

CCJDC GIS MAPPING CONTEST

Map Design Principles

The following notes are taken from Robinson and Sales "Elements of Cartography."

The planning and design of a map is vital to the cartographic process because effective visual communication requires that the various marks, lines, tones, colors, patterns, symbols, lettering, etc. being used must be carefully chosen and fitted together. The manner of presentation of the many map components so that together they appear as an integrated whole, devised systematically to fit the objectives, includes elements ranging from mathematics to art. The aim of cartographic design is to present geographical data in such a fashion that the map appears as an integrated unit and so that each item included is clear, legible, and neither more or less prominent than it should be.

MOST IMPORTANT ELEMENTS OF MAP DESIGN:

Contrast - the manner and way in which a map component is contrasted with its surroundings determine its visibility.

Contrast is achieved by varying the visual characteristics of lines and shapes, patterns, value (relative darkness), and other characteristics of color.

Color Value - (relative darkness) is provided primarily by the amount of ink per unit area employed in producing a pattern and is the most important of all contrast elements.

The human eye can only distinguish about 6 shades of gray between black and white. Hue (color) or a pattern of lines or dots (texture) must be used if more contrast between symbols is required. Color is a clarifying and simplifying element. Texture leads to greater figure to ground differentiation.

Figure to Ground - Contrast between a symbol and its surroundings (allows immediate perception of the most important thematic information).

Proper graphic display allows the quick recognition of forms, shapes and symbols. Lighter areas are more easily perceived as the figure (foreground). Darker areas recede and are more easily perceived as background (ground).

Closed figures are more easily perceived as foreground (figure). Symmetry and simplicity of forms and symbols give greater figure to ground differentiation. Smaller areas tend to emerge as figure, whereas larger areas recede and appear more as background (ground).

Balance - involves layout and general arrangement of map elements (i.e., positioning of various visual components so that their relationship is logical).

Well-balanced design leaves nothing too short or too long, too dark or too light, too small or too large. Balance depends on relative position and importance of the basic parts of the map. Optical center of a map is usually about 5% above the center of a bounding shape. Easiest way to achieve balance is to prepare "thumbnail sketches."

CLARITY AND LEGIBILITY:

- a) Clarity and legibility require that the intellectual aspects of the map are not subject to question or misinterpretation
- b) Clarity and legibility require the proper choice of lines, shapes and colors and by their precise and correct delineation

GENERAL PRINCIPLES:

- There is a lower threshold below which an unfamiliar shape or symbol cannot be identified
- If lines and symbols are too small to be seen, they are essentially useless
- There is a difference between visibility and legibility
- An improperly designed map will be a cartographic failure
- Think in visual terms
- Clear visual differences require considerable actual differences