LRGVDC FIF PROJECT

2024 Regional Small Cities Coalition Annual Conference

LRGVDC

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Session III

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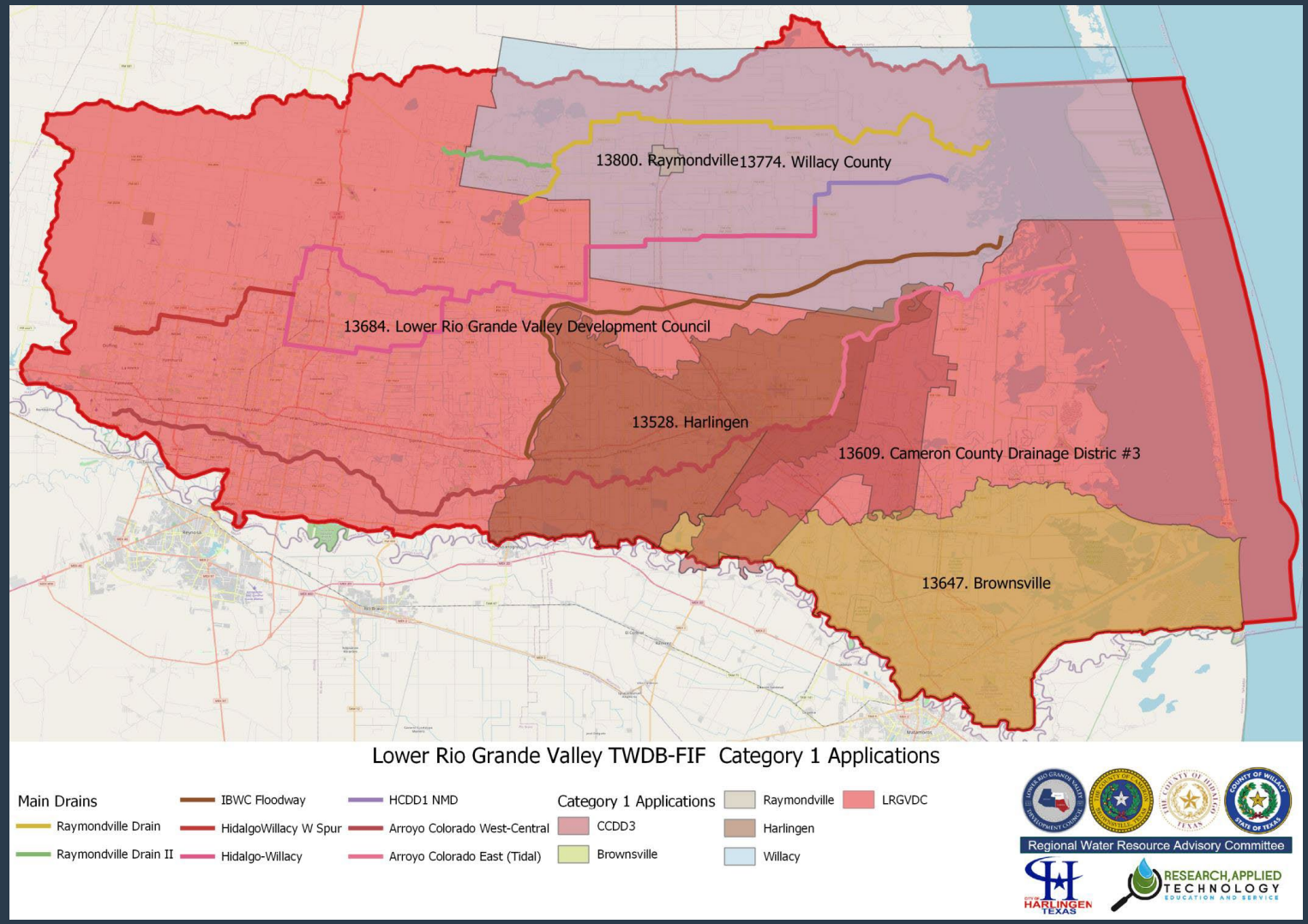
Project Overview

- Fiscal Lead: LRGVDC
  - LRGVDC project is 1 of 5 in LRGV
  - LRGVDC project spans entire HUC 8
- Partners
  - RATES
  - Cameron and Willacy Counties
- Objectives:
  1. Regional Coordination and Technical Infrastructure
  2. Identification, Assessment and Prioritization of Regional Flood Control Projects

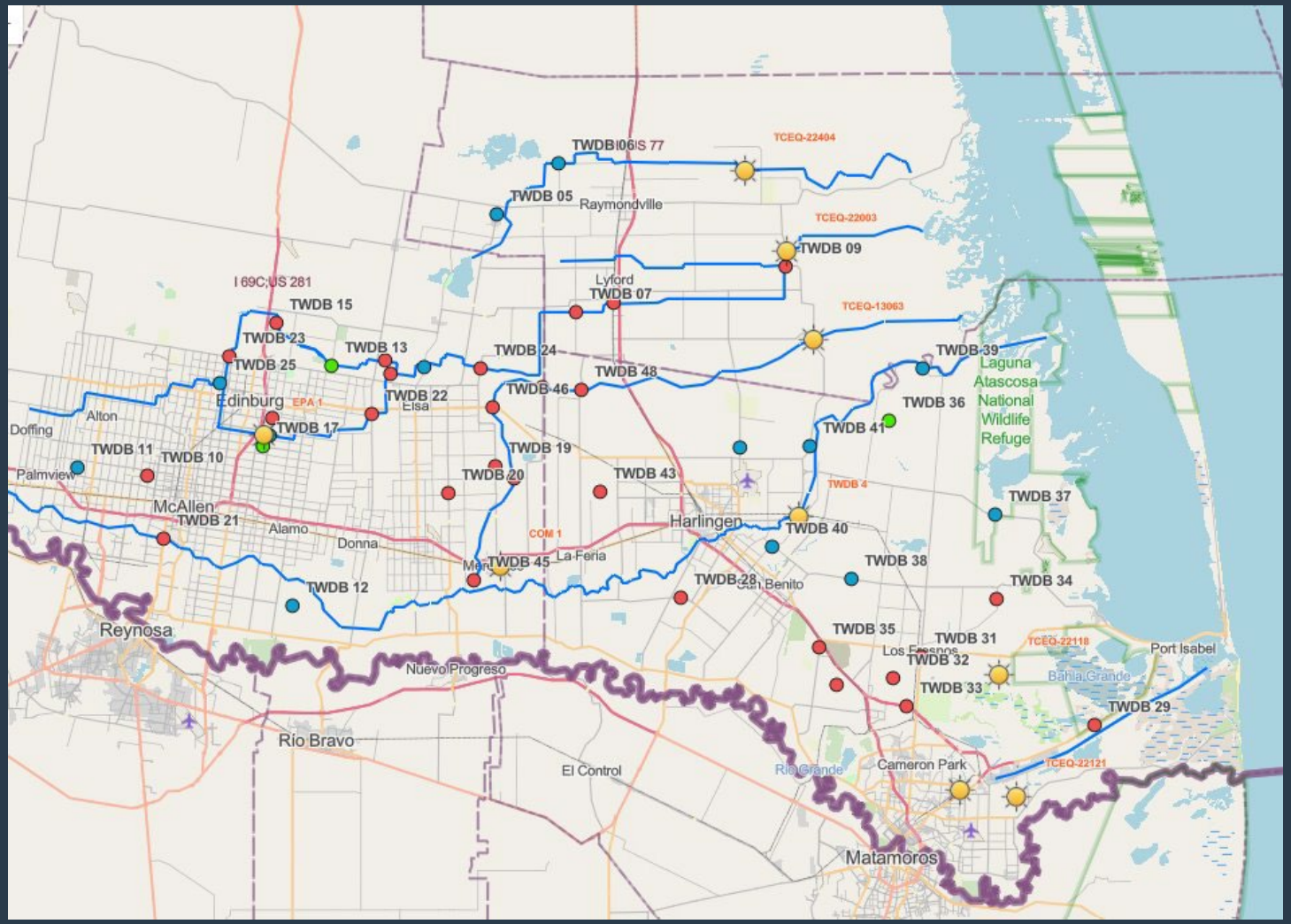


TASK 1 Regional Hydrology and Hydraulics

- Data Collection and Assimilation
  - Addressing data gaps wrt stream gaging
- Regional Modeling (Hydrologic Modeling)
  - National Water Center and Machine Learning
- Sub-regional Modeling (Hydraulic)
  - HEC-RAS
- Urban (Hydraulic)
  - Storm Water Management Model (SWMM)

Real Time Hydrologic System (RTHS)

- 44 Stations
- Permits-
  - 41 fully permitted
  - Remaining in progress
- Installed
  - 38 to date
  - Anticipated completion: Summer 2024
  - Transitioning to Year-2 O&M
    - Discharge measurements
      - Rating curve development

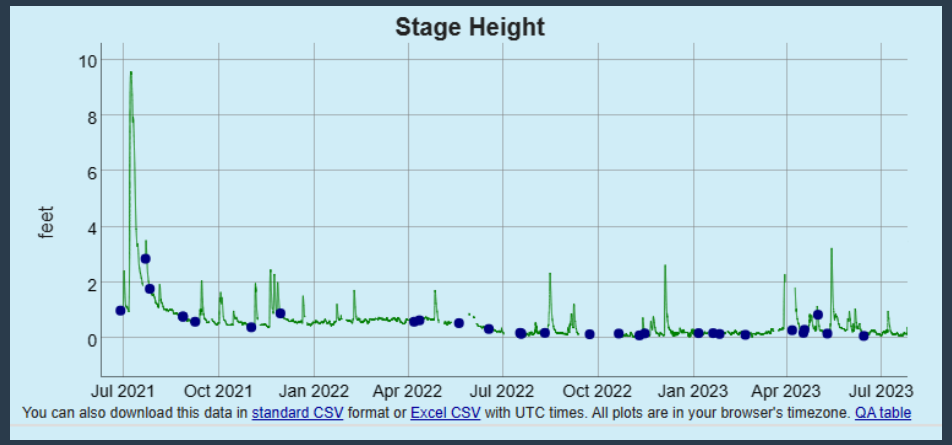


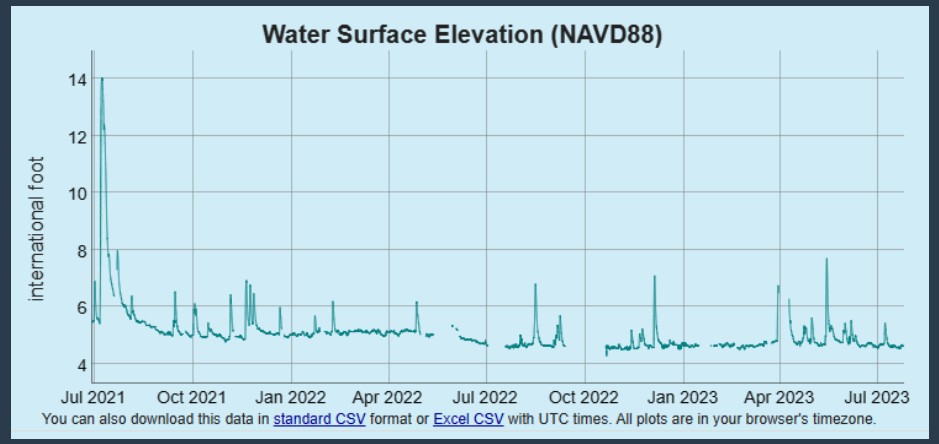
https://rates.maps.arcgis.com/apps/instant/basic/index.html?appid=1401b51cf4e64254b508351123910cc9

Interactive Time-Series Data:

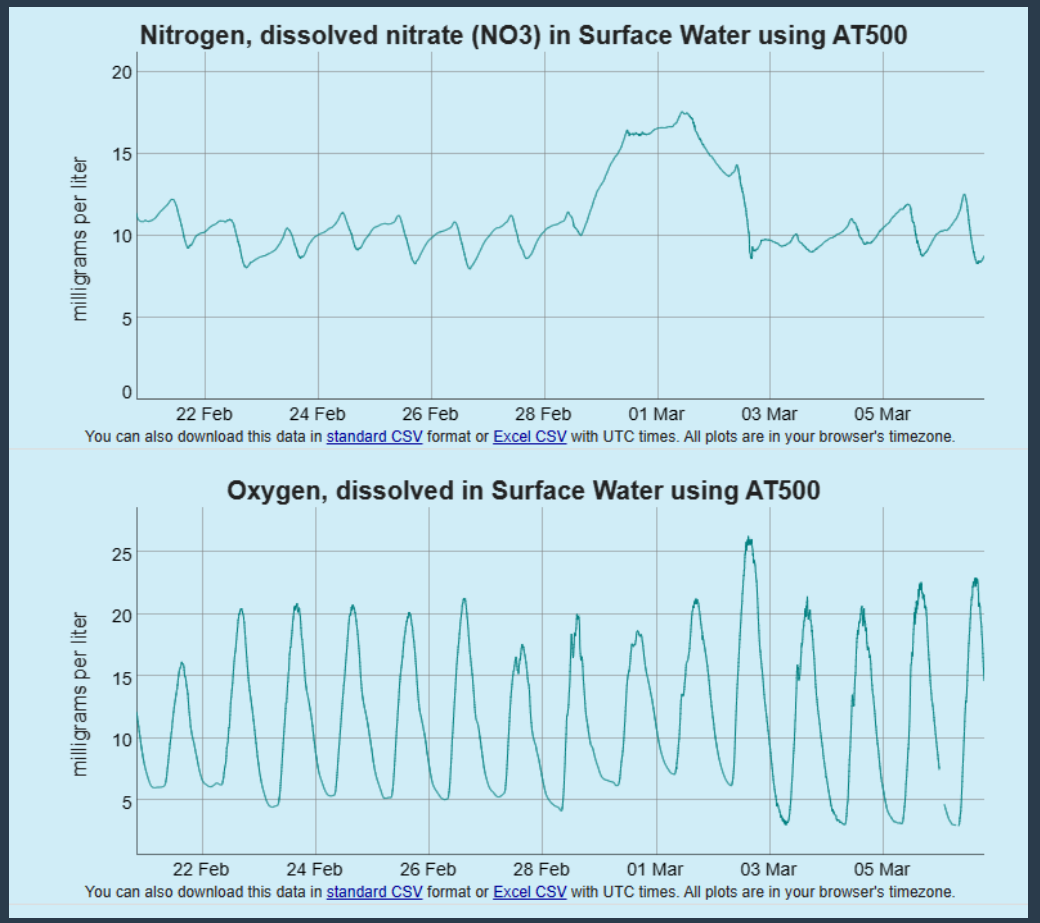
http://rths.us/twdb.cgi ; http://rths.us/reonrgv.cgi

Water surface (on visual gage / vs. sea level):





Water Quality:



Cross Channel Surveys

- Will establish benchmarks at each station and determine elevations (NAVD88) of water level gages
  - Necessary to report stage as water surface elevation
- Cross Channel Surveys- applicable to hydraulic model development (e.g. HEC-RAS)
- Contract/Task Orders have been executed with local engineering/surveying firms
  - Surveys beginning at commissioned stations in March 2024

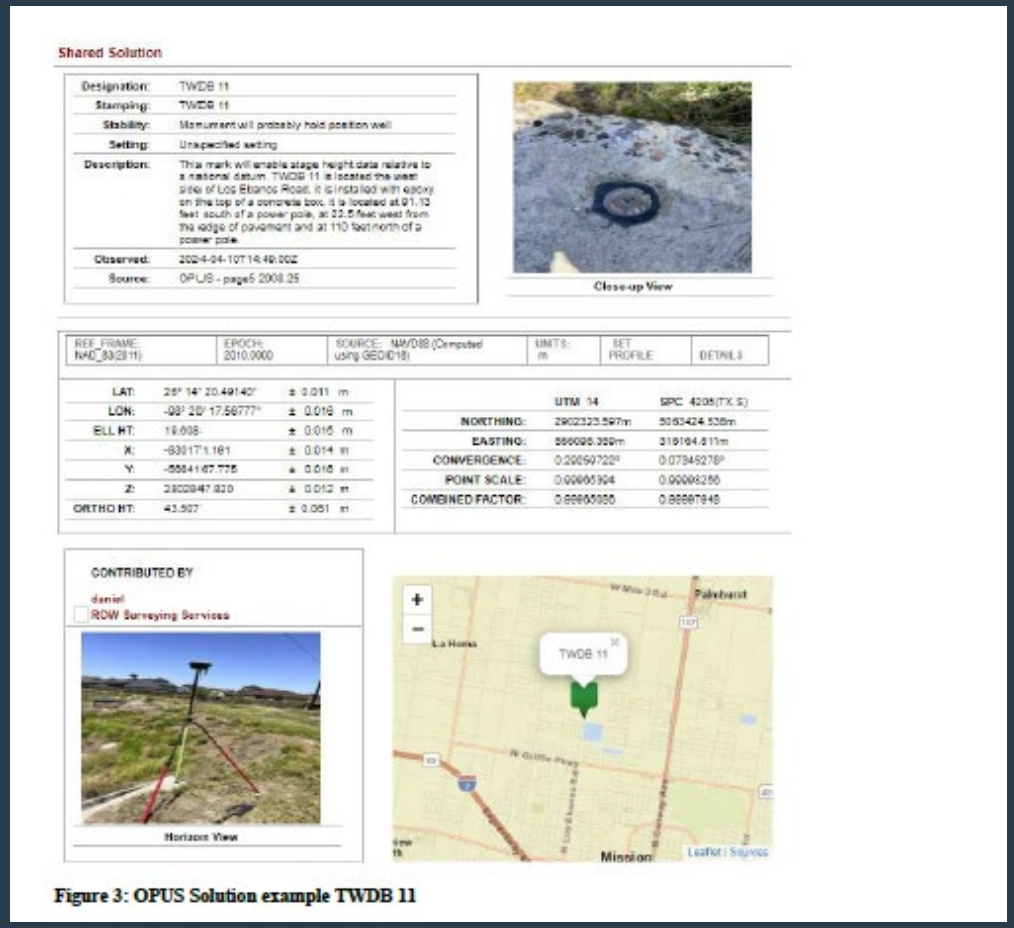
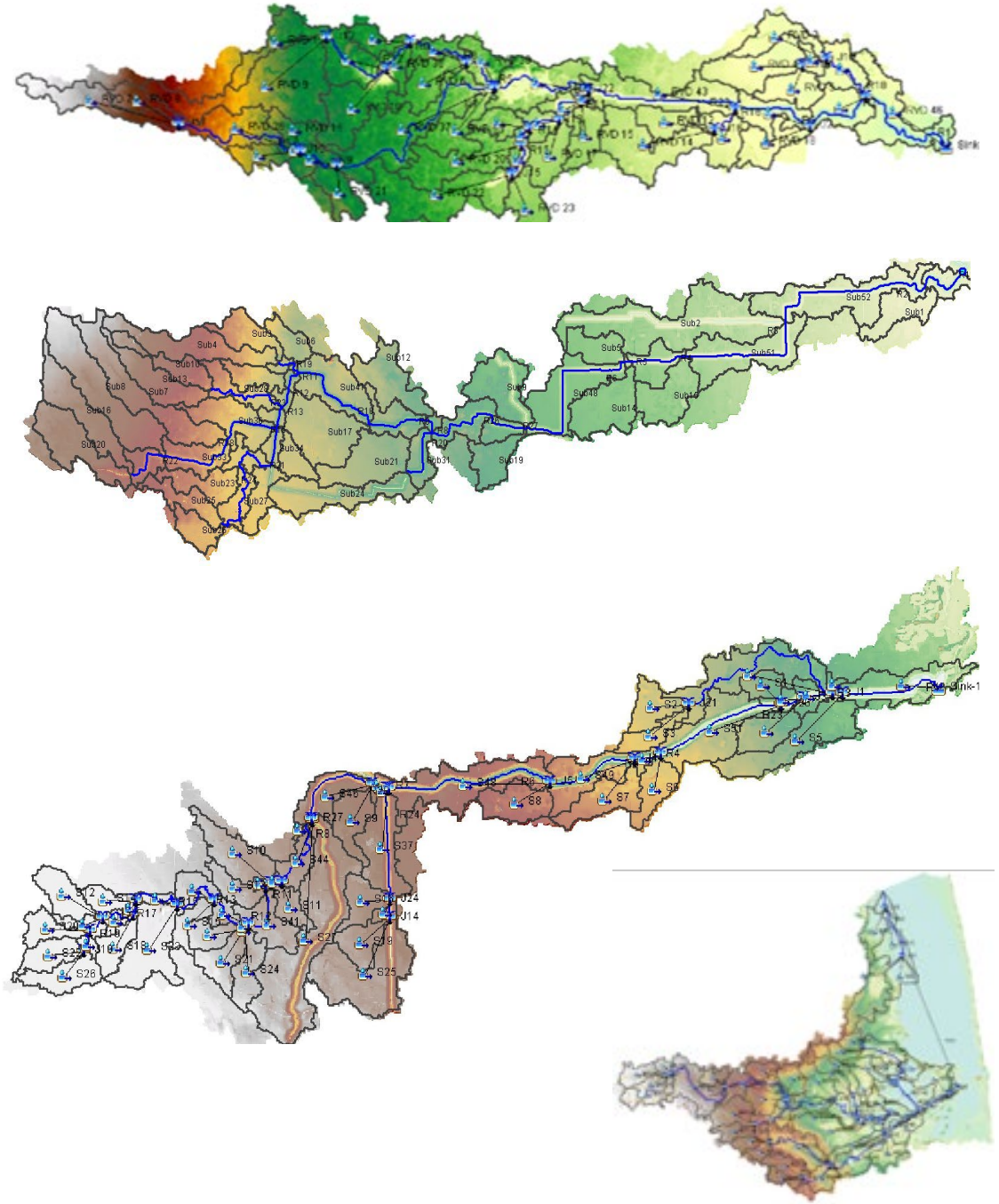


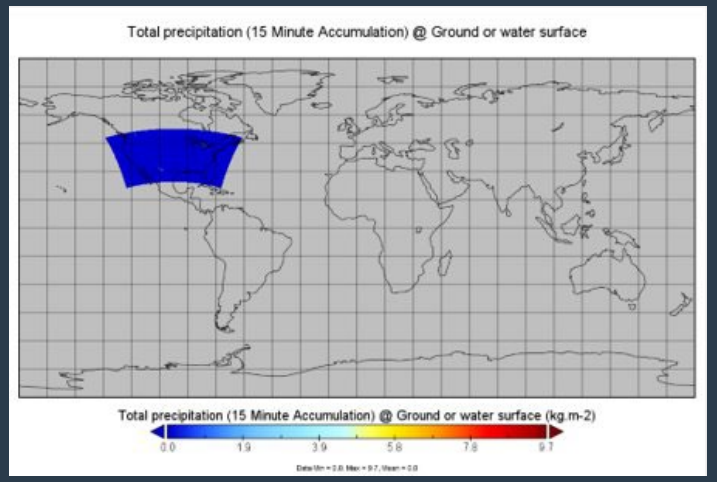
Figure 3: OPUS Solution example TWDB 11

Tier 1 Modeling HEC-HMS

- Hydrologic Model - HEC-HMS
  - Precipitation Data:
    - NOAA Frequency Storm Events
      - 10- year
      - 50- year
    - NOAA Grid Data
  - 2019 Land Cover Data from Texas Natural Resources Information System (TNRIS)
  - 2018 LiDAR-Terrain data



Tier 1 Modeling rtsPy (documented code available at https://github.com/jlgutenson/rtsPy)

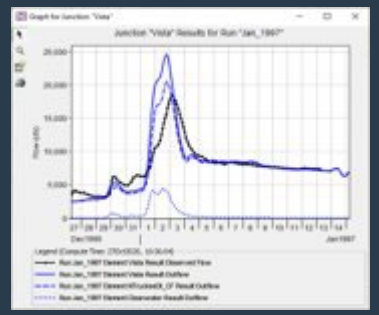


~86 GB downloaded daily

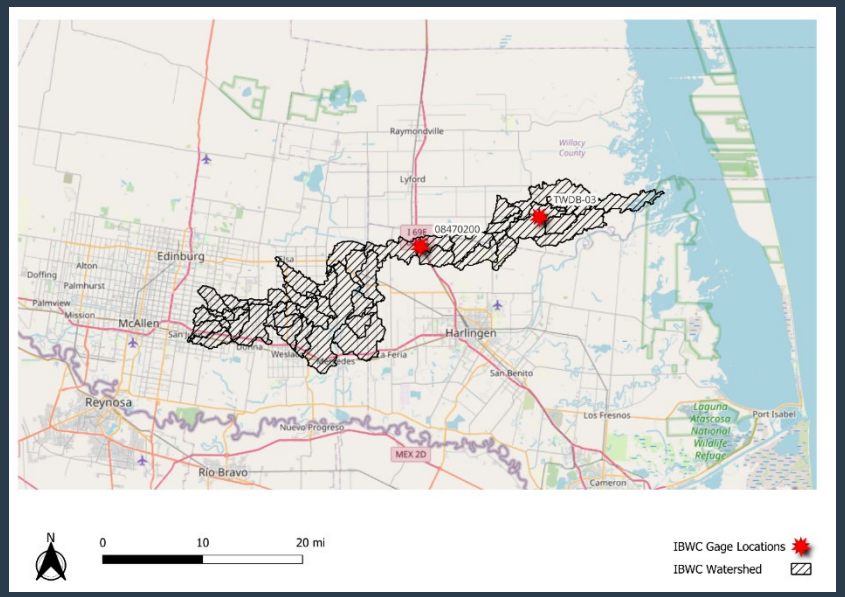
High Resolution Rapid Refresh (HRRR) Meteorological Forecasts

rtsPy

USACE HEC Libraries



15-Hour Lead-Time Hydrologic Forecast in HEC DSS Format Ready for Tier II (HEC-RAS) integration

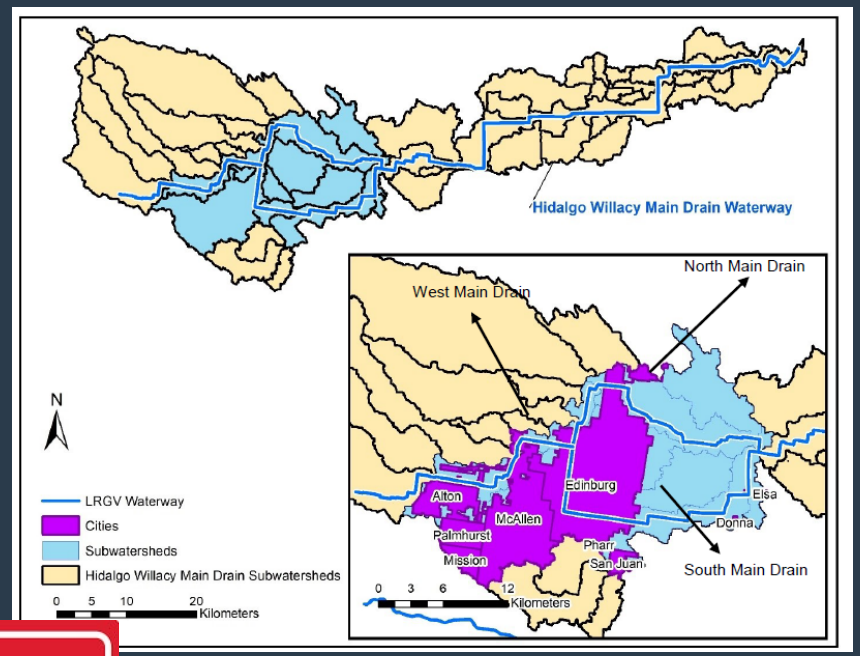


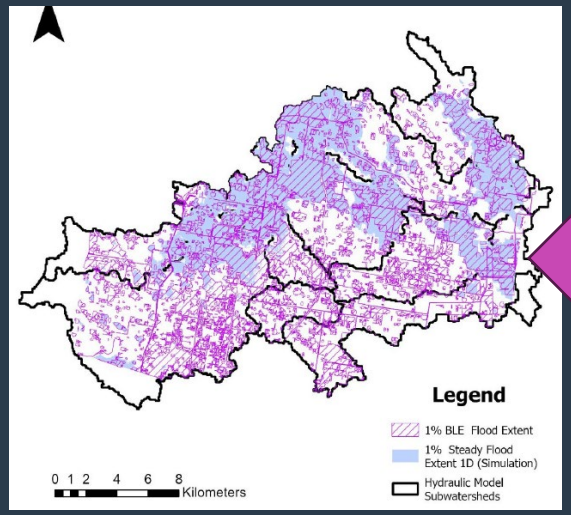
Observations (RTHS and Otherwise)

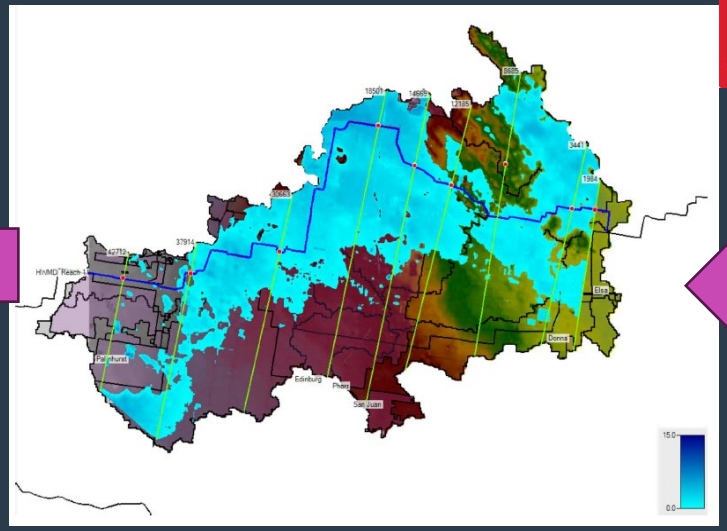
Updates Hourly

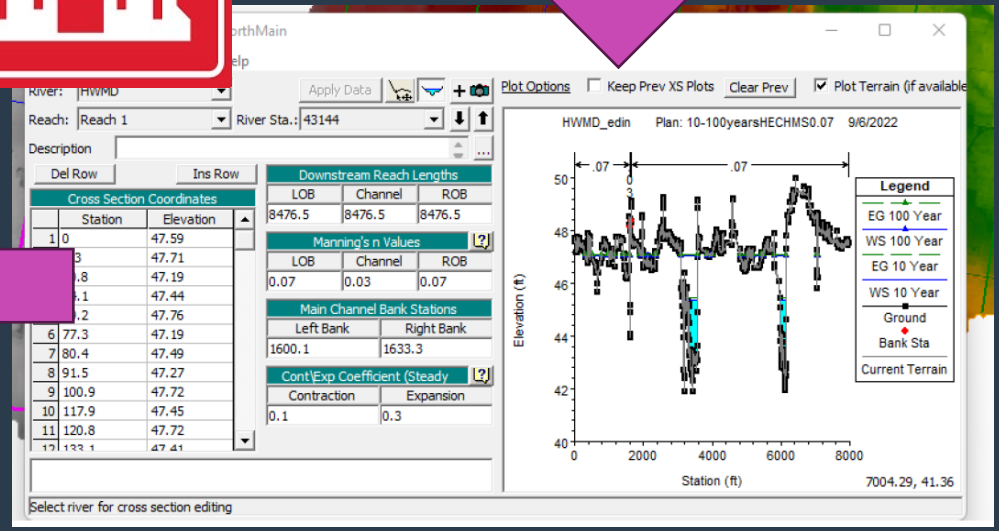
Tier 2 Modeling: HEC-RAS (Linda)

- HEC-RAS Model Development/Validation
  - Six sub-regional models
  - 1.2.3.1.(1-6): Development (Completed 2022)
    - Flow Data (Boundary/initial conditions)
    - Geometry Data (Features / terrain data)
  - 1.2.3.2.(1-6): Validation (Completed 2022)



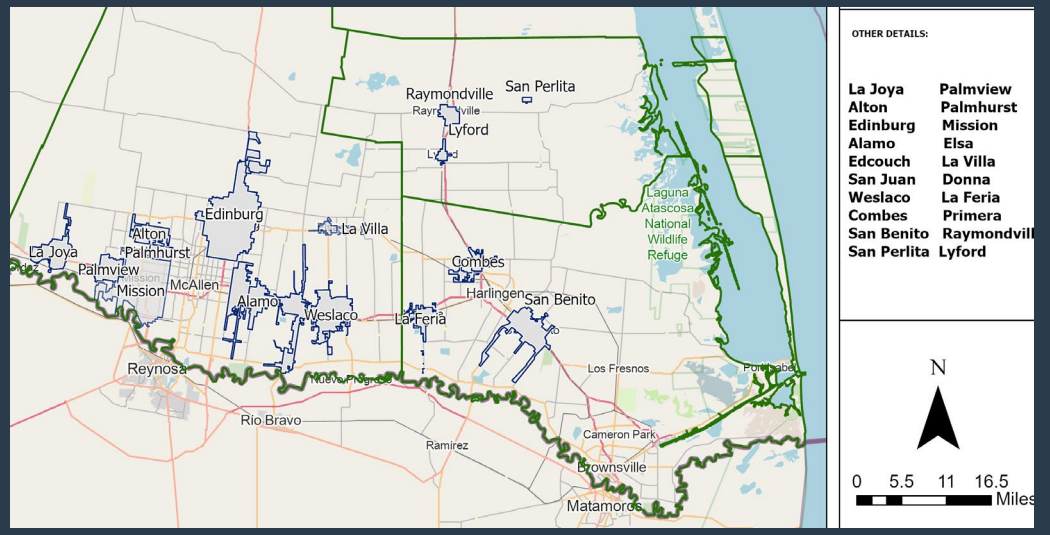


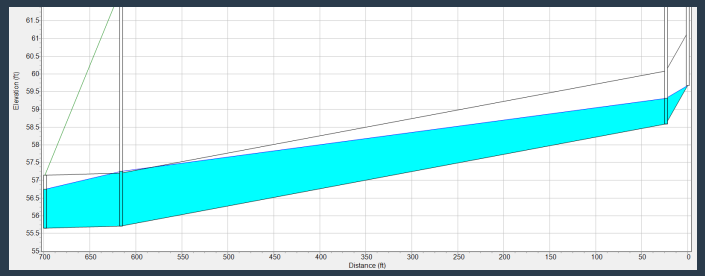




Tier 3 Modeling: SWMM

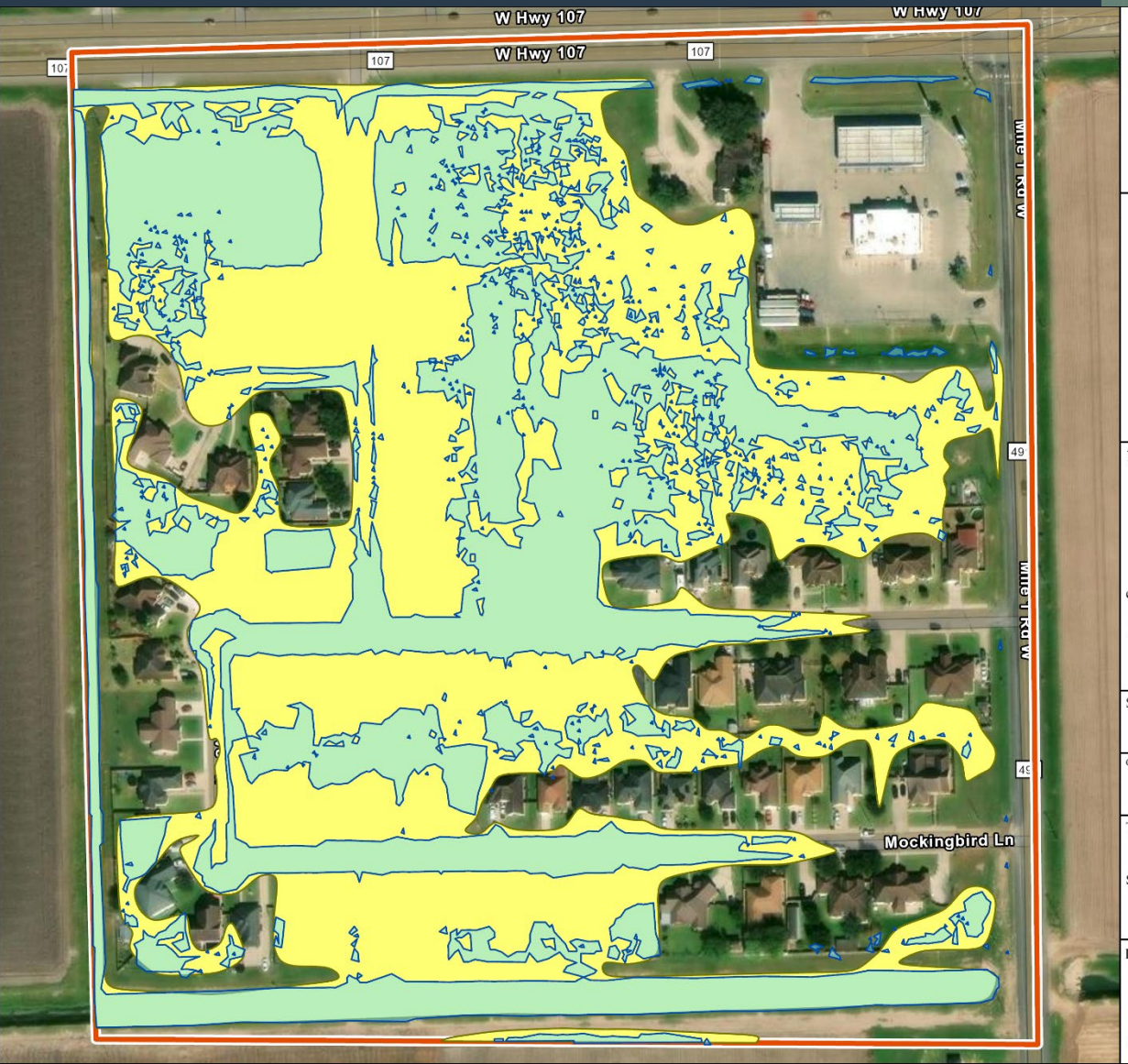
- EPA Storm Water Management Model (SWWM)
- SWMM Model Development/Validation
  - Twenty urban models
  - 1.2.4.1.(1-20): Development (Completed)
    - Outreach to LRGV Municipalities
    - Identification of Flood-Prone Areas
    - Identification and Application of Available Data
    - Preliminary Model Development
      - Automated Tools
  - 1.2.4.2.(1-20): Validation (Ongoing Completed)
    - Incorporate Hydraulic Asset Data
    - Generation of SWMM-Based Flood Maps
      - Compare with local reports of flooding
      - Compare with BLE (HEC-RAS)
    - Assess conduit flow rates and water levels





Tier III Modeling

CITY OF LA VILLA MODEL VALIDATION



- City of La Villa after strong storm affectations in June 2019. Source: City of La Villa.

Task 2 Drainage System Characterization and Project Assessments

- Subcontracts with Cameron and Hidalgo Counties executed for Task 2
  - July 2024
  - Subrecipient Aggreements
    - Cameron County-RATES executed
- Characterization and Assessments will be conducted for 20-25 project areas in Cameron, Hidalgo, and Willacy Counties
- Subtask
    - 2.2.1 Obtain and Review Existing Data
    - 2.2.2 Existing conditions Model Report
    - 2.3.1 Flood Mitigation Solution
      - May include: no-action, administrative controls, physical controls
    - 2.3.2 Solution mitigation
      - Will include costs benefit analysis
      - Preliminary Engineering Reports
      - Prerequisite for funding opportunities (e.g. design and implementation)

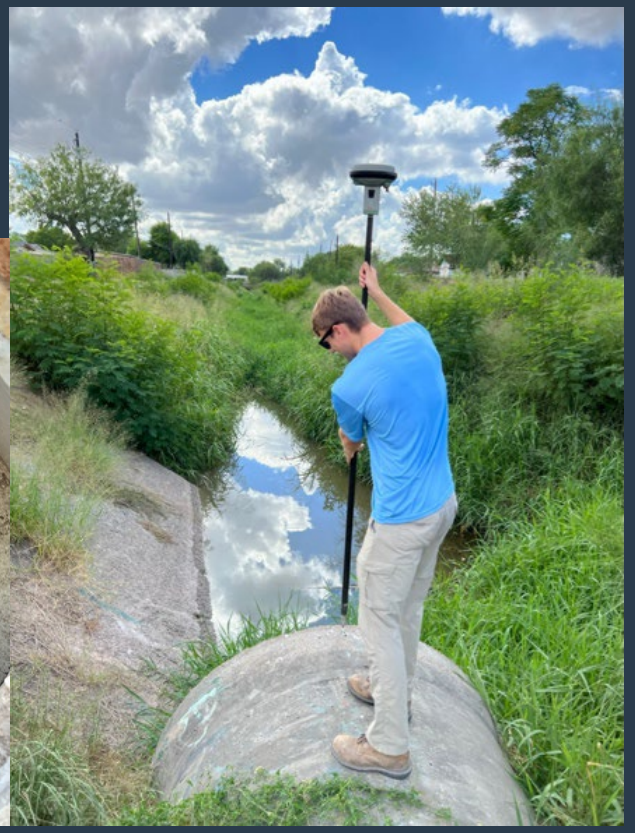
Project Status

- RTHS entering year 2 of 3 years of operation
- Modeling deliverables have been completed
  - Tiers I, II, and III
- Efforts now shifting toward Task 2 Drainage Characterizations and Assessments
- Continuing FIF Funding Efforts by the LRGV communities

Tier 3 Modeling: SWMM

Stormwater Hydraulic Assets Data Integration and SWING Tool

- FIELD DATA COLLECTION
- STORMWATER INFRASTRUCTURE GEODATA TOOL
- RESULTS: https://arcg.is/198915



- Storm Water Infrastructure Geodata (SWING) Tool to map hydraulic assets.
- Data Collection. San Benito in October 2019.

Continuing FIF Funding Efforts- SFY 2024-2025 Abridged Applications

- **Cameron County- Flood Warning System, Planning, Operation and Maintenance**
  - Project Type: Flood Management Strategy
  - Project leverages monitoring infrastructure commissioned throughout LRGV through LRGVDC FIF project and others
  - Spans Cameron, Hidalgo, and Willacy Counties
- Developing a Regional Master Drainage Plan for Cameron and Hidalgo Counties
  - Project Type: Flood Management Evaluation
  - Project will leverage work from LRGVDC and other regional FIF Cat. 1 projects to establish a Regional Master Drainage Plan that develops flood risk maps and proposes CIPs to address flood risks
  - Spans Cameron and Hidalgo Counties

Questions ?

RESEARCH, APPLIED TECHNOLOGY EDUCATION AND SERVICE
Rio Grande Valley

Thank You

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