Discovering the Upper Texas Coast, The Virtual Field Trip

Carolina Ramon-Duenas, Virginia Sisson, Julia Wellner, Jennifer Lytwyn, Daniel Hauptvogel
Dept of Earth and Atmospheric Sciences
University of Houston

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Collaborators

• Jinny Sisson
  Instructional Professor

• Julia Wellner
  Associate Professor

• Jennifer Lytwyn
  Instructional Assistant Professor

• Daniel Hauptvogel
  Instructional Assistant Professor

• Carolina Ramon-Duenas
  Teaching Assistant/ Geology Ph.D. student

• Others: Andrea Paris and Ekenem Adigwe
The Texas coast has a group of 12 barrier islands along the Gulf of Mexico.

Including the world’s largest barrier island, Padre Island.
Upper Texas Coast

- Diurnal tides ranging from 45-60 cm
- Low amplitude waves with periods ranging between 4-6 s
- Barrier island formed as a result of rising sea level through the Holocene
- Bays correspond with the Brazos and Trinity rivers’ incised valleys, formed during the Last Glacial Maximum
Motivations

• +1200 undergrad students in Physical Geology classes this fall
• Provide options for students of all with busy schedules that can not attend to complete day fieldtrips to experience field work
• Increase participation on fieldtrips
• Teach basic field techniques
• Some stops are difficult to access, especially for big groups

How

• By creating an authentic field experience for students using high resolution 360-degree photos, videos, and interactive exercises
How the VFT Works

• Immersive experience: High resolution 360° photos and videos
• Easy access to virtual field trip using any navigator, computer or tablet
• Exercises are designed to facilitate the understanding of coastal process and evolution through time
Exercises: River Process

- Look at temporal changes in a fluvial environment, such as bar migration and erosion
- Understand the present and formation of multiple sedimentary structures
Exercises: Sediment grain size
Exercises: Coastal change and human impact

Accretion - Jetties

- Look at coastal dynamics
- Not everything is erosion!
Erosion - Galveston Seawall

Exercises: Coastal change and human impact

- Use aerial photos to quantify beach retreat rate
- Understand the effect of manmade structures in coastal dynamics
Pros and Cons of student learning using the VFT

- Students can interpret and learn from more exercises
- Students learn details about of the environment...skills needed in the field
- Shorter time and more flexible for working students
- It is cheaper than traditional fieldtrips
- More students can be reached
- Shorter time and more flexible for working students

- Loss of opportunity for hands on exploration of environments
- Students miss the interaction with active coastal processes...see first-hand changes in a fast-changing environments as the Texas coast
- Students don’t get to practice field skills
- Lack of the personal interactions to expand learning
Future Work

- Implement a metric system to record number of people accessing and average time expend in the VFT
- Implement the VFT in all the entry level geology classes
- Improve videos adding more background information
- Implement procedures to prevent cheating
- Develop concepts sketches for exercises

Check the VFT at:
https://sites.google.com/view/vftgalveston/home
Thanks!