

**POTENTIAL APPLICATION OF VETIVER
SYSTEM FOR EROSION CONTROL AT POINT
CELESTE MARSH, NEW ORLEANS, USA**

**Jack Bertel
and Paul Truong**

INTRODUCTION

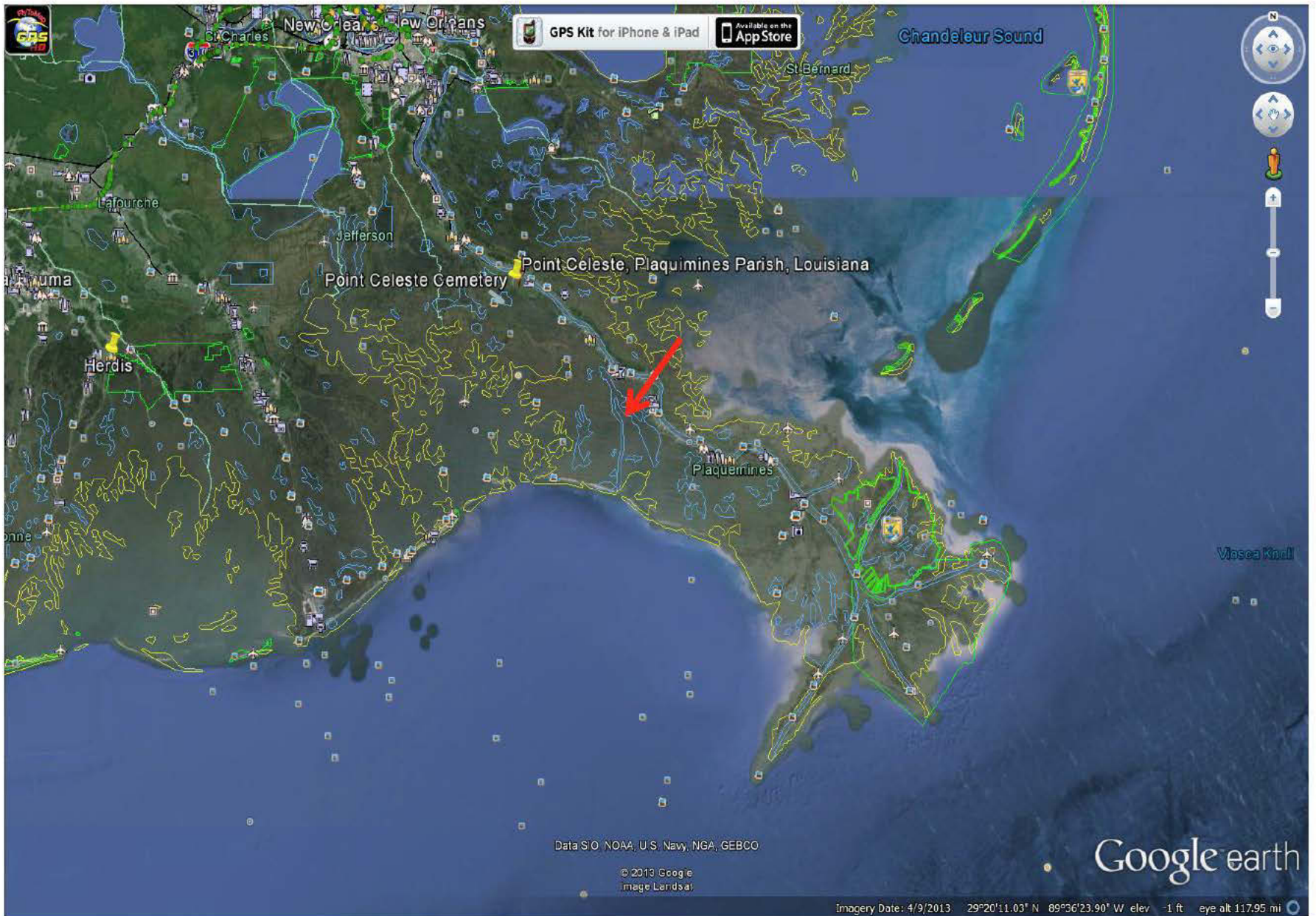
- The brackish marshes to the south of New Orleans and running along the Louisiana coast, protect New Orleans and other cities from hurricane storm surges by absorbing the tidal force of the storms. The native vegetation has not done the job and the marshes have been losing ground at least the equivalent of two football fields per day.

- We hope to help design an application for Vetiver within the scope of the coastal zone plan conceived by Plaquemines Parish One of the elements of this plan consist of building miles and miles of Forested Ridges which would rise higher than the marsh. They would be built with dredged material from the Mississippi River. Mr. Nungesser President of the local government, has targeted \$500 million of the BP settlement for this project. It is expected that it will take 3 years to build the ridges, after which they will be planted with trees and vegetation. Hopefully, rows of Vetiver will be incorporated on the ridges, above the tidal zone and before the tree line.

The building of the berms will take about 3 years at which time they will need to be planted. We are talking miles and miles.

My main purpose at the Point Celeste site was to show that Vetiver would grow here and take a storm (and what a storm Hurricane Issaac was!). I can't say that it does well in the tidal zone, but on a few feet above the tidal zone, the Vetiver was the only vegetation not washed away by Isaac, which pounded hurricane force winds for 4 days and overtopped the Vetiver by 8 feet with salt water . As far as we know, it is the only plant capable of withstanding the force of a hurricane , provided its roots are some feet above the tidal zone.

Point Celeste:



A typical landscape of the marsh at Point Celeste:





the bottom row of Vetiver, slid down because the bank sheared off. The bank is very steep here, going down to a depth of about 2 meters



Despite all of this, the Vetiver was growing one month later, in the brackish water and it was frequently covered with water.

Vetiver must be planted above the high water level of the tidal zone in salt water, so that the crown is not covered with salt water on a daily basis. Occasional salt water flooding of the crown is acceptable.



Higher up on the bank, with just a month of growth between April and May, you can see that the Vetiver is growing well, and better than the plants in the water.



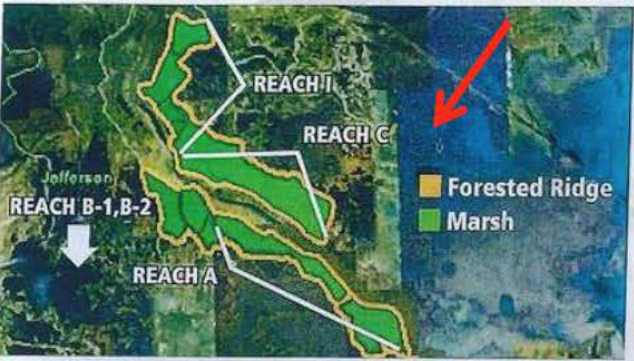
Vetiver grew well above the normal high tide mark,. Even the Vetiver that was close to the water's edge did well





East & West Bank: Forested Ridge Creation & Enhancement

Hurricane simulation modeling used by the Corps of Engineers has indicated that forested ridges reduce hurricane storm surge and associated wave action. The Parish wide program calls for the development of new forested ridges immediately adjacent to levee Reaches C and I on the East Bank and Reaches A, B-1, and B-2 on the West Bank and for the strategic raising and strengthening of the naturally occurring ridges that exist throughout the marsh and bayou systems of the Parish.



These slides show that vetiver can be grown in brackish ground of the marsh, as long as it is not under high water level of tidal fluctuation. In this case V roots are dig into the brackish water zone of the marsh, as long as the Vetiver Crown stays out of the tidal zone. However, the Vetiver can stand up to occasional storm surges of salt water, which overtop the crown.

Works on aquaculture pond in Vietnam where Vetiver was used to stabilise the pond batter in brackish water supported the observation and trial in Point Celeste and Avery

The outside wall of the pond subjected to daily tidal movement, occasional tidal surge and also constant wave action

Vetiver can not survive daily high tide, but can tolerate fortnightly tidal surge

The key is to grow V above the high tide and protect its foot with a more Salt tolerant species, in Vietnam they use sea fern in VN

**Erosion on fish pond batter facing estuary river, left,
and protected by V on the right**



10 1 2005

Erosion control with V on fish pond batter facing estuary river



Vetver planting above high water level and sea fern in the tidal zone



Sea fern

10 1 2005

Vetiver planting above high water level and sea fern in the tidal zone



Sea fern

10 1 2005









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Estuary sea facing dyke in the Mekong Delta, before and after Vetiver planting





Fortnightly tidal surge submerged 1/3 of the V
planting up to 10h a time

Mangrove

12 6 2007

Mangrove

Sea dyke

Lowest row



4 1 2005

A photograph of a dirt road in a mangrove area. The road is made of reddish-brown soil and gravel, stretching from the foreground into the distance. On the left side of the road, there is a dense thicket of tall, golden-brown grasses. Behind the grasses, there is a dense forest of green mangrove trees. The sky is a pale, clear blue. In the bottom right corner, there is a red date stamp.

Mangrove

4 1 2005



Texas



So the solution is to find a local plant like sea fern in Vietnam

THANK YOU