

**1. Annual Report:** Sunrise Wind Telemetry Project

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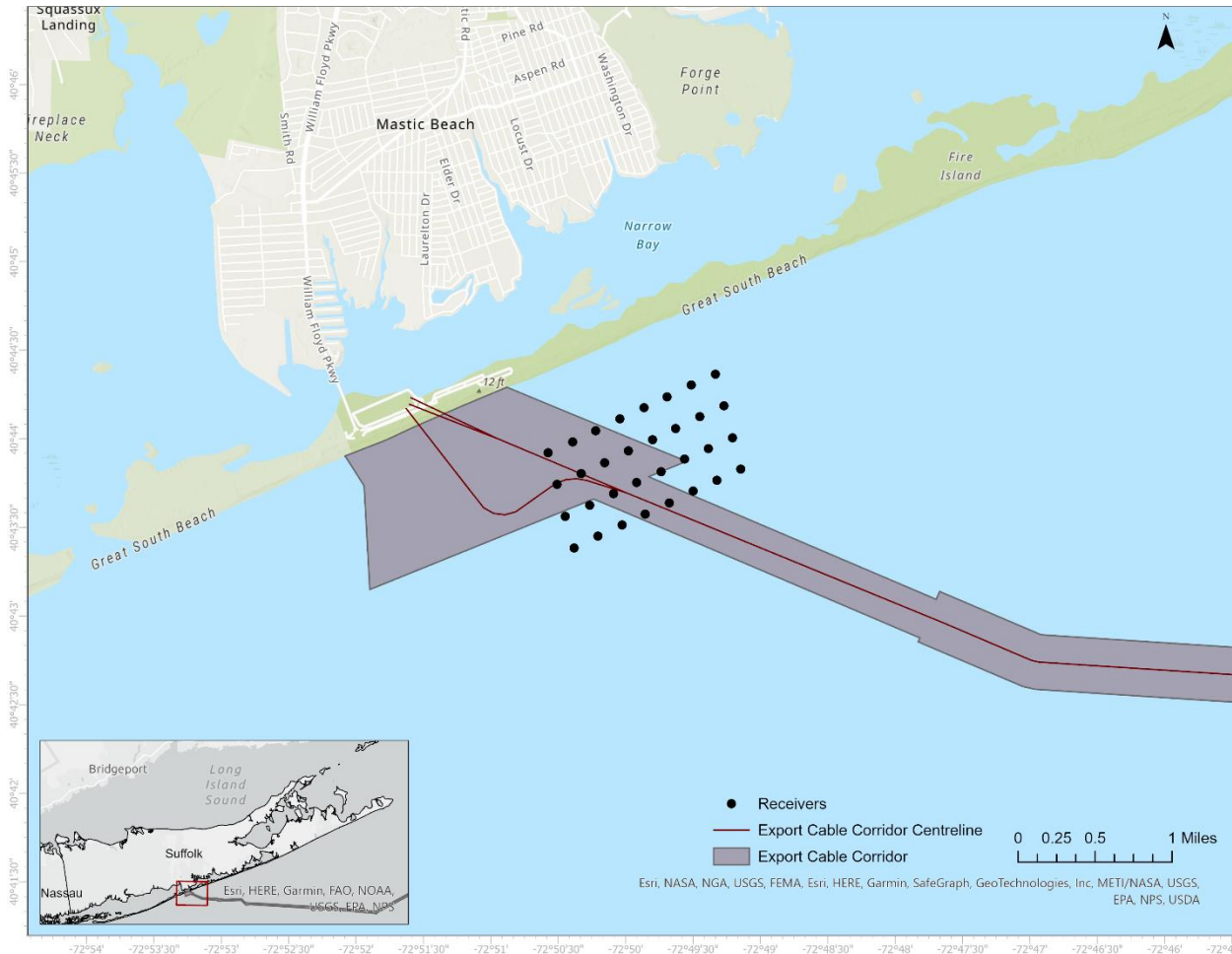
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**3. Project Term:** September 2022 through December 2022

## **Introduction/Background**

Cornell Cooperative Extension has been working with Stony Brook University to conduct a multi-year acoustic telemetry study to assess the potential impacts of the electromagnetic field (EMF) emitted by the Sunrise Wind Export Cable (SRWEC) on select migratory marine invertebrates. In collaboration with the Peterson Lab at Stony Brook University, a VEMCO VPS nearshore positional array was deployed in July 2022 (Figure 1). This array is composed of 32 receivers and acoustic release buoys in an 8 x 4 pattern to reduce risks to local marine mammals, other protected species, and minimize interactions with commercial fisheries in this region. The positional array is designed to track the fine-scale movements of the targeted acoustically tagged fish and invertebrates, and to determine if there are any changes in behavior pre-and post-construction of the export cable.

CCE's contract with Orsted was finalized in late August 2022, and our work on lobster (*Homarus americanus*) and horseshoe crab (*Limulus polyphemus*) tagging began at this time and is summarized in this report.



**Figure 1.** Location of the near-shore Sunrise positional array, composed of four rows of eight receivers (32 receivers total) deployed about 400 m apart. The array overlaps the SRWEC to study fine-scale behavior of target species in relation to the potential effects of the electromagnetic field emitted.

## Vessel Approvals

CCE began the process of meeting Orsted’s Health and Safety requirements and receiving approvals for the following vessels used on this research project: the R/V Karen/June and the R/V Scout. The vessels were inspected and later approved by Orsted after all safety requirements were fulfilled and all safety equipment was obtained. Once the vessels were approved, our team began to order the acoustic tags and supplies needed to tag the horseshoe crabs and lobsters. We began to capture and attach acoustic transmitters to horseshoe crabs in September 2022. In December, we began conducting preliminary surveys and trap deployments to identify areas suitable for catching lobster.

## Atlantic Horseshoe Crab Tagging Activity

During September of 2022, a total of 25 adult horseshoe crabs were caught by hand in Moriches Bay (Figure 1). Although it was late in the season to collect horseshoe crab in the embayment, and most had likely migrated to the ocean, we elected to see if we could catch a few that had not yet migrated and tag them. We managed to successfully capture 25 horseshoe crabs by hand in the shallow water areas in Moriches Bay. The horseshoe crabs were tagged with V-16 acoustic telemetry transmitters following the established protocol by Brousseau et al. (Brousseau et al. 2004) utilizing a Velcro harness and Zap-a Gap CA+ superglue (Table 1). They were subsequently released the same day, in healthy condition at the center of the Sunrise acoustic array (40.73050, -72.83018) (Figure 2). Of the 25 tagged crabs, 20 were female (prosomal carapace width:  $24.97 \pm 1.9$  cm) and 5 were male (prosomal carapace width:  $19.32 \pm 0.68$  cm). We attempted to tag 50 crabs total, but found that the crabs caught were of an older age class and heavily skewed female, which we felt was not an accurate representation of the local horseshoe crab community. As a result, we were concerned that these late-stage female horseshoe crab may be less vagile and thus, would not be suitable for addressing the main goals of the study. We therefore, elected to suspend collecting and tagging any additional horseshoe crabs at this time and to delay further tagging efforts until the 2023 horseshoe crab spawning season in May and June. This delay will provide an opportunity to select from a larger and more representative sample of the overall population.

**Table 1.** Summary of Horseshoe Crabs tagged in 2022 for the Sunrise Wind Export Cable Acoustic Telemetry Study. All Horseshoe Crabs were tagged in Moriches Bay (40.77559, -72.74741), and released in the center of the acoustic array off Smith Point (40.73050, -72.83018).

Date	Acoustic Tag ID#	Tag Serial #	Button Tag ID #	Sex	Prosomal Width (cm)	Weight (kg)
9/12/2022	A69-9001-55520	1536964	488501	Female	21.5	1.55
9/12/2022	A69-9001-55521	1536965	488502	Female	27.5	3.1
9/12/2022	A69-9001-55522	1536966	488512	Female	25	2.35
9/12/2022	A69-9001-55523	1536967	488504	Female	23	1.35
9/12/2022	A69-9001-55524	1536968	488503	Female	27.1	2.35
9/12/2022	A69-9001-55525	1536969	488505	Female	24.1	2.3
9/12/2022	A69-9001-55526	1536970	488506	Female	23.7	1.95
9/12/2022	A69-9001-55527	1536971	488507	Female	25.7	2.3
9/12/2022	A69-9001-55528	1536972	488508	Female	27.9	2.8
9/12/2022	A69-9001-55529	1536973	488509	Female	26	3.05
9/12/2022	A69-9001-55530	1536974	488510	Female	26	2.4
9/12/2022	A69-9001-55531	1536975	488511	Female	27.5	2.65
9/12/2022	A69-9001-55532	1536976	488513	Male	20.2	1.35
9/12/2022	A69-9001-55533	1536977	488514	Female	24.7	2.5
9/12/2022	A69-9001-55534	1536978	488515	Male	18.8	1.05
9/12/2022	A69-9001-55535	1536979	488516	Male	19.6	0.85
9/14/2022	A69-9001-55518	1536962	488518	Female	24.2	2.7
9/14/2022	A69-9001-55519	1536963	488517	Female	22.6	1.9
9/14/2022	A69-9001-55536	1536980	488519	Female	24.4	2.4
9/14/2022	A69-9001-55537	1536981	488520	Female	23.3	2.2
9/14/2022	A69-9001-55538	1536982	488521	Male	18.5	0.45
9/14/2022	A69-9001-55539	1536983	488522	Female	27.9	3.15
9/14/2022	A69-9001-55540	1536984	488523	Male	19.5	1.45
9/14/2022	A69-9001-55541	1536985	488524	Female	25.2	2.8
9/14/2022	A69-9001-55542	1536986	488525	Female	22	2.1

## American Lobster Tagging Activity

Several preliminary surveying trips were made to Hempstead Reef, Moriches Reef, and Fire Island Reef in December 2022 in an attempt to identify suitable locations to capture lobster for tagging (Figure 1). No lobsters were tagged during these trips. We did, however, confirm that the areas off of Hempstead and Fire Island artificial reefs did support adult lobster of suitable size to tag with V-13 tags. Moriches artificial reef was also supporting some lobster, but at lower densities than the other two sites. We intend to continue lobster trapping during the winter months in 2023 and aim to tag and release a total of 50 lobster at that time.



**Figure 2.** Diagram of Sunrise acoustic telemetry fine-scale positioning array, showing locations where horseshoe crabs were collected and tagged, and the three artificial reefs where pilot testing of lobster trapping was implemented. The release location of tagged horseshoe crabs is in the center of the positional array.

**References:**

Brousseau, L.J., Sclafani, M., Smith, D.R. and Carter, D.B., 2004. Acoustic-tracking and radio-tracking of horseshoe crabs to assess spawning behavior and subtidal habitat use in Delaware Bay. *North American Journal of Fisheries Management*, 24(4), pp.1376-1384.