UNIVERSITY OF MARYLAND CENTER FOR ENVIRONMENTAL SCIENCE
CHESAPEAKE BIOLOGICAL LABORATORY

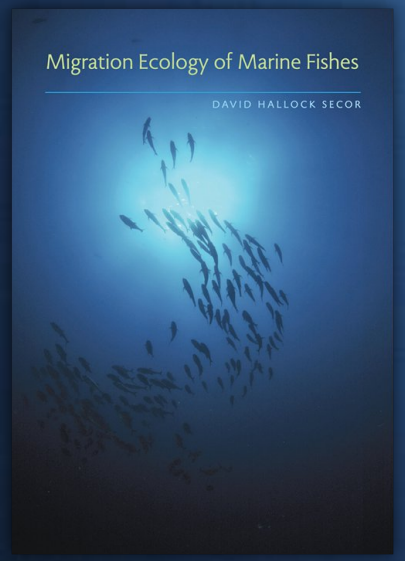
ASC '26

ICES CIEM

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Co-author:
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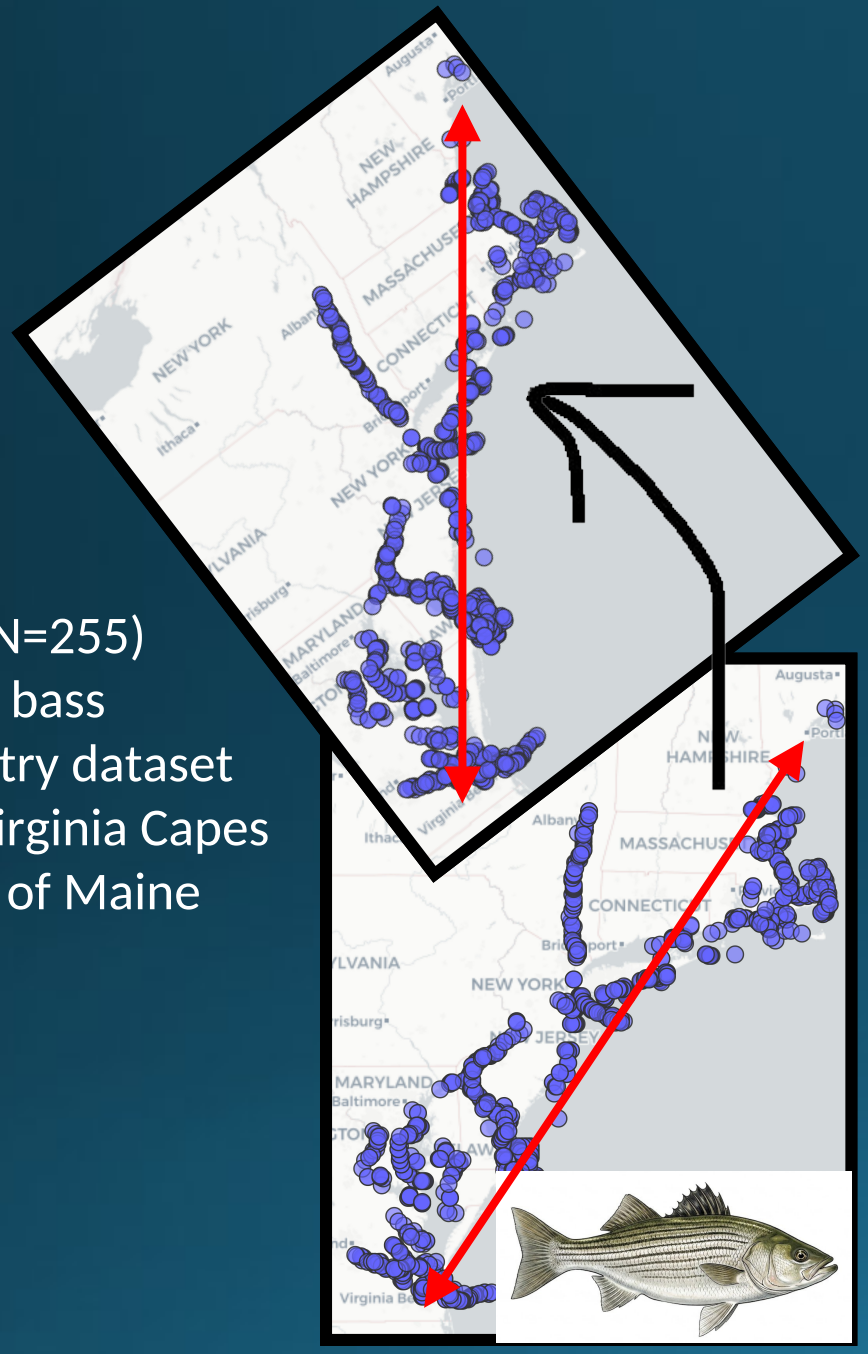
The flyway construct and assessment of offshore wind farm impacts on migratory marine fauna



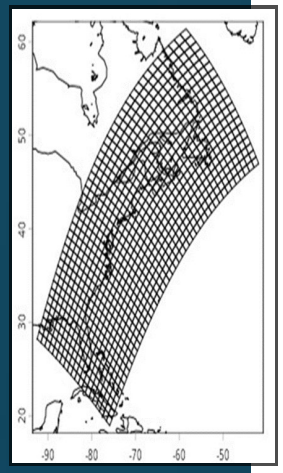
***Migration**: Collective movement of individuals that occurs chiefly through motivated behaviors, resulting in changed ecological status.*

Finding Migration "North"

10-yr (N=255) striped bass telemetry dataset from Virginia Capes to Gulf of Maine



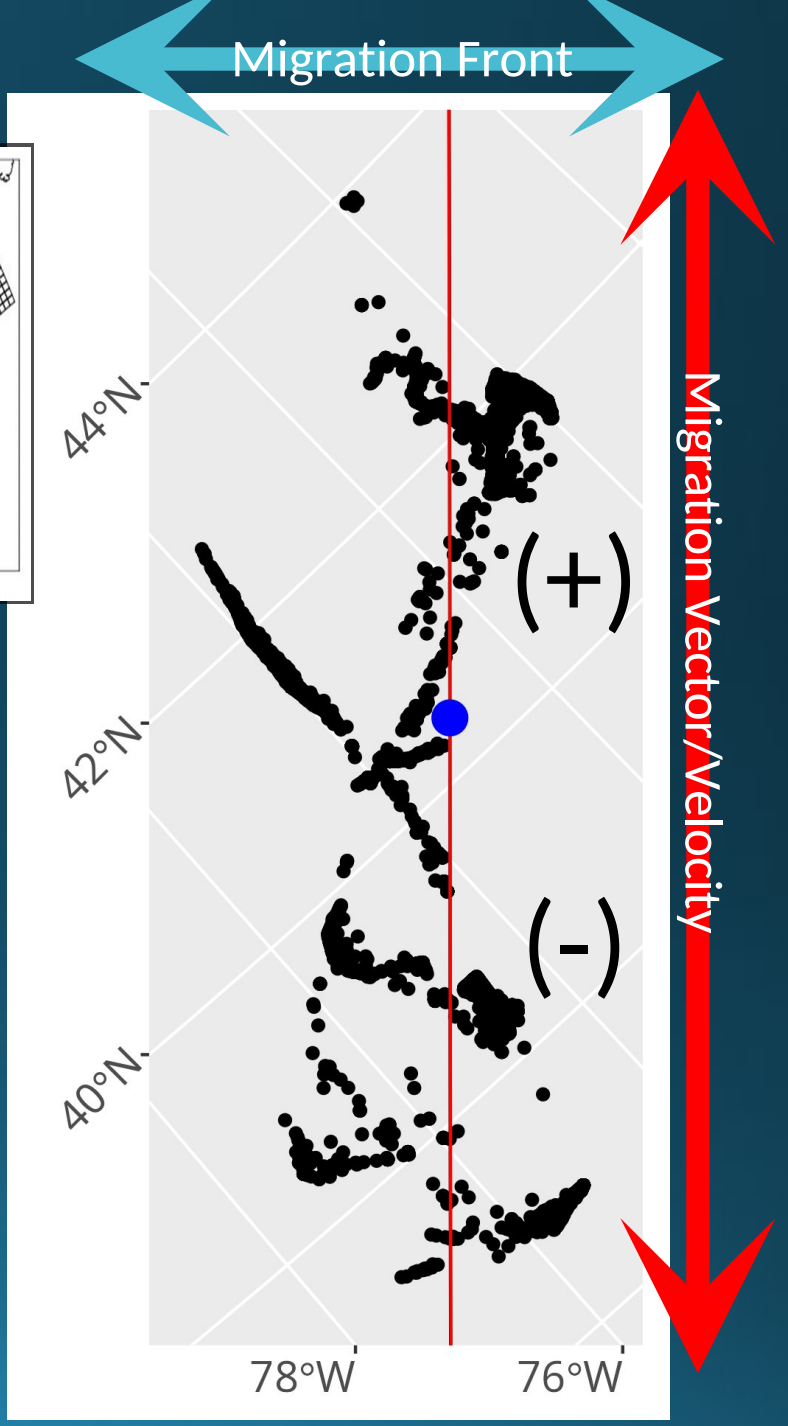
Azimuthal equi-distant projection



PCA on projected coordinates of telemetry detections

PC-1 =Migration Vector (long-shelf)
PC-2=Migration Front (cross-shelf)

Median location (blue circle) partitions
Migration North (+)
Migration South (-)



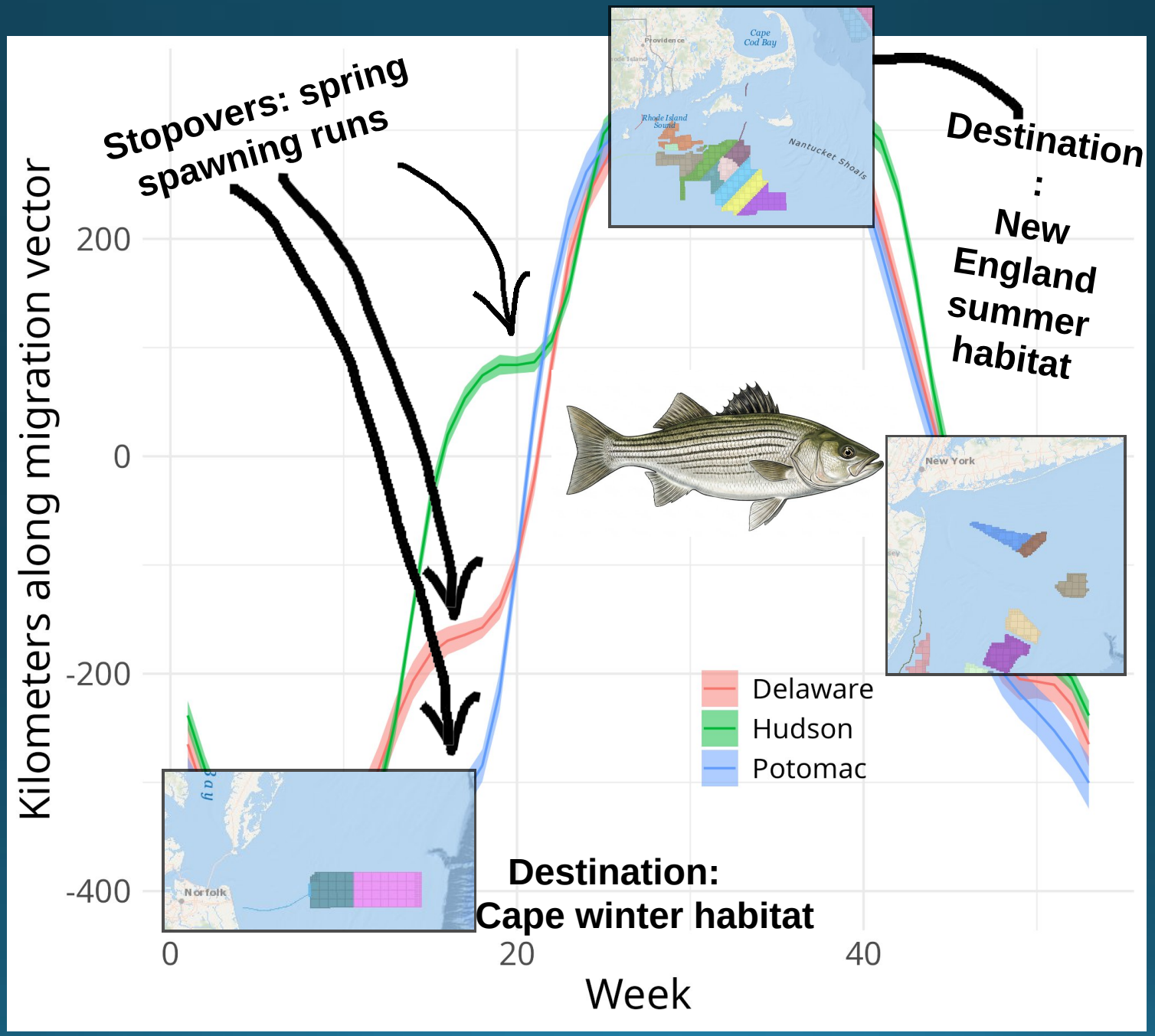
Modeling Flyways

By-variable GAM, for three populations

Flat migration vector
- Destination habitat
- Stopover habitat

Broad seasonal synchrony in migration patterns and vectors between populations

What does this have to do with scaling up OWF impacts???



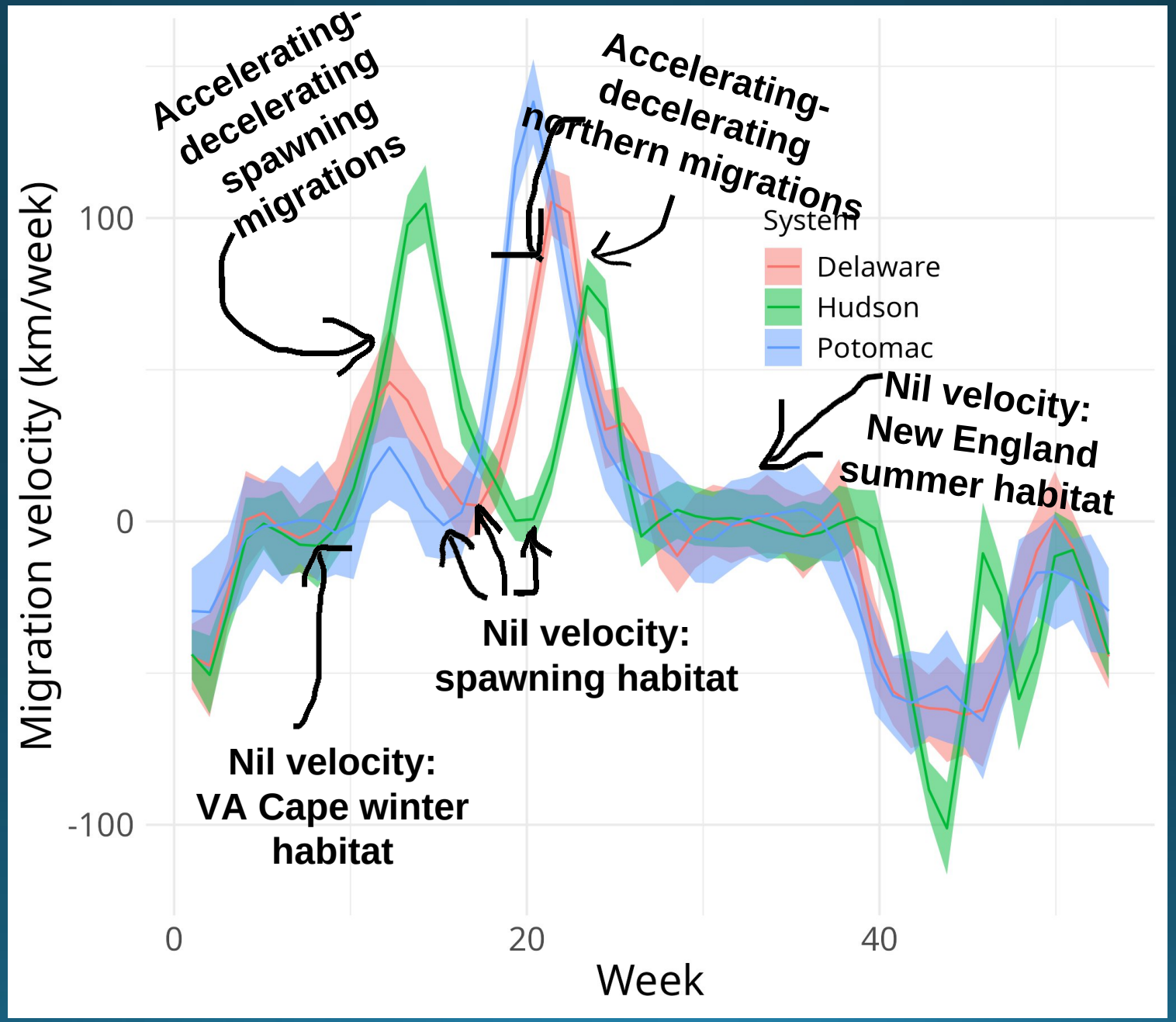
Migration Velocity

Migration Velocity is the 1st derivative of the Migration Vector

Nil Migration Velocity
- Destination habitat
- Stopover habitat

Velocities accelerate then decelerate as destination and stopover habitats are approached

Broad seasonal asynchrony in migration velocity between populations



Asynchronous velocities between populations

Southern migration: Too much to label!

Assessment Framework

ROSA Team: David Secor, Michael O'Brien, Aaron Carlisle, Bradley Wetherbee, Dewayne Fox, Matthew Breece

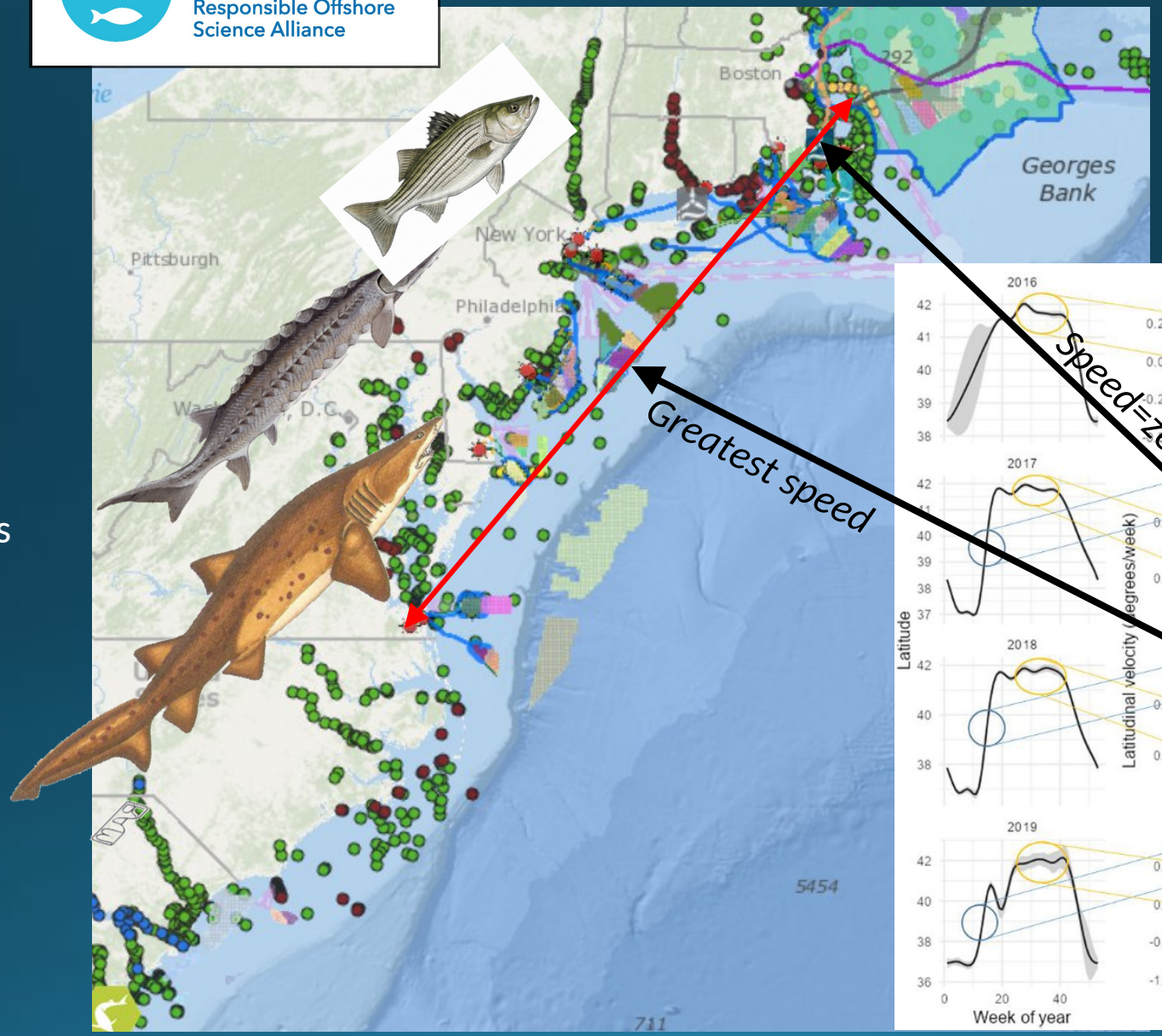
ROSA
Responsible Offshore Science Alliance

Model migration flyways
- Striped bass
- Atlantic sturgeon
- Sand tiger shark
- Co-migration

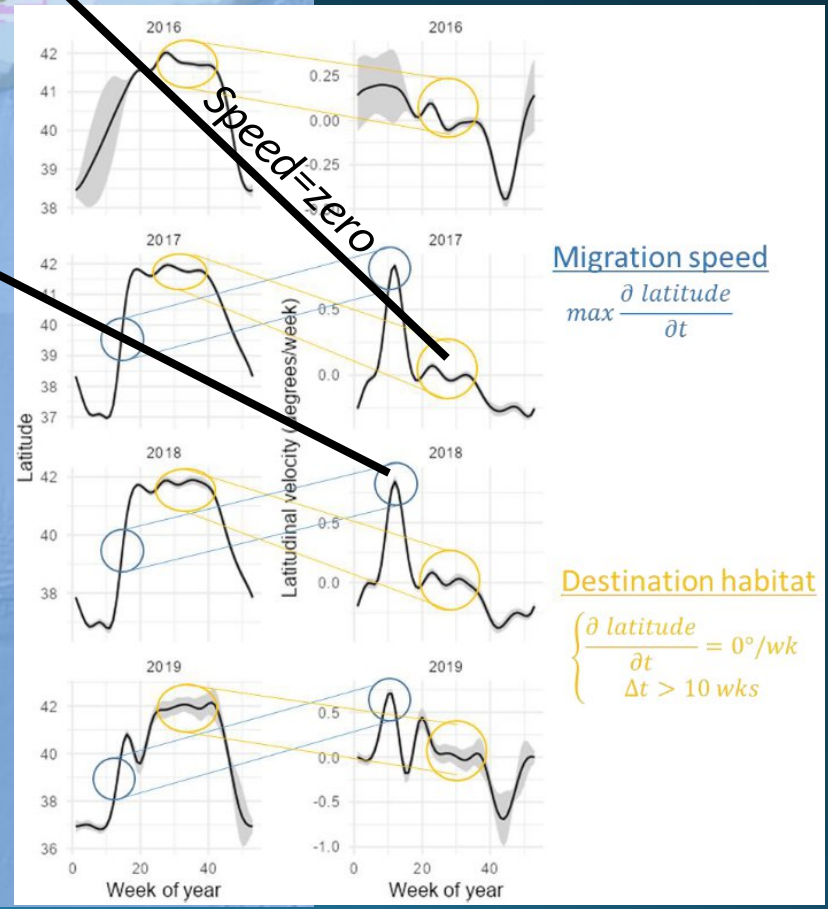
Model oceanogr covariates

Extract flyway metrics
- Migration velocity
- Destination/stopover habitats
  - Timing
  - Duration
  - Persistence
- Migration front

Test flyway metrics
- Interpretability
- Bias
- Study design (BACI)

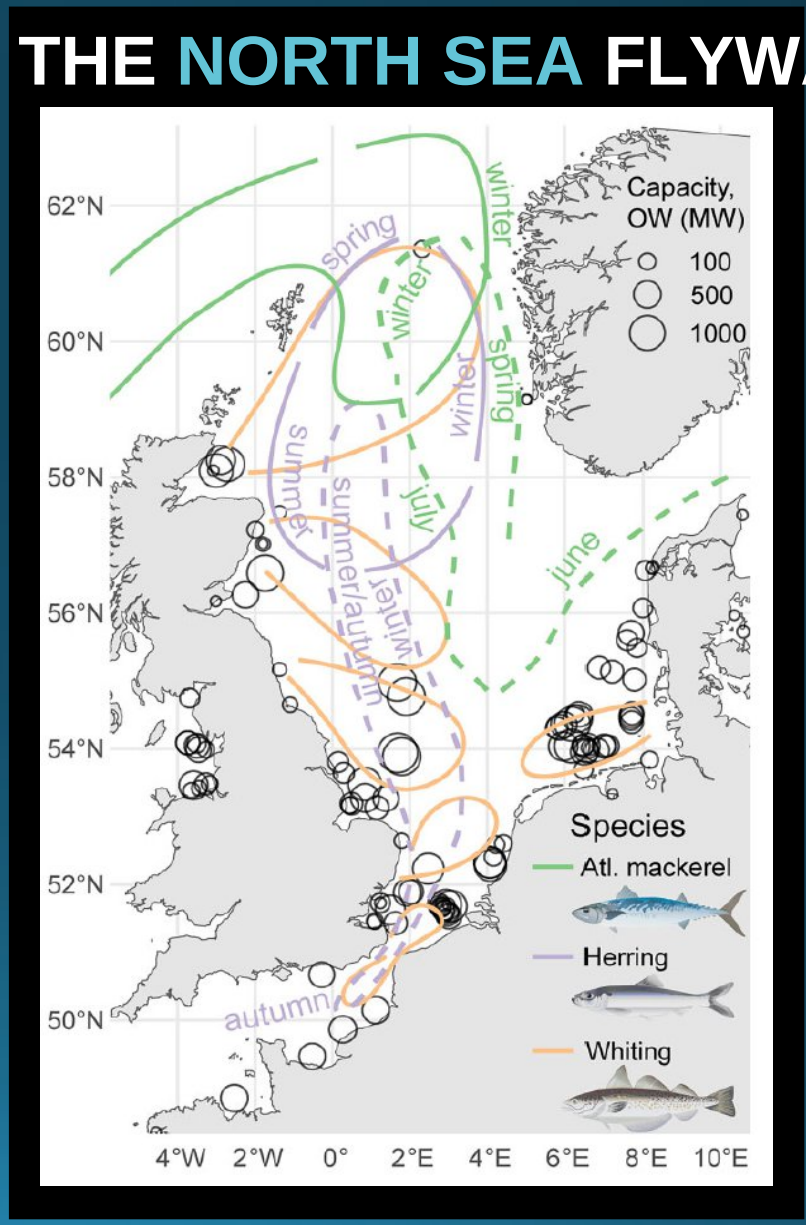


Feature analysis of migration speed to estimate flyway metrics



OW development in the South and East China Sea, North Sea, and US Mid-Atlantic Bight will result in thousands of offshore wind turbines that transect coastal and shelf flyways, not only for birds but also for fishes, sea turtles, and marine mammals.





Dave Secor

Co-author:
Mike O'Brien

Flyway construct and metrics

OWF development ~ shelf assets in regional telemetry/observing systems

Dynamic (Lagrangian)

Novel assessments of regional OWF, climate, oceanographic, fishing impacts