TPWD MISSION: To manage and conserve the natural and cultural resources of Texas and to provide hunting, fishing and outdoor recreation opportunities for the use and enjoyment of present and future generations.

The Kills and Spills Team
an agency approach to assessing and conserving fish and wildlife resources

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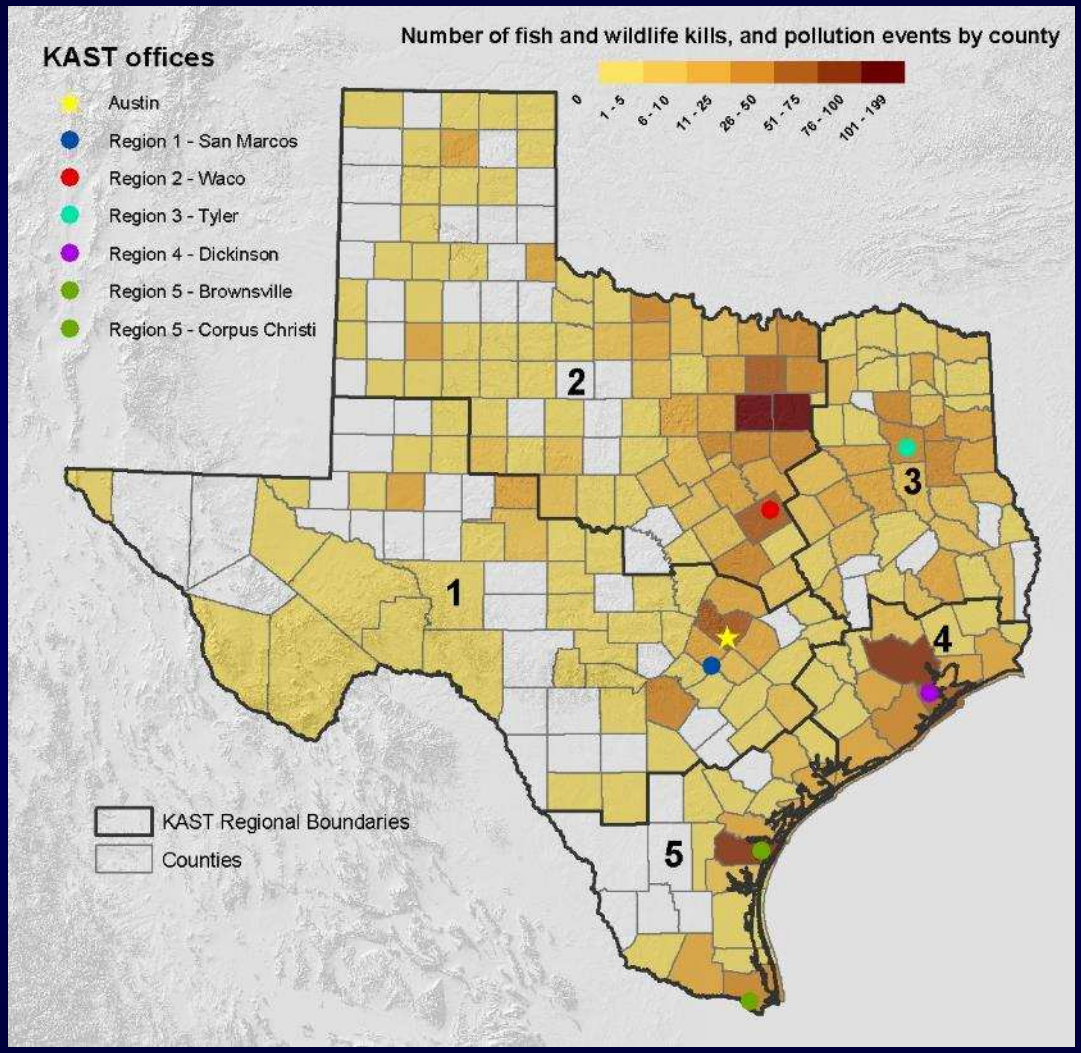
Overview:

- **KAST**
- **The resource**
- **Fish kill and pollution response**
- **Aquatic resource conservation planning**

Texas Parks & Wildlife Department

- Since the 1950s, TPWD has investigated fish and wildlife kills, and pollution incidents
- # of events investigated: 9,720
- # of estimated fish & wildlife lost: 529,271,011
- Estimated value of fish and wildlife lost: $255,180,576.93
- Mid–1990's the interdivisional group was named the Kills and Spills Team

Concentration of KAST Investigations



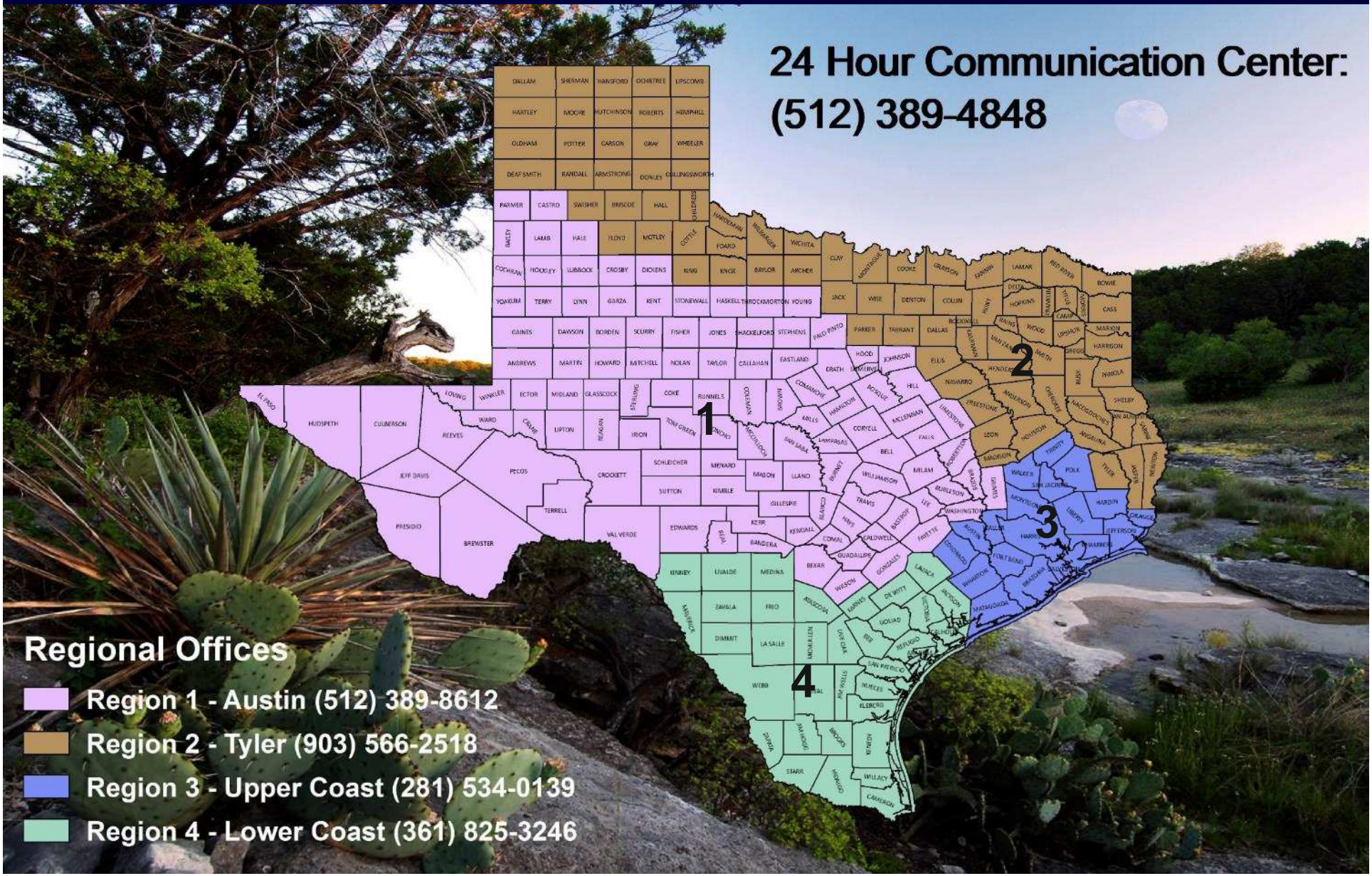
- Number of fish and wildlife kills, and pollution events in the Pollution Response Inventory Species Mortality (PRISM) database by county, January 2002-2012.
- Map reflect historical KAST regions prior to 2013

Kills and Spills Team (KAST)

Goals:

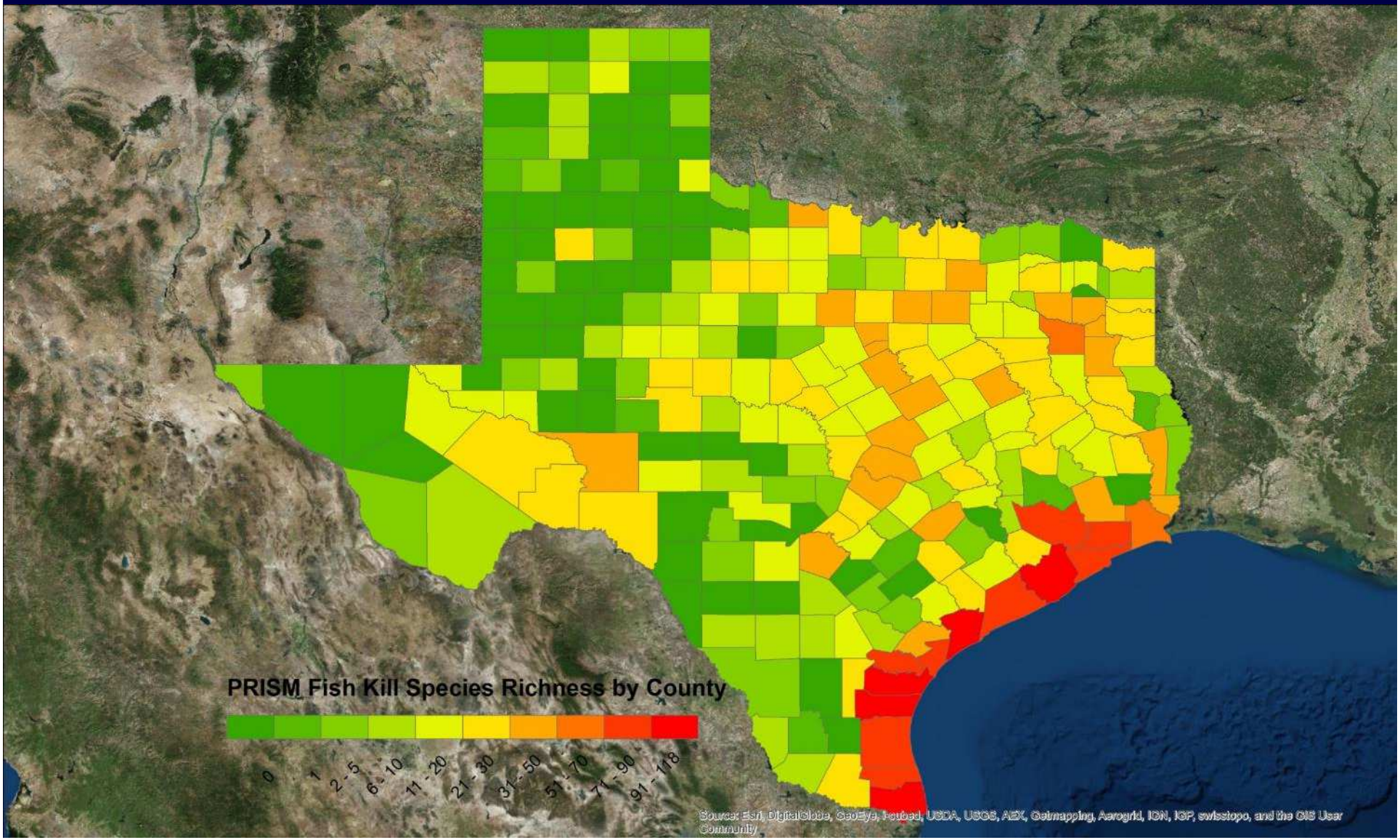
- Determine the cause of fish and wildlife kills and pollution incidents
- Obtain compensation for lost resources and restore affected habitat
- Provide recommendations for protecting fish and wildlife resources

Kills and Spills Team



The Resource

The Resource



Trinity River Aquatic Life

- **113 species, 32 families of fish**
- **34 species of freshwater mussels**

Photo courtesy of Dan Bennett and the 76” Alligator Gar

Trinity River Water Quality History

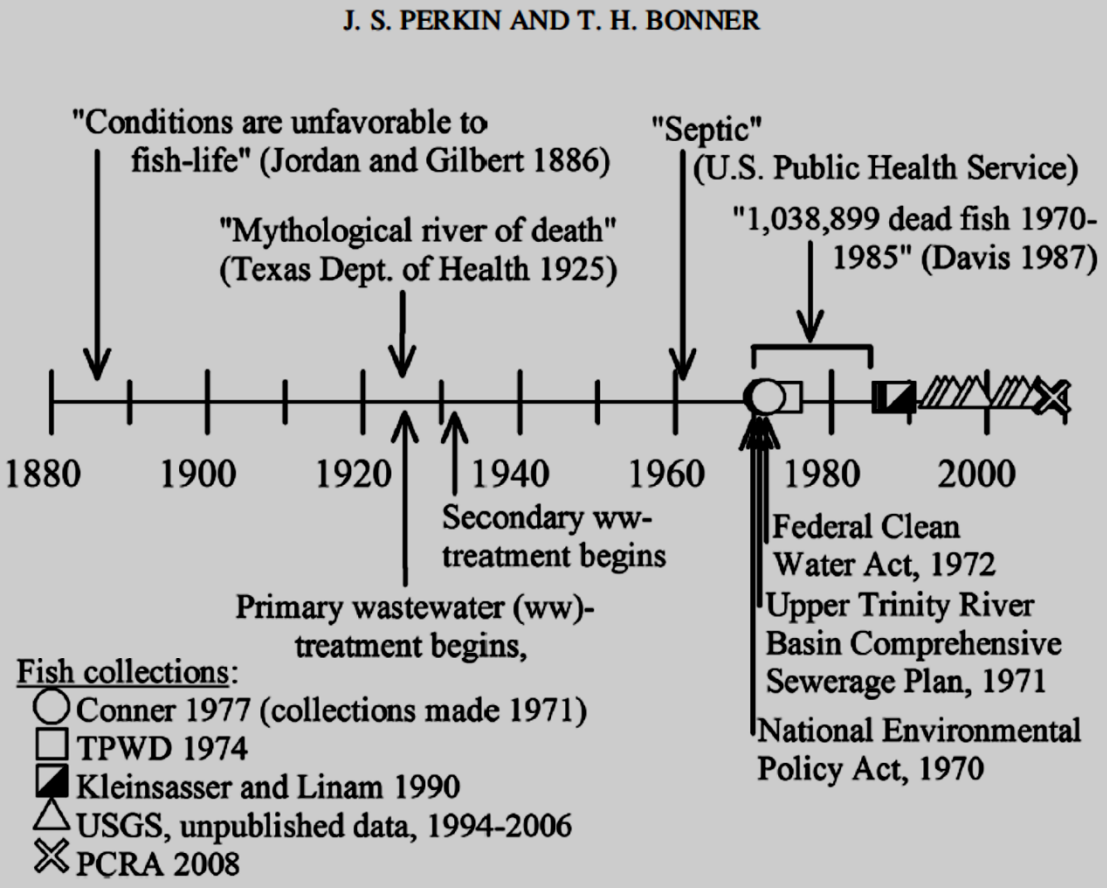


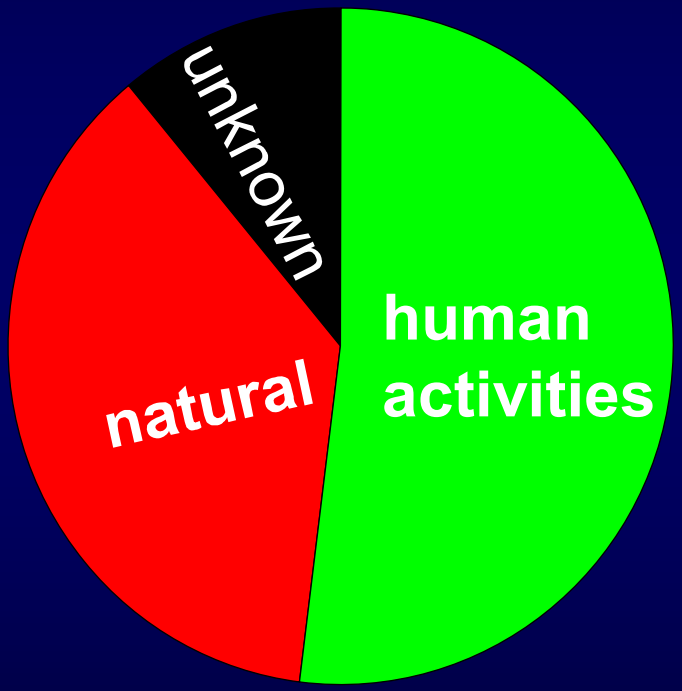
Figure 1. Timeline of Trinity River of Texas water quality and fish sampling. Water quality notes are after Land *et al.* (1998), and fish collection data were compiled from published literature, state, federal, and private sources

Fish Kill and Pollution Response

Natural vs. human activities

Lake Livingston 2004

Prairie Creek 2007



Investigation Procedures

Elements of an investigation:

- Determine the cause
- Determine extent of impact (distance, area, habitat affected)
- Identify and measure
- Identify responsible party if necessary

TPWD photo - red tide 2009

Fish Kill Investigation Procedures

Investigations follow KAST SOP based on the American Fisheries Society (AFS) guidelines:

- Provide an unbiased estimate of species lost
- Calculate the monetary value of organisms killed using species and length data
- Make resource management decisions and seek civil restitution using investigation data and monetary values

Resource Value Calculation

Base value + Recreational Value + Threatened or Endangered value = Sum

Sum x Inflation factor = Total value

Fairfield Lake 2009

Pollution Response Inventory Species Mortality (PRISM)

Investigations are reported in the PRISM database:

- Includes detailed investigation information
- Can be queried by a number of parameters
- Used for observing trends and the 305(b) assessment
- Available for open records requests

Fish Kill Sources

Natural causes:

- Low dissolved oxygen
- Toxic algal blooms
- Disease
- Weather

Human activities:

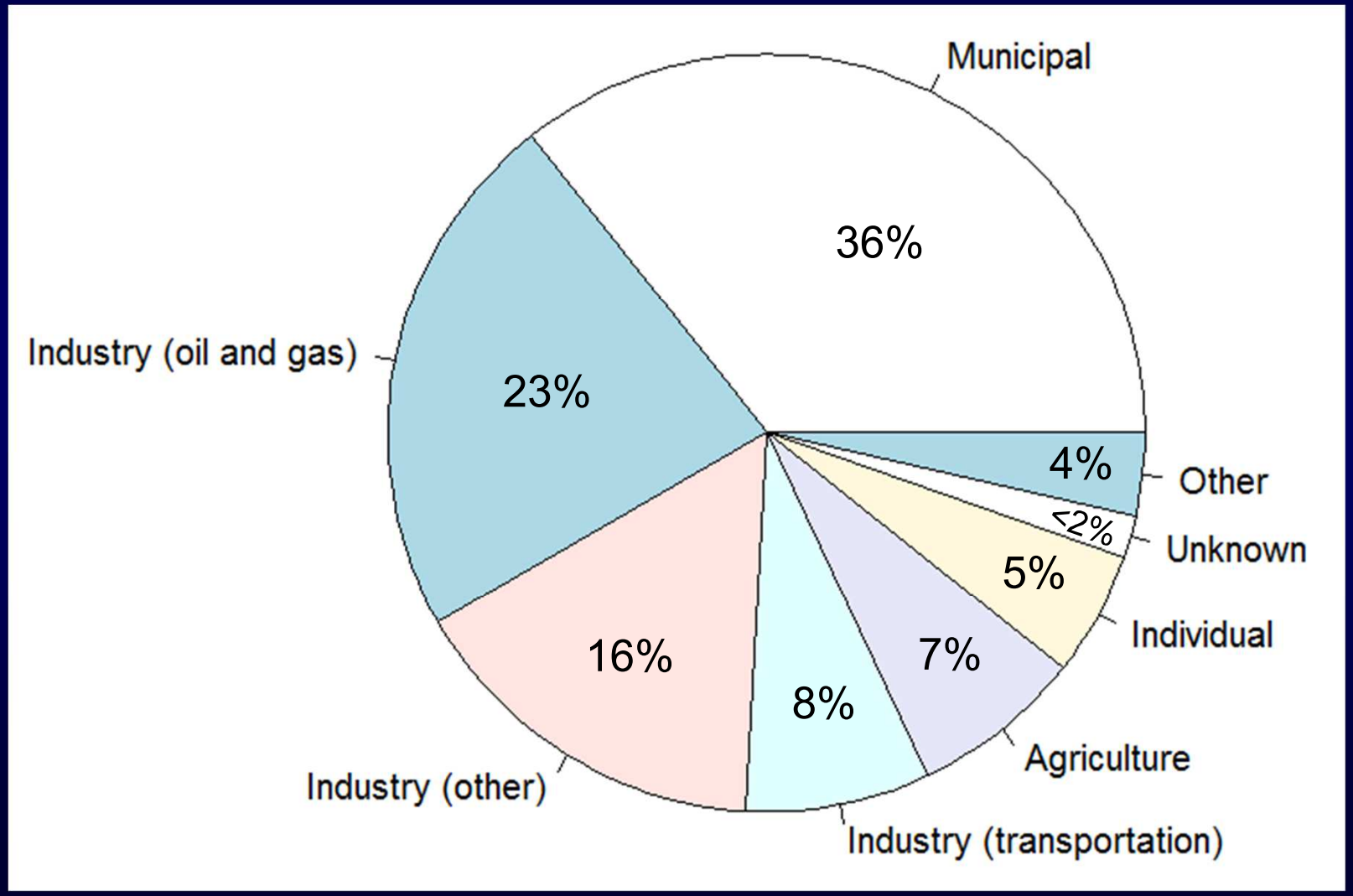
- Industry
- Municipal

Welsh Reservoir 2001

Gregg County 2001

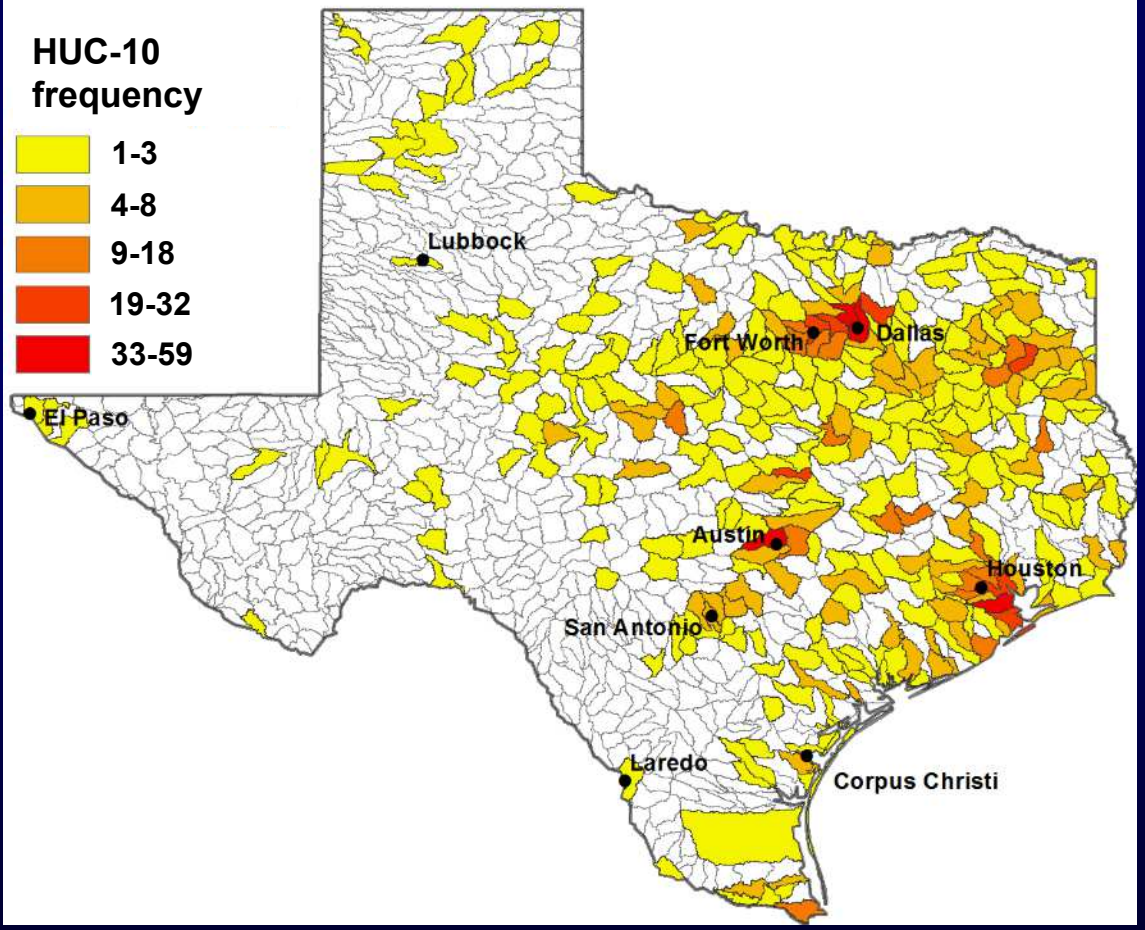
General Sources - Statewide

Pollutants (n=1342 events)



Pollutants

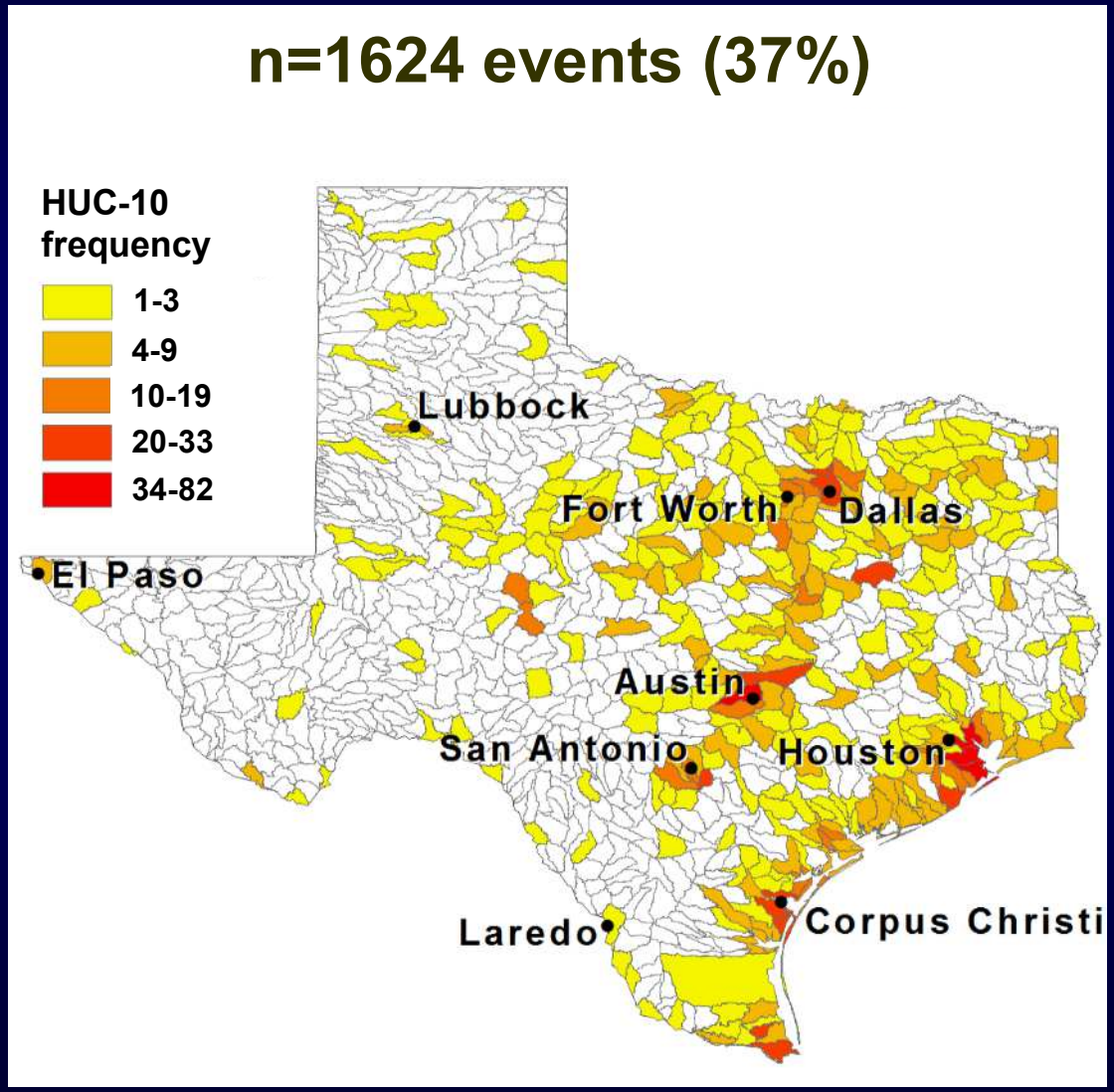
n=1342 events (31%)



Specific Causes:

- Sewage
- Chlorine
- Crude oil
- Pesticides

Low Dissolved Oxygen



Specific Causes:

- Phytoplankton respiration
- Flow decreased/ stopped
- Sewage

Industry

Hydrochloric acid

Industry

Oil and gas

Industry

Diesel

Train derailment

Power generation

Trichloroisocyanuric acid

Gasoline storage facility

Fire fighting foam

Municipal

Sanitary Sewer Systems -

- **Unauthorized discharge (lift station, manhole, pipeline break, chlorine - HTH)**

Potable Water Systems -

- **Unauthorized discharge (pipeline break, chlorine residual)**

Municipal - Sewage

Broken sewer pipe

Grease trap / OSSF waste

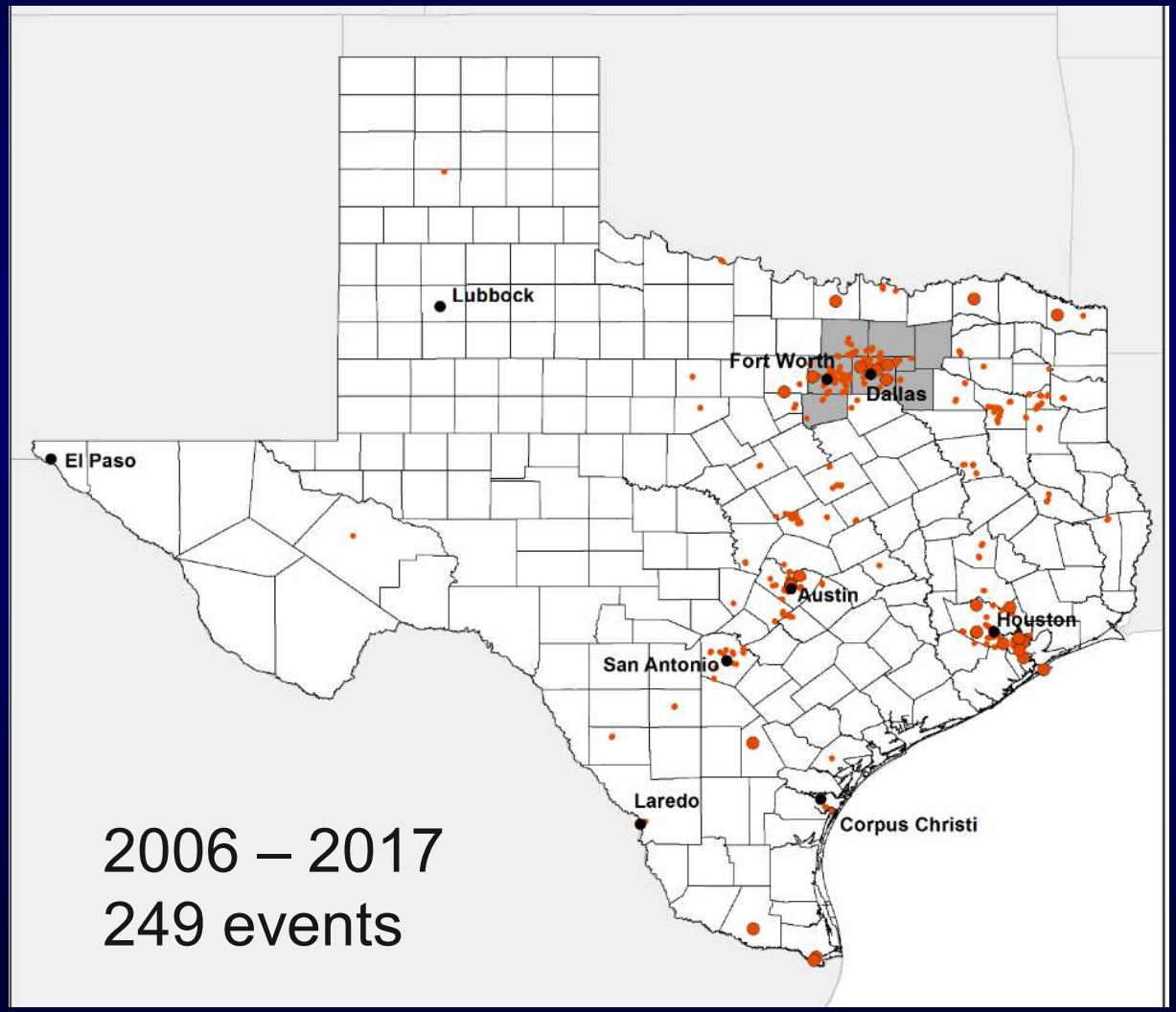
Sewer cleanout

Sewer manhole

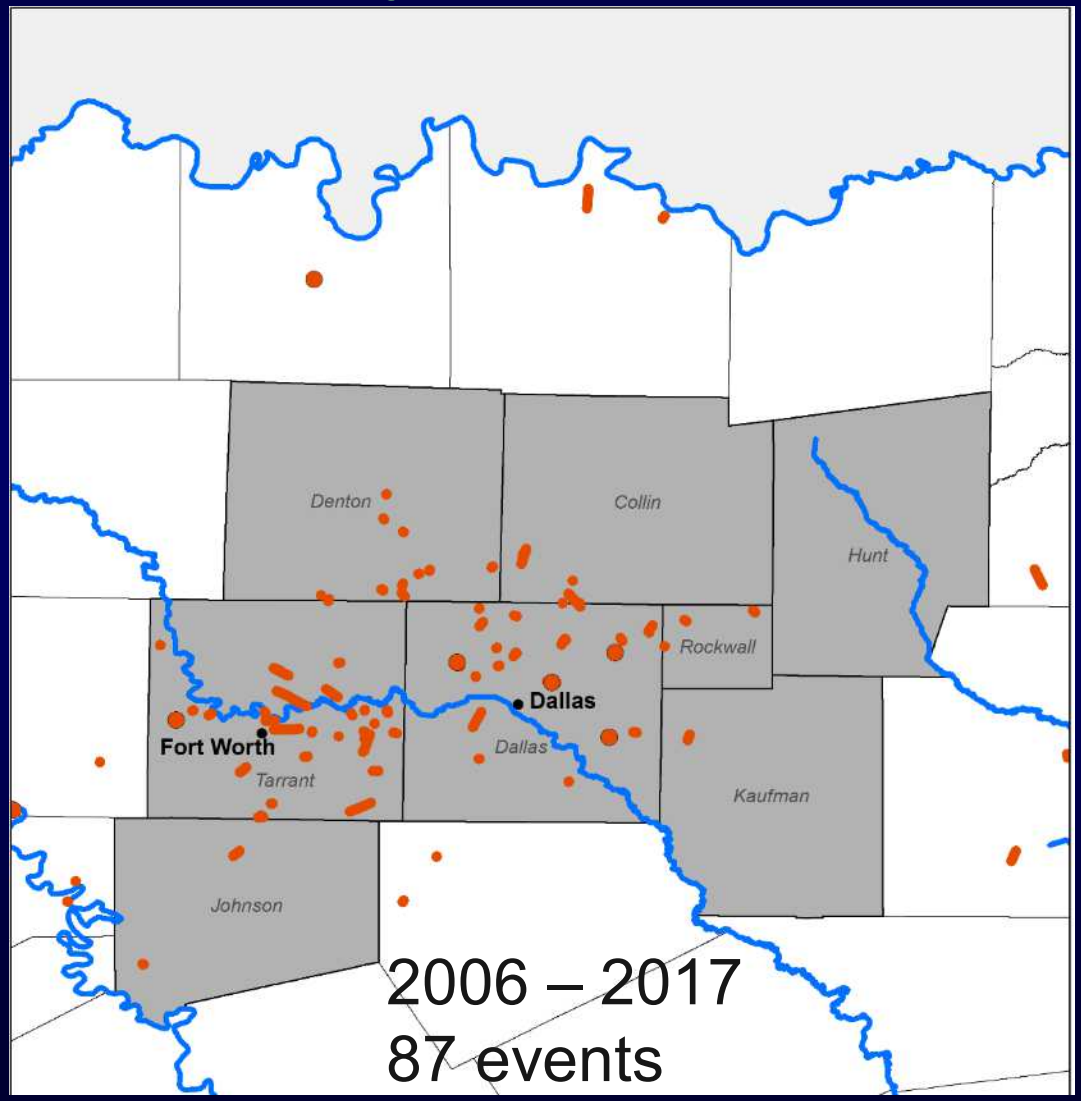
Sewer main break

Sewage Releases in DFW

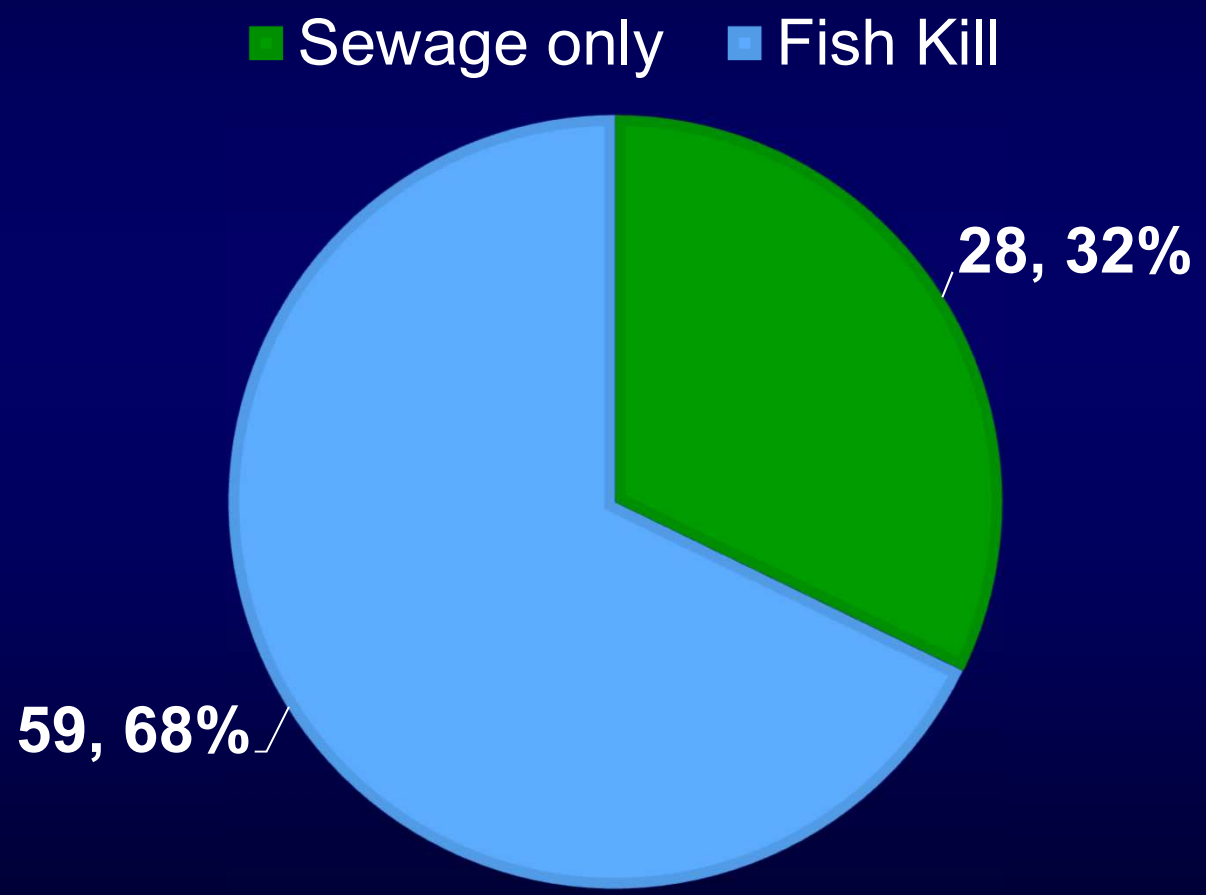
Sewage Releases Investigated by KAST



Sewage Releases Investigated by KAST



Sewage Events in the Eight County Area*



*2006 – 2017: Sewage events in Dallas, Denton, Collin, Hunt, Rockwall, Johnson, Tarrant, Kaufman counties

Aquatic Resource Conservation Planning

Aquatic Resource Relocation Plans (ARRP):

- Collection and relocation of aquatic resources out of an area prior to construction.

- A proactive/preventative way to prevent loss of aquatic resources from projects instream.

ARRP Guidelines:

- Background/Purpose
- Specific info necessary for an ARRP
- Fish and shellfish handling protocols
- BMPs for preventing the spread of Invasive Species
- Freshwater mussel survey protocols

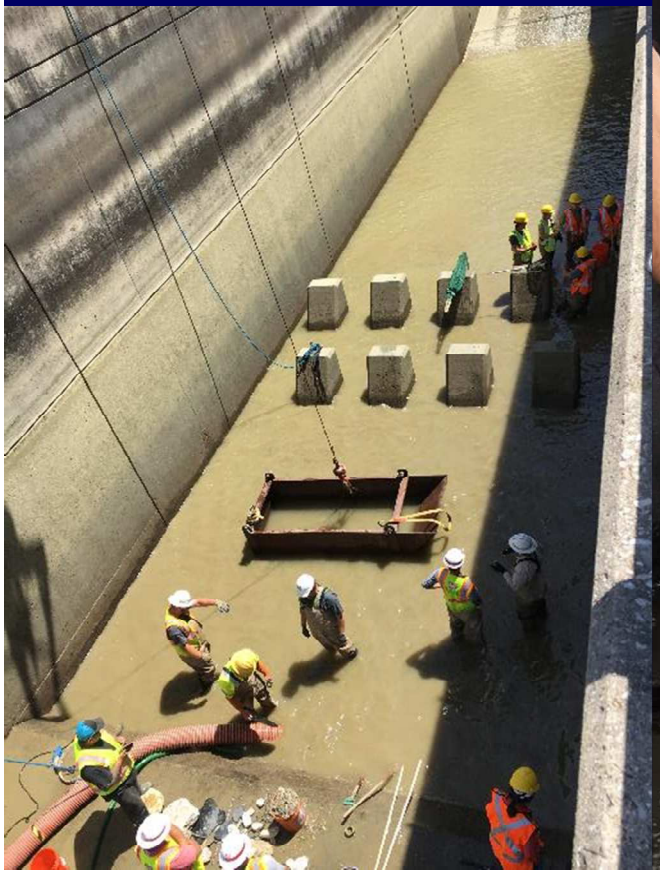
https://tpwd.texas.gov/landwater/water/environconcerns/kills_and_spills/minimize.phtml

Introduction Permit:

- Gives permission to move native fish and mussels to an approved location
- Introduction Permit Application sent in at same time as ARRP
- Once ARRP is approved the Introduction Permit will be issued

https://tpwd.texas.gov/landwater/water/environconcerns/kills_and_spills/minimize.phtml

ARRP Projects



Sabine River below Lake Tawakoni 2008

Early Notification is the Key to a Successful Investigation

Prompt Notification is Appreciated:

- **As soon as a FK is known, please contact KAST R2 directly or TPWD communications at (512) 389-4848**
- **TPWD is fine with leaving fish to decompose and be scavenged, but the entity can remove them for disposal with approval by TPWD**
- **If TPWD is unable to investigate, the following information is very much appreciated**

Essential Info for a FK Investigation:

- **Start date of FK**
- **Entity contact**
- **Name of waterbody**
- **Cause and water quality info (D.O., Temp, pH, Chlorine Res, etc)**
- **Volume**
- **Location, including a map**
- **Distance of fish kill**
- **Latitude and Longitude of start and end of FK**
- **Photo documentation of species**
- **Fish identified to species and each individual measured by inch class (if too many to measure then can subsample)**