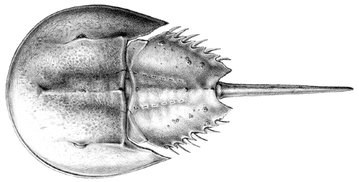
Subtidal Movements of Horseshoe Crabs in the Delaware Bay



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Introduction

The Atlantic Horseshoe Crab (*Limulus polyphemus*) plays a key role in structuring the ecology and economics of the mid-Atlantic. To date, most research has focused on understanding the phenomena of Horseshoe Crab spawning in the Delaware Bay. This is countered by the relative lack of information on the sub-tidal components where they spend the vast majority of their lifespan. Given the multiple demands made upon this invaluable resource, information on this important phase of their life history is critical for the conservation and management of this species.

Objectives

- Identify estuarine residency patterns of Horseshoe Crabs in the Delaware Bay.
- Identify habitat requirements of Horseshoe Crabs.

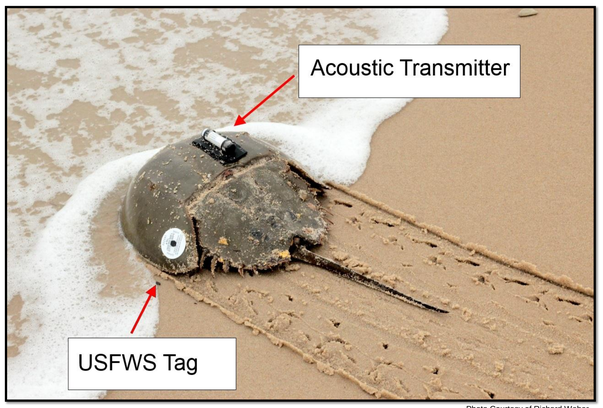

Photo Courtesy of Richard Weber

Figure 1. Horseshoe Crab affixed with VEMCO Ltd. V16-4H acoustic transmitter and USFWS button tag at time of release.

Methods

- On June11 - 13th, 2014, 65 individually coded acoustic transmitters, with three year life spans, (VEMCO Ltd. V16-4H) were externally attached to terminal molt adult Horseshoe Crabs collected on seven known spawning beaches (Figure 1).
- A total of 70 VEMCO VR2W receivers were deployed in the Delaware Bay (Figure 2).

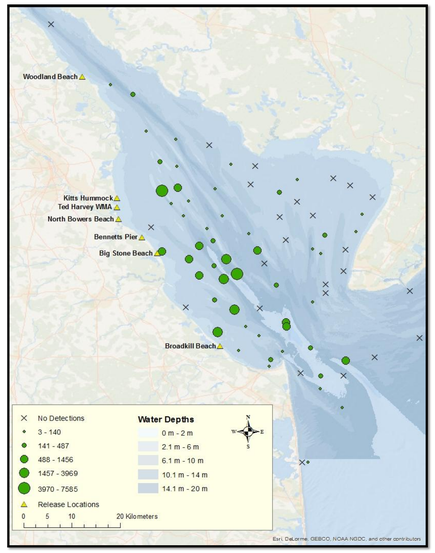

Figure 2. General study area showing the Delaware Bay receiver array, release beaches, and the relative frequencies of Horseshoe Crab detections from June through December 2014.

Results

Table 1. Relative frequency of Horseshoe Crabs detected by Sex in Delaware Bay and number of receivers where each sex was detected.

	Females (n=32)	Males (n=33)
Number of Unique Horseshoe Crabs Detected	**27 (84.3%)**	**22 (66.7%)**
Number of Receivers Where Detected	**47**	**35**

Results

Monthly Detections

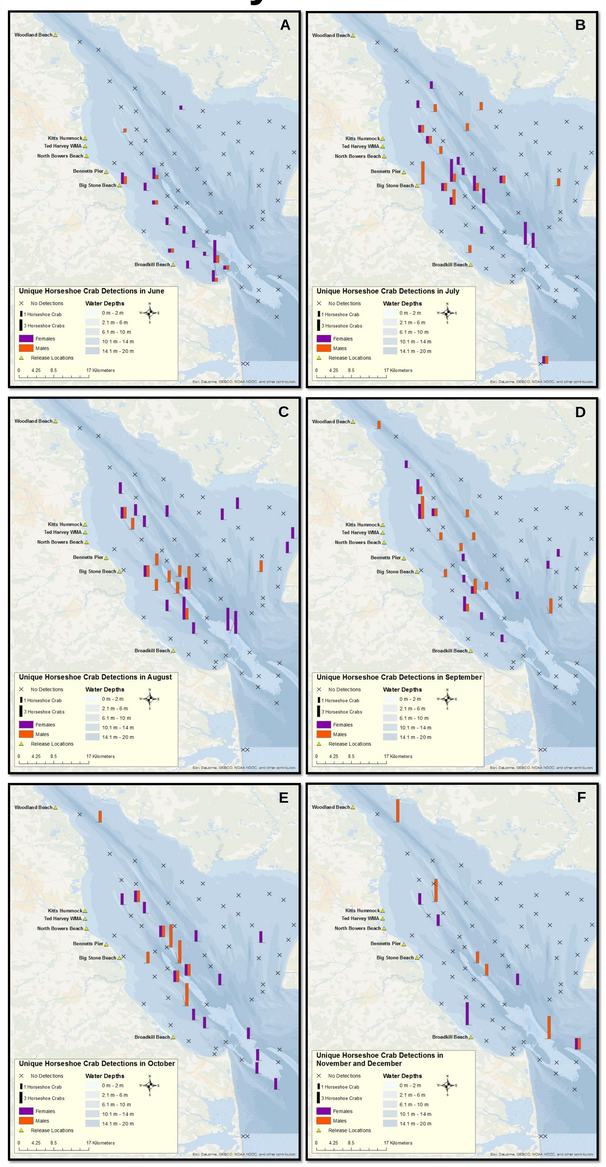

Figure 3. Maps showing the number of unique Horseshoe Crabs detected at receivers in the Delaware Bay, based on sex, for (A) June, (B) July, (C) August, (D) September, (E) October, and (F) both November and December. One receiver in the anchorage was lost and two nearshore receivers have not been downloaded. New Jersey's receivers on the eastern side of Delaware Bay were removed in October.

Summary

- There have been 37,989 Horseshoe Crab detections at 52 of the 70 receivers in the Delaware Bay from June to December 2014.
- To date, 27 females and 22 males have been detected, representing 75.4% of all tagged Horseshoe Crabs.
- Horseshoe Crab detections have been predominately along the western shore of the Delaware Bay.
- In July, two Horseshoe Crabs were detected as far south as the Indian River Inlet.
- Preliminary data suggests females may begin to leave the Delaware Bay in October.

Next Steps

- Dependent on funding, more Horseshoe Crabs may be tagged in June 2015 to better understand sub-tidal movements of the Delaware Bay's Horseshoe Crab population.
- Quantify sex based movements and residency times of Horseshoe Crabs in the Delaware Bay.
- Determine if there are benthic habitat and depth preferences exhibited by tagged Horseshoe Crabs.

Acknowledgements

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