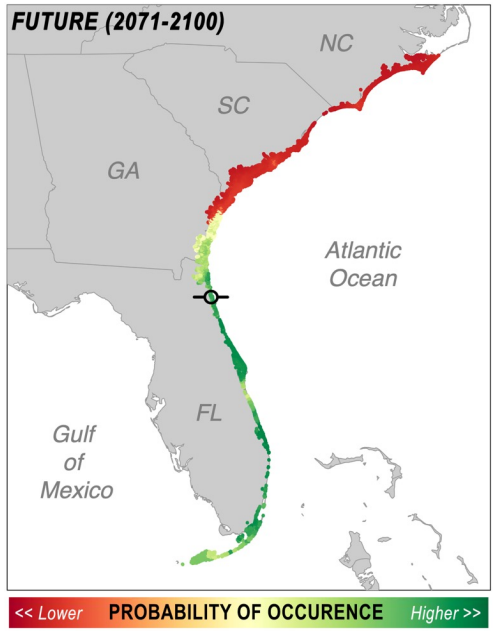
Mangrove Expansion Along Southeast U.S. in the 21st Century

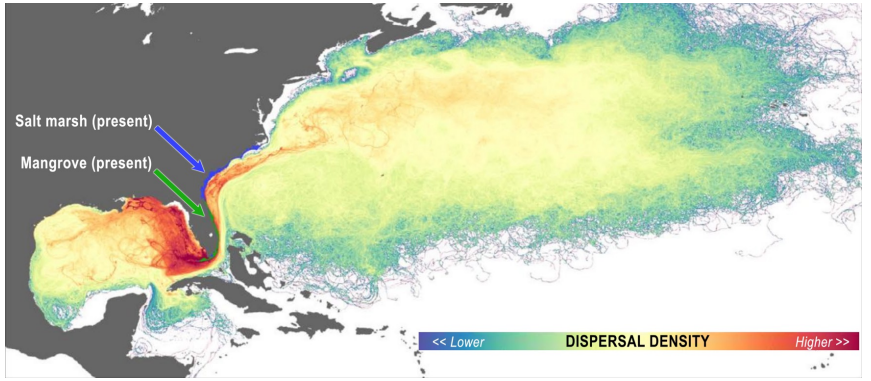
- Warming winters are driving **expansion of tropical, cold-sensitive mangroves into temperate ecosystems**
- We show continued poleward expansion along North America's Atlantic coast, **potentially reaching South Carolina by 2100**
- **Hurricanes may significantly contribute** by facilitating long-distance, storm-driven propagule dispersal

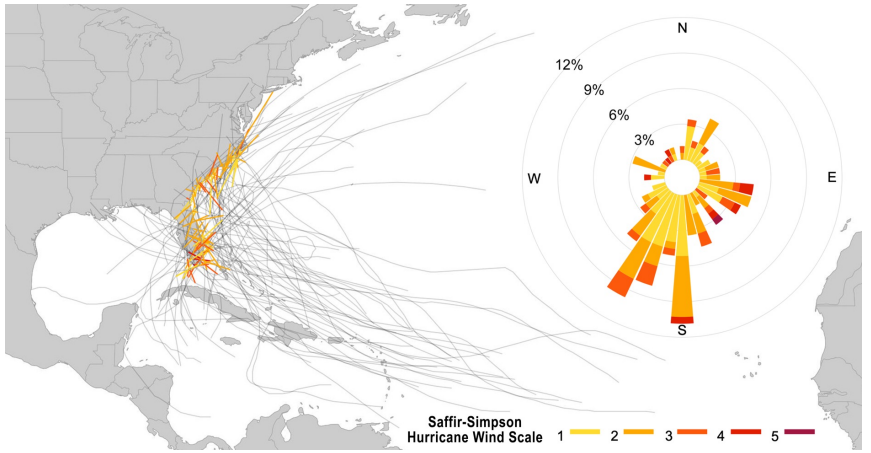
We use a high-resolution, eddy-and tide-resolving numerical ocean model (MITgcm) to simulate individual mangrove propagule trajectories. It allows us to examine the spatial scales of simulated propagule transport in the region, test the likelihood of dispersal beyond the present-day mangrove range limit, and assess connectivity between established mangrove populations and unoccupied suitable mangrove habitat. Within our study area, we find peak propagule production and release (August-October) coincide with the Atlantic hurricane season, increasing the likelihood of storm-driven dispersal.

Our results highlight the relevance of integrating climatic and dispersal factors when projecting future mangrove range dynamics. Both mangroves and salt marshes are highly valued ecosystems. Changes to their distribution could have significant ecological and socioeconomic impacts.

Enes Gramoso, L. et al. (2026) 21st-Century Mangrove Expansion Along the Southeastern United States, Glob. Change Biol., 32(1), e70676, doi: 10.1111/gcb.70676







ABOVE: Probability of mangrove occurrence under a future very high emissions scenario. UPPER RIGHT: Simulated trajectories of mangrove propagules released from present-day mangrove locations. LOWER RIGHT: Historical hurricane tracks across study region.

All our future predictions indicate suitable mangrove habitat extending beyond the current range limit, with the extent of suitable mangrove habitat increasing under more severe climate change scenarios.