

**TSV in Texas, 2004:
Summary of a Collaborative
Program Involving
Commercial Shrimp Farms,
State and Federal
Institutions / Agencies**

"Texas Shrimp Farmers"

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Introduction

- 1992 - Taura syndrome first encountered in Ecuador (Jimenez, 1992)
- TSV outbreak in Texas, 1995 (80% to 100% mortality)
- New TSV outbreak reported in Texas on May 29, 2004 (50-60% mortality)
- In reaction to this a **COLLABORATIVE** research effort was organized involving:

- **In reaction to this – a collaborative research effort was organized involving:**
- **US Marine Shrimp Farming Program (Tx. A&M U. System, U. of Az, Gulf Coast Res. Lab., Tufts U., O.I.)**
- **Texas Shrimp Farmers**
- **Texas Parks & Wildlife**
- **Texas Veterinary Diagnostic Lab**
- **Texas A&M Corpus Christi**
- **Texas Sea Grant Program**

US Marine Shrimp Farming Program

- **Oceanic Institute: Tony Ostrowski**
- **Arizona Experiment Station,
University of Arizona: Don Lightner
and staff (materials, advisor, student
co-advisor, PCR, histopathology)**
- **Gulf Coast Research Laboratory: Jeff
Lotz (advisor, epidemiology)**
- **Tufts University: A. Alcivar-Warren
(microsatellite analysis)**

Texas Shrimp Farmers

- **Southern Shrimp Farms**

- Harlingen Shrimp Farms, Ltd. (HSF) – Kieth Gregg, Fritz Janike, Kim Page
- Bayview Aquaculture (HSF) – Brent Burkott
- Arroyo Aquaculture (HSF) – John Brauner
- Loma Alta Aquaculture (HSF) – Robert Smiley

- **Northern Shrimp Farms**

- Bowers Shrimp Farm
- St. Martins Shrimp Farm

Texas Parks and Wildlife Coastal Conservation Division



- Dr. Ya Sheng Juan
- Mr. Robert Adame
- Dr. Jim Tolan
- Mr. Mike Ray
- Survey, Shrimp Samples

Texas Veterinary Medical Diagnostic Laboratory

- Dr. Patricia Varner
- Dr. Ken Hasson
- Histopathology, PCR,
Advisors



Texas Sea Grant Program

- Mr. Granvil Treece
- Mr. Tony Reisinger
- Farm and Processing Plant Surveys, Co-Ordination



Texas A&M Univeristy, Corpus Christi

- Dr. Joe Fox, Co-Principal Inv.,
Student Co-advisor, Lab Site
- Dr. P. Larkin & Dr. D. Moury



A Survey of Taura Syndrome Virus Intermediate Hosts on South Texas Shrimp Farms

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TX

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⁴University of Arizona, Tucson, AZ

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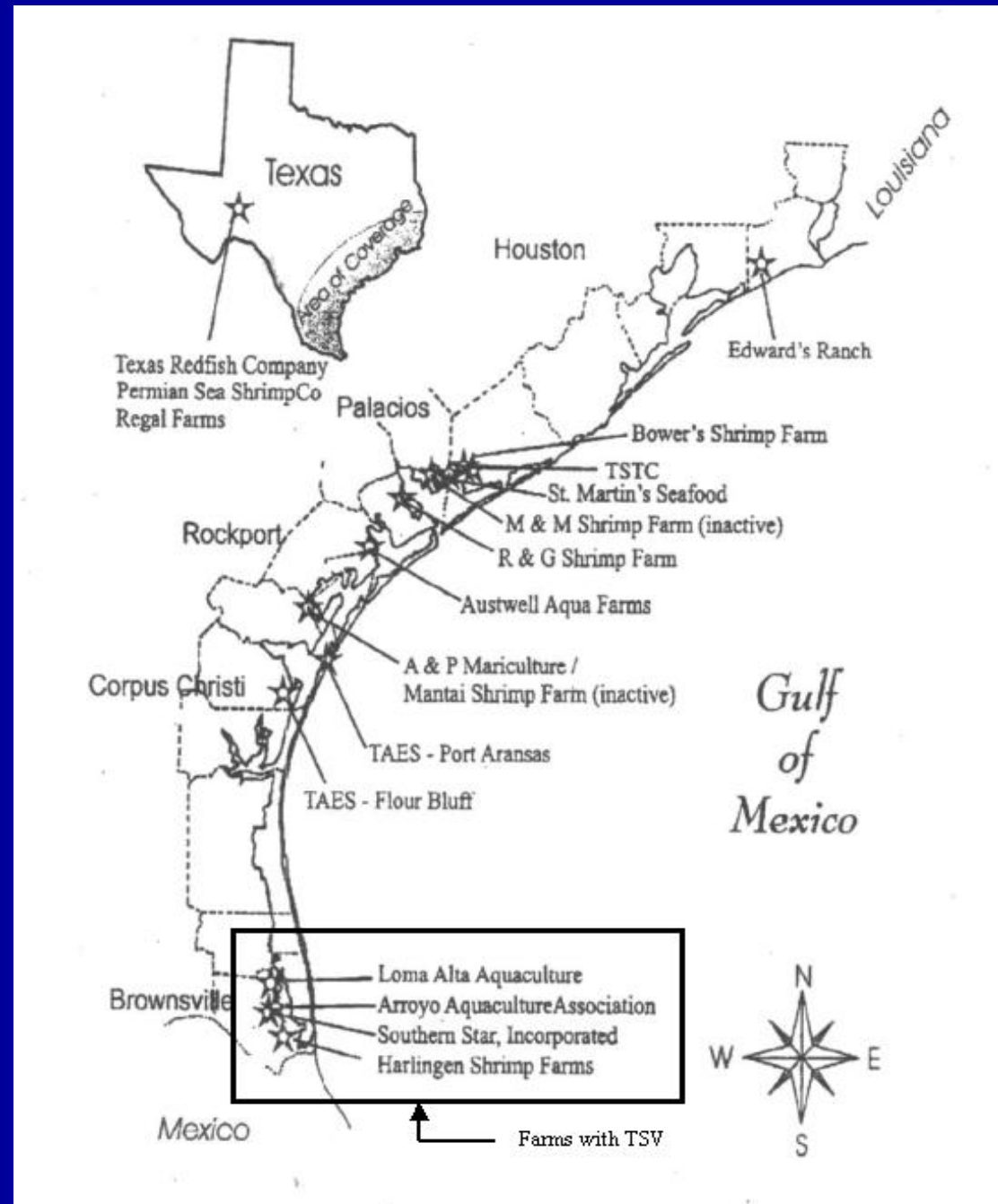
Program Objectives

- 1)** Survey 2 northern (non TSV infected) and 3 southern (TSV infected) shrimp farms in terms of environmental, conditions, farm procedures, production parameters, etc.
- 2)** Survey aquatic environment within quarantined shrimp farms for potential vectors;
- 3)** Use PCR to determine what micro/macro invertebrates are TSV positive;

Program Objectives

- 1) Previous slide -
- 2) Previous slide -
- 3) Previous slide -
- 4) Evaluate monthly presence of TSV-positive organisms and how these change over time;
- 5) Compare findings between different farms having TSV;
- 6) Survey other potential TSV sources, e.g. processing plants, bait stands, etc.
- 7) TSV resistant vs. Growth MSFP genetic lines for commercial farm survival.

- Sampled geographically separated 3 shrimp farms in south Texas
 - **HSF-Bayview, Bayview, TX**
 - **Arroyo Aquaculture Association, Arroyo City, TX**
 - **Loma Alta Aquaculture, San Perlita, TX**
- Global sampling regimen implemented (i.e., sample as many potential vectors as possible from each farm)
- Five Texas shrimp farms surveyed for TSV and farm conditions



Discussion and Conclusions

- In general, association of potential vectors and TSV was relatively similar by vector group (plankton vs. macroinvert's)
- Appears to be some potential for vectors to transmit TSV to shrimp in that TSV was found in some vectors samples prior to shrimp samples

Discussion and Conclusions

- However, vectors could be simply concentrating TSV from shrimp (i.e., TSV present in shrimp, but at undetectable level)
- **Question:** is TSV in vectors purely a mechanical issue or did they actively infect shrimp? Cannot say from this study.

Discussion and Conclusions

- Presence and absence of TSV in plankton samples could represent cyclical nature of life cycle of planktonic species
- Hatching of *Palaemonetes* sp. larvae has been shown to follow a 2-week incubation/brooding cycle in the natural environment (Lund et al., 2000)

Discussion and Conclusions

- Are vectors infected by extra-farm agents (e.g. other shrimp species) and then do they enter ponds and infect pond shrimp? Many scenarios are possible, but none confirmed, e.g. bait stands, processing plants.
- Future work should be comprehensive in evaluating source water biota prior to filling ponds, more frequent sampling with confirmation of active infection via histology and *in-situ* hybridization

Discussion and Conclusions

- Shrimp feed and PL's stocked not the sources of TSV.
- This is the plan for subsequent research funded by APHIS for 2005, contingent upon presence of TSV this coming season.
- Analysis yet to be done:
EPIDEMIOLOGY EVALUATIONS - by
Jeff Lotz, Gulf Coast Research
Laboratory

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- Texas A&M University – Corpus Christi
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 - Texas A&M University, Corpus Christi
 - Texas A&M Sea Grant College Program

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- William Bray

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