Louisiana

Historically, a variety of plant and animal nonindigenous aquatic nuisance species (ANS) have negatively impacted Louisiana, and Louisiana Sea Grant has sponsored research and outreach to reduce such impacts. For example, in the 1980s when the numbers of voracious nutria (*Myocastor coypu*) in Louisiana reached levels that seriously threatened coastal estuarine and marsh habitats (areas vital for the nurturing and growth of commercial and recreational species of fish), Louisiana Sea Grant sponsored research projects to study the animal's life cycle and the planting of selected grasses and other methods to reduce their numbers and impacts.

Louisiana's ecology and economy are especially vulnerable to the introduction of ANS because the state is dominated by water — the Mississippi River, coastal marshes, and many fresh and brackish bayous. In fact, about 40 percent of the nation's coastal wetlands are in Louisiana and a large proportion of its people work and play in the aquatic environment.

In the 1990s, when Louisiana Sea Grant realized that some state industries or freshwater lakes might be affected by a zebra mussel invasion advancing down the Mississippi River from the Great Lakes, it partially funded some basic physiological research on the zebra mussel (*Dreissena polymorpha*), while initiating outreach efforts to introduce the species to groups that may have to cope with an invasion. Initially, this ANS was a threat to industry rather than the environment and the initial proactive effort, conducted in conjunction with the National Sea Grant Zebra Mussel Initiative led by New York Sea Grant, was successful in preventing any zebra mussel-caused shutdowns or other industrial catastrophes. In subsequent years, as the zebra mussel spread to Louisiana and settled in the major river systems, Louisiana Sea Grant has taken steps to reduce a broad range of impacts.

By 1999, the state of Louisiana began to actively control ANS plants such as hydrilla (*Hydrilla verticillata*) and water hyacinth (*Eichhornia crassipes*) in popular recreational waters, and introduced some monitoring for nonindigenous species on a number of lakes and bayous. Local associations and businesses also became interested and as a result, an early infestation of giant salvinia (*Salvinia molesta*) was isolated at Toledo Bend Reservoir on the state's western border. Because this plant is believed to be popular among water gardeners, the Louisiana Department of Wildlife and Fisheries immediately began asking water garden plant suppliers to stop marketing the plant.

In 1998, a new ANS was discovered in the drainage canals in New Orleans — the Rio Grande cichlid (*Cichlasoma cyanoguttatum*). It was outcompeting native fishes and depleting grass beds along the south shore of Lake Pontchartrain. The Rio Grande cichlid is believed to be the result of dumping by an aquarium hobbyist. This ANS is currently controlled by local recreational fishers who claim that it is "good eating."

In response to these new ANS invasions, Louisiana Sea Grant began to use its teacher-education program to heighten ANS awareness among the general population and to encourage habits that control these species. Fliers on this topic for aquatic hobbyists, produced in cooperation with the Sea Grant programs in the Gulf of Mexico region, have been widely distributed. Presentations have also been made at water garden societies to further encourage public involvement in ANS control. At the turn of the century, giant salvinia appears to be infesting only Toledo Bend Reservoir in Louisiana and the Rio Grande cichlid appears to be confined to the New Orleans area.

Sea Grant
Louisiana

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Species of Concern
Giant salvinia
Hydrilla
Nutria
Rio Grande cichlid
Water hyacinth
Zebra mussel

LSU

Research and Outreach

Louisiana's ecology and economy are especially vulnerable to the introduction of ANS because the state is dominated by water — the Mississippi River, coastal marshes and many fresh and brackish bayous.

From 1993 to 1997, Louisiana Sea Grant sponsored and participated in numerous workshops, conferences, and other outreach projects designed to stimulate monitoring and awareness among the users of surface water such as municipal utilities, the aquaculture industry, and navigation interests. The program provided seed money that led to research conducted in Louisiana State University's Department of Biological Sciences on zebra mussel physiology, feeding habits, and reproduction in rivers as well as other aquatic environments. In 1995, the program combined outreach and research to gather data while teaching monitoring protocol and control processes to personnel in 10 power plants owned by Entergy Inc. in Louisiana, Mississippi, and Arkansas. The research goal was to understand the zebra mussel's viability in the southern riverine environment. This project resulted in developing a simplified monitoring protocol, *Sampling for Zebra Mussels in Industrial Facilities*, that has been distributed throughout the country.

Louisiana Sea Grant, Louisiana State University's Coastal Fisheries Institute, and the U.S. Army Corps of Engineers supported ecological research on zebra mussels, comparing their growth and living conditions in the upper and lower Mississippi River. Besides increasing the understanding of the zebra mussel in the riverine environment, this research provided data to help the towing industry address problems caused by zebra mussel fouling in towboats' raw water intakes.

The zebra mussel taught Louisiana Sea Grant that an aquatic nuisance species can be dispersed by the same people that it impacts. Recreational boaters and aquaculturists were the targets of the program's nonindigenous efforts between 1995 to 1997 when Louisiana Sea Grant joined with the Alabama and Mississippi Sea Grant Extension programs to publish audience-specific brochures such as *Keep Our Waters Free of Zebra Mussels* for recreational boaters, and a series of aquaculture species-specific critical control point brochures for aquaculturists. In 1999 Louisiana Sea Grant produced a waterproof poster to remind recreational boaters and anglers about ANS. *Protect Your Boat and Louisiana's Waters* is posted at all public and many private boat landings throughout the state. These materials have also been shared with Sea Grant Programs across the country.

Beginning in 1998, Louisiana Sea Grant placed increased emphasis on potential dispersal of ANS through inland navigation and contact with transoceanic vessels in the state's ports. Louisiana State University's Coastal Fisheries Institute studied the effects of zebra mussels on towboats and barges using the inland waterways. As part of the project, the researchers taught operators, maintenance foremen, and ship repair personnel that they can affect the environment by the type of control or treatment used on ANS infesting their raw water intake systems. A supporting fact sheet was developed and distributed for use throughout the eastern inland river system entitled *Zebra Mussels in Commercial Vessels on Inland Waterways*.

In conjunction with direction from the National ANS Task Force and the President's Nonindigenous Council, Louisiana Sea Grant has begun a cooperative effort to consolidate all databases and lists of Louisiana species to be used as a management baseline. This will be turned over to the state agency charged with ANS management in the future.

The leaders of Louisiana Sea Grant realize that the types of aquatic nuisance species that will impact the state in future years may change, but the issues related to why aquatic nuisance species are a problem do not change. People need to clearly understand that any ANS has unique potential to wreak havoc because of its adaptability and prolific reproduction capability. In addition, people have unique potential to control this havoc if they are conscious of deliberate and accidental ANS introductions.

Louisiana Sea Grant College Program

Zebra mussels have become a foulant for inland navigation by settling in towboat sea chests and keel coolers.

Gulf-Wide Projects

Since 1997, Louisiana Sea Grant has led Gulf-wide outreach projects to foster a general understanding of ANS concepts in partnership with the Alabama Sea Grant Extension, Mississippi Sea Grant Extension, the Florida Sea Grant College Program, and the Texas Sea Grant College Program. Although this group initiative focuses on selected target audiences — surface water using industries and utilities, aquaculture, recreational boaters, inland and transoceanic navigation, and those state government agencies that may have some responsibility associated with aquatic nuisance species — each of the partnering Sea Grant programs has taken the lead with one or more of these groups. Besides coordinating the effort of all of the regional partners, Louisiana Sea Grant is responsible for the surface water using industry/utility audience and the navigation audience.

With the surface water using industries and utilities, Louisiana Sea Grant has used workshop presentations and news releases to remind people of the on-going nature of the problems associated with aquatic nuisance species, and the industrial practices necessary to keep impacts at a minimum: know your company's aquatic environment and ecosystems, identify all unknown species in your system, try to confine deliberate introductions to native species, and control ANS in an ecologically-safe manner. In partnership with the Tennessee Valley Authority and the U.S. Fish and Wildlife Service, Louisiana Sea Grant publishes a national *Zebra Mussel Newsletter* concentrating on these topics and the program has contributed ideas to a series of ANS public service announcements being developed by Mississippi Sea Grant Extension as well.

Transoceanic navigation has been identified by the U.S. Coast Guard and the International Maritime Organization (IMO) as a possible dispenser of ANS during ballast exchange. After researchers determined that an open-ocean ballast water exchange by transoceanic shipping will kill freshwater ANS that may be living in the vessel's ballast, both the U.S. Coast Guard and the IMO have recommended the exchange for all transoceanic shipping before entering ports or coastal waters. In cooperation with some members of the Gulf of Mexico region shipping community, Louisiana Sea Grant published a paper for ports and shippers called *Assessing the Potential for Introduction of Nonindigenous Species through U.S. Gulf of Mexico Ports*. It encourages compliance with Coast Guard mandates and guidelines for open ocean ballast exchange and provides the shipping community with a method for assessing their vulnerability to new ANS introductions through ballast water. To better understand and approach the question of ANS dispersal in ballast water, the Gulf of Mexico Sea Grant programs have participated in three EPA Gulf of Mexico Program workshops for the shipping community on this topic during 1999-2000.

ANS outreach should consistently promote interest in native species, knowledge and appreciation of local ecosystems, and practices that result in the sustainability of all resources.

Louisiana Sea Grant College Program

Aquatic nuisance species research and outreach endeavors are affected by the intersection of the Mississippi River System with the Gulf of Mexico.

People need to clearly understand that any ANS has the potential to wreak havoc because of its adaptability and prolific capability, but people have the potential to control this by awareness of ANS introductions.

Lloyd Lemmerman

Zebra mussels *(Dreissena polymorpha)* on a native clam.

Other Collaborative Efforts

In support of the Gulf of Mexico Sea Grant partners' efforts, Louisiana Sea Grant has distributed brochures about accidental dispersal of ANS to aquarium and water garden hobbyists and retailers, recreational boaters and anglers, and coordinated a workshop in 1999 for state government officials on developing an ANS regional management plan. Program personnel have also appeared on a local radio program for anglers in order to discourage deliberate introductions and accidental transfer of ANS larvae or plants in bait buckets or on recreational boats and trailers.

Finally, Louisiana Sea Grant has participated in planning and implementing many workshops and conferences on ANS regionally and nationally. The most recent conference was *Aquatic Nuisance Species: A Focus on the Southeast* held in Charleston, S.C. in 1999. It was designed to give all southeast coast target audiences a broad understanding of the ANS situation in their states. Sea Grant staff from the Gulf programs have presented papers on outreach techniques at the 1996 and 1998 *International Zebra Mussel and other Aquatic Nuisance Species* conferences in Michigan and California respectively, sharing outreach experiences and ideas with other groups with similar goals. Louisiana Sea Grant served as a Gulf representative on the National ANS Task Force's Ballast Water Program Effectiveness and Adequacy Criteria Committee during 1998-99.

While Sea Grant research and outreach in the Gulf of Mexico Region must continue to focus on aquatic nuisance species, especially as the world becomes smaller and species transfers become more frequent, Louisiana Sea Grant has added a positive outreach approach. To reduce the impacts of ANS, Louisiana Sea Grant tries to consistently promote interest in native species, knowledge and appreciation of local ecosystems, and practices that result in the sustainability of all resources.