

# ANNUAL REPORT FOR 2005



**Cedar Point Mitigation Site  
Carteret County  
Project No. 6.16901T  
TIP No. R-2105 AB**



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## **SUMMARY**

The Cedar Point Mitigation Site, located in Carteret County, serves as mitigation for marsh impacts within the White Oak River Basin. Located adjacent to NC 24, the site was constructed in 2002 and is in its fourth year of monitoring following construction. The site was monitored in 2005 for both hydrologic and vegetation success.

Hydrologic monitoring consisted of examining the data from two onsite surface gauges. The primary hydrologic input is surface water from an onsite channel that is connected to open water. Therefore, the hydrologic success criteria are based on site flooding. The site must flood twice daily with the same frequency and duration as adjacent marsh systems.

The fourth year of hydrology monitoring indicates that the Cedar Point Mitigation Site is functioning as planned. The surface gauges indicate that the site is being flooded twice daily during the growing season. An examination of the water levels over a two-day period (Figure 3) illustrates that the site is flooding twice daily. In 2005, the Morehead Climate Station did not collect rainfall data, therefore no rainfall data is available for this site.

The site was tilled and replanted in May of 2003. Vegetation on site has improved greatly as seen in the photos. Frequency and coverage are on track for the third year of monitoring. *Spartina alterniflora* is coming in naturally throughout the site. The 2005 monitoring was completed during high tide.

NCDOT will continue to monitor for hydrology and vegetation at the Cedar Point Mitigation Site.

## 1.0 INTRODUCTION

### 1.1 Project Description

The Cedar Point Mitigation Site is located in Carteret County adjacent to both NC 24 and the White Oak River (Figure 1). The site was designed as an emergent marsh. A constructed channel within the site promotes tidal exchange within the mitigation area.

### 1.2 Purpose

In order to demonstrate successful mitigation, both the hydrologic and vegetation conditions of the new site must be monitored. This report details the hydrologic and vegetation monitoring on the Cedar Point Mitigation Site in 2005; this is the fourth year that the site has been monitored following construction.

### 1.3 Project History

March-May 2002	Site Construction
May 2002	Site Planted
June 2002	Surface Gauges Installed
June-December 2002	Hydrologic Monitoring (Year 1)
August 2002	Vegetation Monitoring (Year 1)
May 2003	Site Tilled and Supplemental Planting
March-November 2003	Hydrologic Monitoring (Year 2)
August 2003	Vegetation Monitoring (Year 1 Restart)
March-November 2004	Hydrologic Monitoring (Year 3)
July 2004	Vegetation Monitoring (Year 2)
March-November 2005	Hydrologic Monitoring (Year 4)
August 2005	Vegetation Monitoring (Year 3)



Figure 1. Site Location Map

## **2.0 HYDROLOGY**

### **2.1 Success Criteria**

Though most mitigation sites are monitored according to federal wetland hydrology criteria, NCDOT and cooperating agencies decided that the Cedar Point Mitigation Site should be evaluated using different criteria. This is due mainly to the fact that the site is located on the coast and it receives its primary hydrologic input from an onsite channel that is connected to open water. The site's flooding regime, if it is consistent with that outside of the mitigation area, will determine hydrologic success. The site must be flooded twice daily and have the same elevation and duration as flooding outside of the mitigation area in order to be considered successful. The site will be monitored for three years or until success criteria are met. Local rainfall is monitored to ensure site success in average local climate conditions, though rainfall is not the primary hydrologic input.

### **2.2 Hydrologic Description**

Due to the site's proximity to the White Oak River, as well as the constructed channel designed to increase tidal exchange, the Cedar Point Site is monitored by surface water gauges (Figure 2). These gauges should indicate if the site is flooded twice daily as is required for success. The flooding regime of the site is expected to be the same as that measured for the biological benchmarks for *Spartina alterniflora*, since it can reflect long-term tidal fluctuations. A rain gauge was not installed as surface water is the primary hydrologic input to this site.

### **2.3 Results of Hydrologic Monitoring**

#### **2.3.1 Site Data**

Appendix A contains plots of data recorded at both of the surface gauges on the site. The plots show the depth of surface water recorded by each gauge.

Figure 3 is a surface water plot of the data recorded at both gauges over a two-day period. This figure illustrates that flooding occurs twice daily as required in the permit conditions. The two days in the plot were chosen at random and are representative of conditions throughout the growing season.

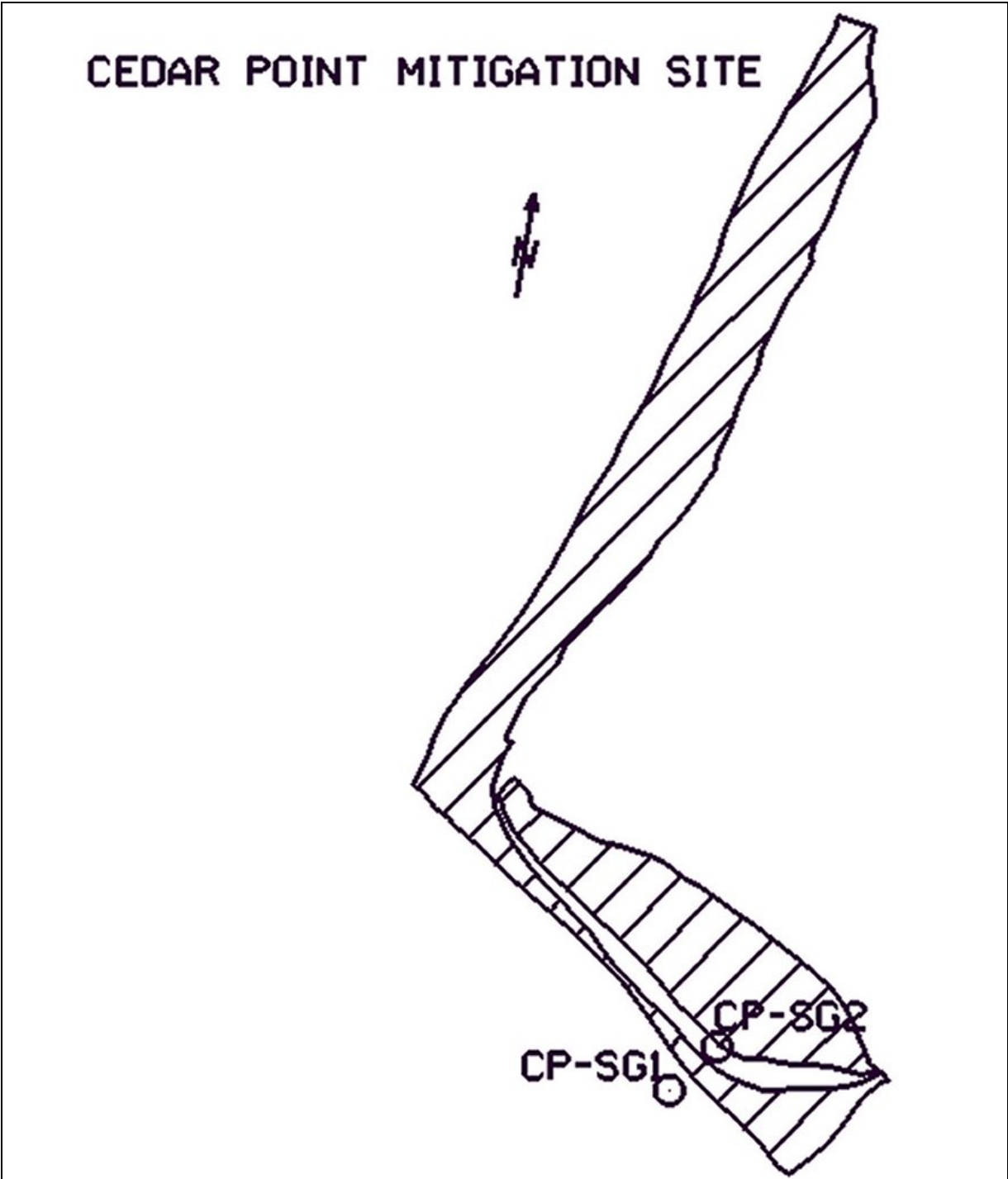
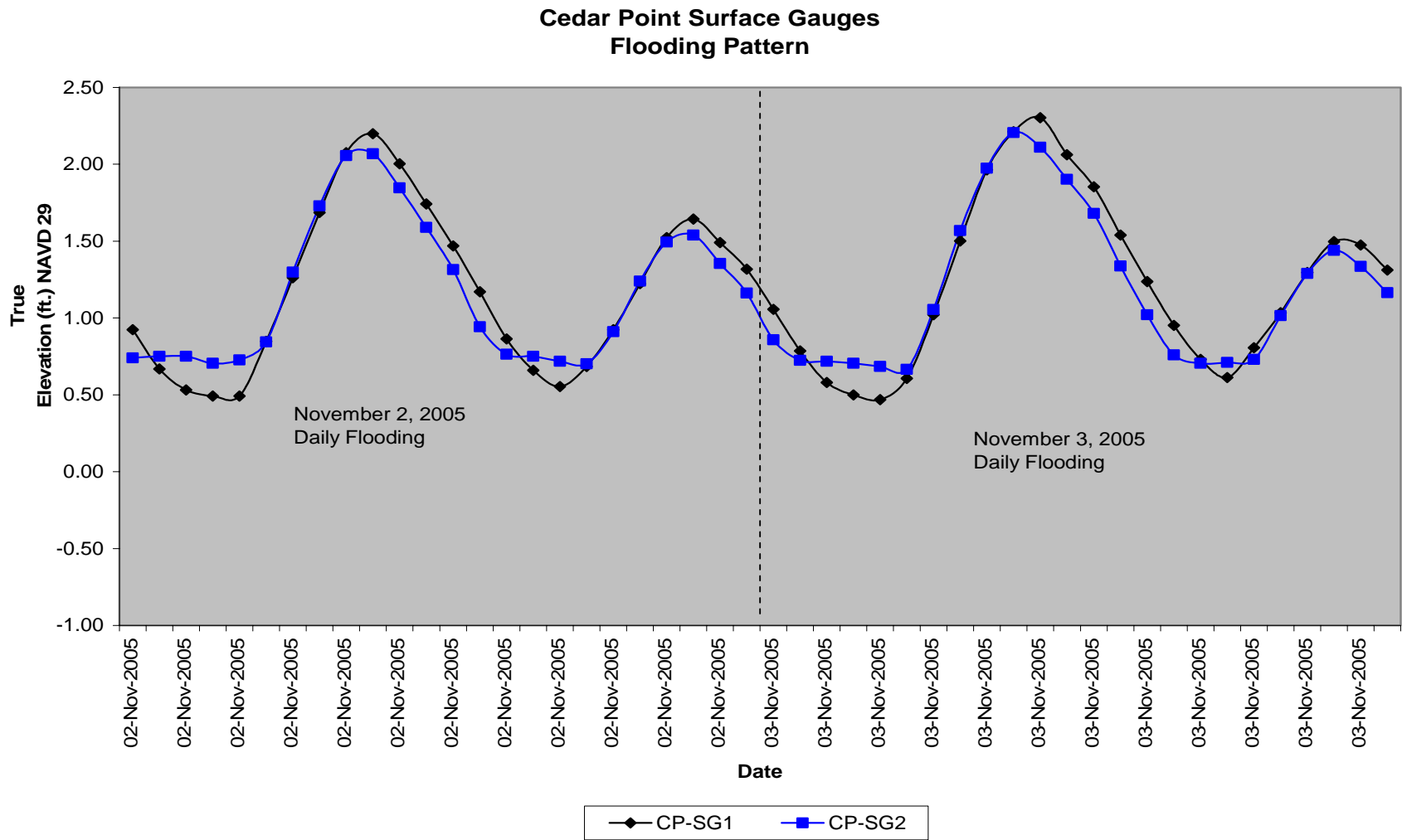


Figure 2. Gauge Location Map

Figure 3. Plot of Daily Flooding Pattern (2-day period shown)



### **2.3.2 Climatic Data**

In 2005, the Morehead Climate Station did not collect rainfall data, therefore no rainfall data is available for this site.

Precipitation is not the primary hydrologic input for the site; therefore, it is expected that the site would show the required flooding regardless of area rainfall totals.

## **2.4 Conclusions**

The surface gauges indicate that the site is being flooded twice daily during the growing season. An examination of the water levels over a two-day period (Figure 3) illustrates that the site floods twice daily under average climatic conditions. The two days in the plot were chosen at random and are representative of typical conditions during the growing season.

NCDOT will continue hydrology monitoring at Cedar Point Mitigation Site.

## **3.0 VEGETATION: CEDAR POINT MITIGATION SITE (YEAR 3 MONITORING)**

### **3.1 Success Criteria**

The site will be considered a success if the calculated value for frequency is 5.0 and the calculated value for average percent cover is at least 80% by the end of the fifth growing season.

### **3.2 Description of Species**

The following species were planted in the Wetland Restoration Area:

*Spartina alterniflora*, Smooth Cordgrass

*Spartina patens*, Salt Meadow Hay

### 3.3 Results of Vegetation Monitoring

**Table 1.** Vegetation Monitoring Results

Plot #	Scale Factor	<i>Spartina patens</i>	<i>Spartina alterniflora</i>	Frequency	Comments
1	5.0		■	■	
2	5.0		■	■	
3	5.0		■	■	
4	5.0		■	■	
5					Open Water
6					Open Water
7	5.0	■		■	
8	5.0		■	■	
9					Open Water
10	5.0		■	■	
11	3.0		■	■	
12	1.0		■	■	
13	4.0		■	■	
14	5.0		■	■	
15	3.0		■	■	
16	1.0	■		■	
17	2.0		■	■	
18	4.0		■	■	
19	5.0		■	■	
20	4.0		■	■	
21	5.0		■	■	
22	4.0		■	■	
23	3.0		■	■	
24	3.0		■	■	
25					Open Water
26	4.0		■	■	
27	4.0		■	■	
28	5.0		■	■	
29	1.0		■	■	
30	3.0		■	■	
Frequency (Percentage of Plots with Desired Species)		7.7%	92.3%	100.0%	
Sum Scale Value				99.0	
Total Number of Plots				26	
Vegetative Cover (Scale Value)				3.8	

**Site Notes:** Other species noted: glasswort and marsh-elder. Site was monitored during high tide.

### 3.4 Conclusions

Percent Frequency of Target Species      **100 %**

Frequency of 80% required for year 5.

Vegetative Cover Scale Value              **3.8**

Scale Value of 5 required for year 5.

The site was tilled and replanted in May of 2003. Vegetation on site has improved greatly as seen in the photos. Frequency and coverage are on track for the third year of vegetation monitoring. *Spartina alterniflora* is coming in naturally throughout the site. The 2005 monitoring was completed during high tide.

### 4.0 OVERALL CONCLUSIONS/ RECOMMENDATIONS

The fourth year of hydrology monitoring indicates that the Cedar Point Mitigation Site is functioning as planned. The surface gauges indicate that the site is being flooded twice daily during the growing season. An examination of the water levels over a two-day period (Figure 3) illustrates that the site is flooding twice daily under normal conditions. The two days in the plot were chosen at random and represent typical conditions during the growing season.

The site was tilled and replanted in May of 2003. Vegetation on site has improved greatly as seen in the photos. Frequency and coverage are on track for the third year of vegetation monitoring. *Spartina alterniflora* is recruiting naturally into the site. The 2005 monitoring was done during high tide.

NCDOT will continue to monitor for hydrology and vegetation at the Cedar Point Mitigation Site.

**APPENDIX A**  
**GAUGE DATA GRAPHS**

**APPENDIX B**  
**SITE PHOTOS AND**  
**PHOTO AND PLOT LOCATIONS MAP**

# Cedar Point



Photo 1



Photo 2



Photo 3

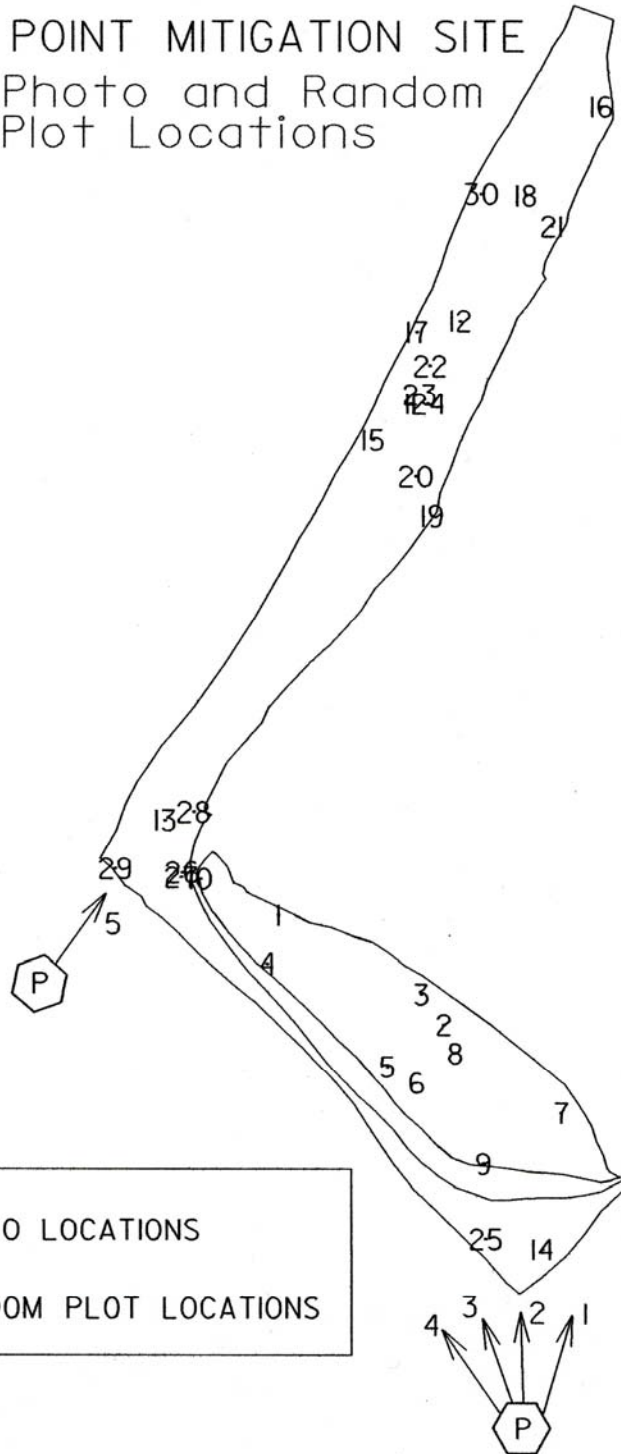



Photo 4



Photo 5

CEDAR POINT MITIGATION SITE  
2005 Photo and Random  
Plot Locations



 PHOTO LOCATIONS  
· RANDOM PLOT LOCATIONS