Lecture 9: Principles of map design and layout
Cartographic Design

• Mental and physical map creation process
• Design relates to appearance, effectiveness in information communication
• Base level: follow rules, guidelines and conventions
• Increasing body of research on how maps work
• Even so, many maps can be created to solve a task, is there an optimum?
• Artistic element “guided less by experiment and more by intuition and critical examination”
• Significant overlap with graphic design more generally, e.g. text
The Mapping Process

Feedback

Map legends

Inset maps

Data field

Map author/cartographer

Map

Map Reader

Transformation one
Map making

Transformation two
Map use

Cartographic process
Slocum’s Map Elements

- Frame and neat line
- Mapped area (figure)
- Inset
- Title and subtitle
- Legend
- Data source
- Scale
- Orientation
Gestalt

- Map consists of elements
- Human cognition is based on clumping
- Elements seen both individually and holistically
- Eye seeks similarity, proximity, continuity, closure
- Symmetry, simplicity, balance favored
Clumping
Water bodies
Slocum’s design process

• Choose reproduction method
• Select scale and projection appropriate for theme
• Classification and symbolization method
• Select map elements required
• Rank symbols and elements into an “intellectual hierarchy”
• Create a sketch map for design experiments
• Test map on audience before making final version
Visual hierarchy
Tricks for creating a visual hierarchy

• Create figure-ground contrast
• Figure isolation, vignette
• Line weight and type
• Color, shading and transparency
• Drop shadows, halos, masks, gaps
• Symbol overlap
• Extrusion, shading and 3D effects
Figure-Ground

Poor Figure/Ground, Visual Noise

Better
Inverse convention
Leave out the unknown
View, perspective, color scheme, unanticipated elements
Apollo 11 lunar lander
People often underestimate quite how large Africa is, so we figured we'd put it in perspective by transposing as many of the world's other countries over it as we could. As you can see, Africa is larger than China, the USA, Western Europe, India, Argentina and the British Isles... combined!
Counter-convention
Symmetry

Population density in the Iberian Peninsula

Legend
Population density (people per km²)
- 0 - 50
- 51 - 100
- 100 - 250
- 250 - 500
- > 500

Scale
1,500,000

Source: compiled by author
Cartographic analysis: municipal cartography provided by National Statistics Institute (INE) as part of the P5-Map tool and Carta Administrativa Oficial de Portugal (CAOP) provided by Instituto de Geografia Português (IGP).
Data sources: National Statistics Institute (INE) and Statistics Portugal (INE).

Application of the RIN guidelines in Spain at various scales

Copyright © 2009 Pearson Prentice Hall, Inc.
Visual balance

• The size of the symbols
• The pattern of the symbols
• The color of the symbols
• The visual hierarchy of the symbols and elements
• The location of the elements with respect to each other and the visual center of the map
Visual center

5% of height

Landscape

5% of height

Portrait
Visual balance and layout

Title Here

Good

Bad
Visual balance

• Left right
• Top down
• Several smaller objects can counter one larger
• Sensitive to alignment
• Text and legend can be used to fill spaces
• Including graticule or unmapped area to neat line can work well
Same for posters, information graphics
Balance and content

Conrad Hackett @conradhackett - 4 okt.
50% of China's GDP comes from the areas in orange, 50% comes from the areas in grey

foreignpolicy.com/articles/2014/...
Alignment: precision matters
Select and group
Align and distribute
Snap
Screening
Vignettes
Drop shadows in Inkscape

- Select feature -> group
- Copy and paste
- Select new object, change color to gray or black
- Optionally blur
- Displace it slightly
- Push it into the background
- Separate function for text
Drop shadow coastline
Emboss, highlight
Simplicity
Reduce unnecessary complexity
Symbol complexity
Good vs. Bad design
Good vs. Bad design

District of Columbia Home Sales: 2012

Circle size represents sale price. One square meter equals one dollar.
Good vs. Bad Design

Figure 1.47  Annual incidence of tornadoes in the United States. Central, eastern and north eastern states are most affected. Source: Redrawn from Monmonier 1998.
Good vs. Bad Design
Good vs. Bad Design
Good vs. Bad Design

Ancient Courses of the Mississippi River Meander Belt Sheet 10
gеological survey map vintage reproduction 1943
Summary

• Good design makes map more effective and interpretable
• Eye seeks similarity, proximity, continuity, closure
• Symmetry, simplicity, balance favored
• Figure—ground
• Alignment, balanced layout
• Follow convention, except when you want to emphasize or challenge
• When in doubt, reduce complexity