Developing and Implementing Total Maximum Daily Loads

Sandra A. Alvarado

Total Maximum Daily Load Program
Water Programs, Chief Engineer's Office
Texas Commission on Environmental Quality

Presentation Overview

- TMDL Program Overview
  - Who? What? Where? When? Why?
- Historical Data Review
  - Aransas River – tidal and above tidal
  - Mission River – tidal and above tidal
  - Copano Bay
- Where are we currently in the TMDL development process and where we will go from here.

Texas Water Quality Management Program

- The federal Clean Water Act and Texas Law define a water body as impaired if it does not meet the criteria for support of its beneficial uses, as defined in the Texas Surface Water Quality Standards.
- Impaired waters are identified every two years in the Texas Water Quality Inventory and 303(d) List.
- Texas is required to develop TMDLs for impaired waters.

303(d) Listed Segments

- Mission River tidal (2001)
  - Contact recreation impairment due to elevated bacteria levels
- Aransas River tidal
  - Contact recreation impairment due to elevated bacteria levels
- Copano Bay
  - Oyster water use impairment due to elevated bacteria levels

What Is a TMDL?

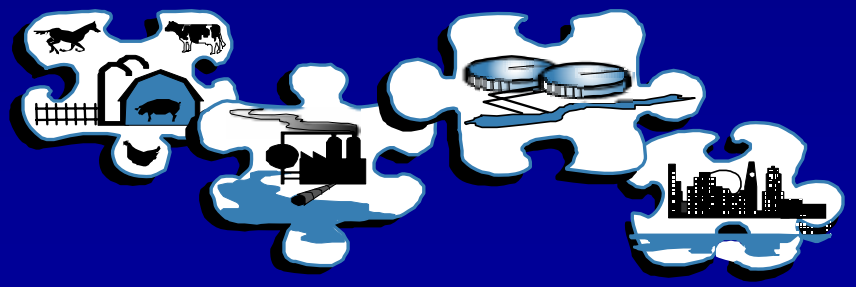
A total maximum daily load (TMDL) is a scientific model that:

- Determines the maximum amount (or load) of pollution that a water body can receive and still attain its uses
- Allocates the allowable load to point and nonpoint sources of pollution

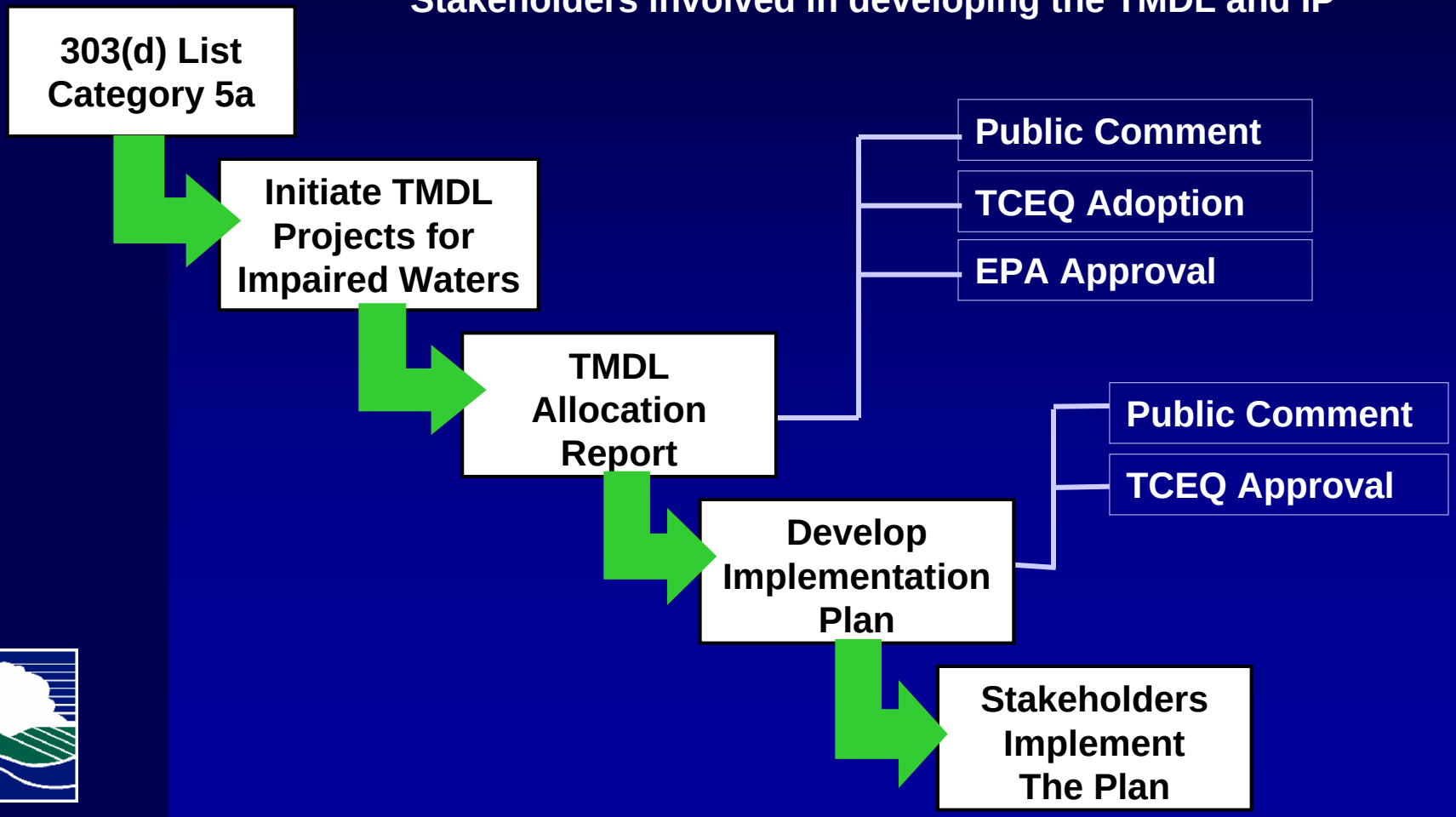
Water Quality Restoration —A Two Part Process

- Establish a total maximum daily load to guide restoration efforts

- Develop and implement a plan to restore water quality, and monitor progress toward achieving the restoration goal



The TMDL/IP Process



Historical Data Review

Segment	Description	Type	Designated Uses	Impairment
2001	Mission River tidal	Tidal stream	Aquatic life, contact recreation, general, fish consumption	Contact recreation
2002	Mission River above tidal	Freshwater stream	Aquatic life, contact recreation, general, fish consumption	None
2003	Aransas River tidal	Tidal stream	Aquatic life, contact recreation, general, fish consumption	Contact recreation
2004	Aransas River above tidal	Freshwater stream	Aquatic life, contact recreation, general, fish consumption	None
2472	Copano Bay/Port Bay/ Mission Bay	Estuary	Aquatic life, contact recreation, general, fish consumption, oyster waters	Oyster waters

Criteria and Indicator Bacteria for the Contact Recreation Use

- Indicator for the contact recreation use in saltwater is Enterococci
- Contact Recreation
  - Geometric mean (GM): 35 cfu/100 ml
  - Single sample (SS): 89 cfu/100ml (Incorrect)

Assessment Criteria for Contact Recreation Use

- Fully supporting if geometric mean < criterion and 25% of time or less, concentrations are < single sample criterion.

- Not supporting if geometric mean > standard, or if concentrations are > single sample standard more than 25% of time.

Tidal River Assessments

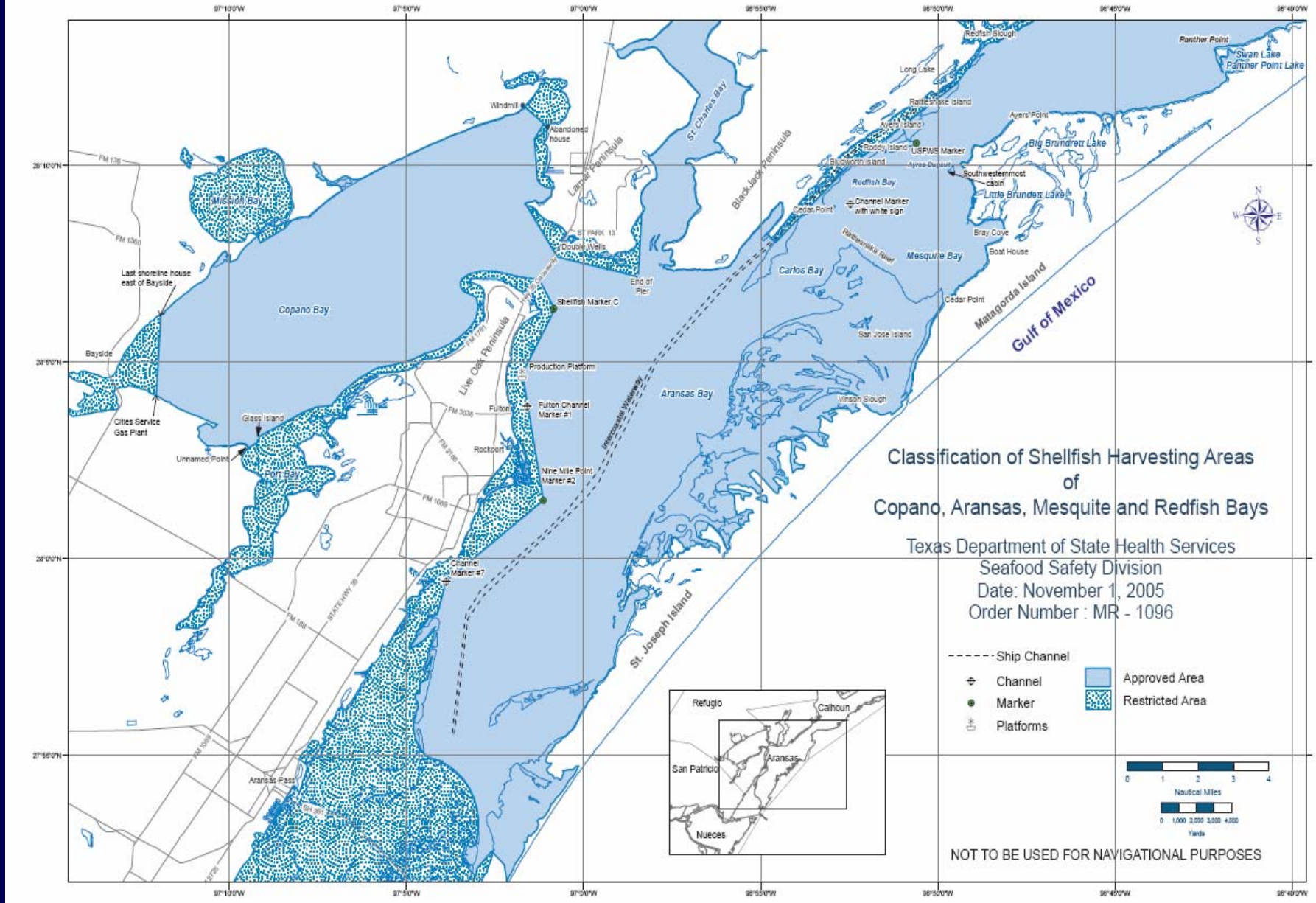
Segment	No. Samples	Geometric Mean (cfu/100 ml)	Single Sample (%)
Aransas River Tidal (2003)	11	259	55
Mission River Tidal (2001)	16	75	38

Above Tidal River Assessments

Segment	No. Samples	Geometric Mean (cfu/100 ml)	Single Sample (%)
Aransas River Above Tidal (2004)	4	713	100
Mission River Above Tidal (2002)	3	590	100

Criteria and Indicator Bacteria for the Oyster Waters Use

- Indicator for the oyster waters use is *E. coli*
- Oyster Waters Use
  - Median $\leq$ 14 MPN
  - No more than 10% of all samples > 43 MPN


Classification of Shellfish Harvesting Areas
of
Copano, Aransas, Mesquite and Redfish Bays
Texas Department of State Health Services
Seafood Safety Division
Date: November 1, 2005
Order Number : MR - 1096
Ship Channel
Channel
Marker
Platforms
Approved Area
Restricted Area
Nautical Miles
Yards
NOT TO BE USED FOR NAVIGATIONAL PURPOSES
Copano Bay
Aransas Bay
Mesquite Bay
Redfish Bay
Carlos Bay
Mission Bay
Port Bay
Live Oak Peninsula
Lamar Peninsula
Black Jack Peninsula
St. Joseph Island
Matagorda Island
Gulf of Mexico
St. Charles Bay
Big Brundrett Lake
Little Brundrett Lake
Swan Lake
Panther Point Lake
Panther Point
Long Lake
Redfish Slough
Rattlesnake Island
Ayers Island
Ayers Point
Roddy Island
USFWS Marker
Southwesternmost cabin
Channel Marker with white sign
Cedar Point
Bray Cove
Boat House
Rattlesnake River
San Jose Island
Vinson Slough
Windmill
Abandoned house
Double Wells
End of Pier
Shellfish Marker C
Production Platform
Fulton
Fulton Channel Marker #1
Rockport
Nine Mile Point Marker #2
Channel Marker #7
Intracoastal Waterway
Last shoreline house east of Bayside
Bayside
Cities Service Gas Plant
Grass Island
Unnamed Point
Aransas Pass
STATE HWY 35
FM 136
FM 1360
FM 1781
FM 3036
FM 2725
FM 1069
FM 188
FM 1069
Refugio
Calhoun
San Patricio
Aransas
Nueces

Other presentations:

- Dr. Joanna Mott, TAMUCC
  - Bacteria Source Tracking Results in Copano Bay
- Dr. David Maidment, UT CRWR
  - Carrie Gibson, Graduate Student
  - Bacteria Loadings Watershed Model

Next Steps

- Establish Copano Watershed Stakeholder Work Group
- Develop TMDL Allocation Report
- Develop Implementation Plan

Questions?

Sandra A. Alvarado
salvarad@tceq.state.tx.us
(512) 239-6643

www.tceq.state.tx.us/water/quality/tmdl/