The Map Design Process

Principles of Map Design

- Ensure Legibility
- Ensure Visual Contrast
- Ensure Figure – Ground
- Employ Visual Hierarchy
- Maintain Balance

Identify Map Requirements & Constraints

Audience

Publish

Consider Geographic Phenomena Characteristics → **Data Acquisition** → **Design** → **Draft Assess & Test** → **Refine**

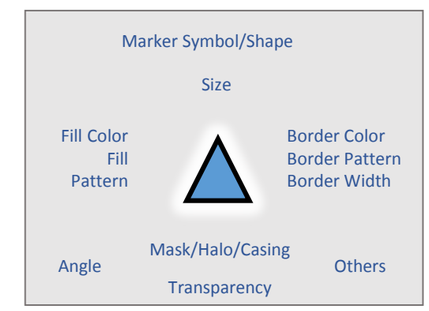
Controls of Map Design

- Geographic Reality
- The Audience
- Purpose of Map
- Available Data
- Map Scale Options
- Conditions of Use
- Technical Limitations

Fundamentals of Map Design

Graphic Variables

Position | **Size** | **Shape** | **Color** (**Hue** | **Value** | **Saturation**) | **Pattern**



Each Mapped Phenomena (aka Layer)

Select Data | **Generalize** | **Symbolize** | **Label**

Design Page Layout

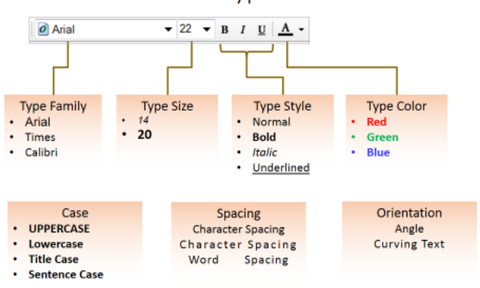
Labeling General Guidelines

- Do not Passively Use Software Defaults
- Avoid Decorative Type
- Use Bold and Italic Sparingly
- Two or less type families
- Use Smallest Font Size Possible
- Type Size Should relate to importance
- Spelll Cheeck ☺

(Slocum, 2005)

- Clearly associate Labels with features
- Avoid overprinting features, particularly boundaries & lines: *consider Masks, Halos, Callouts*
- Normally Orient Type Horizontally

Characteristic of Type *in ArcGIS*

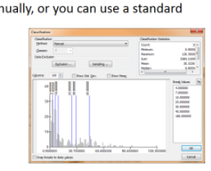


Generalize

- Classify
- Simplify
- Exaggerate

Classification

- When you perform a classification, you group similar features into classes by assigning the same value or symbol to each member of the class.
- By altering the class breaks (the boundary between classes), you can create very different-looking maps.
- Classes can be created manually, or you can use a standard classification scheme.
  - Equal Interval
  - Defined Interval
  - Quantile
  - Natural Breaks
  - Geometric Interval
  - Standard Deviation



Taken from ESRI ArcGIS 10.0 help

Raster Resampling

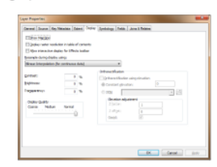
Rarely do you see 1 for 1 the pixels of a raster on your screen. You typically are seeing pixels & parts of pixels grouped into one.

Set Resampling

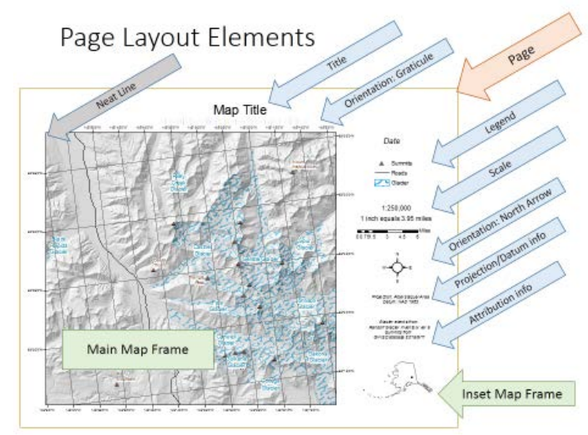
- For on-the-fly viewing in Layer Properties
- When Projecting Data & Building Pyramids
- Others

Methods

- Nearest Neighbor
- Bi-Linear Interpolation
- Cubic Convolution
- Majority

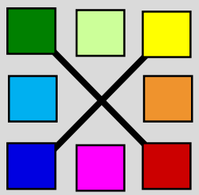


Page Layout Elements

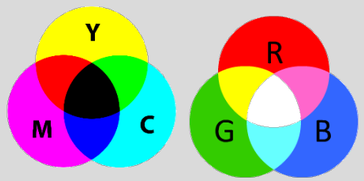


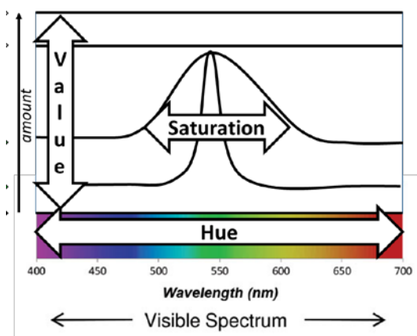
DNR DGGS Cartography Workshop
Mike Hendricks & Patricia Gallagher
Dec 2015

Opponent Process Colors



Subtractive vs. Additive Colors





The dominate wavelength of a color

The amount or brightness of a color

The intensity or purity of the Color

Graphic Variables

Graphic Primitives

Graphic Variables	Point	Line	Polygon
Position	*Hard to use effectively on a map*		
Shape	● ▲ ★	/	⬢
Hue	● ● ●	/ / /	⬢ ⬢ ⬢
Value	● ● ●	/ / /	⬢ ⬢ ⬢
Saturation	● ● ●	/ / /	⬢ ⬢ ⬢
Size	● ● ●	/ / /	⬢
Pattern	▨ ▨ ▨	/ / /	▦ ▦ ▦

Differentiating

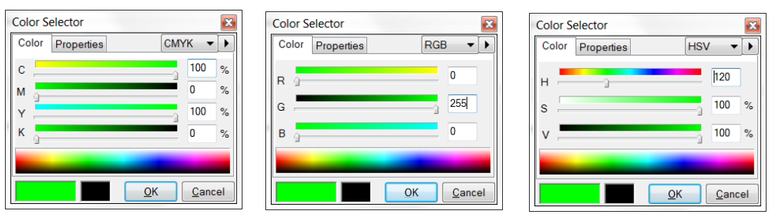
Qualitative
Nominal
Difference only

Ordering

Sequential
Ordinal
big, better, best

Quantitative
Interval/Ratio
Numeric

Color Models in ArcGIS



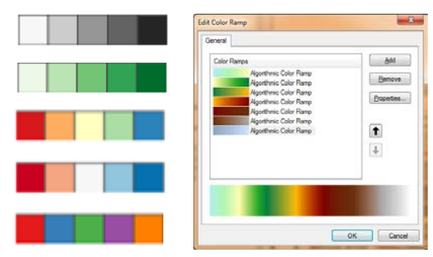
Other Color Models

- Hue, Saturation, and Luminosity (HSL)
- Hexidecimal triplet used for web
- Commercial Color Models

Munsell COLOR PANTONE® NCS

Some Color Progressions

- Value Progression
- Single Hue Progression
- Multi Hue Progression
- Diverging (Negative to Positive)
- Quantitative (Nominal)



Drawing Order in ArcGIS

By Default ArcGIS draws by Layer, from bottom to top of the table of Contents

Each feature within the Feature Class is Drawn in the Order it is stored in its Data Table,

Each Symbol Part is Drawn in Order of Symbol Layers

Options for Saving & Reusing Symbology in ArcGIS

- Layer Files (.lyr)
- Styles (.style)
- Representation in a Feature Class
- Within a Map Document/Templates (.mxd)

DNR DGGS Cartography Workshop
Mike Hendricks & Patricia Gallagher
Dec 2015