



Discovering the Upper Texas Coast, The Virtual Field Trip

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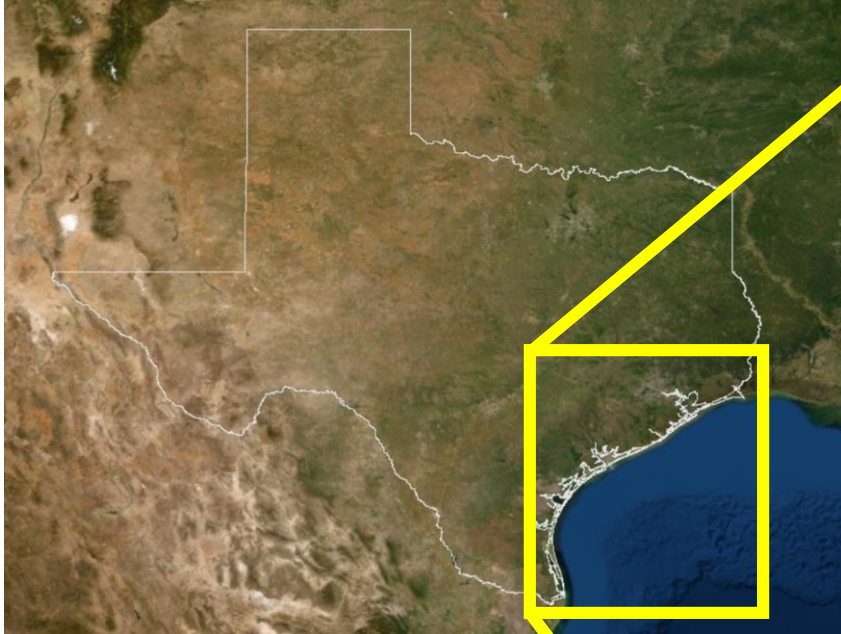
GSA meeting 2019

Collaborators

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- Jennifer Lytwyn
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Instructional Assistant
Professor
- Carolina Ramon-Duenas
Teaching Assistant/ Geology
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- Others: Andrea Paris and
Ekenem Adigwe



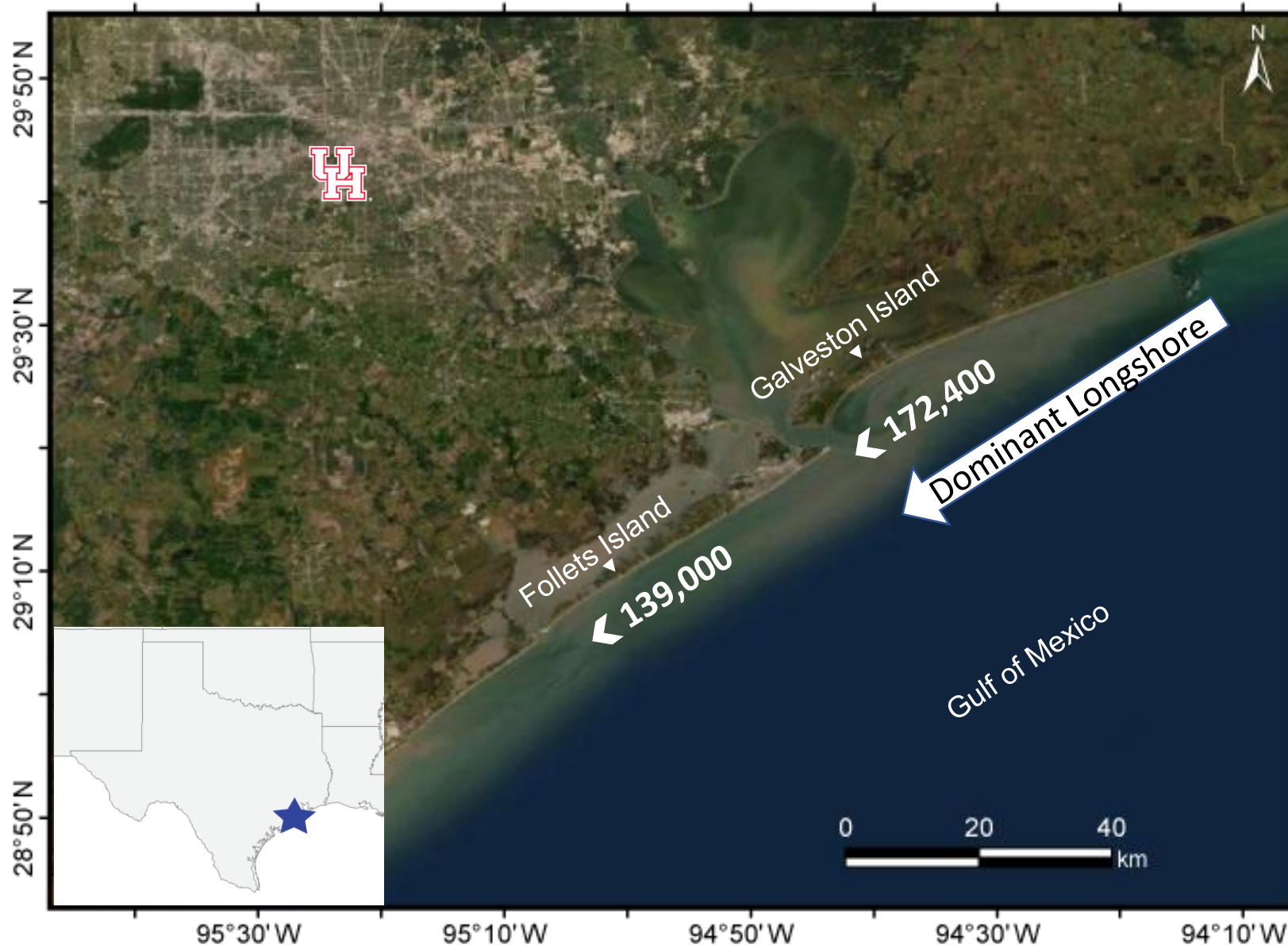
Texas Coast



- 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

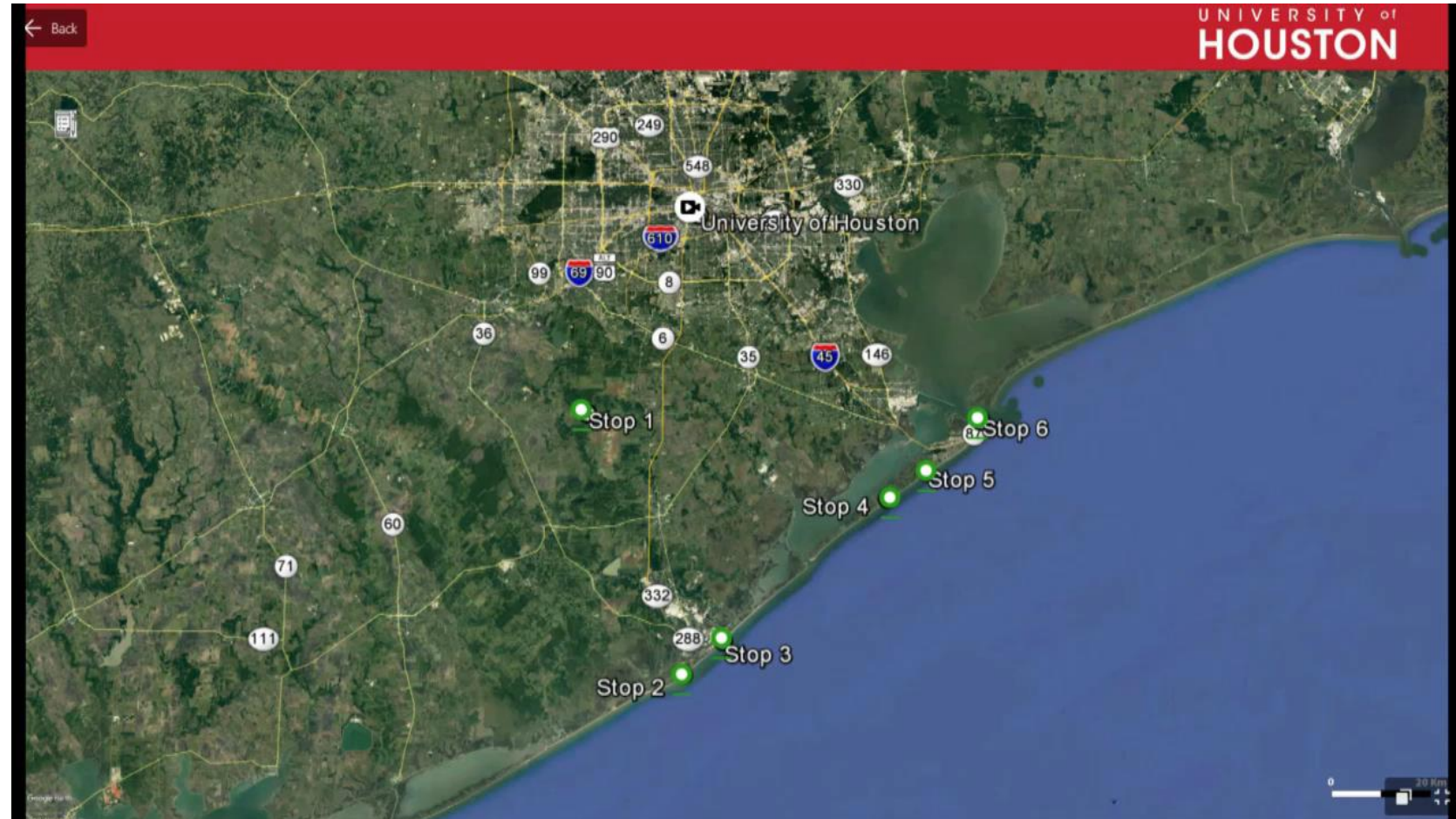
How

- 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

Brazos River



Modern Bar

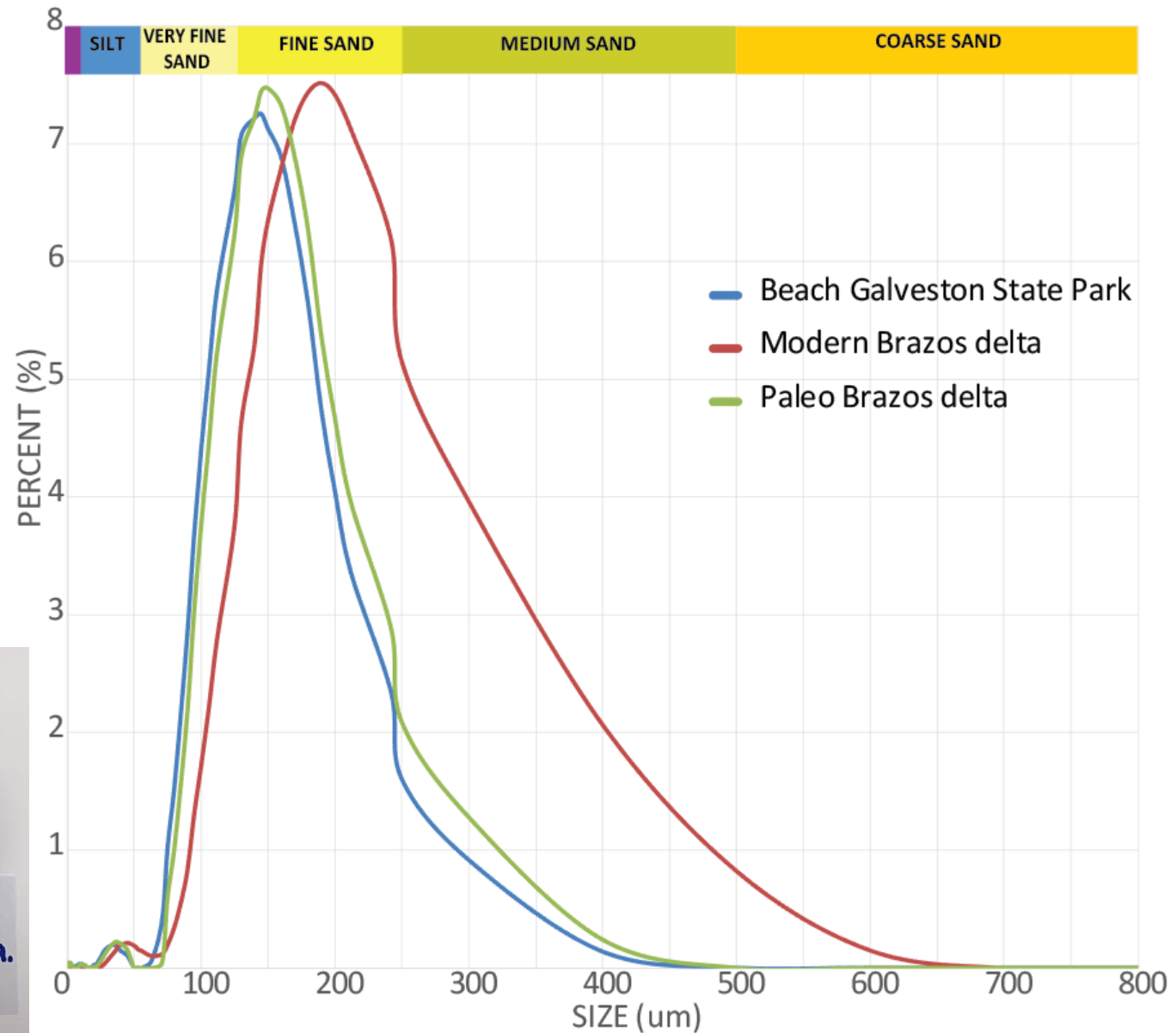
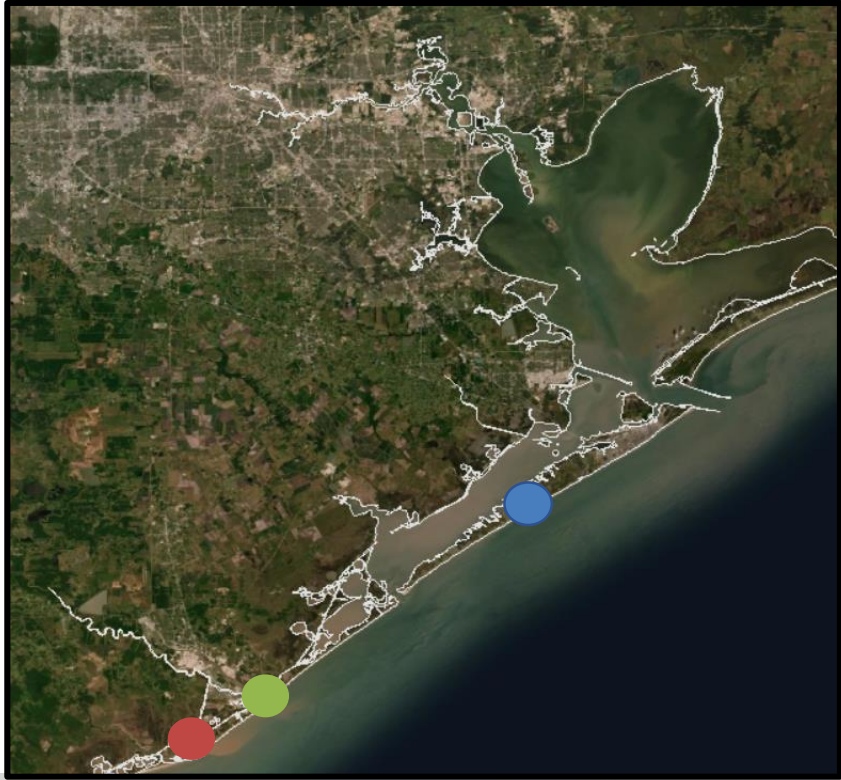


Upper point bar deposits



- 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



Galveston State
Park



Paleo Brazos Delta



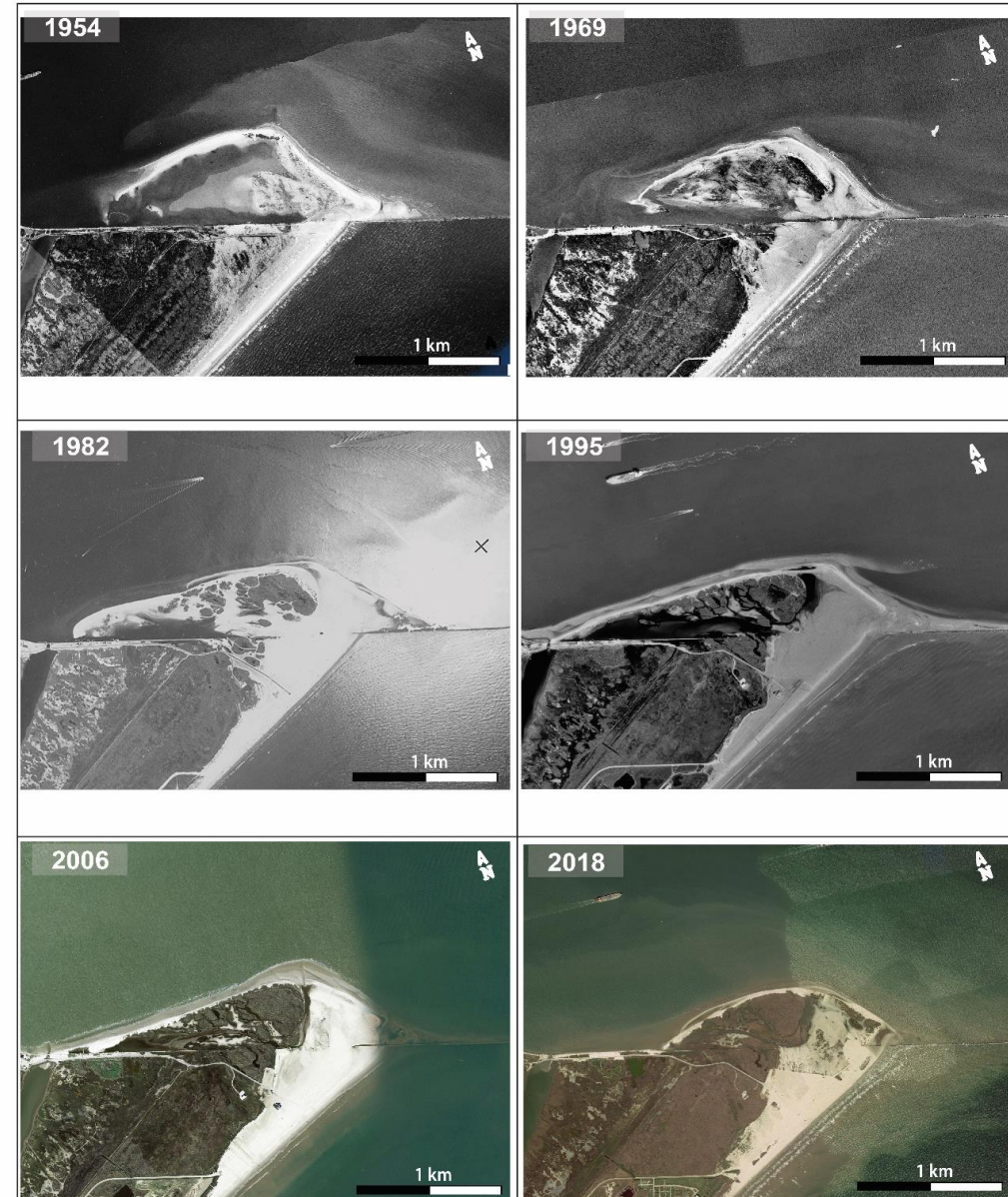
Modern Brazos Delta.

Exercises: Coastal change and human impact

Accretion- Jetties



- Look at coastal dynamics
- Not everything is erosion!

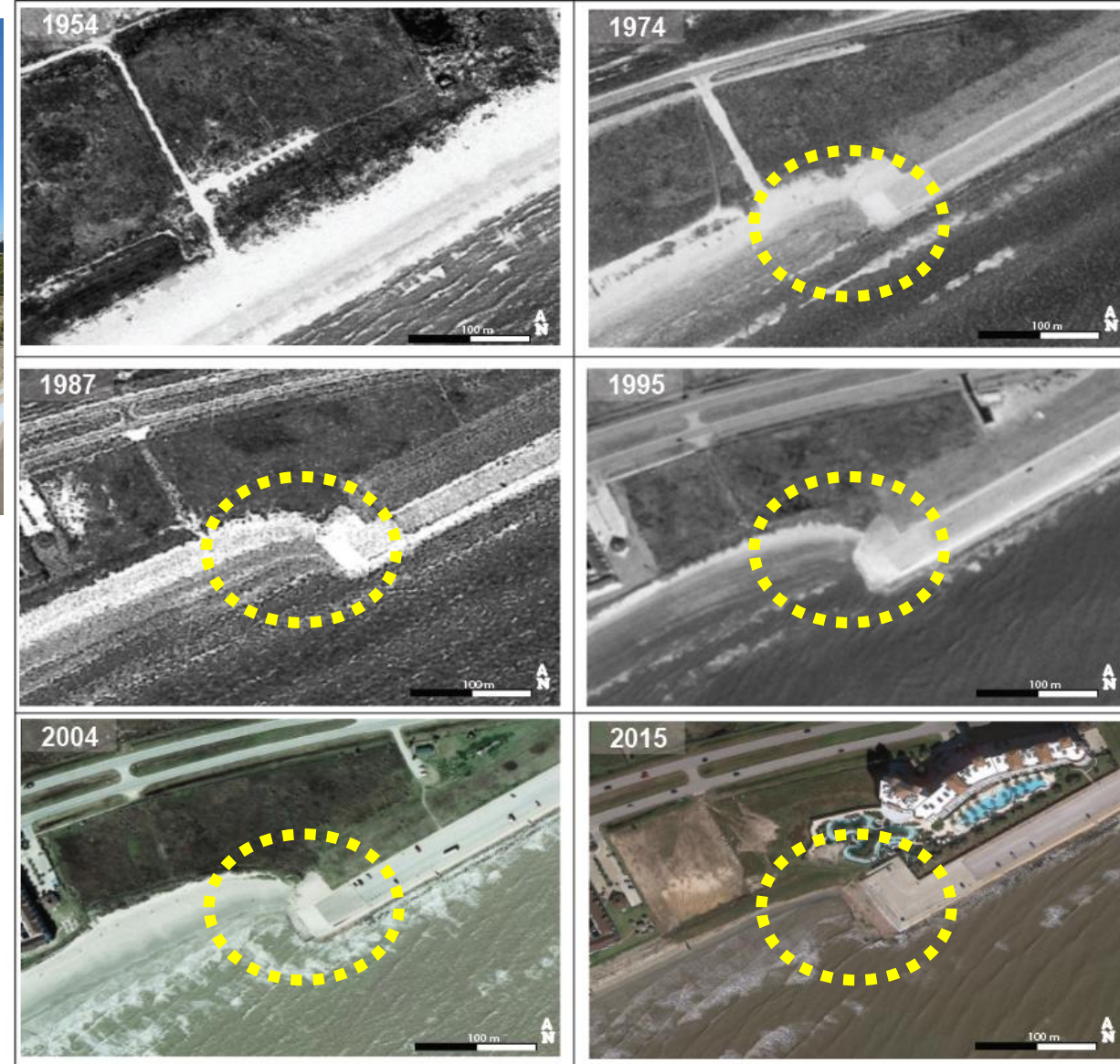


Exercises: Coastal change and human impact

Erosion- Galveston Seawall



- 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 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>



A wide-angle photograph of a beach at sunset. The sky is filled with dramatic, dark clouds, with a bright glow from the setting sun on the left. The beach is covered in dark sand, scattered with driftwood and seaweed. In the foreground, a large, weathered log lies horizontally. To the right, several large, smooth, light-colored rocks are visible. In the background, a long, white, multi-story building with a red roof sits atop a grassy dune. A small bridge or walkway is visible near the building. The word "Thanks!" is overlaid in white text on the left side of the image.

Thanks!