

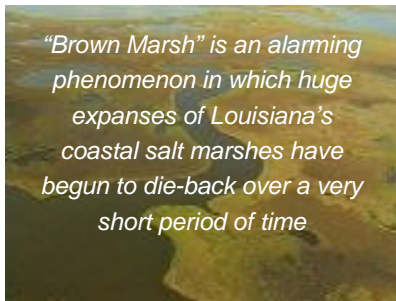


# Louisiana Wetland News

Fall 2000

## The Brown Marsh Phenomenon: Accelerated Dieback of Louisiana's Coastal Salt Marshes

Louisiana's coastal land loss problems recently took a major turn for the worse. Since the spring of 2000, large expanses of coastal salt marsh have begun exhibiting alarmingly high levels of die-back, primarily in stands of Smooth Cordgrass (*Spartina alterniflora*). Although salt marsh die-back itself is not uncommon, these recent episodes are unprecedented, and could potentially result in the loss of thousands of acres of coastal wetlands within a very compressed time frame.



*"Brown Marsh" is an alarming phenomenon in which huge expanses of Louisiana's coastal salt marshes have begun to die-back over a very short period of time*

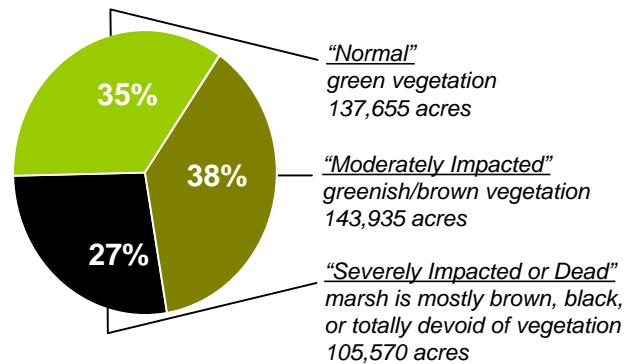
Causes for the phenomenon, referred to as "Brown Marsh", are still under investigation. However, scientists studying the crisis have indicated that an interaction of several environmental factors may be responsible. Salt marsh vegetation,

typically tolerant of high salinity, has in recent years been exposed to hypersaline conditions due to an extended drought. Excessive heat and evaporation have compounded these conditions, along with extremely low discharges in from the Mississippi and Atchafalaya Rivers. This cascading of negative environmental factors may have somehow exceeded the tolerance of salt marsh vegetation already pre-stressed from nutrient starvation.

Although Brown Marsh incidents have been observed coast-wide, the most affected areas are concentrated in the inter-tidal marshes of Barataria-Terrebonne. Since late summer, damage in this region has been quantified using aerial surveys and a descriptive index based on vegetation color. Over-flight data indicates that in Barataria-Terrebonne alone, 65% (approximately 250,000 acres) of *Spartina alterniflora* marsh has been either severely or moderately impacted.

In September, the Governor's Office of Coastal Activities convened a forensic ecology panel to evaluate the severity of salt marsh dieback in Louisiana. The panel, composed of numerous scientists from state and federal agencies, is working collectively to address the extent, cause(s), impacts, and remedies for the Brown Marsh phenomenon. In October, Governor Foster issued an executive order regarding the Brown Marsh crisis (pages 2 - 3) and an emergency request of \$3.7 million has been sent to congress to finance short-term research and remedial actions.

### Quantifying "Brown Marsh" in Barataria-Terrebonne



**Aerial surveys indicate that as much as 65% of the estuary's salt marshes have been severely or moderately impacted by Brown Marsh.**

The best hope for immediate action is to increase flows of freshwater into coastal marshes. Indeed, those areas receiving regular influxes of freshwater have remained relatively healthy throughout the recent drought period. As research into the Brown Marsh phenomenon continues a 2-day public symposium is being planned for January 11-12, 2000 to be held at the Radisson Hotel in in Baton Rouge. Details about this meeting and additional information and fact sheets regarding Brown Marsh can be found at the Breaux Act Web Site:

[www.LAcoast.gov/brownmarsh](http://www.LAcoast.gov/brownmarsh)



**EXECUTIVE DEPARTMENT  
BATON ROUGE  
EXECUTIVE ORDER NO. MJF 2000 - 41  
SALTWATER MARSH DIE-OFF ACTION PLAN**

WHEREAS, forty percent (40%) of the saltwater marshes in the contiguous United States are found in the state of Louisiana; nonetheless, Louisiana has lost more than fifteen hundred (1,500) square miles of marsh since 1930, which is the highest rate of land loss in the nation, and Louisiana is continuing to lose marsh land at a rate of twenty-five (25) to thirty-five (35) square miles a year;

WHEREAS, saltwater marshes are vital to the state of Louisiana as both a critical component of the state's coastal wetland ecosystem and a first line of defense in the state's coordinated system to protect coastal communities against harm from storm surges and hurricanes;

WHEREAS, during the spring of 2000, state and federal officials made the alarming discovery of the "brown marsh phenomenon," also referred to as "saltwater marsh die-off," an unusually extensive browning and/or die-off of the normally lush green saltwater marsh grass *Spartina alterniflora*, known more commonly as oyster grass or smooth cordgrass (hereafter "marsh grass");

WHEREAS, a collaborative team of state and federal officials and university scientists, coordinated by the governor's executive assistant for coastal activities, promptly mobilized to determine a) the extent of the affected saltwater marsh area, b) whether the browning and/or die-off is spreading, c) the causes of the browning and/or die-off, d) the possible short-term protective measures and long-term remediation and/or recovery strategies, and e) the possible funding sources for research and remediation to prevent the reoccurrence of the browning and/or die-off;

WHEREAS, the collaborative team determined that the saltwater marsh area in the state of Louisiana primarily affected is located between the deltas of the Atchafalaya River and the Mississippi River in the parishes of Lafourche, Terrebonne, Jefferson, and Plaquemines, centering in the Barataria-Terrebonne National Estuary (hereafter "Estuary"), a fragile wetland area containing approximately three hundred ninety thousand (390,000) acres of saltwater marsh, of which about one hundred ten thousand (110,000) acres is severely impacted and about one hundred fifty thousand (150,000) acres is moderately impacted;

WHEREAS, of the severely impacted saltwater marsh acreage in the Estuary, at least seventeen thousand (17,000) acres of marsh grasses have already converted from dense vegetation to open mud flats with little or no vegetation and without roots to hold the land together and prevent erosion; consequently, it is likely that Louisiana's already staggering rate of annual land loss will be greatly exacerbated;

WHEREAS, although the investigations of the collaborative team are still on-going, preliminary findings indicate the likely cause of the browning and/or die-off is a lack of fresh water flow resulting from record drought, record high temperatures, abnormally low water levels in the Mississippi River during the spring, and unusually low summer tides, the combination of which severely compounded the long-term effects of the nation's extensive levee system which limits natural fresh water flow to Louisiana's saltwater marshes;

WHEREAS, the combination of recent events and the nation's levee system has caused a lack of fresh water and/or periodic flooding essential to saltwater marshes for replenishing the water table and maintaining the normal salinity levels of the marshes;

WHEREAS, because the browning and/or die-off of the saltwater marshes constitutes a natural disaster that has created an immediate threat to public health and safety, the environment, and public and private property, on October 23, 2000, the governor issued Proclamation No. 55 MJF 2000, which declares a state of emergency to exist in the parishes of Lafourche, Terrebonne, Jefferson and Plaquemines; and

WHEREAS, the Wetlands Conservation and Restoration Authority (hereafter "Authority") is the entity legislatively mandated to provide aggressive state leadership and direction in the development and implementation of the state of Louisiana's Wetlands Conservation and Restoration Plan and its wetlands related policies, the best interests of the citizens of the state of Louisiana shall be served by the Authority and the governor's executive assistant for coastal activities immediately performing duties specifically related to saltwater marsh browning and/or die-off;

NOW THEREFORE, I, M.J. "MIKE" FOSTER, JR., Governor of the state of Louisiana, by virtue of the authority vested by the Constitution and the laws of the state of Louisiana, do hereby order and direct as follows:

SECTION 1: In conjunction with its statutory duties set forth in R.S. 49:213.1, et seq., the Wetlands Conservation and Restoration Authority (hereafter "Authority"), under the direction of the governor's executive assistant for coastal activities (hereafter "executive assistant"), shall immediately take all feasible and necessary action to respond to and/or remediate the unusual saltwater marsh browning and/or die-off of the normally lush green saltwater marsh grass *Spartina alterniflora*, in the parishes of Lafourche, Terrebonne, Jefferson, and Plaquemines. This remedial and/or responsive action shall include, but is not limited to, completing the following actions by January 31, 2001:

A. Developing a prioritization plan for stabilizing the saltwater marsh areas in the parishes of Lafourche, Terrebonne, Jefferson, and Plaquemines (hereafter "affected parishes"), which are most severely affected by browning and/or die-off and giving priority ranking to the marsh areas considered severely or moderately impacted that are located in the vicinity of coastal communities, fresh water drinking sources, emergency evacuation routes, and/or flood protection systems;

B. Developing an emergency contingency plan for reintroducing a sufficient amount of freshwater to the saltwater marshes in the affected parishes to achieve normal water salinity levels, and identifying factors and/or events that would occur prior to the institution of such an emergency contingency plan;

C. Evaluating the feasibility of expediting the construction and early operation of the Davis Pond Diversion Project;

D. Evaluating the feasibility of expanding the operational functions of existing structures, such as the Old River Control Structure, pump stations, and/or navigational locks, to include non-traditional wetland restoration uses;

E. Evaluating the feasibility of expediting proposed projects to divert additional fresh water from the Mississippi and Atchafalaya Rivers; and

F. Evaluating the potential for utilizing satellite remote sensing and computer modeling technology to monitor wetland conditions and optimize management of available fresh water.

SECTION 2: As far as practicable, the executive assistant and the Authority shall collaborate and work in conjunction with the executive director of the Barataria-Terrebonne National Estuary Program to fulfill the duties set forth in Section 1 of this Order.

SECTION 3: On or before January 31, 2001, the Authority and the executive assistant shall jointly submit to the governor, through the governor's special assistant for environmental affairs, a comprehensive report which addresses the issues set forth in Section 1 of this Order.

SECTION 4: All departments, commissions, boards, agencies, and offices of the state, or any political subdivision thereof, are authorized and directed to cooperate in the implementation of the provisions of this Order.

SECTION 5: This Order is effective upon signature and shall continue in effect until January 31, 2001, unless amended, modified, terminated, or rescinded by the governor, or terminated by operation of law prior to that date.

IN WITNESS WHEREOF, I have set my hand officially and caused to be affixed the Great Seal of Louisiana, at the Capitol, in the city of Baton Rouge, on this 27th day of October, 2000.

GOVERNOR OF LOUISIANA



## Marsh Maneuvers: A Review of 2000

The Marsh Maneuvers program is a joint effort of the LSU Agricultural Center, the Barataria-Terrebonne National Estuary Program, the Louisiana Department of Wildlife and Fisheries, and the Louisiana Sea Grant College Program. Since the program's inception over 13 years ago, it has become well-known as an intensive curriculum featuring a range of hands-on educational activities related to coastal ecology, wetland loss, and key social issues affecting the health and economic well being of Louisiana's coastal communities. The program has had a banner year in 2000 with 7 separate multi-day camps and a record number of participants. However, current demand for the Marsh Maneuvers program is well beyond capacity and expansion opportunities are being investigated to allow more access to the program. To find out more visit us at: <http://www.agctr.lsu.edu/wwwac/wetlands/MMcamp.htm>



**April** - Claude and Merle Lirette (Terrebonne) were 2 of the 40 adults who toured Isle Deniers this spring as part of the first ever "Adult Marsh Maneuvers" program. For many years kids returning from Marsh Maneuvers have bragged to older friends and relatives about their educational experiences in coastal Louisiana. After years of being asked "when is the Adult camp?" the program has been offered to an older generation. The inaugural adult camp was coordinated by the LSU AgCenter/Sea Grant Marine Extension Project (MEP) and held at the Louisiana Universities Marine Consortium (LUMCON) in Cocodrie, La. The program was designed for emerging leaders interested in Louisiana's coastal wetland resources. In addition to the island tour, participants were engaged in a variety of demonstrations and presentations ranging from estuarine productivity to coastal restoration. Funds and additional staff for the program were provided by the Barataria Terrebonne National Estuary Program (BTNEP).



**May** - Joby Richard (Cameron) holds a baby alligator taken from one several incubators at Rockefeller Refuge. Joby is one of 12 students who participated in "Cal/Cam Marsh Maneuvers 2000". This ancillary Marsh Maneuvers program is coordinated by Kevin Savoie, an MEP Fisheries Agent who provides the camp annually for students in Cameron and Calcasieu Parishes. This year's Cal/Cam Marsh Maneuvers was held at the LDWF Rockefeller Refuge, world-renown for its research with the American Alligator. Students also toured nearby Sabine National Wildlife Refuge and took part in boat tours of the surrounding marsh, marine sampling, water quality analysis, and site tours of restoration projects at Martin and Holly beaches along Highway 82. Sponsors for the Cal/Cam Marsh Maneuvers Program included the Cameron Parish Police Jury, Stream Properties, and Crain Brothers Inc. Facilities and staff support were provided by the LDWF Rockefeller Refuge and the Sabine National Wildlife Refuge.



**July/August** - Marcus Coleman (left, Tensas) and Charlie Rube (right, Grant) are two in a long list of students who have climbed atop historic Fort Livingston during the Marsh Maneuvers Coastal Education Program held annually on Grand Terre Island. Each summer, four 1-week camps are held in which 16 students per week experience an intensive curriculum designed to teach them more about Louisiana's wetlands. Featured topics include habitat carrying capacity, trophic-webs, bioaccumulation, hypoxia, and biodiversity, to name a few. Hands-on learning activities include vegetative wetland restoration, marine fisheries sampling, cast netting, sport-fishing, crabbing, water quality testing, seafood handling (food safety), nature viewing, fish and wildlife identification, and role-playing exercise based on resource management. This year's program will be primarily remembered for the numerous large redfish caught. In one camp alone over 16 bull redfish (~25 pound average) were caught in the channels surrounding Grand Terre.



**October** - Julie Mclain (Vermilion) is a very good sport. When an early season cold front turned into the "Perfect Storm", it looked as though the Warren Mermilliod Advanced Coastal Aquatic Camp (Advanced Marsh Maneuvers) would be blown-out. This program typically affords 16 of the most motivated campers from regular Marsh Maneuvers an opportunity for a full-day aboard the research vessel "Acadiana" based out of LUMCON in Cocodrie, La. Although gale force winds kept LUMCON boats docked for the weekend, enthusiasm was undaunted. Julie was one of many who took the plunge to collect estuarine samples for laboratory work. Other activities included scope-on-a-rope analysis of benthic & plankton samples, Gyotaku (fish printing), and a series of oral reports by students on topics ranging from pelicans to pigfish. The most vivid lesson came during a visit to a commercial shrimp dock where students witnessed the bounty of white shrimp harvested as strong North winds drained local



## ESOS-V: Nov. 16-17th 2000

The Environmental Research Consortium of Louisiana (ERCLA) in conjunction with the LSU InterCollege Environmental Cooperative and the LSU AgCenter has organized the Environmental State of the State (ESOS)-V conference. The ESOS-V conference will be held November 16 and 17, 2000 at the Pennington Biomedical Research Center. This is technical conference of platform and poster presentations focusing on environmental research on-going at state universities and other organizations. Topic areas include concurrent sessions on water quality, waste management, coastal issues, global warming, and air quality. Presentation topics, registration information, and a tentative agenda can be found online at:

[www.agctr.lsu.edu/pdfs/esosconf.pdf](http://www.agctr.lsu.edu/pdfs/esosconf.pdf)



### Panel Addresses Problems with Common Salvinia

A panel of experts met September 6th at the Rockefeller State Wildlife Refuge on the Gulf coast in Cameron Parish to discuss existing and future threats from the invasive aquatic plant *Salvinia*. Although much attention has been recently given to problems with Giant Salvinia (*Salvinia molesta*) the purpose of this meeting was primarily to discuss Common Salvinia (*Salvinia minima*), originally considered the more environmentally benign of the 2 species. Common Salvinia, an aquatic fern native to Central and South America, was first identified in Louisiana in 1980, but it didn't pose any serious problems until a few years ago, according to Charlie Dugas, a plant biologist with the Louisiana Department of Wildlife and Fisheries. The plant floats on top of the water, effectively blocking out sunlight to plants and animals below, Dugas said, adding that Salvinia also reduces oxygen and restricts navigation and irrigation flow in bayous and canals.

Common Salvinia is of particular concern to duck hunters because it can displace waterfowl habitat. Located at the southern end of the Mississippi and Central flyways, Louisiana is winter home to millions of ducks geese, according to Robert Helm, waterfowl biologist with the Department. "Research has shown fresh and intermediate wetlands are most important for duck habitat," Helm said. "These areas - the most productive - are where Salvinia is invading and flourishing." Other habitats, such as inland swamps, lakes, and agricultural fields are increasingly susceptible to infestation, Helm said. "Salvinia has potential to be a problem greater than all other plant species combined," he added.

To the extent that Salvinia impedes access and displaces habitat, the economic impact of salvinia on waterfowl hunting could be significant, according to Dr. Rex Caffey, a wetlands specialist with the LSU AgCenter/Sea Grant. Nearly 100,000 hunters generate an estimated \$70 million in economic activity annually in Louisiana. A disproportionate amount of these dollars are spent on waterfowl leases, which in some cases demand several thousand dollars per year for the lease of individual blinds.



Common Salvinia (*Salvinia minima*)

Dr. Dearl Sanders, a weed scientist with the LSU AgCenter, has been evaluating chemical controls, but they are costly, he said. "Louisiana has a comprehensive spray program for water hyacinth at a cost of a few dollars an acre," Sanders explained. The cost of controlling Salvinia, on the other hand, can range from \$80 to \$600 per acre. Dugas said is evaluating biological control with a Salvinia weevil that's been identified in Florida, where Salvinia has been since 1920 but is not considered a problem weed.

"We need to bring this to the attention of the people - this affects everybody in this area," said Gerald Theunissen, state senator for District 25, who has been an instrumental leader in the Louisiana Salvinia Task Force that's working to control the problem weed. Calling Salvinia a "big nuisance and serious problem," Theunissen mentioned the need for matching state funds to garner federal funding and said he's preparing legislation that would impose user fees to provide the necessary funds.

For additional information contact: Dr. Dearl Sanders at (225) 683-5848 or [sanders@agctr.lsu.edu](mailto:sanders@agctr.lsu.edu), Dr. Rex Caffey at (225) 578-2266 or [rcaffey@agctr.lsu.edu](mailto:rcaffey@agctr.lsu.edu), Robert Helm at (225) 765-2358, [helm\\_rn@wlf.state.la.us](mailto:helm_rn@wlf.state.la.us), or Charlie Dugas at (337) 948-0255 or [dugas\\_cn@wlf.state.la.us](mailto:dugas_cn@wlf.state.la.us).

Adapted from Rick Bogren, LSU AgCenter Communications



Please send any questions or comments regarding to this newsletter to:

#### Louisiana Wetland News

Rex H. Caffey  
Room 131, Agriculture Administration Building  
Louisiana State University, Baton Rouge, LA 70803-5604  
(225) 578-2266 (phone)  
(225) 578-2716 (fax)  
[rcaffey@agctr.lsu.edu](mailto:rcaffey@agctr.lsu.edu)

LSU AGRICULTURAL CENTER  
U.S. DEPARTMENT OF AGRICULTURE  
KNAPP HALL  
P.O. BOX 25100  
BATON ROUGE, LA 70894-5100



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