

FIG. 1. Australian place names used in text.

FIG. 2. Australian river names used in text.

FIG. 3. Australian elevations at 30 arc-second (ca. 1 km) resolution from the U.S. Geological Survey GLOBE project.

FIG. 4. Australian mean annual rainfall based on the period 1961-1990 at 0.025- X 0.025-degree resolution. Modified from Australian Commonwealth Bureau of Meteorology.

FIG. 5. Australian mean January maximum temperature based on the period 1961-1990 at 0.025- X 0.025-degree resolution. Modified from Australian Commonwealth Bureau of Meteorology.

FIG. 6. Australian freshwater fish richness (number of species) by region. Regional acronyms (see page xii for names) and number of species with ranges indicated by differential shading.

FIG. 7. Australian freshwater fish richness (number of species) by region regressed by latitude. The dashed line is a regression of the entire dataset, represented by open circles. The solid line is a regression of the dataset without the regions WP, TORR PILB, BARK, BULL, LEB, and MDB, represented by solid circles. Excluded regions all experience considerable aridity (see Fig. 4), except for MDB; WP, LEB, and MDB have particularly broad latitudinal ranges. Both factors likely account for improved fit of the regression when they are excluded.

FIG. 8. Australian freshwater fish endemism by region. Regional acronyms (see page xii for names) and individual numbers of endemics are given, accompanied by percentage endemism indicated by differential shading. Note that most regions west and south of the "endemic line" have high endemism (i.e., >20%), while most north and east have low endemism (i.e., <10%) except NEQ with high absolute (six), and moderate percentage endemism (15%).



FIG. 9. Relationships of numbers of species versus numbers of regions in which they occur. A larger percentage of the overall ichthyofauna is narrowly distributed, e.g., seventy-eight species (47% of the fauna) occur in only one region, while a few are widespread, e.g., one species occurs in twenty-two regions.

FIG. 10. UPGMA trees of 167 species and thirty-one regions (see page xii for names) similarity coefficient matrices are shown for: a. Jaccard's Coefficient; b. Dice's Coefficient; c. Ochiai's Coefficient; d. Kulczynski's #2 Coefficient. Cophenetic correlations were all between 0.92 and 0.95. Jaccard's and Dice's coefficients produced identically branched trees, while Ochiai's Coefficient varied only in the position of WP. Kulczynski's #2 Coefficient differs in the positions of PILB, WP, and MDB, and the cluster LEB, BULL, and BARK differed in internal arrangement.

FIG. 11. Consensus trees of single- and complete-linkage trees of 167 species and thirty-one regions (see page xii for names) are shown for the following similarity coefficients: a. Jaccard's Coefficient; b. Dice's Coefficient; c. Ochiai's Coefficient; d. Kulczynski's #2 Coefficient. The consensus trees show the most distinctive clusters. Clusters present are more similar to each other than any region within the cluster is to any region outside.

FIG. 12. Non-metric multidimensional scaling plots of 167 species and thirty-one regions (see page xii for names) are shown for the following similarity coefficients: a. Jaccard's Coefficient; b. Kulczynski's #2 Coefficient. Stress values were 0.12 and 0.11 and cophenetic correlations were 0.90 and 0.96, respectively. A minimum spanning tree connecting regions is shown to indicate whether nearby pairs of regions in the plot are actually close, or distant if other dimensions are considered.

FIG. 13. Parsimony analysis consensus tree of eighty-eight species (= characters) and twenty-eight regions (= OTUs) (see page xii for names) (uninformative characters and OTUs were removed prior to analysis). The fifteen shortest trees were calculated with length 214 (CI=0.411, RI=0.753, RL=0.310, and HI=0.589). Bootstrap values are shown above the branches with values >50%, decay index values are shown below the branches with values >0.

FIG. 14. Australian low sea-level drainage patterns to 500 m below sea-level derived in ArcView from a bathymetric 30 arc-second (ca. 1 km) dataset produced by the Australian Geological Survey Organisation. Regional boundaries and bathymetric contours of 100, 200, and 500 m below sea-level are given. See Fig. 6 for regional acronyms and page xii for names.

FIG. 15. Freshwater fish occurrences by region through central Australia. See Appendix VI for species designations. On the y axis each number represents the distribution of a species, with continuous lines indicating presence of a species in adjacent regions on the x axis (see page xii for names). For each region, beginning from one direction, all known species are listed sequentially from those with the broadest range to those which are endemic. Once all species in a region have been added, new species are added sequentially in the next, those with the widest ranges first.

FIG. 16. Freshwater fish occurrences by region across southern Australia. See Appendix VI for species designations and Fig. 15 for further explanation.



FIG. 17. Freshwater fish occurrences by region across western, northern, and eastern Australia. See Appendix VI for species designations and Fig. 15 for further explanation.

FIG. 18. Proposed freshwater fish biogeographic provinces in Australia. See page 34 for further explanation.