as is suggested here (though it does occur)
- Healthy rivers connect diverse habitats and the people, plants and animals that rely on clean and abundant water supplies to thrive.
- Periodic floods shape river channels and redistribute sediment, creating essential habitat for commercial and recreational fish and other aquatic life.
- Some migratory fish species, like sturgeon, striped bass and shad, depend on a river's seasonal flow cycles to successfully reach upstream spawning habitat
- Floodplains are vital links for connecting rivers, lakes and wetlands. They absorb and store water, allowing valuable aquifers to recharge and the natural water purification processes to occur.
- Floodplains can support agriculture, grazing, and the harvesting of timber and fiber. But in order to function properly, floodplains must be periodically flooded.
- Fresh water is the lifeblood of estuaries. Regular flows of fresh water help regulate the salinity levels of estuarine waters, creating a delicate balance to sustain oyster reefs, sea grass beds, mangrove forests, and fish and shellfish nurseries—and their associated economies upon which people rely.
- The seasonal flow of freshwater nourishes bottomland forest habitats, supporting an array of resident and migratory birds, fish, reptiles, amphibians, mammals and plant life.

Rivers with healthy seasonal flows are not only a vital natural resource, but they are essential to healthy human communities and a vibrant economy.

- Early civilizations often viewed the constant motion of rivers—the cyclic flow and flooding—as a symbol of purification and rebirth. Today, people spend their leisure time on rivers, finding peaceful respite from hectic lives while reconnecting with nature.

- Our freshwater systems – including lakes, wetlands, streams and rivers – are part of what draws visitors and residents to the South. These resources are critical to multi-million dollar industries such as tourism and recreation.
 - During Fiscal Year 2002, the state of South Carolina earned more than \$3.2 million from the sale of fishing licenses to both visitors and residents.
 - Another financial stat
- Healthy seasonal flows of rivers support an array of aquatic life, which in turn supports healthy commercial and recreational fisheries. Generations of Southerners depend on healthy fisheries for their livelihoods and some depend on it to feed their families.
 - Healthy influxes of fresh water mixing with the tidal flow of salt water create a robust estuary, which serves as a nursery for shrimp, crabs, oysters and a variety of fish species – all vital to the success of coastal commercial and recreational fishing operations.
 - Georgia’s estuaries support an annual \$14 million commercial fishing industry (double-check the number)
- Rivers are often integral to the social fabric of Southern communities. From the annual Cahaba Lily Festival in Alabama to the Blessing of the Fleet along the Altamaha in Georgia, rivers bring together generations of residents and visitors for annual festivals, fishing tournaments, and a host of other activities.

During the past century, the flow of fresh water in Southern rivers has been significantly altered to the detriment of both nature and people.

- Southern rivers face common threats throughout the South. Most damaging among these are dam operations, consumptive water use, land development, flood control, and channel engineering practices that are often incompatible with the natural flows and ecological processes that sustain these valuable freshwater systems.
- Worldwide, about 60 percent of the 227 largest rivers have been fragmented by dams, diversions or other infrastructure.
- Two centuries of dam building, levee construction and straightening of river channels have left very few river segments in their natural state. Only 2 percent of rivers and streams in the United States remain free-flowing.
- While the total amount of fresh water in the world remains the same, the amount of water withdrawn per person is increasing. Twice as much water was used worldwide in 2000 as in 1960.

- Globally, nearly 960 cubic miles of fresh water are withdrawn every year—an average of around 450 gallons per person per day.
- In the southern U.S., 125,650 million gallons of fresh water were withdrawn each day in the year 2000. (USGS, 2004)
- It was estimated that in the year 2000, agriculture represented nearly 39 percent of the total amount of fresh water withdrawal in the southern U.S.
 - Fresh water used for irrigation amounted to 25,764 million gallons/day (31 percent), while livestock accounted for 639 million gallons/day (8 percent).
 - Other notable freshwater withdrawal statistics for 2000 include:
 - Thermoelectric - 25 percent
 - Industrial - 10 percent
 - Public supply - 17 percent
- More than 31,333 large dams and an even larger number of smaller dams have been constructed on streams and rivers in the Southern U.S.
- Not only have dams and levees caused widespread loss of river, floodplain, and estuary species, they have in many places actually increased flood risks by creating a false sense of security and encouraging inappropriate floodplain development.

Fresh water is a finite resource in high demand. Cities across the South—from large metropolises to rural towns—depend on the irreplaceable services and benefits derived from the healthy flow of rivers and streams. The greatest long-term value of freshwater, however, lies in the natural services it performs as part of a larger, functioning ecosystem.

- The water we drink and use to grow food, and even the water we use to generate power and wash our hands, is all drawn from our finite freshwater resources. We need to take measures now to manage those resources for the future.
- Conflicts over the allocation of water between human needs and ecosystem needs have been intensifying across the country and across country borders.
 - For more than a decade, Alabama, Georgia and Florida have disputed how best to share the waters of the Appalachian-Chattahoochee-Flint Basin, an ecosystem severely stressed by increasing water withdrawals and flow modifications.
 - Texas / Oklahoma water conflict
 - Texas / Mexico
- Rivers, wetlands and other freshwater ecosystems constitute part of the natural infrastructure that fuels the Southern economy.

- Flowing rivers perform numerous ecosystem services for free. The services provided by wetlands alone—including improving water quality, recharging aquifers, reducing flooding and providing critical habitat for plants and animals—can be worth \$20,000 per hectare per year.

Guided by science and supported by policy, we have the unique opportunity to collaborate across all levels of government, academia, and NGOs to restore and protect the flowing waters of our rivers, while continuing to meet critical human needs like drinking water, agriculture, industry, hydropower and storage of flood water.

- Scientists have amassed considerable evidence that naturally occurring changes to water flows are essential to the health and sustainability of freshwater ecosystems.
- It is important to engage decision-makers in an effort to minimize the environmental and social threats posed by water-related projects.
 - Science-based solutions to wise water management exist. Executing these solutions, however, requires political will.
- We need to manage our water resources in an integrated way, addressing the social, economic and health needs of people in conjunction with the needs of the environment.
 - The Flint River Project in Georgia represents a unique collaboration between agriculture, industry, government, academia, and conservationists to explore ways that effectively conserve fresh water used for irrigation while improving economic and social interests.
 - Conservation scientists the Army Corps of Engineers have collaborated on rivers across the country—including the Savannah River in Georgia and South Carolina and the Green River in Kentucky—to improve dam management in order to protect the ecological health of rivers and surrounding natural areas while continuing to provide services such as flood control and power generation.
- By adopting state and federal policies that support wise use of flowing freshwater systems, we can ensure a legacy of sustainable resources for future generations.
 - Specific example?
- Working together, we—conservation organizations, government officials, water managers and citizens—can help ensure that our water resources are managed in ways that promote a sustainable future for the benefit of both people and nature.

