

Black Bass Population Characteristics in Lake Norman, North Carolina After the Introduction of Alabama Bass



Lawrence Dorsey and Michael Abney

USA MAP



New insight on bass diversity

FOR THE PAST 100-plus years, scientific work on bass species has focused almost entirely on largemouth and smallmouth bass. This makes sense, as these two species are the most widely distributed, and they support the most popular fisheries in North America.

More recently, we've seen a new interest brewing for fisheries scientists studying black bass, and the focus has shifted to the lesser-known, mainly stream-dwelling species that inhabit the Southeastern United States, from Texas through South Carolina.

This interest recently culminated in a Black Bass Diversity Symposium, which was held in Nashville in 2013 and will result in a book set to come out this fall. This symposium focused not on traditional fisheries management in reservoirs, but on conservation of black bass. As speakers emphasized, the lesser-known species really need protection.

Many of these lesser-known black bass — such as the Guadalupe bass in Texas and the shoal bass in Alabama, Georgia and Florida — are under threat from hybridization with other black bass stocked into their waters. They also have been impacted by habitat loss from dam construction and agricultural and urban development. The book, which will be published by the American Fisheries Society, is the first of its kind and contains more than 50 papers that focus on



Northern largemouth



Florida largemouth



Smallmouth



Spotted bass



Shoal bass



Redeye bass



Guadalupe bass



Suwannee bass

Black bass are far more diverse than simply largemouth and smallmouth. Illustrations by Jonathan H. Milo

conservation and management of stream-dwelling black bass.

The results of the studies show how much we have learned and how much there is yet to learn. As scientists, we are only recently understanding the diversity of black bass species.

New species still are being found, such as the Choctaw bass that Dr. Mike Tringali and colleagues recently described in the rivers of western Florida. Some species remain that are

not officially described as species today, such as "Bartram's bass," which is found in South Carolina.

New genetic techniques have allowed scientists to identify differences among species that are not discernable visually on the fish. This has caused some debate over what defines a species, but without a doubt, there are more forms of black bass than we were aware of only 10 years ago. Black bass are incredibly diverse, and we only recently began to appreciate just how many species there may be.

In addition to providing a better understanding of black bass diversity, the symposium highlighted new information about habitat requirements and spawning behavior. Roger Bitz and colleagues obtained video of spawning shoal bass. It's fascinating footage, showing how the fish use eddies behind rocks in shoals to protect their nest from current and also to guard against nest predators.

This symposium is a landmark work for science on bass. As scientists and anglers, we should appreciate the diversity and take measures for protection. We'll look more closely at insights from this symposium in the coming months.

MIKE ALLEN



Dr. Mike S. Allen is a professor in the Fisheries and Aquatic Sciences program at the University of Florida.



SDAFS Black Bass Conservation Committee
<https://www.facebook.com/AFS.Black.Bass/>

Outline

- **History of Black Bass at Lake Norman**
- **Population Characteristics since 1993**
- **Sampling Results in the Upper Portion of Lake Norman**



Acknowledgement – Data Sharing



History

- 1962 - Catawba River impounded forming Lake Norman
- 1975 - Largemouth bass fisherman meet with NCWRC staff over poor fishing
- 1985 – NCWRC asked to stock spotted bass. White paper written and decision is made not to stock spotted bass.



History

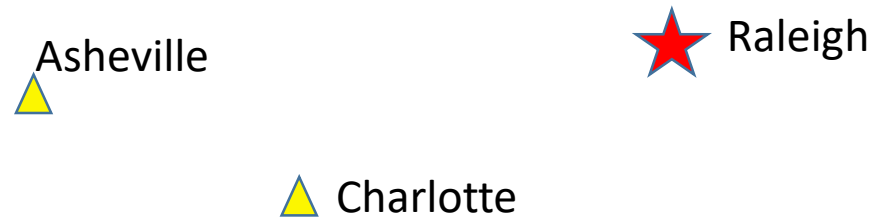
- 2000 – Duke Energy staff collect first Alabama Bass from Lake Norman
- 2004 – State record Spotted Bass (likely Alabama) caught (2.86 kg)
- 2009 – Godbout et. al (2009) confirm hybridization between Largemouth Bass and Alabama Bass
- 2015 – “Spotted Bass” confirmed as Alabama Bass.



Lake Norman

- 13,000 hectares
- Impounded in 1962
- Mesotrophic / Oligotrophic
- Contains a Hydro Facility, a Nuclear Station, and a Coal Fired Station





Methods - Sampling

- Three sampling zones: McGuire Nuclear Station (Lower Forebay), Reference Zone (Upper Forebay), and Marshall Steam Station (Mid-Lake)
- Ten 300 m transects are sampled per zone
- All transects have been sampled annually since 1993 except for 1998





Methods - Analysis

- Mean CPUE, mean total length, and mean relative weight scores were calculated by zone and year for both species
- Three distinct time periods were created: Pre-establishment (1993-2000), Establishment (2001-2006), and Post-establishment (2007-2013)



Methods - Analysis

- Generalized Poisson linear mixed model used to analyze CPUE data
- Linear mixed model used to analyze mean total length and mean relative weight scores
- ANCOVA used to determine changes in CPUE, total length, and relative weight by zone from Establishment to the end of Post-establishment period.

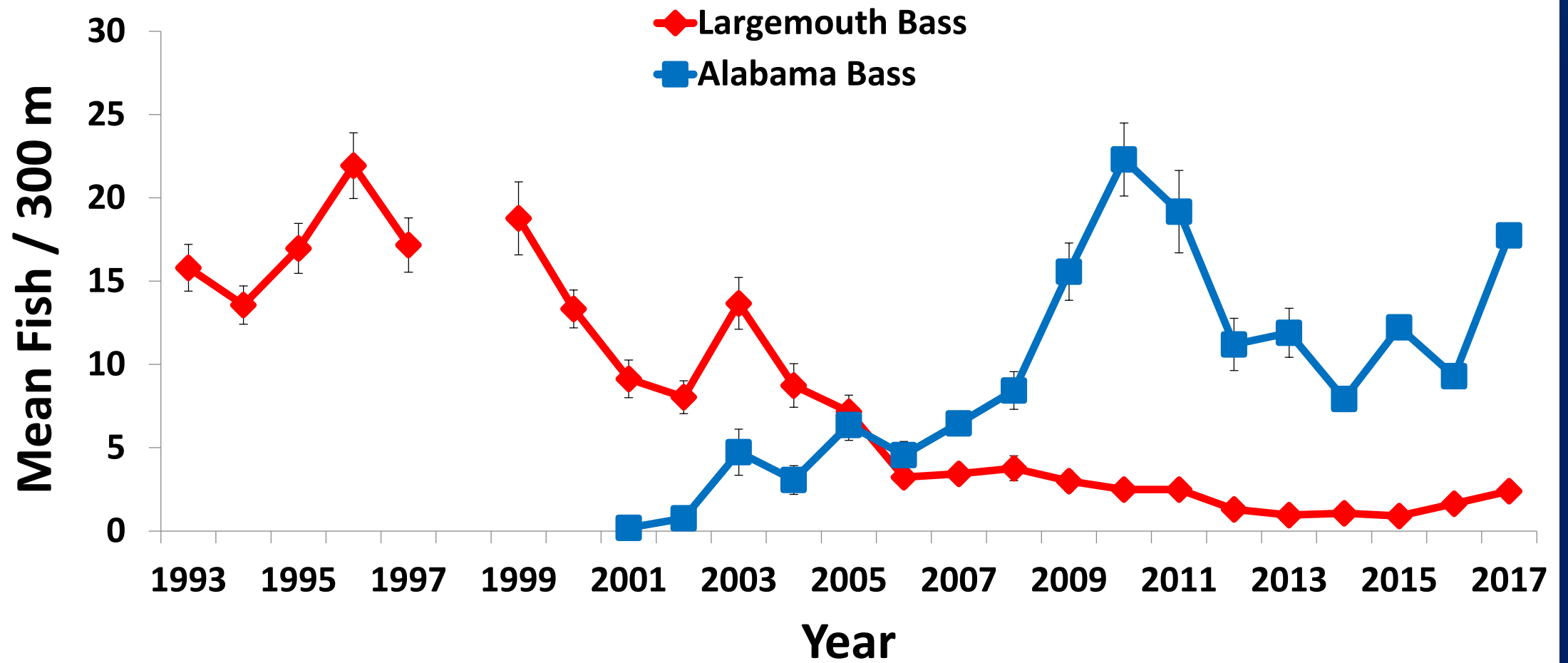


Acknowledgement – Statistical Analysis

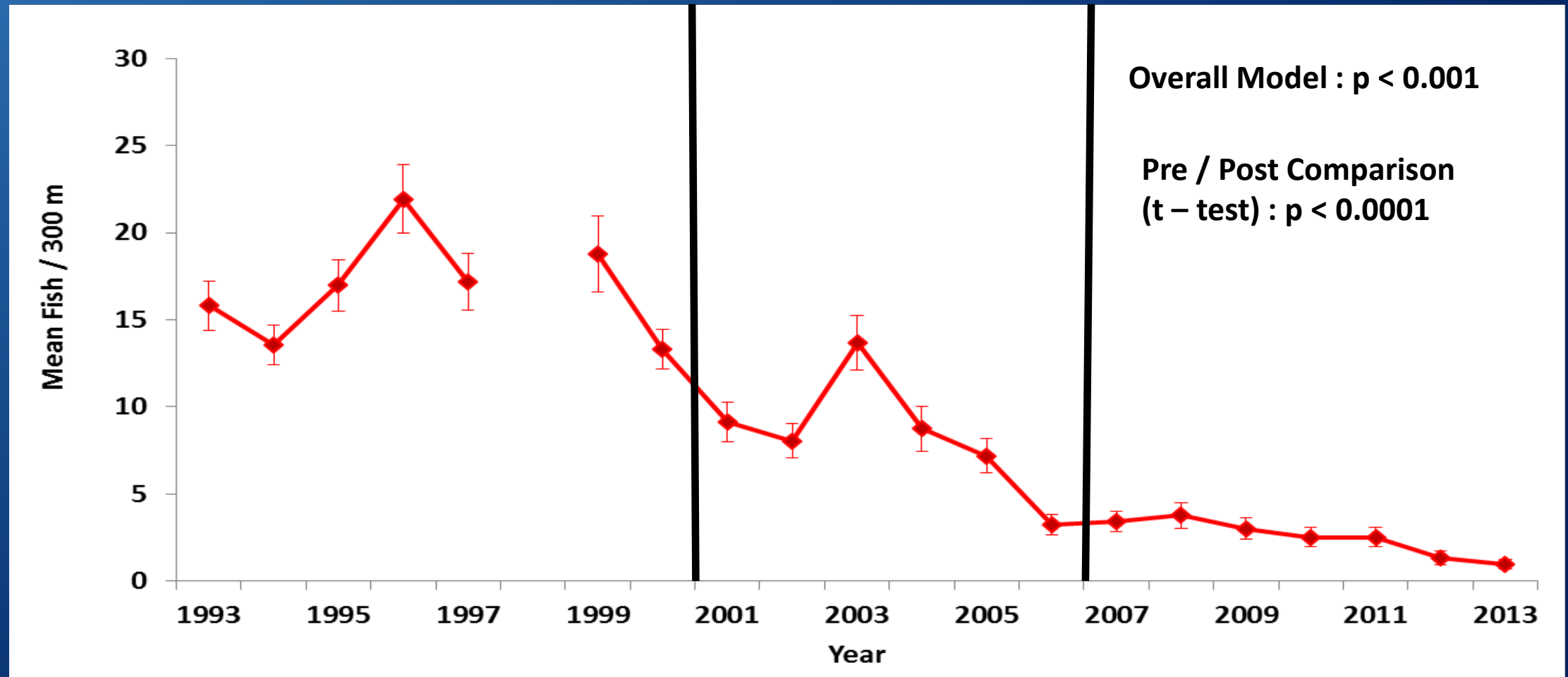


Dr. Qiang Wu
Department of Biostatistics
East Carolina University

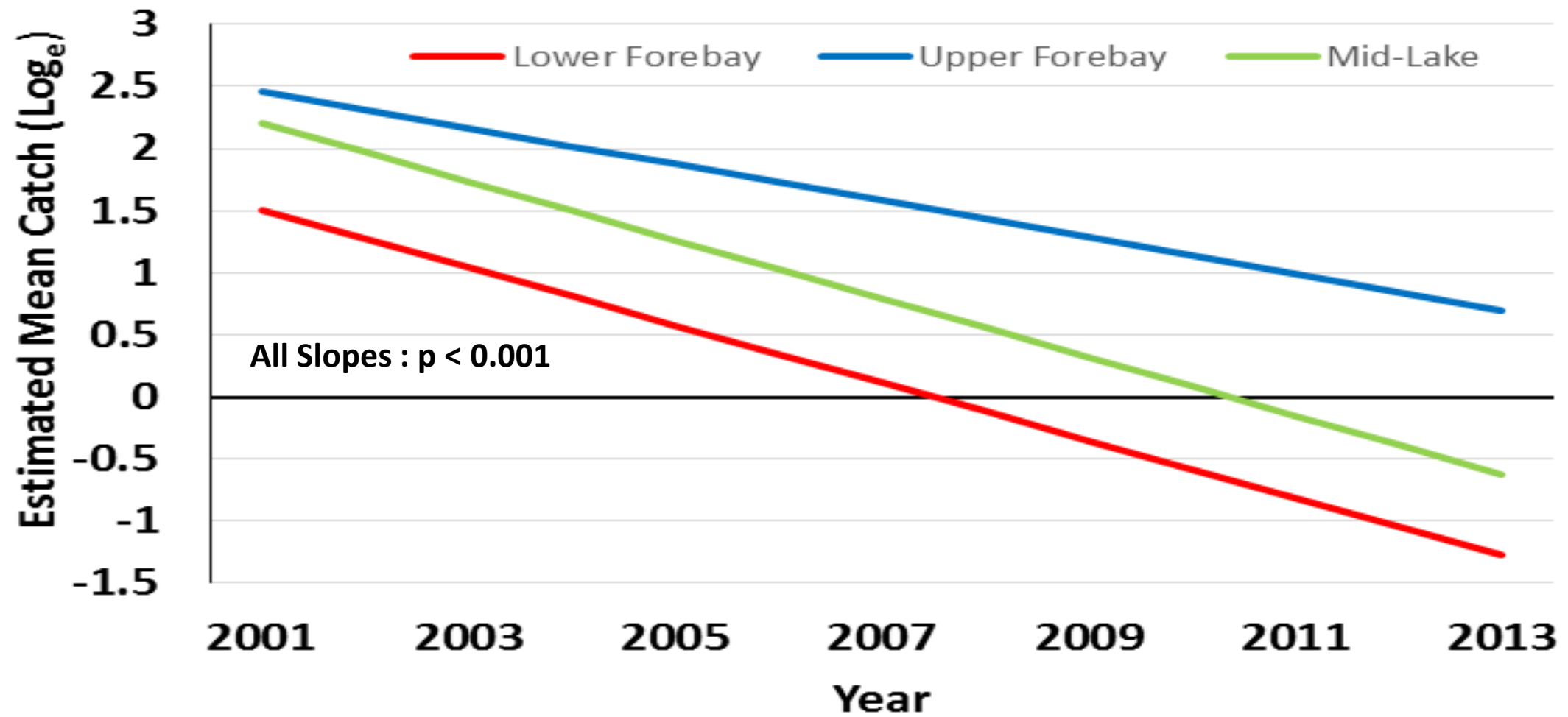
CPUE



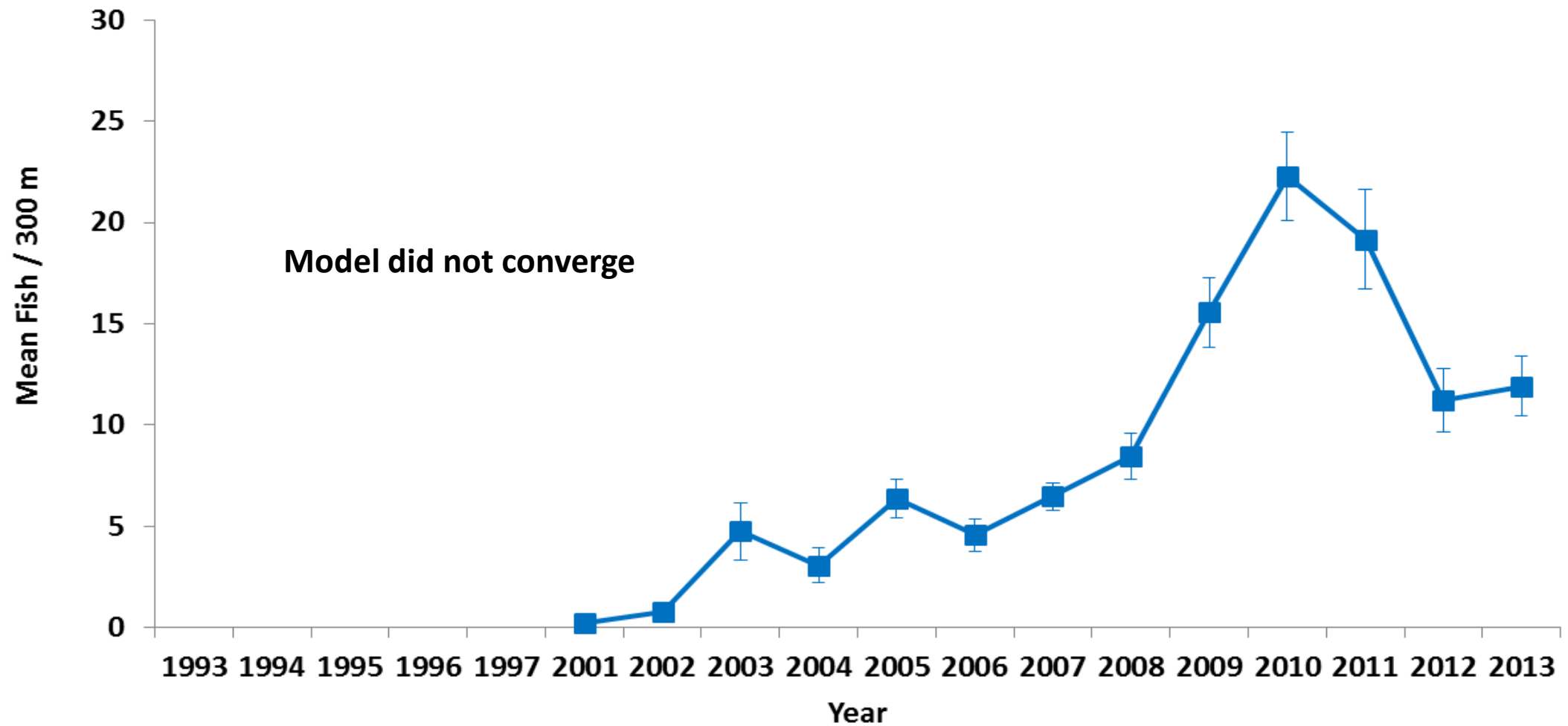
CPUE- LMB



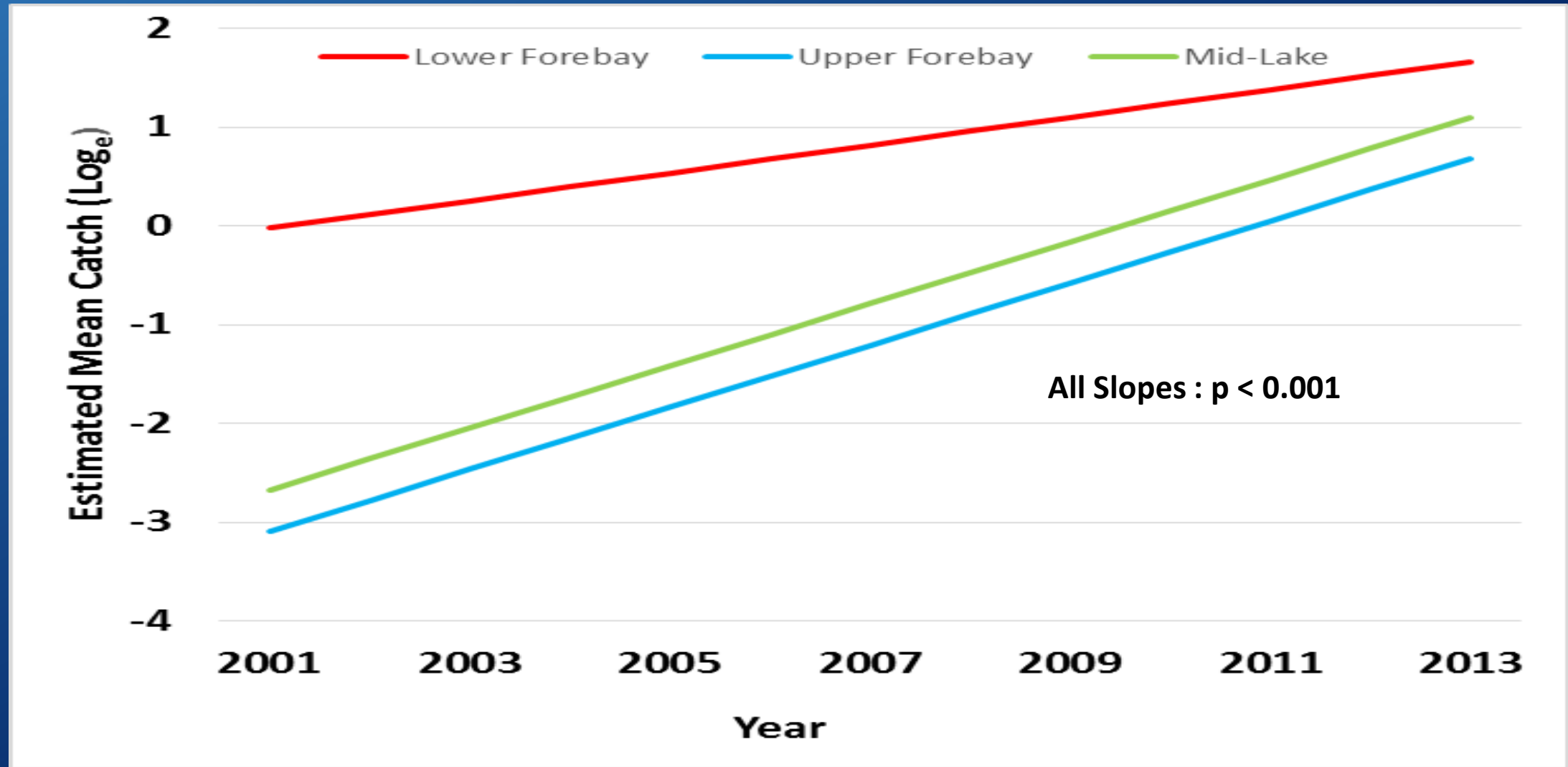
CPUE – LMB by Zone



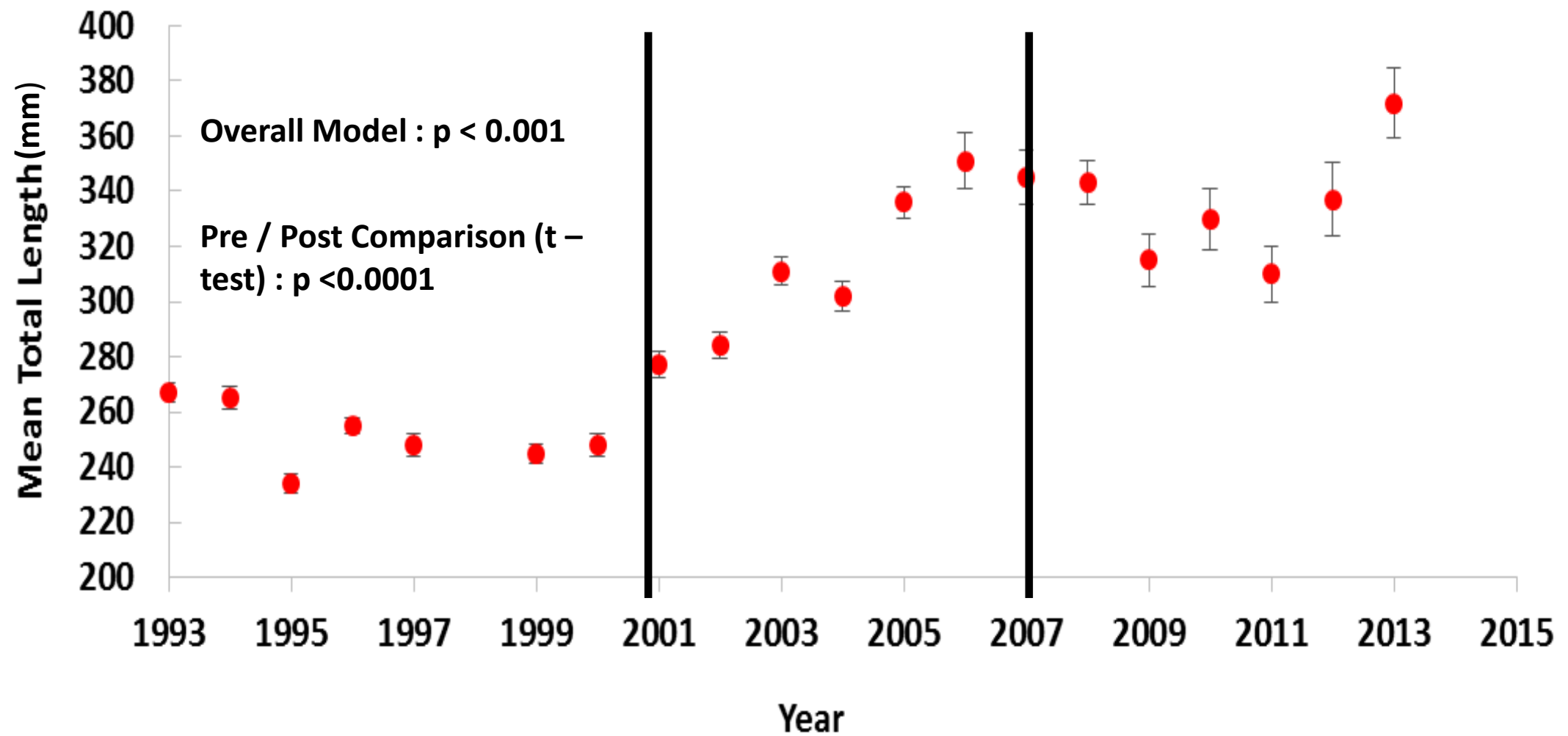
CPUE- ALB



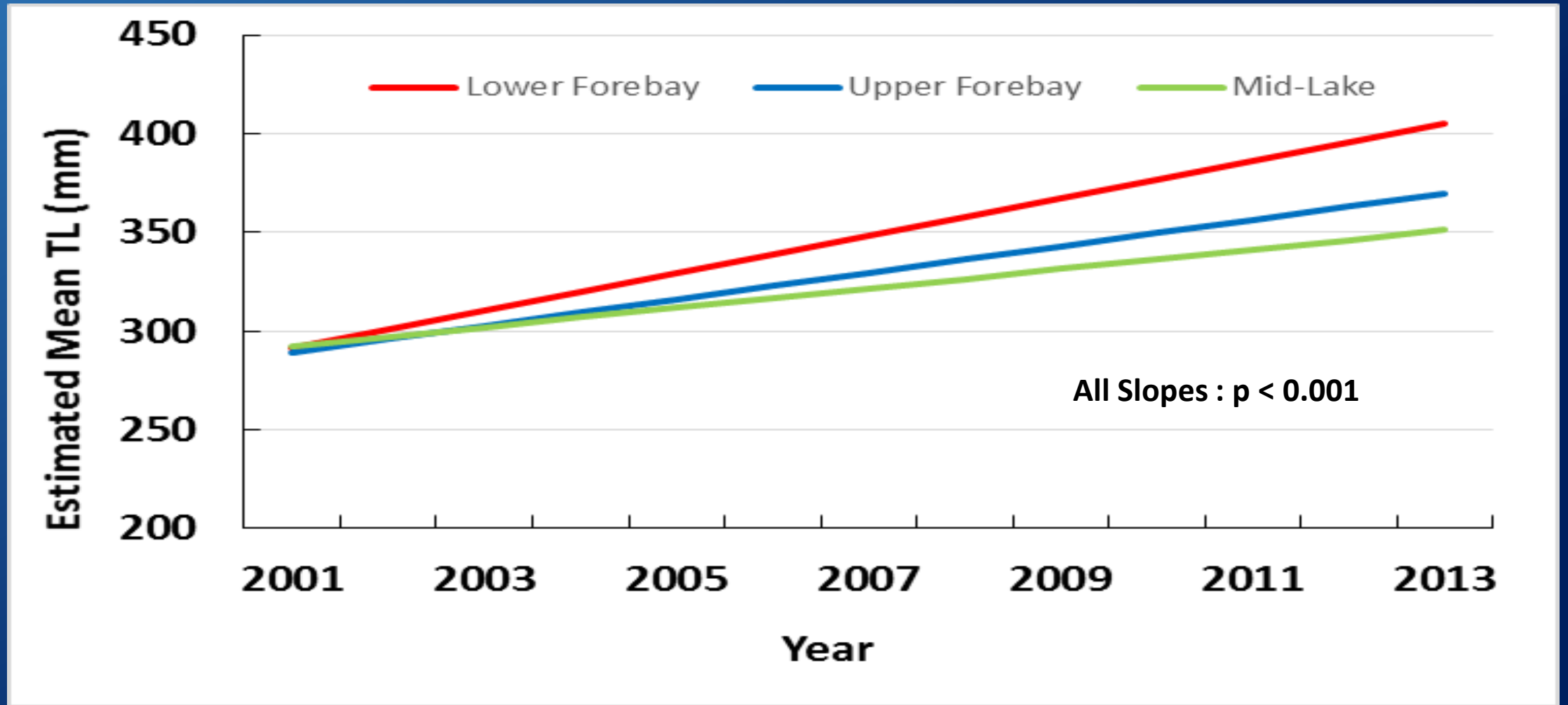
CPUE – ALB by Zone



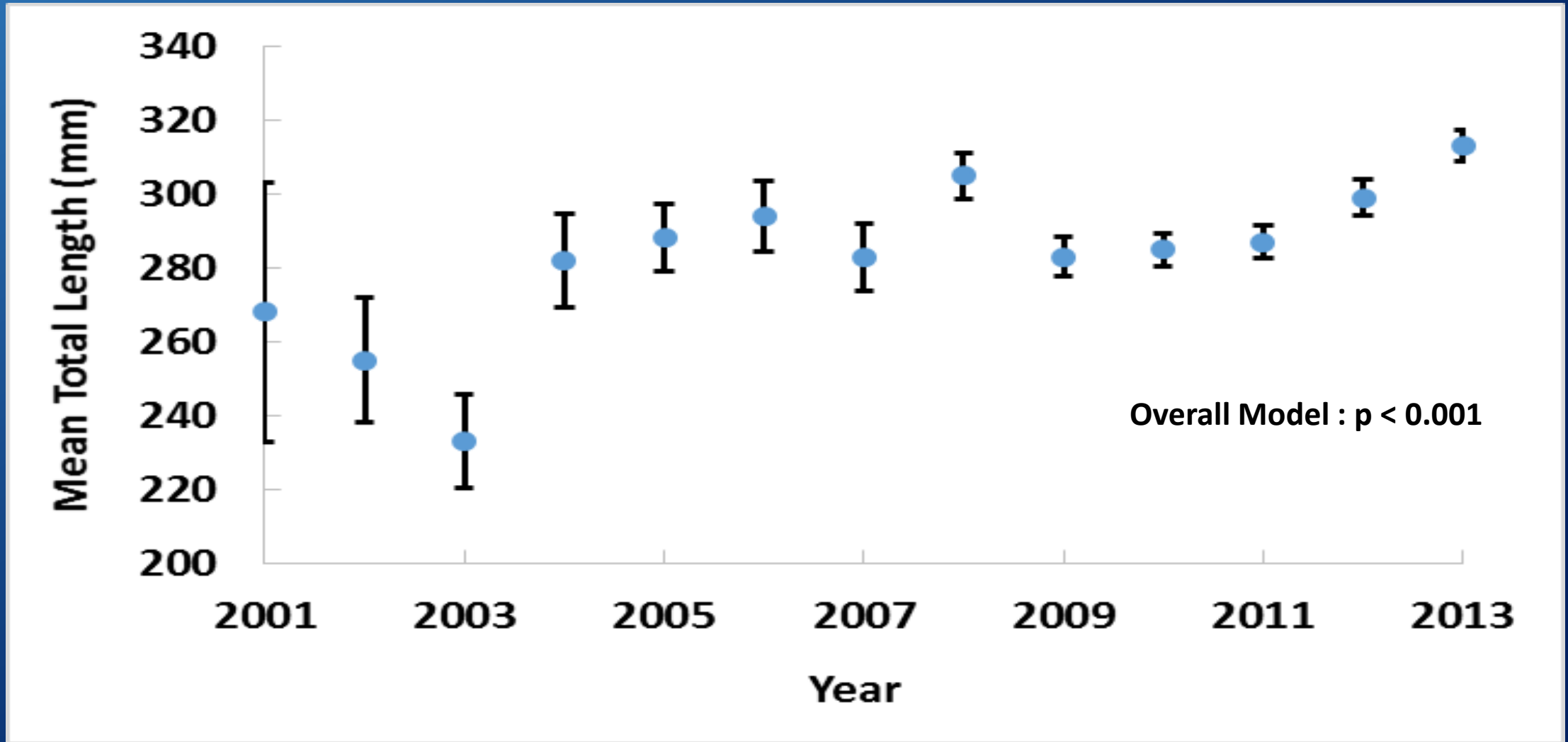
LMB – Total Length



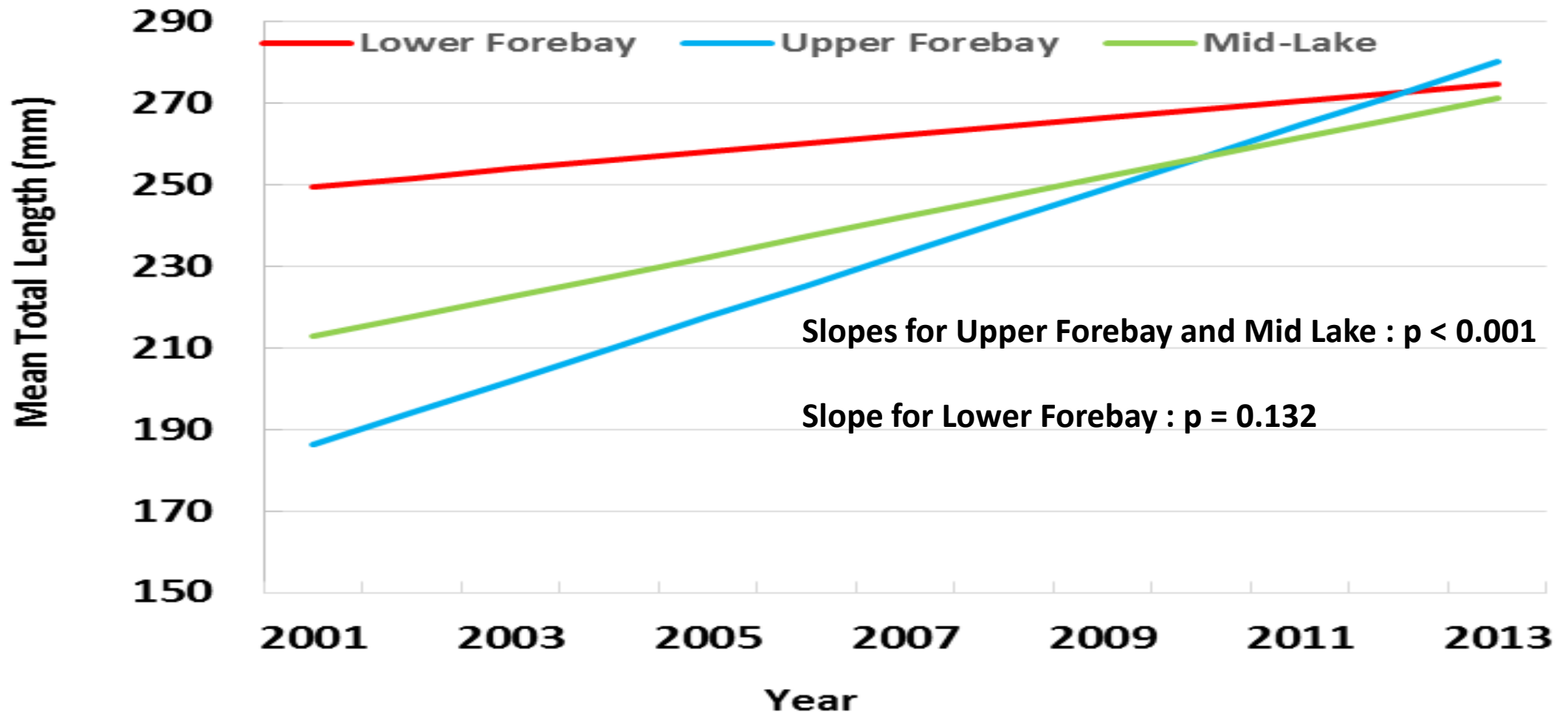
LMB – Total Length by Zone



ALB – Total Length



ALB – Total Length by Zone



Uplake Surveys and Analysis

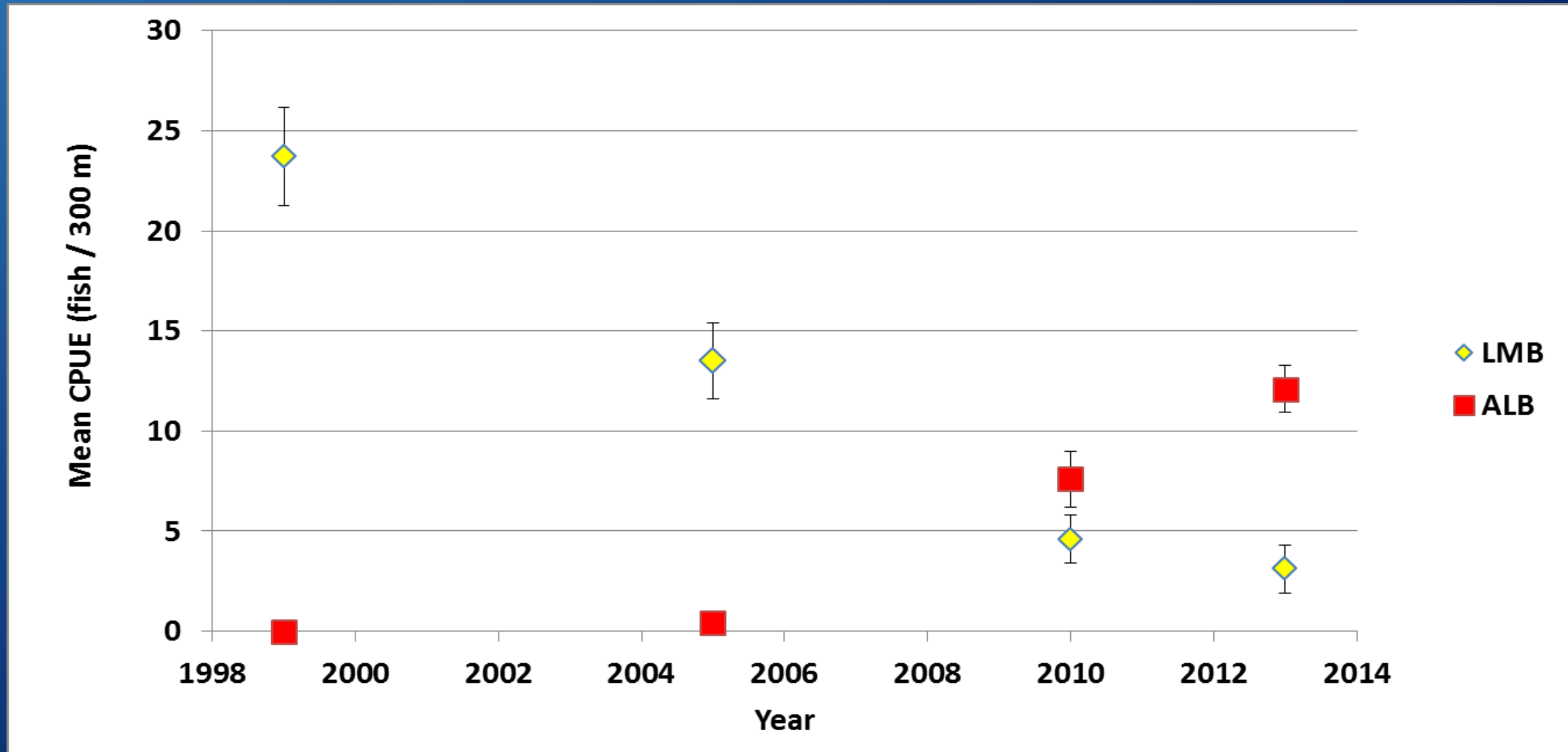
- 10 additional transects above Highway 150; sampled by Duke Energy in 1999 and 2005
- NCWRC sampled in 2010 and 2013; five additional transects added by NCWRC – surveyed in 2010 and 2013
- Generalized Poisson linear mixed model was used to analyze CPUE data between habitat types by species



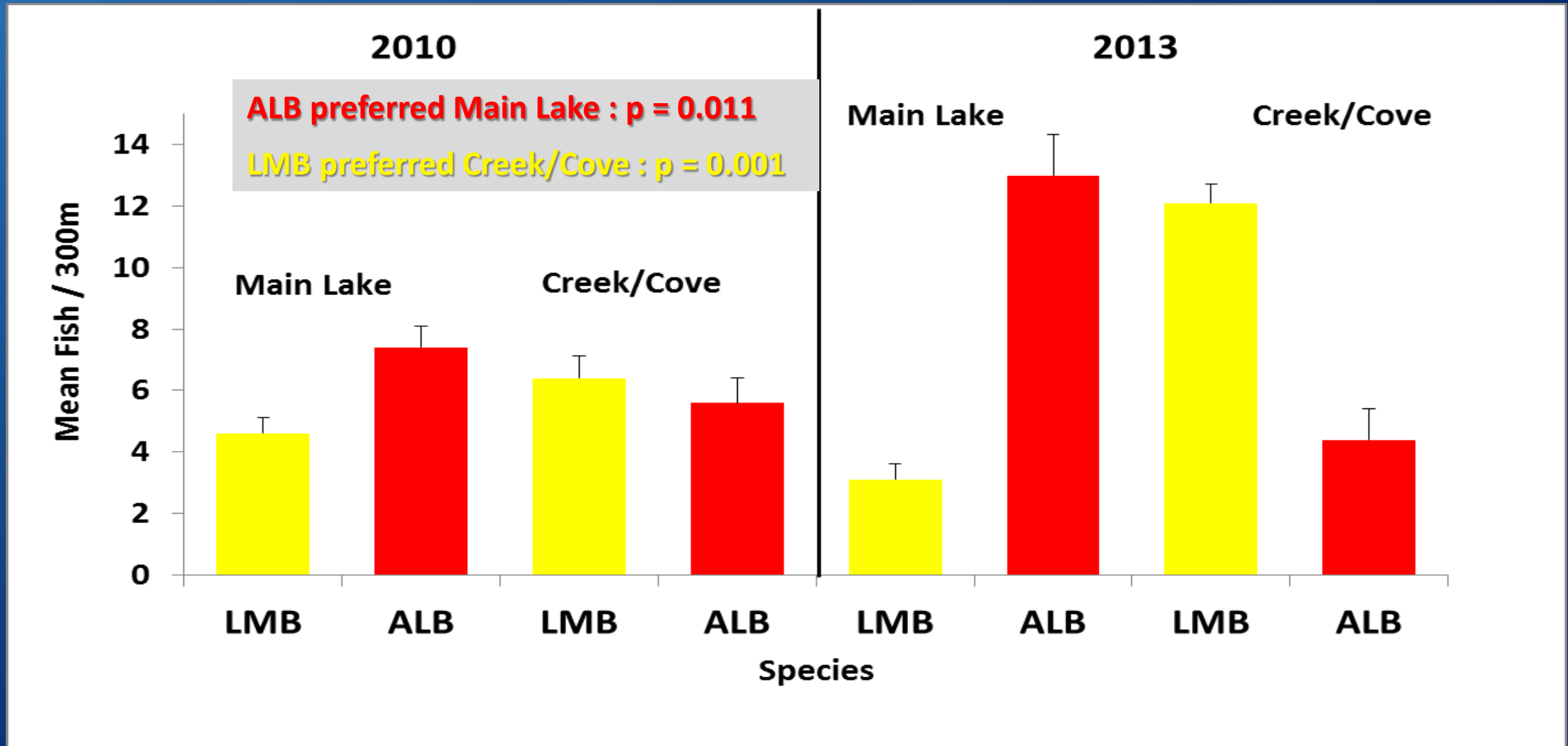
0 0.75 1.5 3 Kilometers



Uplake Black Bass CPUE



CPUE by Habitat



Conclusions

- Alabama Bass have become the dominant black bass at Lake Norman
- Mean CPUE and mean total length of largemouth bass changed conversely after the introduction of Alabama Bass
- Sampling must cover all habitats to gain an accurate picture of the black bass fishery

Questions ?

