Value your maps!
A checklist approach for map evaluation
Kenneth Field, Allen Carroll, Damien Demaj
Kenneth Field
Damien Demaj
Outline of session

- Why a checklist approach to evaluation?
- Cartographic Requirement
- Cartographic design principles - devil is in the detail
- Putting the pieces together - marginalia and layout
- Synopsisis, final checking
Why a checklist approach to evaluation?

Map User

GIS User

Knowledge Transfer

Map-maker

Cartographer
**Temperature Concern on SRM Joints**

27 Jan 1986
Edward Tufte, 2005, Visual and statistical thinking
“Making decisions based on evidence requires the appropriate display of that evidence. Good displays of data help reveal knowledge relevant to understanding mechanism, process and dynamics, cause and effect. Displays of data should directly serve the task at hand”.

Edward Tufte, 2005, Visual and statistical thinking
GIS is not a cartographic expert system...it provides the novice map maker with defaults to ‘design’ maps such as page templates and pre-designed symbols but they may not be suitable!
Evaluation as part of the design process
Cartographic requirement
What’s the story?
Cartographic requirement

Written/spoken word: SERIAL

Graphics: PARALLEL
Cartographic requirement

- Pleasing composition – gets our attention
- Makes an immediate and lasting harmonious impression
- Enhances clarity
- Acquires and retains attention
- Instills confidence
Cartographic requirement

- Record data
- Store data
- Display information
- Data recovery
- Analysis of spatial patterns
- Understand processes
- Convincing
- Persuading
- Propagandist
Cartographic requirement

- Audience
- Media resolution
- Viewing distance
- Output medium
Cartographic requirement
Demo: requirement
Cartographic design principles
Visual hierarchy

Source: www.direct.gov.uk
Visual hierarchy

Schools in Northampton

Legend:
- Infant
- Junior
- Secondary & colleges

Source: www.direct.gov.uk
Demo: visual hierarchy
Visual contrast
Figure-ground
Demo: figure-ground
The devil is in the detail
Projections
Projections – use your head
Projections – use your head
Projections – use your head
Demo: projection
Symbols
Symbol palette

- **Spacing**
- **Size**
- **Shape**
- **Orientation**
- **Hue**
- **Lightness**
# Symbol meaning

## Points
- **Nominal**
  - Airport
  - Emergency Phone
  - Picnic site

- **Ordinal**
  - Large
  - Medium
  - Small

- **Interval or Ratio**
  - 500 - 999
  - 100 - 499
  - 0 - 99

## Lines
- **Nominal**
  - Motorway
  - Railway
  - River
  - Canal

- **Ordinal**
  - Motorway
  - A road (dual)
  - A road
  - B road
  - Minor

- **Interval or Ratio**
  - 30 - 39
  - 20 - 29
  - 10 - 19
  - 0 - 9

## Areas
- **Nominal**
  - Forest
  - Agricultural

- **Ordinal**
  - Large
  - Medium
  - Small

- **Interval or Ratio**
  - 40 - 49
  - 30 - 39
  - 20 - 29
  - 10 - 19
  - 0 - 9
  - %
Demo: symbols
Classifying data
Feature generalization

Processes to transform feature representation for different scales

Large scale

Small scale
Feature generalization

- Simplify
- Smooth
- Aggregate
- Amalgamate
- Collapse
Feature generalization

- Merge
- Refine
- Exaggerate
- Enhance
- Displace
Demo: Feature generalization
(Example of “Diverging Critical Class”)
Color

(Example of “Qualitative”)
Shaded relief
Bathymetry
Demo: color
Typography

**Purpose**

- CITIES
- Towns
- Villages

**Size**

- 5 point
- 7 point
- 10 point
- 12 point
- 18 point
- 24 point

**Position**

- London

**Conflict**

**Style**

- sans serif
- serif
Demo: typography
Putting the pieces together
Marginalia

- Main map
- Inset maps (detail/locative)
- Title
- Subtitles
- Legends
- Scale indicators
- Orientation indicators
- Graticule
- Explanatory text
- Source note
- Copyright note
- Neatline
Marginalia: Textual components

- Title
- Subtitle
- Copyright note
- Source text
- Explanatory text
- Contextual
Marginalia: Legends

(a) choropleth/graduated symbol map legends
- Crimes per sq km:
  - 200 +
  - 100 - 199
  - 30 - 99
  - 20 - 29
  - 10 - 19
  - 0 - 9
- Change in temp (°C):
  - 10.1 to 14.9
  - 5.1 to 10.0
  - 0.1 to 5.0
  - -0.1 to -5.0
  - -5.1 to -10.0
  - -10.1 to -14.9

(b) qualitative map legends
- Land use:
  - Forested
  - Agricultural
  - Industrial
  - Urban
- Roads:
  - Motorway
  - Primary route (dual)
  - A Road
  - B Road
- Fuel types:
  - Oil
  - Gas
  - Coal
  - Diesel

(c) proportional symbol map legends
- Number of people:
  - 10,000
  - 1,000
  - 100

(d) dot density map legend
- Sample densities (people per sq km):
  - 150
  - 100
  - 50
  - Each square = 100 sq km

(e) legends for multivariate symbols
- Posterior probability:
  - 0.80 - 1.00
  - 0.60 - 0.80
  - 0.40 - 0.60
  - 0.20 - 0.40
  - 0.00 - 0.20
- Relative risk:
  - 1.20 - 1.26
  - 1.10 - 1.15
  - 1.00 - 1.05

(f) legend for elevation/depth
- Height in m
Marginalia: Scale statements

1 centimetre equals 350 kilometres

1:35,000,000
Marginalia: Orientation
Visual balance

Visual page centre

Geometric page centre
Layout
Demo: layout
Synopsis
Maps and Maidens

Edward Willats 1908-2000
Geographer & cartographer
Founder member of British Cartographic Society

“They must be well proportioned and not too plain;
Color must be applied carefully and discretely;
They are more attractive if well dressed but not over dressed;
They are very expensive things to dress up properly;
Even when they look good they can mislead the innocent;
And unless they are very well bred they can be awful liars!”
www.esri.com/sessionevals

esri.mappingcenter.com

kfield@esri.com  @kennethfield
ddemaj@esri.com  @damiendemaj
acarroll@esri.com