

Satellite telemetry reveals fine-scale Common Tern (*Sterna hirundo*) breeding, migration, and overwintering movements

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BACKGROUND

- Improvements to GPS tech allow for fine-scale tracking of small seabirds including Common Terns (*Sterna hirundo*; COTE)¹
- An ongoing New Hampshire (NH)-based project aims to assess breeding season COTE movements via leg-loop harness-affixed GPS tags expected to fall off over migration due to weight loss
- One individual (henceforth referred to as “ct165”) tagged in 2022 retained its tag through both migrations and overwintering
- ct165’s annual track provides insight into COTE migratory behavior and highlights strengths of fine-scale GPS tracking

METHODS

- Tagging on White and Seavey Islands (Fig. 1): 11km off the NH coast, supports ~3,000 COTE breeding pairs annually
- N=10 GPS tags (Pathtrack nano-Fix GEO+RF) deployed on breeding COTE June-July 2022
- Tags collected 20-min fixes Apr.-Sept. and 12-hr fixes Oct.-Mar.
- When within range (~200m), tags offloaded positional data to a base station via UHF link
- Migratory distances calculated using Vincenty distance in R²
- Static maps made in ArcGIS Pro³; animation made using R package *moveVis*⁴

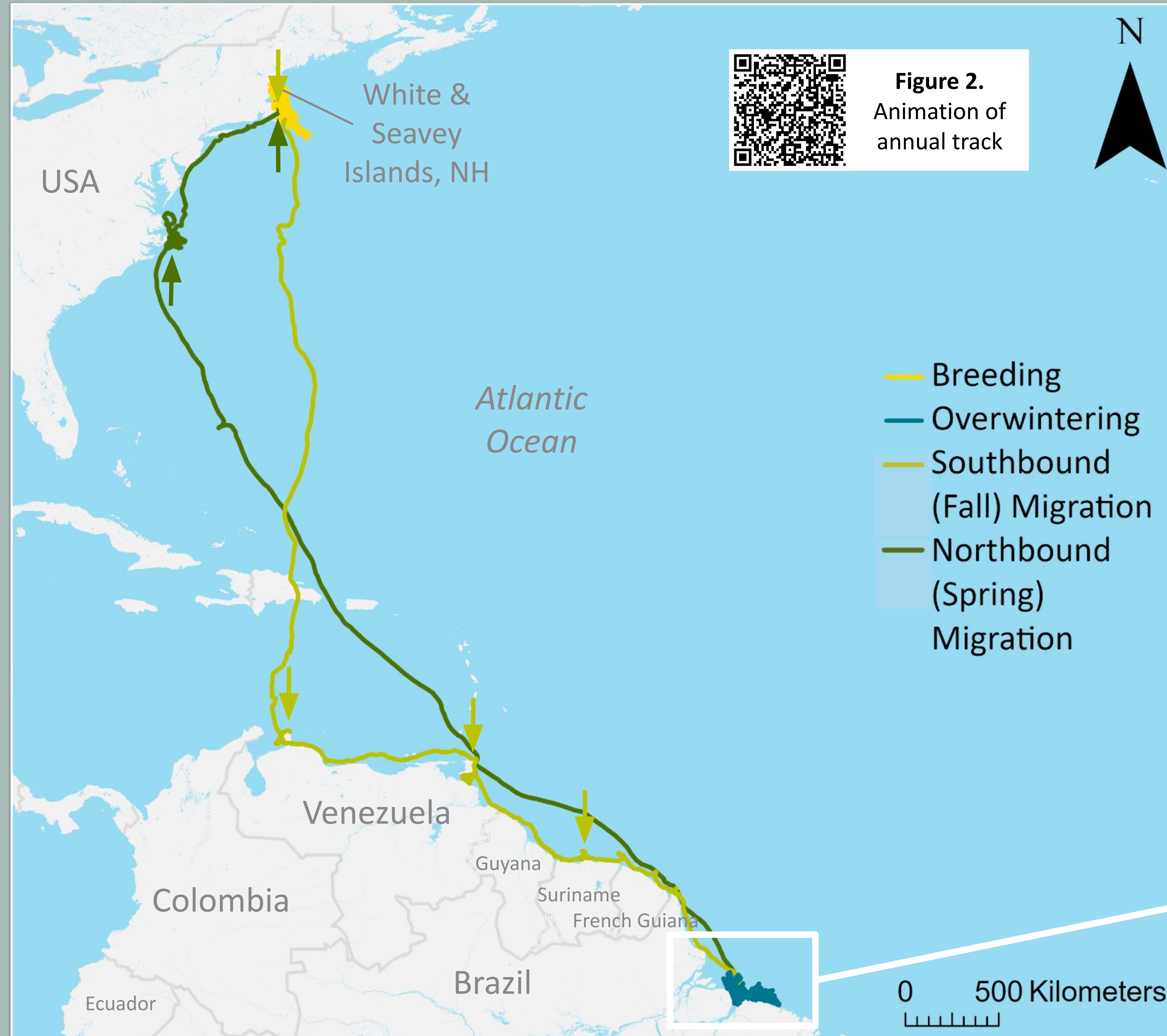


Figure 1. Annual track of Common Tern “ct165”. Breeding, migration, and overwintering movements in yellow, green, and blue lines. Staging areas indicated by arrows.

KEY FINDINGS

- **Total tracked distance:** 39,040 km over 343 days (7/1/22 - 6/13/23)
- **Fall migration:** 6,536 km over 26 days (averaged 251 km/day)
- **Fall staging locations:** Cape Cod, Massachusetts (MA), USA → Falcon, Venezuela → Guayaguayare, Trinidad & Tobago → North Saramacca, Suriname (Fig. 1-2)
- **Overwintering location:** Marajo Bay, Brazil at the base of the Amazon River (Fig. 2-3)
- **Spring migration:** 6,089 km over 18 days (averaged 338 km/day)
- **Spring staging locations:** Cape Hatteras, North Carolina, USA → Cape Cod, MA, USA (Fig. 1-2)

DISCUSSION

- Our data provide one of the first fine-scale descriptions of annual NE USA-breeding COTE space use
- Previous light-level geolocator research found that USA- and Azores-breeding COTE used some of the same staging areas as ct165,^{5,6} that ct165 followed migratory pathways similar to other USA birds,⁵ and that birds from the Azores wintered in the same area as ct165 while most USA birds wintered farther South
- Understanding migratory and non-breeding space use is crucial for COTE conservation and that of related tern species



Figure 3. Map of ct165 wintering positions.

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