

Spatial and Temporal Distribution of Coastal Marsh Dieback in Louisiana, 2000-2003, as Determined from Aerial Surveys

Task # III.8

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TABLE OF CONTENTS

	Page
ACKNOWLEDGMENTS	4
ABSTRACT	4
INTRODUCTION	4
METHODS	5
Aerial Surveys	5
Ground Truthing	6
Photo-documentation	7
Evaluation of Impacted Acreages	7
Statistical Analysis	8
RESULTS	8
DISCUSSION	9
REFERENCES	11
TABLES	13
FIGURES	19
APPENDICES	23

TABLES

Table 1. Classification scheme for marsh dieback appearance/color categories used in aerial surveys of coastal Louisiana, 2000-2003.

Table 2. Summary data from aerial surveys, including total number of observations, number of impacted areas, percent impacted, and estimates for acreage impacted by marsh type for the Deltaic Plain and the Chenier Plain, and totals for all transects.

Table 3. Mean %BROWN by marsh type for aerial surveys in the Deltaic Plain, Louisiana, 2000-2003 (total n = 53,133 data points; each data point represents a patch of marsh approximately 100 m in diameter).

FIGURES

Figure 1. Map of study area showing six transects used in aerial surveys to evaluate marsh dieback color in coastal Louisiana.

Figure 2. Estimated area (acres) of marsh dieback, by survey date and marsh type, for the Deltaic Plain of coastal Louisiana, 2000-2003 (see Appendix A for calculations).

Figure 3. Estimated area (acreage) of impacted marsh found in each coastal Louisiana parish that was surveyed for dieback effects, 2000-2003 (see Appendix A for calculations).

Figure 4. Percentage of total observations for each color classification for transect D1, which followed the coast (primarily saline marsh) in the Deltaic Plain region from Point au Fer Island to California Point (see Figure 1 for transect location).

Figure 5. Percentage of total observations for each color classification for transect C1, which followed the coast (primarily saline and brackish marsh) in the Chenier Plain region from Marsh Island to Sabine Pass (see Figure 1 for transect location).

Figure 6. Mean %BROWN by marsh type and month for coastal Louisiana aerial surveys, 2000-2003.

Figure 7. Mean %BROWN by year for months that were surveyed in multiple years, saline marsh only, coastal Louisiana aerial surveys 2000-2003.

APPENDICES

Appendix A. Aerial oblique photographs of marsh showing vegetation signatures for the five color classes used for this study (see Table 1): green (G), green/brown (G/B), brown/green (B/G), brown (B), and deadflat (D).

Appendix B. Maps of flight transects, ground reference sites, and survey results from all coastal Louisiana flights, 2000-2003, showing spatial distribution of marsh observations by color class.

Appendix C. Tables for each survey flight, 2000-2003, showing raw data from which impacted acreage estimates were calculated.

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ABSTRACT

We conducted monthly or bimonthly aerial surveys to track the extent of coastal marsh dieback in Louisiana from June 2000 to August 2002; we conducted a follow-up survey in June 2003. We estimated the total affected area in the Deltaic Plain (southeast Louisiana) to have been about 35,000 acres in June 2000, at the start of the dieback. The dieback increased and peaked in March 2001 (126,444 acres), then decreased steadily to about 35,000 acres in August 2002, and down to about 17,000 acres in June 2003. All coastal parishes and all marsh types were affected, but, by far, most of the dieback acreage was in saline marsh, primarily in Terrebonne and Lafourche Parishes. During the peak of the dieback (March 2001) 95% of the affected Deltaic Plain acreage was in saline marsh, and 90% of the affected marsh acreage was in Terrebonne and Lafourche Parishes (50% and 40%, respectively). We found a seasonal pattern of browning associated with normal winter senescence, but there was also a pattern of dieback-related browning that was superimposed on the seasonal pattern. For months that were surveyed in two or three successive years we found a significant decrease in the percent of brown coloration in the vegetation from 2000 to 2001, and from 2001 to 2002. As of late 2003, most of the saline marsh dieback sites had recovered, but there were still a significant number that had not completely revegetated. In addition, we found an increase in impacted area of non-saline marsh types, especially in the Chenier Plain, toward the end of the study in 2002. Therefore, we recommend continued monitoring of coastal marshes to track dieback and recovery in future years.

INTRODUCTION

Dieback of *Spartina alterniflora* and *S. patens* in Louisiana marshes has been previously reported (Smith 1970, Mendelssohn and McKee 1988, Webb et al. 1995), but previous diebacks were limited to small patches in localized areas. The dieback documented herein, however, occurred on a much larger scale, leading to concern that accelerated wetland conversion to open water could result from impacted areas. During the growing season, when saline marshes are typically healthy and support rapidly growing plants, resource managers and biologists documented an unprecedented expanse of stressed, dying, and dead vegetation. Brown patches of *S. alterniflora* were first observed in the coastal marshes of southeastern Louisiana (in Terrebonne Parish, south of Blue Hammock Bayou and east of Fourleague Bay) during an aerial survey in May 2000 (G. Linscombe, Louisiana Department of Wildlife and Fisheries personal communication). A

few days later we confirmed his observations and noted similar areas of brown marsh scattered throughout the Deltaic Plain. We immediately initiated a plan to document the spatial extent of the dieback and to track the changes over time by using low-altitude aerial surveys.

METHODS

Aerial Surveys

Monthly or bimonthly flights were made over coastal Louisiana from June 2000 through August 2002; an additional survey flight was conducted in June 2003. Flights over southeastern Louisiana were divided into two regions consisting of four transects (Figure 1): the Central Bays region (Transects B1 and B2: from Jefferson Island to Point au Fer Island) and the Deltaic Plain region (D1 and D2: Point Au Fer Island to the eastern side of the Mississippi River). We later (August 2000) established two additional transects in the Chenier Plain region (C1 and C2: Marsh Island to Sabine Pass). Each transect was numbered to indicate whether a coastal (1) or inshore (2) flight path was taken.

We conducted aerial surveys from a single-engine, fixed-winged amphibious aircraft (Cessna 185) owned and operated by the U.S. Department of the Interior (U.S. Geological Survey [USGS]). The aircraft was configured with a voice/global positioning system (GPS)/moving map system (Hodges 1999) that linked the aircraft's GPS, intercom system, and laptop computers so that each voice observation from the pilot or observer was assigned to a specific latitude, longitude, and time. The system also allowed geospatial points, the flight track of the aircraft, its present position, and the location of recent voice observations to be simultaneously displayed on a 1:250,000-scale digital map image in a computer monitor screen mounted on the aircraft's instrument panel in view of the pilot and observer.

The flight crew consisted of a pilot and an observer. Every 5 seconds, as determined from a digital elapsed-time indicator on the instrument panel, both the observer and the pilot assessed the general appearance and color of the marsh adjacent to the aircraft, directly beneath the wing, on their respective sides. The appearance/color of the marsh was assigned to one of five categories based on the estimated percent of brown (as opposed to green) vegetation that was visible on the patch of marsh (Table 1). For the initial flight (June 2000) we used four color categories (see Appendix A): green (G), green/brown (G/B), brown/green (B/G), and brown (B). As the study progressed, we modified the classification system. We decided after the first flight that a given patch of marsh classified as "brown" (i.e., 85 – 100% brown vegetation) may or may not have been completely dead because standing brown, or mostly brown, vegetation could still be viable. Therefore, we added a fifth category, "dead," to describe a patch of vegetation that was grayish-brown or brownish-gray in color, and for which the plants appeared matted and/or degraded on the marsh surface, as opposed to standing brown vegetation that appeared to be still viable. By November 2000 we had added the term "deadflat" to describe dead areas that had become completely devoid of vegetation. We could easily distinguish these areas from unvegetated tidal flats that existed prior to this dieback event

because tidal flats were lower in elevation and had a well-developed marsh shoreline that separated them from the surrounding marsh. In contrast, the “deadflats” appeared to be the same elevation as the surrounding marsh, without a well-developed shoreline, and often had a sparse covering of stubble or remnant sprigs from the vegetation that had previously covered them.

Additional modifiers were later developed to provide a more detailed description of the five basic categories. These included “burned,” “mangrove,” and “sparse.” Thus an area that would have been initially described as “brown” may have been called “brown-mangrove” in a later survey, thus retaining the original method and description but allowing new information to be incorporated within that framework. We also added color modifiers to deadflat areas, during the revegetation phase, to indicate the color of vegetation that was colonizing the open deadflats. We do not present data from the modifiers in this report, but those data are available upon request from the authors. For classification of patches we used the 30% rule (Cowardin et al. 1979); for example, an area was classified as “deadflat” if the open area was greater than 30%, but it was classified as normal marsh with one of the four color categories if vegetation coverage was at least 70%.

The aircraft was flown at an altitude of 50 m above ground level with airspeed maintained at approximately 90 knots (nautical miles per hour). The pilot and observer viewed the marsh from a continuous perspective defined by the window frame, pontoon, and wing strut. The viewing area of the marsh was about 100 meters in diameter. These observations were recorded using the “record” program of the voice/GPS/moving map system (Hodges 1999).

Following each flight, the voice observations were transcribed by using the “transcribe” program of the voice/GPS/moving map system (Hodges 1999) to digitize the voice observations and link them to GPS locations and time. Once transcribed, the biological, geographical and temporal information was imported into Excel™ spreadsheet files. We then imported all transcribed data into a geographical information systems (GIS) software package (ArcView 3.2a) to produce maps showing affected marsh distribution and to perform other spatial relationship functions. Marsh status observations were displayed on a LANDSAT Thematic Mapper satellite image of south Louisiana (Braud 2000) with coastal marsh salinity-type data from Chabreck et al. (2001). We used GIS-generated habitat data to determine total affected acreage by parish by salinity type (see below).

Ground Truthing

The aerial surveys were designed to fly near ground reference sites, thus enabling us to “calibrate” our aerial assessment with detailed ground studies. We classified each of our nine ground sites (Michot et al. 2004) to link aerial classifications to vegetation conditions on the ground (see Appendix B for location of ground sites). Additionally, ground-truthing surveys conducted in conjunction with the mapping of 12 quadrangles as part of the marsh dieback syndrome study (Handley et al. 2004) provided extensive

corroborative information. Finally, use of the amphibious aircraft allowed us to land, when circumstances warranted, to assess the marsh along the flight path.

Photo-documentation

A digital videocamera was often employed while conducting surveys. The videocamera was pointed at an oblique angle to simulate the view angle of pilot and observer, thus allowing simultaneous documentation of observed marsh features. The audio recorder for the camera was wired into the aircraft communication system to allow the pilot and observer to record all cockpit conversation while recording video. This allowed us to narrate descriptions of the marsh videotape whenever needed. The chronometer on the camera was synchronized with that on the voice/GPS/moving map system to link photos with spatial data. Oblique digital still photos were also taken at selected ground reference sites. Photos and videotapes from those flights are archived at the USGS National Wetlands Research Center in Lafayette. Some photos have been posted on the web site www.brownmarsh.net.

Evaluation of Impacted Acreages

For each aerial survey we used GIS to assign every data point (observation) to a parish (Figure 1) and marsh type, then constructed a frequency table of total points and affected points by parish and marsh type (Appendix C). We divided the numbers of affected points by the total number of points for each parish x marsh type to estimate the proportion of affected marsh, under the assumption that our sample was representative within each parish. We multiplied the proportion affected by total acreage of that marsh type within the parish (Chabreck et al. 2001) to estimate the total acreage of affected marsh by parish. We then summed over parish to estimate total acreage of impacted, or affected, marsh within the entire study area (coastal Louisiana) or within the Deltaic Plain or Chenier Plain regions. Affected marsh was defined as sites classified as “dead” or “deadflats,” except for June and September of 2000, when “brown” sites were used (see Aerial Surveys section). For analysis purposes we pooled data from transects B1, B2, D1, and D2 for the Deltaic Plain, and for the Chenier Plain we used all observations within Cameron, Vermilion, and Iberia Parishes (Figure 1).

When the dieback was first discovered it appeared to be close to the coast in the saline marsh zone, so we focused our Deltaic Plain sampling effort in that marsh type. Therefore, sampling intensity was greatest in the saline marsh (e.g., on the average, 48% of 2,865 observations in the Deltaic Plain) and less in brackish (21%), intermediate (13%), and fresh (18%) marsh types. In the Chenier Plain, which has less saline marsh, more samples fell in the intermediate (e.g., on the average, 44% of 2,562 observations) and brackish (38%) marsh types, and less in the saline (15%) and fresh (2%) types (calculated from Appendix C).

Statistical Analysis

Categorical values for marsh color classes were converted to the numeric midpoint of the range for each class to estimate a percentage (%BROWN) for each observation (Table 1). These values could then be used in statistical analysis to assess significance of differences among groups. We used a two-way factorial analysis of variance (ANOVA) to assess effects of marsh type (fresh, intermediate, brackish, saline) and survey date.

To minimize the number of possible interactions we reduced contrast statements so that the mean %BROWN value for a given survey date by marsh type was compared to only the previous and next survey date within the same marsh type. Due to the Bonferroni effect, we set the alpha level for pairwise comparisons at 0.0001 to achieve an experimentwise Type I error rate of 0.05 (Day and Quinn 1989). To evaluate temporal changes that were independent of seasonal effects we used contrast statements to perform pairwise comparisons of values by marsh type for the same month over successive years (e.g., June 2001 versus June 2002 versus June 2003).

RESULTS

We estimated that about 35,000 acres of coastal marsh in the Deltaic Plain were impacted when we initiated the study in June of 2000 (Table 2; Figure 2). By November 2000 most of the dead areas had converted from standing brown vegetation to unvegetated deadflats. The area affected by the dieback (i.e., dead marsh and deadflats) continued to increase from June 2000 through March of 2001, when it peaked at about 126,000 acres in the Deltaic Plain. After March 2001 the affected area decreased steadily to about 35,000 acres in August 2002; by June of 2003 the total area affected had decreased to less than 17,000 acres.

All coastal parishes and all marsh types were affected, but, by far, most of the dieback acreage was in saline marsh, primarily in Terrebonne and Lafourche Parishes. During the peak of the dieback (March 2001) 95% of the affected Deltaic Plain acreage was in saline marsh, and 90% of the affected marsh acreage was in Terrebonne and Lafourche Parishes (50% and 40%, respectively). Those two parishes tracked one another closely, and they peaked at more than 50,000 acres each (Figure 3), although the peaks were in different months (March 2001 for Terrebonne and May 2001 for Lafourche). Some of the most highly impacted saline marshes were along transect D1 in the vicinity of Bay Junop (Terrebonne Parish), Bay Felicity (Terrebonne Parish), and Pass Fourchon (Lafourche Parish; see Appendix B). The changes in frequency of dead, brown, and green marsh patches over time in the Deltaic Plain (Figure 4) showed two patterns. We found a seasonal pattern, with more browns in the winter, but superimposed on that seasonal pattern was a dieback pattern with more dead and brown marsh in the first year and less in subsequent years as the marsh recovered. In the Chenier Plain (Figure 5) the same seasonal pattern was present, but it was less apparent due to a lower sampling frequency, especially during the winter months. There appeared to be an increase in affected marsh acreage toward the end of the study (summer 2002) in Cameron, Vermilion, and

Plaquemines Parishes (Figure 3), and an increase in affected non-saline marsh types at that time in both regions (Figure 2, Appendix C).

The dieback extended as far east as St. Bernard Parish, which was not on our normal survey route, but we documented numerous dieback areas there on separate surveys in August 2000 and June 2001 (data available on request). As far as we know, the dieback did not extend into coastal Mississippi, but we did not survey that area. We did survey coastal Texas and found that the dieback extended at least as far west as San Luis Pass, southwest of Galveston Island, in August and October of 2000 (data available on request).

Between June 2000 and August 2002 we made 53,133 observations of marsh vegetation color in the Deltaic Plain of coastal Louisiana (Table 3). From our ANOVA we found a significant interaction effect of marsh type and survey date on the response variable (%BROWN). There was a prominent seasonal effect with less brown (i.e., more green) during the growing season and more brown during the winter (Figure 6). This seasonal pattern was significant for all marsh types (i.e., winter values were significantly higher than summer values; Table 3), but saline marsh showed the least difference between summer and winter values because of the high percentage of brown and dead marsh observed in that marsh type during the growing season. Differences among marsh types were most pronounced during the growing season, whereas during the winter differences usually were not significant. During most months, especially non-winter, saline marsh values were higher and fresh marsh values were lower than other marsh types, whereas intermediate and brackish marsh values were not significantly different from each other. Toward the end of the study (August 2002, June 2003) differences among marsh types were diminished due to the low values for all marsh types.

When we compared values for the same month during different years, we found that the amount of brown or dead vegetation in saline marsh during the growing season generally decreased from one year to the next. The mean %BROWN decreased significantly from 2000 to 2001 during the months of June and August, and again from 2002 to 2003 during March, April, May, June, and August (Figure 7). During January there was no significant difference between years, and during March there was a significant increase from 2001 to 2002. The %BROWN in other (non-saline) marsh types generally did not change during the growing season from one year to the next, with the exception being that intermediate marsh was significantly greener in June of 2001 and 2002 than it was during June of 2000 (Figure 6). During the winter, fresh and intermediate marsh types were greener in January of 2002 than in 2001, and all marsh types were browner in March of 2002 than in 2001.

DISCUSSION

Our data show that the dieback affected all marsh types but was most pronounced by far in saline marsh. All marsh types showed a typical seasonal pattern of winter browning that was superimposed on the browning caused by the dieback, but dieback effects were

noted especially during the growing seasons and in comparisons among marsh types and years. The dieback affected all marsh types in the spring of 2000 and continued through the end of the study, though the effects diminished over time. By the end of the third growing season (August 2002) saline marsh had greened up to about the level of brackish marsh, so recovery continued and marsh color was probably approaching “normal” levels. We acknowledge that, even under normal (non-dieback) conditions, there is always some brown vegetation in the marsh during the growing season from replacement of leaves and stems. We have no baseline data from normal years, however, with which to compare data from this study, and to our knowledge there has never been a study of color changes over time for coastal marsh vegetation. At all of our ground sites we found that marsh vegetation started to green up later in the spring of 2002 than in 2001, probably because of the effects of a colder late winter and “later spring” in 2002 that was not associated with the dieback event. This would account for the higher mean %BROWN values for all marsh types found in March 2002 than in March 2001. Examination of our ground study sites (Michot et al. 2004) during aerial overflights as recently as October 2003 revealed that at least one site (Lake Felicity) was only about 40% revegetated, while others (Bay Junop, Old Oyster Bayou and Bayou Salé) were 100% revegetated. The reason for the lack of total recovery at the Felicity site is not known because the bare patches were greater than 20 m from our sample plots (Michot et al. 2004).

Our analysis showed that the area impacted by deadflats in coastal Louisiana continued to increase from June 2000 and peaked in March of 2001, then began a more or less steady decrease to the end of the study (August 2002). Because normal winter senescence should result in only browning of standing vegetation, and not complete devegetation of a site, we believe that the trend shown accurately depicts the peak of the dieback event in the winter of 2001. From our ground studies (Michot et al. 2004) we know that surviving live vegetation continued to show signs of stress (browning and lack of vigor) through the spring and into the summer of 2001. We also noted that new vegetation that became established on deadflats grew with more vigor and was greener, taller, and thicker than live vegetation in patches that survived the dieback. This probably explains the downward trend in impacted area starting in the spring of 2001.

Though all parishes and all marsh types were affected by the dieback, the greatest impact was observed in the saline marshes of Terrebonne and Lafourche Parishes. The Deltaic Plain had greater impact than the Chenier Plain, but that could be because the Deltaic Plain has much more saline marsh. Saline marsh areas in the Chenier Plain, especially in the vicinity of Calcasieu Lake, were heavily impacted (Egerova et al. 2003, Edwards and Proffitt 2003). We noted a substantial amount of impacted brackish marsh in the Chenier Plain, especially toward the end of our study (2002), in the vicinity of Marsh Island, south of Pecan Island and Grand Chenier, south of Calcasieu Lake, and between Sabine and Calcasieu Lakes. Many of these areas and possibly some new ones were dead as recently as early December 2003.

In summary, most of the saline marsh dieback sites had recovered by 2003, but there were still a significant number that had not completely revegetated. In addition, we found an increase in impacted area of non-saline marsh types, especially in the Chenier Plain, toward the end of the study. Therefore, we recommend continued monitoring of coastal marshes to track dieback and recovery in future years.

REFERENCES

- Braud, D.W. 2000. Louisiana GIS CD: A Digital Map of the State, Ver 2.0. Louisiana State University, Department of Geography and Anthropology, Baton Rouge, Louisiana.
- Chabreck, R.H., G.Linscombe, S. Hartley, J. Johnston, and A. Martucci. 2001. Coastal Louisiana Marsh Vegetation types (CD-ROM). Unpublished data from U.S. Geological Survey, National Wetlands Research Center, Lafayette, Louisiana.
- Cowardin, L. M., V. Carter, F. C. Golet, and E. T. LaRoe. 1979. Classification of Wetlands and Deepwater Habitats of the United States. U.S. Fish and Wildlife Service, Office of Biological Services, Washington, DC, USA. FWS/OBS 79/31. 108p.
- Day, R.W., and G.P. Quinn. 1989. Comparisons of treatments after an analysis of variance in ecology. *Ecological Monographs* 58:433-463.
- Egerova, J., C.E. Proffitt, and S.E. Travis. 2003. Facilitation of survival and growth of *Baccharis halimifolia* L. by *Spartina alterniflora* Loisel in a created Louisiana salt marsh. *Wetlands* 23:250–256.
- Edwards, K.R., and C.E. Proffitt. 2003. Comparison of wetland structural characteristics between created and natural salt marshes in southwest Louisiana, USA. *Wetlands* 23:344–356.
- Handley, L., C.J. Wells, and S. Hartley. 2004. Brown marsh status and trends Tasks 1.1 and 1.4. U.S.G.S. - National Wetlands Research Center, Report to Louisiana Department of Natural Resources, Task # 2.4. DNR Interagency Agreement No. OCR 435-400540, DNR Contract Number 2512-05-03.
- Hodges, J. 1999. Voice/GPS/Moving Map Software. Unpublished Software, U.S. Fish and Wildlife Service, Juneau, Alaska.
- Mendelssohn, I.A., and K.L. McKee. 1988. *Spartina alterniflora* dieback in Louisiana: time-course investigation of soil waterlogging effects. *Journal of Ecology* 76:509-521.
- Michot, T.C., R. S. Kemmerer, and J.J. Reiser. 2004. Plant and Soil Characterizations in a *Spartina alterniflora* saltmarsh experiencing dieback in Terrebonne Parish, Louisiana, USA. U.S.G.S. - National Wetlands Research Center, Report to Louisiana Department of

Natural Resources, Task # 2.4. DNR Interagency Agreement No. OCR 435-400540,
DNR Contract Number 2512-05-03.

Smith, W.G. 1970. *Spartina* "die-back" in Louisiana marshlands. Coastal Studies
Bulletin 5:89-96.

Webb, E.C., I.A. Mendelssohn, and B.J. Wilsey. 1995. Causes for vegetation dieback in
a Louisiana salt marsh: a bioassay approach. Aquatic Botany 51:281-289.

Table 1. Classification scheme for marsh appearance/color categories used in aerial surveys of coastal Louisiana, 2000-2003.

Color Class	Abbreviation	Percent Brown Vegetation	
		Range	Midpoint
Green	G	1 - 15	7.5
Green/Brown	G/B	16 - 50	33
Brown/Green	B/G	51 - 84	67.5
Brown	B	85 - 100	92.5
Dead ¹	D	100	100

¹ “Dead” includes patches of standing dead vegetation as well as “deadflats” that were completely devoid of vegetation; see Methods section.

Table 2. Summary data from aerial surveys, including total number of observations, number of impacted areas, percent impacted, and estimates for acreage impacted by marsh type for the Deltaic Plain and the Chenier Plain, and totals for all transects.

n Obs. = number of observations performed during the survey

n Aff. = number of affected (dead) observations for the survey

% Aff. = percent of affected marsh from the survey (n Aff. / n obs.)

**DELTAIC PLAIN
TRANSECTS**

<u>Date</u>	<u>n Obs.</u>	<u>n Aff.</u>	<u>% Aff.</u>	<u>Acres Affected</u>				
	<u>Total</u>	<u>Total</u>	<u>Total</u>	<u>Total</u>	<u>Saline</u>	<u>Brackish</u>	<u>Intermediate</u>	<u>Fresh</u>
June 2000	1,272	79	6.2%	35,415	33,858	1,557	0	0
August 2000	1,142	85	7.4%	34,270	33,226	1,044	0	0
September 2000	2,306	97	4.2%	58,818	22,409	5,092	20,521	10,796
October 2000	2,647	166	6.3%	56,862	54,614	1,699	549	0
November 2000	3,528	317	9.0%	69,864	66,320	1,690	1,154	700
January 2001	2,912	245	8.4%	68,526	67,301	0	1,225	0
February 2001	2,789	367	13.2%	92,251	85,313	4,904	0	2,034
March 2001	3,210	499	15.5%	126,444	119,608	2,679	836	3,322
April 2001	2,531	368	14.5%	114,028	111,097	2,931	0	0
May 2001	2,687	339	12.6%	110,005	109,607	398	0	0
June 2001	2,699	323	12.0%	106,252	103,013	2,766	473	0
July 2001	2,919	244	8.4%	74,837	73,406	906	525	0
August 2001	2,647	249	9.4%	78,630	74,230	776	0	3,624
October 2001	2,592	244	9.4%	78,271	75,210	3,061	0	0
December 2001	2,582	148	5.7%	56,728	53,004	3,724	0	0
January 2002	2,235	190	8.5%	59,692	54,562	2,789	1,468	873
March 2002	2,298	231	10.1%	74,119	72,241	1,878	0	0
April 2002	2,773	175	6.3%	50,807	49,070	1,126	611	0
May 2002	2,879	128	4.4%	40,027	36,451	772	2,804	0
June 2002	2,986	117	3.9%	40,539	29,720	2,462	8,357	0
August 2002	2,649	65	2.5%	34,941	17,545	3,665	13,731	0
June 2003	2,685	49	1.8%	16,634	14,660	1,974	0	0

**CHENIER PLAIN
TRANSECTS**

<u>Date</u>	<u>n Obs.</u>	<u>n Aff.</u>	<u>% Aff.</u>	<u>Acres Affected</u>				
	<u>Total</u>	<u>Total</u>	<u>Total</u>	<u>Total</u>	<u>Saline</u>	<u>Brackish</u>	<u>Intermediate</u>	<u>Fresh</u>
August 2000	1,777	0	0.0%	0	0	0	0	0
October 2000	2,487	5	0.2%	966	0	966	0	0
February 2001	2,294	0	0.0%	0	0	0	0	0
April 2001	3,007	48	1.6%	8,301	114	1,369	6,818	0
June 2001	3,194	0	0.0%	0	0	0	0	0
August 2001	2,487	9	0.4%	1,542	605	322	615	0
April 2002	2,479	141	5.7%	22,844	2,344	3,792	16,708	0
June 2002	2,854	118	4.1%	25,013	2,057	2,921	9,044	10,991
August 2002	2,477	79	3.2%	36,610	1,375	2,691	12,397	20,147

Table 2 (continued).**ALL TRANSECTS** (data only from months when both the Chenier Plain and Deltaic Plain were surveyed)

<u>Date</u>	<u>n Obs.</u>	<u>n Aff.</u>	<u>% Aff.</u>	<u>Acres Affected</u>				
	<u>Total</u>	<u>Total</u>	<u>Total</u>	<u>Total</u>	<u>Saline</u>	<u>Brackish</u>	<u>Intermediate</u>	<u>Fresh</u>
August 2000	2,995	86	2.9%	42,836	33,226	9,610	0	0
October 2000	5,134	170	3.3%	57,828	54,614	2,665	549	0
February 2001	5,083	367	7.2%	92,251	85,313	4,904	0	2,034
April 2001	5,406	416	7.5%	122,329	111,211	4,300	6,818	0
June 2001	4,602	335	7.3%	118,606	103,428	3,855	1,250	10,073
August 2001	5,134	258	5.0%	80,172	74,835	1,098	615	3,624
April 2002	5,252	316	6.0%	73,651	51,414	4,918	17,319	0
June 2002	5,840	235	4.0%	65,552	31,777	5,383	17,401	10,991
August 2002	5,126	144	2.8%	71,551	18,920	6,356	26,128	20,147

Table 3. Percent brown by marsh type for monthly brown marsh aerial surveys in the Mississippi River Deltaic Plain, Louisiana, 2000-2003 (total n = 53,133 data points; each data point represents ca. 100 m diameter patch of marsh). Mean percent brown represents the approximate brownness of that group of data points (see Methods and Table 1).

DATE	MARSH TYPE	n	MEAN	SE	MIN	MAX
June 2000	Fresh	1	7.5		7.5	7.5
	Intermediate	96	30.9	2.17	7.5	92.5
	Brackish	292	28.6	1.34	7.5	92.5
	Saline	883	49.0	0.81	7.5	92.5
August 2000	Fresh	14	13.6	6.07	7.5	92.5
	Intermediate	39	19.3	2.91	7.5	67.5
	Brackish	171	29.4	2.05	7.5	100.0
	Saline	994	49.6	0.90	7.5	100.0
September 2000	Fresh	426	18.2	0.83	7.5	92.5
	Intermediate	272	25.9	1.46	7.5	92.5
	Brackish	533	27.7	0.87	7.5	92.5
	Saline	1075	39.7	0.75	7.5	92.5
November 2000	Fresh	522	31.3	0.93	7.5	100.0
	Intermediate	512	38.6	1.00	7.5	100.0
	Brackish	737	42.7	0.81	7.5	100.0
	Saline	1757	52.3	0.69	7.5	100.0
January 2001	Fresh	516	73.0	0.78	33.0	92.5
	Intermediate	361	71.3	0.96	7.5	100.0
	Brackish	600	67.0	0.72	33.0	92.5
	Saline	1435	71.3	0.54	7.5	100.0
February 2001	Fresh	444	59.8	1.09	7.5	100.0
	Intermediate	358	47.7	1.19	7.5	100.0
	Brackish	605	47.4	0.96	7.5	100.0
	Saline	1576	65.1	0.70	7.5	100.0
March 2001	Fresh	549	34.1	0.86	7.5	100.0
	Intermediate	386	39.0	0.93	7.5	100.0
	Brackish	695	34.0	0.61	7.5	100.0
	Saline	1580	58.4	0.80	7.5	100.0
April 2001	Fresh	564	17.6	0.57	7.5	67.5
	Intermediate	298	25.5	0.84	7.5	67.5
	Brackish	560	25.2	0.72	7.5	100.0
	Saline	1280	48.1	0.99	7.5	100.0
May 2001	Fresh	506	10.1	0.38	7.5	92.5
	Intermediate	345	21.8	0.96	7.5	92.5
	Brackish	604	24.4	0.70	7.5	100.0
	Saline	1232	49.2	1.00	7.5	100.0

Table 3. (continued).

DATE	MARSH TYPE	n	MEAN	SE	MIN	MAX
June 2001	Fresh	597	9.5	0.29	7.5	67.5
	Intermediate	421	20.4	0.92	7.5	100.0
	Brackish	659	23.2	0.77	7.5	100.0
	Saline	1229	41.3	1.08	7.5	100.0
July 2001	Fresh	557	9.9	0.32	7.5	33.0
	Intermediate	404	18.2	0.77	7.5	100.0
	Brackish	678	26.7	0.68	7.5	100.0
	Saline	1280	37.6	0.96	7.5	100.0
August 2001	Fresh	506	12.8	0.54	7.5	100.0
	Intermediate	364	19.7	0.84	7.5	67.5
	Brackish	660	25.4	0.71	7.5	100.0
	Saline	1280	38.0	0.98	7.5	100.0
October 2001	Fresh	473	14.8	0.56	7.5	67.5
	Intermediate	294	28.1	0.89	7.5	67.5
	Brackish	568	32.3	0.91	7.5	100.0
	Saline	1257	36.6	0.98	7.5	100.0
December 2001	Fresh	582	40.9	1.08	7.5	92.5
	Intermediate	354	42.5	1.21	7.5	92.5
	Brackish	557	49.5	0.97	7.5	100.0
	Saline	1200	59.6	0.72	7.5	100.0
January 2002	Fresh	190	62.5	1.68	7.5	100.0
	Intermediate	315	60.6	1.41	7.5	100.0
	Brackish	458	65.9	1.13	7.5	100.0
	Saline	1272	73.0	0.61	7.5	100.0
March 2002	Fresh	417	60.1	1.14	7.5	92.5
	Intermediate	250	60.4	1.32	7.5	92.5
	Brackish	440	60.9	0.85	7.5	100.0
	Saline	1191	67.6	0.64	7.5	100.0
April 2002	Fresh	573	16.8	0.66	7.5	67.5
	Intermediate	366	24.0	0.87	7.5	100.0
	Brackish	631	25.9	0.68	7.5	100.0
	Saline	1380	40.8	0.76	7.5	100.0
May 2002	Fresh	564	10.2	0.36	7.5	67.5
	Intermediate	373	19.2	0.91	7.5	100.0
	Brackish	627	23.6	0.82	7.5	100.0
	Saline	1315	37.1	0.78	7.5	100.0
June 2002	Fresh	593	9.0	0.24	7.5	33.0
	Intermediate	433	17.2	0.81	7.5	100.0
	Brackish	698	23.9	0.75	7.5	100.0
	Saline	1463	35.3	0.72	7.5	100.0

Table 3 (continued).

DATE	MARSH TYPE	n	MEAN	SE	MIN	MAX
August 2002	Fresh	557	10.6	0.36	7.5	67.5
	Intermediate	381	18.0	0.84	7.5	100.0
	Brackish	656	24.8	0.86	7.5	100.0
	Saline	1252	25.6	0.74	7.5	100.0

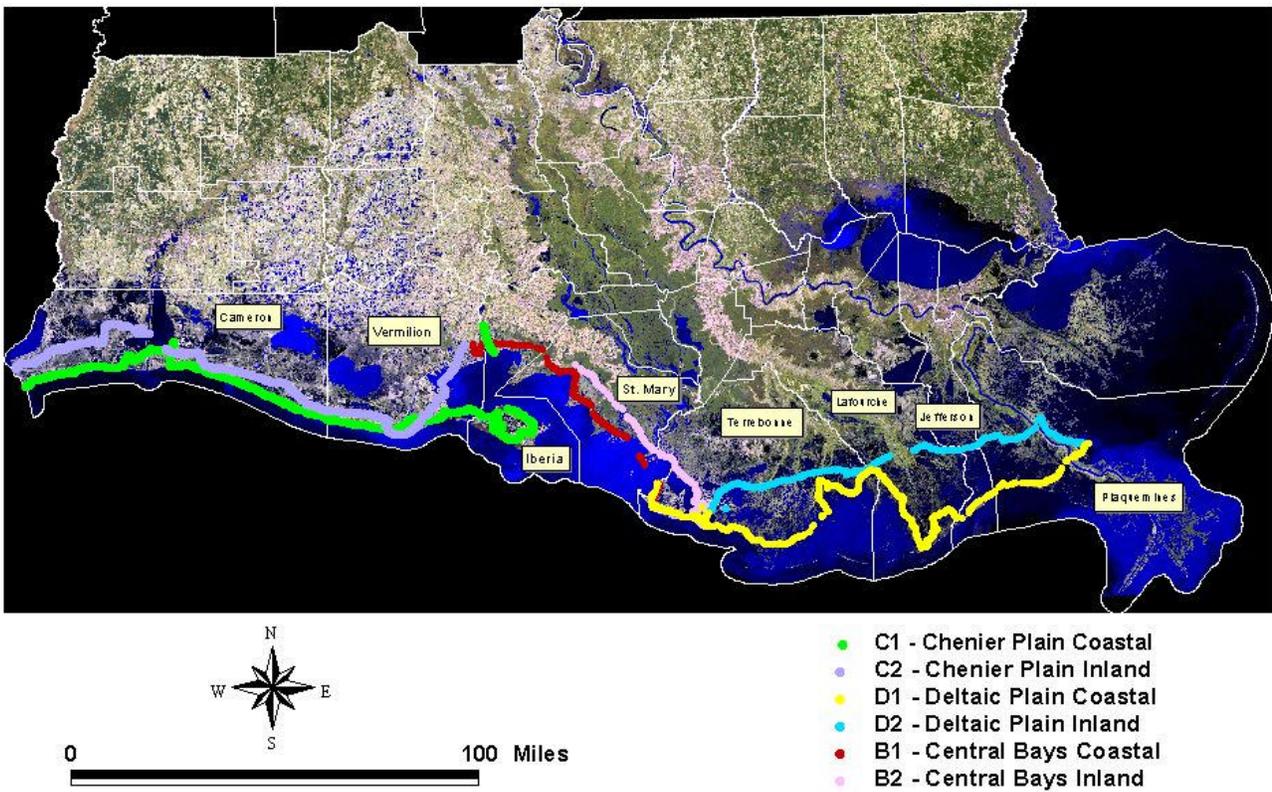


Figure 1. Map of study area showing six transects used in aerial surveys to evaluate marsh color in coastal Louisiana.

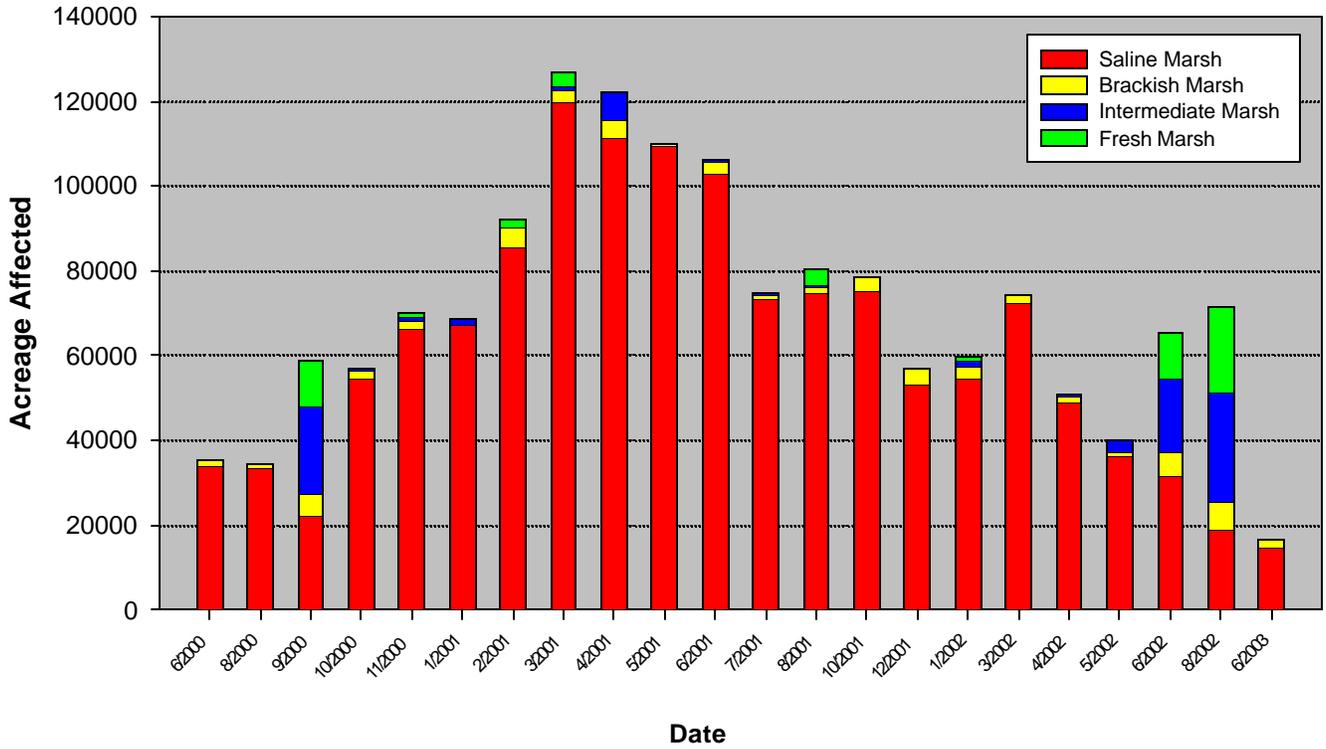


Figure 2. Estimated area (acres) of marsh dieback, by survey date (month/year) and marsh type, for the Deltaic Plain of coastal Louisiana, 2000–2003 (see Appendix C for calculations).

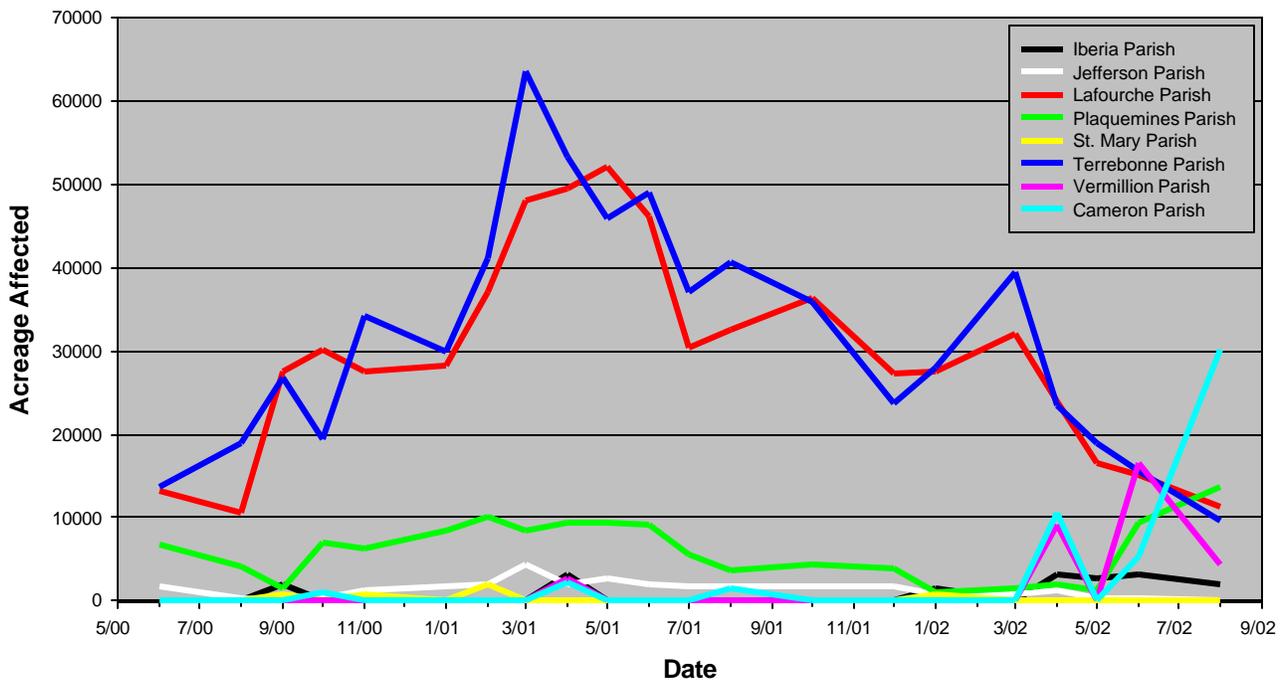


Figure 3. Estimated area (acreege) of impacted marsh found in each coastal Louisiana parish that was surveyed for dieback effects, 2000–2002 (see Appendix A for calculations).

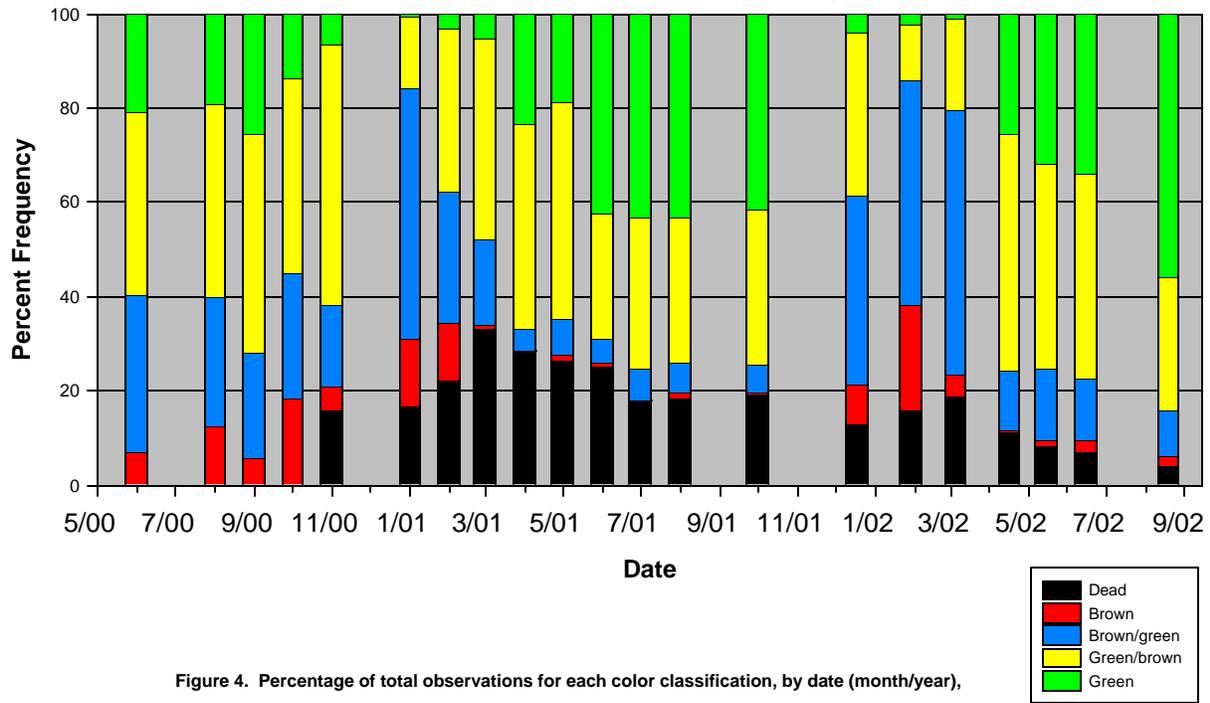


Figure 4. Percentage of total observations for each color classification, by date (month/year), for transect D1, which followed the coast (primarily saline marsh) in the Deltaic Plain region from Point au Fer Island to California Point (see Figure 1 for transect location).

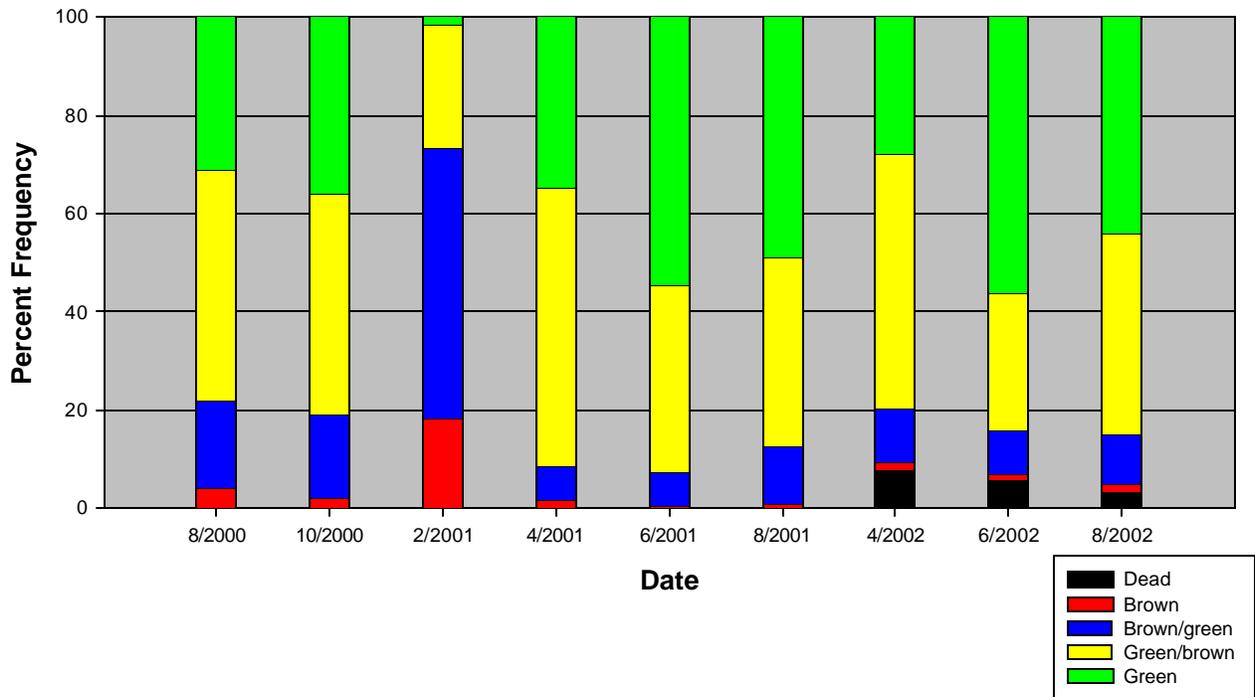


Figure 5. Percentage of total observations for each color classification, by date (month/year), for transect C1, which followed the coast (primarily saline and brackish marsh) in the Chenier Plain region from Marsh Island to Sabine Pass (see Figure 1 for transect location).

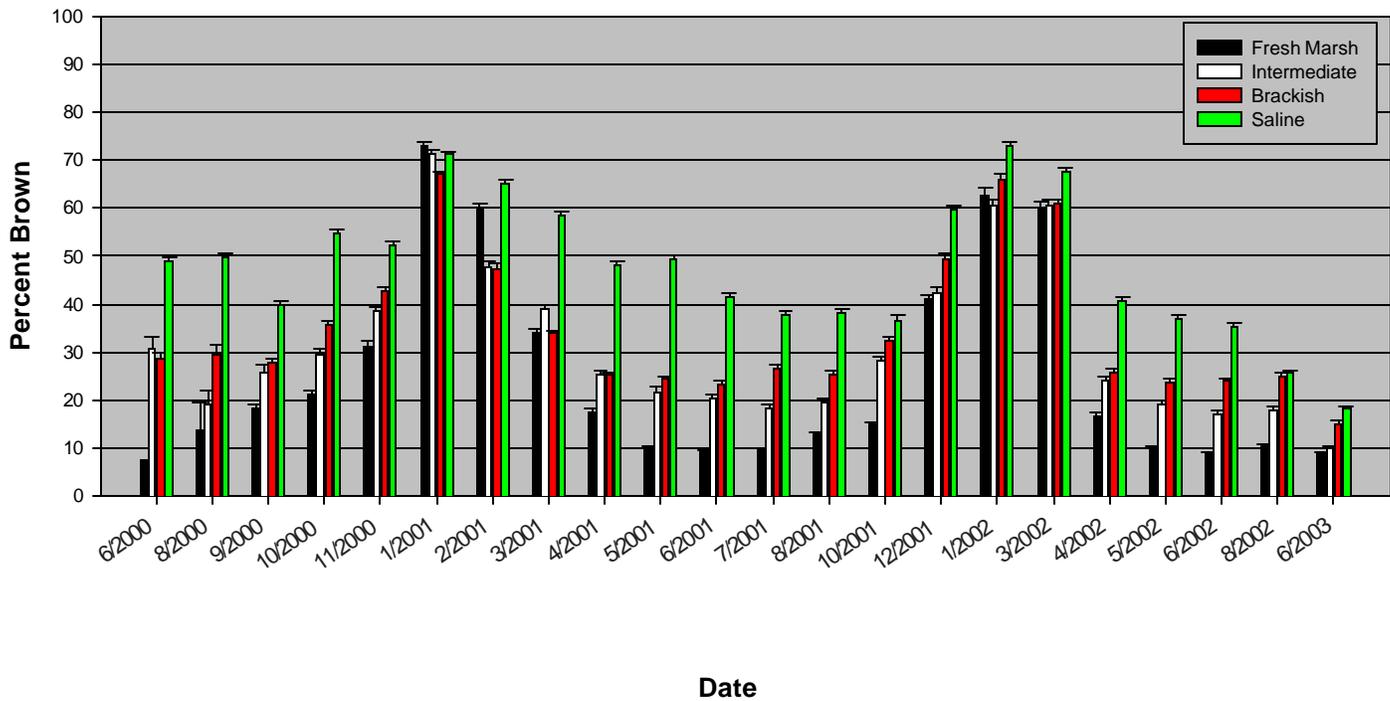


Figure 6. Mean Percent Brown by marsh type and (month/year) for coastal Louisiana aerial surveys, Deltaic Plain only, 2000-2003 (see Table 3 for actual values and for significance among means).

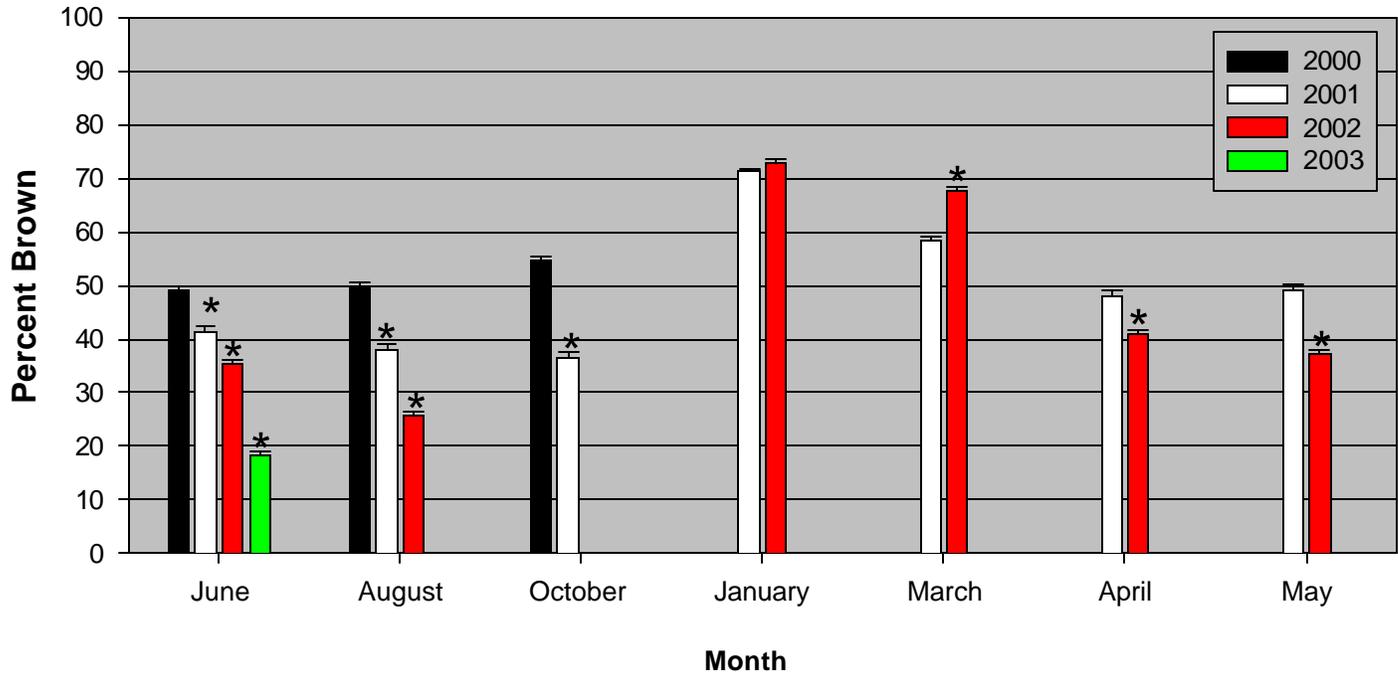


Figure 7. Mean Percent Brown by year for months that were surveyed in multiple years, saline marsh only, in coastal Louisiana aerial surveys 2000-2003.

Asterisk (" * ") indicates that the mean is significantly ($P < 0.0001$) different from previous year, same month.

Appendix A

Aerial oblique photographs of marsh showing vegetation signatures for the five color classes used for this study (see Table 1): green (G), green/brown (G/B), brown/green (B/G), brown (B), and deadflat (D).

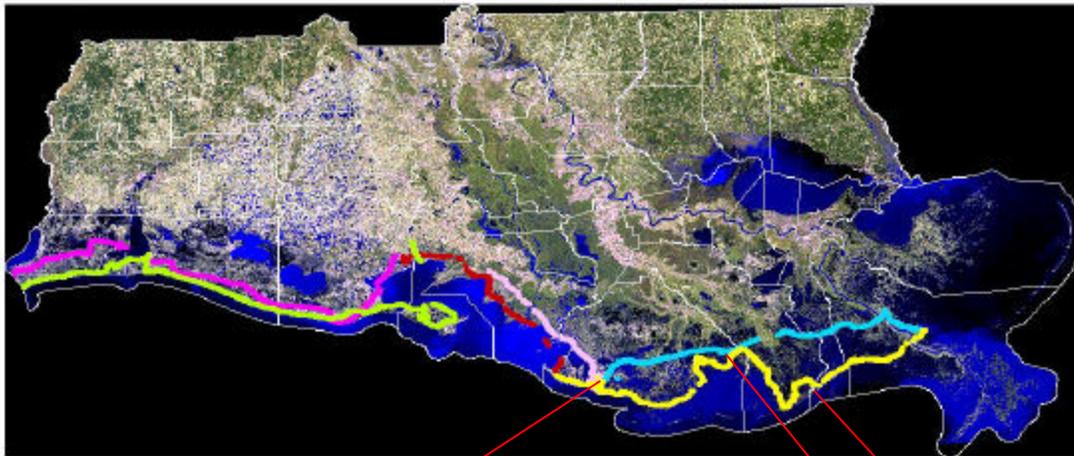
Vegetation signatures



Appendix B

Maps of flight transects, ground reference sites, and survey results from all coastal Louisiana flights, 2000-2003, showing spatial distribution of marsh observations by color class (note: dead and brown areas are on the top GIS layer, whereas green areas are on the bottom layer, so some green symbols may be hidden).

Flight Transects for Aerial Surveys of Brown Marsh Die-Off in Coastal Louisiana



Bay Junop

- C1 - Chenier Plain Coastal
- C2 - Chenier Plain Inland
- D1 - Deltaic Plain Coastal
- D2 - Deltaic Plain Inland
- B1 - Central Bays Coastal
- B2 - Central Bays Inland

Pass Fourchon

Bay Felicity



Brown Marsh Ground Reference Sites

Old Oyster Bayou

Coordinates: N 29° 15' 40.3"
W - 91° 05' 41.2"

Bay Junop

Coordinates: N 29° 12' 13.5"
W - 91° 03' 56.7"

Bayou Sale

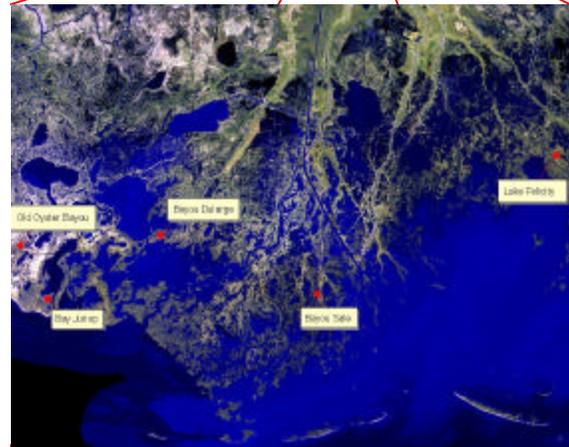
Coordinates: N 29° 12' 06.2"
W - 90° 43' 07.3"

Lake Felicity

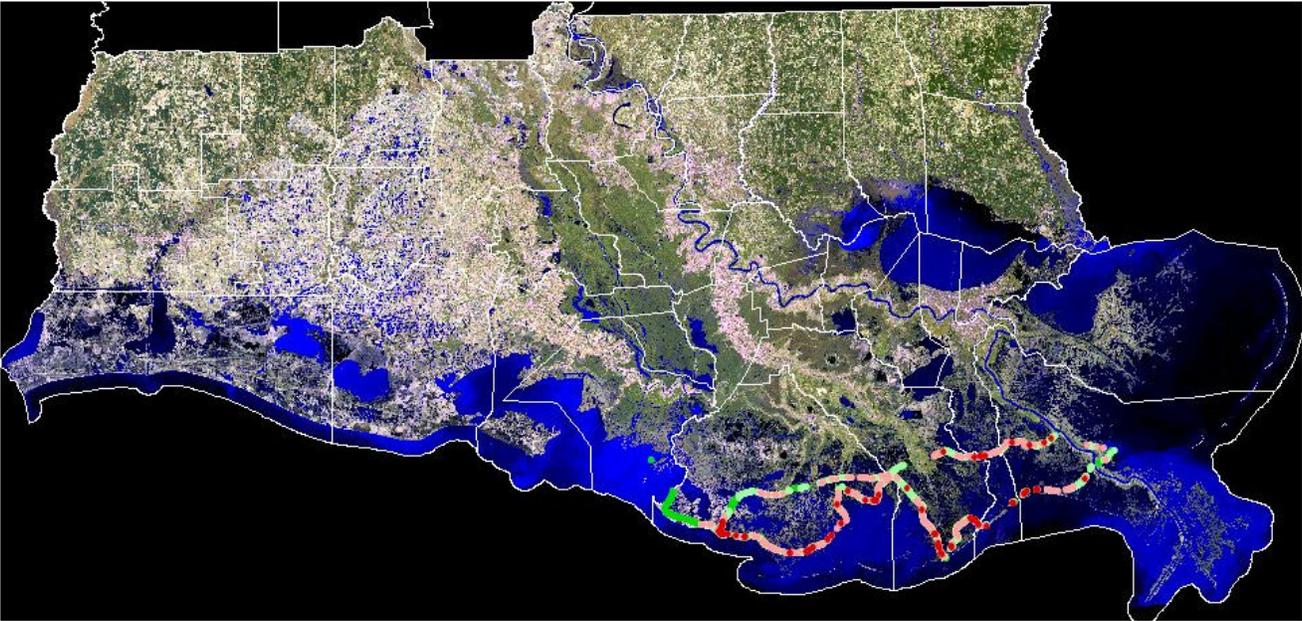
Coordinates: N 29° 21' 03.1"
W - 90° 24' 45.4"

Bayou Dularge

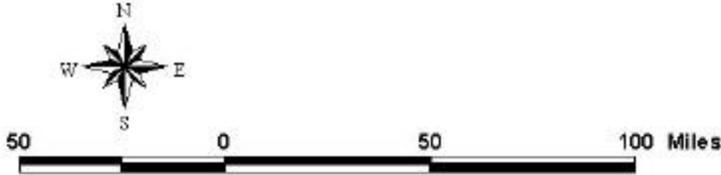
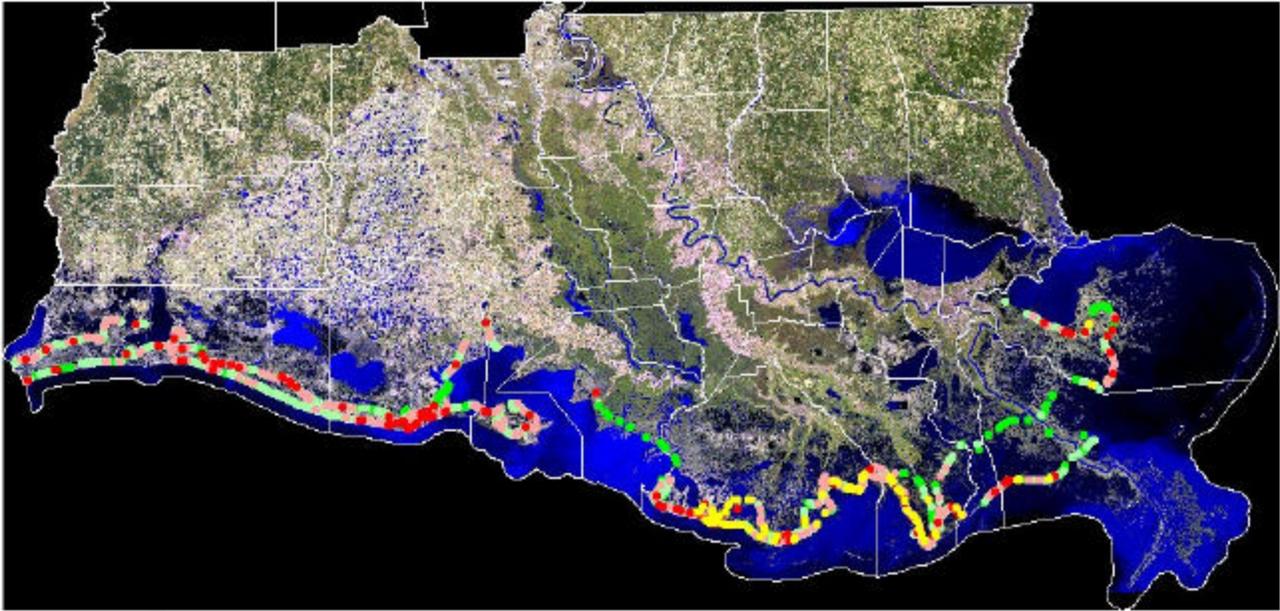
Coordinates: N 29° 15' 09.0"
W - 91° 00' 07.3"



**Aerial Survey of Saltmarsh Die-Off in Coastal Louisiana
(Michot, T., Flight Lines, June 2000)**

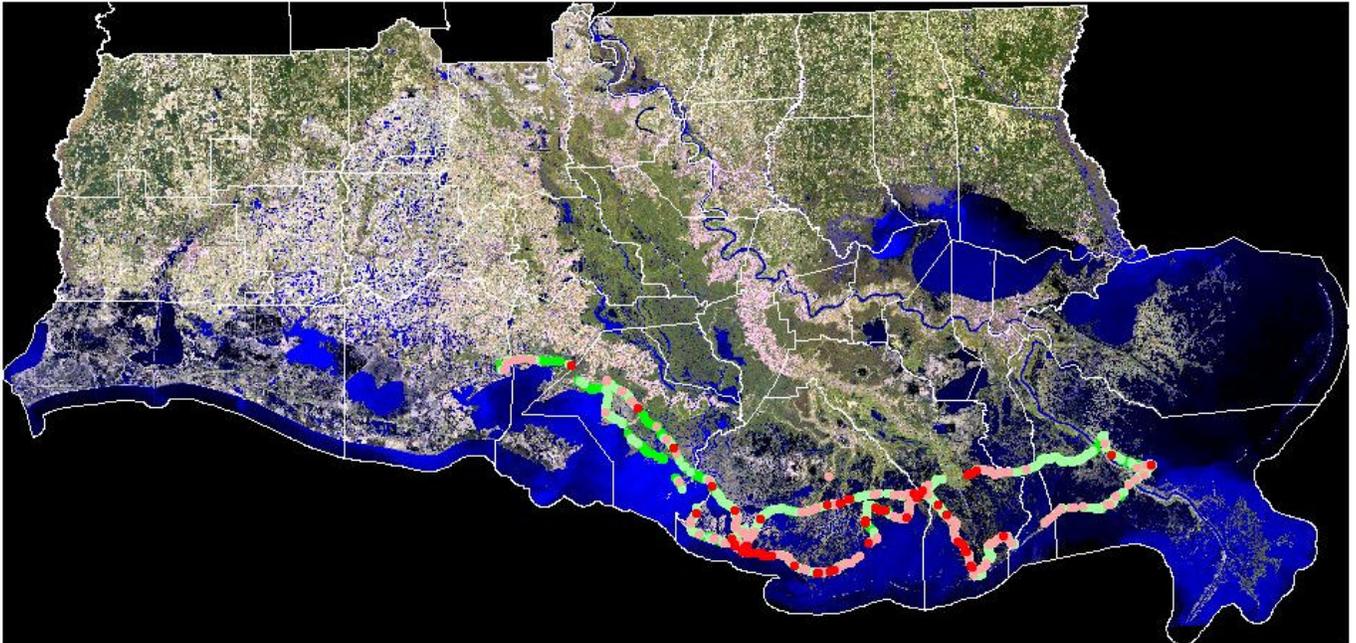


**Aerial Survey of Saltmarsh Die-off in Coastal Louisiana
(Michot, T., Flight Lines: August 2000)**

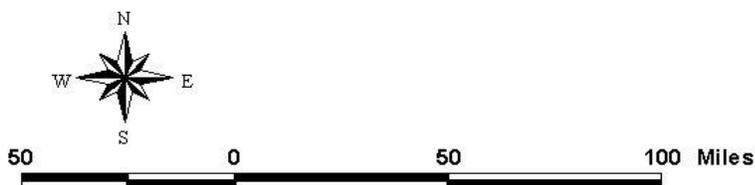
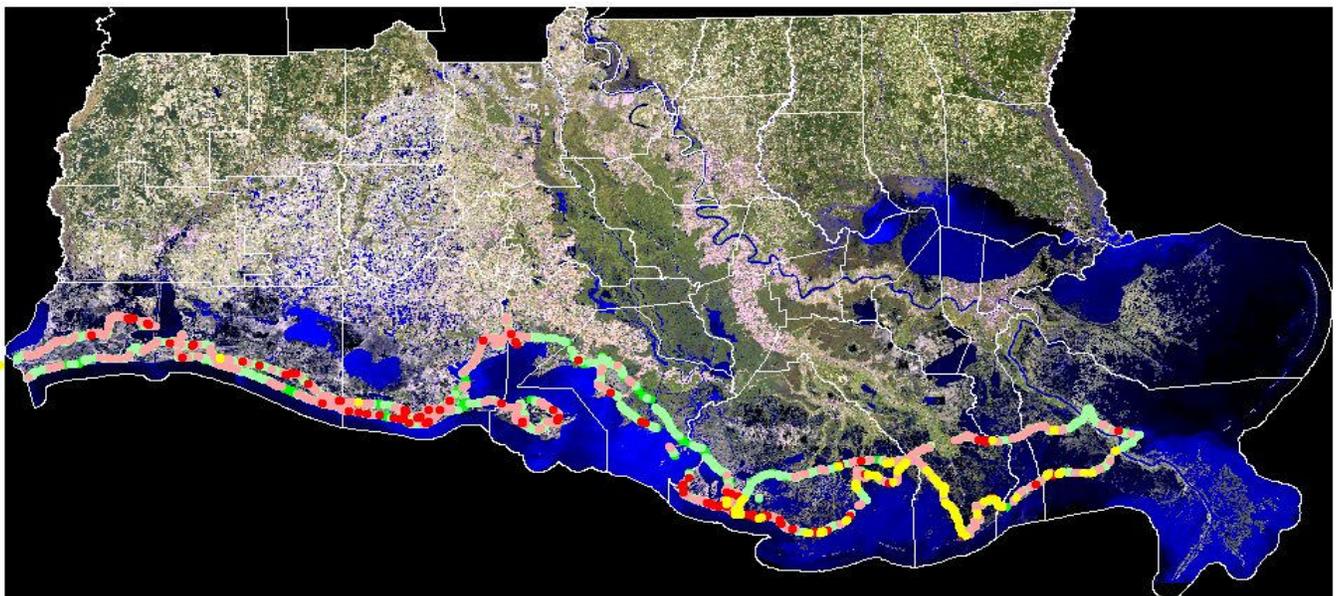


- Dead
- Brown
- Brown - Green
- Green - Brown
- Green

Aerial Survey of Saltmarsh Die-off in Coastal Louisiana (Michot, T., Flight Lines: September 2000)

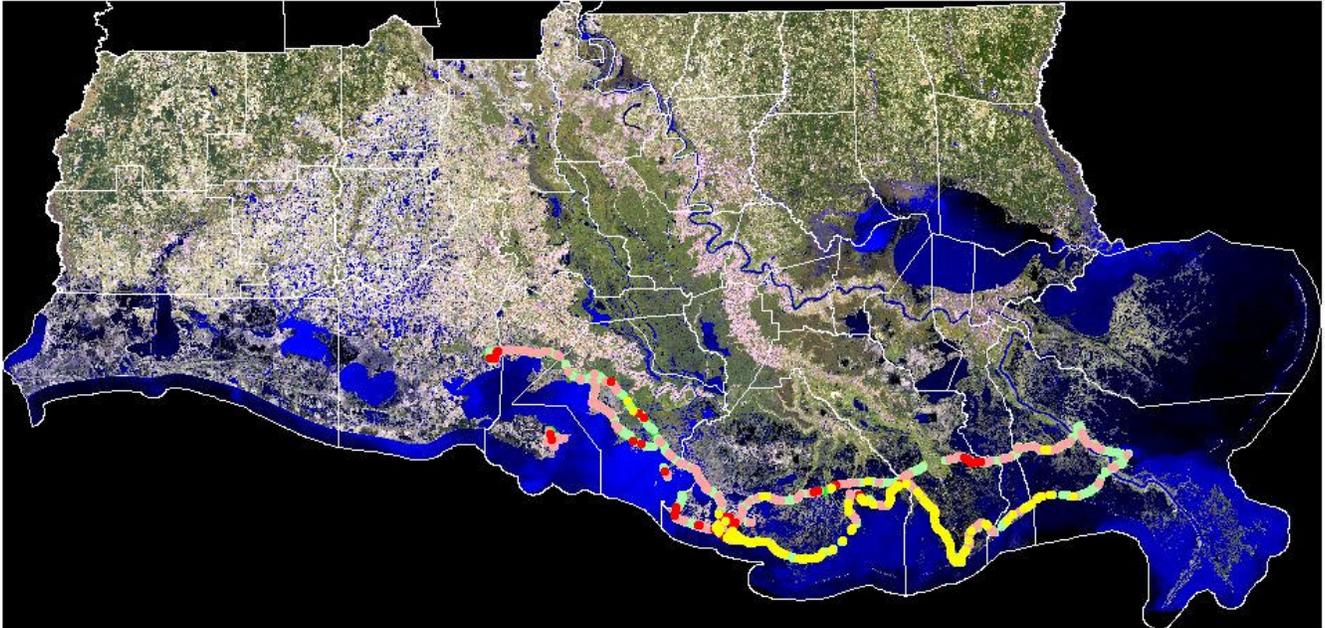


Aerial Survey of Saltmarsh Die-off in Coastal Louisiana (Michot, T., Flight Lines: October 2000)

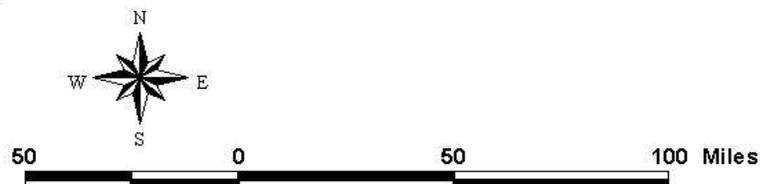
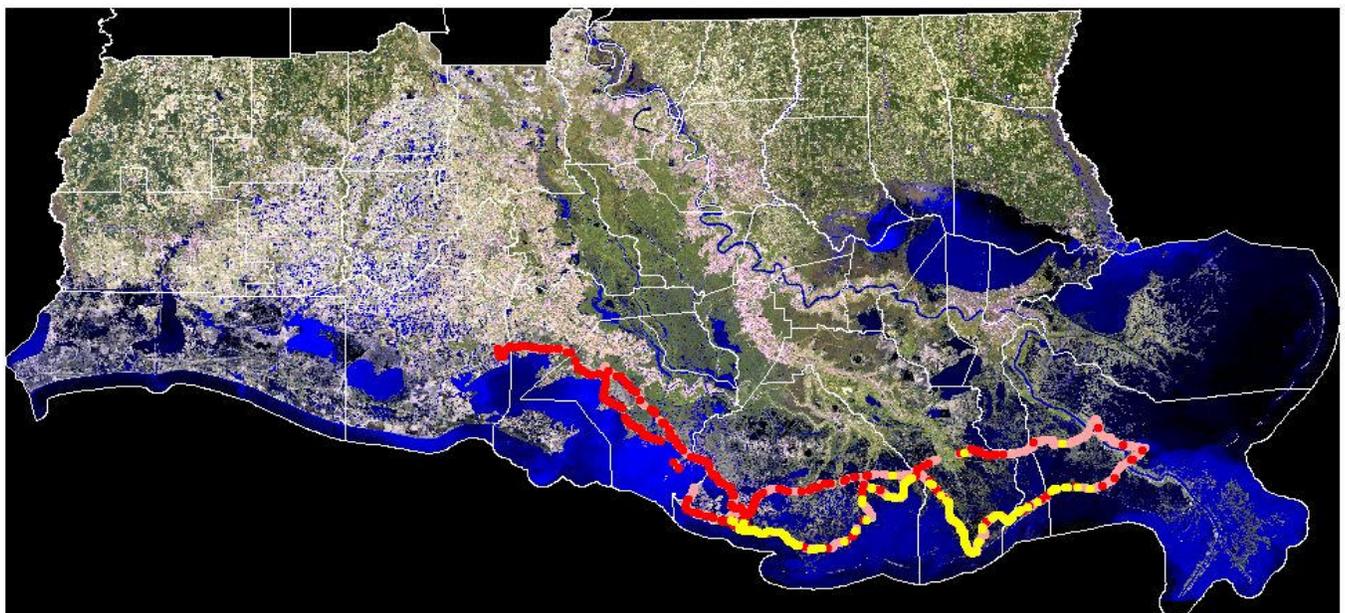


- Dead
- Brown
- Brown - Green
- Green - Brown
- Green

Aerial Survey of Saltmarsh Die-off in Coastal Louisiana (Michot, T., Flight Lines: November 2000)

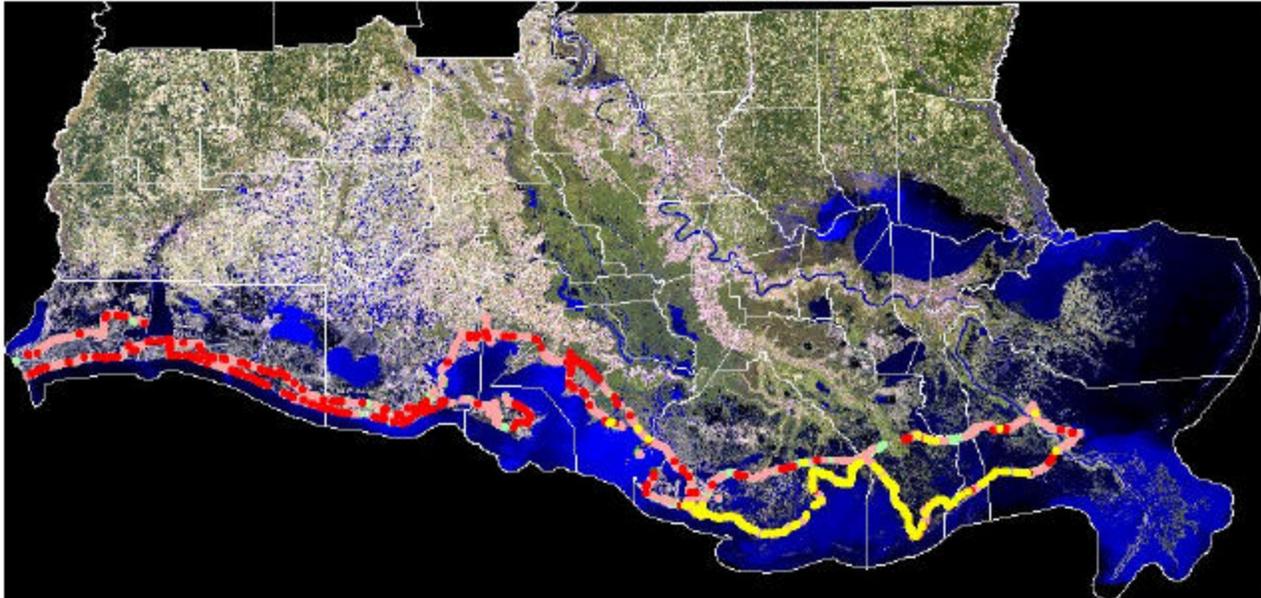


Aerial Survey of Saltmarsh Die-off in Coastal Louisiana (Michot, T., Flight Lines: January 2001)

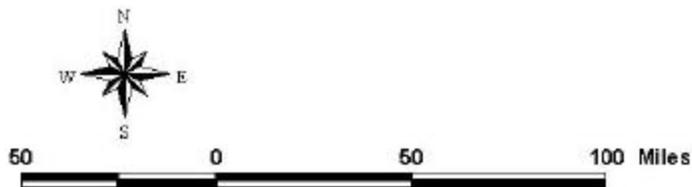
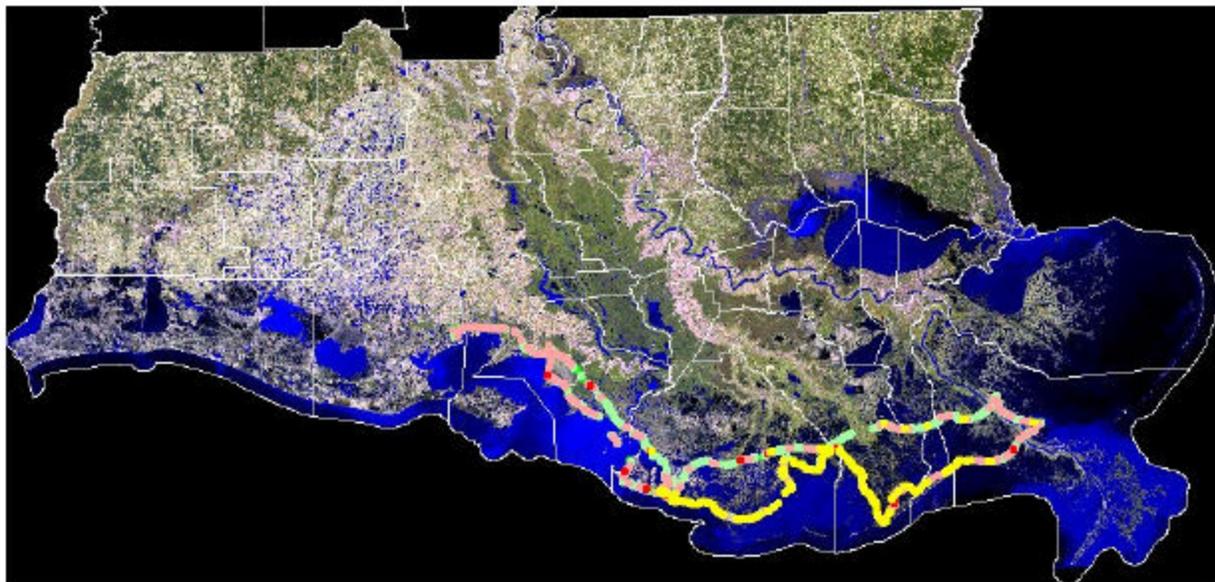


- Dead
- Brown
- Brown - Green
- Green - Brown
- Green

**Aerial Survey of Saltmarsh Die-off in Coastal Louisiana
(Michot, T., Flight Lines: February 2001)**

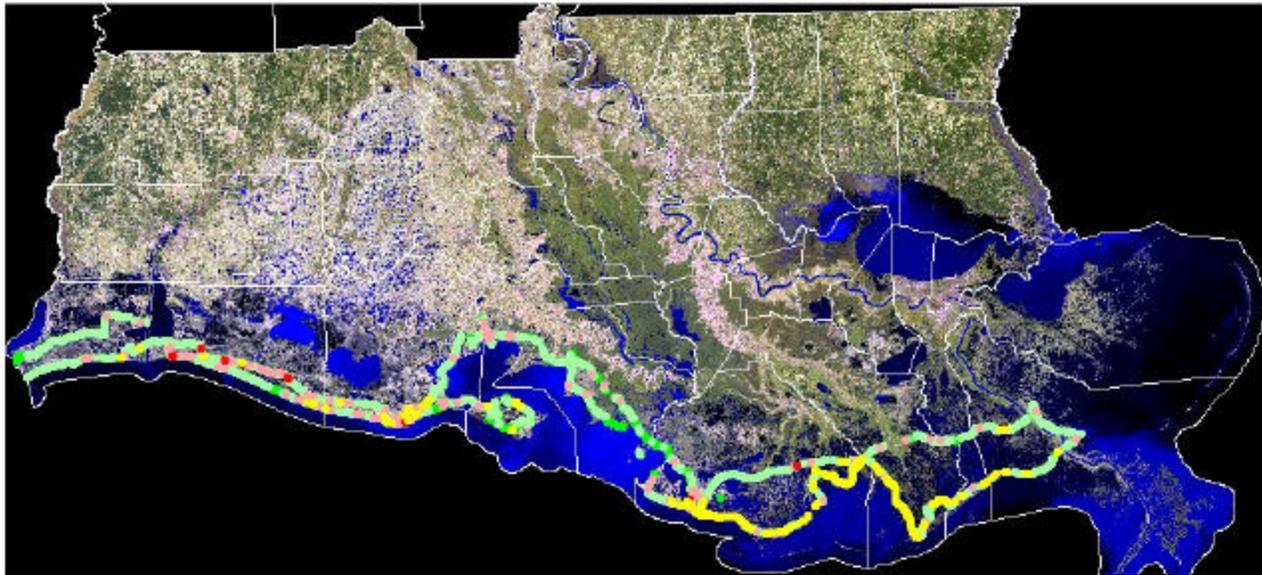


**Aerial Survey of Saltmarsh Die-off in Coastal Louisiana
(T. Michot, Flight Lines: March 2001)**

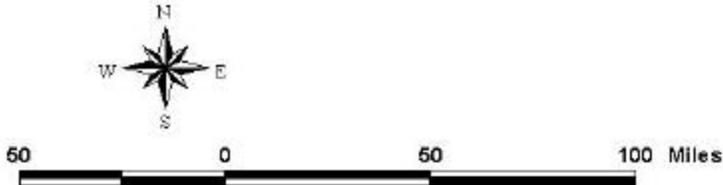
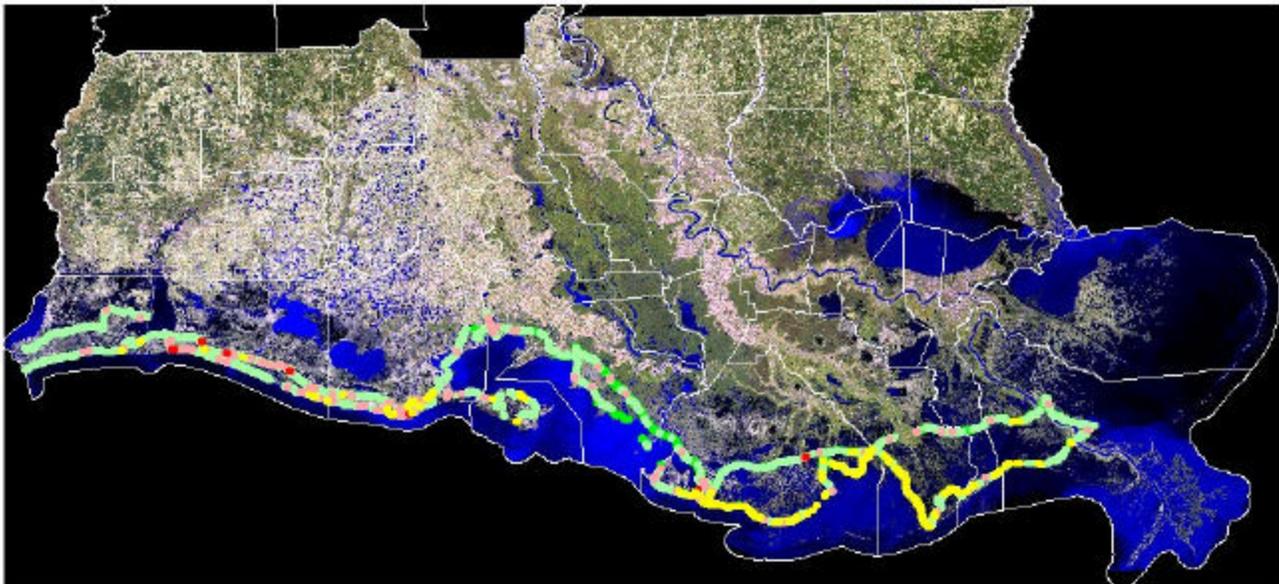


- Dead
- Brown
- Brown Green
- Green Brown
- Green

**Aerial Survey of Saltmarsh Die-off in Coastal Louisiana
(Michot, T., Flight Lines: April 2001).**

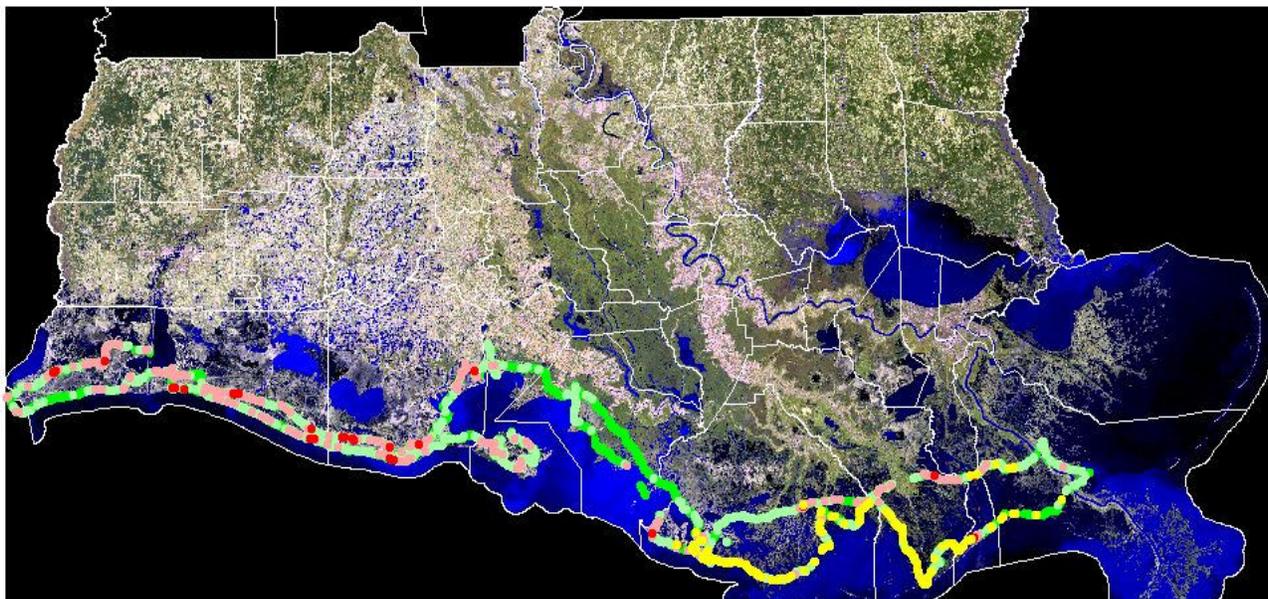


**Aerial Survey of Saltmarsh Die-off in Coastal Louisiana
(Michot, T., Flight Lines: May 2001)**

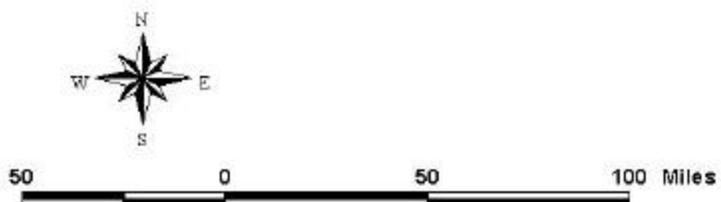
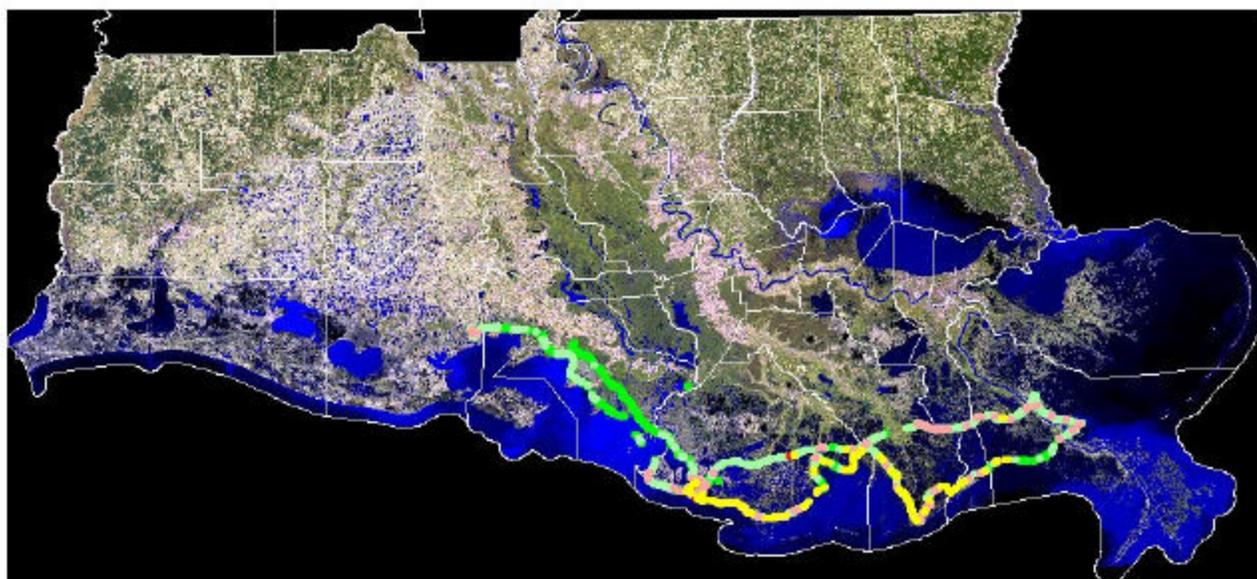


- Dead
- Brown
- Brown - Green
- Green - Brown
- Green

Aerial Survey of Saltmarsh Die-off in Coastal Louisiana (Michot, T., Flight Lines: June 2001)

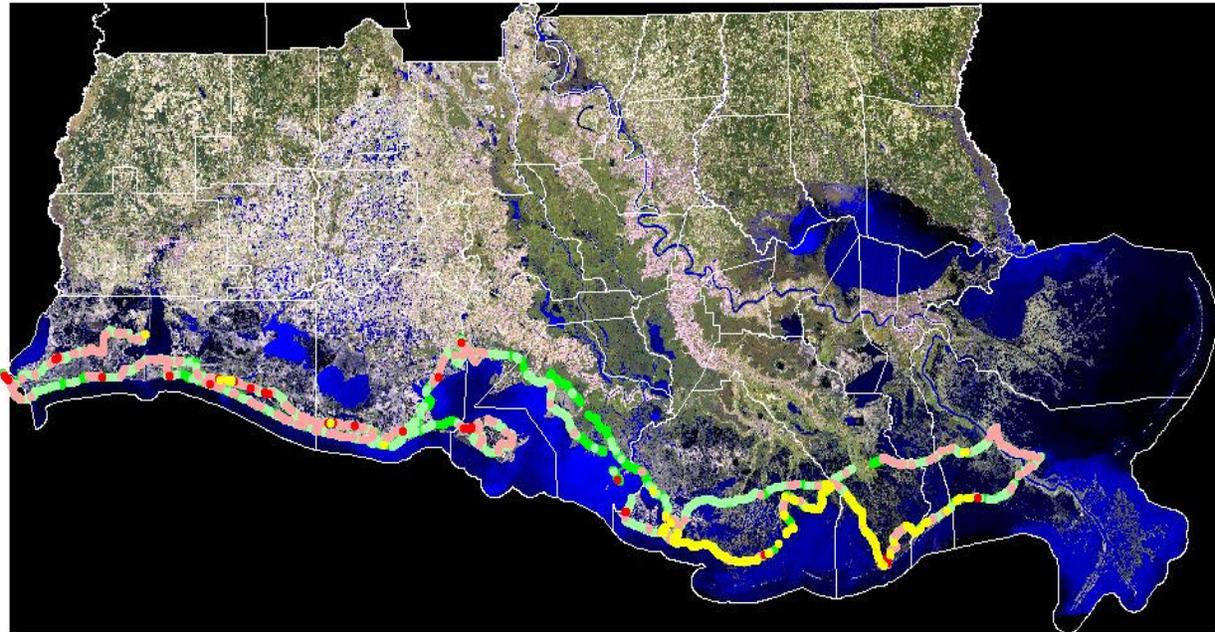


Aerial Survey of Saltmarsh Die-off in Coastal Louisiana (Michot, T., Flight Lines: July 2001)

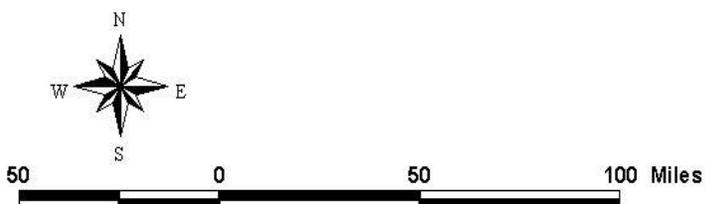
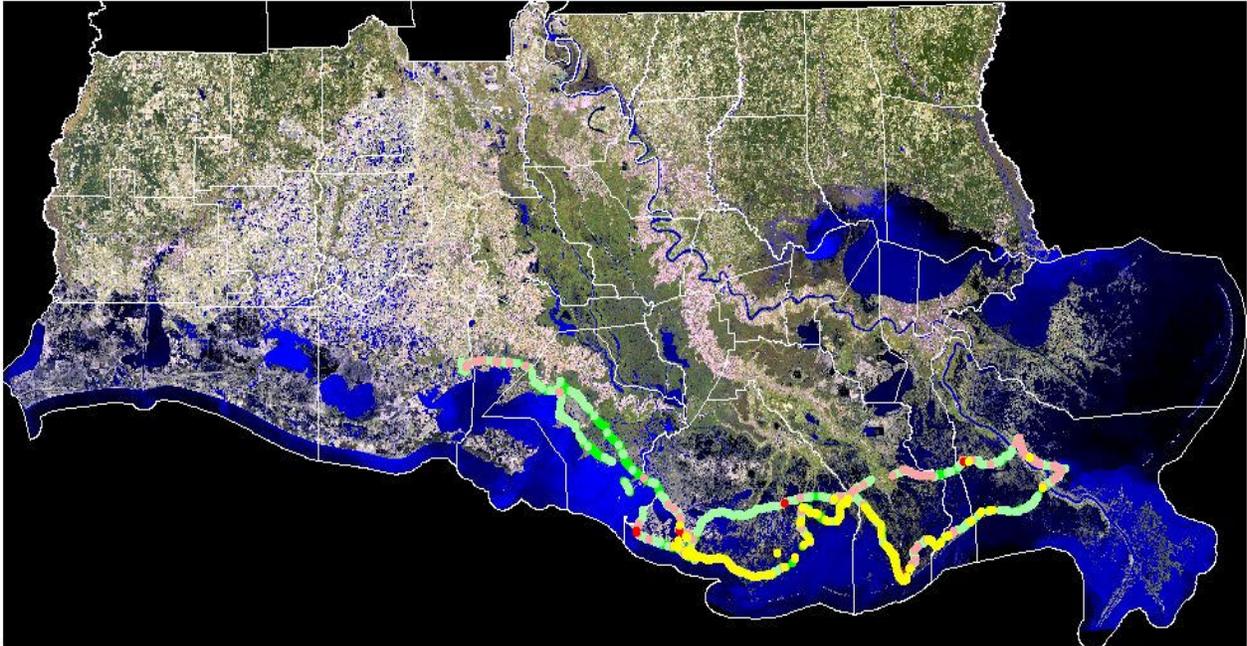


- Dead
- Brown
- Brown - Green
- Green - Brown
- Green

Aerial Survey of Saltmarsh Die-off in Coastal Louisiana (Michot, T., Flight Lines: August 2001)

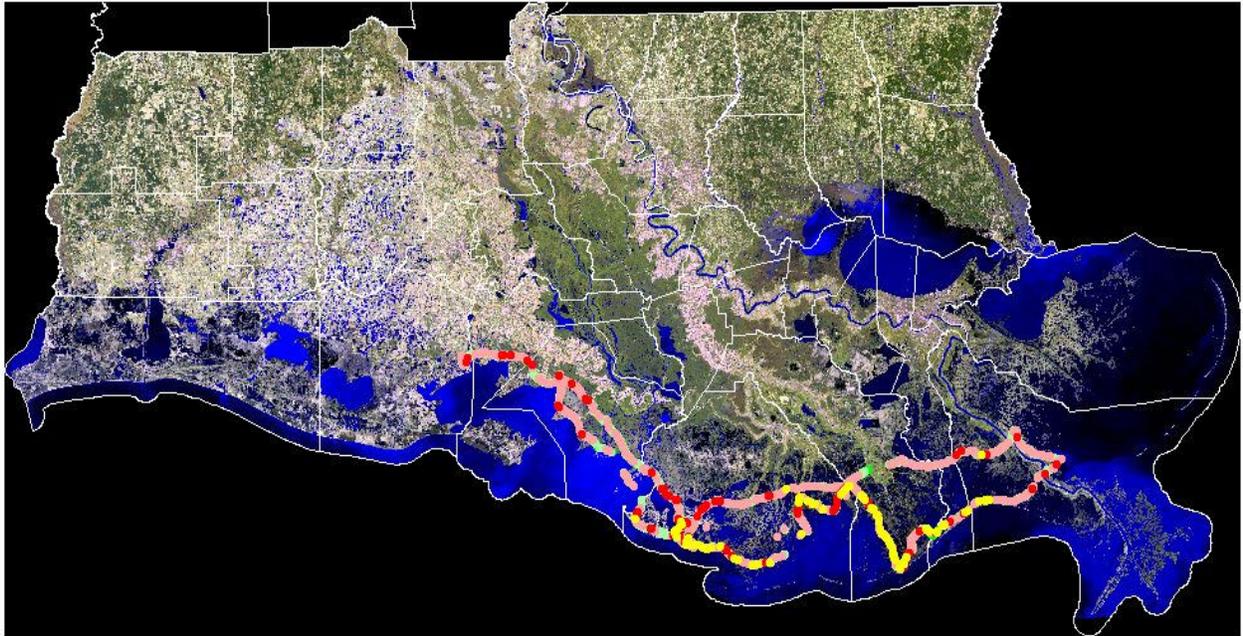


Aerial Survey of Saltmarsh Die-off in Coastal Louisiana (Michot, T., Flight Lines: October 2001)

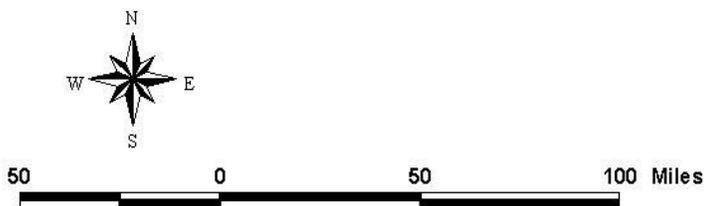
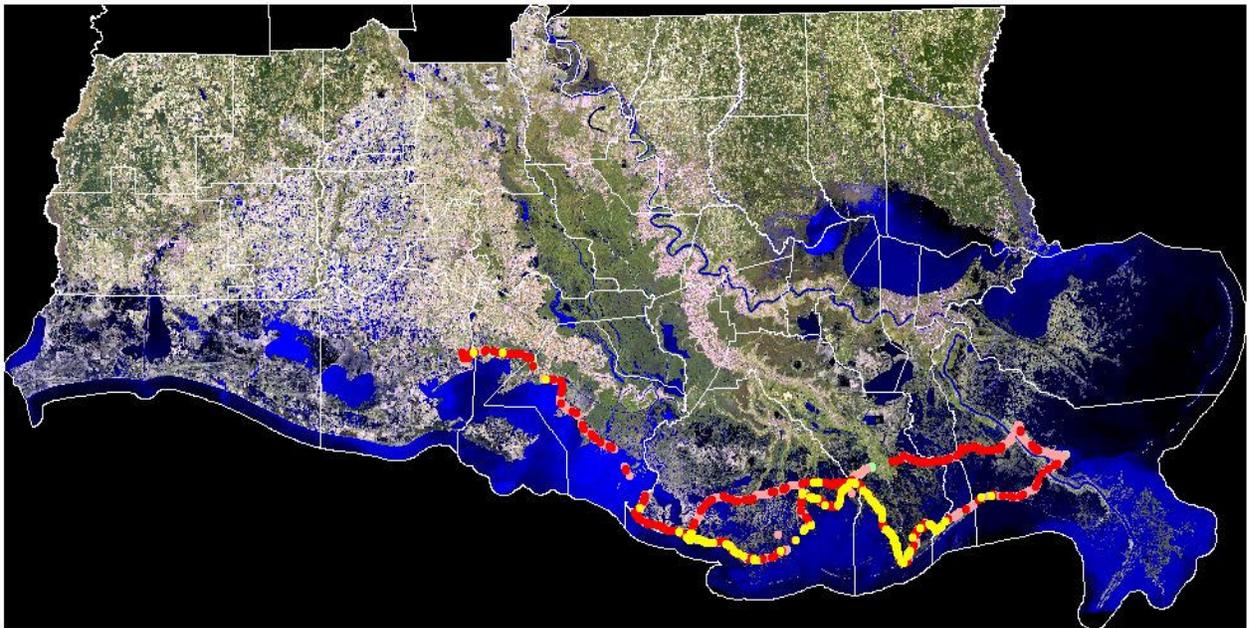


- Dead
- Brown
- Brown - Green
- Green - Brown
- Green

Aerial Survey of Saltmarsh Die-off in Coastal Louisiana (Michot, T., Flight Lines: December 2001)

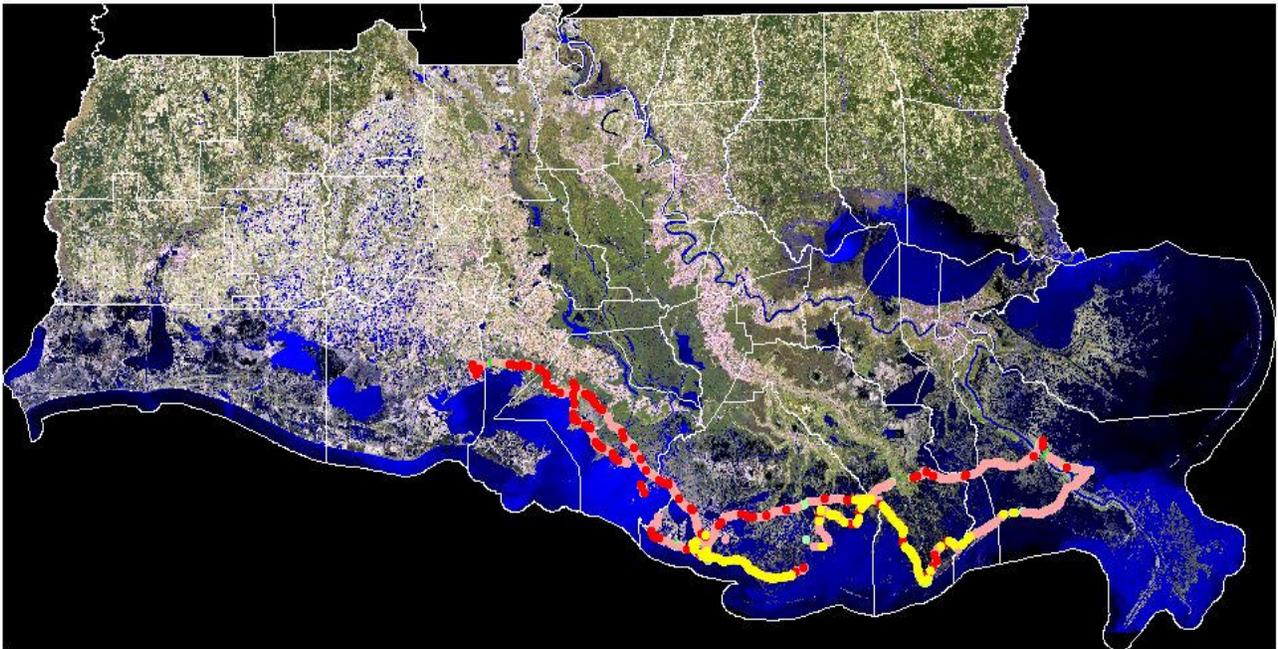


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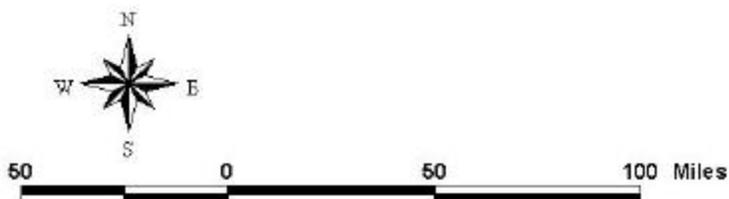
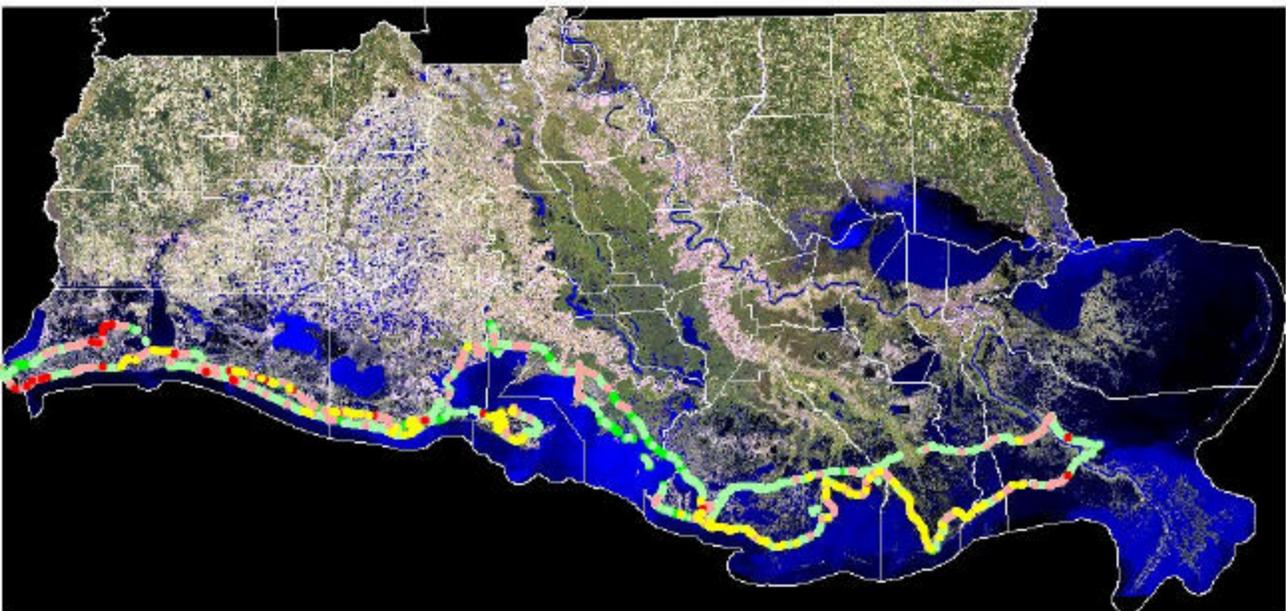


- Dead
- Brown
- Brown - Green
- Green - Brown
- Green

Aerial Survey of Saltmarsh Die-off in Coastal Louisiana (Michot, T., Flight Lines: March 2002)

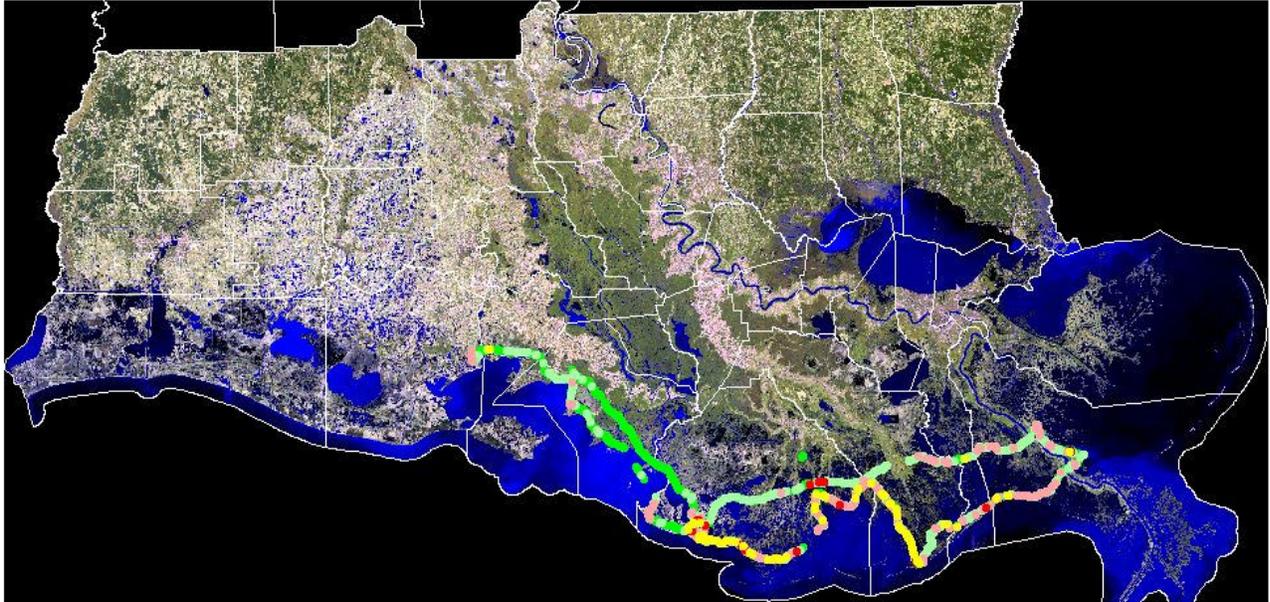


Aerial Survey of Saltmarsh Die-off in Coastal Louisiana (Michot, T., Flight Lines: April 2002)

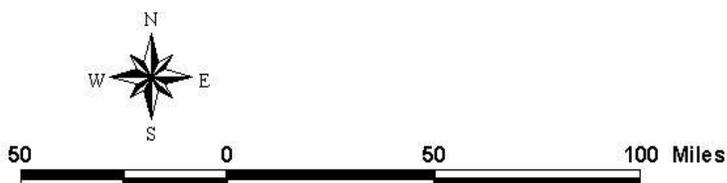
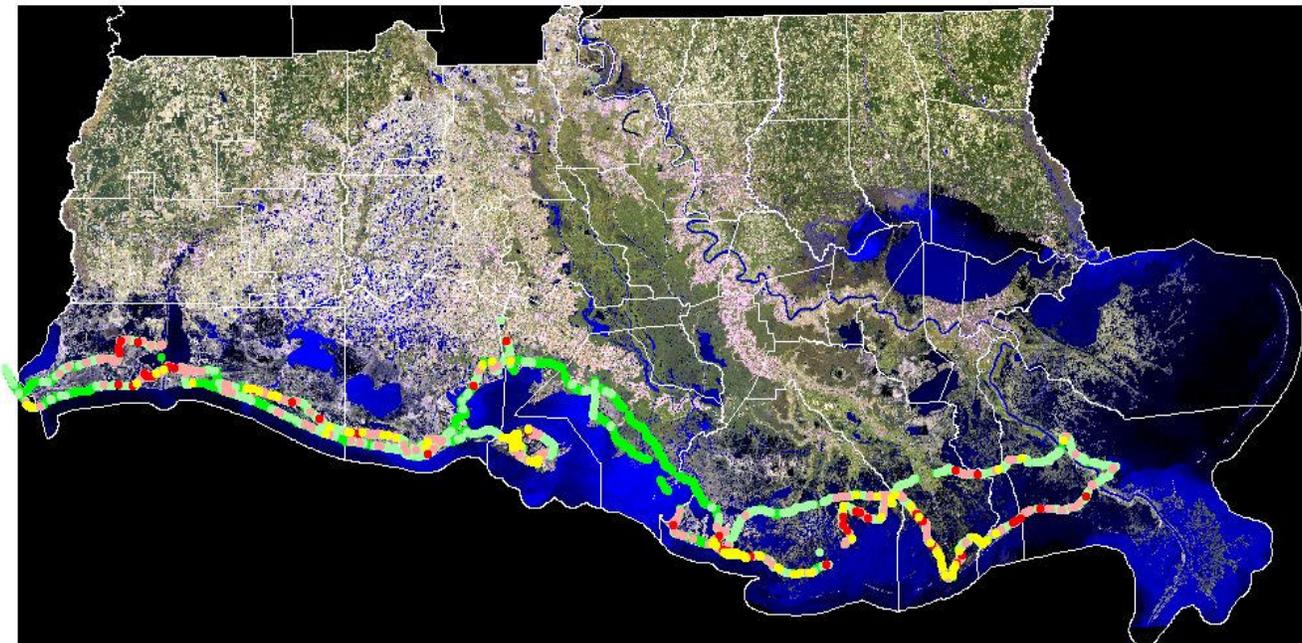


- Dead
- Brown
- Brown - Green
- Green - Brown
- Green

Aerial Survey of Saltmarsh Die-off in Coastal Louisiana (Michot, T., Flight Lines: May 2002)

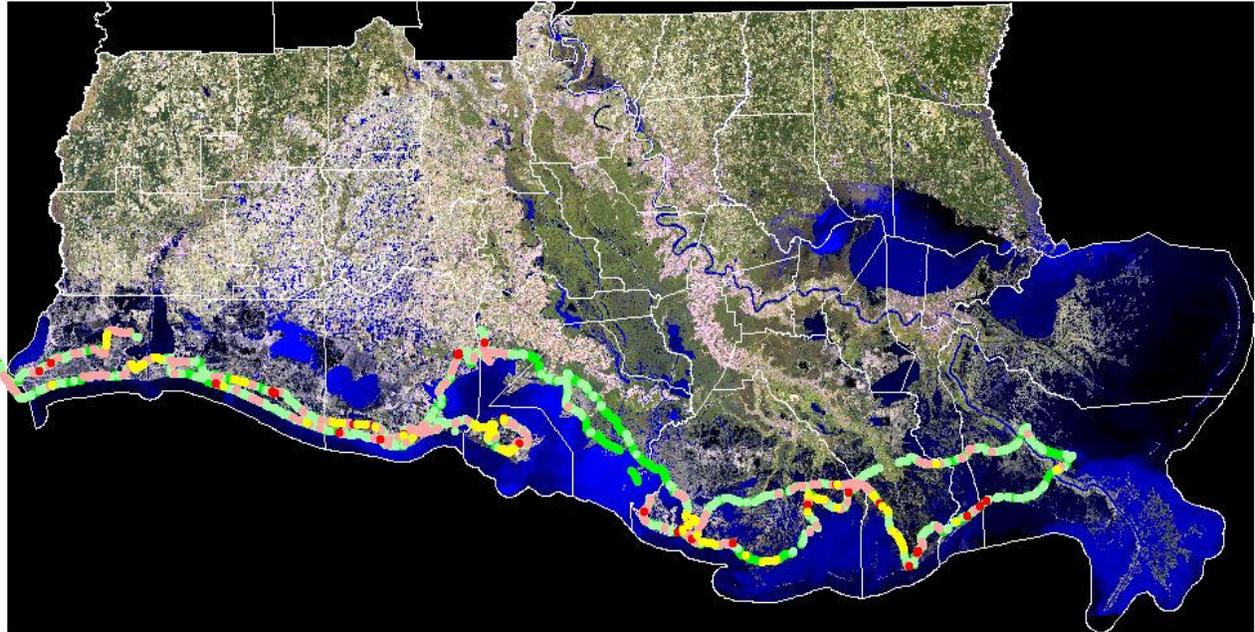


Aerial Survey of Saltmarsh Die-off in Coastal Louisiana (Michot, T., Flight Lines: June 2002)

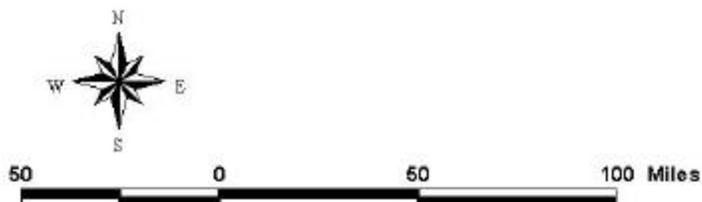
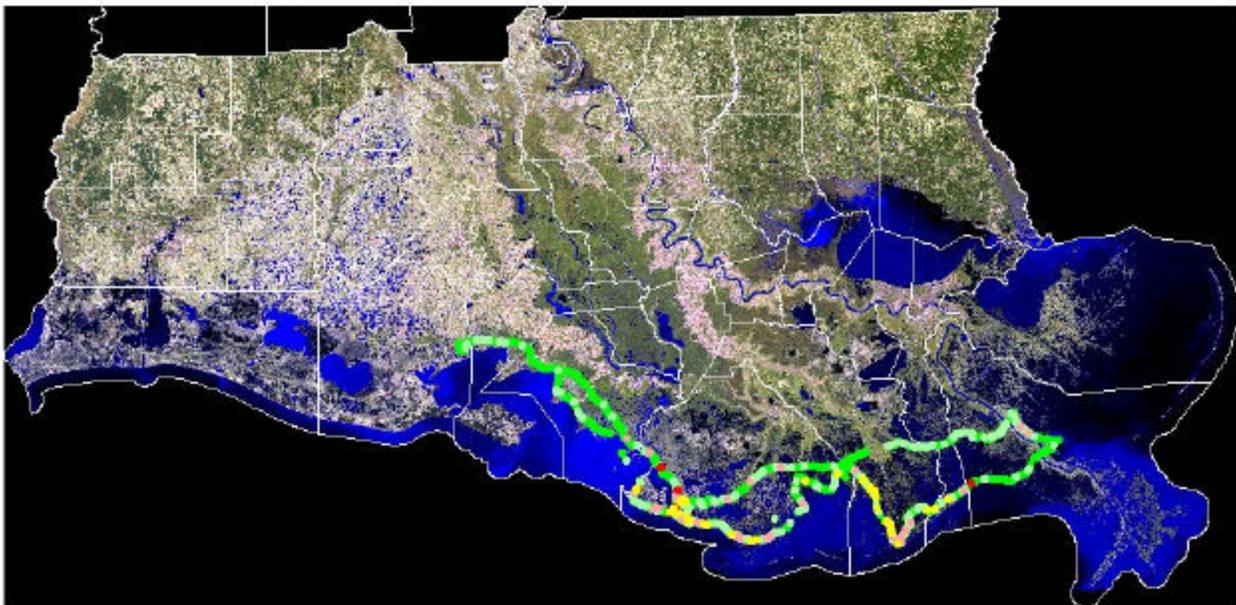


- Dead
- Brown
- Brown - Green
- Green - Brown
- Green

Aerial Survey of Saltmarsh Die-off in Coastal Louisiana (Michot, T., Flight Lines: August 2002)



Aerial Survey of Saltmarsh Die-off in Coastal Louisiana (Michot, T., Flight Lines: June 2003)



- Dead
- Brown
- Brown - Green
- Green - Brown
- Green

Appendix C

Tables for each survey flight, 2000-2003, showing raw data from which impacted acreage estimates were calculated. Included in the tables are, by marsh type and parish, the total number of observations (points surveyed), the number of impacted or affected points (“deadflats”), the percent impacted, and estimates for acreage impacted based on total area by marsh type for each parish.

Louisiana Brown Marsh by Parish

JUNE

2000

Data taken from survey flight on 06/07/00

"affected" = brown

<u>Parish</u>	<u>Total Points</u>	<u>Saline</u>	<u>Brackish</u>	<u>Intermediate</u>	<u>Fresh</u>
JEFFERSON	30	30	0	0	0
LAFOURCHE	358	254	73	31	0
PLAQUEMINES	186	140	42	4	0
ST MARY	1	0	0	0	1
TERREBONNE	697	459	177	61	0
Total	1272	883	292	96	1

<u>Parish</u>	<u>Total affected pts</u>	<u>Saline</u>	<u>Brackish</u>	<u>Intermediate</u>	<u>Fresh</u>
JEFFERSON	4	4	0	0	0
LAFOURCHE	26	24	1	1	0
PLAQUEMINES	11	9	2	0	0
ST MARY	0	0	0	0	0
TERREBONNE	38	36	2	0	0
Total	79	73	5	1	0

<u>Parish</u>	<u>Percent affected</u>	<u>Saline</u>	<u>Brackish</u>	<u>Intermediate</u>	<u>Fresh</u>
JEFFERSON	13.33%	13.33%	0.00%	0.00%	0.00%
LAFOURCHE	7.26%	9.45%	0.00%	0.00%	0.00%
PLAQUEMINES	5.91%	6.43%	0.00%	0.00%	0.00%
ST MARY	0.00%	0.00%	0.00%	0.00%	0.00%
TERREBONNE	5.45%	7.84%	1.13%	0.00%	0.00%
Total	6.21%	8.27%	1.71%	1.04%	0.00%

<u>Parish</u>	<u>Total marsh (acres)</u>	<u>Saline</u>	<u>Brackish</u>	<u>Intermediate</u>	<u>Fresh</u>
JEFFERSON	110,669	13,012	21,642	36,367	39,648
LAFOURCHE	422,339	139,581	70,547	52,664	159,547
PLAQUEMINES	516,074	104,772	100,961	192,220	118,121
ST MARY	433,316	0	271,029	6,924	155,363
TERREBONNE	653,675	155,541	137,775	81,323	279,036
Total	2,136,073	412,906	601,954	369,498	751,715

<u>Parish</u>	<u>Affected acreage</u>	<u>Saline</u>	<u>Brackish</u>	<u>Intermediate</u>	<u>Fresh</u>
JEFFERSON	1,735	1,735	0.00	0.00	0.00
LAFOURCHE	13,189	13,189	0.00	0.00	0.00
PLAQUEMINES	6,735	6,735	0.00	0.00	0.00
ST MARY	0.00	0.00	0.00	0.00	0.00
TERREBONNE	13,756	12,199	1,557	0.00	0.00
Total	35,415	33,858	1,557	0.00	0.00

Louisiana Brown Marsh by Parish

AUGUST

2000

Data taken from survey flights on 8/15/00 and 8/31/00

"affected" = deadflats

<u>Parish</u>	<u>Total points</u>	<u>Saline</u>	<u>Brackish</u>	<u>Intermediate</u>	<u>Fresh</u>
CAMERON	930	244	351	324	11
IBERIA	303	9	97	197	0
JEFFERSON	32	32	0	0	0
LAFOURCHE	313	300	13	0	0
PLAQUEMINES	141	123	10	8	0
ST MARY	8	0	0	0	8
TERREBONNE	648	479	132	31	6
VERMILION	544	30	267	231	16
Total	2919	1217	870	791	41

<u>Parish</u>	<u>Total affected pts</u>	<u>Saline</u>	<u>Brackish</u>	<u>Intermediate</u>	<u>Fresh</u>
CAMERON	0	0	0	0	0
IBERIA	0	0	0	0	0
JEFFERSON	1	1	0	0	0
LAFOURCHE	23	23	0	0	0
PLAQUEMINES	5	5	0	0	0
ST MARY	0	0	0	0	0
TERREBONNE	56	55	1	0	0
VERMILION	0	0	0	0	0
Total	85	84	1	0	0

<u>Parish</u>	<u>Percent affected</u>	<u>Saline</u>	<u>Brackish</u>	<u>Intermediate</u>	<u>Fresh</u>
CAMERON	0.00%	0.00%	0.00%	0.00%	0.00%
IBERIA	0.00%	0.00%	0.00%	0.00%	0.00%
JEFFERSON	3.13%	3.13%	0.00%	0.00%	0.00%
LAFOURCHE	7.35%	7.67%	0.00%	0.00%	0.00%
PLAQUEMINES	3.55%	4.07%	0.00%	0.00%	0.00%
ST MARY	0.00%	0.00%	0.00%	0.00%	0.00%
TERREBONNE	8.64%	11.48%	0.76%	0.00%	0.00%
VERMILION	0.00%	0.00%	0.00%	0.00%	0.00%
Total	2.91%	6.90%	0.11%	0.00%	0.00%

<u>Parish</u>	<u>Total marsh acres</u>	<u>Saline</u>	<u>Brackish</u>	<u>Intermediate</u>	<u>Fresh</u>
CAMERON	753,152	43,703	151,378	255,873	302,198
IBERIA	117,107	2,520	30,614	77,815	6,158
JEFFERSON	110,669	13,012	21,642	36,367	39,648
LAFOURCHE	422,339	139,581	70,547	52,664	159,547
PLAQUEMINES	516,074	104,772	100,961	192,220	118,121
ST MARY	433,316	271,029	0	6,924	155,363
TERREBONNE	653,675	155,541	137,775	81,323	279,036
VERMILION	337,631	4,133	50,383	140,230	142,885
Total	3,343,963	734,291	563,300	843,416	1,202,956

<u>Parish</u>	<u>Affected acreage</u>	<u>Saline</u>	<u>Brackish</u>	<u>Intermediate</u>	<u>Fresh</u>
CAMERON	0	0	0	0	0
IBERIA	0	0	0	0	0
JEFFERSON	407	407	0	0	0
LAFOURCHE	10,701	10,701	0	0	0
PLAQUEMINES	4,259	4,259	0	0	0
ST MARY	0	0	0	0	0
TERREBONNE	18,903	17,860	1,044	0	0
VERMILION	0	0	0	0	0
Total	34,270	33,226	1,044	0	0

Louisiana Brown Marsh by Parish

SEPTEMBER 2000

Data taken from survey flights on 09/2000

"affected" = brown

<u>Parish</u>	<u>Total points</u>	<u>Saline</u>	<u>Brackish</u>	<u>Intermediate</u>	<u>Fresh</u>
IBERIA	62	0	0	59	3
JEFFERSON	28	28	0	0	0
LAFOURCHE	387	281	80	26	0
PLAQUEMINES	301	182	106	13	0
ST MARY	352	0	0	0	352
TERREBONNE	1145	584	348	142	71
VERMILION	31	0	0	31	0
Total	2306	1075	534	271	426

<u>Parish</u>	<u>Total affected pts</u>	<u>Saline</u>	<u>Brackish</u>	<u>Intermediate</u>	<u>Fresh</u>
IBERIA	1	0	0	0	1
JEFFERSON	0	0	0	0	0
LAFOURCHE	26	15	2	9	0
PLAQUEMINES	2	1	1	0	0
ST MARY	2	0	0	0	2
TERREBONNE	66	54	6	4	2
VERMILION	0	0	0	0	0
Total	97	70	9	13	5

<u>Parish</u>	<u>Percent affected</u>	<u>Saline</u>	<u>Brackish</u>	<u>Intermediate</u>	<u>Fresh</u>
IBERIA	1.61%	0.00%	0.00%	0.00%	33.33%
JEFFERSON	0.00%	0.00%	0.00%	0.00%	0.00%
LAFOURCHE	6.72%	5.34%	2.50%	34.62%	0.00%
PLAQUEMINES	0.66%	0.55%	0.94%	0.00%	0.00%
ST MARY	0.57%	0.00%	0.00%	0.00%	0.57%
TERREBONNE	5.76%	9.25%	1.72%	2.82%	2.82%
VERMILION	0.00%	0.00%	0.00%	0.00%	0.00%
Total	4.21%	6.51%	1.69%	4.80%	1.17%

<u>Parish</u>	<u>Total marsh acres</u>	<u>Saline</u>	<u>Brackish</u>	<u>Intermediate</u>	<u>Fresh</u>
IBERIA	117,107	2,520	30,614	77,815	6,158
JEFFERSON	110,669	13,012	21,642	36,367	39,648
LAFOURCHE	422,339	139,581	70,547	52,664	159,547
PLAQUEMINES	516,074	104,772	100,961	192,220	118,121
ST MARY	433,316	0	271,029	6,924	155,363
TERREBONNE	653,675	155,541	137,775	81,323	279,036
VERMILION	337,631	4,133	50,383	140,230	142,885
Total	2,590,811	419,559	682,951	587,543	900,758

<u>Parish</u>	<u>Affected acreage</u>	<u>Saline</u>	<u>Brackish</u>	<u>Intermediate</u>	<u>Fresh</u>
IBERIA	2,053	0	0	0	2,053
JEFFERSON	0	0	0	0	0
LAFOURCHE	27,444	7,451	1,764	18,230	0
PLAQUEMINES	1,528	576	952	0	0
ST MARY	883	0	0	0	883
TERREBONNE	26,909	14,382	2,375	2,291	7,860
VERMILION	0	0	0	0	0
Total	58,817	22,409	5,092	20,521	10,796

Louisiana Brown Marsh by Parish

OCTOBER

2000

Data taken from survey flights during 10/2000
 "affected" = deadflats

<u>Parish</u>	<u>Total points</u>	<u>Saline</u>	<u>Brackish</u>	<u>Intermediate</u>	<u>Fresh</u>
IBERIA	513	0	162	340	11
JEFFERSON	79	79	0	0	0
LAFOURCHE	514	335	132	47	0
PLAQUEMINES	414	224	173	17	0
ST MARY	418	0	0	0	418
TERREBONNE	1222	642	355	148	77
VERMILION	700	31	318	345	6
CAMERON	1274	361	470	416	27
Total	5134	1672	1610	1313	539

<u>Parish</u>	<u>Total affected pts</u>	<u>Saline</u>	<u>Brackish</u>	<u>Intermediate</u>	<u>Fresh</u>
IBERIA	0	0	0	0	0
JEFFERSON	2	2	0	0	0
LAFOURCHE	72	71	1	0	0
PLAQUEMINES	15	15	0	0	0
ST MARY	0	0	0	0	0
TERREBONNE	77	73	3	1	0
VERMILION	1	0	1	0	0
CAMERON	3	0	3	0	0
Total	170	161	8	1	0

<u>Parish</u>	<u>Percent affected</u>	<u>Saline</u>	<u>Brackish</u>	<u>Intermediate</u>	<u>Fresh</u>
IBERIA	0%	0%	0%	0%	0%
JEFFERSON	2.53%	2.53%	0%	0%	0%
LAFOURCHE	14.01%	21.19%	1%	0%	0%
PLAQUEMINES	3.62%	6.70%	0%	0%	0%
ST MARY	0%	0%	0%	0%	0%
TERREBONNE	6.30%	11.37%	0.85%	1%	0.00%
VERMILION	0.143%	0%	0%	0%	0%
CAMERON	0.235%	0.000%	0.638%	0.000%	0%
Total	3.31%	9.63%	0.50%	0.08%	0.00%

<u>Parish</u>	<u>Total marsh acres</u>	<u>Saline</u>	<u>Brackish</u>	<u>Intermediate</u>	<u>Fresh</u>
IBERIA	117,107	2,520	30,614	77,815	6,158
JEFFERSON	110,669	13,012	21,642	36,367	39,648
LAFOURCHE	422,339	139,581	70,547	52,664	159,547
PLAQUEMINES	516,074	104,772	100,961	192,220	118,121
ST MARY	433,316	0	271,029	6,924	155,363
TERREBONNE	653,675	155,541	137,775	81,323	279,036
VERMILION	337,631	4,133	50,383	140,230	142,885
CAMERON	753,152	43,703	151,378	255,873	302,198
Total	3,343,963	463,262	834,329	843,416	1,202,956

<u>Parish</u>	<u>Affected acreage</u>	<u>Saline</u>	<u>Brackish</u>	<u>Intermediate</u>	<u>Fresh</u>
IBERIA	0	0	0	0	0
JEFFERSON	329	329	0	0	0
LAFOURCHE	30,117	29,583	534	0	0
PLAQUEMINES	7,016	7,016	0	0	0
ST MARY	0	0	0	0	0
TERREBONNE	19,400	17,686	1,164	549	0
VERMILION	0	0	0	0	0
CAMERON	966	0	966	0	0
Total	57,829	54,614	2,665	549	0

Louisiana Brown Marsh by Parish

NOVEMBER

2000

Data taken from survey flights on 11/22/00

"affected" = deadflats

<u>Parish</u>	<u>Total points</u>	<u>Saline</u>	<u>Brackish</u>	<u>Intermediate</u>	<u>Fresh</u>
IBERIA	317	0	80	230	7
JEFFERSON	84	84	0	0	0
LAFOURCHE	637	474	114	49	0
PLAQUEMINES	428	254	157	17	0
ST MARY	444	0	0	0	444
TERREBONNE	1543	945	386	141	71
VERMILION	75	0	0	75	0
Total	3528	1757	737	512	522

<u>Parish</u>	<u>Total affected pts</u>	<u>Saline</u>	<u>Brackish</u>	<u>Intermediate</u>	<u>Fresh</u>
IBERIA	0	0	0	0	0
JEFFERSON	8	8	0	0	0
LAFOURCHE	92	91	1	0	0
PLAQUEMINES	15	15	0	0	0
ST MARY	2	0	0	0	2
TERREBONNE	200	195	3	2	0
VERMILION	0	0	0	0	0
Total	317	309	4	2	2

<u>Parish</u>	<u>Percent affected</u>	<u>Saline</u>	<u>Brackish</u>	<u>Intermediate</u>	<u>Fresh</u>
IBERIA	0.00%	0.00%	0.00%	0.00%	0.00%
JEFFERSON	9.52%	9.52%	0.00%	0.00%	0.00%
LAFOURCHE	14.44%	19.20%	0.88%	0.00%	0.00%
PLAQUEMINES	3.50%	5.91%	0.00%	0.00%	0.00%
ST MARY	0.45%	0.00%	0.00%	0.00%	0.45%
TERREBONNE	12.96%	20.63%	0.78%	1.42%	0.00%
VERMILION	0.00%	0.00%	0.00%	0.00%	0.00%
Total	8.99%	17.59%	0.54%	0.39%	0.38%

<u>Parish</u>	<u>Total marsh acres</u>	<u>Saline</u>	<u>Brackish</u>	<u>Intermediate</u>	<u>Fresh</u>
IBERIA	117,107	2,520	30,614	77,815	6,158
JEFFERSON	110,669	13,012	21,642	36,367	39,648
LAFOURCHE	422,339	139,581	70,547	52,664	159,547
PLAQUEMINES	516,074	104,772	100,961	192,220	118,121
ST MARY	433,316	0	271,029	6,924	155,363
TERREBONNE	653,675	155,541	137,775	81,323	279,036
VERMILION	337,631	4,133	50,383	140,230	142,885
Total	2,590,811	419,559	682,951	587,543	900,758

<u>Parish</u>	<u>Affected acreage</u>	<u>Saline</u>	<u>Brackish</u>	<u>Intermediate</u>	<u>Fresh</u>
IBERIA	0	0	0	0	0
JEFFERSON	1,239	1,239	0	0	0
LAFOURCHE	27,416	26,797	619	0	0
PLAQUEMINES	6,187	6,187	0	0	0
ST MARY	700	0	0	0	700
TERREBONNE	34,320	32,096	1,071	1,154	0
VERMILION	0	0	0	0	0
Total	69,862	66,320	1,690	1,154	700

Louisiana Brown Marsh by Parish

JANUARY

2001

Data taken from survey flights on 01/08/01

"affected" = deadflats

<u>Parish</u>	<u>Total points</u>	<u>Saline</u>	<u>Brackish</u>	<u>Intermediate</u>	<u>Fresh</u>
IBERIA	122	0	0	112	10
JEFFERSON	97	97	0	0	0
LAFOURCHE	550	418	89	43	0
PLAQUEMINES	423	245	159	19	0
ST MARY	427	0	0	0	427
TERREBONNE	1237	675	352	131	79
VERMILION	56	0	0	56	0
Total	2912	1435	600	361	516

<u>Parish</u>	<u>Total affected pts</u>	<u>Saline</u>	<u>Brackish</u>	<u>Intermediate</u>	<u>Fresh</u>
IBERIA	0	0	0	0	0
JEFFERSON	13	13	0	0	0
LAFOURCHE	82	81	0	1	0
PLAQUEMINES	20	20	0	0	0
ST MARY	0	0	0	0	0
TERREBONNE	130	130	0	0	0
VERMILION	0	0	0	0	0
Total	245	244	0	1	0

<u>Parish</u>	<u>Percent affected</u>	<u>Saline</u>	<u>Brackish</u>	<u>Intermediate</u>	<u>Fresh</u>
IBERIA	0.00%	0.00%	0.00%	0.00%	0.00%
JEFFERSON	13.40%	13.40%	0.00%	0.00%	0.00%
LAFOURCHE	14.91%	19.38%	0.00%	2.33%	0.00%
PLAQUEMINES	4.73%	8.16%	0.00%	0.00%	0.00%
ST MARY	0.00%	0.00%	0.00%	0.00%	0.00%
TERREBONNE	10.51%	19.26%	0.00%	0.00%	0.00%
VERMILION	0.00%	0.00%	0.00%	0.00%	0.00%
Total	8.41%	17.00%	0.00%	0.28%	0.00%

<u>Parish</u>	<u>Total marsh acres</u>	<u>Saline</u>	<u>Brackish</u>	<u>Intermediate</u>	<u>Fresh</u>
IBERIA	117,107	2,520	30,614	77,815	6,158
JEFFERSON	110,669	13,012	21,642	36,367	39,648
LAFOURCHE	422,339	139,581	70,547	52,664	159,547
PLAQUEMINES	516,074	104,772	100,961	192,220	118,121
ST MARY	433,316	0	271,029	6,924	155,363
TERREBONNE	653,675	155,541	137,775	81,323	279,036
VERMILION	337,631	4,133	50,383	140,230	142,885
Total	2,590,811	419,559	682,951	587,543	900,758

<u>Parish</u>	<u>Affected acreage</u>	<u>Saline</u>	<u>Brackish</u>	<u>Intermediate</u>	<u>Fresh</u>
IBERIA	0	0	0	0	0
JEFFERSON	1,744	1,744	0	0	0
LAFOURCHE	28,273	27,048	0	1,225	0
PLAQUEMINES	8,553	8,553	0	0	0
ST MARY	0	0	0	0	0
TERREBONNE	29,956	29,956	0	0	0
VERMILION	0	0	0	0	0
Total	68,525	67,301	0	1,225	0

Louisiana Brown Marsh by Parish

FEBRUARY

2001

Data taken from survey flights during 02/2001

"affected" = deadflats

<u>Parish</u>	<u>Total points</u>	<u>Saline</u>	<u>Brackish</u>	<u>Intermediate</u>	<u>Fresh</u>
IBERIA	459	10	174	261	14
JEFFERSON	82	82	0	0	0
LAFOURCHE	583	430	109	44	0
PLAQUEMINES	385	227	145	13	0
ST MARY	382	0	0	0	382
TERREBONNE	1357	837	351	120	49
VERMILION	585	42	218	317	8
CAMERON	1250	317	398	503	32
Total	5083	1945	1395	1258	485

<u>Parish</u>	<u>Total affected pts</u>	<u>Saline</u>	<u>Brackish</u>	<u>Intermediate</u>	<u>Fresh</u>
IBERIA	0	0	0	0	0
JEFFERSON	12	12	0	0	0
LAFOURCHE	112	108	3	1	0
PLAQUEMINES	21	19	2	0	0
ST MARY	5	0	0	0	5
TERREBONNE	217	213	4	0	0
VERMILION	0	0	0	0	0
CAMERON	0	0	0	0	0
Total	367	352	9	1	5

<u>Parish</u>	<u>Percent affected</u>	<u>Saline</u>	<u>Brackish</u>	<u>Intermediate</u>	<u>Fresh</u>
IBERIA	0%	0%	0%	0%	0%
JEFFERSON	14.63%	14.63%	0%	0%	0%
LAFOURCHE	19.21%	25.12%	3%	0%	0%
PLAQUEMINES	5.45%	8.37%	1%	0%	0%
ST MARY	1%	0%	0%	0%	1%
TERREBONNE	15.99%	25.45%	1.14%	0%	0.00%
VERMILION	0.000%	0%	0%	0%	0%
CAMERON	0.000%	0.000%	0.000%	0.000%	0%
Total	7.22%	18.10%	0.65%	0.08%	1.03%

<u>Parish</u>	<u>Total marsh acres</u>	<u>Saline</u>	<u>Brackish</u>	<u>Intermediate</u>	<u>Fresh</u>
IBERIA	117,107	2,520	30,614	77,815	6,158
JEFFERSON	110,669	13,012	21,642	36,367	39,648
LAFOURCHE	422,339	139,581	70,547	52,664	159,547
PLAQUEMINES	516,074	104,772	100,961	192,220	118,121
ST MARY	433,316	0	271,029	6,924	155,363
TERREBONNE	653,675	155,541	137,775	81,323	279,036
VERMILION	337,631	4,133	50,383	140,230	142,885
CAMERON	753,152	43,703	151,378	255,873	302,198
Total	3,343,963	463,262	834,329	843,416	1,202,956

<u>Parish</u>	<u>Affected acreage</u>	<u>Saline</u>	<u>Brackish</u>	<u>Intermediate</u>	<u>Fresh</u>
IBERIA	0	0	0	0	0
JEFFERSON	1,904	1,904	0	0	0
LAFOURCHE	36,999	35,058	1,942	0	0
PLAQUEMINES	10,162	8,769	1,393	0	0
ST MARY	2,034	0	0	0	2,034
TERREBONNE	41,152	39,582	1,570	0	0
VERMILION	0	0	0	0	0
CAMERON	0	0	0	0	0
Total	92,251	85,313	4,904	0	2,034

Louisiana Brown Marsh by Parish

MARCH

2001

Data taken from survey flights on 03/16/01

"affected" = deadflats

<u>Parish</u>	<u>Total points</u>	<u>Saline</u>	<u>Brackish</u>	<u>Intermediate</u>	<u>Fresh</u>
IBERIA	113	0	0	107	6
JEFFERSON	78	78	0	0	0
LAFOURCHE	637	432	142	63	0
PLAQUEMINES	539	295	226	18	0
ST MARY	459	0	0	0	459
TERREBONNE	1334	775	327	148	84
VERMILION	50	0	0	50	0
Total	3210	1580	695	386	549

<u>Parish</u>	<u>Total affected pts</u>	<u>Saline</u>	<u>Brackish</u>	<u>Intermediate</u>	<u>Fresh</u>
IBERIA	0	0	0	0	0
JEFFERSON	26	26	0	0	0
LAFOURCHE	152	149	2	1	0
PLAQUEMINES	24	24	0	0	0
ST MARY	0	0	0	0	0
TERREBONNE	297	292	4	0	1
VERMILION	0	0	0	0	0
Total	499	491	7	1	0

<u>Parish</u>	<u>Percent affected</u>	<u>Saline</u>	<u>Brackish</u>	<u>Intermediate</u>	<u>Fresh</u>
IBERIA	0.00%	0.00%	0.00%	0.00%	0.00%
JEFFERSON	33.33%	33.33%	0.00%	0.00%	0.00%
LAFOURCHE	23.86%	34.49%	1.41%	1.59%	0.00%
PLAQUEMINES	4.45%	8.14%	0.00%	0.00%	0.00%
ST MARY	0.00%	0.00%	0.00%	0.00%	0.00%
TERREBONNE	22.26%	37.68%	1.22%	0.00%	1.19%
VERMILION	0.00%	0.00%	0.00%	0.00%	0.00%
Total	11.15%	25.71%	1.06%	0.24%	0.00%

<u>Parish</u>	<u>Total marsh acres</u>	<u>Saline</u>	<u>Brackish</u>	<u>Intermediate</u>	<u>Fresh</u>
IBERIA	117,107	2,520	30,614	77,815	6,158
JEFFERSON	110,669	13,012	21,642	36,367	39,648
LAFOURCHE	422,339	139,581	70,547	52,664	159,547
PLAQUEMINES	516,074	104,772	100,961	192,220	118,121
ST MARY	433,316	0	271,029	6,924	155,363
TERREBONNE	653,675	155,541	137,775	81,323	279,036
VERMILION	337,631	4,133	50,383	140,230	142,885
Total	2,590,811	419,559	682,951	587,543	900,758

<u>Parish</u>	<u>Affected acreage</u>	<u>Saline</u>	<u>Brackish</u>	<u>Intermediate</u>	<u>Fresh</u>
IBERIA	0	0	0	0	0
JEFFERSON	4,337	4,337	0	0	0
LAFOURCHE	49,972	48,143	994	836	0
PLAQUEMINES	8,524	8,524	0	0	0
ST MARY	0	0	0	0	0
TERREBONNE	63,611	58,604	1,685	0	3,322
VERMILION	0	0	0	0	0
Total	126,444	119,608	2,679	836	3,322

Louisiana Brown Marsh by Parish
Data taken from survey flights during 4/2001
"affected" = deadflats

APRIL 2001

<u>Parish</u>	<u>Total points</u>	<u>Saline</u>	<u>Brackish</u>	<u>Intermediate</u>	<u>Fresh</u>
IBERIA	420	5	176	239	0
JEFFERSON	71	71	0	0	0
LAFOURCHE	445	333	91	21	0
PLAQUEMINES	363	213	140	10	0
ST MARY	480	0	0	0	480
TERREBONNE	1172	659	329	117	67
VERMILION	901	40	424	417	20
CAMERON	1554	383	553	587	31
Total	5406	1704	1713	1391	598

<u>Parish</u>	<u>Total affected pts</u>	<u>Saline</u>	<u>Brackish</u>	<u>Intermediate</u>	<u>Fresh</u>
IBERIA	11	0	1	10	0
JEFFERSON	11	11	0	0	0
LAFOURCHE	118	118	0	0	0
PLAQUEMINES	19	19	0	0	0
ST MARY	0	0	0	0	0
TERREBONNE	220	213	7	0	0
VERMILION	29	1	19	8	1
CAMERON	8	1	5	2	0
Total	416	363	32	20	1

<u>Parish</u>	<u>Percent affected</u>	<u>Saline</u>	<u>Brackish</u>	<u>Intermediate</u>	<u>Fresh</u>
IBERIA	2.62%	0.00%	0.00%	4.18%	0.00%
JEFFERSON	15.49%	15.49%	0.00%	0.00%	0.00%
LAFOURCHE	26.52%	35.44%	0.00%	0.00%	0.00%
PLAQUEMINES	5.23%	8.92%	0.00%	0.00%	0.00%
ST MARY	0.00%	0.00%	0.00%	0.00%	0.00%
TERREBONNE	18.77%	32.32%	2.13%	0.00%	0.00%
VERMILION	3.22%	0.00%	0.00%	1.92%	0.00%
CAMERON	0.51%	0.26%	0.90%	0.34%	0.00%
Total	7.70%	21.30%	1.87%	1.44%	0.17%

<u>Parish</u>	<u>Total marsh acres</u>	<u>Saline</u>	<u>Brackish</u>	<u>Intermediate</u>	<u>Fresh</u>
IBERIA	117,107	2,520	30,614	77,815	6,158
JEFFERSON	110,669	13,012	21,642	36,367	39,648
LAFOURCHE	422,339	139,581	70,547	52,664	159,547
PLAQUEMINES	516,074	104,772	100,961	192,220	118,121
ST MARY	433,316	0	271,029	6,924	155,363
TERREBONNE	653,675	155,541	137,775	81,323	279,036
VERMILION	337,631	4,133	50,383	140,230	142,885
CAMERON	753,152	43,703	151,378	255,873	302,198
Total	3,343,963	463,262	834,329	843,416	1,202,956

<u>Parish</u>	<u>Affected acreage</u>	<u>Saline</u>	<u>Brackish</u>	<u>Intermediate</u>	<u>Fresh</u>
IBERIA	3,256	0	0	3,256	0
JEFFERSON	2,016	2,016	0	0	0
LAFOURCHE	49,461	49,461	0	0	0
PLAQUEMINES	9,346	9,346	0	0	0
ST MARY	0	0	0	0	0
TERREBONNE	53,205	50,273	2,931	0	0
VERMILION	2,690	0	0	2,690	0
CAMERON	2,355	114	1,369	872	0
Total	122,329	111,211	4,300	6,818	0

Louisiana Brown Marsh by Parish

MAY

2001

Data taken from survey flights on 5/23/01

"affected" = deadflats

<u>Parish</u>	<u>Total points</u>	<u>Saline</u>	<u>Brackish</u>	<u>Intermediate</u>	<u>Fresh</u>
IBERIA	120	0	0	107	13
JEFFERSON	63	63	0	0	0
LAFOURCHE	471	327	102	42	0
PLAQUEMINES	381	213	156	12	0
ST MARY	426	0	0	0	426
TERREBONNE	1175	629	346	133	67
VERMILION	51	0	0	51	0
Total	2687	1232	604	345	506

<u>Parish</u>	<u>Total affected pts</u>	<u>Saline</u>	<u>Brackish</u>	<u>Intermediate</u>	<u>Fresh</u>
IBERIA	0	0	0	0	0
JEFFERSON	13	13	0	0	0
LAFOURCHE	122	122	0	0	0
PLAQUEMINES	19	19	0	0	0
ST MARY	0	0	0	0	0
TERREBONNE	185	184	1	0	0
VERMILION	0	0	0	0	0
Total	339	338	1	0	0

<u>Parish</u>	<u>Percent affected</u>	<u>Saline</u>	<u>Brackish</u>	<u>Intermediate</u>	<u>Fresh</u>
IBERIA	0.00%	0.00%	0.00%	0.00%	0.00%
JEFFERSON	20.63%	20.63%	0.00%	0.00%	0.00%
LAFOURCHE	25.90%	37.31%	0.00%	0.00%	0.00%
PLAQUEMINES	4.99%	8.92%	0.00%	0.00%	0.00%
ST MARY	0.00%	0.00%	0.00%	0.00%	0.00%
TERREBONNE	15.74%	29.25%	0.29%	0.00%	0.00%
VERMILION	0.00%	0.00%	0.00%	0.00%	0.00%
Total	12.62%	27.44%	0.17%	0.00%	0.00%

<u>Parish</u>	<u>Total marsh acres</u>	<u>Saline</u>	<u>Brackish</u>	<u>Intermediate</u>	<u>Fresh</u>
IBERIA	117,107	2,520	30,614	77,815	6,158
JEFFERSON	110,669	13,012	21,642	36,367	39,648
LAFOURCHE	422,339	139,581	70,547	52,664	159,547
PLAQUEMINES	516,074	104,772	100,961	192,220	118,121
ST MARY	433,316	0	271,029	6,924	155,363
TERREBONNE	653,675	155,541	137,775	81,323	279,036
VERMILION	337,631	4,133	50,383	140,230	142,885
Total	2,590,811	419,559	682,951	587,543	900,758

<u>Parish</u>	<u>Affected acreage</u>	<u>Saline</u>	<u>Brackish</u>	<u>Intermediate</u>	<u>Fresh</u>
IBERIA	0	0	0	0	0
JEFFERSON	2,685	2,685	0	0	0
LAFOURCHE	52,076	52,076	0	0	0
PLAQUEMINES	9,346	9,346	0	0	0
ST MARY	0	0	0	0	0
TERREBONNE	45,898	45,500	398	0	0
VERMILION	0	0	0	0	0
Total	110,005	109,607	398	0	0

Louisiana Brown Marsh by Parish

JUNE 2001

Data taken from survey flights during 6/2001

"affected" = deadflats

<u>Parish</u>	<u>Total points</u>	<u>Saline</u>	<u>Brackish</u>	<u>Intermediate</u>	<u>Fresh</u>
IBERIA	587	9	202	359	0
JEFFERSON	70	70	0	0	17
LAFOURCHE	454	300	106	48	0
PLAQUEMINES	421	231	176	14	0
ST MARY	496	0	0	0	496
TERREBONNE	1258	625	377	172	84
VERMILION	980	49	453	462	16
CAMERON	1627	451	556	590	30
Total	5893	1735	1870	1645	643

<u>Parish</u>	<u>Total affected pts</u>	<u>Saline</u>	<u>Brackish</u>	<u>Intermediate</u>	<u>Fresh</u>
IBERIA	0	0	0	0	0
JEFFERSON	11	11	0	0	0
LAFOURCHE	99	99	0	0	0
PLAQUEMINES	20	19	1	0	0
ST MARY	0	0	0	0	0
TERREBONNE	193	186	6	1	0
VERMILION	0	0	0	0	0
CAMERON	0	0	0	0	0
Total	323	315	7	1	0

<u>Parish</u>	<u>Percent affected</u>	<u>Saline</u>	<u>Brackish</u>	<u>Intermediate</u>	<u>Fresh</u>
IBERIA	0.00%	0.00%	0.00%	0.00%	0.00%
JEFFERSON	15.71%	15.71%	0.00%	0.00%	0.00%
LAFOURCHE	21.81%	33.00%	0.00%	0.00%	0.00%
PLAQUEMINES	4.75%	8.23%	0.57%	0.00%	0.00%
ST MARY	0.00%	0.00%	0.00%	0.00%	0.00%
TERREBONNE	15.34%	29.76%	1.59%	0.58%	0.00%
VERMILION	0.00%	0.00%	0.00%	0.00%	0.00%
CAMERON	0.00%	0.00%	0.00%	0.00%	0.00%
Total	5.48%	18.16%	0.37%	0.06%	0.00%

<u>Parish</u>	<u>Total marsh acres</u>	<u>Saline</u>	<u>Brackish</u>	<u>Intermediate</u>	<u>Fresh</u>
IBERIA	117,107	2,520	30,614	77,815	6,158
JEFFERSON	110,669	13,012	21,642	36,367	39,648
LAFOURCHE	422,339	139,581	70,547	52,664	159,547
PLAQUEMINES	516,074	104,772	100,961	192,220	118,121
ST MARY	433,316	0	271,029	6,924	155,363
TERREBONNE	653,675	155,541	137,775	81,323	279,036
VERMILION	337,631	4,133	50,383	140,230	142,885
CAMERON	753,152	43,703	151,378	255,873	302,198
Total	3,343,963	463,262	834,329	843,416	1,202,956

<u>Parish</u>	<u>Affected acreage</u>	<u>Saline</u>	<u>Brackish</u>	<u>Intermediate</u>	<u>Fresh</u>
IBERIA	0	0	0	0	0
JEFFERSON	2,045	2,045	0	0	0
LAFOURCHE	46,062	46,062	0	0	0
PLAQUEMINES	9,191	8,618	574	0	0
ST MARY	0	0	0	0	0
TERREBONNE	48,955	46,289	2,193	473	0
VERMILION	0	0	0	0	0
CAMERON	0	0	0	0	0
Total	106,252	103,013	2,766	473	0

Louisiana Brown Marsh by Parish

JULY

2001

Data taken from survey flights on 07/18/01

"affected" = deadflats

<u>Parish</u>	<u>Total points</u>	<u>Saline</u>	<u>Brackish</u>	<u>Intermediate</u>	<u>Fresh</u>
IBERIA	134	0	0	118	16
JEFFERSON	69	69	0	0	0
LAFOURCHE	475	316	113	46	0
PLAQUEMINES	443	244	186	13	0
ST MARY	473	0	0	1	472
TERREBONNE	1254	651	379	155	69
VERMILION	71	0	0	71	0
Total	2919	1280	678	404	557

<u>Parish</u>	<u>Total affected pts</u>	<u>Saline</u>	<u>Brackish</u>	<u>Intermediate</u>	<u>Fresh</u>
IBERIA	0	0	0	0	0
JEFFERSON	9	9	0	0	0
LAFOURCHE	69	69	0	0	0
PLAQUEMINES	13	12	1	0	0
ST MARY	0	0	0	0	0
TERREBONNE	153	151	1	1	0
VERMILION	0	0	0	0	0
Total	244	241	2	1	0

<u>Parish</u>	<u>Percent affected</u>	<u>Saline</u>	<u>Brackish</u>	<u>Intermediate</u>	<u>Fresh</u>
IBERIA	0.00%	0.00%	0.00%	0.00%	0.00%
JEFFERSON	13.04%	13.04%	0.00%	0.00%	0.00%
LAFOURCHE	14.53%	21.84%	0.00%	0.00%	0.00%
PLAQUEMINES	2.93%	4.92%	0.54%	0.00%	0.00%
ST MARY	0.00%	0.00%	0.00%	0.00%	0.00%
TERREBONNE	12.20%	23.20%	0.26%	0.65%	0.00%
VERMILION	0.00%	0.00%	0.00%	0.00%	0.00%
Total	8.36%	18.83%	0.29%	0.25%	0.00%

<u>Parish</u>	<u>Total marsh acres</u>	<u>Saline</u>	<u>Brackish</u>	<u>Intermediate</u>	<u>Fresh</u>
IBERIA	117,107	2,520	30,614	77,815	6,158
JEFFERSON	110,669	13,012	21,642	36,367	39,648
LAFOURCHE	422,339	139,581	70,547	52,664	159,547
PLAQUEMINES	516,074	104,772	100,961	192,220	118,121
ST MARY	433,316	0	271,029	6,924	155,363
TERREBONNE	653,675	155,541	137,775	81,323	279,036
VERMILION	337,631	4,133	50,383	140,230	142,885
Total	2,590,811	419,559	682,951	587,543	900,758

<u>Parish</u>	<u>Affected acreage</u>	<u>Saline</u>	<u>Brackish</u>	<u>Intermediate</u>	<u>Fresh</u>
IBERIA	0	0	0	0	0
JEFFERSON	1,697	1,697	0	0	0
LAFOURCHE	30,478	30,478	0	0	0
PLAQUEMINES	5,696	5,153	543	0	0
ST MARY	0	0	0	0	0
TERREBONNE	36,966	36,078	364	525	0
VERMILION	0	0	0	0	0
Total	74,837	73,406	906	525	0

Louisiana Brown Marsh by Parish
 Data taken from survey flights during 8/2001
 "affected" = deadflats

AUGUST 2001

<u>Parish</u>	<u>Total points</u>	<u>Saline</u>	<u>Brackish</u>	<u>Intermediate</u>	<u>Fresh</u>
IBERIA	513	0	162	340	11
JEFFERSON	79	79	0	0	0
LAFOURCHE	514	335	132	47	0
PLAQUEMINES	414	224	173	17	0
ST MARY	418	0	0	0	418
TERREBONNE	1222	642	355	148	77
VERMILION	700	31	318	345	6
CAMERON	1274	361	470	416	27
Total	5134	1672	1610	1313	539

<u>Parish</u>	<u>Total affected pts</u>	<u>Saline</u>	<u>Brackish</u>	<u>Intermediate</u>	<u>Fresh</u>
IBERIA	0	0	0	0	0
JEFFERSON	10	10	0	0	0
LAFOURCHE	78	78	0	0	0
PLAQUEMINES	8	8	0	0	0
ST MARY	0	0	0	0	0
TERREBONNE	153	150	2	0	1
VERMILION	2	0	2	0	0
CAMERON	7	5	1	1	0
Total	258	251	5	1	1

<u>Parish</u>	<u>Percent affected</u>	<u>Saline</u>	<u>Brackish</u>	<u>Intermediate</u>	<u>Fresh</u>
IBERIA	0%	0%	0%	0%	0%
JEFFERSON	12.66%	12.66%	0%	0%	0%
LAFOURCHE	15.18%	23.28%	0%	0%	0%
PLAQUEMINES	1.93%	3.57%	0%	0%	0%
ST MARY	0%	0%	0%	0%	0%
TERREBONNE	12.52%	23.36%	0.56%	0%	1.30%
VERMILION	0.286%	0%	0%	0%	0%
CAMERON	0.549%	1.385%	0.213%	0.240%	0%
Total	5.03%	15.01%	0.31%	0.08%	0.19%

<u>Parish</u>	<u>Total marsh acres</u>	<u>Saline</u>	<u>Brackish</u>	<u>Intermediate</u>	<u>Fresh</u>
IBERIA	117,107	2,520	30,614	77,815	6,158
JEFFERSON	110,669	13,012	21,642	36,367	39,648
LAFOURCHE	422,339	139,581	70,547	52,664	159,547
PLAQUEMINES	516,074	104,772	100,961	192,220	118,121
ST MARY	433,316	0	271,029	6,924	155,363
TERREBONNE	653,675	155,541	137,775	81,323	279,036
VERMILION	337,631	4,133	50,383	140,230	142,885
CAMERON	753,152	43,703	151,378	255,873	302,198
Total	3,343,963	463,262	834,329	843,416	1,202,956

<u>Parish</u>	<u>Affected acreage</u>	<u>Saline</u>	<u>Brackish</u>	<u>Intermediate</u>	<u>Fresh</u>
IBERIA	0	0	0	0	0
JEFFERSON	1,647	1,647	0	0	0
LAFOURCHE	32,499	32,499	0	0	0
PLAQUEMINES	3,742	3,742	0	0	0
ST MARY	0	0	0	0	0
TERREBONNE	40,741	36,341	776	0	3,624
VERMILION	0	0	0	0	0
CAMERON	1,542	605	322	615	0
Total	80,172	74,835	1,098	615	3,624

Louisiana Brown Marsh by Parish
Data taken from survey flights on 10/01/01
"affected" = deadflats

OCTOBER 2001

<u>Parish</u>	<u>Total points</u>	<u>Saline</u>	<u>Brackish</u>	<u>Intermediate</u>	<u>Fresh</u>
IBERIA	93	0	0	83	10
JEFFERSON	74	74	0	0	0
LAFOURCHE	462	322	104	36	0
PLAQUEMINES	425	232	175	18	0
ST MARY	400	0	0	0	400
TERREBONNE	1089	629	289	108	63
VERMILION	49	0	0	49	0
Total	2592	1257	568	294	473

<u>Parish</u>	<u>Total affected pts</u>	<u>Saline</u>	<u>Brackish</u>	<u>Intermediate</u>	<u>Fresh</u>
IBERIA	0	0	0	0	0
JEFFERSON	10	10	0	0	0
LAFOURCHE	84	84	0	0	0
PLAQUEMINES	9	7	2	0	0
ST MARY	0	0	0	0	0
TERREBONNE	141	137	4	0	0
VERMILION	0	0	0	0	0
Total	244	238	6	0	0

<u>Parish</u>	<u>Percent affected</u>	<u>Saline</u>	<u>Brackish</u>	<u>Intermediate</u>	<u>Fresh</u>
IBERIA	0.00%	0.00%	0.00%	0.00%	0.00%
JEFFERSON	13.51%	13.51%	0.00%	0.00%	0.00%
LAFOURCHE	18.18%	26.09%	0.00%	0.00%	0.00%
PLAQUEMINES	2.12%	3.02%	1.14%	0.00%	0.00%
ST MARY	0.00%	0.00%	0.00%	0.00%	0.00%
TERREBONNE	12.95%	21.78%	1.38%	0.00%	0.00%
VERMILION	0.00%	0.00%	0.00%	0.00%	0.00%
Total	9.41%	18.93%	1.06%	0.00%	0.00%

<u>Parish</u>	<u>Total marsh acres</u>	<u>Saline</u>	<u>Brackish</u>	<u>Intermediate</u>	<u>Fresh</u>
IBERIA	117,107	2,520	30,614	77,815	6,158
JEFFERSON	110,669	13,012	21,642	36,367	39,648
LAFOURCHE	422,339	139,581	70,547	52,664	159,547
PLAQUEMINES	516,074	104,772	100,961	192,220	118,121
ST MARY	433,316	0	271,029	6,924	155,363
TERREBONNE	653,675	155,541	137,775	81,323	279,036
VERMILION	337,631	4,133	50,383	140,230	142,885
Total	2,590,811	419,559	682,951	587,543	900,758

<u>Parish</u>	<u>Affected acreage</u>	<u>Saline</u>	<u>Brackish</u>	<u>Intermediate</u>	<u>Fresh</u>
IBERIA	0	0	0	0	0
JEFFERSON	1,758	1,758	0	0	0
LAFOURCHE	36,412	36,412	0	0	0
PLAQUEMINES	4,315	3,161	1,154	0	0
ST MARY	0	0	0	0	0
TERREBONNE	35,785	33,878	1,907	0	0
VERMILION	0	0	0	0	0
Total	78,271	75,210	3,061	0	0

Louisiana Brown Marsh by Parish
Data taken from survey flights on 12/17/01
"affected" = deadflats

DECEMBER 2001

<u>Parish</u>	<u>Total points</u>	<u>Saline</u>	<u>Brackish</u>	<u>Intermediate</u>	<u>Fresh</u>
IBERIA	100	0	0	86	14
JEFFERSON	66	66	0	0	0
LAFOURCHE	388	262	86	40	0
PLAQUEMINES	398	212	167	19	0
ST MARY	461	0	0	0	461
TERREBONNE	1108	557	296	149	106
VERMILION	61	0	0	61	0
Total	2582	1097	549	355	581

<u>Parish</u>	<u>Total affected pts</u>	<u>Saline</u>	<u>Brackish</u>	<u>Intermediate</u>	<u>Fresh</u>
IBERIA	0	0	0	0	0
JEFFERSON	9	9	0	0	0
LAFOURCHE	51	51	0	0	0
PLAQUEMINES	8	8	0	0	0
ST MARY	0	0	0	0	0
TERREBONNE	80	72	8	0	0
VERMILION	0	0	0	0	0
Total	148	140	8	0	0

<u>Parish</u>	<u>Percent affected</u>	<u>Saline</u>	<u>Brackish</u>	<u>Intermediate</u>	<u>Fresh</u>
IBERIA	0.00%	0.00%	0.00%	0.00%	0.00%
JEFFERSON	13.64%	13.64%	0.00%	0.00%	0.00%
LAFOURCHE	13.14%	19.47%	0.00%	0.00%	0.00%
PLAQUEMINES	2.01%	3.77%	0.00%	0.00%	0.00%
ST MARY	0.00%	0.00%	0.00%	0.00%	0.00%
TERREBONNE	7.22%	12.93%	2.70%	0.00%	0.00%
VERMILION	0.00%	0.00%	0.00%	0.00%	0.00%
Total	5.73%	12.76%	1.46%	0.00%	0.00%

<u>Parish</u>	<u>Total marsh acres</u>	<u>Saline</u>	<u>Brackish</u>	<u>Intermediate</u>	<u>Fresh</u>
IBERIA	117,107	2,520	30,614	77,815	6,158
JEFFERSON	110,669	13,012	21,642	36,367	39,648
LAFOURCHE	422,339	139,581	70,547	52,664	159,547
PLAQUEMINES	516,074	104,772	100,961	192,220	118,121
ST MARY	433,316	0	271,029	6,924	155,363
TERREBONNE	653,675	155,541	137,775	81,323	279,036
VERMILION	337,631	4,133	50,383	140,230	142,885
Total	2,590,811	419,559	682,951	587,543	900,758

<u>Parish</u>	<u>Affected acreage</u>	<u>Saline</u>	<u>Brackish</u>	<u>Intermediate</u>	<u>Fresh</u>
IBERIA	0	0	0	0	0
JEFFERSON	1,774	1,774	0	0	0
LAFOURCHE	27,170	27,170	0	0	0
PLAQUEMINES	3,954	3,954	0	0	0
ST MARY	0	0	0	0	0
TERREBONNE	23,829	20,106	3,724	0	0
VERMILION	0	0	0	0	0
Total	56,728	53,004	3,724	0	0

Louisiana Brown Marsh by Parish

JANUARY

2002

Data taken from survey flights on 01/28/02 & 01/29/02

"affected" = deadflats

<u>Parish</u>	<u>Total points</u>	<u>Saline</u>	<u>Brackish</u>	<u>Intermediate</u>	<u>Fresh</u>
IBERIA	118	0	0	106	12
JEFFERSON	71	71	0	0	0
LAFOURCHE	501	394	78	29	0
PLAQUEMINES	348	201	133	14	0
ST MARY	178	0	0	0	178
TERREBONNE	960	606	247	107	0
VERMILION	59	0	0	59	0
Total	2235	1272	458	315	190

<u>Parish</u>	<u>Total affected pts</u>	<u>Saline</u>	<u>Brackish</u>	<u>Intermediate</u>	<u>Fresh</u>
IBERIA	2	0	0	2	0
JEFFERSON	4	4	0	0	0
LAFOURCHE	78	78	0	0	0
PLAQUEMINES	2	2	0	0	0
ST MARY	1	0	0	0	1
TERREBONNE	103	98	5	0	0
VERMILION	0	0	0	0	0
Total	190	182	5	2	1

<u>Parish</u>	<u>Percent affected</u>	<u>Saline</u>	<u>Brackish</u>	<u>Intermediate</u>	<u>Fresh</u>
IBERIA	1.69%	0.00%	0.00%	1.89%	0.00%
JEFFERSON	5.63%	5.63%	0.00%	0.00%	0.00%
LAFOURCHE	15.57%	19.80%	0.00%	0.00%	0.00%
PLAQUEMINES	0.57%	1.00%	0.00%	0.00%	0.00%
ST MARY	0.56%	0.00%	0.00%	0.00%	0.56%
TERREBONNE	10.73%	16.17%	2.02%	0.00%	0.00%
VERMILION	0.00%	0.00%	0.00%	0.00%	0.00%
Total	8.50%	14.31%	1.09%	0.63%	0.53%

<u>Parish</u>	<u>Total marsh acres</u>	<u>Saline</u>	<u>Brackish</u>	<u>Intermediate</u>	<u>Fresh</u>
IBERIA	117,107	2,520	30,614	77,815	6,158
JEFFERSON	110,669	13,012	21,642	36,367	39,648
LAFOURCHE	422,339	139,581	70,547	52,664	159,547
PLAQUEMINES	516,074	104,772	100,961	192,220	118,121
ST MARY	433,316	0	271,029	6,924	155,363
TERREBONNE	653,675	155,541	137,775	81,323	279,036
VERMILION	337,631	4,133	50,383	140,230	142,885
Total	2,590,811	419,559	682,951	587,543	900,758

<u>Parish</u>	<u>Affected acreage</u>	<u>Saline</u>	<u>Brackish</u>	<u>Intermediate</u>	<u>Fresh</u>
IBERIA	1,468	0	0	1,468	0
JEFFERSON	733	733	0	0	0
LAFOURCHE	27,633	27,633	0	0	0
PLAQUEMINES	1,043	1,043	0	0	0
ST MARY	873	0	0	0	873
TERREBONNE	27,942	25,153	2,789	0	0
VERMILION	0	0	0	0	0
Total	59,692	54,562	2,789	1,468	873

Louisiana Brown Marsh by Parish
Data taken from survey flights on 03/05/02
affected = deadflats

MARCH 2002

<u>Parish</u>	<u>Total points</u>	<u>Saline</u>	<u>Brackish</u>	<u>Intermediate</u>	<u>Fresh</u>
IBERIA	49	0	0	45	4
JEFFERSON	73	73	0	0	0
LAFOURCHE	458	321	98	39	0
PLAQUEMINES	337	192	122	23	0
ST MARY	358	0	0	0	358
TERREBONNE	978	605	220	98	55
VERMILION	45	0	0	45	0
Total	2298	1191	440	250	417

<u>Parish</u>	<u>Total affected pts</u>	<u>Saline</u>	<u>Brackish</u>	<u>Intermediate</u>	<u>Fresh</u>
IBERIA	0	0	0	0	0
JEFFERSON	5	5	0	0	0
LAFOURCHE	74	74	0	0	0
PLAQUEMINES	3	3	0	0	0
ST MARY	0	0	0	0	0
TERREBONNE	149	146	3	0	0
VERMILION	0	0	0	0	0
Total	231	228	3	0	0

<u>Parish</u>	<u>Percent affected</u>	<u>Saline</u>	<u>Brackish</u>	<u>Intermediate</u>	<u>Fresh</u>
IBERIA	0.00%	0.00%	0.00%	0.00%	0.00%
JEFFERSON	6.85%	6.85%	0.00%	0.00%	0.00%
LAFOURCHE	16.16%	23.05%	0.00%	0.00%	0.00%
PLAQUEMINES	0.89%	1.56%	0.00%	0.00%	0.00%
ST MARY	0.00%	0.00%	0.00%	0.00%	0.00%
TERREBONNE	15.24%	24.13%	1.36%	0.00%	0.00%
VERMILION	0.00%	0.00%	0.00%	0.00%	0.00%
Total	10.05%	19.14%	0.68%	0.00%	0.00%

<u>Parish</u>	<u>Total marsh acres</u>	<u>Saline</u>	<u>Brackish</u>	<u>Intermediate</u>	<u>Fresh</u>
IBERIA	117,107	2,520	30,614	77,815	6,158
JEFFERSON	110,669	13,012	21,642	36,367	39,648
LAFOURCHE	422,339	139,581	70,547	52,664	159,547
PLAQUEMINES	516,074	104,772	100,961	192,220	118,121
ST MARY	433,316	0	271,029	6,924	155,363
TERREBONNE	653,675	155,541	137,775	81,323	279,036
VERMILION	337,631	4,133	50,383	140,230	142,885
Total	2,590,811	419,559	682,951	587,543	900,758

<u>Parish</u>	<u>Affected acreage</u>	<u>Saline</u>	<u>Brackish</u>	<u>Intermediate</u>	<u>Fresh</u>
IBERIA	0.0	0.0	0.0	0.0	0.0
JEFFERSON	891	891	0.0	0.0	0.0
LAFOURCHE	32,178	32,178	0.0	0.0	0.0
PLAQUEMINES	1,637	1,637	0.0	0.0	0.0
ST MARY	0.0	0.0	0.0	0.0	0.0
TERREBONNE	39,414	37,536	1,879	0.0	0.0
VERMILION	0.0	0.0	0.0	0.0	0.0
Total	74,120	72,241	1,879	0.0	0.0

Louisiana Brown Marsh by Parish
Data taken from survey flights during 4/2002
"affected" = deadflats

APRIL 2002

<u>Parish</u>	<u>Total points</u>	<u>Saline</u>	<u>Brackish</u>	<u>Intermediate</u>	<u>Fresh</u>
IBERIA	455	8	133	303	11
JEFFERSON	86	86	0	0	0
LAFOURCHE	518	379	96	43	0
PLAQUEMINES	445	253	168	24	0
ST MARY	489	0	0	0	489
TERREBONNE	1235	662	367	133	73
VERMILION	630	29	267	319	15
CAMERON	1394	317	519	524	34
Total	5252	1734	1550	1346	622

<u>Parish</u>	<u>Total affected pts</u>	<u>Saline</u>	<u>Brackish</u>	<u>Intermediate</u>	<u>Fresh</u>
IBERIA	57	0	45	12	0
JEFFERSON	8	8	0	0	0
LAFOURCHE	65	65	0	0	0
PLAQUEMINES	5	5	0	0	0
ST MARY	0	0	0	0	0
TERREBONNE	97	93	3	1	0
VERMILION	45	0	22	21	2
CAMERON	39	17	13	9	0
Total	316	188	83	43	2

<u>Parish</u>	<u>Percent affected</u>	<u>Saline</u>	<u>Brackish</u>	<u>Intermediate</u>	<u>Fresh</u>
IBERIA	13%	0%	0%	4%	0%
JEFFERSON	9.30%	9.30%	0%	0%	0%
LAFOURCHE	12.55%	17.15%	0%	0%	0%
PLAQUEMINES	1.12%	1.98%	0%	0%	0%
ST MARY	0%	0%	0%	0%	0%
TERREBONNE	7.85%	14.05%	0.82%	1%	0.00%
VERMILION	7.143%	0%	0%	7%	0%
CAMERON	2.798%	5.363%	2.505%	1.718%	0%
Total	6.02%	10.84%	5.35%	3.19%	0.32%

<u>Parish</u>	<u>Total marsh acres</u>	<u>Saline</u>	<u>Brackish</u>	<u>Intermediate</u>	<u>Fresh</u>
IBERIA	117,107	2,520	30,614	77,815	6,158
JEFFERSON	110,669	13,012	21,642	36,367	39,648
LAFOURCHE	422,339	139,581	70,547	52,664	159,547
PLAQUEMINES	516,074	104,772	100,961	192,220	118,121
ST MARY	433,316	0	271,029	6,924	155,363
TERREBONNE	653,675	155,541	137,775	81,323	279,036
VERMILION	337,631	4,133	50,383	140,230	142,885
CAMERON	753,152	43,703	151,378	255,873	302,198
Total	3,343,963	463,262	834,329	843,416	1,202,956

<u>Parish</u>	<u>Affected acreage</u>	<u>Saline</u>	<u>Brackish</u>	<u>Intermediate</u>	<u>Fresh</u>
IBERIA	3,082	0	0	3,082	0
JEFFERSON	1,210	1,210	0	0	0
LAFOURCHE	23,939	23,939	0	0	0
PLAQUEMINES	2,071	2,071	0	0	0
ST MARY	0	0	0	0	0
TERREBONNE	23,589	21,851	1,126	611	0
VERMILION	9,231	0	0	9,231	0
CAMERON	10,530	2,344	3,792	4,395	0
Total	73,652	51,414	4,918	17,319	0

Louisiana Brown Marsh by Parish
 Data taken from survey flights during 5/2002
 "affected" = deadflats

MAY 2002

<u>Parish</u>	<u>Total points</u>	<u>Saline</u>	<u>Brackish</u>	<u>Intermediate</u>	<u>Fresh</u>
IBERIA	121	0	0	111	10
JEFFERSON	94	94	0	0	0
LAFOURCHE	465	319	106	40	0
PLAQUEMINES	407	225	164	18	0
ST MARY	490	0	0	0	490
TERREBONNE	1244	677	357	146	64
VERMILION	58	0	0	58	0
Total	2879	1315	627	373	564

<u>Parish</u>	<u>Total affected pts</u>	<u>Saline</u>	<u>Brackish</u>	<u>Intermediate</u>	<u>Fresh</u>
IBERIA	4	0	0	4	0
JEFFERSON	2	2	0	0	0
LAFOURCHE	38	38	0	0	0
PLAQUEMINES	3	3	0	0	0
ST MARY	0	0	0	0	0
TERREBONNE	81	79	2	0	0
VERMILION	0	0	0	0	0
Total	128	122	2	4	0

<u>Parish</u>	<u>Percent affected</u>	<u>Saline</u>	<u>Brackish</u>	<u>Intermediate</u>	<u>Fresh</u>
IBERIA	3%	0%	0%	4%	0%
JEFFERSON	2%	2%	0%	0%	0%
LAFOURCHE	8%	12%	0%	0%	0%
PLAQUEMINES	1%	1%	0%	0%	0%
ST MARY	0%	0%	0%	0%	0%
TERREBONNE	7%	12%	1%	0%	0%
VERMILION	0%	0%	0%	0%	0%
Total	4%	9%	0%	1%	0%

<u>Parish</u>	<u>Total marsh acres</u>	<u>Saline</u>	<u>Brackish</u>	<u>Intermediate</u>	<u>Fresh</u>
IBERIA	117,107	2,520	30,614	77,815	6,158
JEFFERSON	110,669	13,012	21,642	36,367	39,648
LAFOURCHE	422,339	139,581	70,547	52,664	159,547
PLAQUEMINES	516,074	104,772	100,961	192,220	118,121
ST MARY	433,316	0	271,029	6,924	155,363
TERREBONNE	653,675	155,541	137,775	81,323	279,036
VERMILION	337,631	4,133	50,383	140,230	142,885
Total	2,590,811	419,559	682,951	587,543	900,758

<u>Parish</u>	<u>Affected acreage</u>	<u>Saline</u>	<u>Brackish</u>	<u>Intermediate</u>	<u>Fresh</u>
IBERIA	2,804	0.00	0.00	2,804	0.00
JEFFERSON	277	277	0.00	0.00	0.00
LAFOURCHE	16,627	16,627	0.00	0.00	0.00
PLAQUEMINES	1,397	1,397	0.00	0.00	0.00
ST MARY	0.00	0.00	0.00	0.00	0.00
TERREBONNE	18,922	18,150	772	0.00	0.00
VERMILION	0.00	0.00	0.00	0.00	0.00
Total	40,027	36,451	772	2,804	0.00

Louisiana Brown Marsh by Parish
 Data taken from survey flights during 6/2002
 "affected" = deadflats

JUNE 2002

<u>Parish</u>	<u>Total points</u>	<u>Saline</u>	<u>Brackish</u>	<u>Intermediate</u>	<u>Fresh</u>
IBERIA	528	7	159	350	12
JEFFERSON	91	91	0	0	0
LAFOURCHE	550	390	111	49	0
PLAQUEMINES	481	273	185	23	0
ST MARY	502	0	0	0	502
TERREBONNE	1362	709	402	172	79
VERMILION	863	44	375	431	13
CAMERON	1463	340	535	558	30
Total	5840	1854	1767	1583	636

<u>Parish</u>	<u>Total affected pts</u>	<u>Saline</u>	<u>Brackish</u>	<u>Intermediate</u>	<u>Fresh</u>
IBERIA	70	0	56	14	0
JEFFERSON	3	3	0	0	0
LAFOURCHE	42	42	0	0	0
PLAQUEMINES	3	0	2	1	0
ST MARY	0	0	0	0	0
TERREBONNE	69	65	4	0	0
VERMILION	22	0	7	14	1
CAMERON	26	16	7	3	0
Total	235	126	76	32	1

<u>Parish</u>	<u>Percent affected</u>	<u>Saline</u>	<u>Brackish</u>	<u>Intermediate</u>	<u>Fresh</u>
IBERIA	13%	0%	0%	4%	0%
JEFFERSON	3.30%	3.30%	0%	0%	0%
LAFOURCHE	7.64%	10.77%	0%	0%	0%
PLAQUEMINES	0.62%	0.00%	1%	4%	0%
ST MARY	0%	0%	0%	0%	0%
TERREBONNE	5.07%	9.17%	1%	0%	0.00%
VERMILION	2.55%	0%	2%	3%	8%
CAMERON	1.78%	4.71%	1.31%	0.54%	0%
Total	4.02%	6.80%	4.30%	2.02%	0.16%

<u>Parish</u>	<u>Total marsh acres</u>	<u>Saline</u>	<u>Brackish</u>	<u>Intermediate</u>	<u>Fresh</u>
IBERIA	117,107	2,520	30,614	77,815	6,158
JEFFERSON	110,669	13,012	21,642	36,367	39,648
LAFOURCHE	422,339	139,581	70,547	52,664	159,547
PLAQUEMINES	516,074	104,772	100,961	192,220	118,121
ST MARY	433,316	0	271,029	6,924	155,363
TERREBONNE	653,675	155,541	137,775	81,323	279,036
VERMILION	337,631	4,133	50,383	140,230	142,885
CAMERON	753,152	43,703	151,378	255,873	302,198
Total	3,343,963	463,262	834,329	843,416	1,202,956

<u>Parish</u>	<u>Affected acreage</u>	<u>Saline</u>	<u>Brackish</u>	<u>Intermediate</u>	<u>Fresh</u>
IBERIA	3,113	0	0	3,113	0
JEFFERSON	429	429	0	0	0
LAFOURCHE	15,032	15,032	0	0	0
PLAQUEMINES	9,449	0	1,091	8,357	0
ST MARY	0	0	0	0	0
TERREBONNE	15,631	14,260	1,371	0	0
VERMILION	16,487	0	940	4,555	10,991
CAMERON	5,413	2,057	1,981	1,376	0
Total	65,552	31,777	5,383	17,401	10,991

Louisiana Brown Marsh by Parish
 Data taken from survey flights during 8/2002
 "affected" = deadflats

AUGUST 2002

<u>Parish</u>	<u>Total points</u>	<u>Saline</u>	<u>Brackish</u>	<u>Intermediate</u>	<u>Fresh</u>
IBERIA	486	9	140	321	16
JEFFERSON	81	81	0	0	0
LAFOURCHE	492	340	108	44	0
PLAQUEMINES	378	182	182	14	0
ST MARY	469	0	0	0	469
TERREBONNE	1229	649	366	142	72
VERMILION	859	49	372	413	25
CAMERON	1132	286	450	381	15
Total	5126	1596	1618	1315	597

<u>Parish</u>	<u>Total affected pts</u>	<u>Saline</u>	<u>Brackish</u>	<u>Intermediate</u>	<u>Fresh</u>
IBERIA	34	4	22	8	0
JEFFERSON	1	1	0	0	0
LAFOURCHE	27	26	1	0	0
PLAQUEMINES	1	0	0	1	0
ST MARY	0	0	0	0	0
TERREBONNE	36	28	8	0	0
VERMILION	18	0	5	13	0
CAMERON	27	9	8	9	1
Total	144	68	44	31	1

<u>Parish</u>	<u>Percent affected</u>	<u>Saline</u>	<u>Brackish</u>	<u>Intermediate</u>	<u>Fresh</u>
IBERIA	7%	0%	0%	2%	0%
JEFFERSON	1.23%	1.23%	0%	0%	0%
LAFOURCHE	5.49%	7.65%	1%	0%	0%
PLAQUEMINES	0.26%	0.00%	0%	7%	0%
ST MARY	0%	0%	0%	0%	0%
TERREBONNE	2.93%	4.31%	2.19%	0%	0.00%
VERMILION	2.10%	0%	0%	3%	0%
CAMERON	2.39%	3.15%	1.78%	2.36%	7%
Total	2.81%	4.26%	2.72%	2.36%	0.17%

<u>Parish</u>	<u>Total marsh acres</u>	<u>Saline</u>	<u>Brackish</u>	<u>Intermediate</u>	<u>Fresh</u>
IBERIA	117,107	2,520	30,614	77,815	6,158
JEFFERSON	110,669	13,012	21,642	36,367	39,648
LAFOURCHE	422,339	139,581	70,547	52,664	159,547
PLAQUEMINES	516,074	104,772	100,961	192,220	118,121
ST MARY	433,316	0	271,029	6,924	155,363
TERREBONNE	653,675	155,541	137,775	81,323	279,036
VERMILION	337,631	4,133	50,383	140,230	142,885
CAMERON	753,152	43,703	151,378	255,873	302,198
Total	3,343,963	463,262	834,329	843,416	1,202,956

<u>Parish</u>	<u>Affected acreage</u>	<u>Saline</u>	<u>Brackish</u>	<u>Intermediate</u>	<u>Fresh</u>
IBERIA	1,939	0	0	1,939	0
JEFFERSON	161	161	0	0	0
LAFOURCHE	11,327	10,674	653	0	0
PLAQUEMINES	13,730	0	0	13,730	0
ST MARY	0	0	0	0	0
TERREBONNE	9,722	6,711	3,011	0	0
VERMILION	4,414	0	0	4,414	0
CAMERON	30,257	1,375	2,691	6,044	20,147
Total	71,550	18,920	6,356	26,128	20,147

Louisiana Brown Marsh by Parish
Data taken from survey flights on 06/04/03
"affected" = deadflats

JUNE 2003

<u>Parish</u>	<u>Total points</u>	<u>Saline</u>	<u>Brackish</u>	<u>Intermediate</u>	<u>Fresh</u>
IBERIA	122	0	0	107	15
JEFFERSON	66	66	0	0	0
LAFOURCHE	383	276	75	32	0
PLAQUEMINES	442	253	171	18	0
ST MARY	426	0	0	0	426
TERREBONNE	1200	655	349	113	83
VERMILION	46	0	0	46	0
Total	2685	1250	595	316	524

<u>Parish</u>	<u>Total affected pts</u>	<u>Saline</u>	<u>Brackish</u>	<u>Intermediate</u>	<u>Fresh</u>
IBERIA	0	0	0	0	0
JEFFERSON	2	2	0	0	0
LAFOURCHE	16	16	0	0	0
PLAQUEMINES	0	0	0	0	0
ST MARY	0	0	0	0	0
TERREBONNE	31	26	5	0	0
VERMILION	0	0	0	0	0
Total	49	44	5	0	0

<u>Parish</u>	<u>Percent affected</u>	<u>Saline</u>	<u>Brackish</u>	<u>Intermediate</u>	<u>Fresh</u>
IBERIA	0.00%	0.00%	0.00%	0.00%	0.00%
JEFFERSON	3.03%	3.03%	0.00%	0.00%	0.00%
LAFOURCHE	4.18%	5.80%	0.00%	0.00%	0.00%
PLAQUEMINES	0.00%	0.00%	0.00%	0.00%	0.00%
ST MARY	0.00%	0.00%	0.00%	0.00%	0.00%
TERREBONNE	2.58%	3.97%	1.43%	0.00%	0.00%
VERMILION	0.00%	0.00%	0.00%	0.00%	0.00%
Total	1.82%	3.52%	0.84%	0.00%	0.00%

<u>Parish</u>	<u>Total marsh acres</u>	<u>Saline</u>	<u>Brackish</u>	<u>Intermediate</u>	<u>Fresh</u>
IBERIA	117,107	2,520	30,614	77,815	6,158
JEFFERSON	110,669	13,012	21,642	36,367	39,648
LAFOURCHE	422,339	139,581	70,547	52,664	159,547
PLAQUEMINES	516,074	104,772	100,961	192,220	118,121
ST MARY	433,316	0	271,029	6,924	155,363
TERREBONNE	653,675	155,541	137,775	81,323	279,036
VERMILION	337,631	4,133	50,383	140,230	142,885
Total	2,590,811	419,559	682,951	587,543	900,758

<u>Parish</u>	<u>Affected acreage</u>	<u>Saline</u>	<u>Brackish</u>	<u>Intermediate</u>	<u>Fresh</u>
IBERIA	0	0	0	0	0
JEFFERSON	394	394	0	0	0
LAFOURCHE	8,092	8,092	0	0	0
PLAQUEMINES	0	0	0	0	0
ST MARY	0	0	0	0	0
TERREBONNE	8,148	6,174	1,974	0	0
VERMILION	0	0	0	0	0
Total	16,634	14,660	1,974	0	0