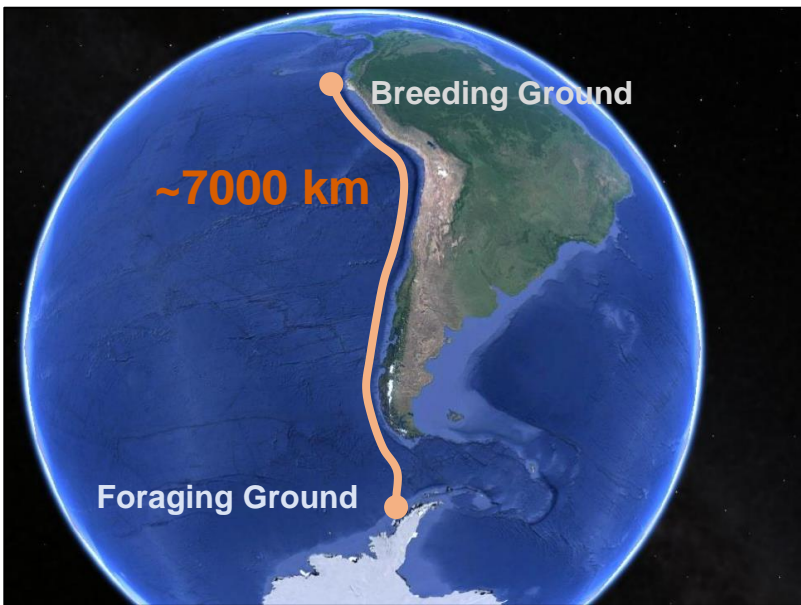
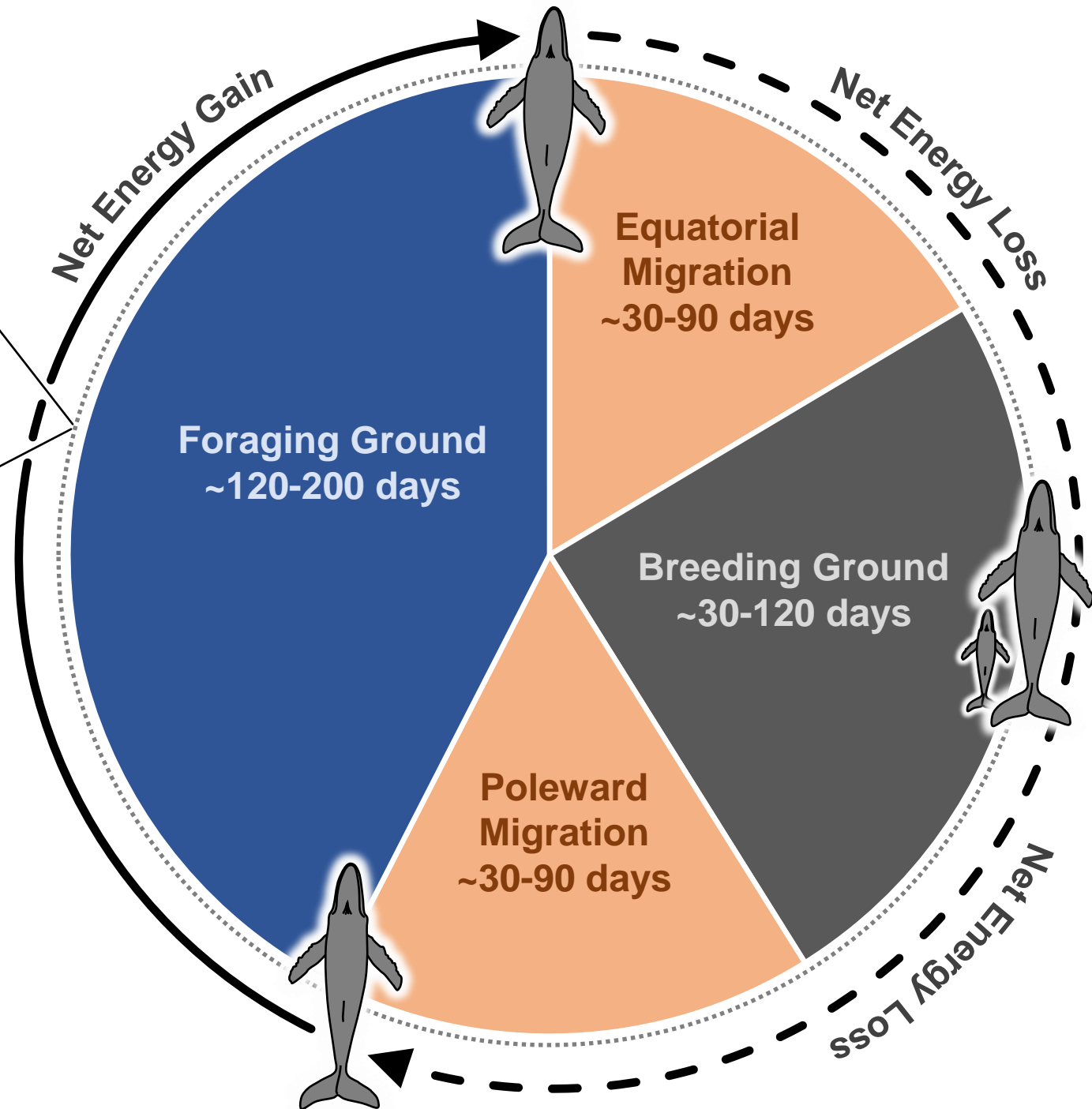
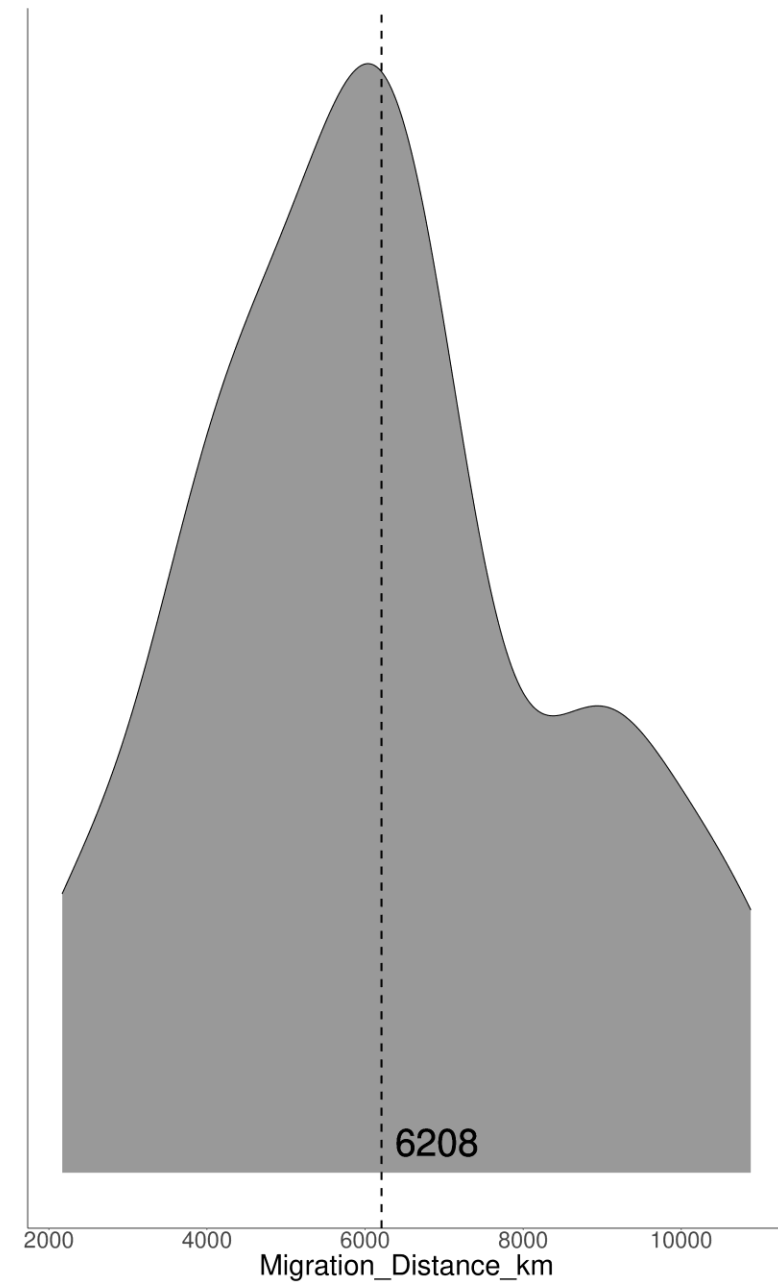
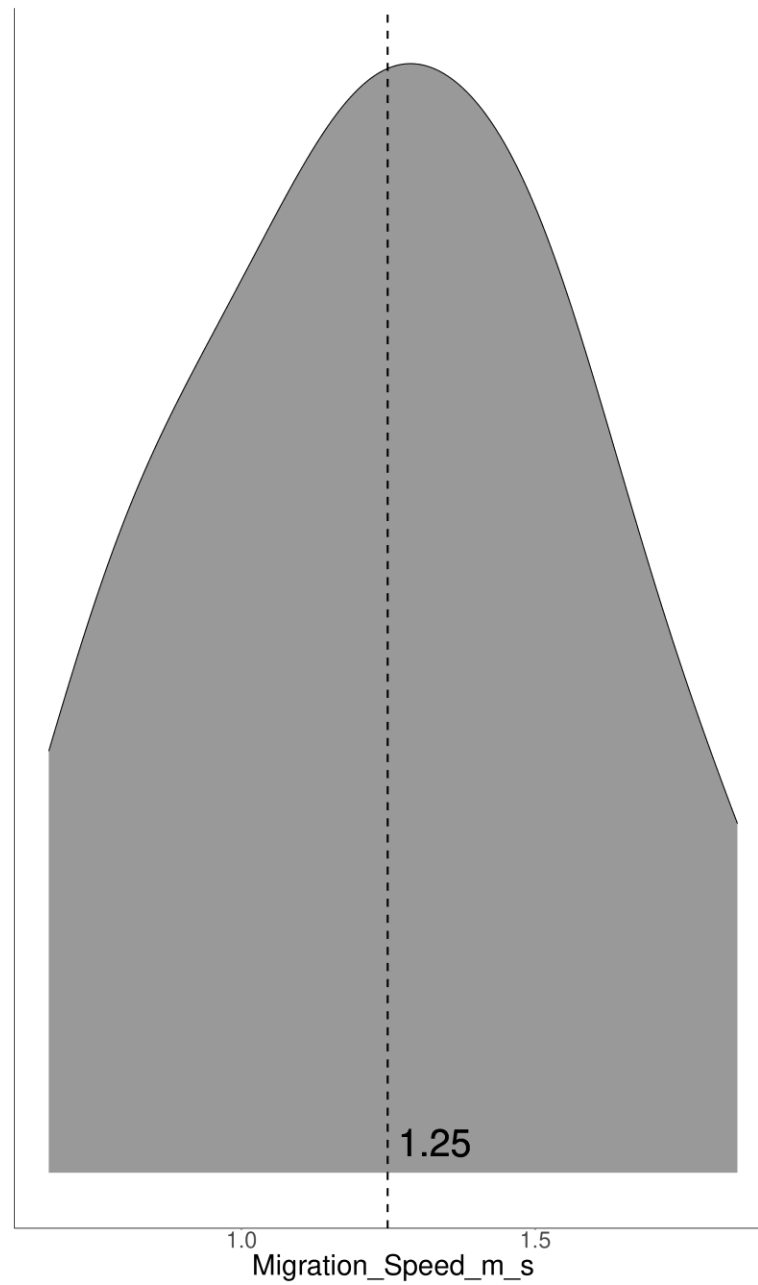
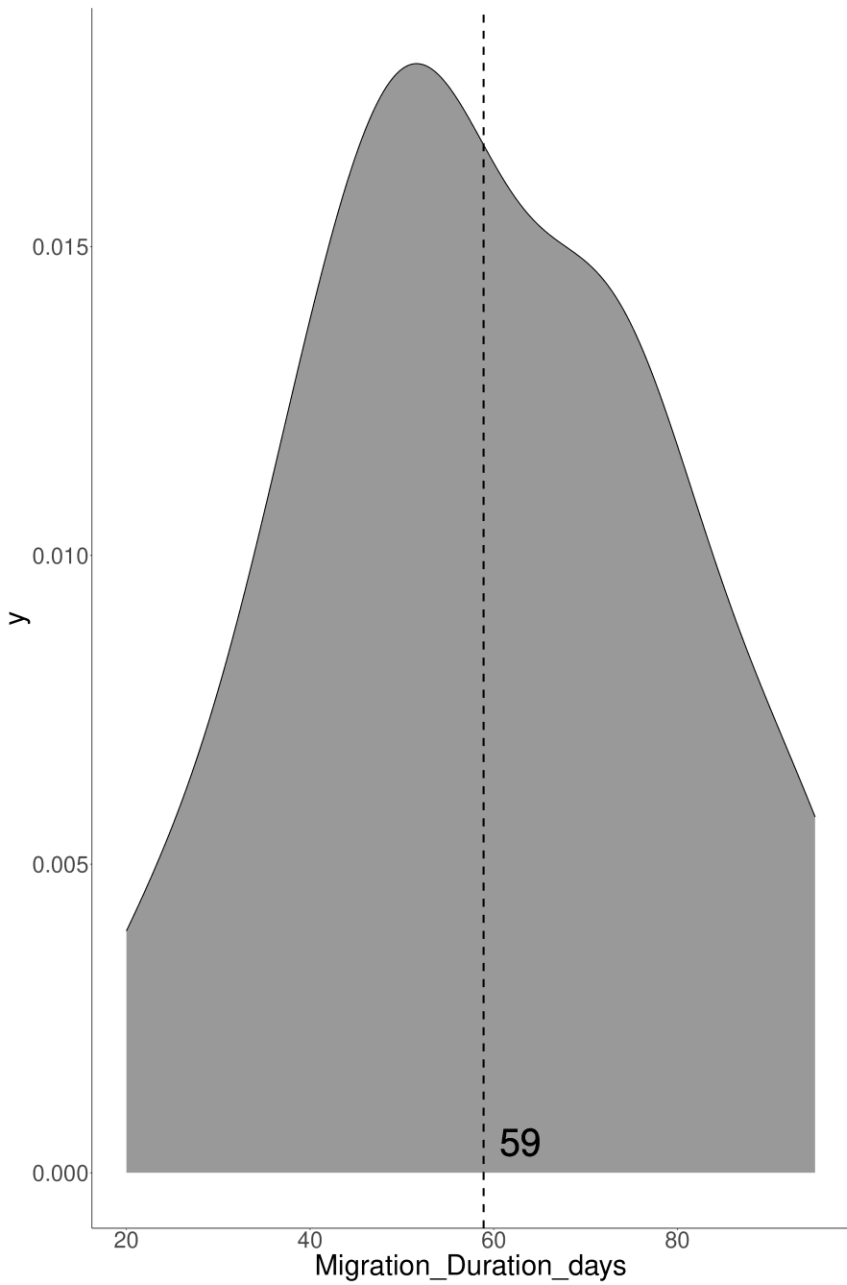


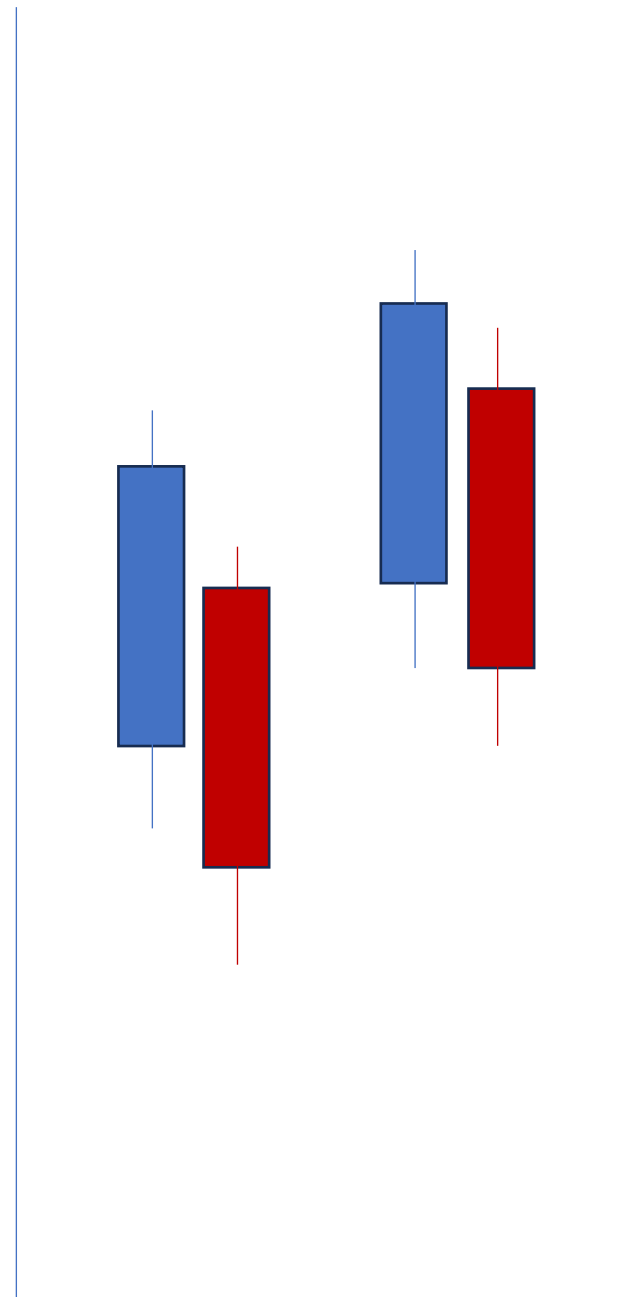
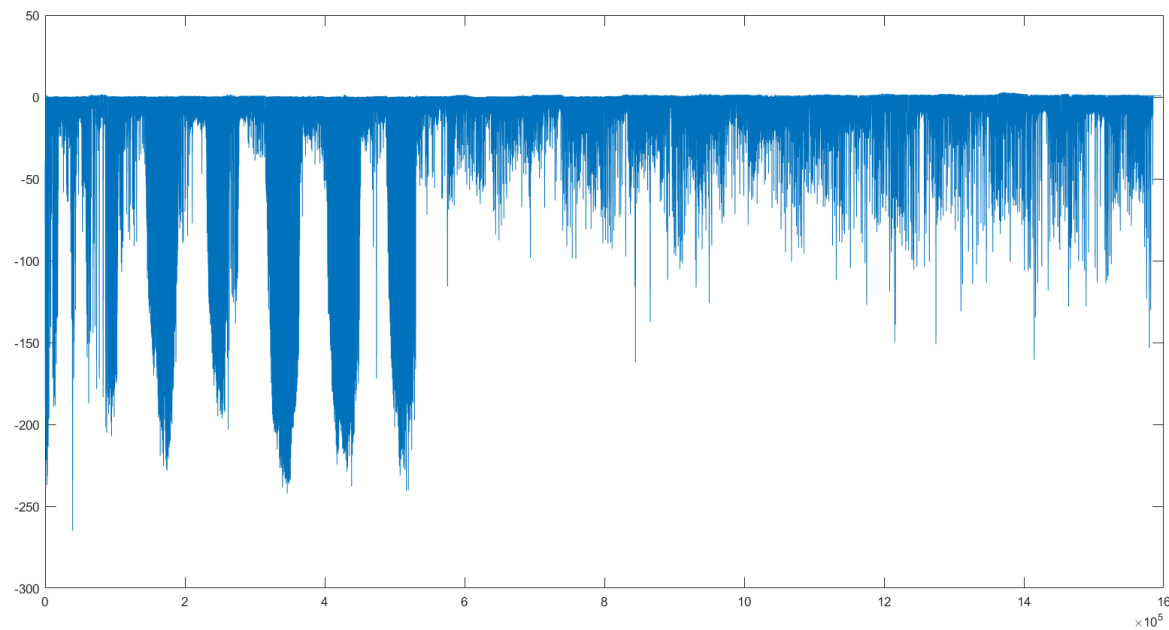
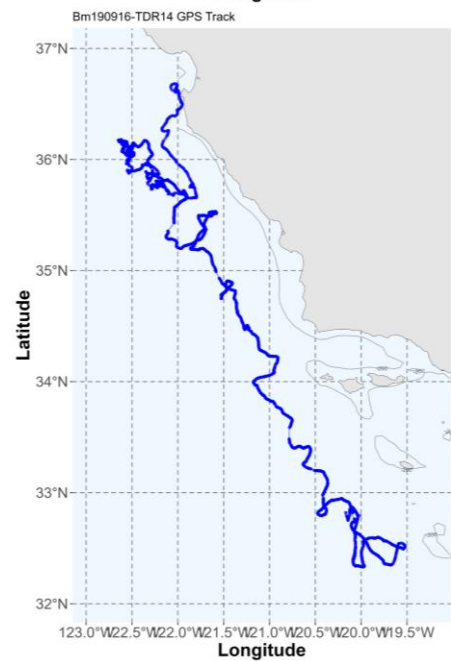
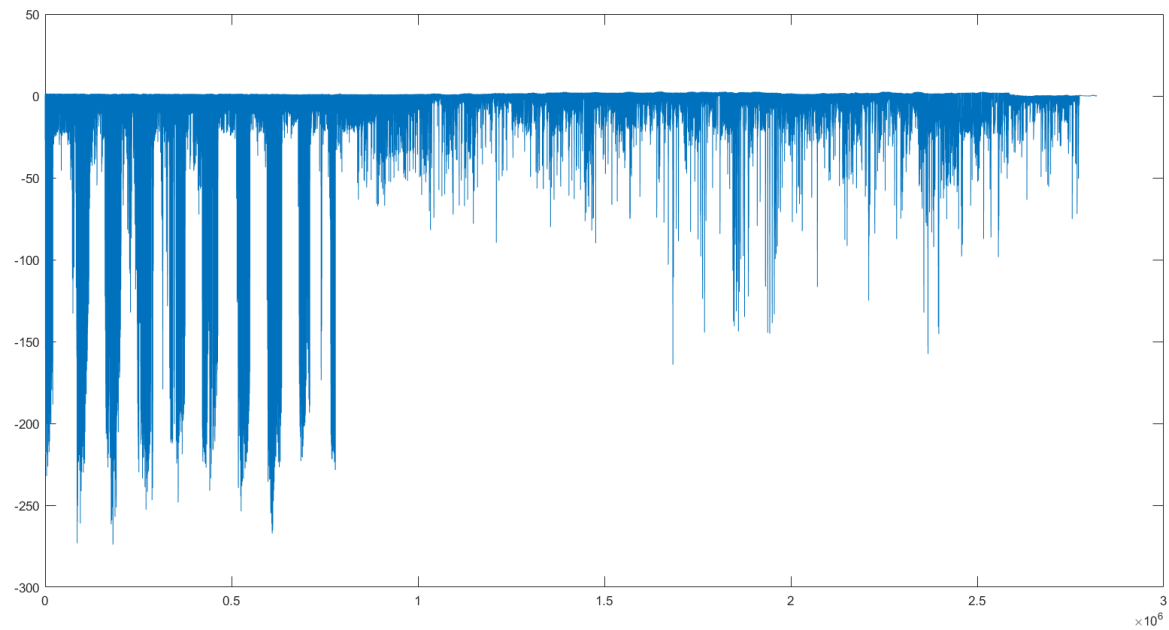
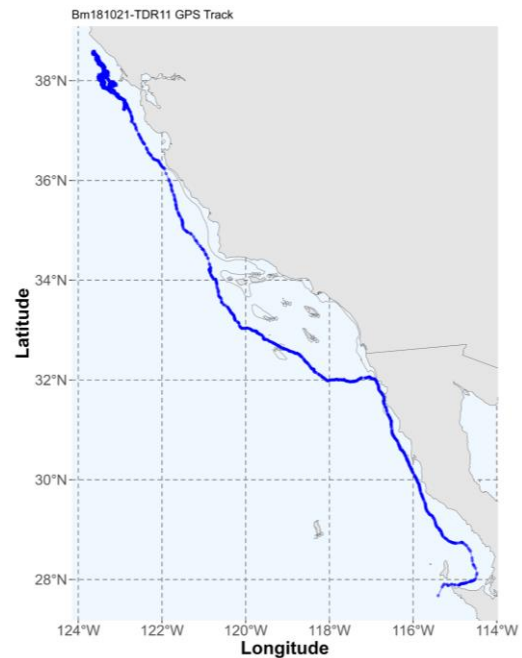
Daily Foraging Variability

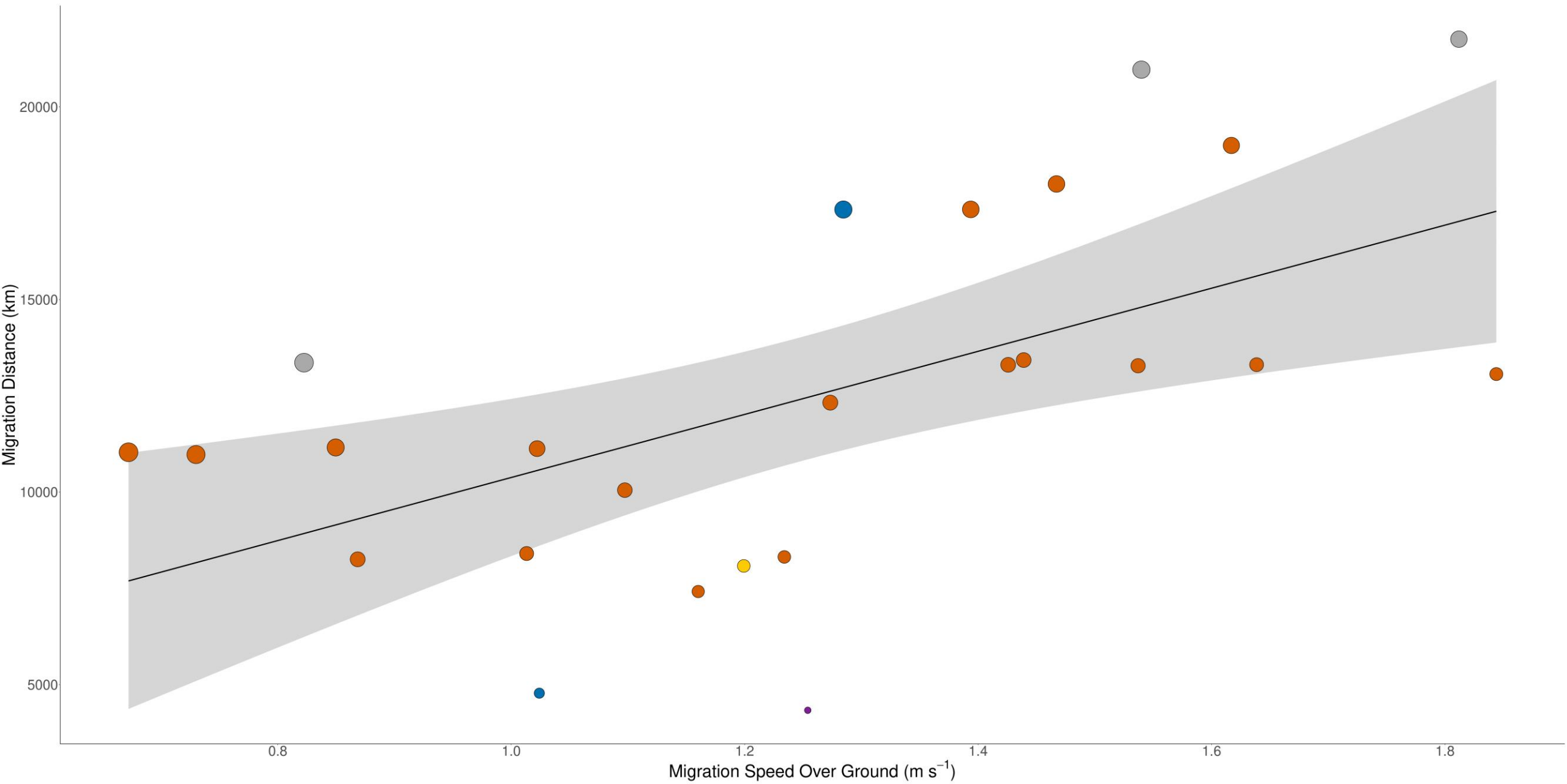


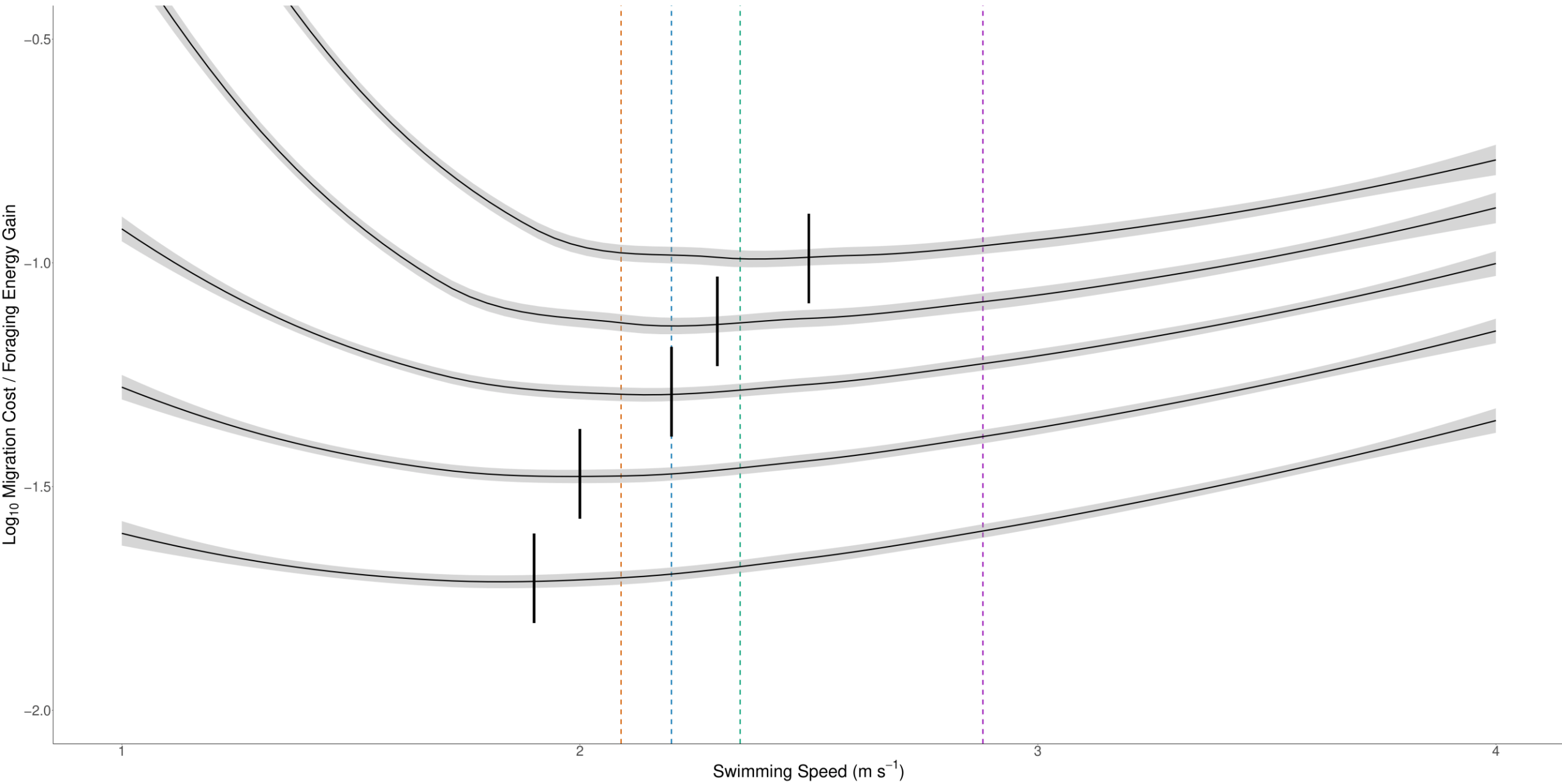
Ecuador – Antarctica



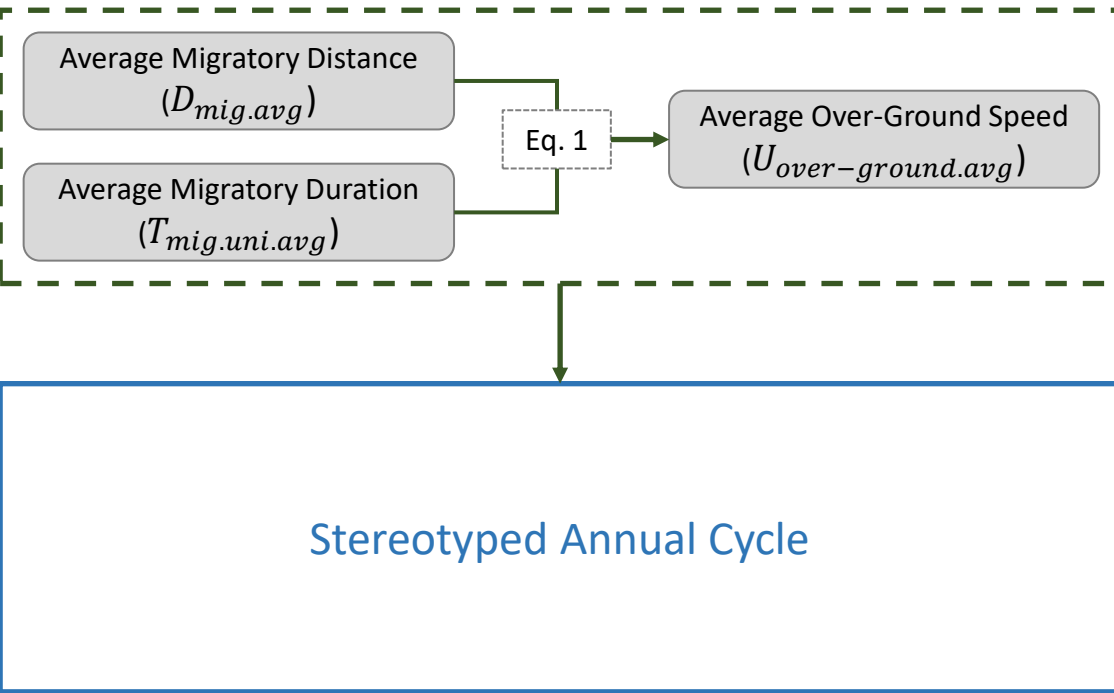








Satellite Tag Data



Multi-sensor Tag Data



U_{opt}

Satellite Tag Data

Average Migratory Distance
($D_{mig.avg}$)

Average Migratory Duration
($T_{mig.uni.avg}$)

Average Over-Ground Speed
($U_{over-ground.avg}$) (Eq. 1)

Kahane-Rapport &
Goldbogen, 2018

Potvin et al. 2021

Body Mass
(M_{body})

Basal Metabolic Rates
($BMR_{kleiber}$)

Cost of Swimming
($E_{swim.sec}$) (Eq. 4)

Migratory Distance Range
(4000 – 12000 km)

Over-Ground Speed Range
(0.5 – 2.0 ms^{-1})

Eq. 7

Speed-Independent

Annual Cycle

Days Migratory Path
($T_{mig.year.standard}$)

Days On Feeding Ground
($T_{feed.standard}$)

Days On Breeding Ground
($T_{breed.standard}$)

Energetic Calculations

Annual Migration Costs
($E_{mig.year.standard}$)

Annual Foraging Net Energy
($E_{feed.year.standard}$)

Eq. 5

Eq. 6

Eq. 3

Gough et al. 2022 (Eq. 2)

Sightings Data;
Savoca et al. 2022

Speed-Dependent

Annual Cycle

New Migration Duration
($T_{mig.year.adj}$)

Change in Feeding Days
($\Delta T_{feed.uni.standard}$)

Energetic Calculations

Annual Migration Costs
($E_{mig.year.adj}$)

Annual Foraging Net Energy
($E_{feed.year.adj}$)

Eq. 8

External Data Sources

Satellite Tag Data

Morphometrics

Sightings Data

Eq. 4

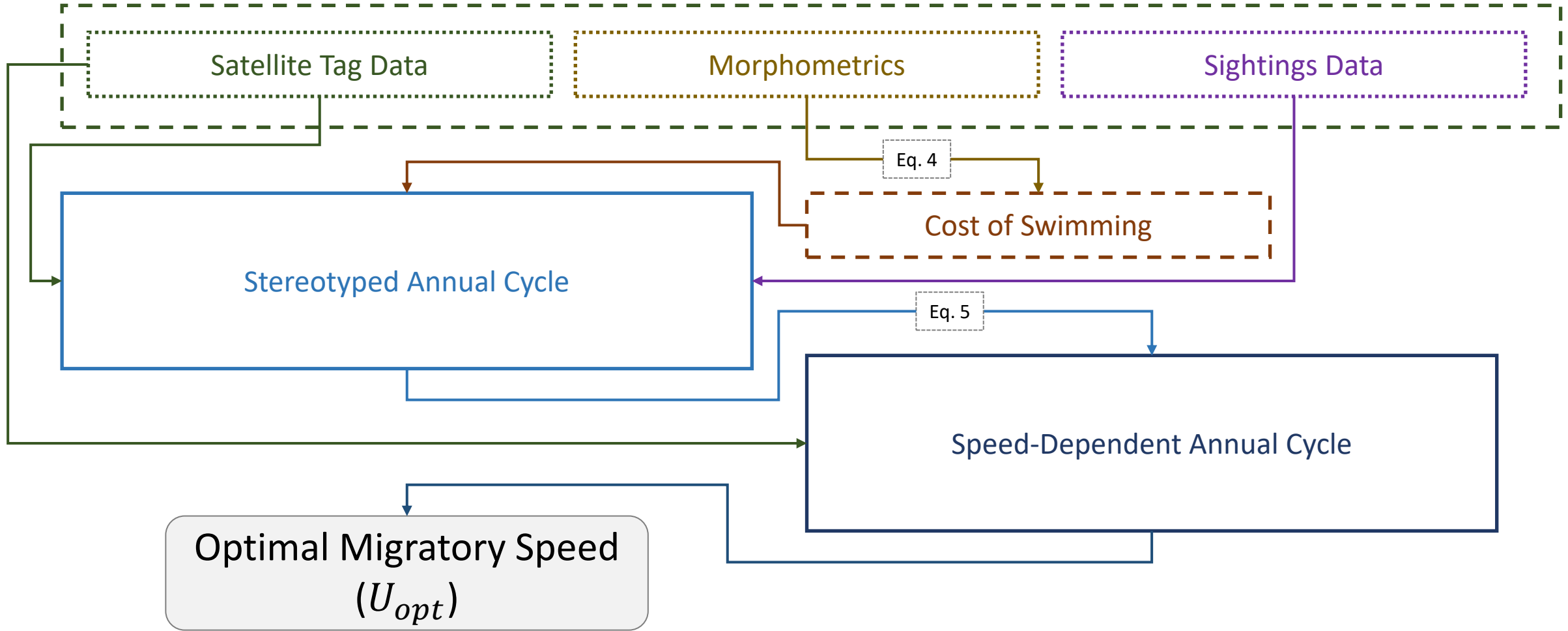
Cost of Swimming

Stereotyped Annual Cycle

Eq. 5

Speed-Dependent Annual Cycle

Optimal Migratory Speed
(U_{opt})



External Data Sources

Satellite Tag Data (Eq. 1)

Morphometrics

Multi-Sensor Tag Data

Fig. 2

Eqs 5, 6

Eq. 4

Eqs. 2, 3

Cost of Swimming

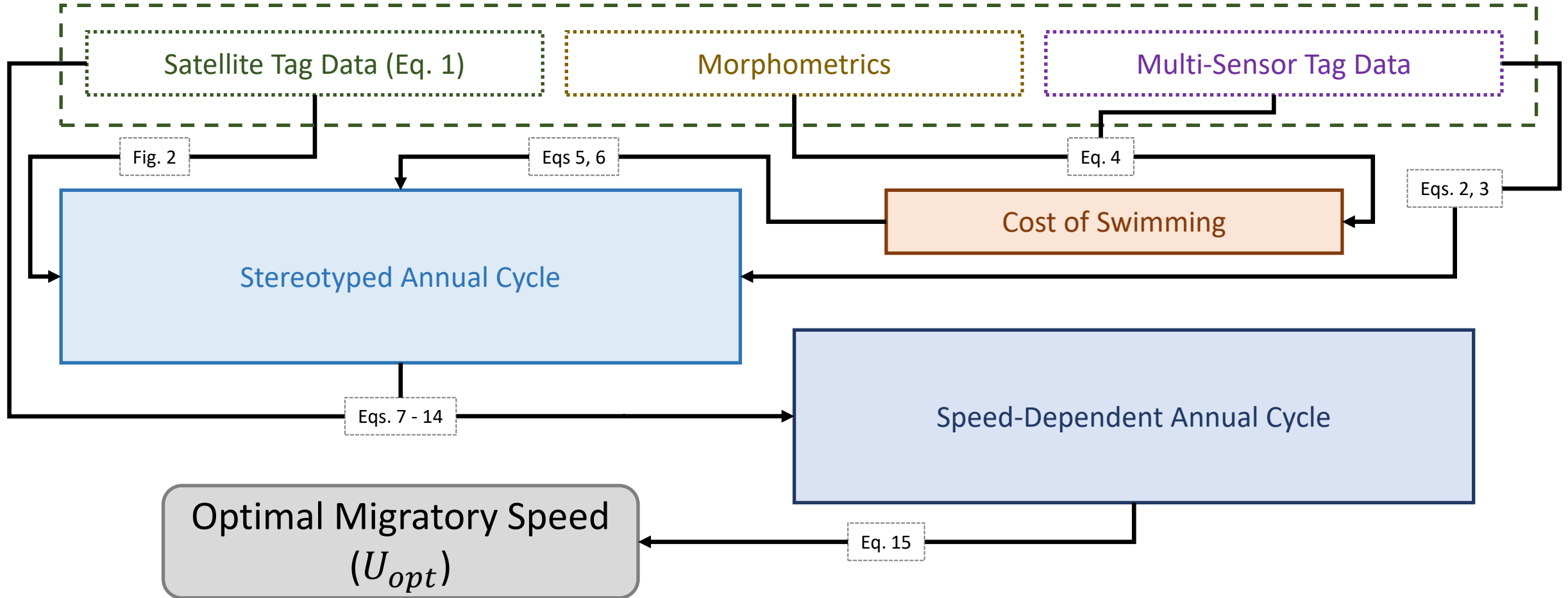
Stereotyped Annual Cycle

Eqs. 7 - 14

Speed-Dependent Annual Cycle

Optimal Migratory Speed
(U_{opt})

Eq. 15



External Data Sources

Satellite Tag Data

Multi-Sensor Tag Data

Morphometrics

Fig. 2; Eqs. 2 - 6

Speed-Independent

Stereotyped Annual Cycle

Eqs. 7 - 14

Speed-Dependent

Adjusted Annual Cycle

Eq. 15

Optimal Migratory Speed

