

# **Assessing Trophic Linkages Between Platforms and Pelagic Fishes Using Ultrasonic Telemetry and Active Acoustics**

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# Background

- Platforms act as artificial habitat
  - Protect from predation
  - Visual attractant for pelagic fishes
- *Caranx crysos* (Blue runner) is one of the most common pelagic fishes around platforms

# Blue Runner

- Feed in schools at surface during day

- Prey

- Smaller fish
- Zooplankton



- Preyed on by tuna and other large fish

# Study Location

- South Timablier 151 (ST151)
- 50km South of Port Fourchon
- 35 km<sup>2</sup> Area
- Water depth 30 – 42m



Photo by S. Keenan

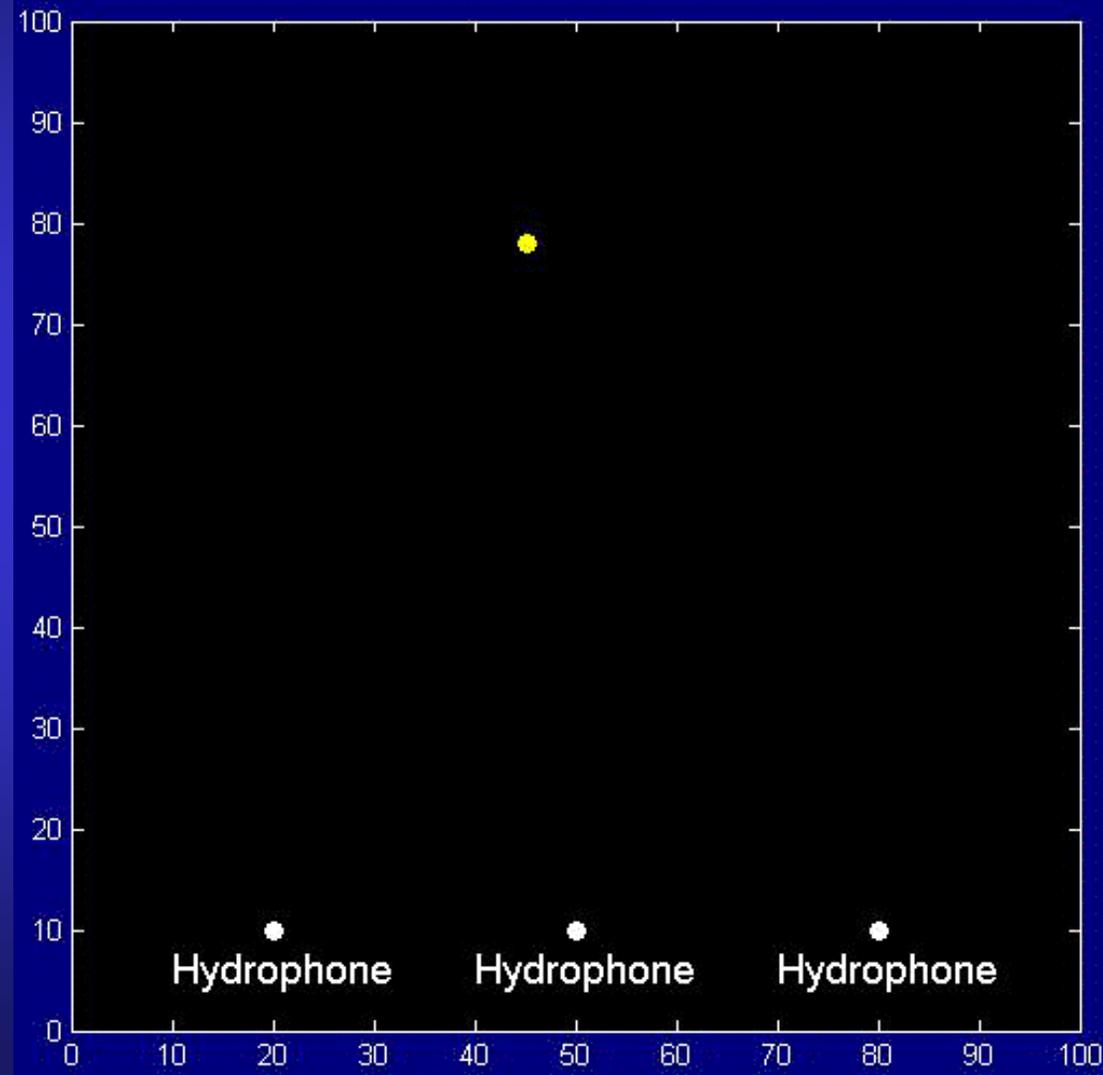
# Objectives

- Quantify the three-dimensional distribution of zooplankton prey within the water column
- Measure the three dimensional foraging patterns of blue runner around a platform
- Quantify the site fidelity of blue runner to various platforms within a platform complex

# Acoustic Localization

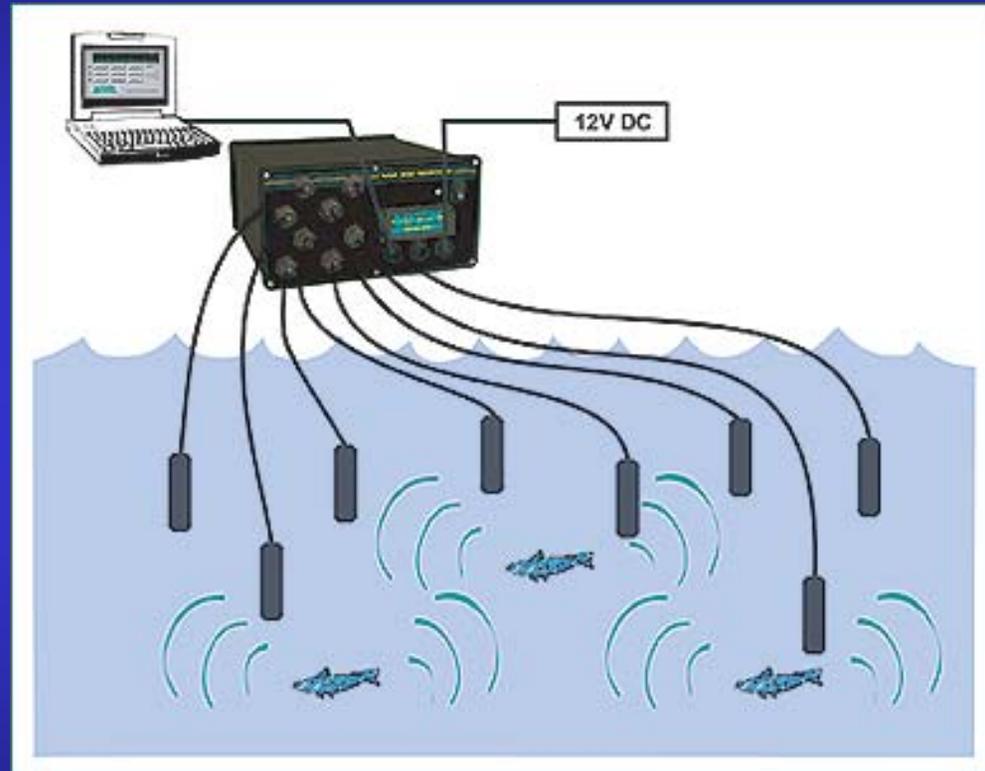
- Fixed hydrophones
- Tagged fish
- Position determined by computing difference in arrival times of signal at hydrophones

[Click to see video clip.](#)



# MAP 600 System

- Lotek Wireless
- Eight fixed hydrophones
- Central receiver
- Download data to laptop



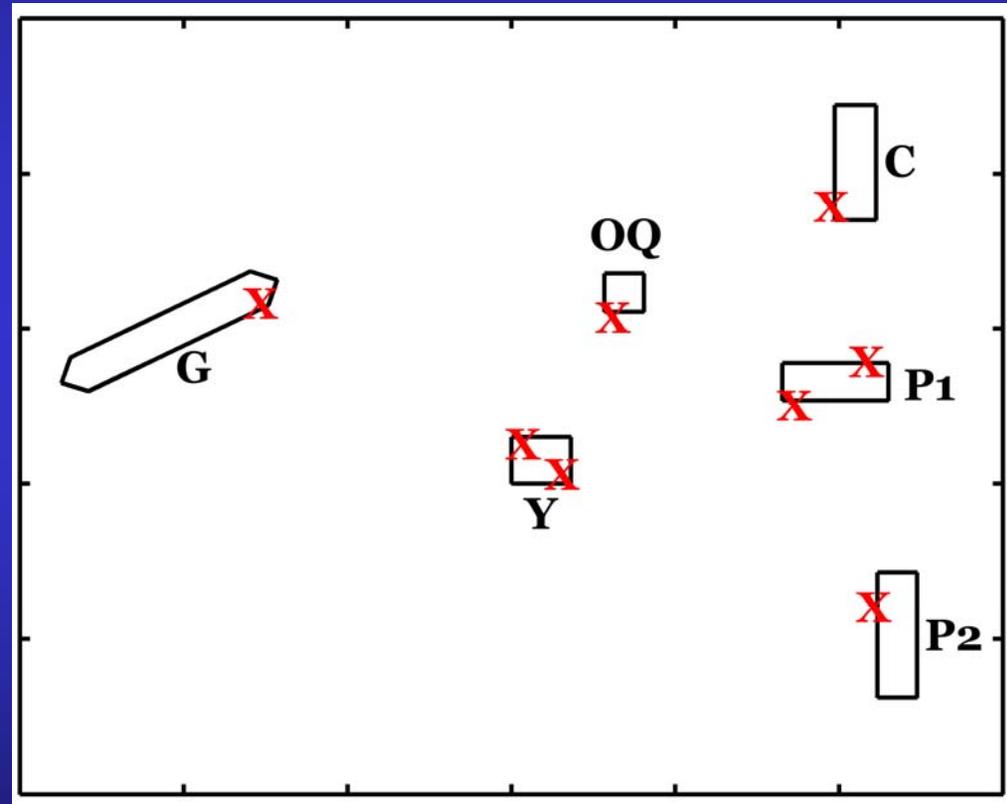
[http://www.lotek.com/map\\_600.htm](http://www.lotek.com/map_600.htm)

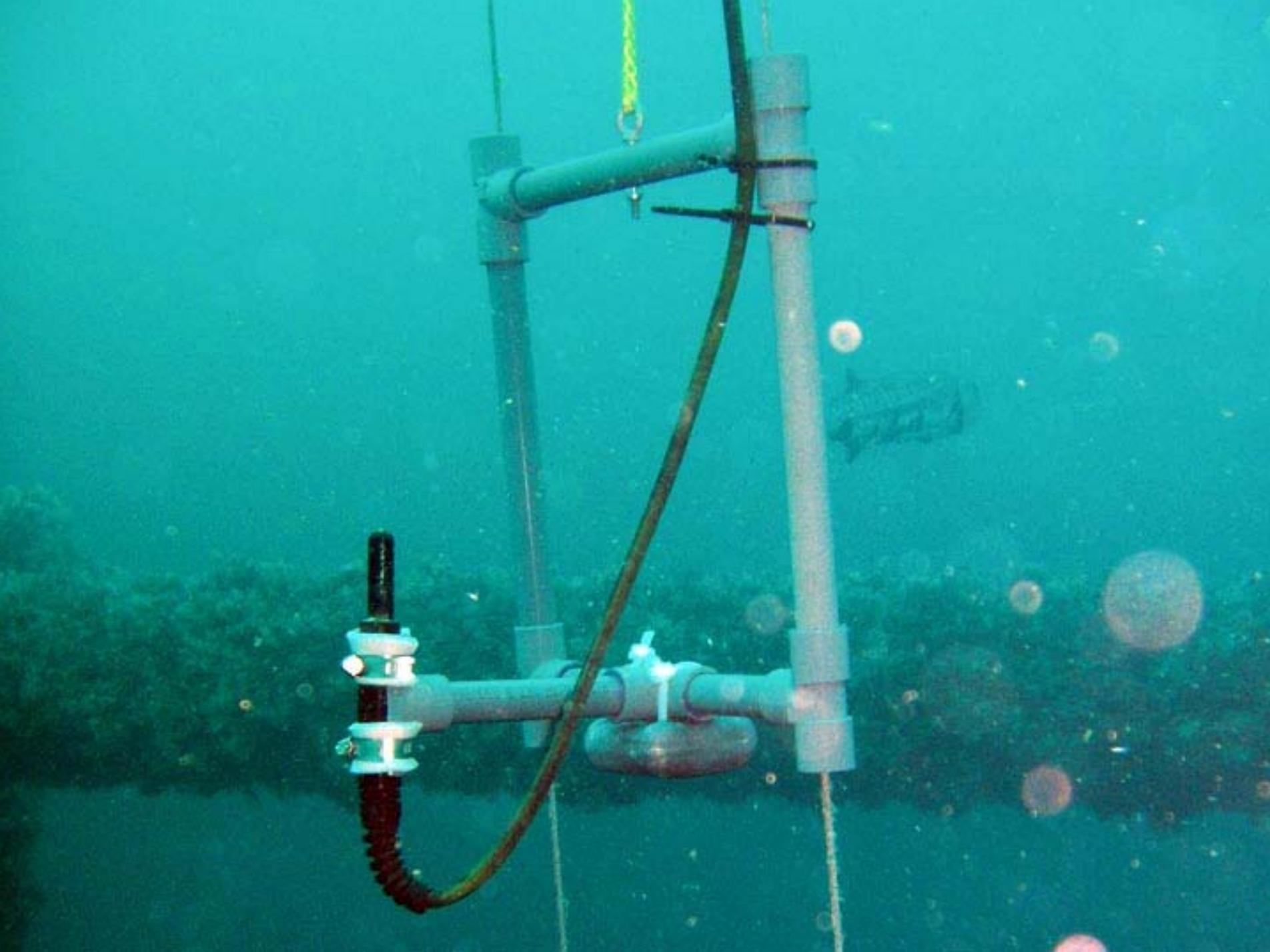


<http://www.lotek.com/hp.htm>

# 2005 Hydrophone Placement

- Secured to legs of all six platforms
- ~10m below surface





# 2005 – Satellite Platforms

- Hydrophones on three satellite platforms
- Presence/absence
- Movement



Photo by S. Keenan

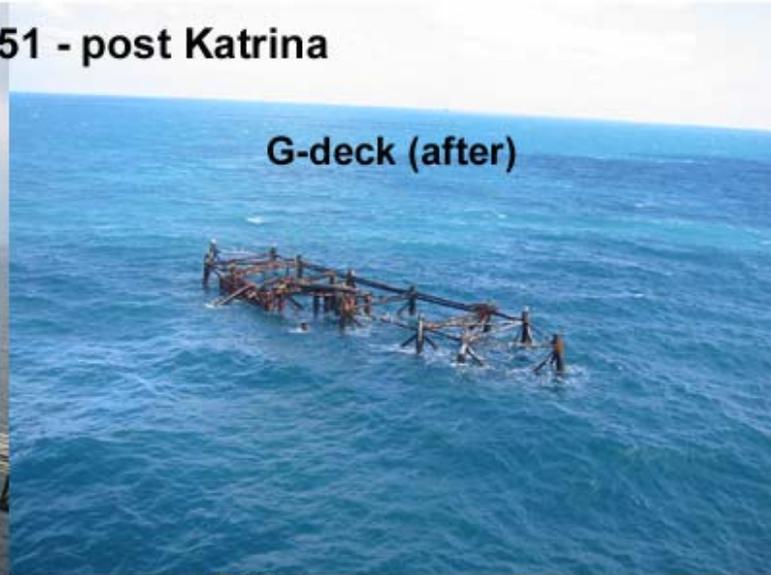
# Effects of Hurricane Katrina

South Timbalier 151 - post Katrina

G-deck (before)



G-deck (after)

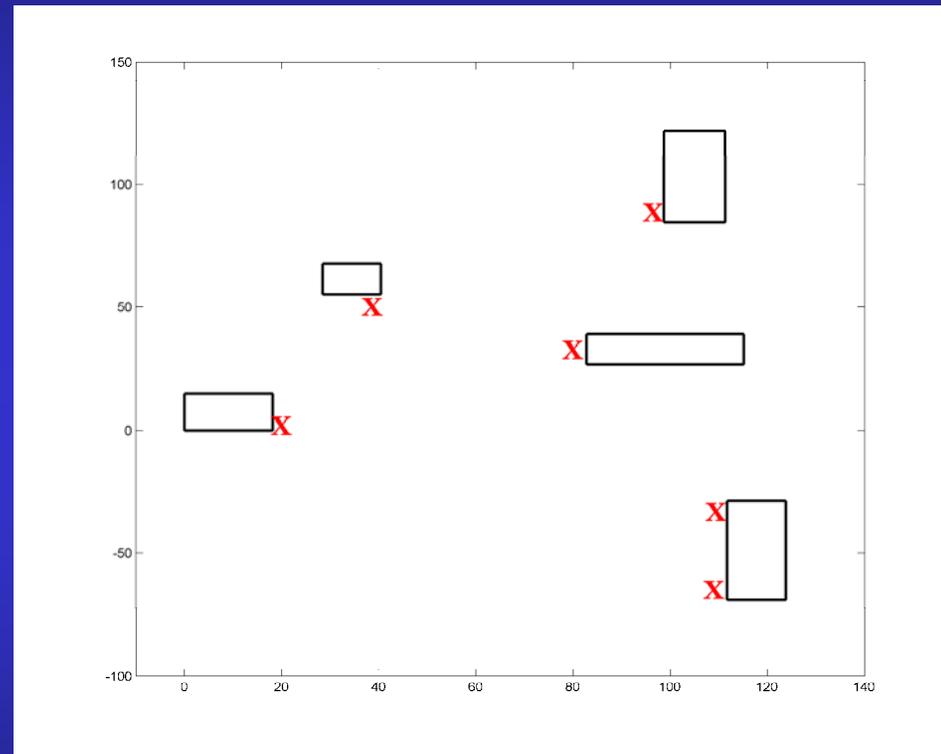


Old Quarters



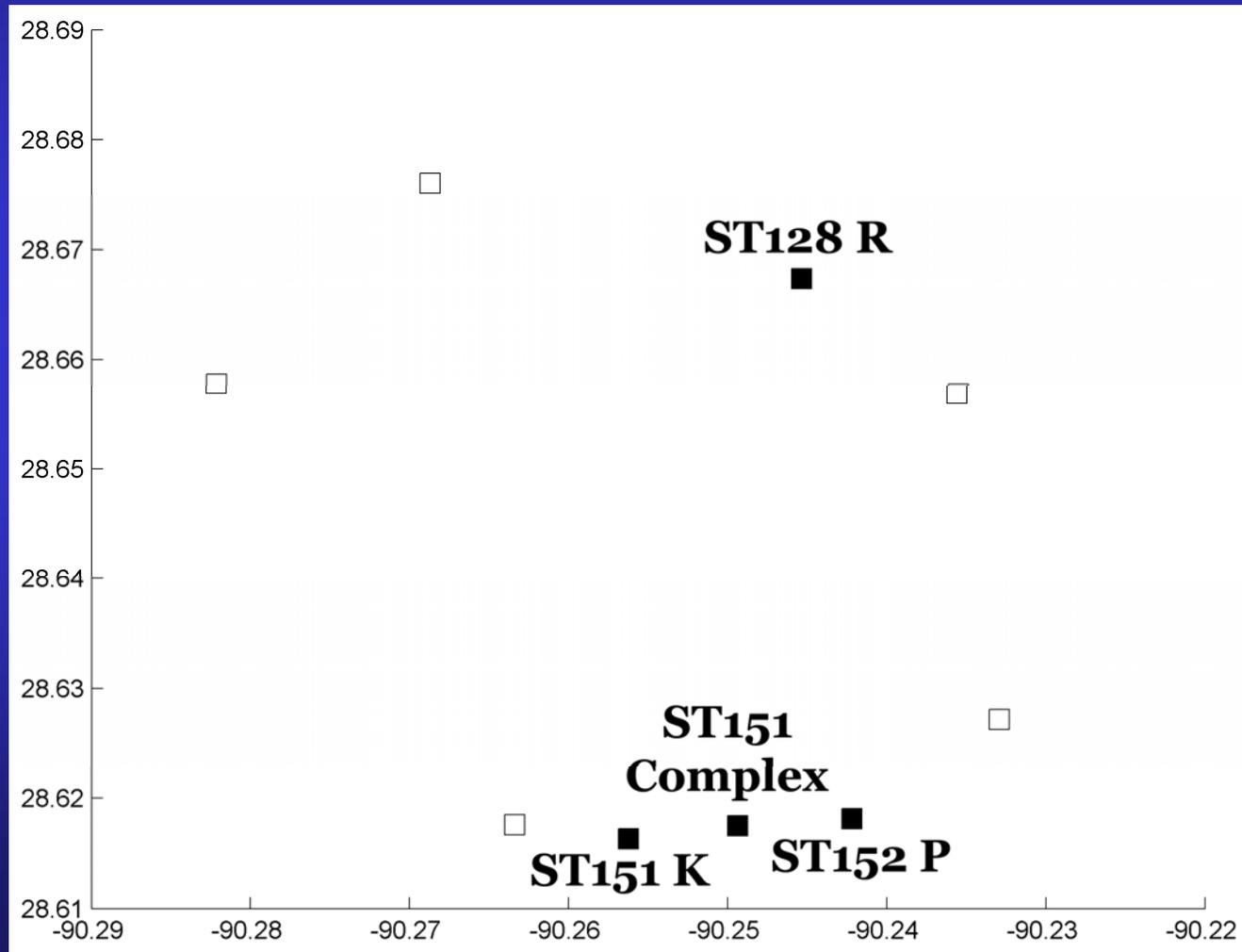
# 2006 Hydrophone Placement

- Seven hydrophones placed around the ST151 main complex



# 2006 Satellite Platforms

- Three hydrophones placed on satellite platforms



# Fish Tagging

- Hook, line and lure
- MS-222
- Tag inserted in peritoneal cavity
- Given antibiotic
- Allowed to recover before release



# Fish Tagging

- 2005

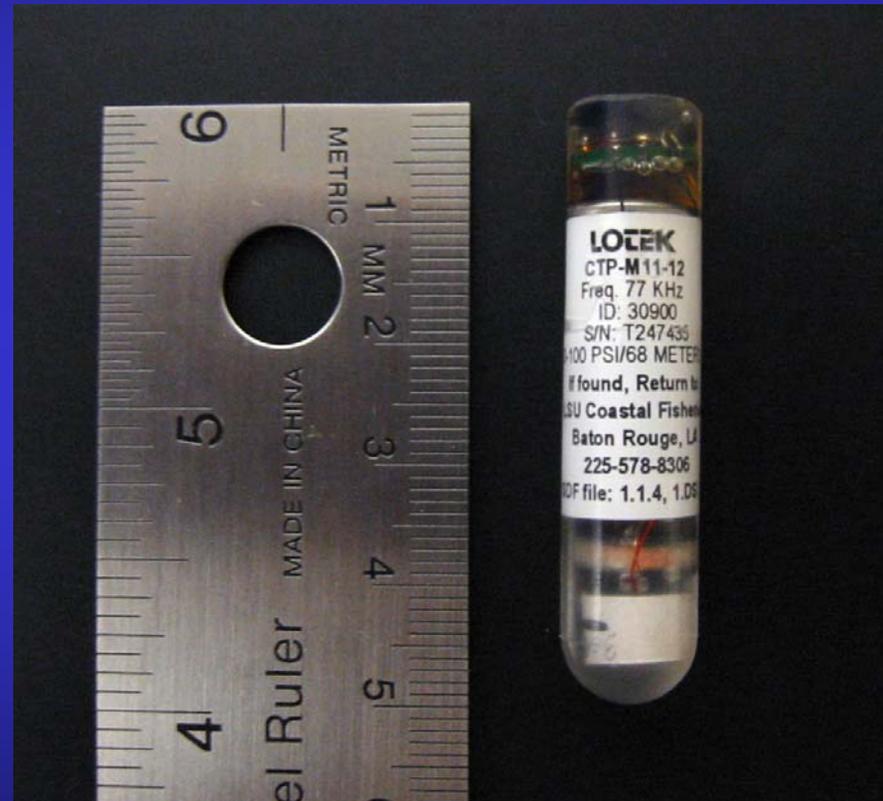


- 2006



# Acoustic tags

- Depth and Temperature sensing
- 2005
  - 46 blue runner tagged
  - 13 with 2-second ping rate
  - 33 with 4-second ping rate
- 2006
  - 19 blue runner tagged
  - One Amberjack tagged
  - Three Mangrove snapper tagged
  - All with 10 second ping rate

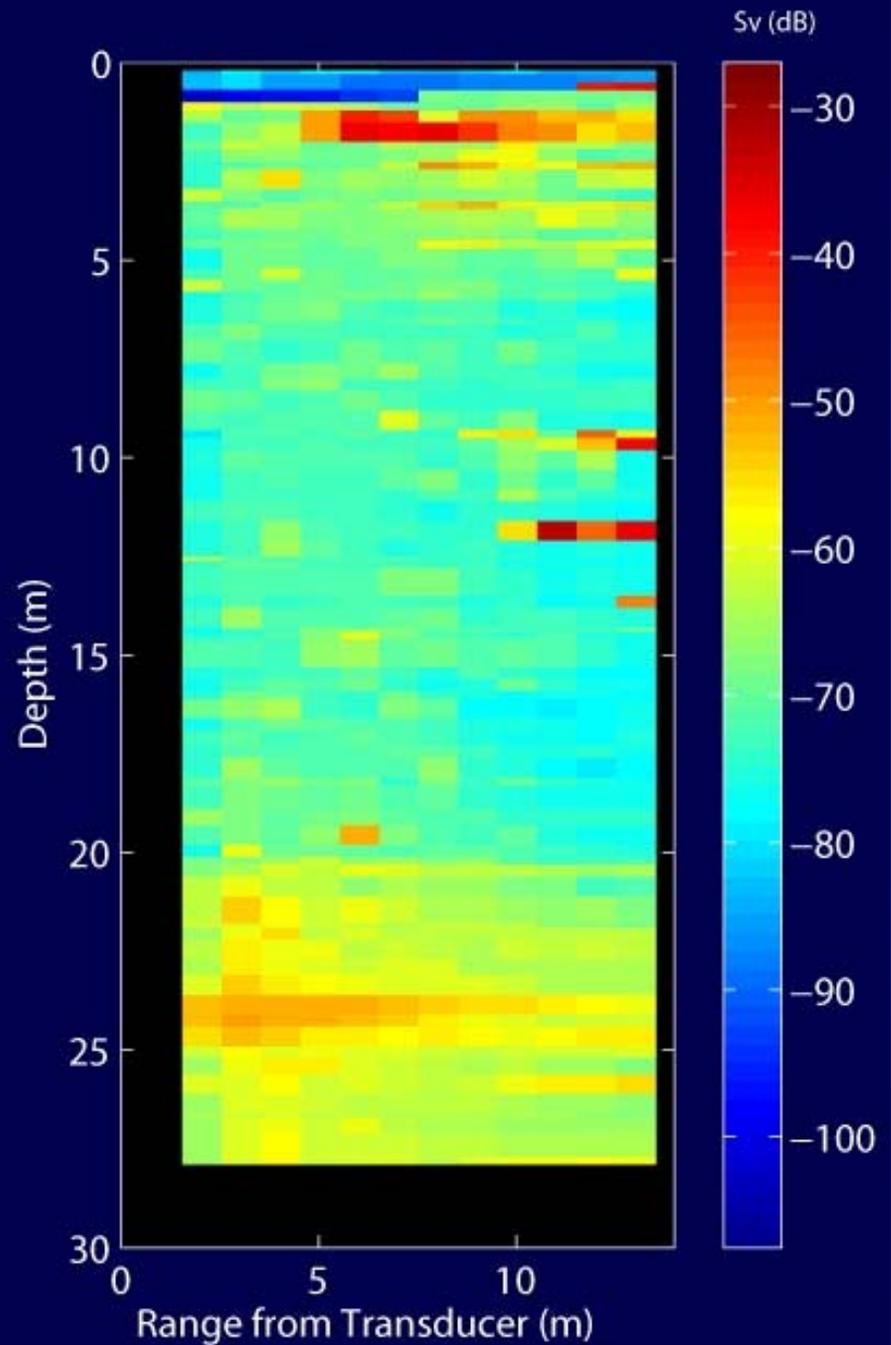


# 3D Distribution of Zooplankton

- ADCP surveys
- 1200 kHz – up to 15m range
- Day and night sampling
- Estimate prey abundance and distribution
- Data currently being analyzed



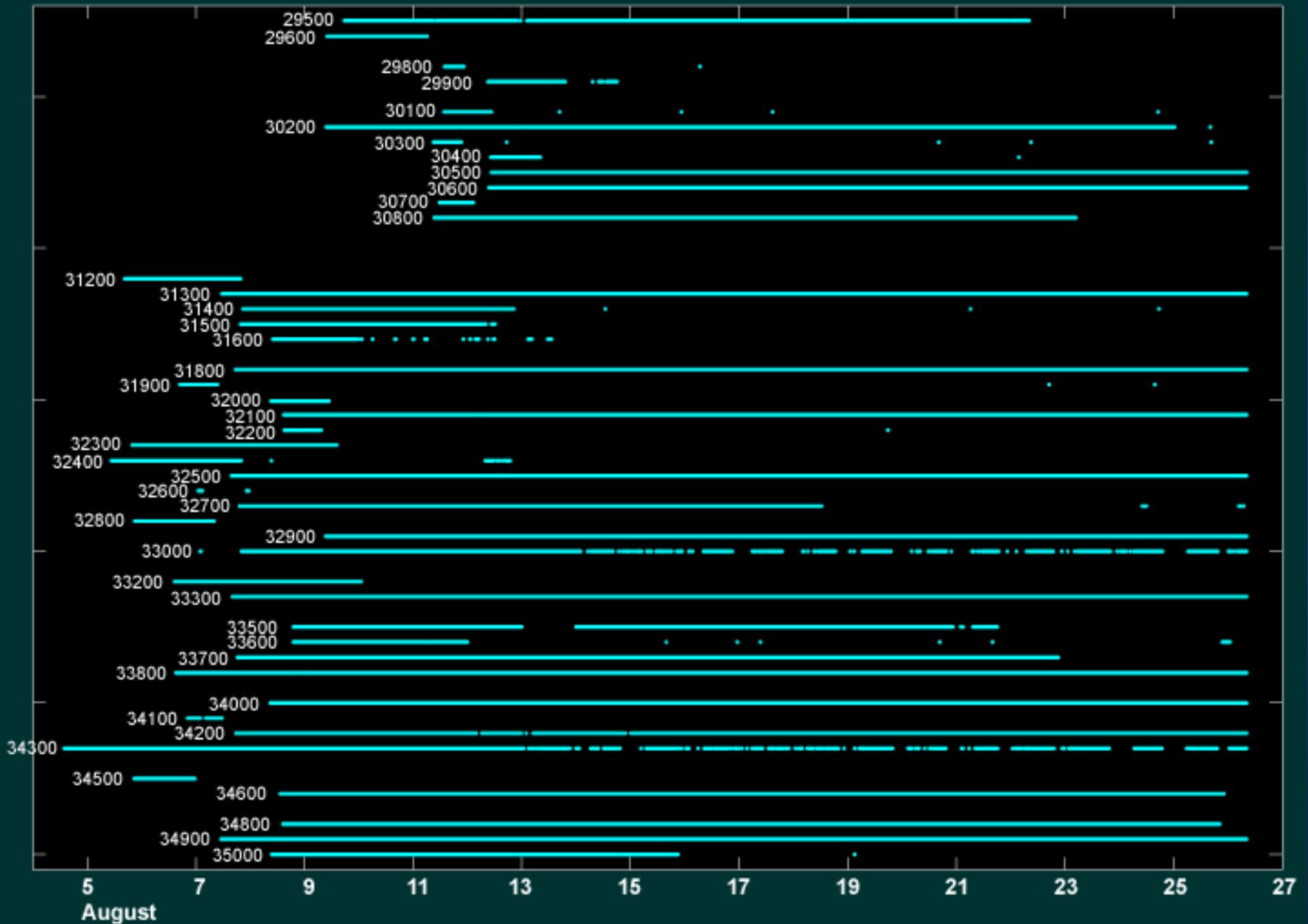
# ADCP Data



# 3D Distribution of Blue Runner

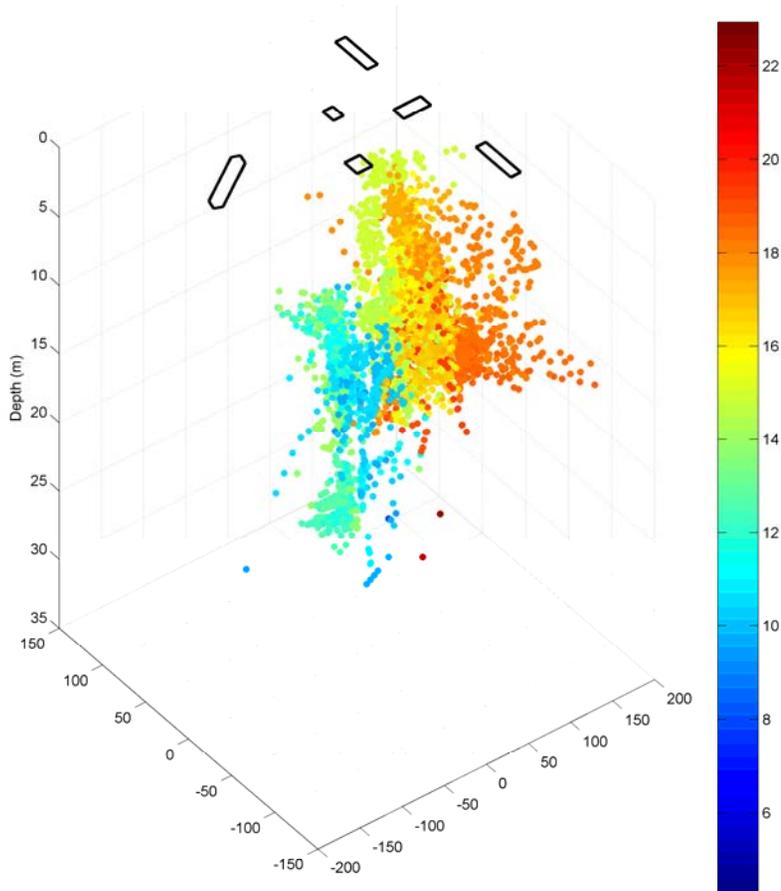
- Acoustic telemetry data from 2005
- Data from 23 fish being analyzed

# 2005 Detections at ST151

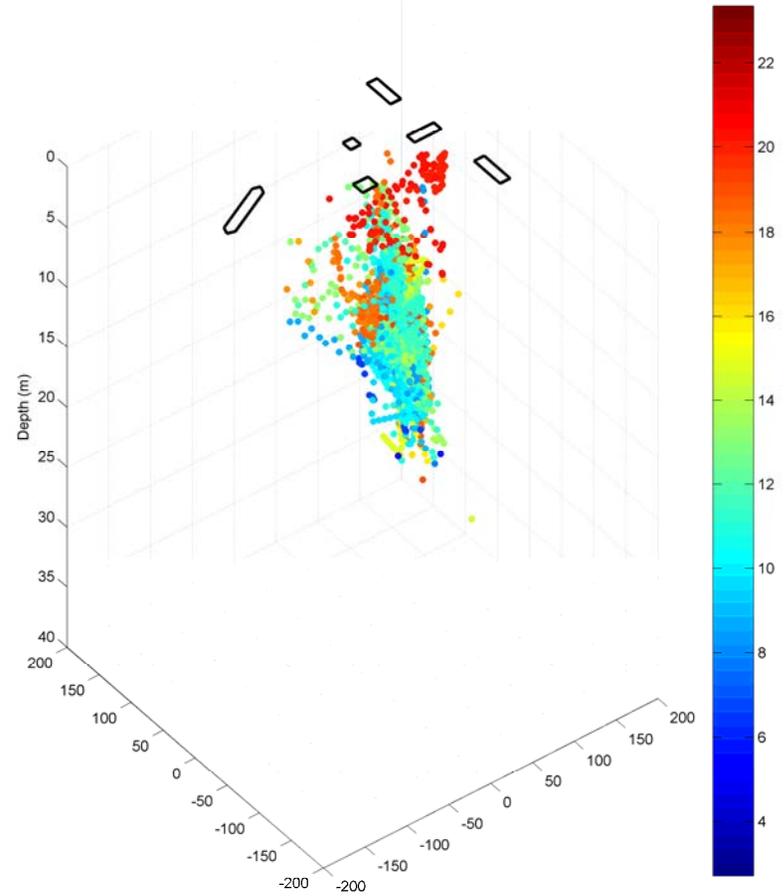


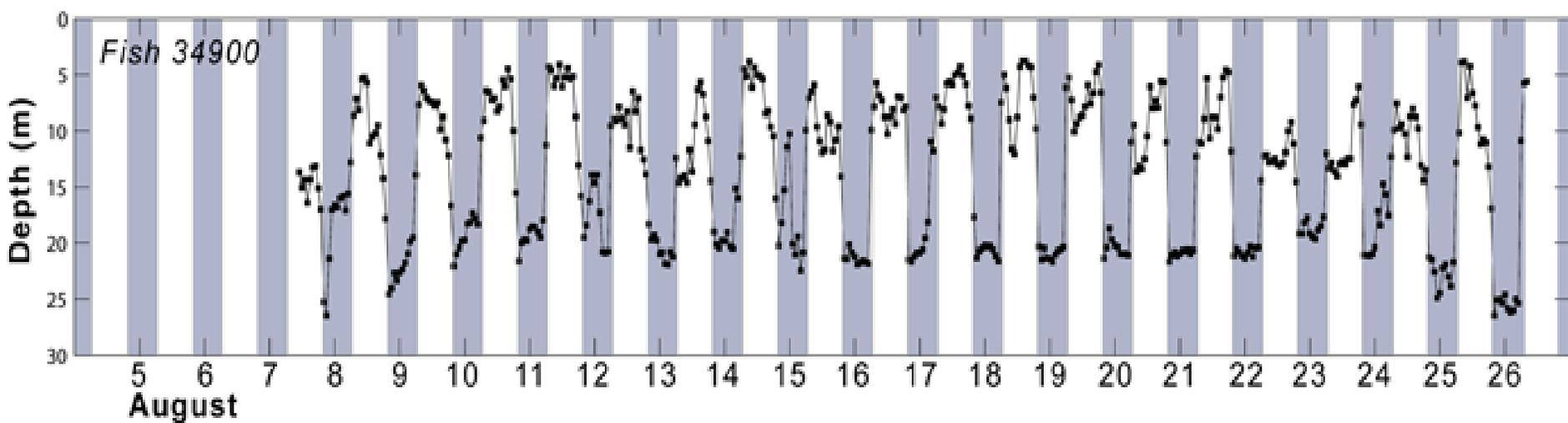
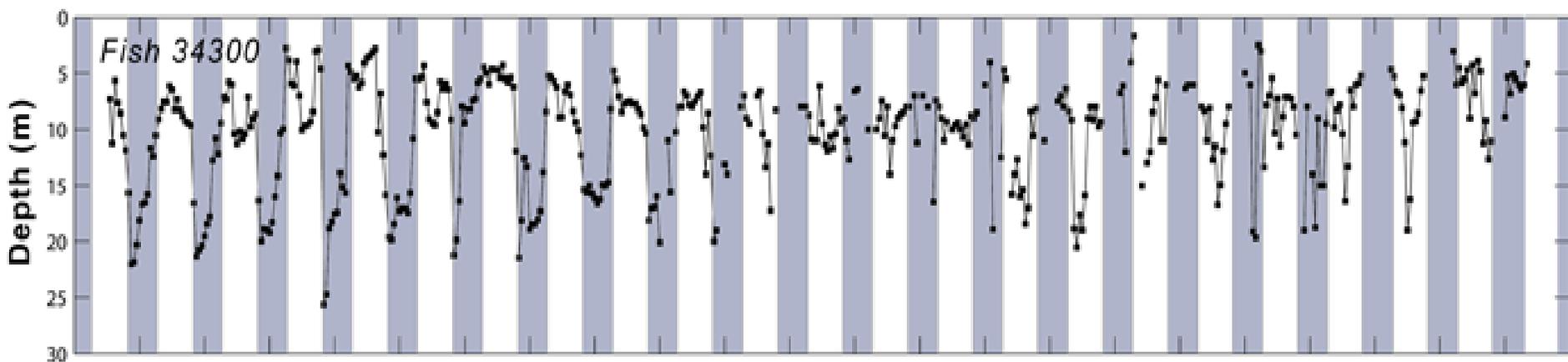
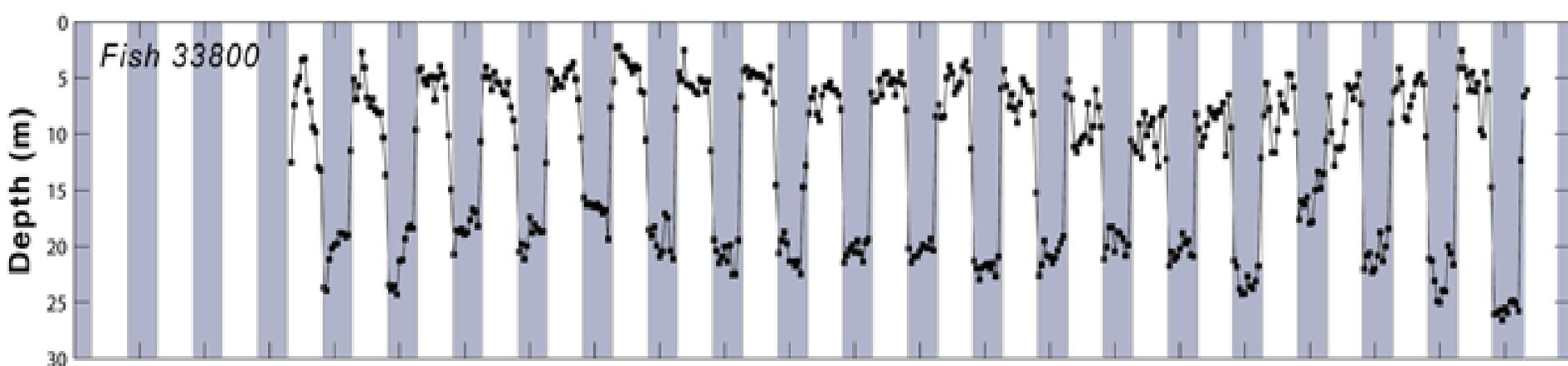
# Blue Runner (Tag # 30600)

August 17, 2005



August 18, 2005



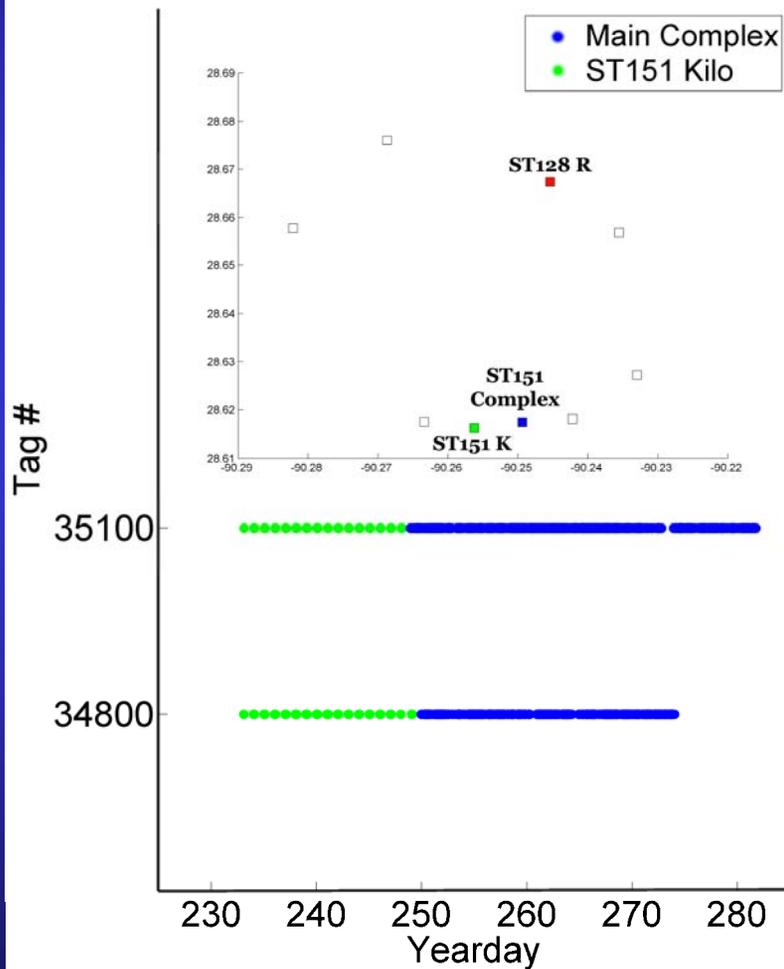


# Site Fidelity of Blue Runner

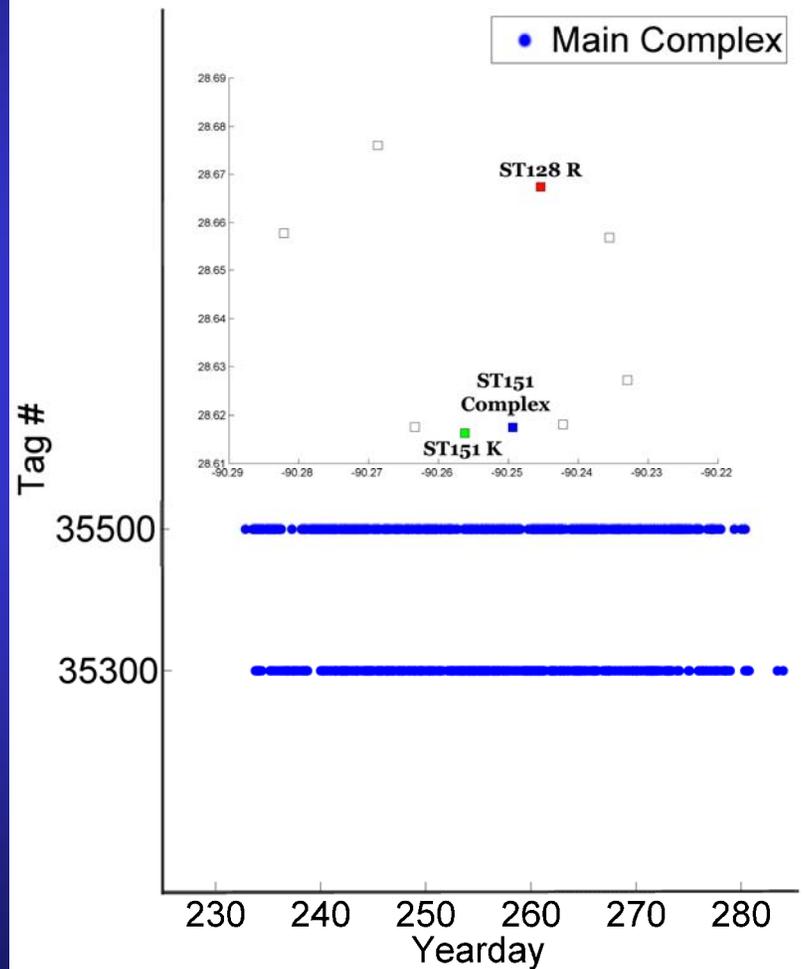
- Acoustic data from 2006
- Nine blue runner caught and released in same location
- Ten blue runner caught and released in different locations
- Three mangrove snappers and one amberjack caught and released in different locations

# Blue Runner Caught at ST151 K

Caught and Released at ST151 Kilo

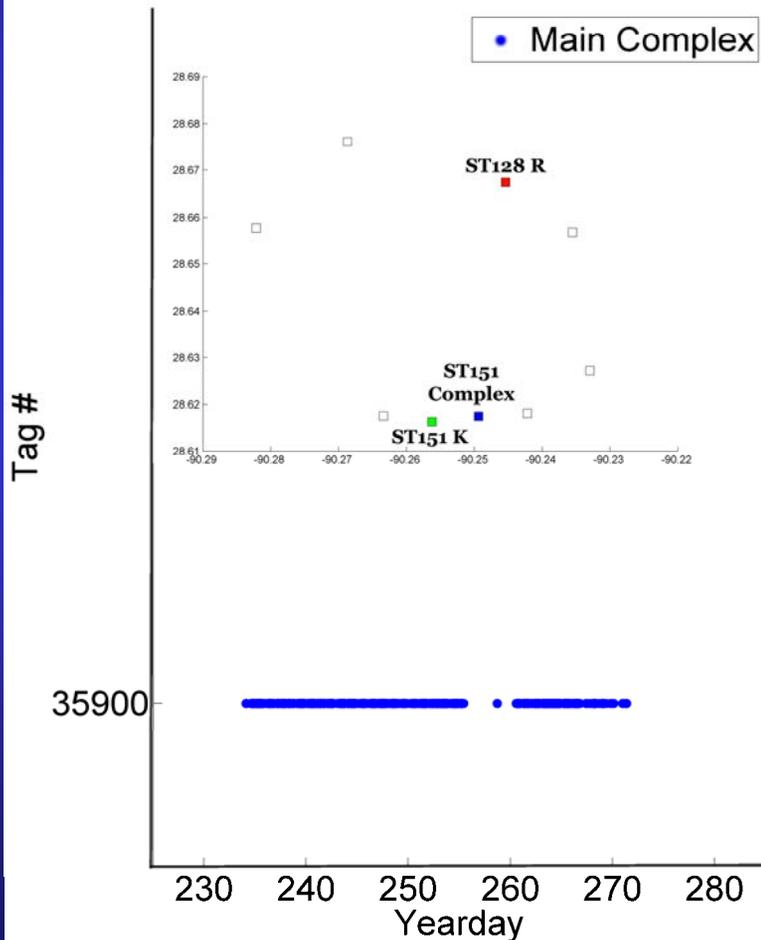


Caught at 151 Kilo, Released at Main Complex

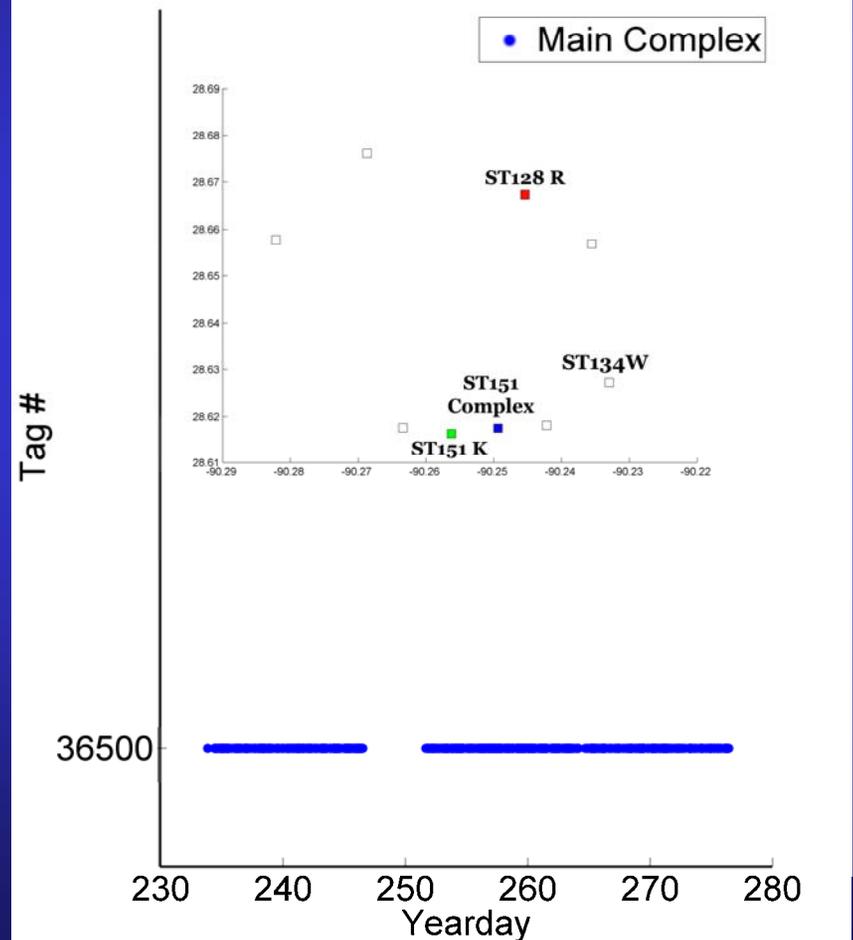


# Blue Runner Released at ST151 Main Complex

Caught and Released at Main Complex

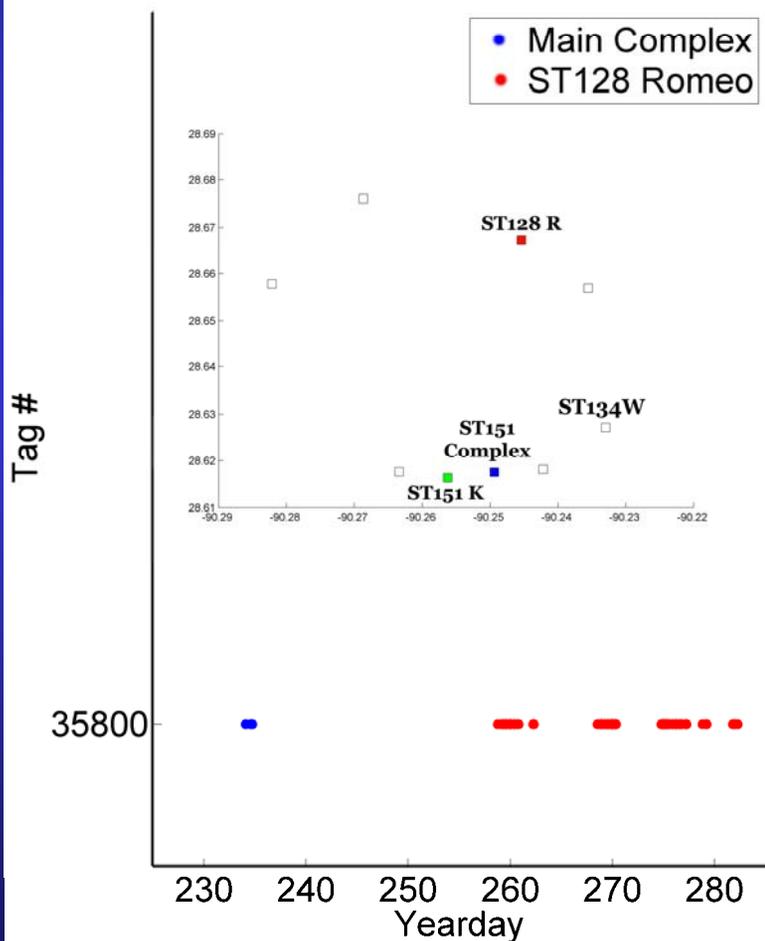


Caught at ST134 W, Released at Main Complex

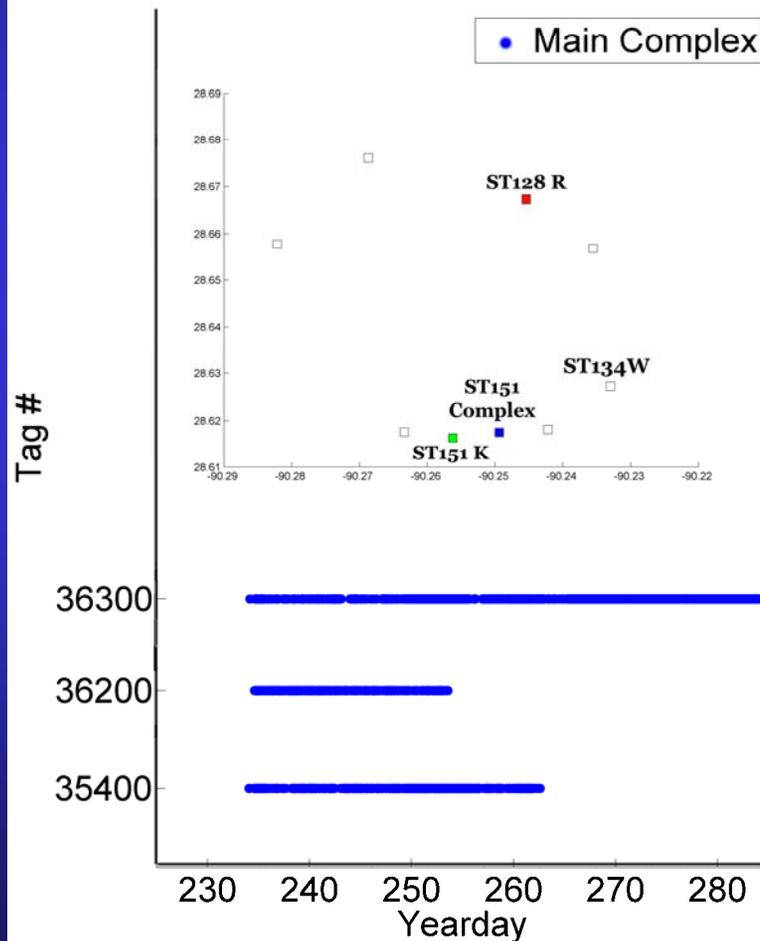


# Amberjack and Mangrove Snapper

Caught at ST134 W, Released at Main Complex



Caught at ST134 W, Released at Main Complex



# Challenges – 2005

- Hurricane Cindy destroyed original hydrophone mounts
- Tropical Storm Dennis delayed start
- Drilling operations and power supply problems reduced number of satellite platforms available
- Hurricane Katrina ended data collection early and destroyed ~\$20,000 worth of equipment

# Challenges – 2006

- Damage from Hurricane Katrina and salvage operations reduced number of satellite platforms available
- Weather problems limited number of tagged fish
- One hydrophone leaked
- One hydrophone worked intermittently
- Difficulties downloading data from three more hydrophones

# Additional Blue Runner Research

- Schooling behavior of blue runner found near petroleum platforms
- Movement patterns
- Nighttime behavior
- Bioenergetics



Photo by S. Keenan