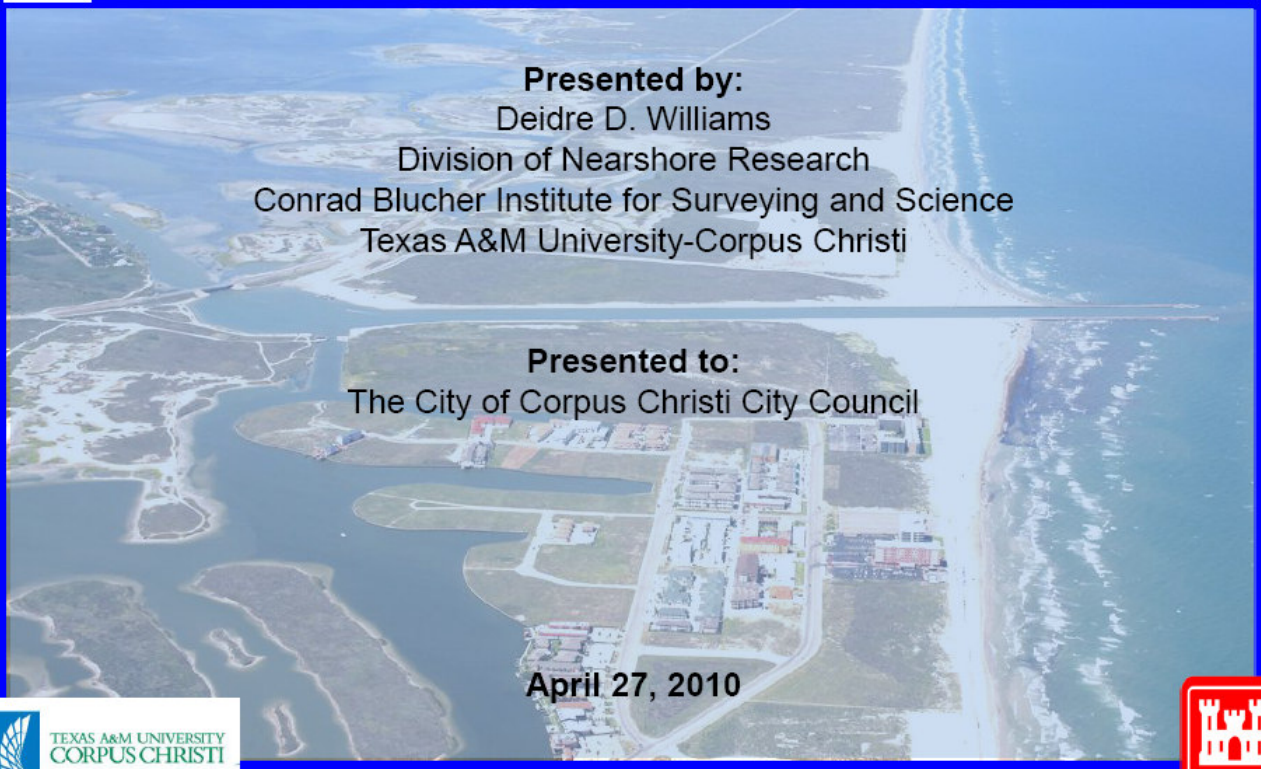
Packery Channel Monitoring Program
Status Update April 2010



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Presented to:
The City of Corpus Christi City Council

April 27, 2010


Highlights
• Brief History
• Why Monitor Packery Channel?
- Management of beach, channel and habitat
•What We Have Learned
- How sand enters the channel and where it goes
- Seasonal and event driven change
- What happens during an Atypical year
• Summary of Packery Facts
• Success to Date
1

Packery Channel: Brief History

Construction begins during 2003 (monitoring begins)

Emily opens channel

July 2005

Channel remains open

July 2006

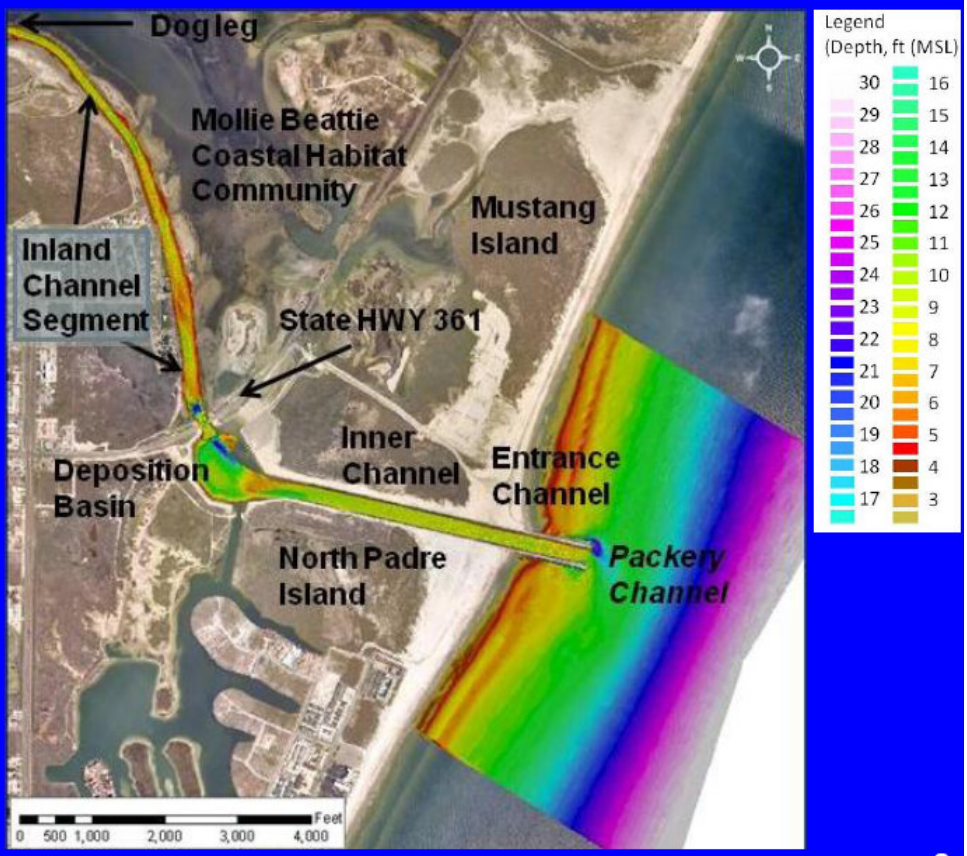
No dredge to date (excluding ramp)

Jan 2010

Why Monitor Packery Channel?

Research-Based Management of a Shared System

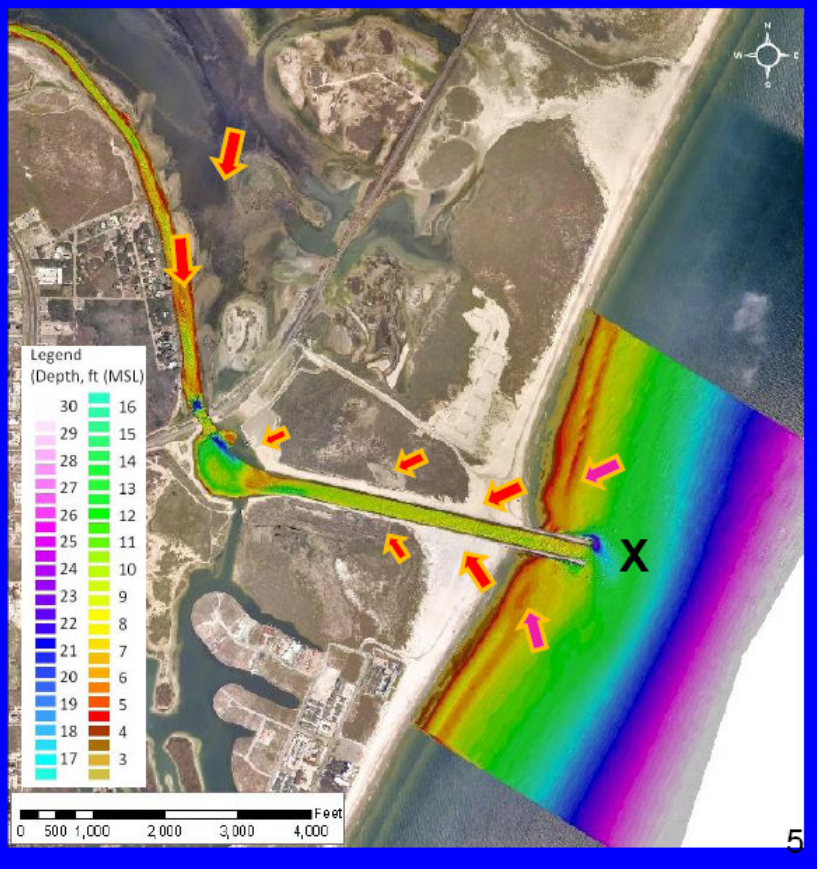
- Habitat (MBCHC)
- Channel- Identify navigation limitations (shoals)
- Channel- Determine potential dredging cycle
- Beach Nourishment



What Have We Learned?

How Does Sand Enter the Channel?

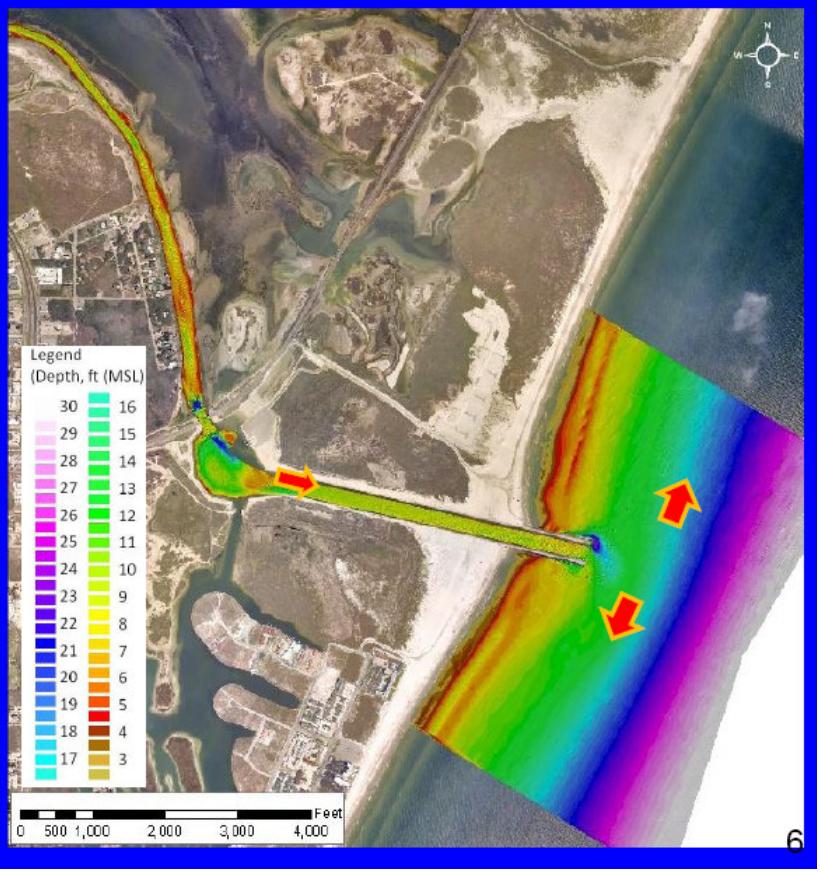
- Wind (beach and dunes)
- Surge (over low jetties)
- Scour (inland channel)
- Spillover (inland channel)



Once Sediment is in the Channel…

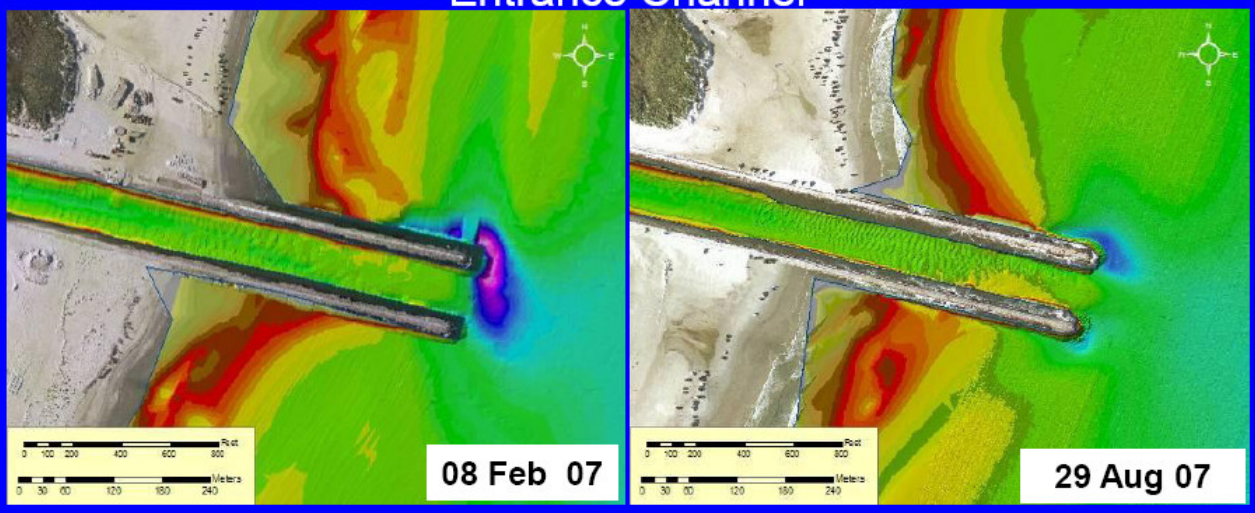
Only One Way Out

- How?
  - Daily ebb current
  - Reinforced ebb during NW fronts
- Where does it go?
  - Alongshore



Change is
Seasonal

Entrance Channel

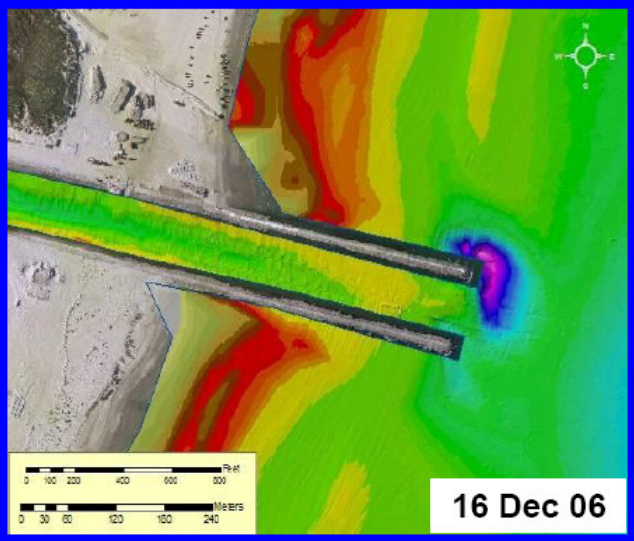


Winter – Scour Dominates

Summer – Shoals Build

Change is *Seasonal*

Summer – Scour at mouth radiates from south jetty



Winter – Scour at mouth radiates from north jetty

What Happens in an Atypical Year?

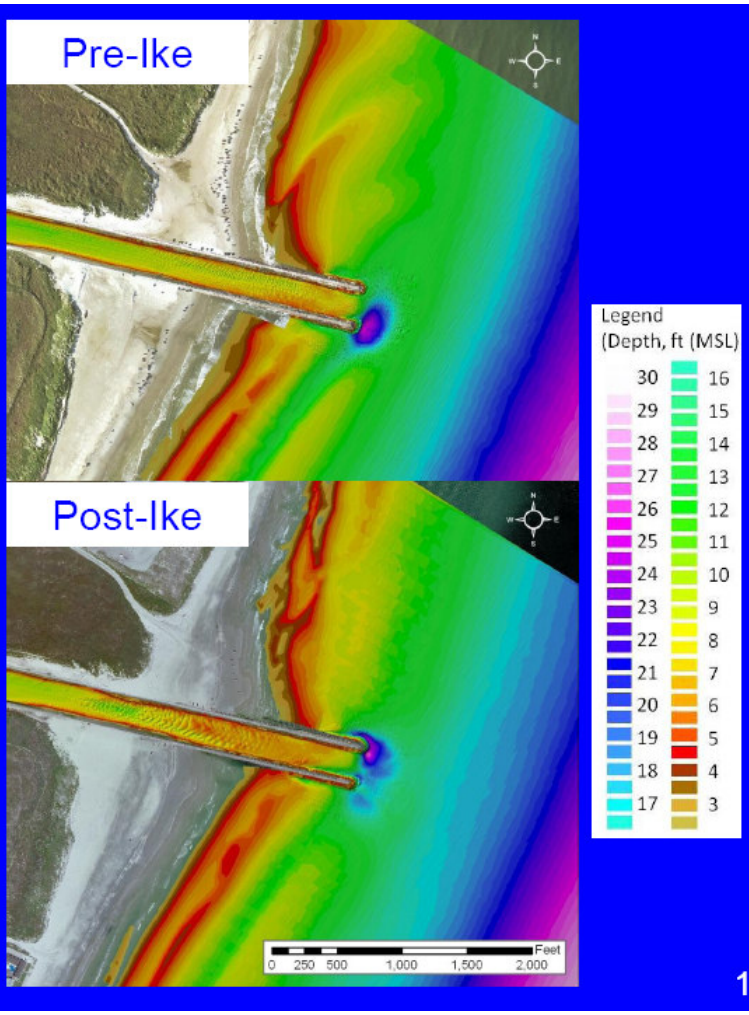
Change is
Event Driven
(Hurricane Ike)

During Ike:

Sand enters channel
by surge over jetties

After Ike:

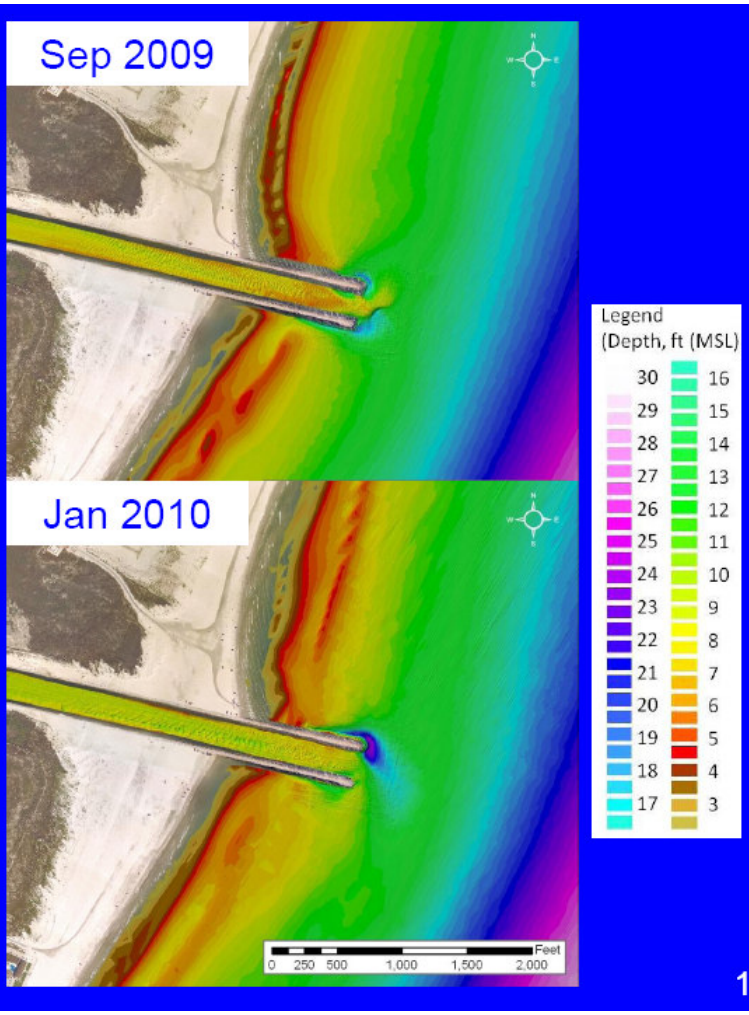
More sand enters channel
by wind transport



Recovery: *Gradual, Slow Process*

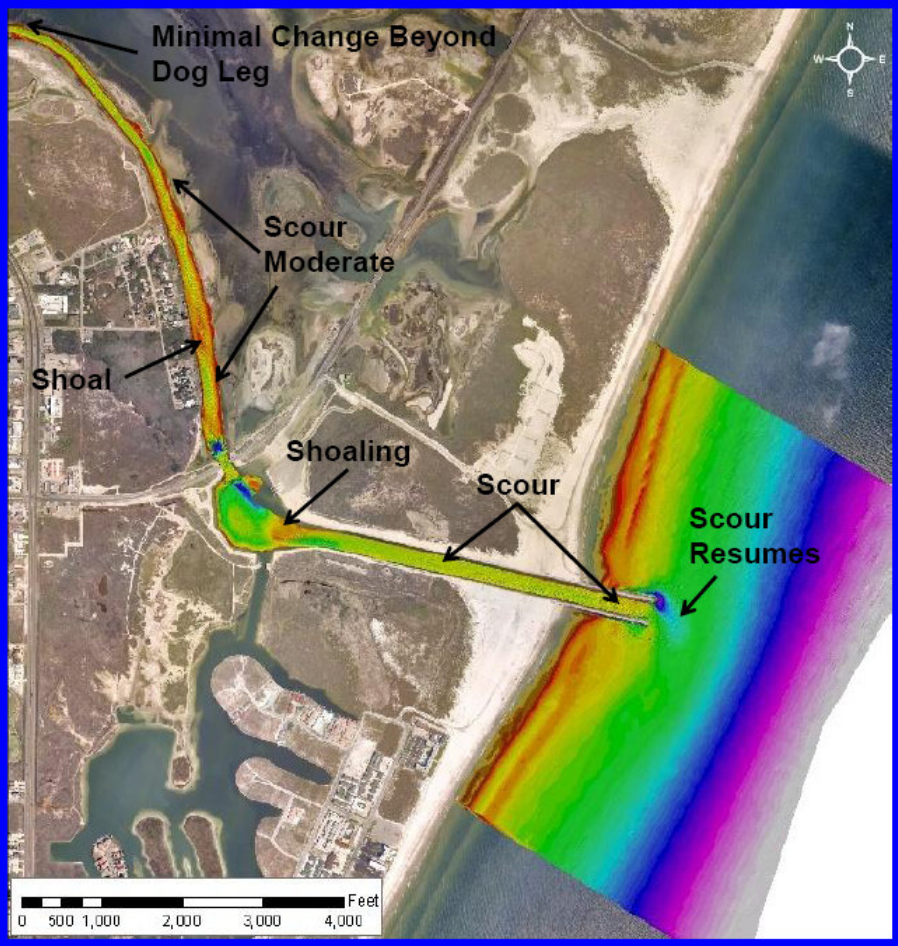
Fostered by:

- NW wind + ebb tide
- Rain
- Few storm events
- Time



Winter 2009/2010

- **Channel Mouth**
  Scour resumes
- **Entrance Channel**
  Scour dominates
- **Inner Channel**
  Scour dominates
- **Basin**
  Shoaling continues
- **Inland Channel**
  Moderate scour
  Shoal near spillover
- **Dog Leg to GIWW**
  Minimal change



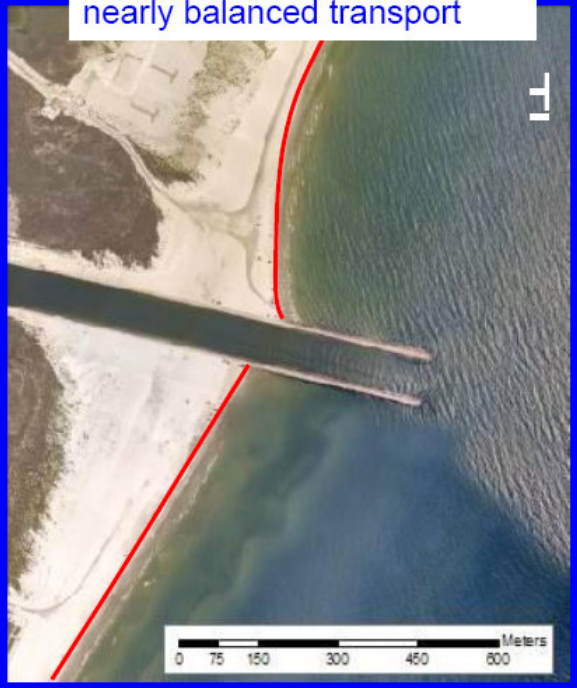
Shoreline Change

Shoreline Position
Nearly Symmetric Adjacent to Inlet

Strong net direction of transport (to north) produces large offset

Mansfield Pass Jan 05 (Lanmon)

Nearly symmetric response = nearly balanced transport

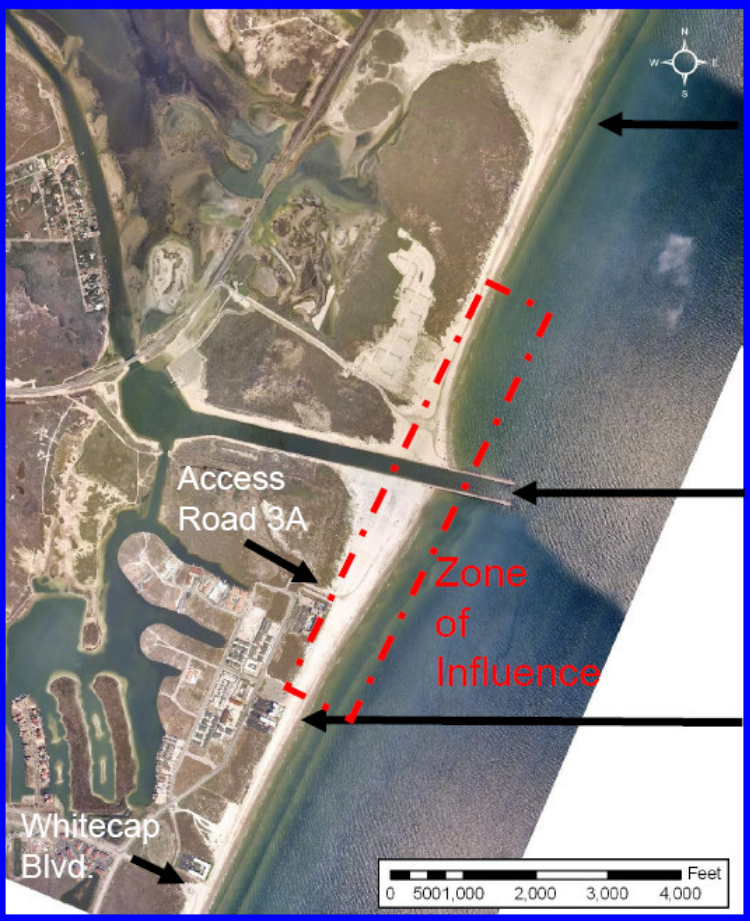


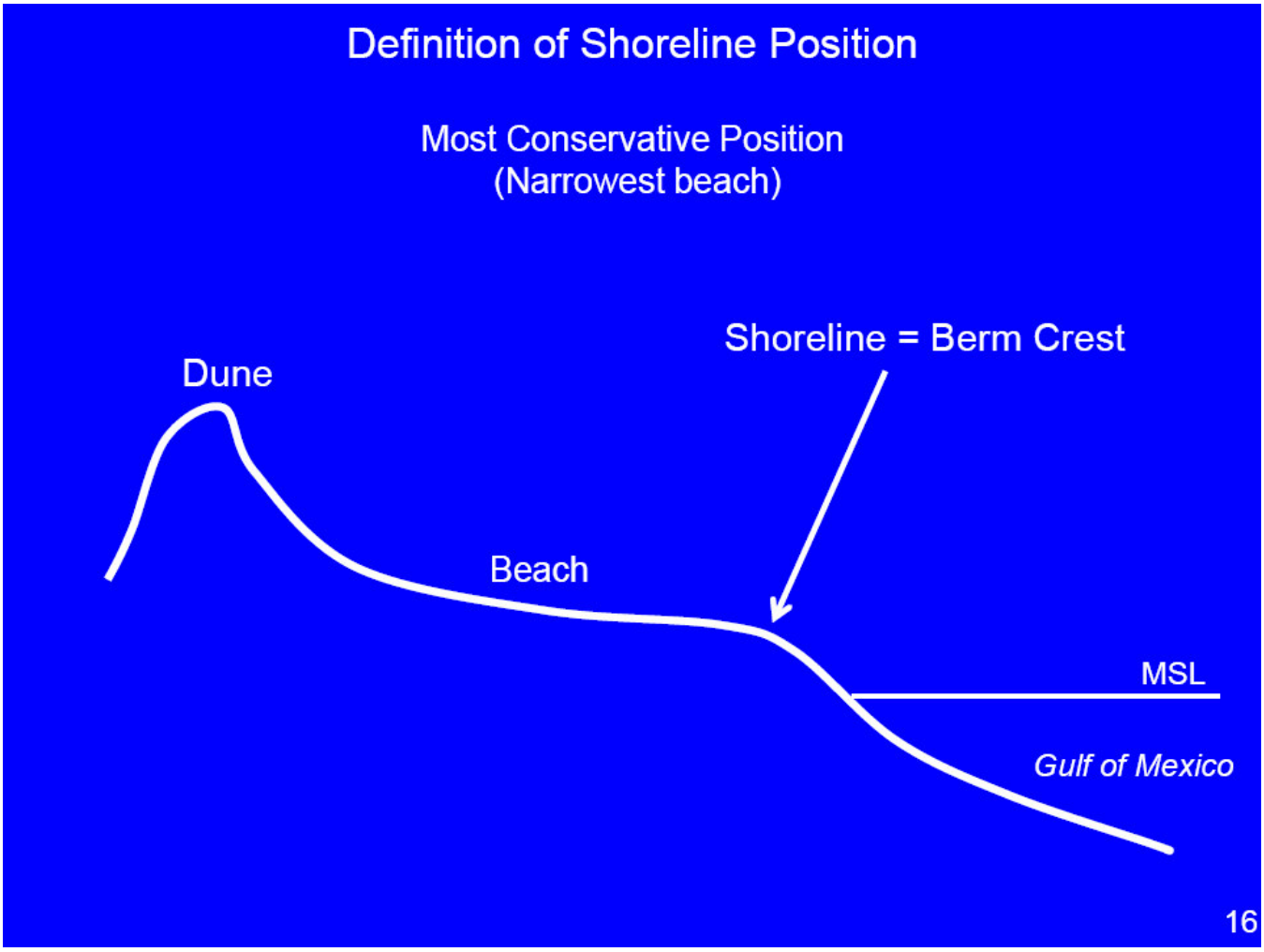
Packery Channel Sep 09 (Tobin)

Zone of Influence

2000-ft N
2500-ft S
of Inlet

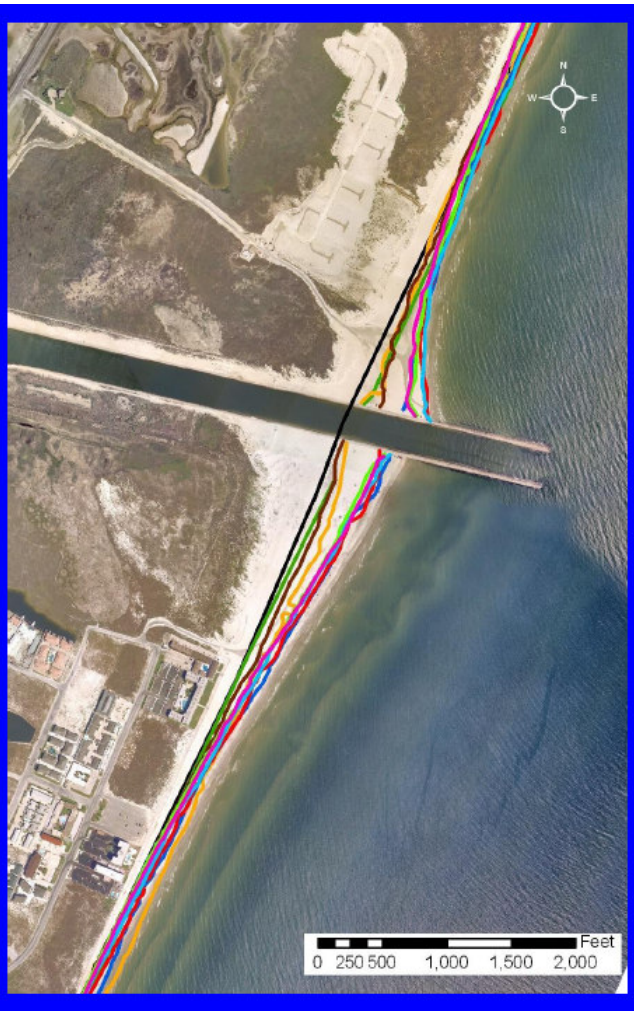
Shoreline stable or advancing




Definition of Shoreline Position
Most Conservative Position
(Narrowest beach)
Shoreline = Berm Crest
Dune
Beach
MSL
Gulf of Mexico
16

No Recession at Inlet Since Ike

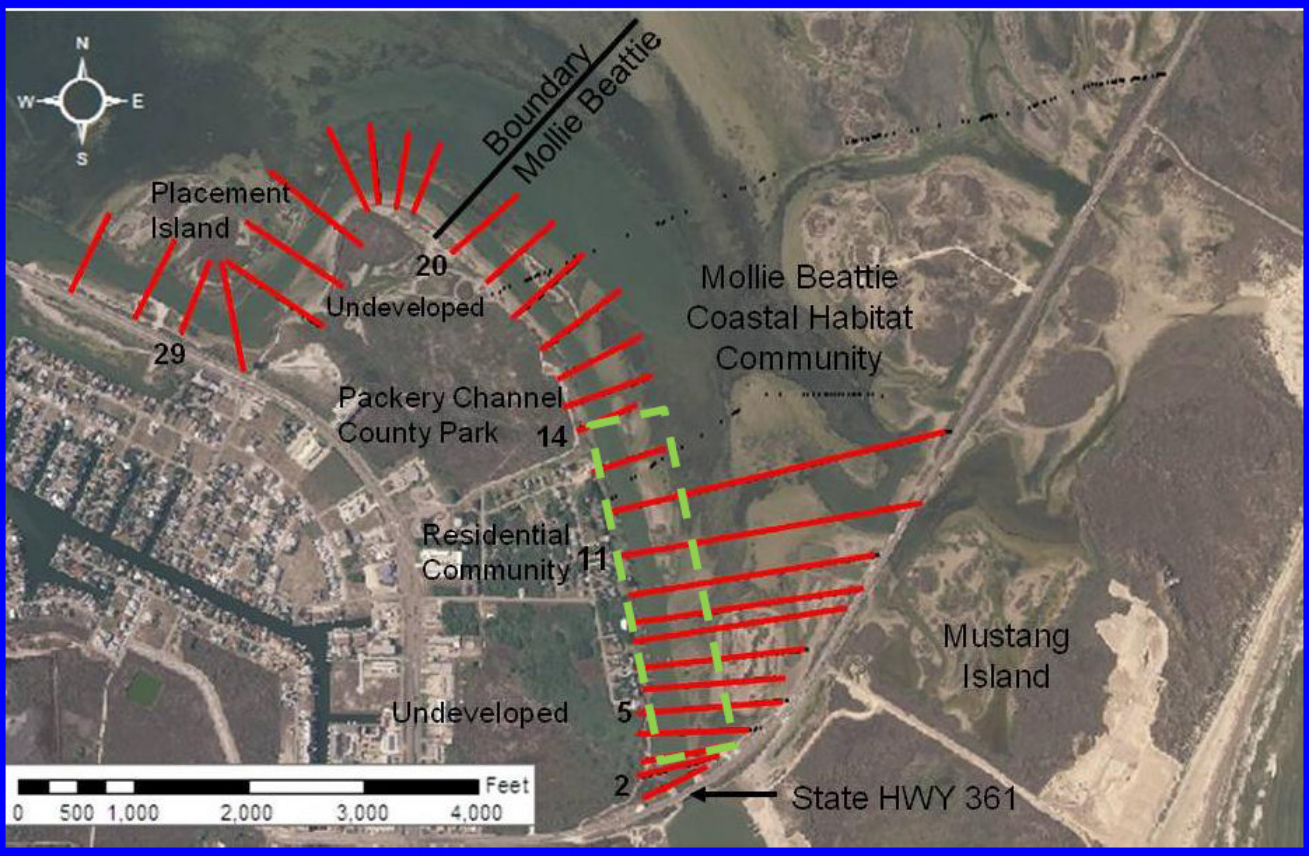
Near Post-Construction Position (2006)



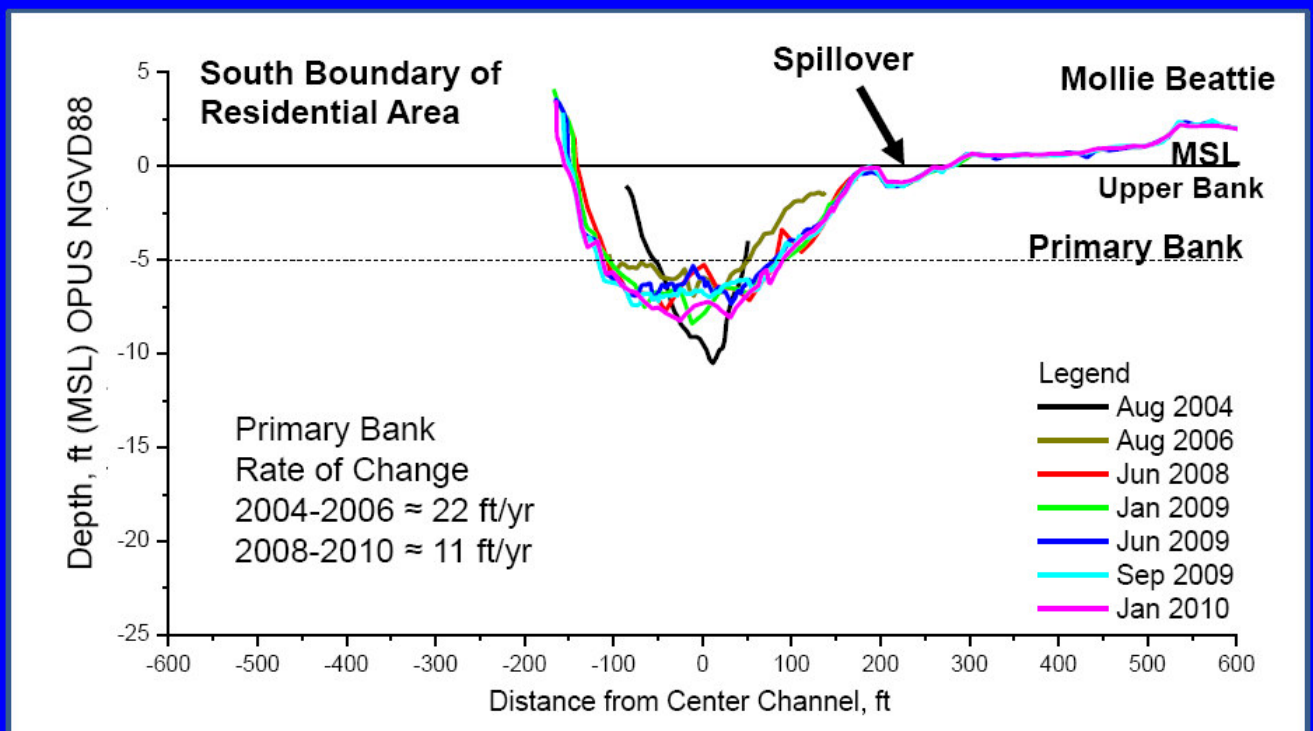
Legend

- Aug 2003 (Pre-Const.
- Jul 2004
- Jul 2005 (Open: Emily)
- Jul 2006 (Near completion)
- Sep 2007 (Pre-Ike)
- Sep 2008 (Post-Ike)
- Jan 2009
- Jul 2009
- Jan 2010

Mollie Beattie Coastal Habitat Community


N
W
E
S
Boundary
Mollie Beattie
Placement
Island
20
Undeveloped
29
Mollie Beattie
Coastal Habitat
Community
Packery Channel
County Park
14
Residential
Community
11
Mustang
Island
Undeveloped
5
2
State HWY 361
Feet
0 500 1,000 2,000 3,000 4,000

Middle of Study Area (Peak Change)



Summary of Channel Facts

- **Change in depth is:**
  - Rapid
  - Seasonal (months)
  - Storm driven (days)
- **Recovery:**
  - Slow (months to years)
- **Channel is Navigable**
  - Concentrated Shoaling in deposition basin
  - Seasonal shoals in Entrance Channel (jetty region)
  - Temporary and migratory shoals inland channel segment
- **No bar or ebb shoal at the channel mouth**
  - Channel opening (Jul 2005) to present (Jan 2010).
- **Sand Volume Available for Dredging (Jan 2010): ≈ 170,000 cu yd**
  - Original Project > 700,000 cu yd

Summary of Channel Facts

- **Shoreline Change Post-Ike**
  - Advance or stability near inlet (Zone of Influence)
  - Variable north and south
  - Recovery slow outside of Zone
- **Bank Change at Mollie Beattie**
  - Change focused at channel boundary
  - Primary Bank (-5 ft)- due to increase in current speed
  - Upper Bank (MSL)- due to wake, current, and surge

Inlet Success to Date

- Seasonal Flushing = Navigable without dredging
  - Location and Design
- No Ebb Shoal
  - Location and Design
- Wide symmetric beach advance near inlet (Zone of Influence)
  - Location and Design