

Watershed-Based Planning Elements A and B



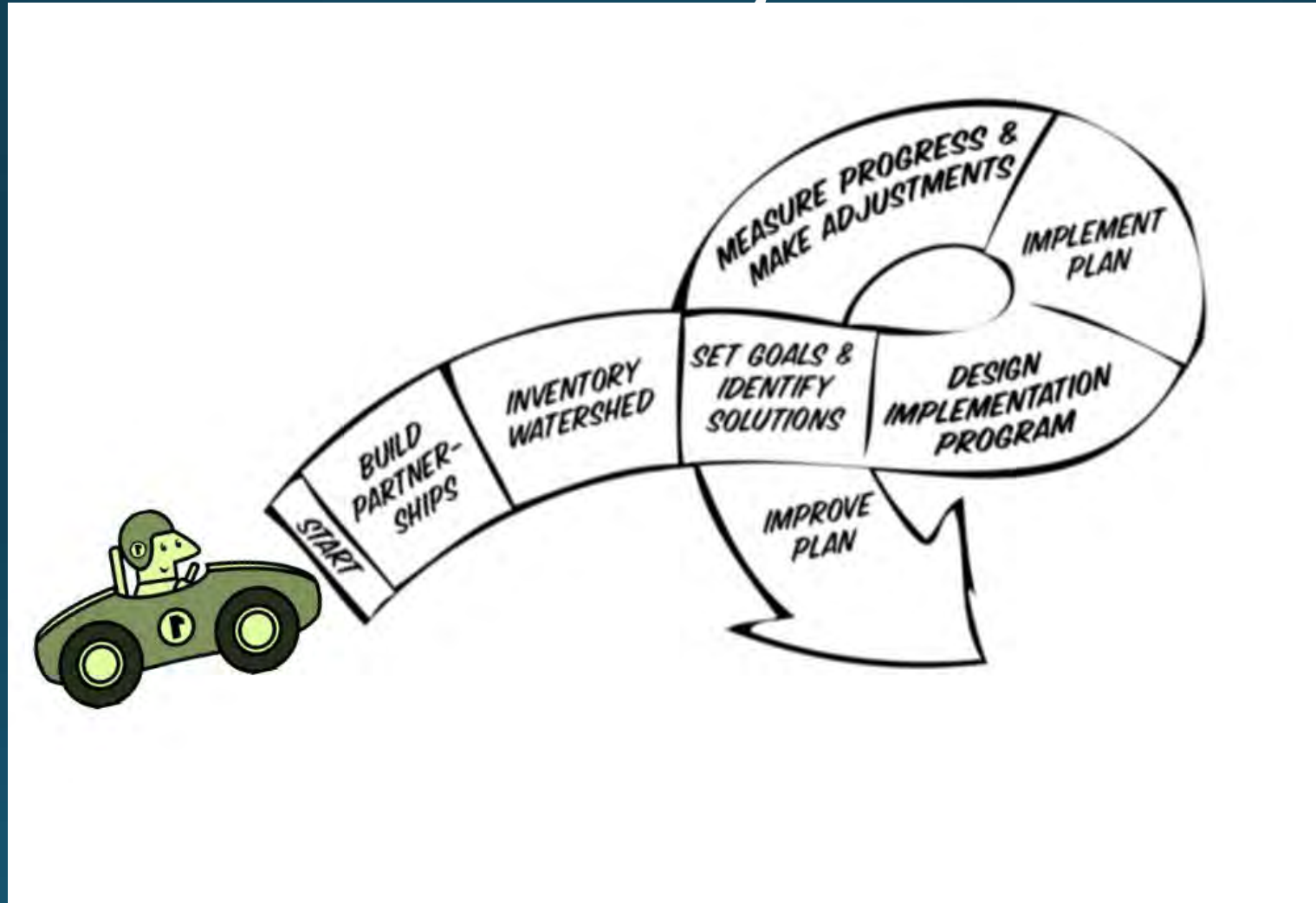
Tim Cawthon
Geographic Information Systems Specialist
Nonpoint Source Program
Texas Commission on Environmental Quality

Watershed Protection Plans

- A voluntary, comprehensive planning document that is developed with stakeholder input
- Provides management measures to reduce nonpoint source pollution
- Implementation of 9-element WPPs prioritized for funding



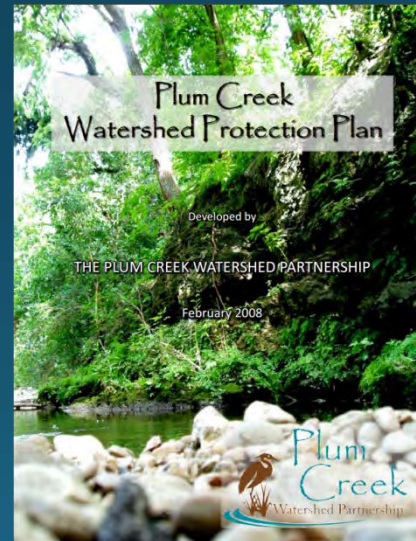
Watershed Planning Process



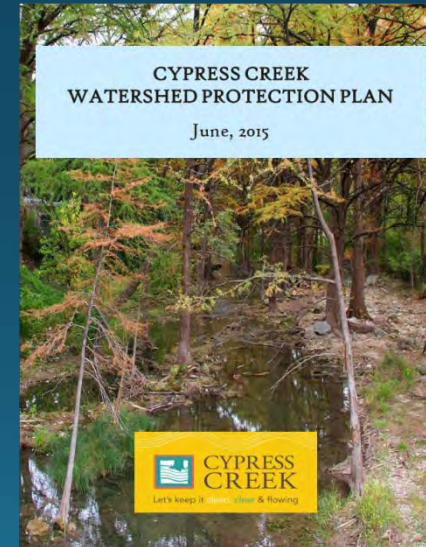
Source: EPA Handbook for Developing Watershed Plans to Restore and Protect Our Waters

Watershed Protection Plans

- Meets the Nine Elements listed in EPA's *Handbook for Developing Watershed Plans*



Restoration

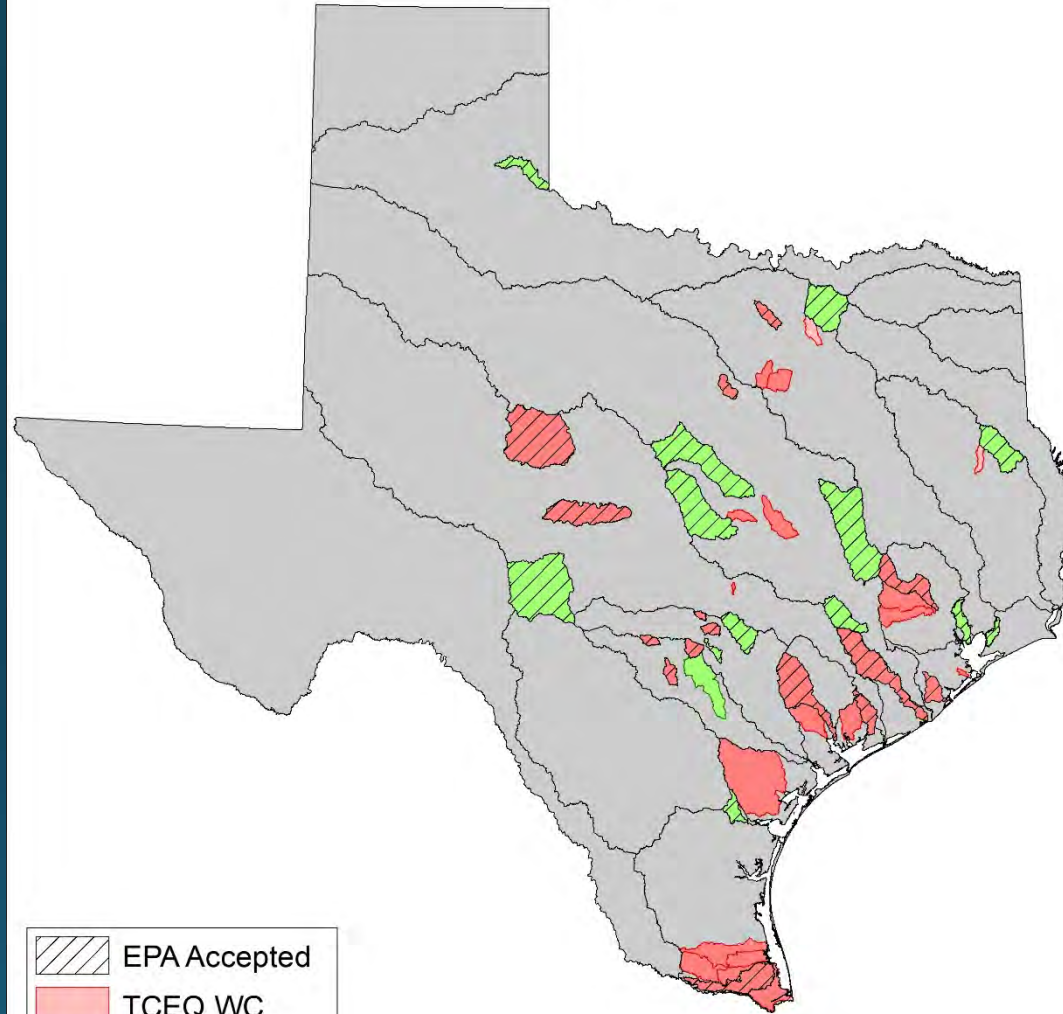






Protection

EPA's 9-Elements

- A- Identify causes and sources of pollution
- B - Estimate pollutant loading into the watershed and the expected load reductions
- C - Describe management measures that will achieve load reductions and targeted critical areas
- D - Estimate amounts of technical and financial assistance and the relevant authorities needed to implement the plan
- E - Develop an information/education component
- F - Develop a project schedule
- G - Describe the interim, measurable milestones
- H - Identify indicators to measure progress
- I - Develop a monitoring component

Texas Nonpoint Source Program
Nine-Element Watershed Protection Plans
March 2019

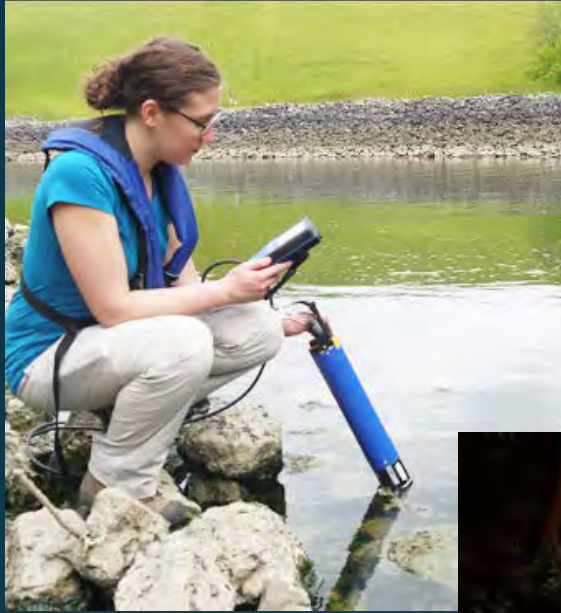


-  EPA Accepted
-  TCEQ WC
-  TCEQ WPP
-  TSSWCB WPP

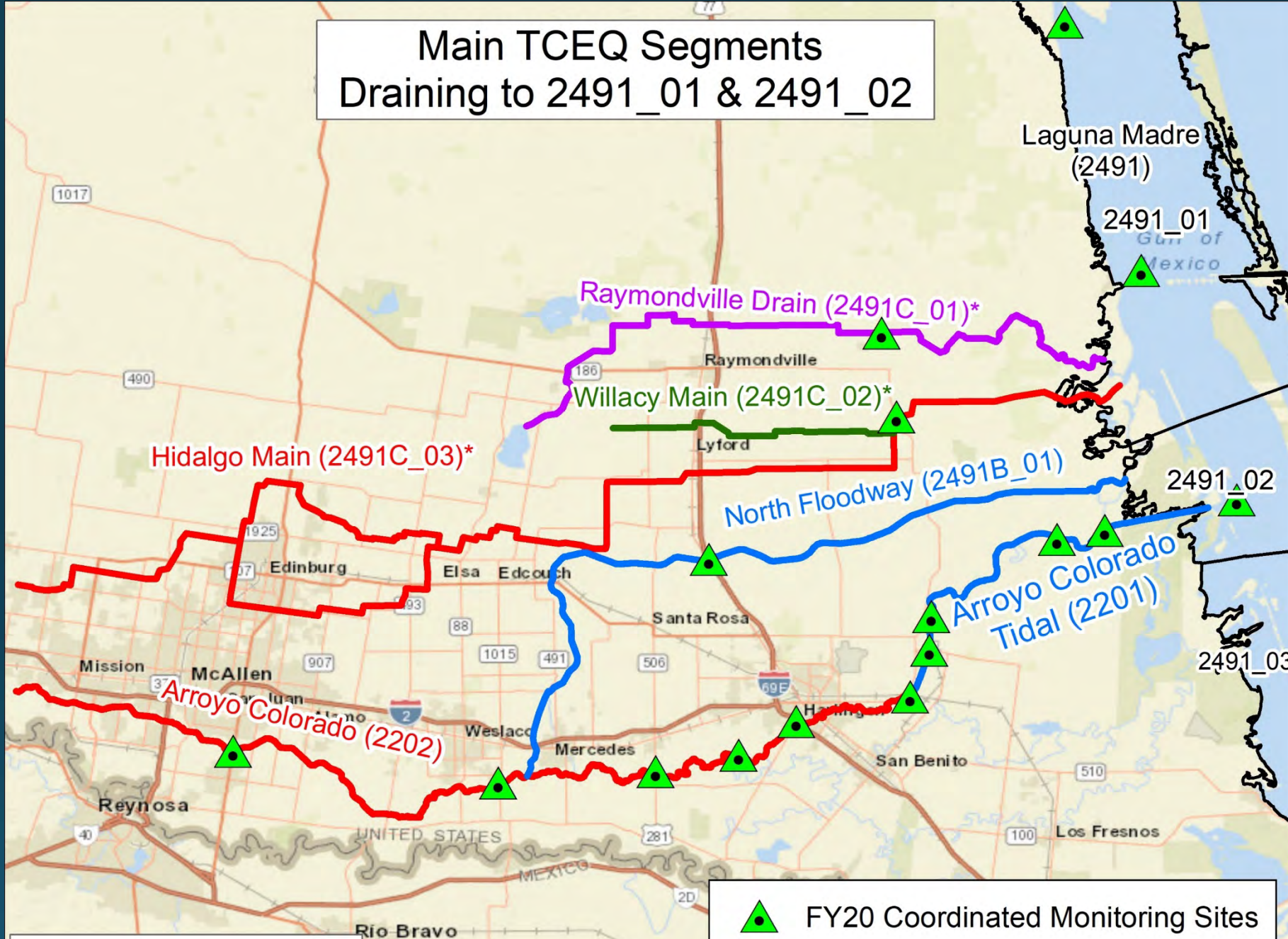
WC = Watershed Characterization
WPP = Watershed Protection Plan


This map was generated by the Water Quality Planning Division of the Texas Commission on Environmental Quality. This product is for informational purposes and may not have been prepared for or be suitable for legal, engineering, or surveying purposes. It does not represent an on-the-ground survey and represents only the approximate relative location of property boundaries. For more information concerning this map, contact the Water Quality Planning Division at 512-239-0845.

Watershed Characterization



Main TCEQ Segments Draining to 2491_01 & 2491_02



 FY20 Coordinated Monitoring Sites

*Draft 2018 Integrated Report

Sources: ESRI HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, © OpenStreetMap contributors, and the GIS User Community

Arroyo Colorado WPP

- WPP completed in 2007. Update completed in 2017
- Since 2010, over \$4.8 million Clean Water Action Section 319(h) federal funds awarded
- Active 319 projects being funded
 - Watershed Coordinator
 - Los Fresnos low impact development
 - Urban low impact development research
 - OSSF inventory and education
- Lots of BMPs completed and ongoing!
 - Contact the Partnership to learn more
<http://arroyocolorado.org/>



Update to the
Arroyo Colorado
Watershed Protection Plan

Watershed Characterization

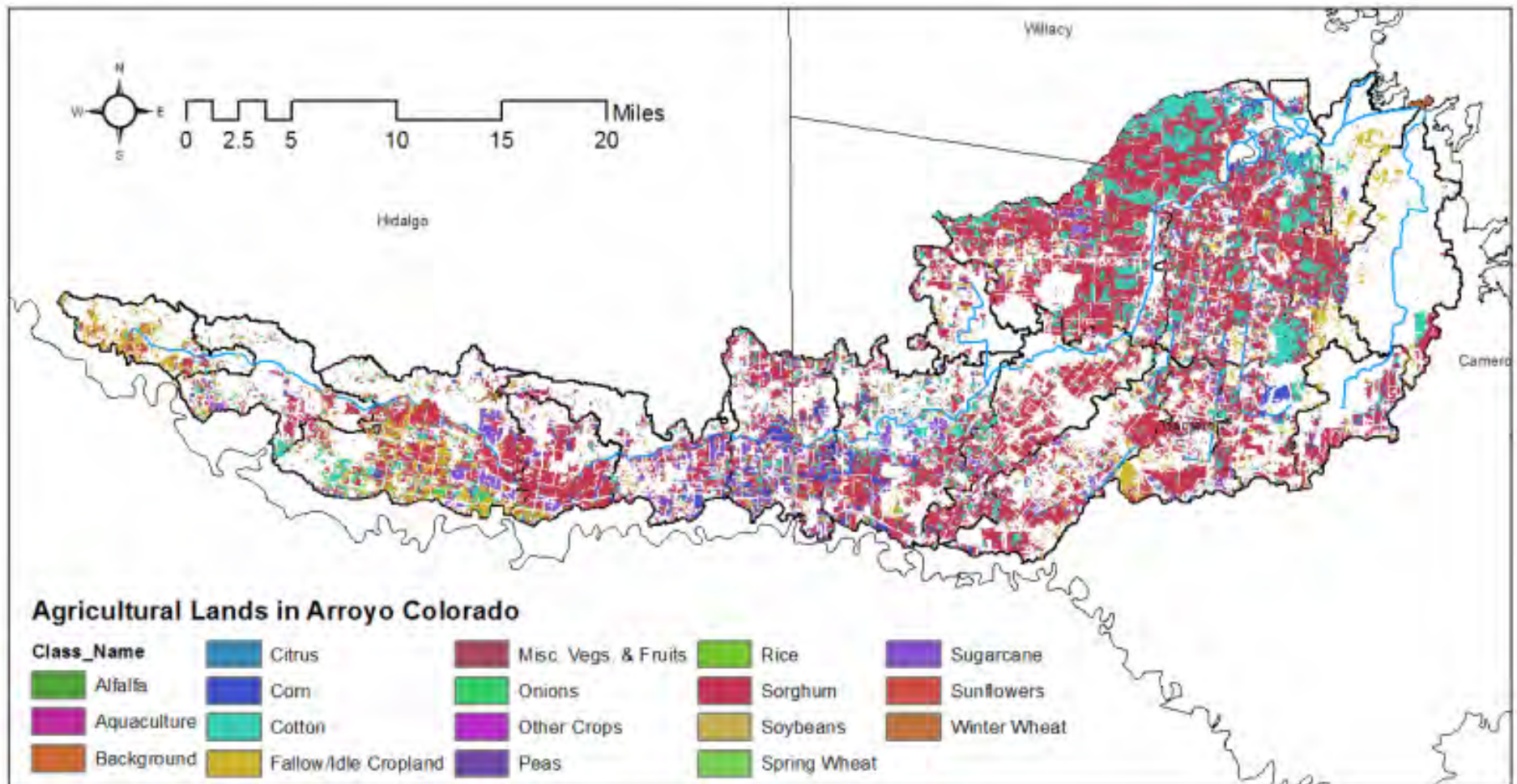


Figure 5.1. Land use map of Arroyo Colorado showing types of cropland

Watershed Characterization



Figure 5.2. Permitted wastewater outfalls within the Arroyo Colorado watershed

Watershed Characterization

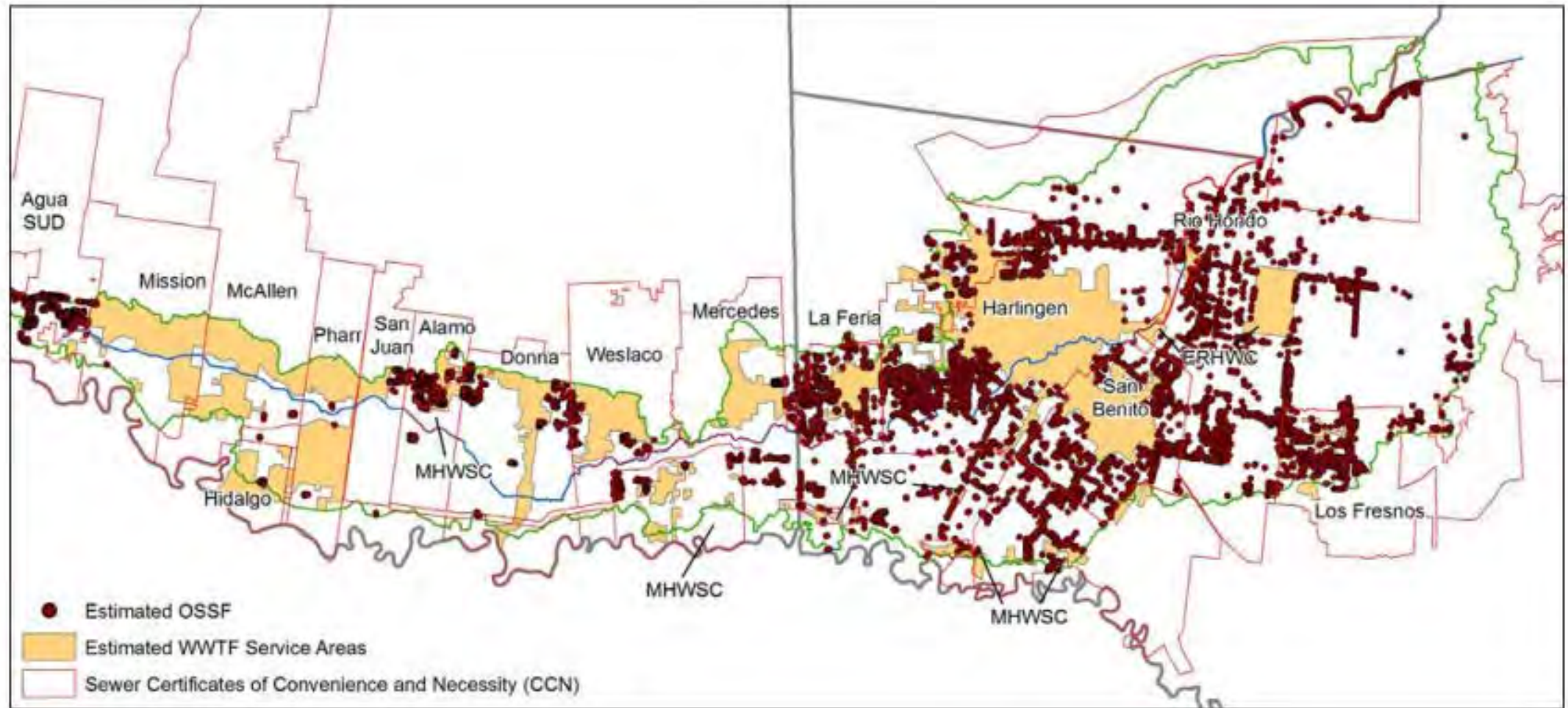


Figure 5.11. Estimated OSSFs

Watershed Characterization

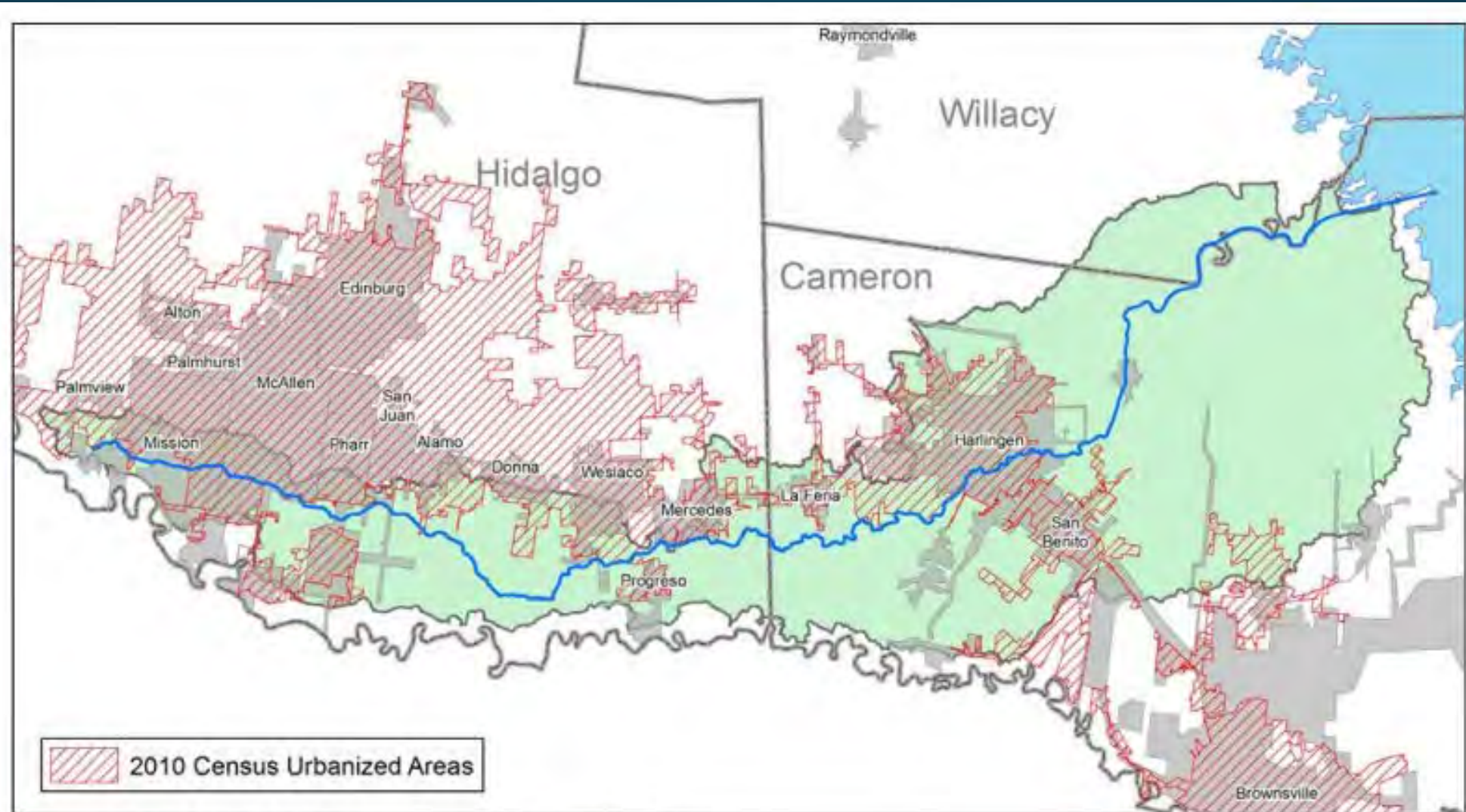


Figure 5.15. Map of 2010 Census urbanized areas

Source Areas

- Identify source areas contributing water flow and pollution

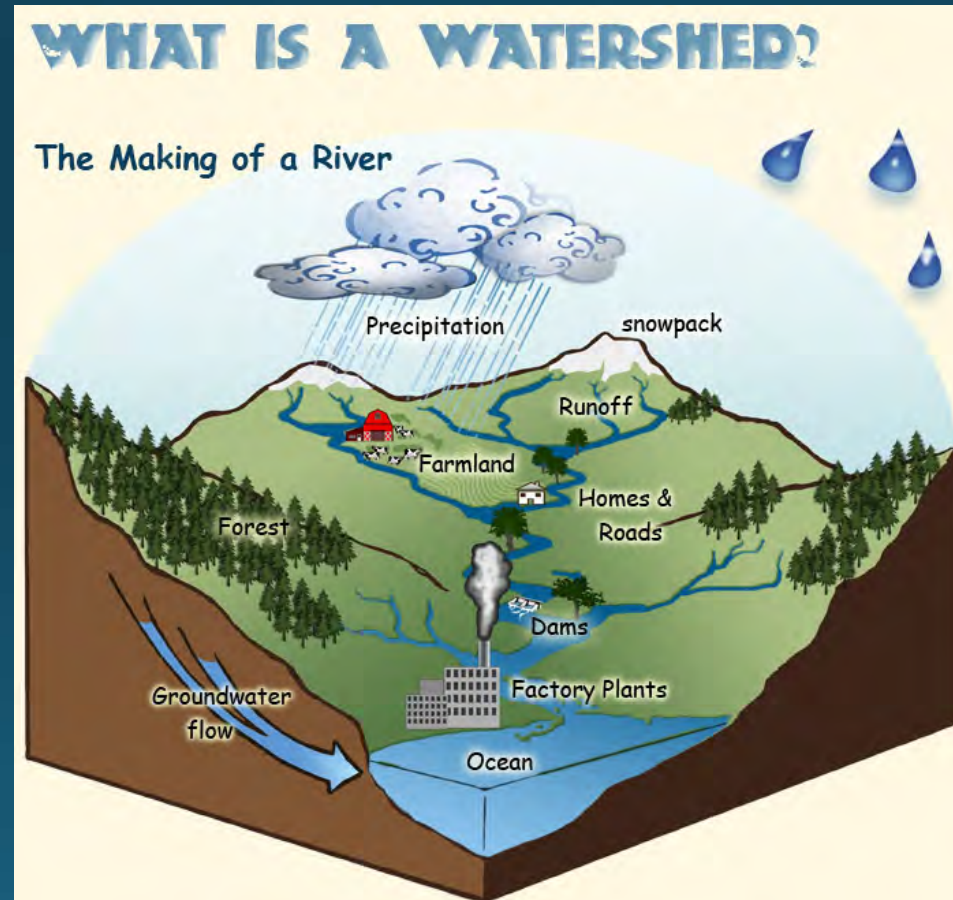


Image Credit. A. Vicente, U.S. Forest Service.

Watershed Characterization

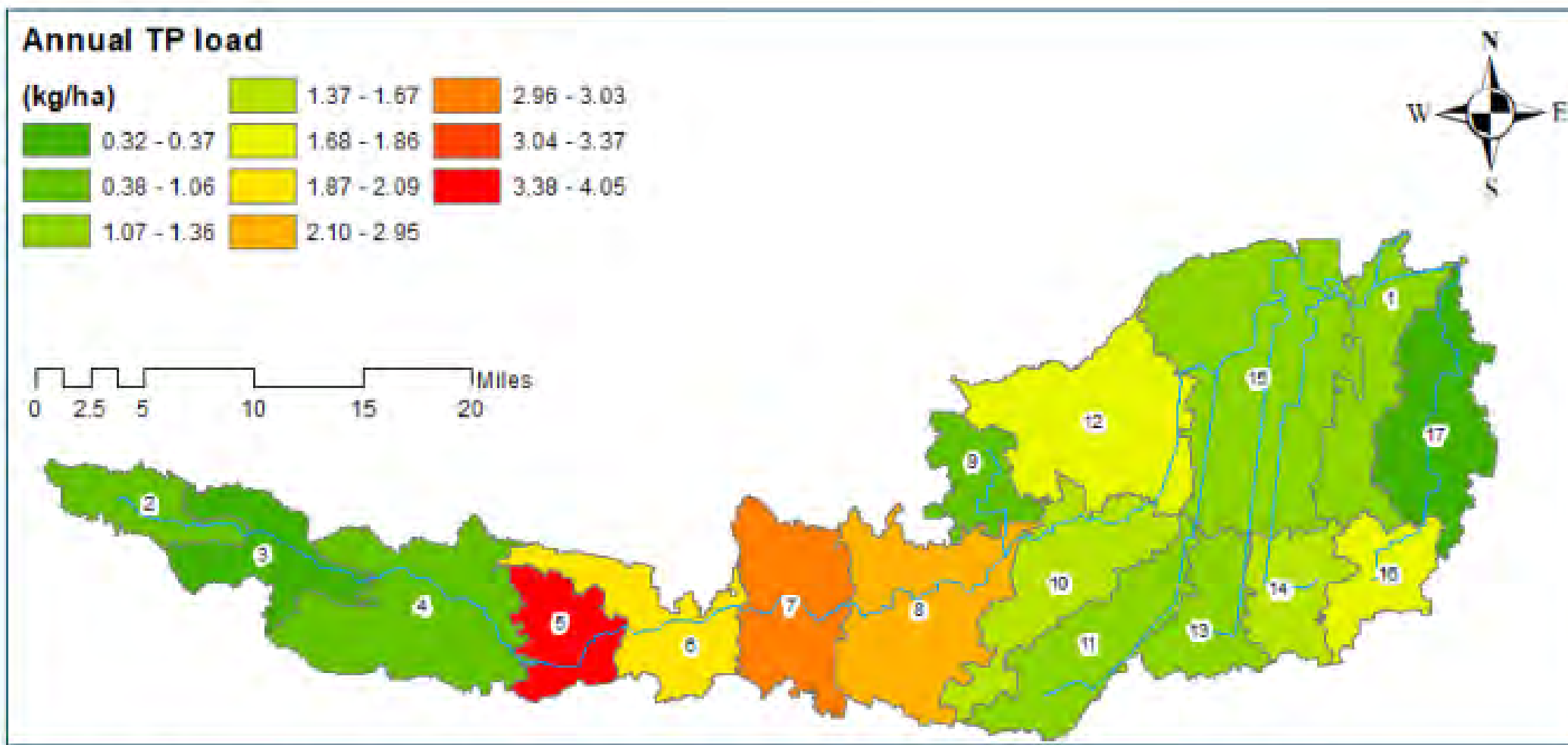
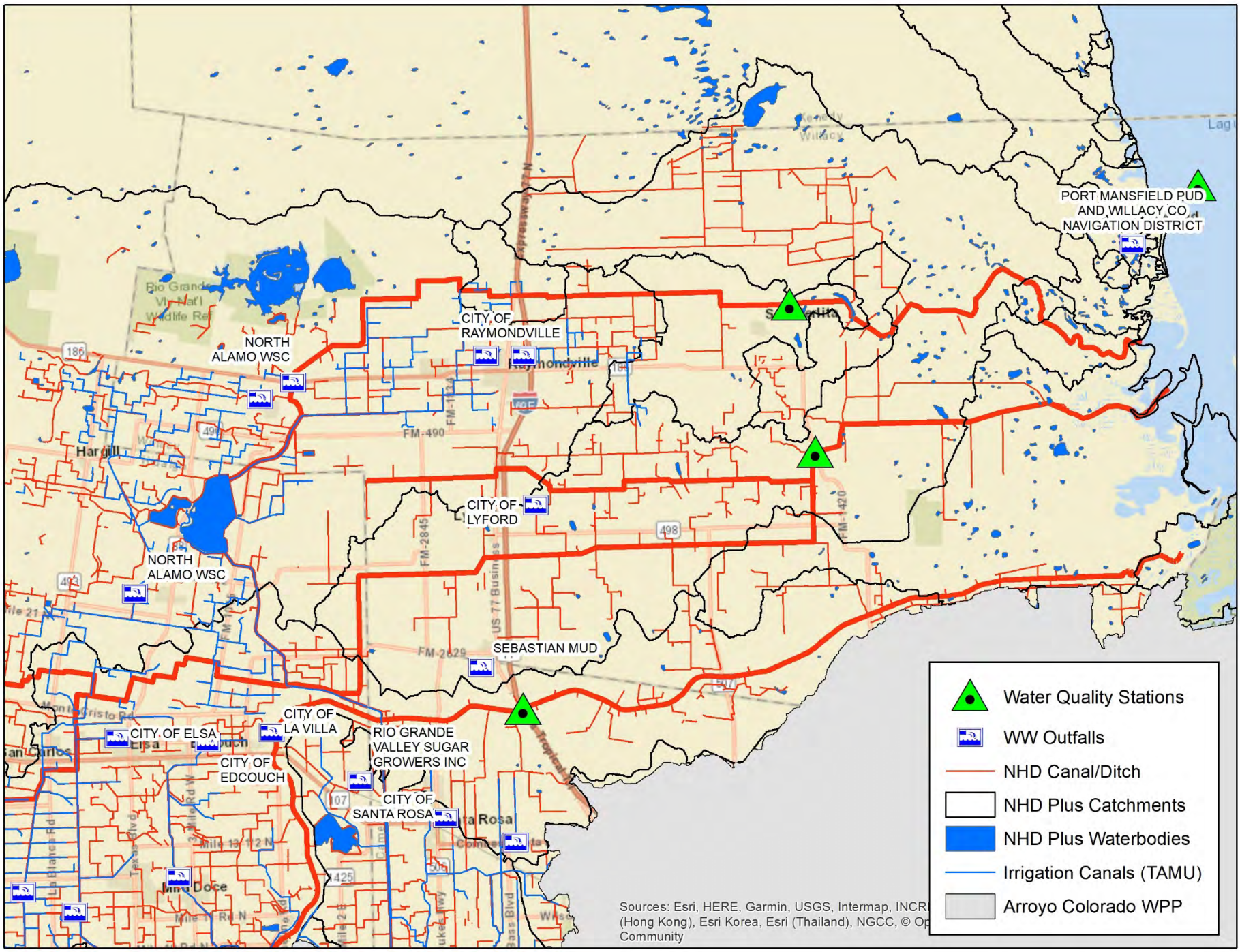


Figure 6.7. Estimated total phosphorus export (kg/ha) from upland nonpoint sources by subbasin








Complicated Drainage

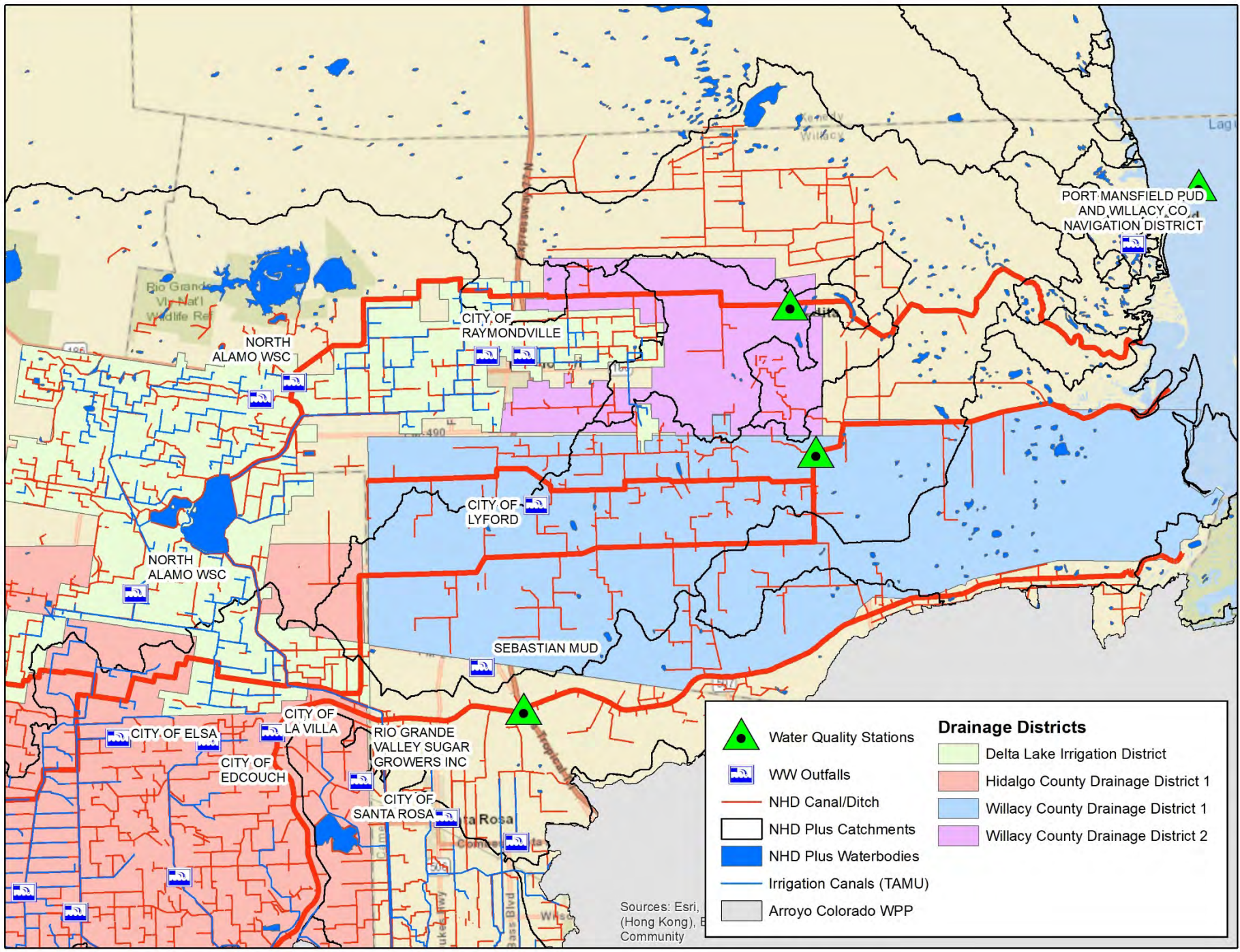
- How do you define source areas/subbasins?





Sources: Esri, HERE, Garmin, USGS, Intermap, INCR (Hong Kong), Esri Korea, Esri (Thailand), NGCC, © OpenStreetMap contributors, and the GIS User Community

	Water Quality Stations
	WW Outfalls
	NHD Canal/Ditch
	NHD Plus Catchments
	NHD Plus Waterbodies
	Irrigation Canals (TAMU)
	Arroyo Colorado WPP



	Water Quality Stations	Drainage Districts
	WW Outfalls	Delta Lake Irrigation District
	NHD Canal/Ditch	Hidalgo County Drainage District 1
	NHD Plus Catchments	Willacy County Drainage District 1
	NHD Plus Waterbodies	Willacy County Drainage District 2
	Irrigation Canals (TAMU)	
	Arroyo Colorado WPP	

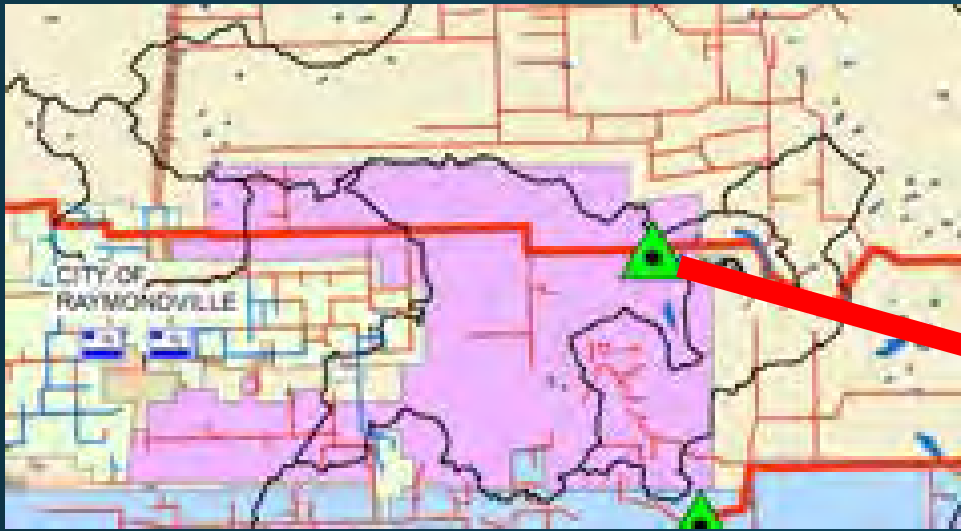
Sources: Esri, (Hong Kong), E Community

Questions?

Tim Cawthon

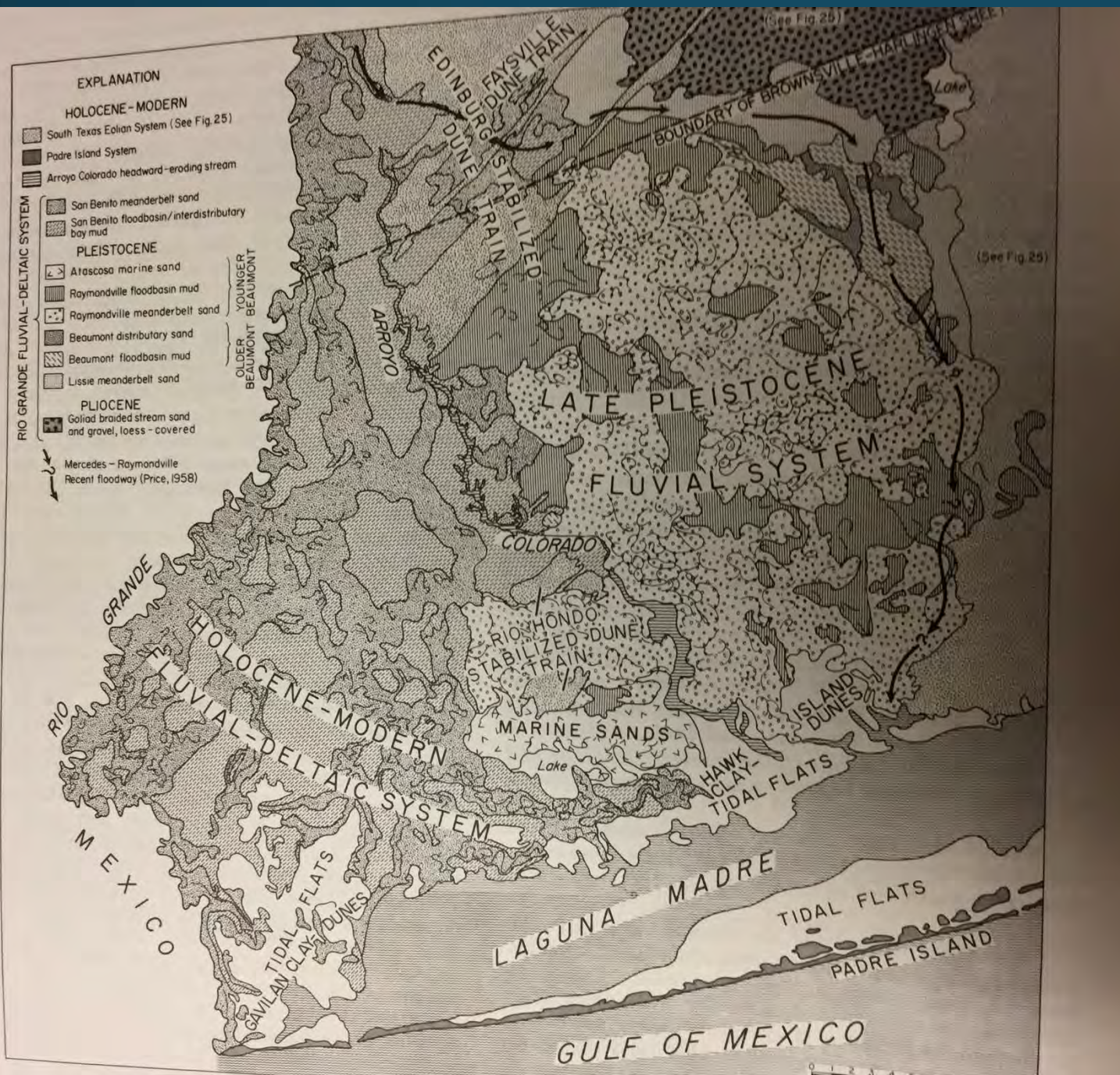
512-239-0845

Tim.Cawthon@tceq.texas.gov



Meander bend scar from ancient Rio Grande Channel




















Environmental Geologic Atlas of the Texas Coastal Zone --Brownsville-Harlingen Area. 1980 Brown, et al



PLEISTOCENE SYSTEMS

FLUVIAL-DELTAIC SYSTEM

-  Meanderbelt sand, little grain preserved, sparse grass
-  Meanderbelt sand, grass-covered, depositional grain well-preserved, entrenched within older fluvial-deltaic sediments
-  Floodplain, overbank mud, including mud-filled abandoned channels and mud-veneered meanderbelt sands, grass-covered
-  Floodplain, mud veneer over meanderbelt sand, little grain preserved, grass-covered
-  Distributary and fluvial sands and silts, including levee and crevasse splay deposits
-  Interdistributary mud, sand veneer, including bay and floodbasin facies
-  Interdistributary mud, including bay, floodbasin, and local abandoned channel facies
-  Marine deltaic sand and/or reworked deltaic and fluvial facies, may be locally veneered by thin lacustrine mud or loess (silt)
-  Mud veneer distributed locally over marine deltaic sand and/or reworked deltaic and fluvial facies
- *  Abandoned channel and course, mud-filled, locally some fresh-water marsh cover (Pleistocene and Holocene-Modern)
- *  Coastal lake or pond, mud-filled, occasionally flooded (Pleistocene and Holocene-Modern)
- *  Clay-sand dunes (locally called gavilans), eolian, accretionary, active, local sparse grass, wind-tidal flat or playa source common (Modern)
- *  Clay-sand dune complexes, eolian, inactive, grass- or brush-covered (Holocene-Modern)
- *  Sand sheet, strong relict grain of base-leveled dunes, grass-covered
- *  Sands and silts, caliche-capped, thin veneer of eolian sand, numerous small circular (karst) depressions (Holocene-Modern)

Local GIS Viewers

- Do an internet search or ask your local GIS experts where to find
- Lower Rio Grande Valley Viewers
 - Arroyo Colorado WPP [Link](#)
 - RATES Viewer [Link](#)
 - Resaca Viewer [Link](#)
 - Hidalgo County Drainage District #1 [Link](#)
 - IBWC Water Viewer [Link](#)
 - Cameron County CAD [Link](#)
 - City of Pharr [Link](#) McAllen [Link](#) Brownsville [Link](#)
 - Probably more...

GIS Layers available online

- Hidalgo County Drainage District [Link](#)