

CLASSIFICATION OF VASCULAR PLANT COMMUNITIES OF THE NORTH CASCADES USING DISCREET SPACE BOUNDARY ANALYSIS

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Abstract

Plant communities in the North Cascades Mountain Range of Washington respond to a broad range of environmental factors, spanning 11.7 SD of species turnover across the primary axis of variation. Vegetation types encompassing maximum satellite spectral and geographic representation across the North Cascades were sampled and 1433 detailed plots were selected for further analysis. These plots were aggregated into composite sample sets using their mean abundance values. The composite samples were partitioned into discreet regions on color-coded scatter plots of the detrended correspondence analysis ordination space, bounded by minimum surfaces along indicator species gradients. The set partitions were then defined by a rule-based sequential filter that separated plots by the abundances of differential plant species. The inequalities which defined the rules formed a dichotomous classification of 14 major sets of North Cascades plant communities. These data sets and their classification keys were compared with other classification systems used in the Pacific Northwest in a classification concordance. The primary ordination axis spanned 11.7 SD and was aligned along an east-west gradient. The secondary ordination axis spanned 6.9 SD, aligned along a wet-dry gradient. Approximately 4 SD represents a complete species turnover, i.e., the ordination distance in which none of the same species occur in the plots. Thus, the primary axis of this data represents approximately 3 complete community turnovers in going from east to west across the North Cascades.

Keywords. Relevés, ordination, heirarchical classification, detrended correspondence analysis, reciprocal averaging, ground truthing, spectral classes.

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