

environmental similarity does not scale linearly with the number of groups (i.e. there is greater environmental distance between 5 and 7 groups than there is between 270 and 80) (Figure 17).

Levels of 270, 150, 80, 60, 40, 30, 20, 15, 7, and 5 groups in the classification hierarchy were mapped in geographic space according to the number of groups, representing differences in the average environmental distance between groups (Figure 18A-C). This analysis shows how at high levels of detail in the dendrogram, there was relatively less (multivariate) distance between groups and each group is represented by a relatively smaller numbers of coastal segments. At lower levels of detail (e.g. 20 groups) there was correspondingly more (multivariate) distance between groups and cluster groupings occupy a comparatively larger numbers of coastal segments (Figure 18C). This analysis also provided information on the spatial configuration of the resultant groups and how changes in the level of detail within the dendrogram are manifested along the coastal fringe of Fiordland. For example, between the 60 and the 20- group level, there is a clearer separation in the outer, mid-, and inner fjord habitats, while some environmental types (e.g. in the northern and southern extremes) maintain their distinctiveness (Figure 17B and C).

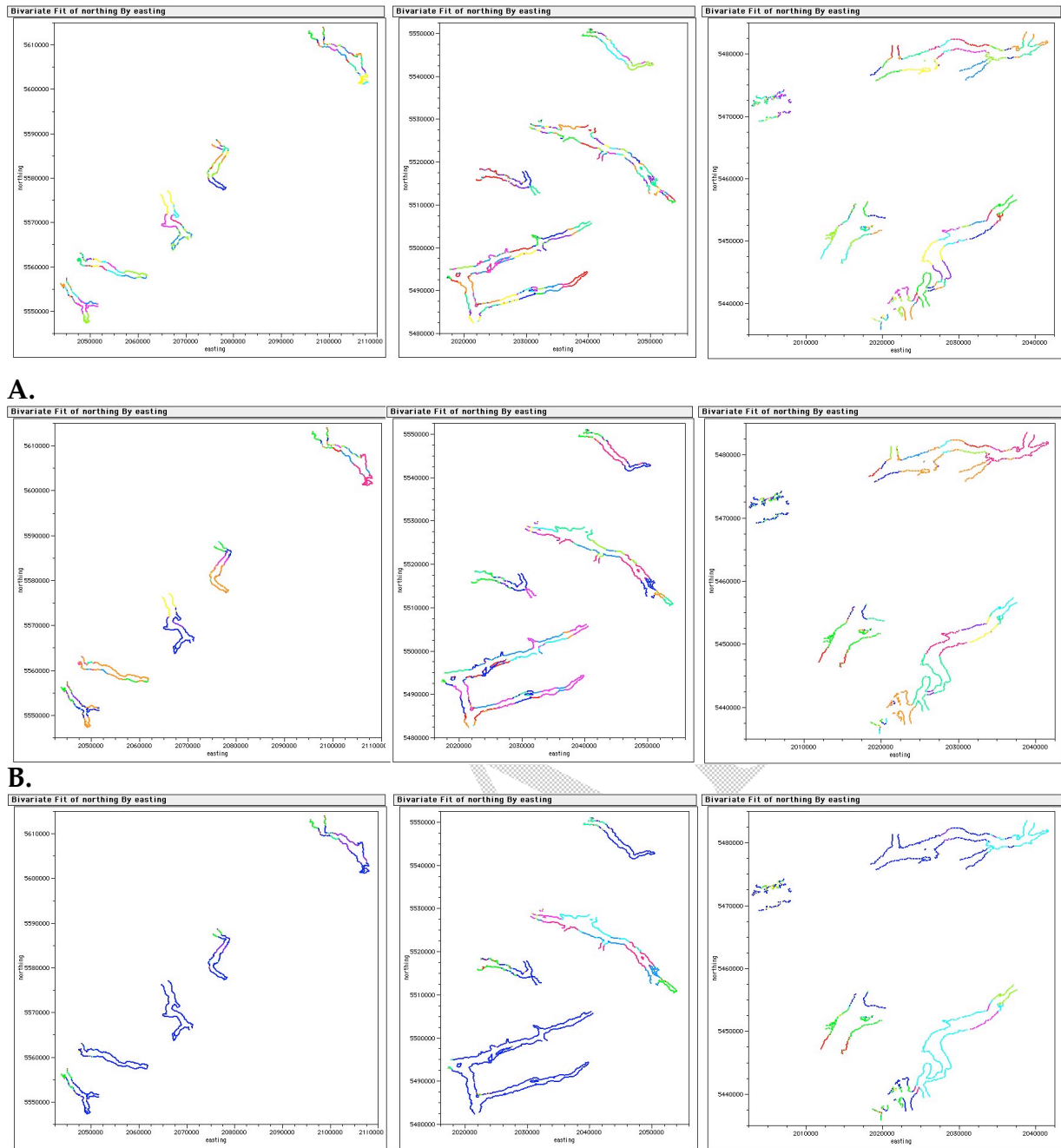


Figure 18. Changes in the distribution of environmental classes for northern, mid- and southern fjords at (A) 270-group level, (B) 60-group level, and (C) 20-group level.

Relationship between Physical Classification and Biological Attributes. The analysis of the relationship between environmental distance (according to the Gower metric) at various levels in the hierarchy and biological pattern was assessed with three distinct biological indicators, similar to the multi-regression modelling. The difference in the mean size of sea urchins (*Evechinus chloroticus*) was chosen as an indicator of biological pattern at the population-level, where mean test diameter has been related to site level patterns of growth. Average