用的扩张法生成的 Voronoi 图，图 5a 是新方法生成的 Voronoi 图，从这几个图形的比较分析，不难发现，图 2 与图 1 的差异较大，而图 5a 与其差异很小. 矢量法产生的 Voronoi 图误差最小，4 邻域、8 邻域扩张法的误差则很大. 新栅格方法生成的 Voronoi 图与矢量法生成的 Voronoi 图只有一个栅格距离的差异，这与采用动态距离变换方法的效果是一样的.

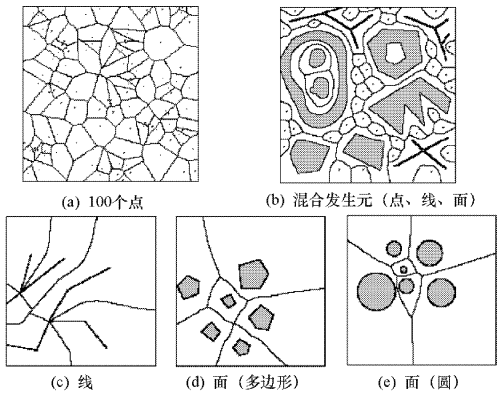

图 5 新栅格方法生成的 Voronoi 图

Fig. 5 Voronoi diagrams by the new raster-based method

新栅格方法在处理线、面或更复杂的发生元时，同处理点的方式一样(图 5b、c、d、e)，这与其它栅格方法是一致的，但与动态距离变换方法相比，新栅格方法生成 Voronoi 图的算法复杂性更小，更易于实现.

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New Raster-Based Method for Constructing Voronoi Diagrams

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Abstract: Most vector-based algorithms of computing Voronoi diagram have some difficulties in handling complex generators (such as curves and areas). A new raster-based method was developed, in which the Voronoi regions were defined by deciding each grid's character. In order to save the CPU time, the approach of searching its nearest generator for a grid was developed, which was based on the quadrantal location of generator grids in a raster space. The module Grid of Arc/Info software was employed to implement vector-raster and raster-vector data conversion and graphic display. The developed method can construct Voronoi diagrams with generators of any forms, and it has only one grid error compared with the vector-based method. The CPU time increases with the reducing of the grid size but decreases with the increasing of the number of generator grids.

Key words: geographical information systems; Voronoi diagram; raster-based method; an approach of searching the nearest neighbor

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