

Environmental determinants of southern elephant seal movements at Marion Island

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Introduction

- Southern elephant seals (SES) are wide-ranging and abundant in the Southern Ocean.
- Marion Island (MI) population at northern limit of the species range.
- MI lies in the direct path of the Antarctic Circumpolar Current (ACC).
- Bounded in the north by the Sub-Antarctic front (SAF) and in the south by the Antarctic Polar front (APF).
- The region is characterized meso-scale eddies formed to the north (SCZ) or to the west where the Andrew Bain fracture zone (ABFZ) intersects with the South West Indian ridge (SWIR).
- Deployments on elephant seals (1999 – 2014).



FIGURE 1. Adult male SES fitted with a SMRU satellite tracking device. This device collected temperature and salinity at various stages during the seals dive.

Methods & Analysis

- Time spent in area
- Transit vs. searching behaviour
- Movements in relation to:
 - Frontal structures
 - Bathymetric features
 - Sea-surface height
 - Chlorophyll concentration
- Variation in relation to:
 - Sex
 - Age
 - Season

Results & Discussion

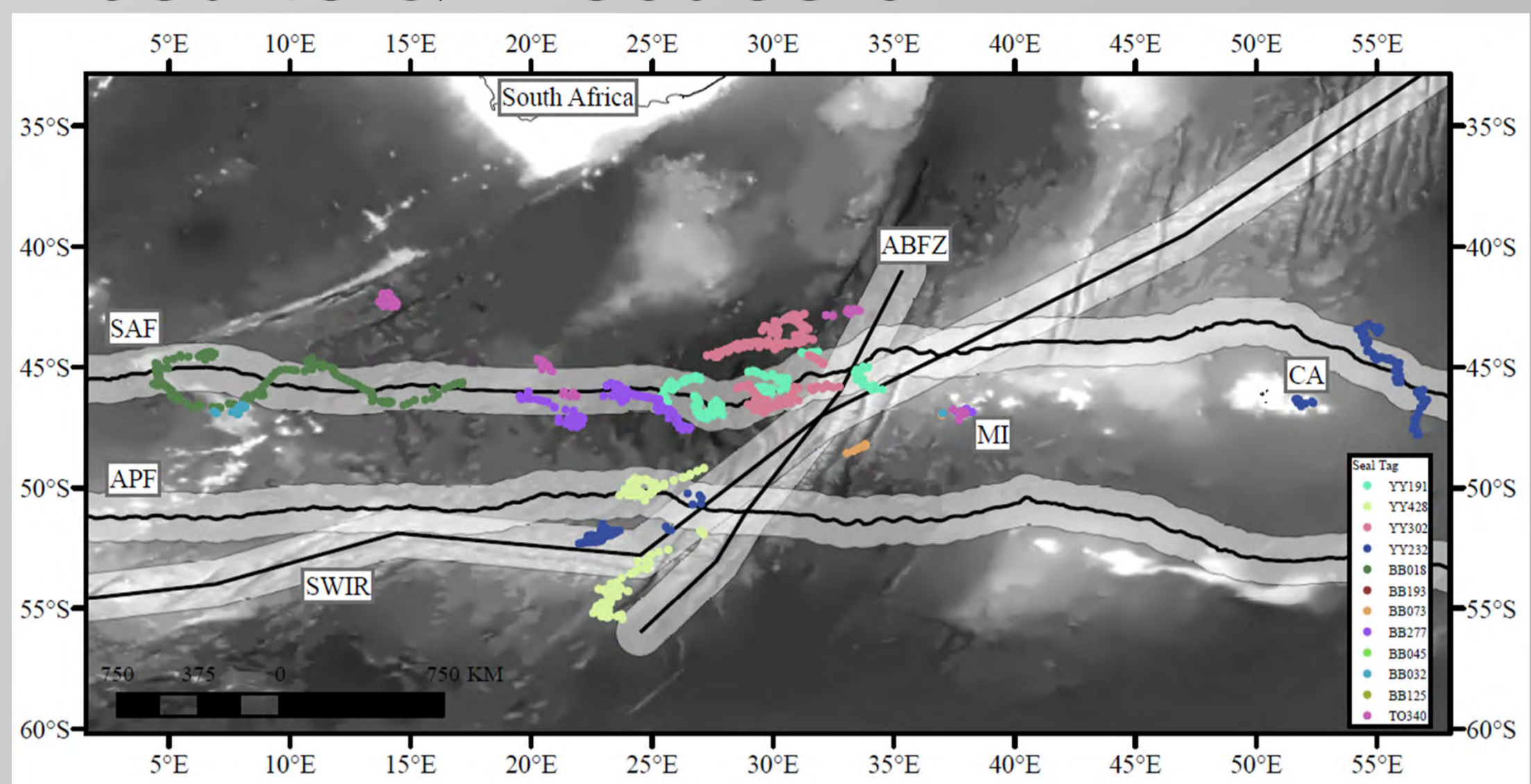


FIGURE 2. Searching behaviour of juvenile SES tracked in 2004 was significantly influenced by frontal structures.

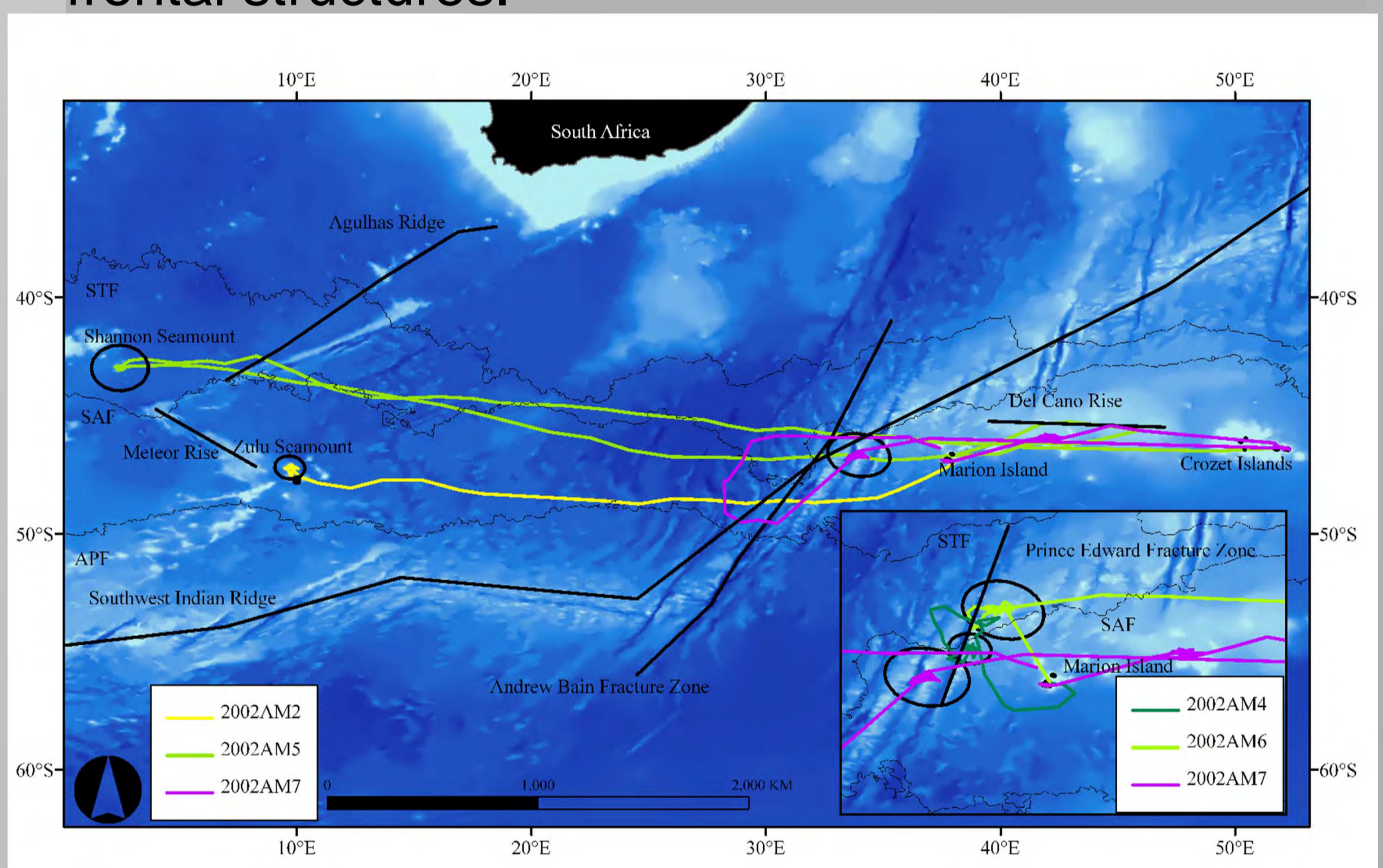


FIGURE 3. Searching behaviour of adult male SES. Searching behaviour is localised over bathymetric features with extensive transit migrations to and from MI.

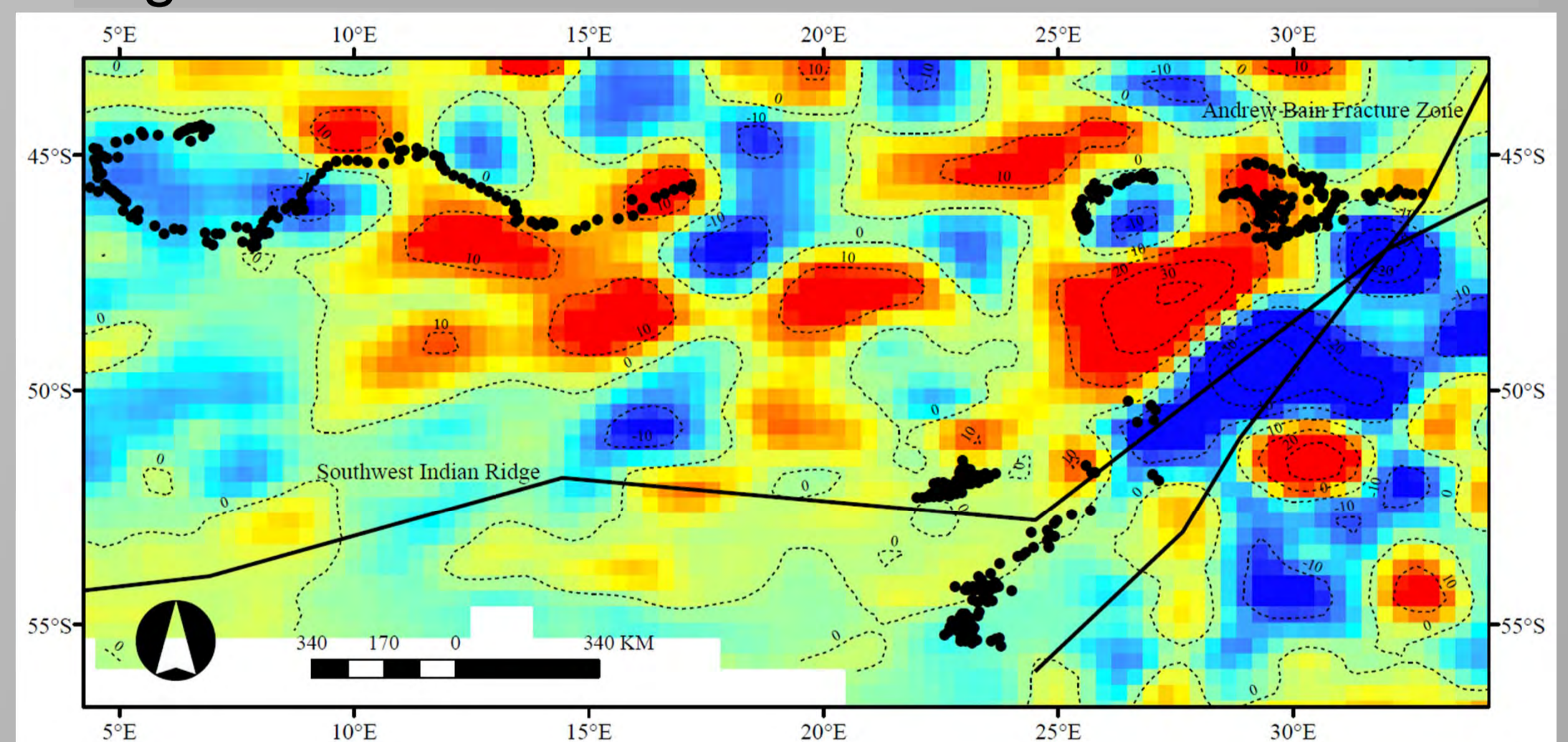


FIGURE 4. Searching behaviour of juvenile SES in relation to sea-surface height anomalies. SES movements change in relation to small changes in sea-surface height.

