UHD Watershed Wonders: Summer Research Camp- 2-year NOAA Award Program

(NOAA Award # NA13NMF4630053)

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Overview

- What is the NOAA Watershed Project?
- NOAA and MWEEs?
- How does University of Houston-Downtown fit into a Watershed project?
- Which watersheds are targeted?
- Project Objectives?
- Instrumentation and Research?
- Approach to Curriculum Development

Rationale for the Project

- Establish a joint research program entitled "**Watershed Wonder: Environmental Camp"**
- **Watershed Wonder** will support and foster environmental problem-solving and stewardship among students from underrepresented groups with interest in science, specifically, biology and microbiology, chemistry, geology, environmental science education as related to meaningful environmental watershed experiences and research associated with the San Jacinto River and Harris County watersheds.

- Provide the foundation for student/teacher-based watershed research in environmental sciences and encourage environmental stewardship central to sustainability of urban and suburban environs.
- Bring together participants with environmental datasets, which can be used by schools studying watershed mitigation of wetlands that surround major urban areas in the southern gulf coast areas of the United States.

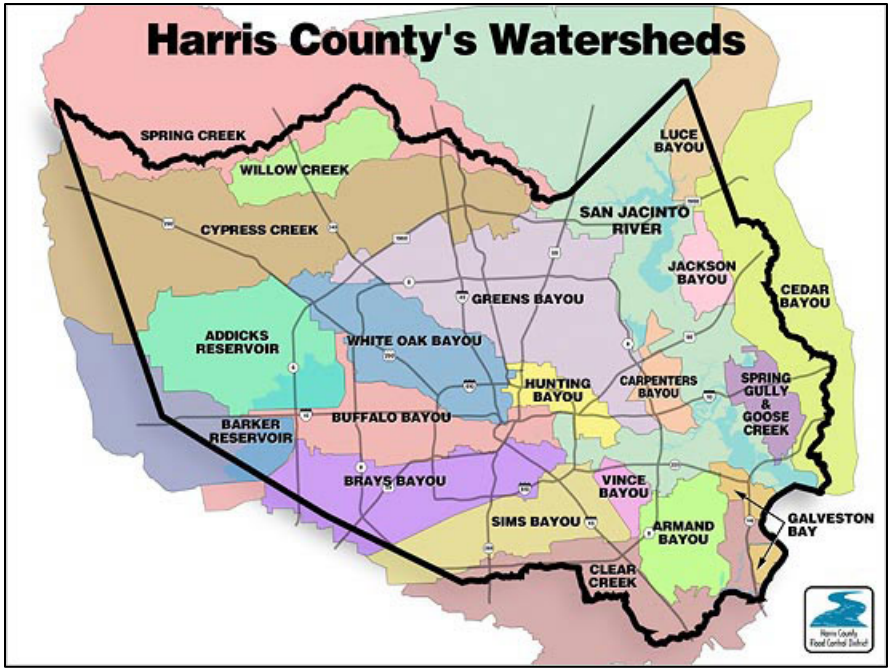
Collaborative Partners

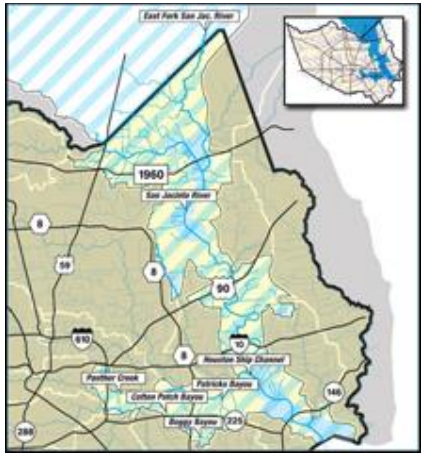
- ISDs
  - Aldine
  - Alief
  - Cypress Fairbanks
  - Sheldon
  - Clear Creek
  - Houston
  - DeBakey
  - Fort Bend
  - Klein
  - Katy
- Non-Profits/Govt
  - Texas Stream Team
  - Houston-Galveston Area Council
  - City of Houston Bureau of Pollution Control
  - TCEQ
  - Galveston Bay Estuary
  - Harris County Flood Control Bureau GIS
  - Buffalo Bayou Partnership

Watershed Influences on Watershed Wonder Project

- Surround UHD campus
  - Buffalo Bayou
  - White Oak Bayou
- Houston comprised of over 20 watersheds
- Lies within San Jacinto and Trinity River Watersheds

Watersheds In Harris County (Houston)





San Jacinto River Watershed in Harris County

Trinity River Watershed in Harris County

Project Objectives

- Enhance Meaningful Watershed Environmental Experiences
- Develop curricular pieces related to Research Investigations aligned with Texas TEKS & made public through HUNSTEM
- Support summer research team investigations in water chemistry, microbiology, and watershed health
- Use NOAA datasets and real-time data-gathering sensors (probeware)
- Investigate impact of project on environmental attitudes and actions

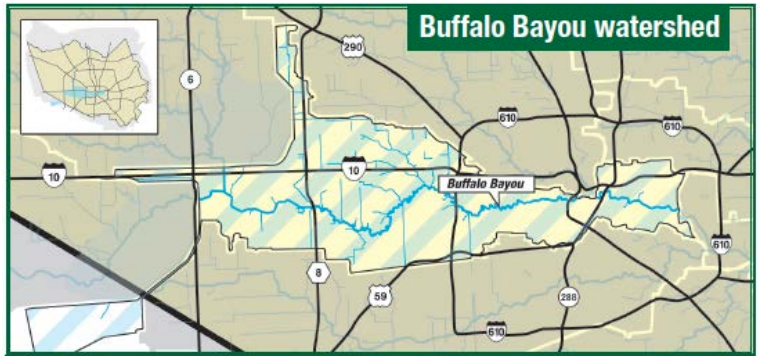
Using Real-time Data & Data Sets

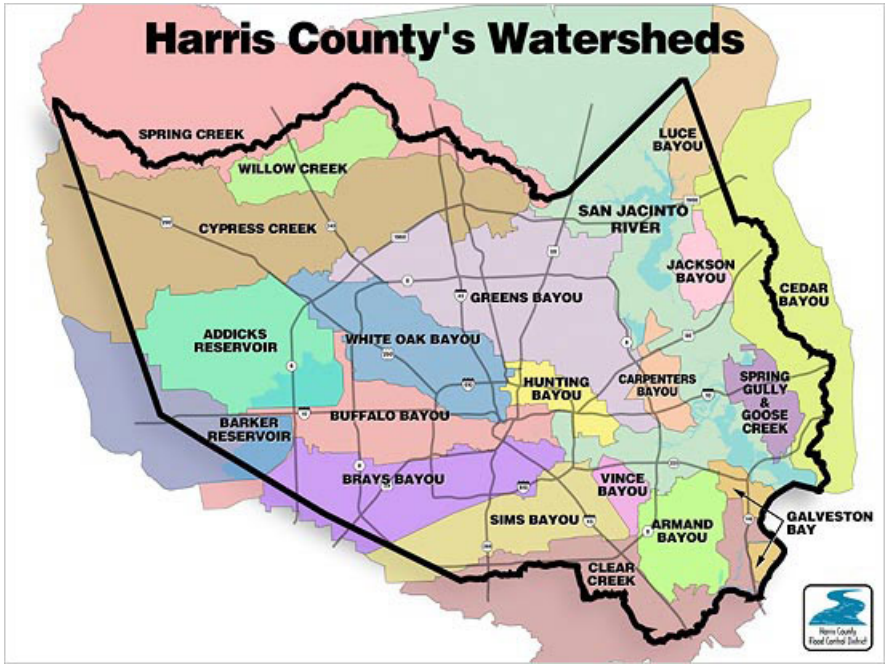
- Vernier Probeware
  - pH
  - Temperature
  - Conductivity

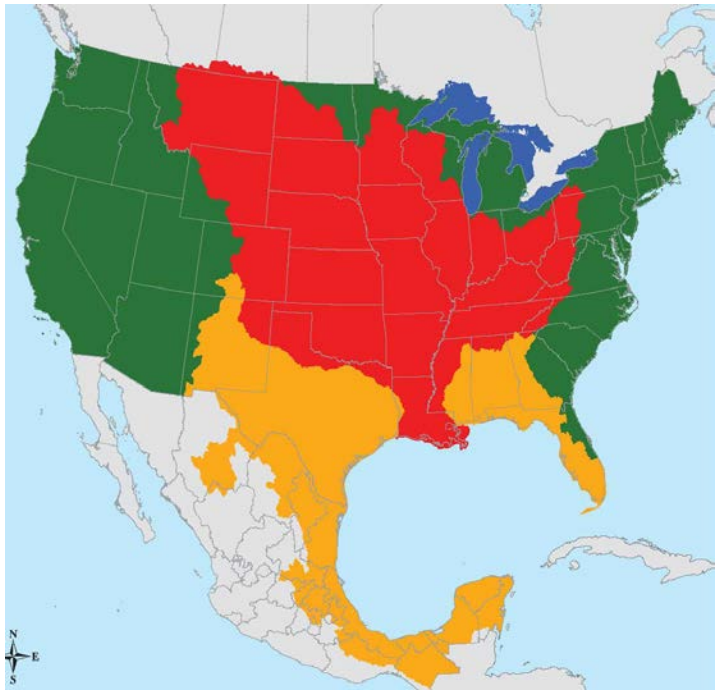
Widening the Meaning of Collected Data with NOAA Datasets

- Watershed in Harris County
  - http://www.harriscountyfemt.org/
- Harris County Flood Warning System
  - http://www.harriscountyfws.org/
- Harris County Flood Control District – Learning Center
  - http://www.hcfcd.org/watersheds.html
- NOAA and data in Texas
  - http://www.nws.noaa.gov/view/states.php?state=TX&map=on
- NOAA and River Observations
  - http://water.weather.gov/ahps/
- National Weather Service
  - http://www.nws.noaa.gov/om/marine/faq.htm#6

Why Datasets?
Support Local Watershed study to Regional & National Comparisons







Meaningful understandings beyond local
information

Problem-based Research Investigations as Methodology

1. Expand previous diatom and arecellacean diversity studies from a description of differences between mitigation and natural wetlands to a gradient of mitigation wetlands of different ages.
2. Determine the relationships between succession trajectory of the microbial communities of wetlands including the diatom community, microbial soil communities, and endophyte communities within plants.
3. Determine the richness and diversity of microbial plant endophytes and soil communities within each of the mitigation wetlands.
4. Determine water quality components of pre-identified watersheds to determine health of the watershed.
5. Determine the richness and diversity of microbial plant endophytes and soil communities within each of the mitigation wetlands.

Curricular Design
Dr. Jon Aoki

- 5 E Lesson Development
- PBWorks.com – Shared Learning Environment
- Teacher researchers – Student researchers – Undergraduate Peer Researchers
- http://uhdwatershedwondersresearchcamp2014.pbworks.com)

Shared Learning Environment: Pbworks.com

Welcome to UHD Watershed Wonders: Summer Environmental Research Camp 2014-2015 - Student & Teacher Participants

Year One: Nov. 15-16; July 7-11, 2014
Year Two: Nov. 14-15; July 6-10, 2015

Website:
uhdwatershedwondersresearchcamp2014.pbworks.com

UHD's HUNSTEM

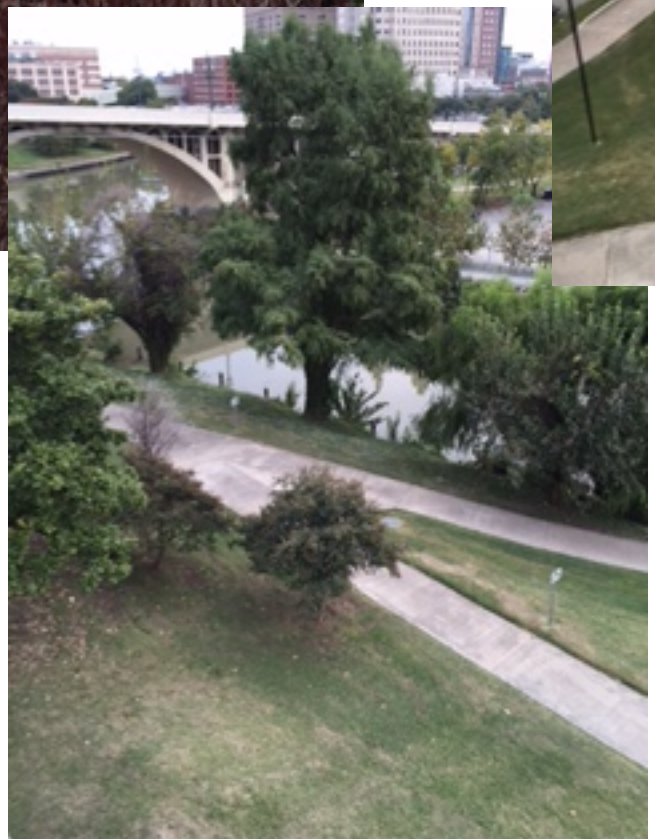
HUNSTEM is an online STEM learning community supported by the **College of Sciences and Technology** at the **University of Houston - Downtown**.

HUNSTEM has three goals:

1) to act as a gateway to local, national, and global STEM resources,
2) to provide tools for collaboration and awareness of STEM programs and events in the greater Houston area,
3) to act as liaison to foster collaboration, support existing programs, and help build new projects. **HUNSTEM** works with numerous community partners on many levels. **HUNSTEM** also supports numerous programs at UHD.

And, HUNSTEM is connected to local, state, national, and international STEM organizations and projects. **HUNSTEM** is a learning community for everyone from pre-school through college. Explore **HUNSTEM**! Join us on our social media sites!

http://hunstem.uhd.edu/



BACTERIAL CELL

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Harris County
Drainage Net
bpa

Training New Monitors
Phase I – Classroom
Orientation, Demonstration, Practice
Phase II – Group Field Trainin
Individual Testing, Focus on Field Observations
Phase III – Site Visit