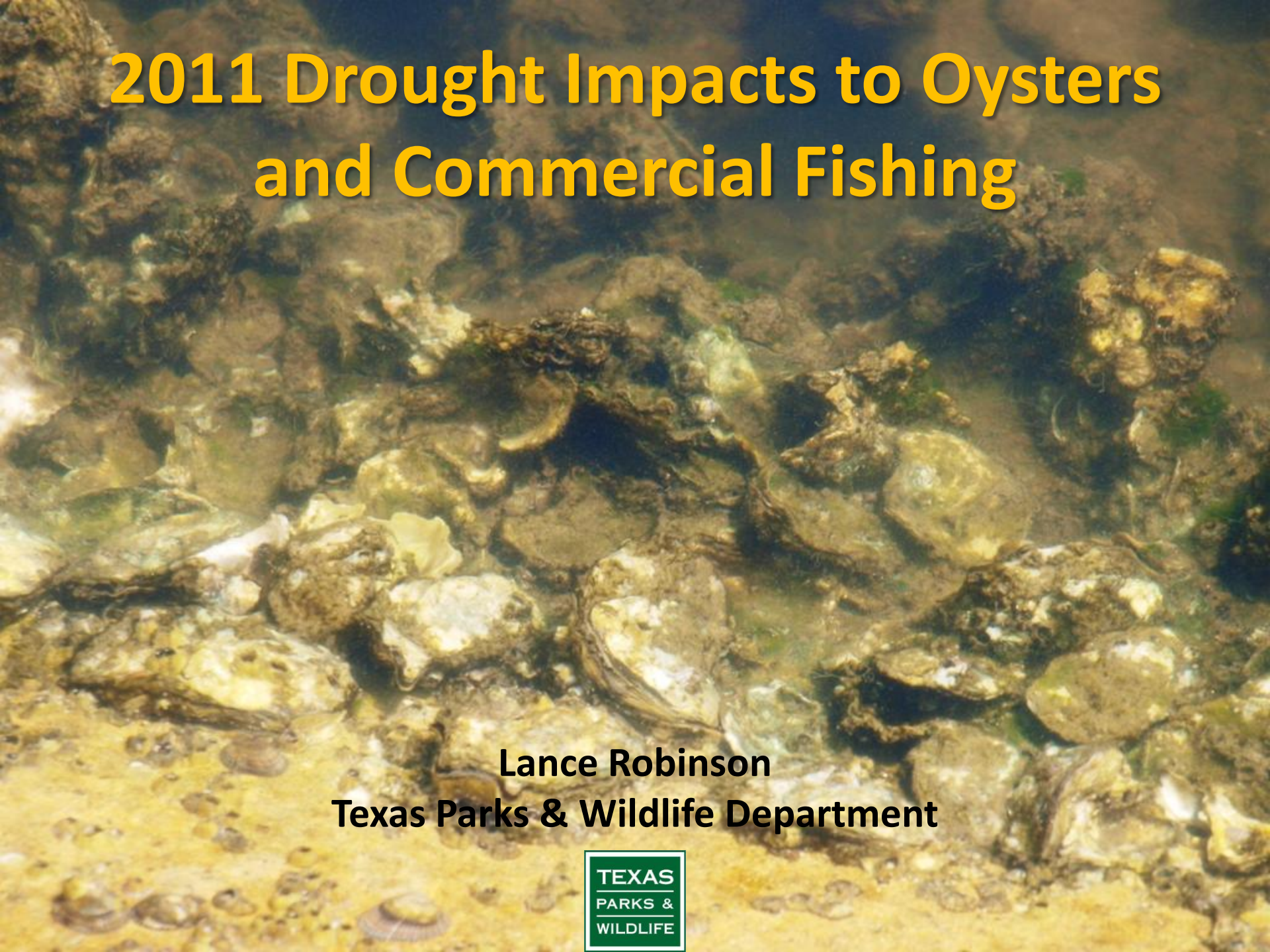
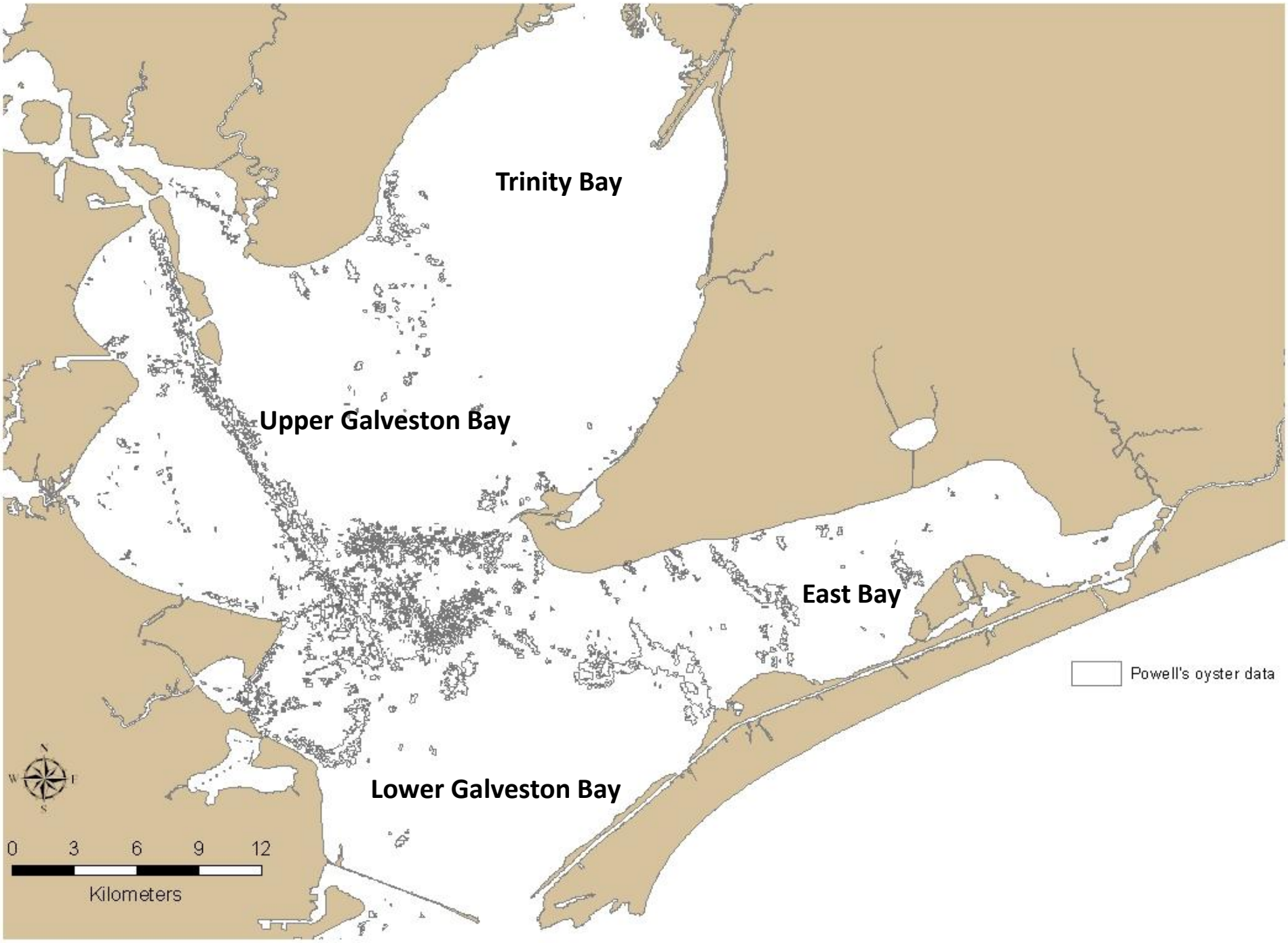
2011 Drought Impacts to Oysters and Commercial Fishing



Lance Robinson
Texas Parks & Wildlife Department

TEXAS PARKS & WILDLIFE


Trinity Bay
Upper Galveston Bay
East Bay
Lower Galveston Bay
Powell's oyster data
0 3 6 9 12
Kilometers

Ecological Services Provided by Oysters

- Habitat
  - Increased landscape diversity
  - Refuge from predation
  - Habitat for fish and invertebrates
  - Enhancement of other fishery resources
- Improvement of water clarity/quality
  - Filtration rate = 50 g^{-day} (130 acre reef = 260 million g^{-day})
- Carbon sequestration
- Habitat stabilization/erosion control
- Directed commercial fishery

Optimal Growth Parameters for Oysters in Texas

Temperature –

- Upper limit > 40° C
- Spawning: > 20° C; > 25° C for mass spawning

Salinity –

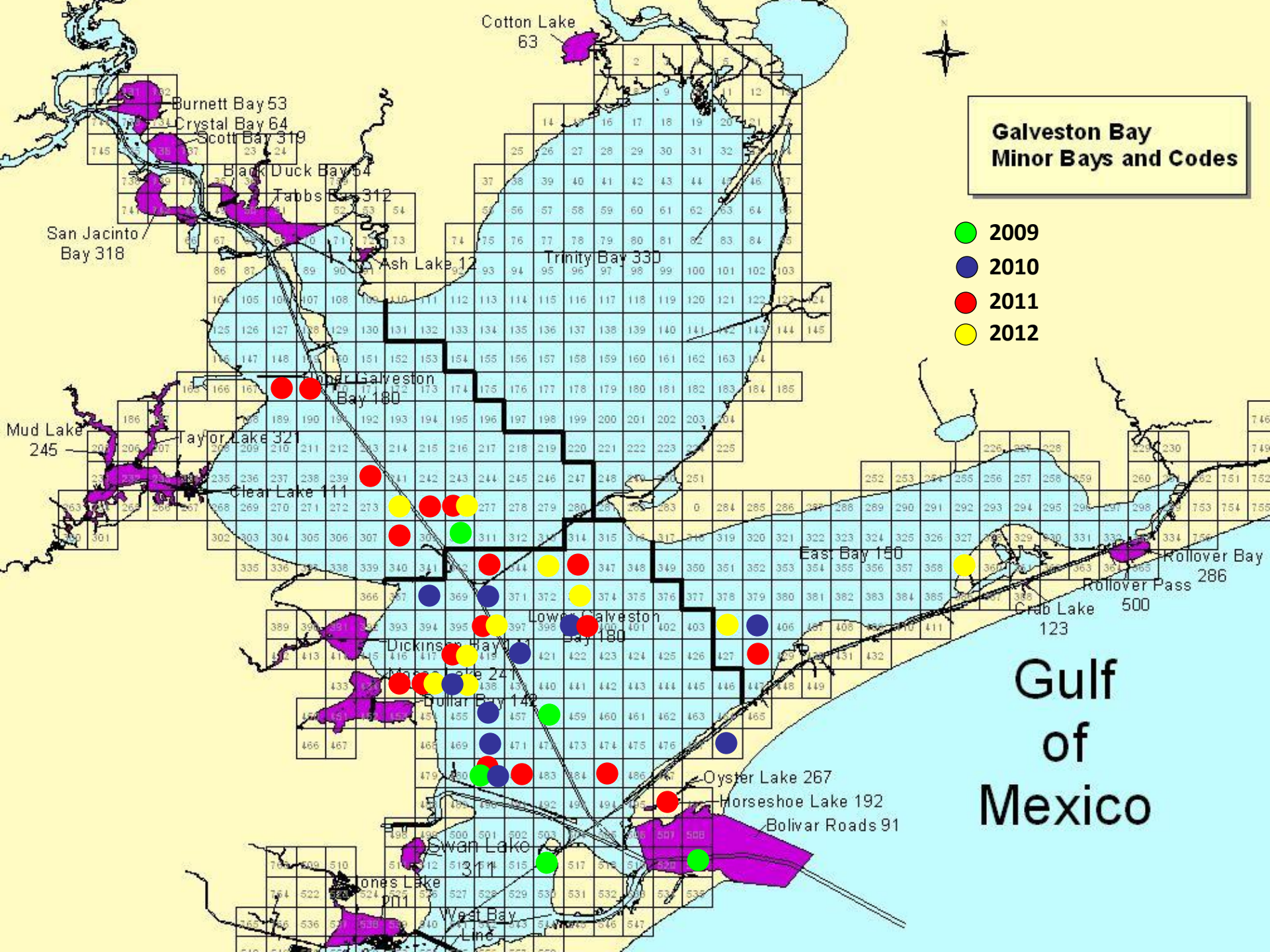
- 5 – 40+ ppt (optimum 14 – 26 ppt)
- 19-35 ppt for normal egg development

Protandrous hermaphroditism

Oyster Drill (Hays Rocksnail)
(*Stramonita haemastoma canaliculata*)

- Most destructive eastern oyster predator from North Carolina through the Gulf of Mexico
- Requires salinities > 15 ppt
- Can reach densities > 27,000 per hectare (Hofstetter 1977)
- Killed more than 80% of oysters in Mobile Bay, AL over 9 month period when salinities averaged over 20 ppt (Hofstetter 1977)

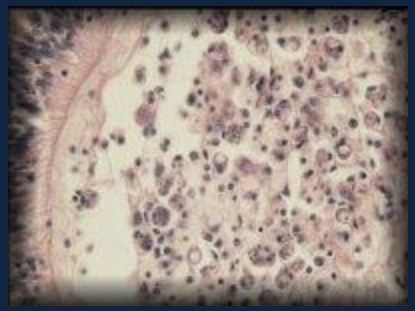

TPWD, Brenda Bowling

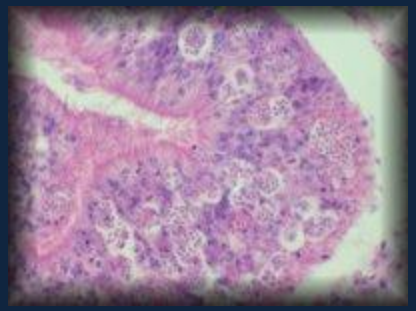

Galveston Bay
Minor Bays and Codes
2009
2010
2011
2012
Cotton Lake
63
Burnett Bay 53
Crystal Bay 64
Scott Bay 319
Black Duck Bay 54
Tabbs Bay 312
San Jacinto
Bay 318
Ash Lake 12
Trinity Bay 330
Upper Galveston
Bay 180
Mud Lake
245
Taylor Lake 321
Clear Lake 111
East Bay 150
Rollover Bay
286
Rollover Pass
500
Crab Lake
123
Lower Galveston
Bay 180
Dickinson Bay
Dollar Bay 142
Oyster Lake 267
Horseshoe Lake 192
Bolivar Roads 91
Swan Lake
311
Jones Lake
pn1
West Bay
Line
Gulf
of
Mexico

"Dermo"
(Perkinsus marinus)

- Protozoan parasite
- Ranges from Gulf of Mexico to Maine
- Thrives in high-salinity/high-temperature conditions
  - Temp >20° C; salinity >15 ppt
- Reduces rate of gametogenesis and fecundity in oysters
- At high infection rates – 100% mortality within a few weeks

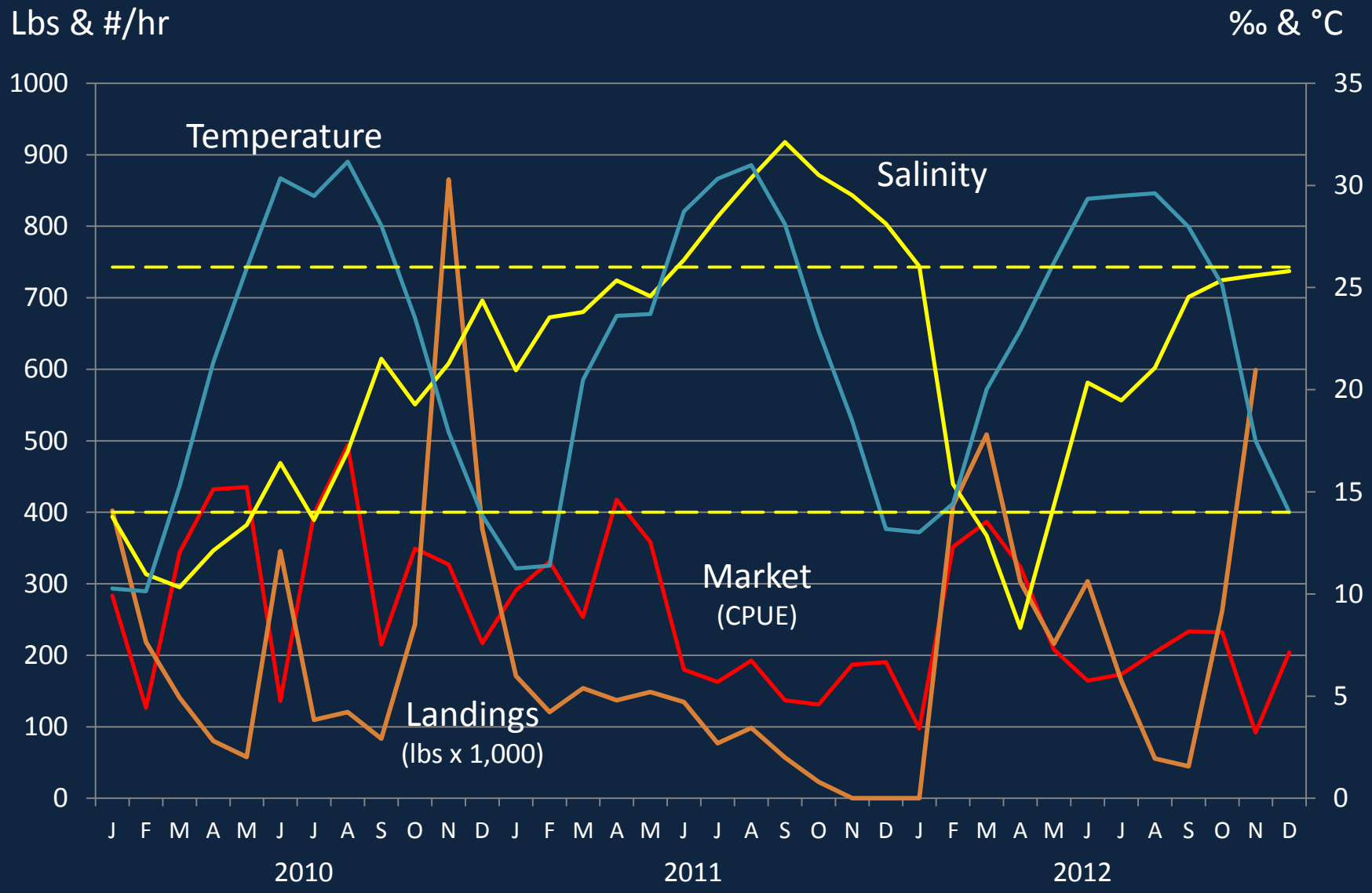
http://library.enaca.org/Health/FieldGuide/images/pm.jpg



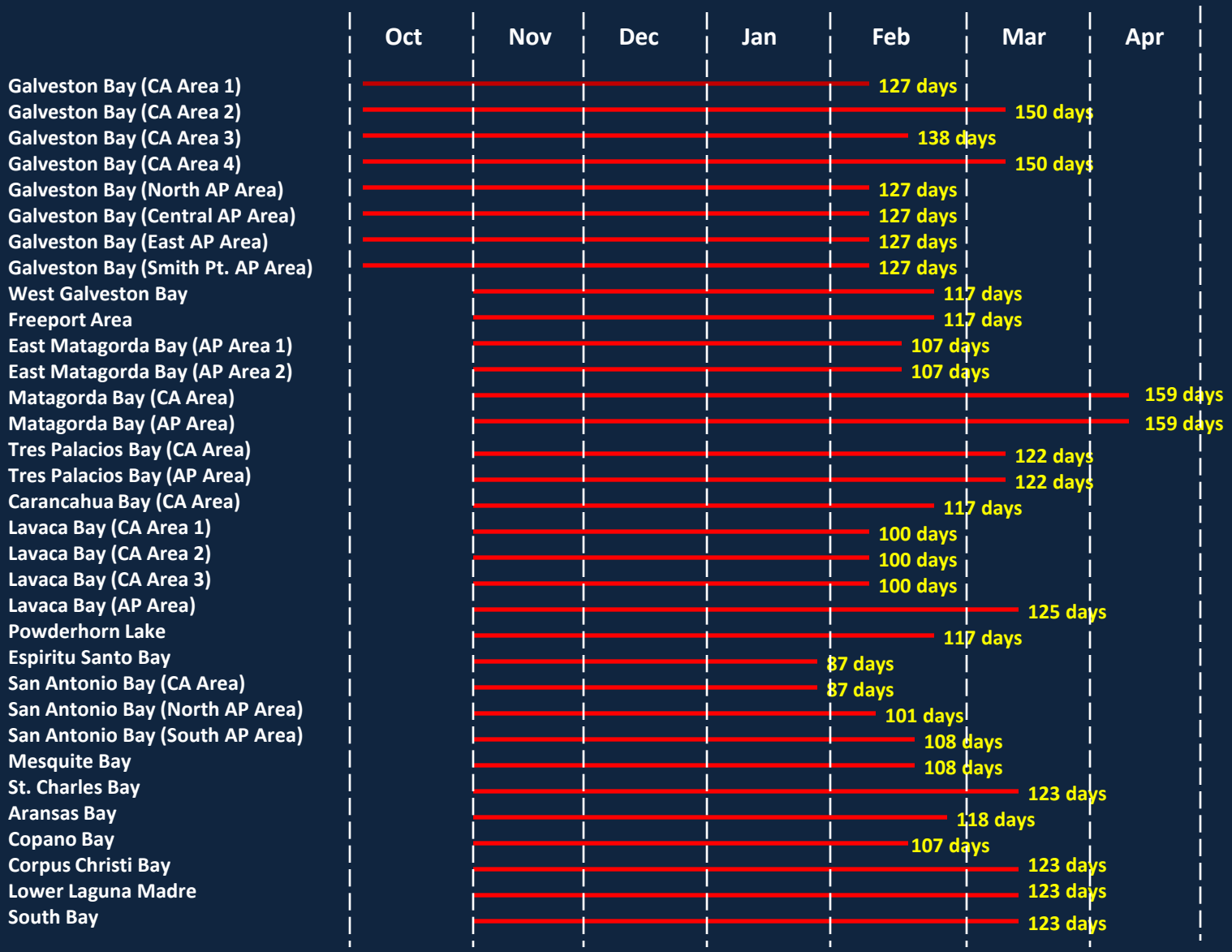


http://www.vims.edu/research/departments/eaah/programs/shellpath/_photoset/shellpath_slideshow/6b_med.jpg

Monthly Oyster Landings & CPUE vs Temp & Salinity 2010 - 2012

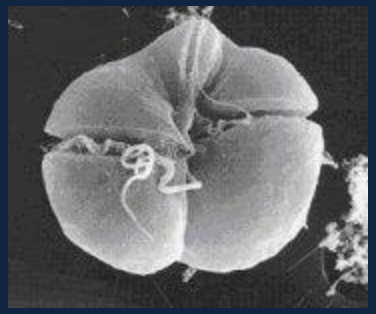


Closures of Approved and Conditionally Approved Shellfish Harvest Areas Due to Red Tide Bloom, October 2011 – April 2012



“Red Tide”
(Karinia brevis)

- Naturally-occurring in Gulf of Mexico
- Blooms do not survive < 24 ppt
- Produces neurotoxin that results in Neurotoxic Shellfish Poisoning in filter-feeding shellfish
- 2011 bloom resulted in a 50% reduction in commercial landings (valued at $9 M) from the 2010-11 season



Questions?