



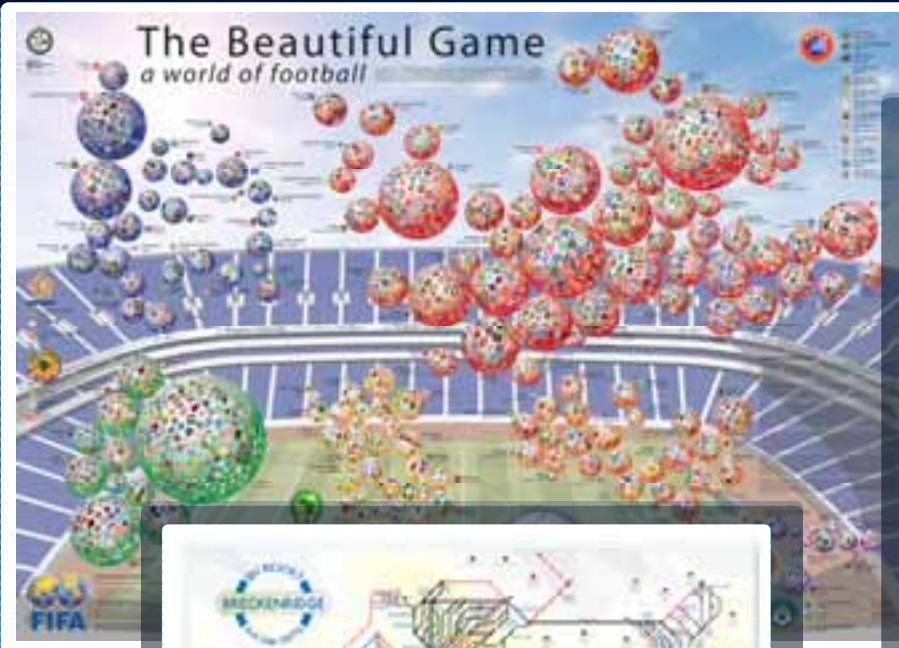
Esri International User Conference | San Diego, CA
Technical Workshops | Tues July 12th 13:30-14:45

Value your maps!

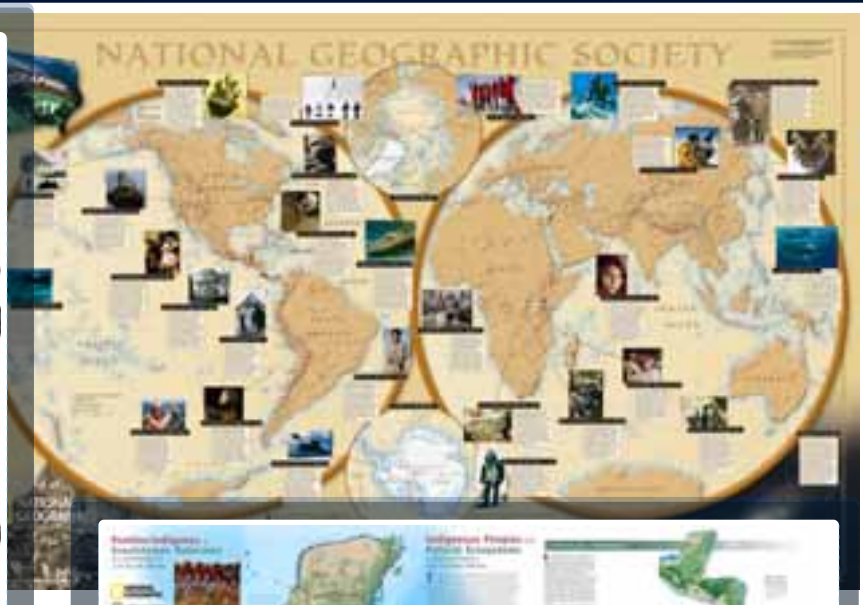
A checklist approach for map evaluation

Kenneth Field, Allen Carroll, Damien Demaj

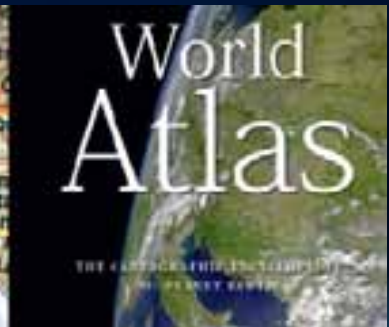
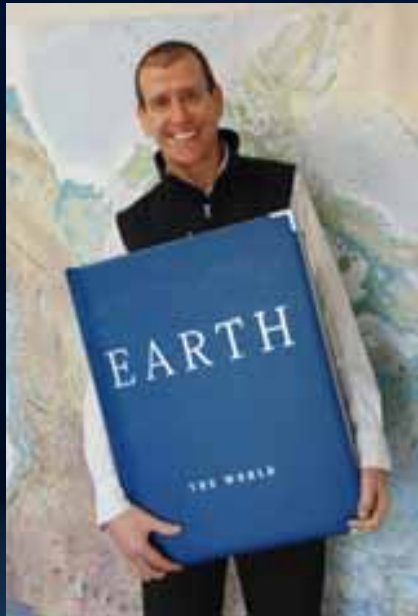
Kenneth Field



Allen Carroll



Damien Demaj



mappingcenter.esri.com

mappingcentre.esri.com



The screenshot shows the Esri Mapping Center website. At the top, the Esri logo and 'Mapping Center' text are visible. A navigation bar contains links: Home, Blog, Ask A Cartographer, Maps, ArcGIS Resources, and Other Resources. A yellow arrow points to the 'Other Resources' link. The main content area includes a welcome message, a search bar, and a 'Most Recent Blog Feeds' section. The first blog post is titled 'Designing Operational Overlays for the ArcMap and ArcGIS Online Basemaps' and includes a map image and text about creating maps with basemaps. Below this is a section for 'Announcing the New Ocean Basemap'. On the right side, there are two sidebar sections: 'Mapping Center Web Site' with links to About Mapping Center, About the Mapping Center Team, About Mapping Center R&D, Getting Started, and Site Map; and 'Mapping Center Blog' with links to About the Blog, Terms of Use, and Submit an Entry, accompanied by an RSS icon. At the bottom right, there is a 'Recent Tweets' section with a Twitter logo and the text 'Join the conversation'.

esri Mapping Center

Welcome! [Login](#)

Home Blog Ask A Cartographer Maps ArcGIS Resources Other Resources

Welcome to Mapping Center

Mapping Center is dedicated to helping you make great maps with ArcGIS. We do this by introducing you to the same concepts and techniques that professional cartographers use. *Our goal is our users' demonstrated success in cartographic information design presentation!*

Search Site

Most Recent Blog Feeds

Designing Operational Overlays for the ArcMap and ArcGIS Online Basemaps



When creating maps using the basemaps that are available in ArcMap or from ArcGIS Online, best practice is to add the basemap to your ArcMap session (if it is a map service that you can open in ArcMap). Then you can design your operational data, which will overlay the basemap, so that it complements the basemap and so that the basemap appears to support the operational data. You can check the results of the map service you create in a Web map viewer. If you need to make changes once you review the results, you can simply edit the ArcMap document until you get the final product you want....(read more)

Announcing the New Ocean Basemap

The Ocean Basemap (Ocean_Basemap) map service was published recently on ArcGIS Online ([services.arcgisonline.com](http://services.arcgisonline.com/server.arcgisonline.com), server.arcgisonline.com). This global map shows the sea floor of

Mapping Center Web Site

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- [About the Mapping Center Team](#)
- [About Mapping Center R&D](#)
- [Getting Started](#)
- [Site Map](#)

Mapping Center Blog

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- [Submit an Entry](#)

Recent Tweets

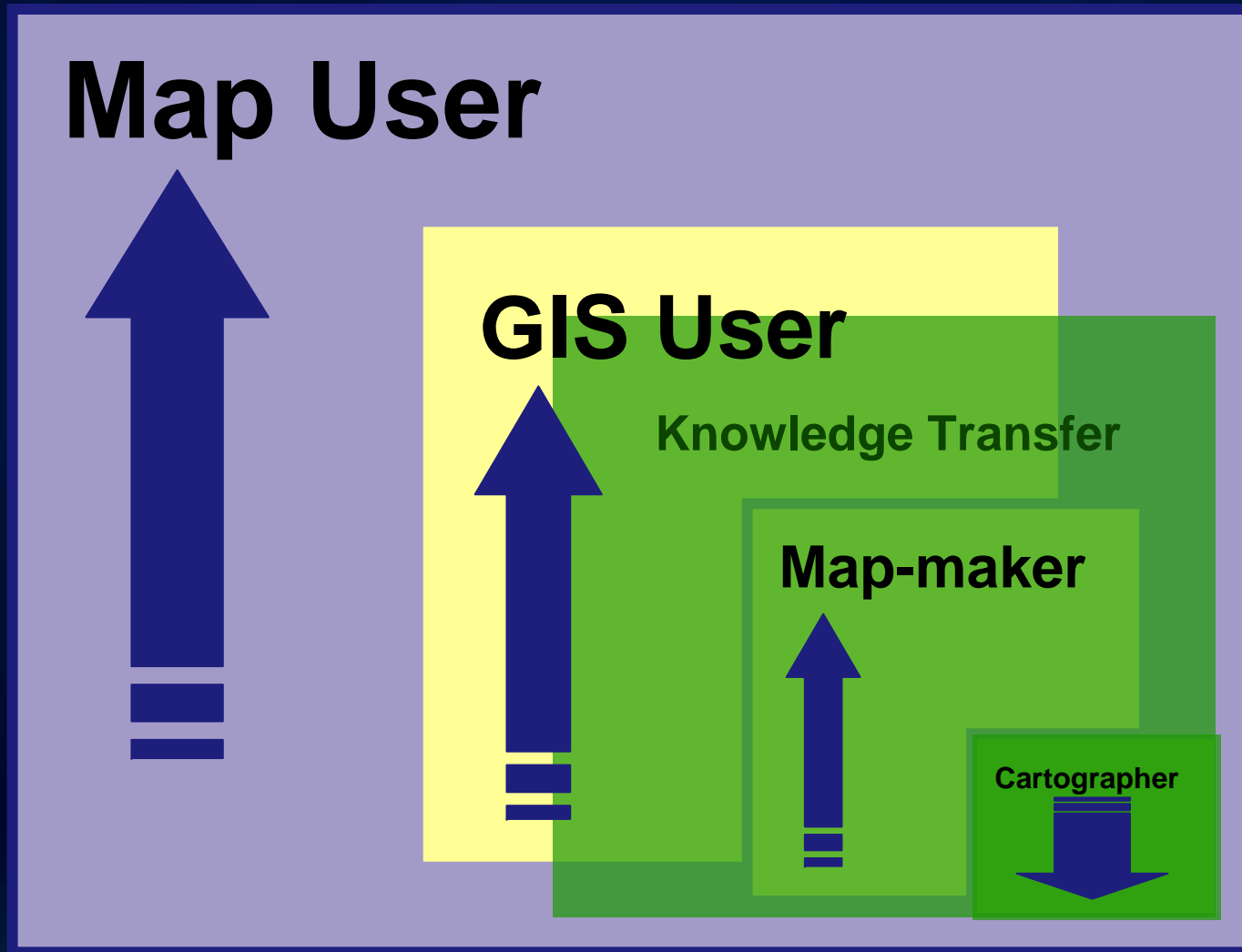
twitter Join the conversation

Outline of session

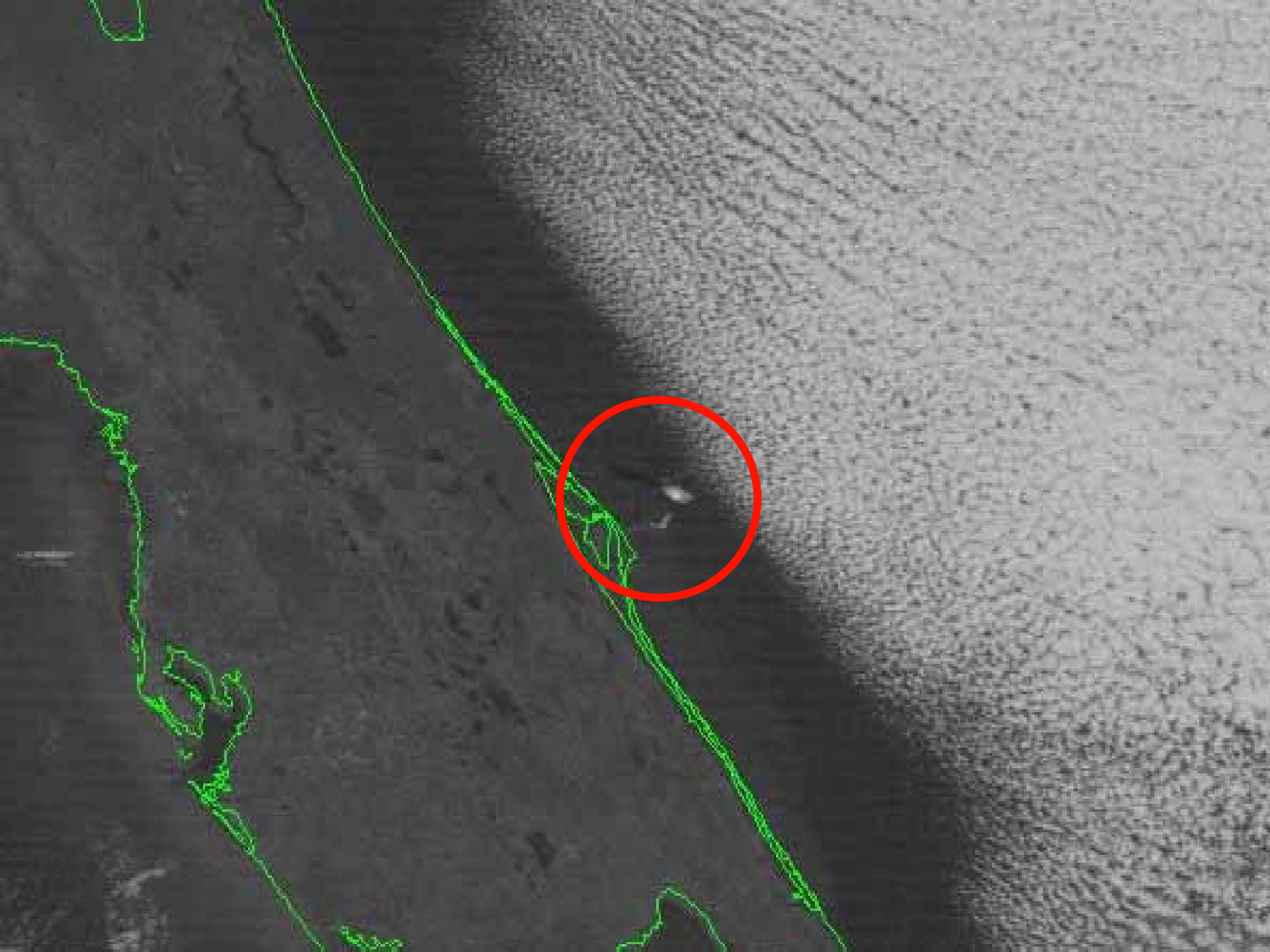
- Why a checklist approach to evaluation?
- Cartographic Requirement
- Cartographic design principles - devil is in the detail
- Putting the pieces together - marginalia and layout
- Synopsis, final checking



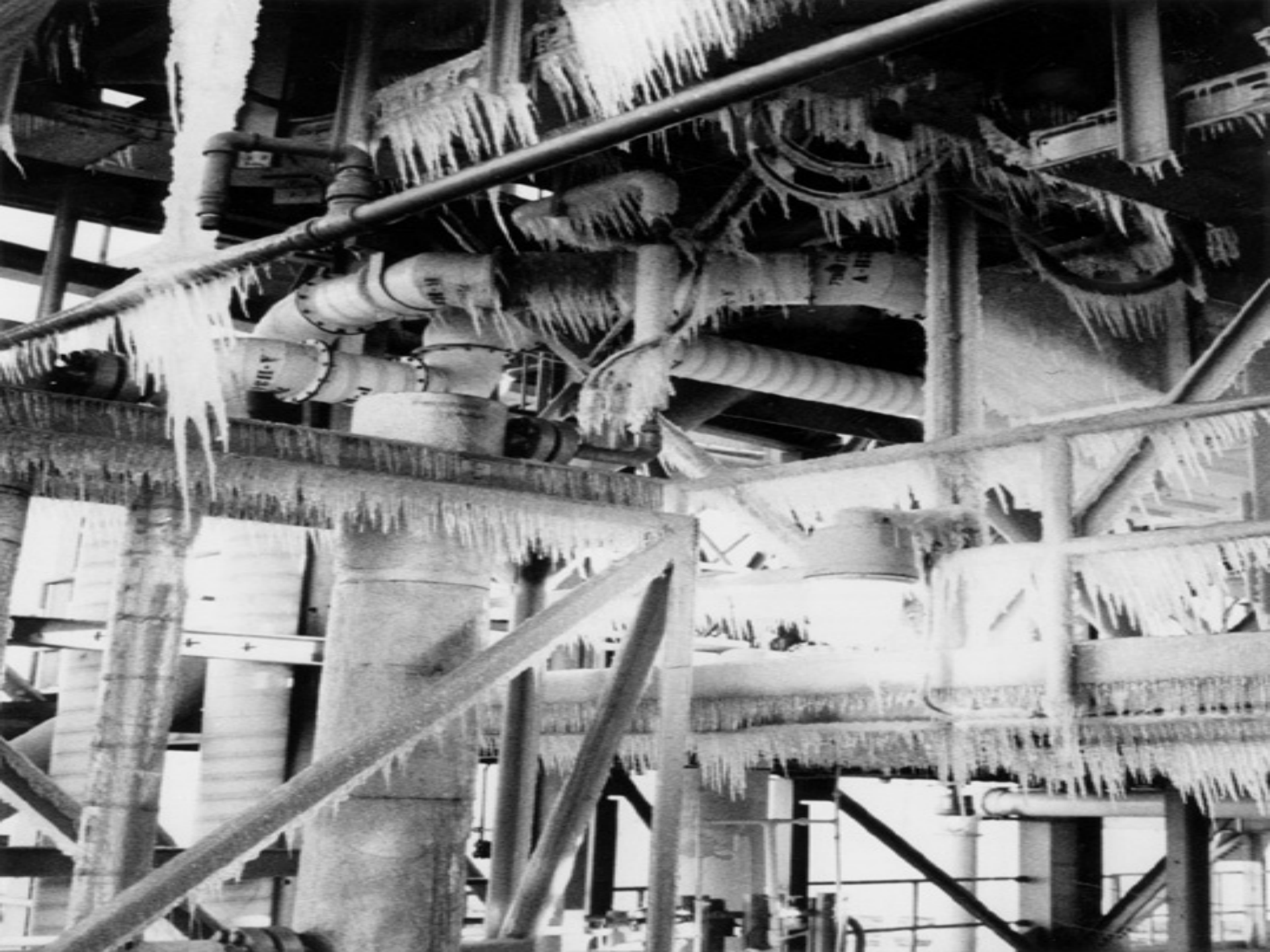
Why a checklist approach to evaluation?











BLOW BY HISTORY

SRM-15 WORST BLOW-BY

0 2 CASE JOINTS (80°), (110°) ARC

0 MUCH WORSE VIBRATION THAN SR

HISTORY OF O-RING TEMPERATURES (DEGREES - F)

| MOTOR | MBT | AMB | O-RING | WIND |
|-------|-----|-----|--------|--------|
| DM-4 | 68 | 36 | 47 | 10 MPH |

HISTORY OF O-RING DAMAGE ON SRM FIELD JOINTS

| SRM No. | Erosion Depth (in.) | Cross Sectional View | | Nominal Dia. (in.) | Top View | | Clocking Location (deg) |
|-------------------------------|---------------------|--------------------------|-------|--------------------|-----------------------------|----------------------------------|-------------------------|
| | | Perimeter Affected (deg) | | | Length of Max Erosion (in.) | Total West Affected Length (in.) | |
| 61A LH Center Field** | 22A | NONE | NONE | 0.280 | NONE | NONE | 36° - 86° |
| 61A LH CENTER FIELD** | 22A | NONE | NONE | 0.280 | NONE | NONE | 338° - 18° |
| 51C LH Forward Field** | 15A | 0.010 | 154.0 | 0.280 | 4.25 | 5.25 | 163 |
| 51C RH Center Field (prim)*** | 15B | 0.038 | 130.0 | 0.280 | 12.50 | 58.75 | 354 |
| 51C RH Center Field (sec)*** | 15B | NONE | 45.0 | 0.280 | NONE | 29.50 | 354 |
| 41D RH Forward Field | 13B | 0.028 | 110.0 | 0.280 | 3.00 | NONE | 275 |
| 41C LH Aft Field* | 11A | NONE | NONE | 0.280 | NONE | NONE | -- |
| 41B LH Forward Field | 10A | 0.040 | 217.0 | 0.260 | 3.00 | 14.50 | 351 |
| STS-2 RH Aft Field | 2B | 0.053 | 116.0 | 0.280 | -- | -- | 90 |

*Hot gas path detected in putty. 1
**Soot behind primary O-ring.
***Soot behind primary O-ring. Heat a

Clocking location of leak check po

OTHER SRM-15 FIELD JOINTS HA
WEAR OR BEYOND THE PRIMARY O

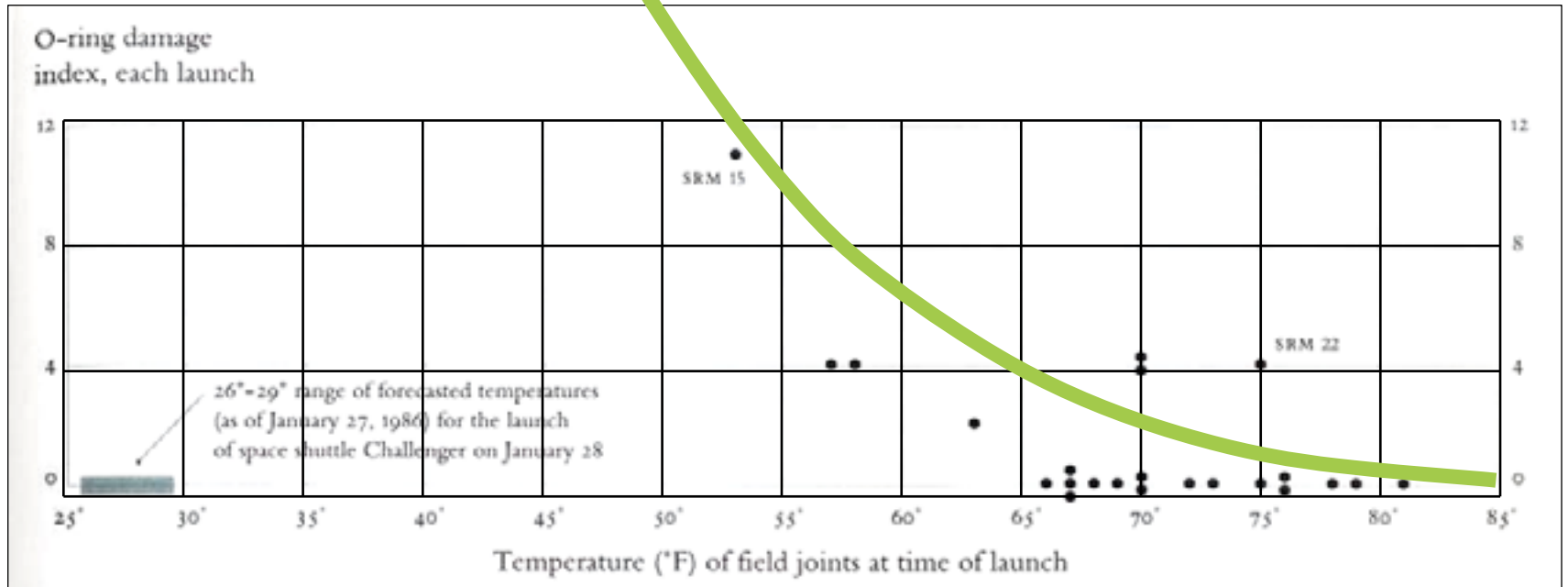
SRM-22 FORWARD FIELD JOINT H
AND NO SOOT BLOWBY. OTHER 3

TEMPERATURE CONCERN ON

SRM JOINTS

0 PROJECT AMT
TO DETERMIN

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”.

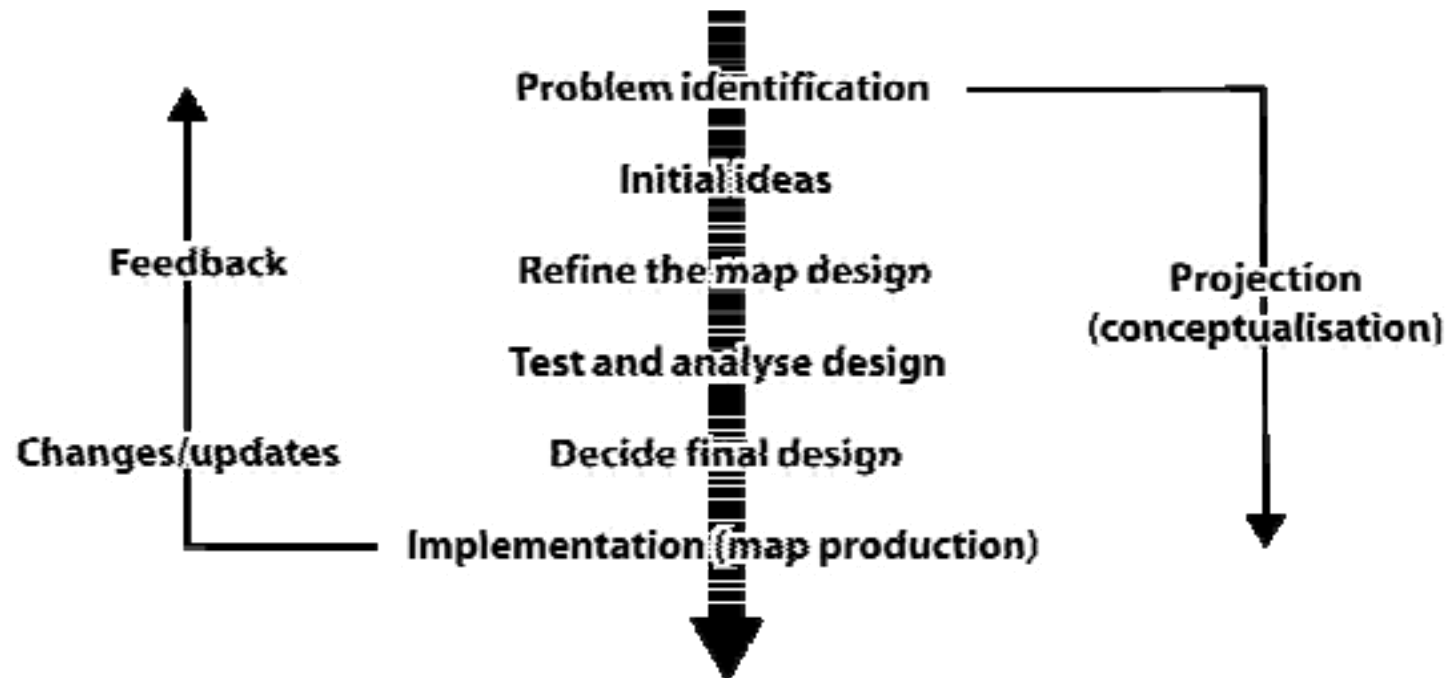
Edward Tufte, 2005, Visual and statistical thinking

Design is crucial to communication in GIS



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!

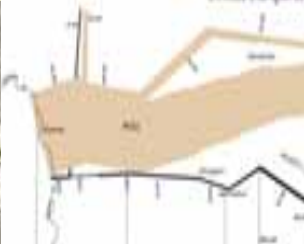
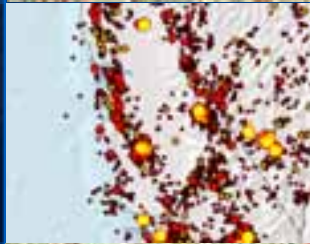
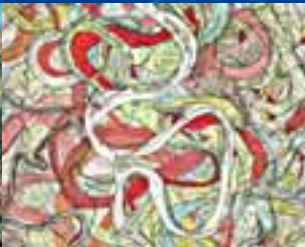
Evaluation as part of the design process



Cartographic requirement



What's the story?



Cartographic requirement

Written/spoken word: SERIAL



Graphics: PARALLEL



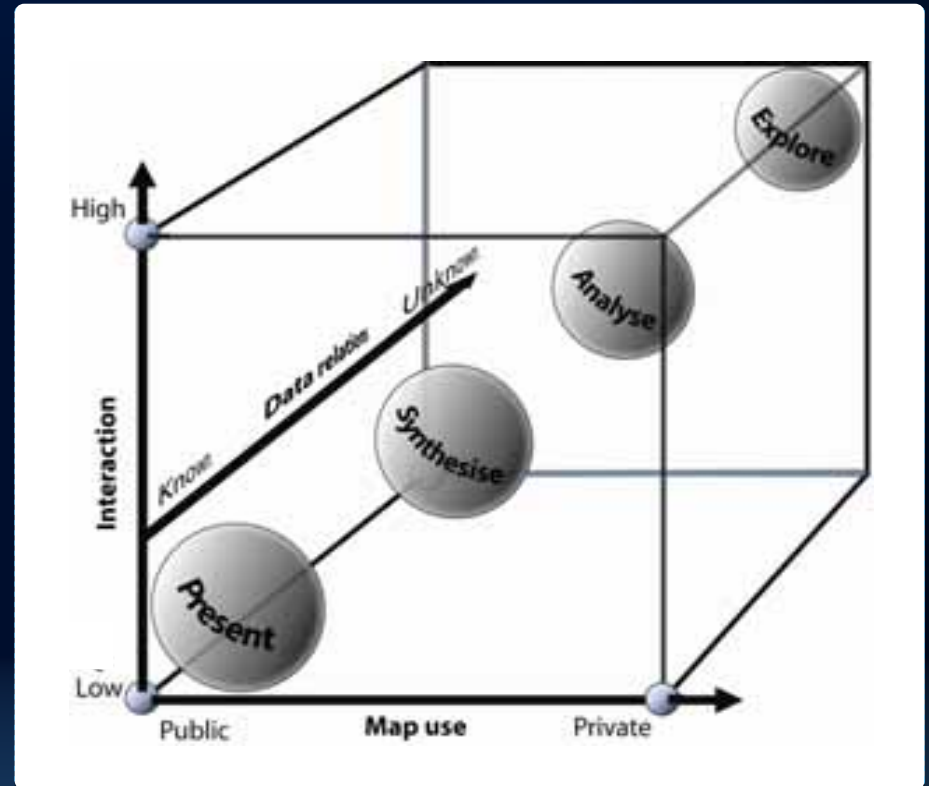
Cartographic requirement

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

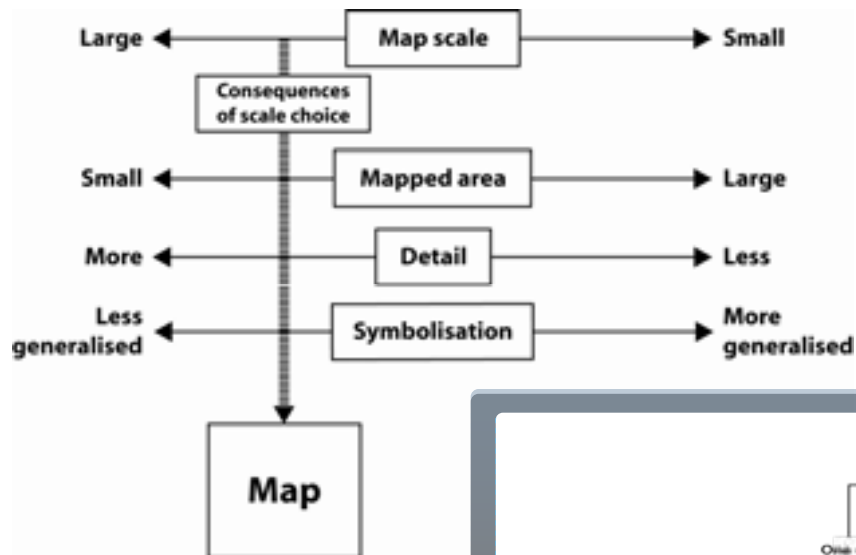


Cartographic requirement

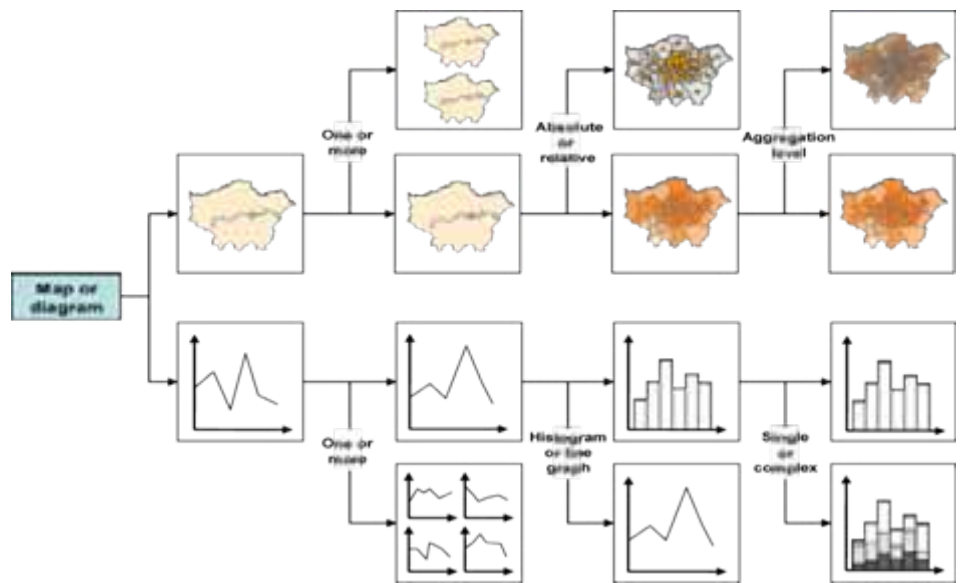
- Record data
- Store data
- Display information
- Data recovery
- Analysis of spatial patterns
- Understand processes
- Convincing
- Persuading
- Propagandist



Cartographic requirement



- Audience
- Media resolution
- Viewing distance
- Output medium



Cartographic requirement



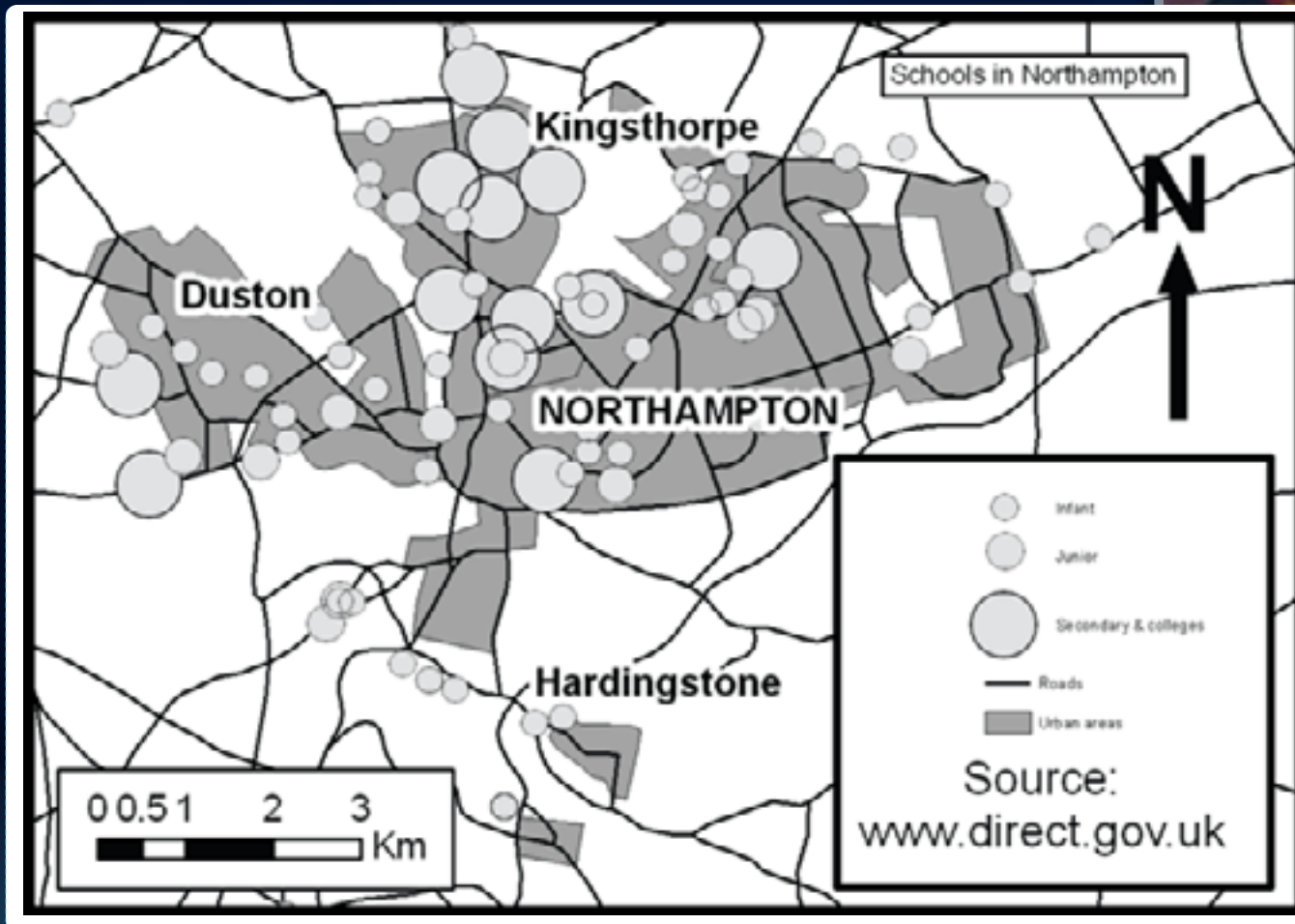
Demo: requirement



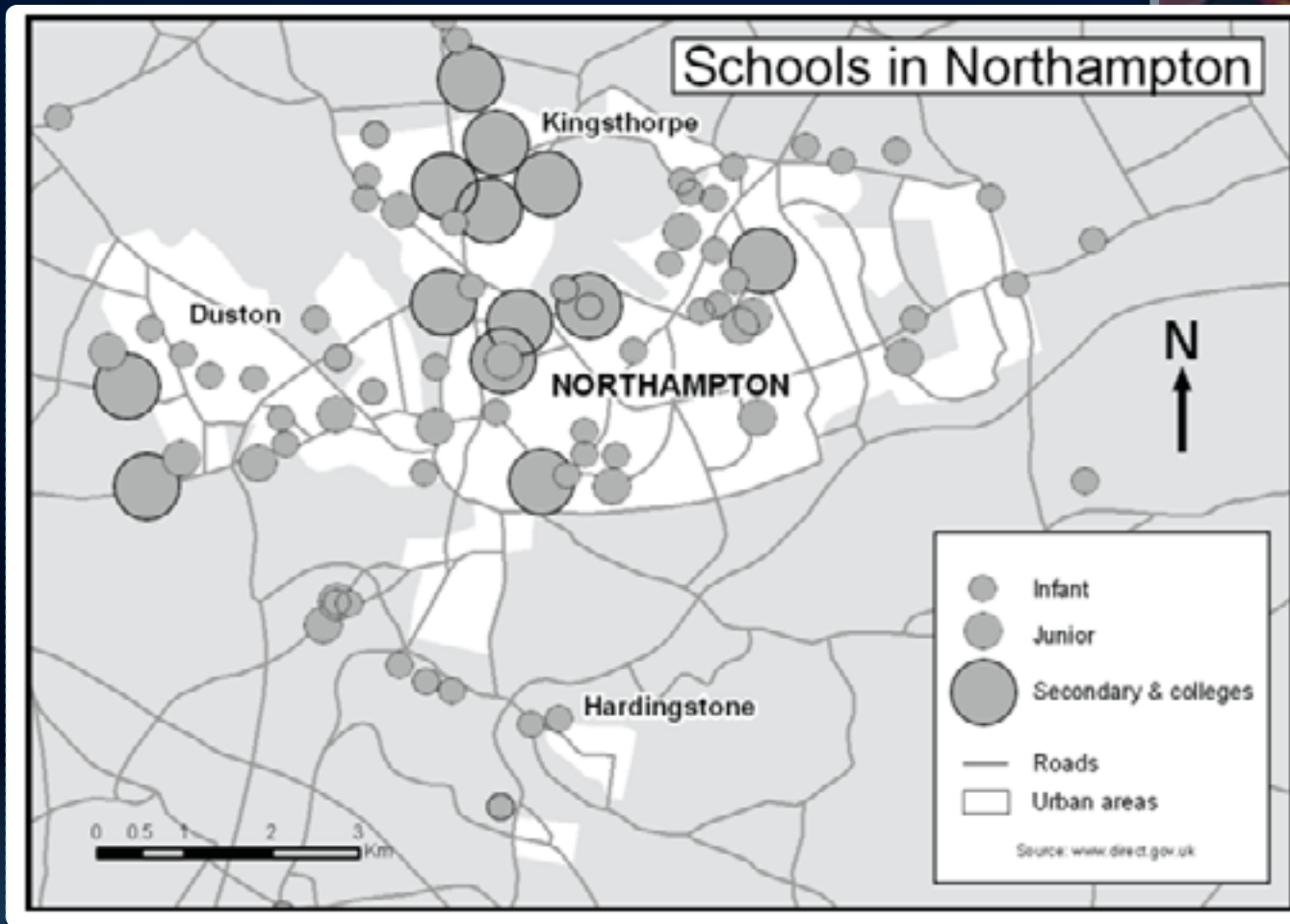
Cartographic design principles



Visual hierarchy



Visual hierarchy



Demo: visual hierarchy



Visual contrast

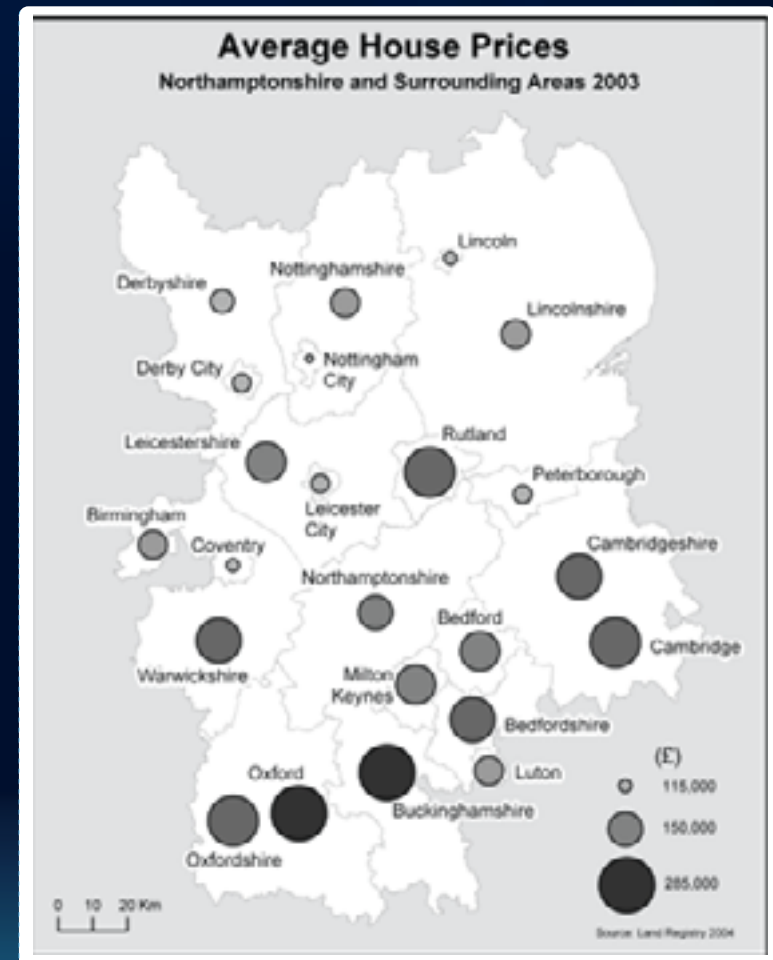
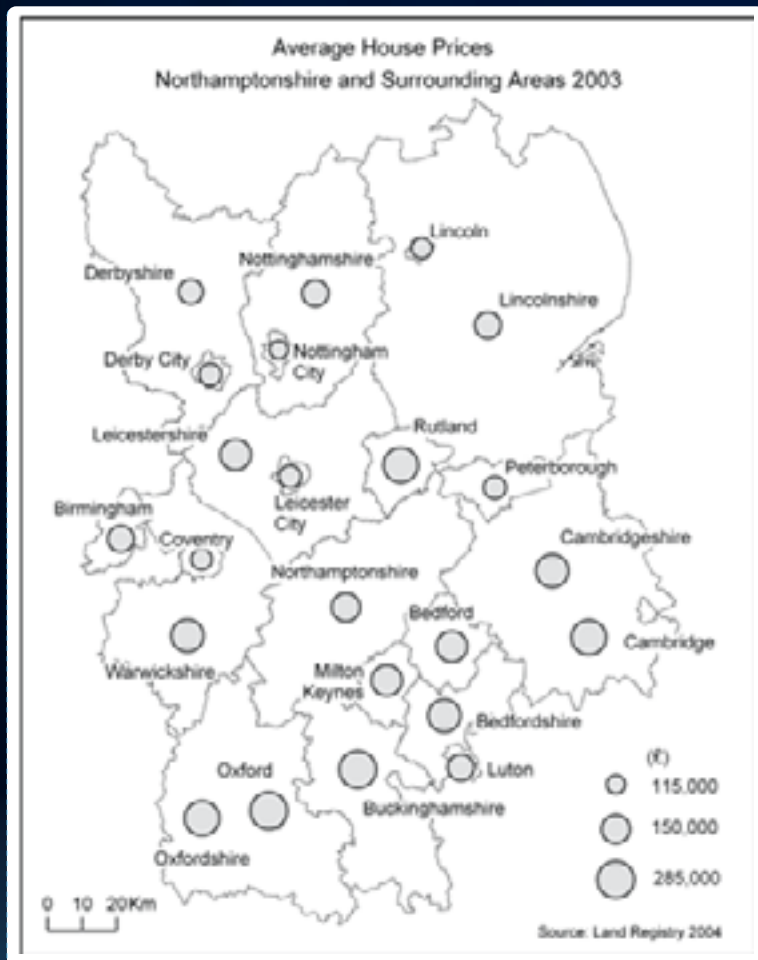
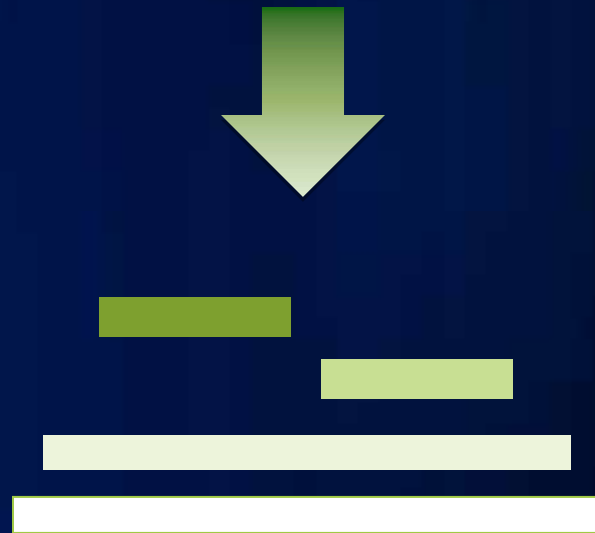


Figure-ground



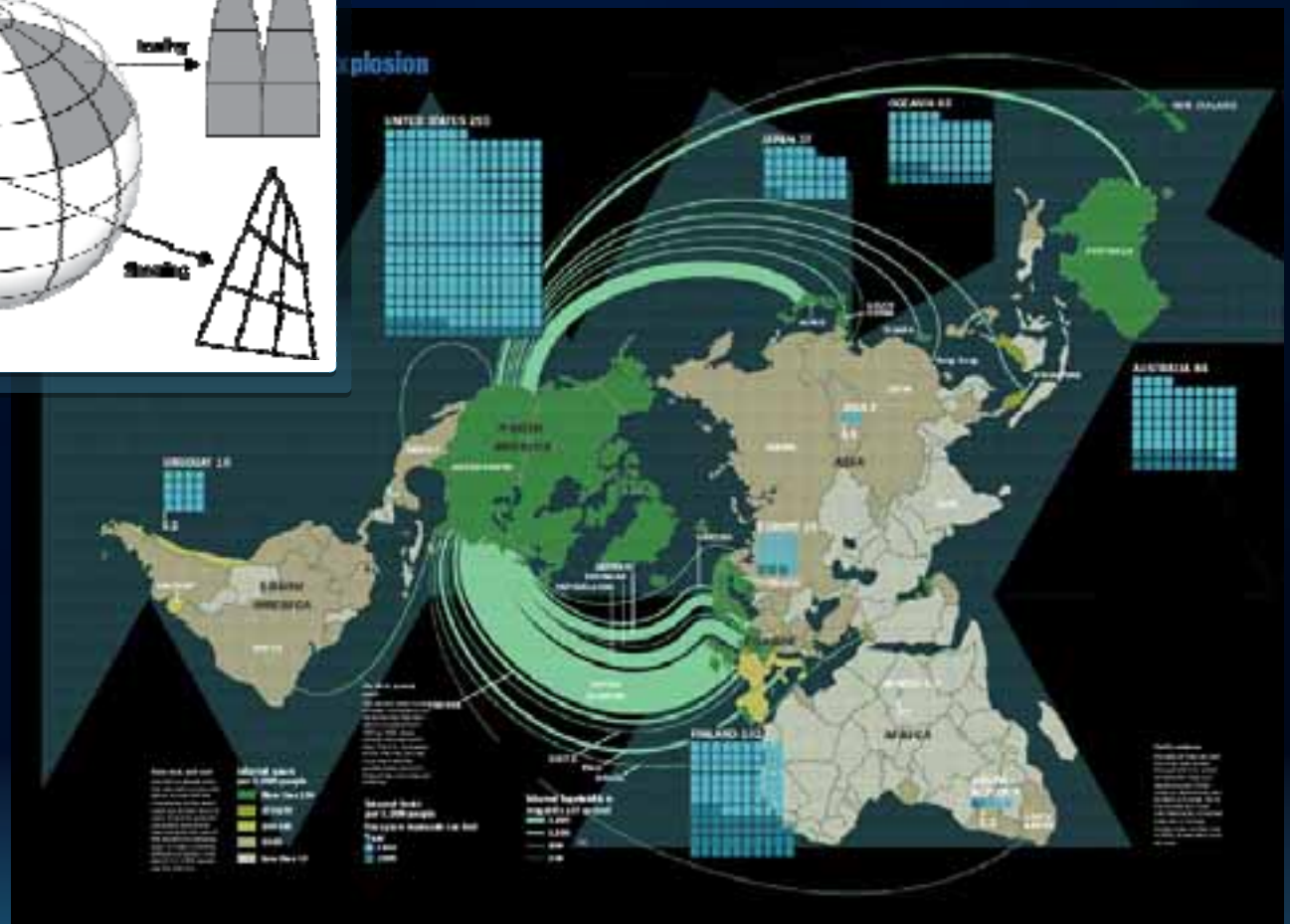
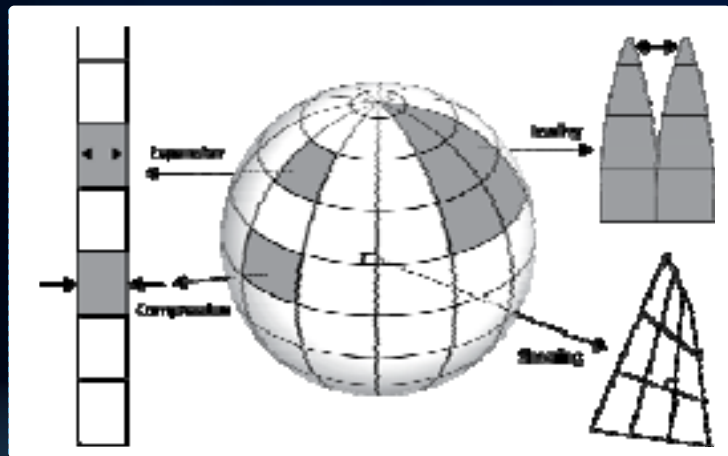
Demo: figure-ground



The devil is in the detail



Projections

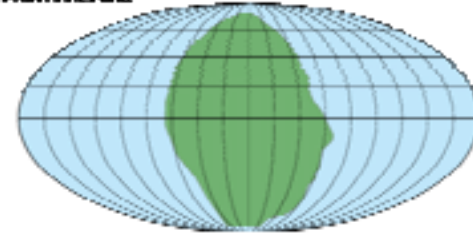


Projections – use your head

Plate Carree



Mollweide

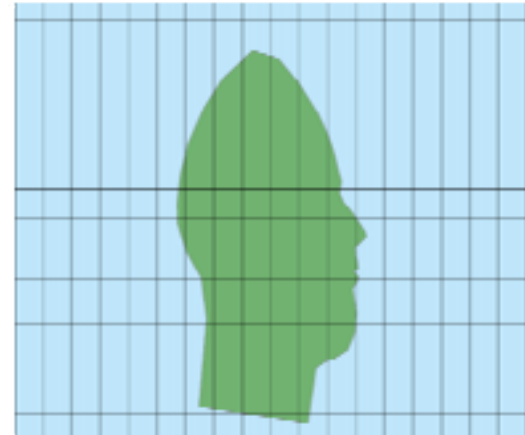


Projections – use your head

Plate Carree



Mercator

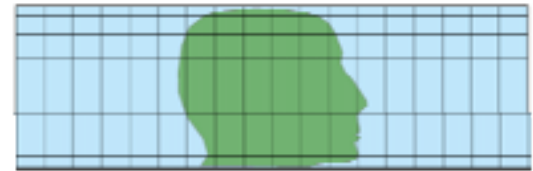


Projections – use your head

Plate Carree



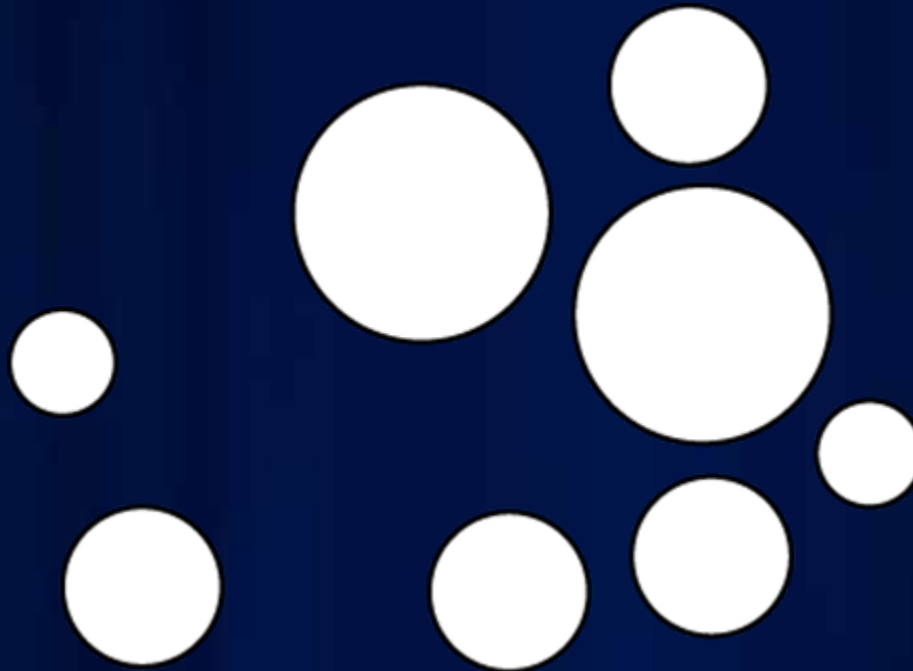
Cylindrical equal area



Demo: projection



Symbols



Symbol palette

spacing



orientation



size



hue



































shape









lightness



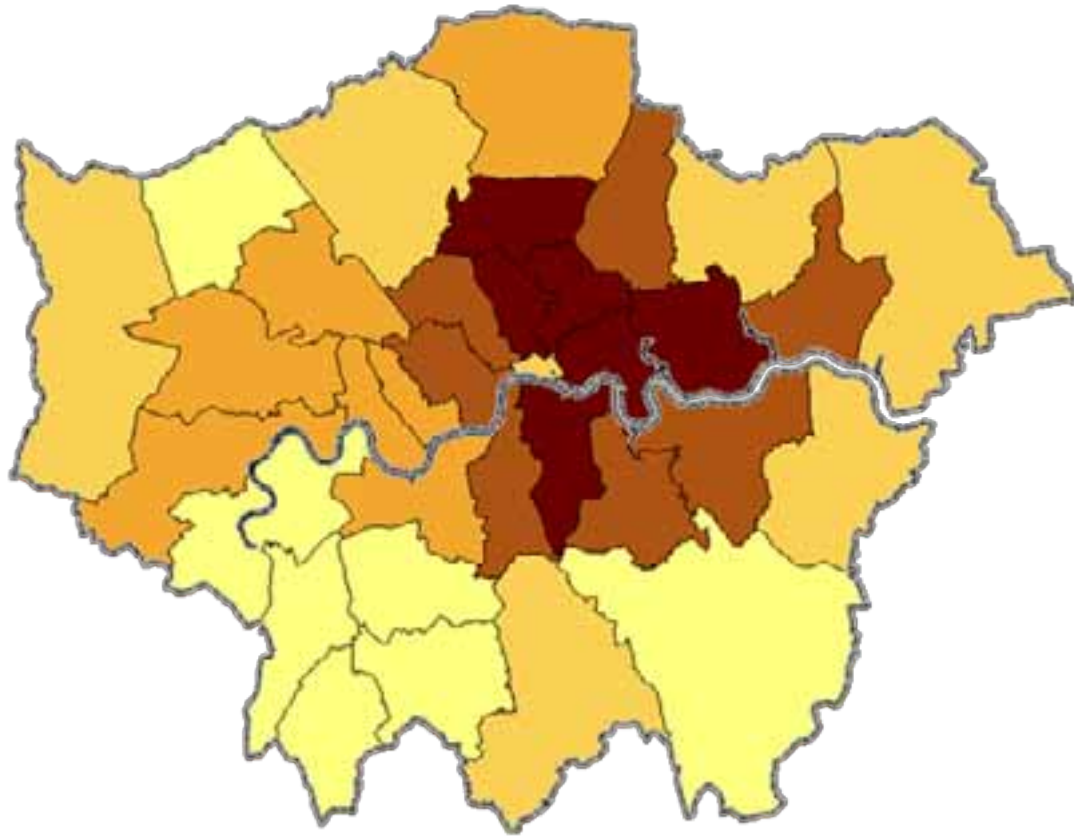
Symbol meaning

| | Points | Lines | Areas |
|-------------------|---|--|--|
| Nominal |  Airport  Emergency Phone  Picnic site |  Motorway  Railway  River  Canal |  Forest  Agricultural |
| Ordinal |  Large  Medium  Small |  Motorway  A road (dual)  A road  B road  Minor |  Large  Medium  Small |
| Interval or Ratio |  500 - 999  100 - 499  0 - 99 |  30 - 39  20 - 29  10 - 19  0 - 9 |  40 - 49  30 - 39  20 - 29  10 - 19  0 - 9 % |

Demo: symbols

| | | | |
|---|------------------------------|---|----------------------|
|  | Lift |  | Warming hut |
|  | Hike to Terrain |  | Emergency telephone |
|  | Easiest Trails |  | Ski Patrol/First Aid |
|  | Intermediate Trails |  | Half pipe |
|  | Intermediate/Advanced Trails |  | Toilets |
|  | Advanced trails/terrain |  | Restaurant |
|  | Expert trails/terrain |  | Information/Tickets |
|  | Terrain Park |  | Resort bus service |
|  | Catwalk |  | Lift access |

Classifying data



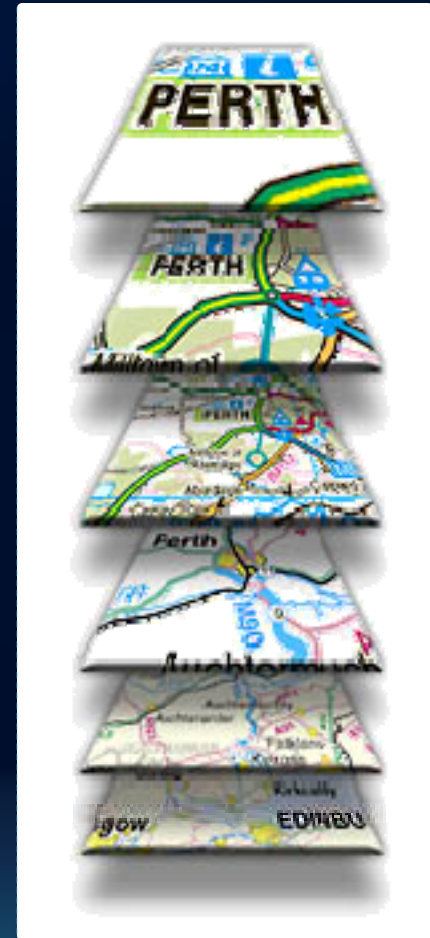
Feature generalization

Processes to transform
feature representation for
different scales

Large scale



Small scale



Feature generalization

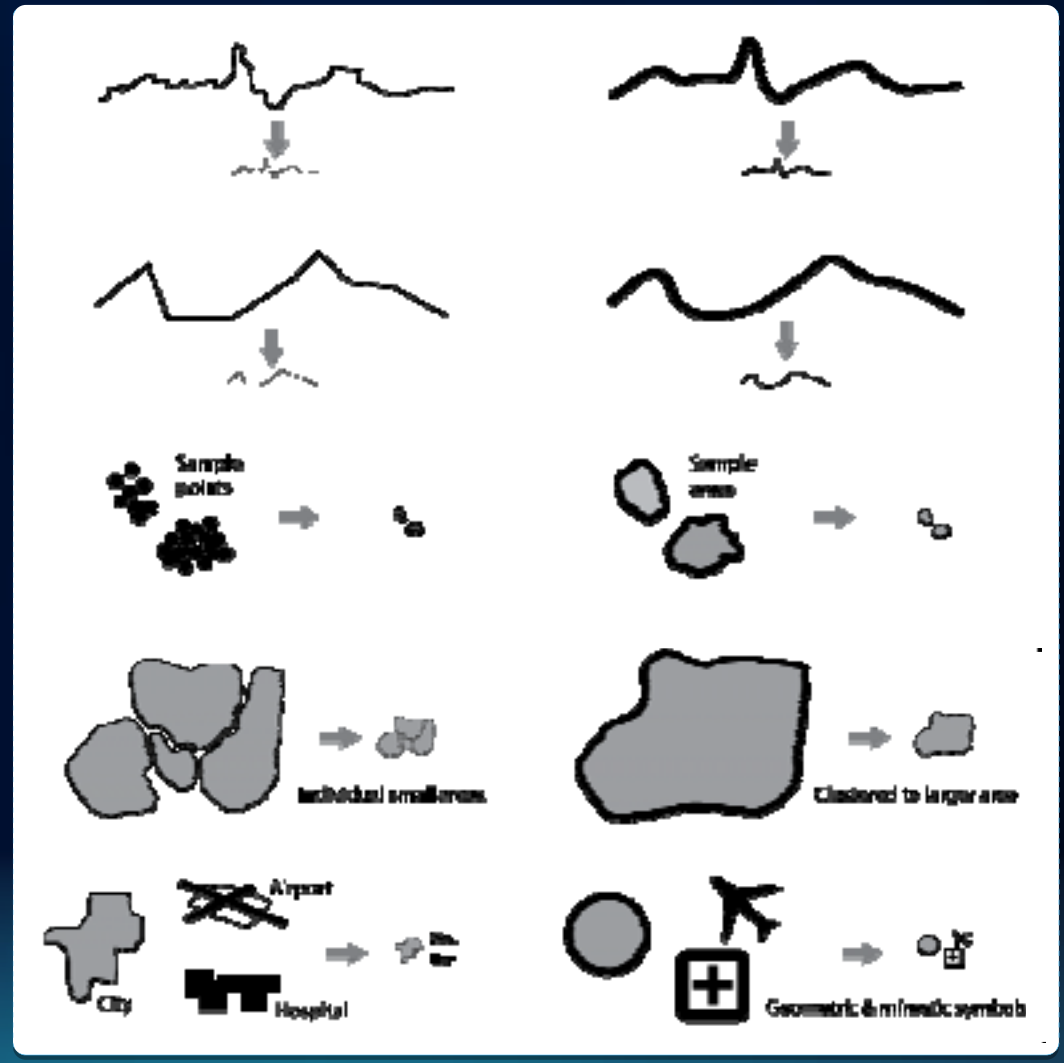
Simplify

Smooth

Aggregate

Amalgamate

Collapse



Feature generalization

Merge



Refine



Exaggerate



Enhance



Displace

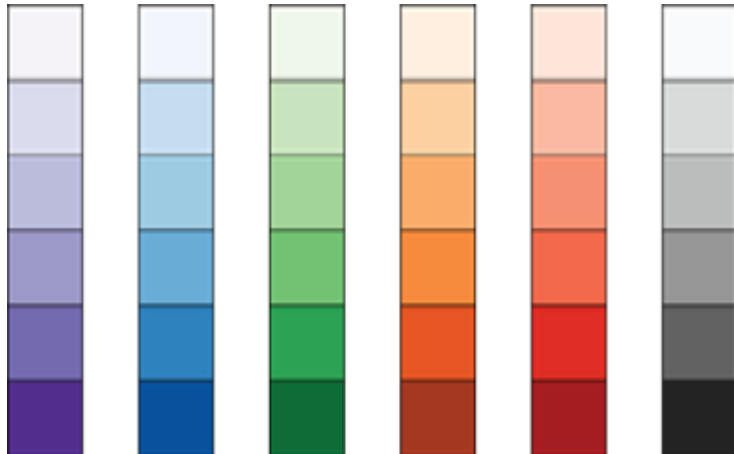


Demo: Feature generalization



Color

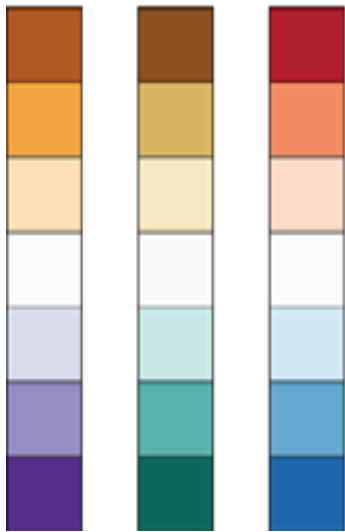
Sequential



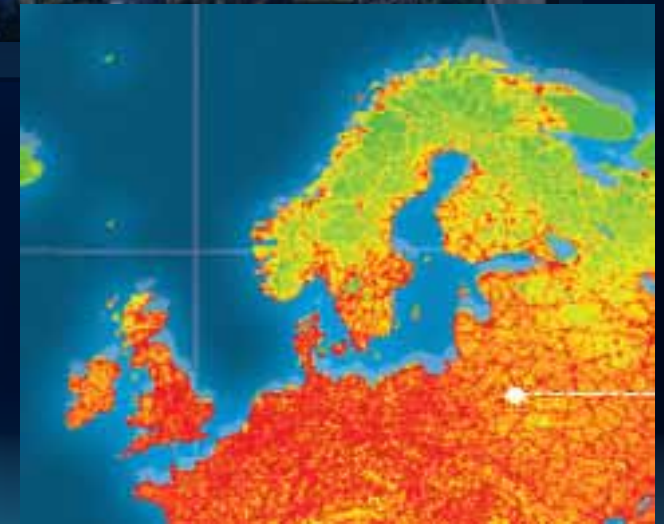
(Example of “Sequential”)

Color

**Diverging
Critical Class**



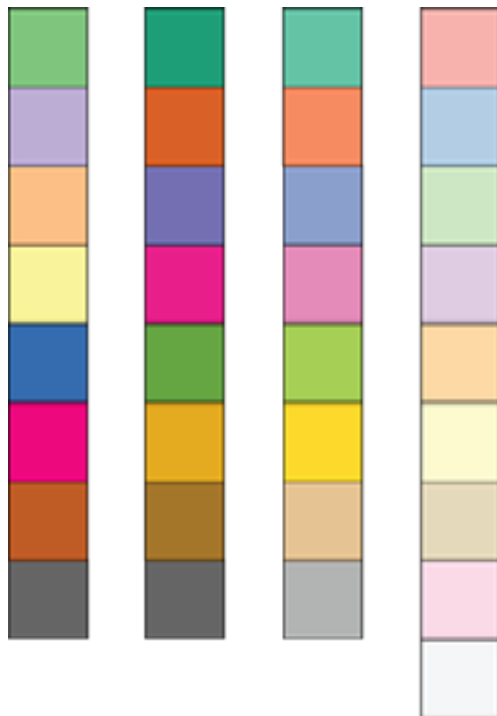
**Diverging
Critical Break**



(Example of “Diverging Critical Class”)

Color

Qualitative

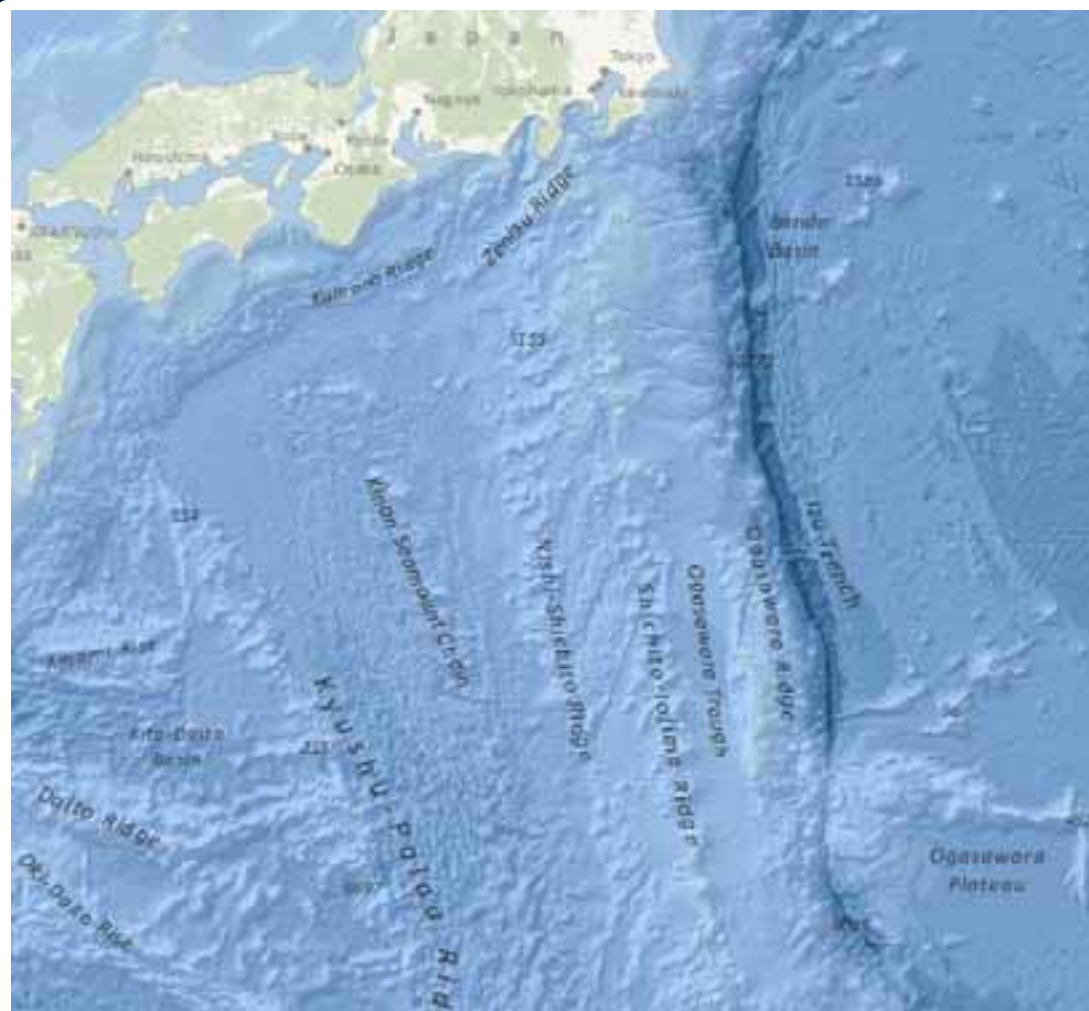


(Example of “Qualitative”)

Shaded relief



Bathymetry



Demo: color



Typography

Purpose



Size

5 point 7 point

10 point 12 point

18 point

24 point

CITIES

Towns
villages

Conflict



Position



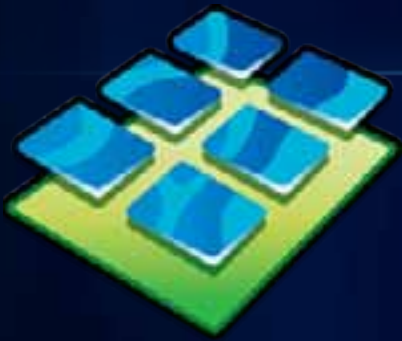
Style

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

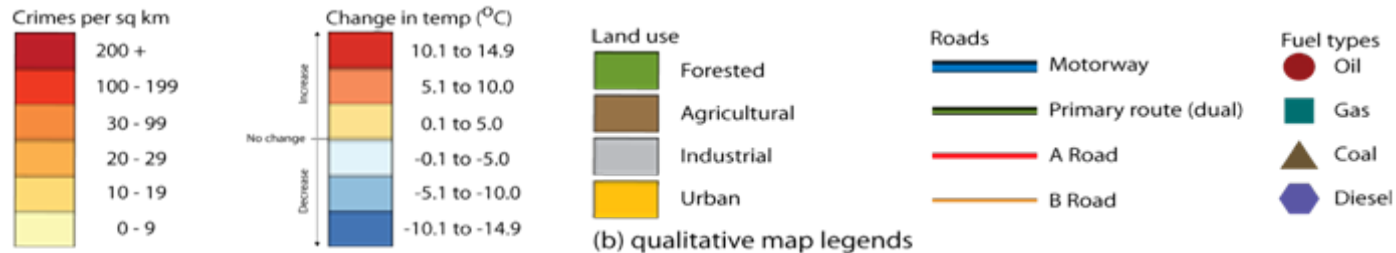


Marginalia: Textual components

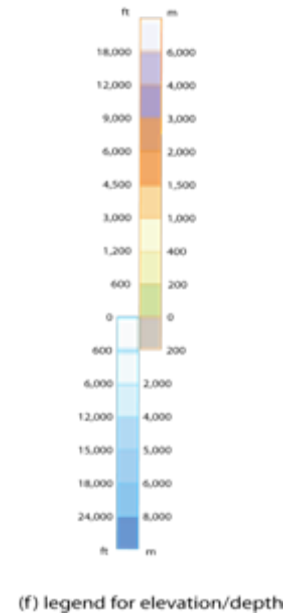
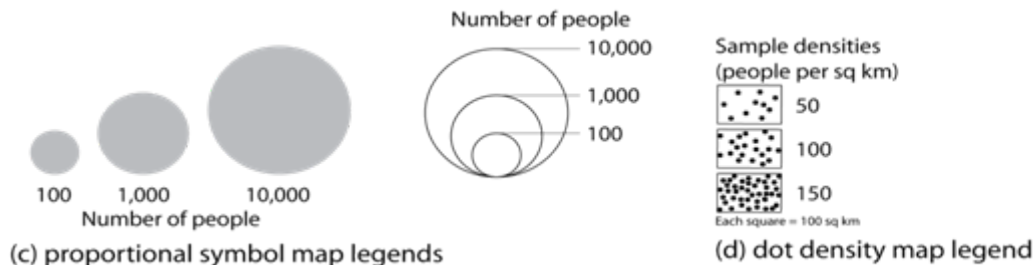
- Title
- Subtitle
- Copyright note
- Source text
- Explanatory text
- Contextual



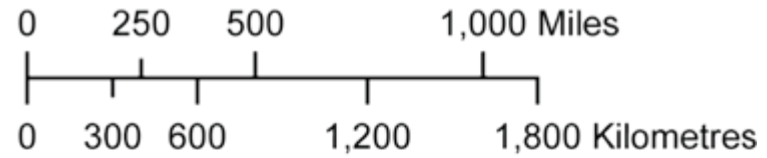
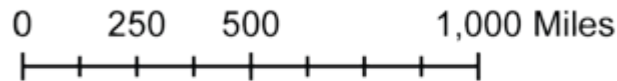
Marginalia: Legends



(a) choropleth/graduated symbol map legends



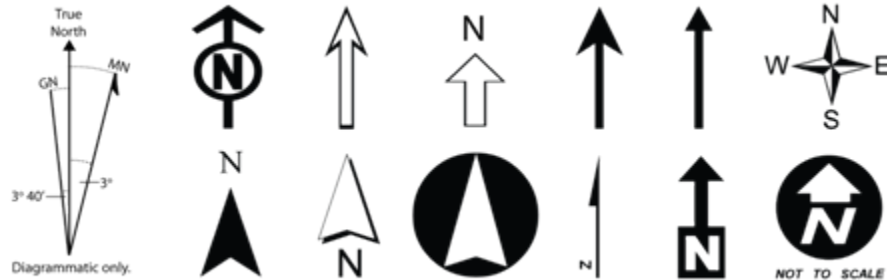
Marginalia: Scale statements



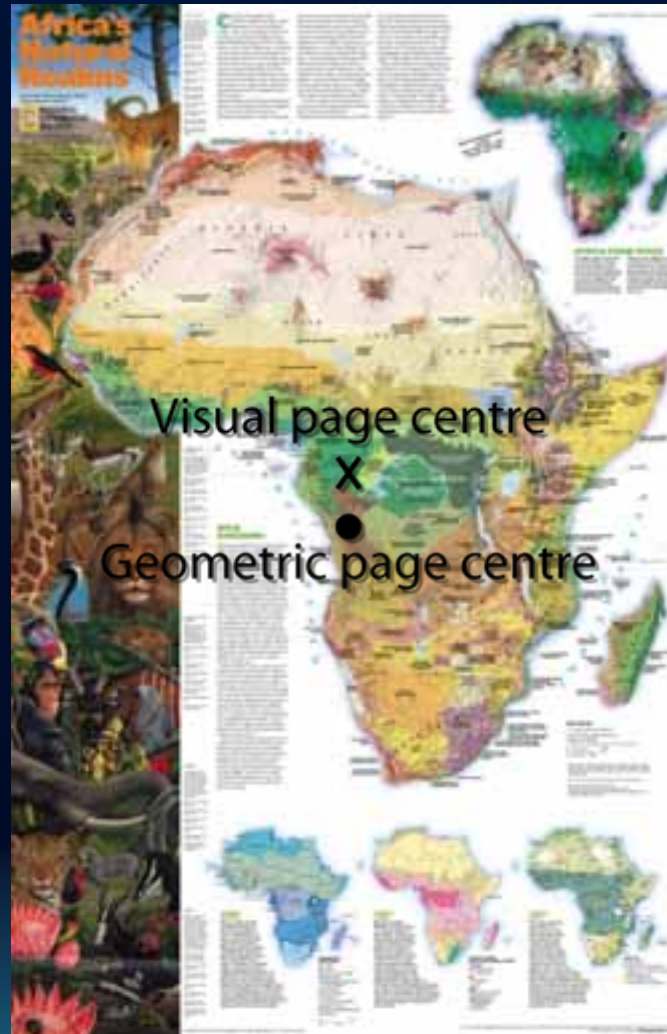
1:35,000,000

1 centimetre equals 350 kilometres

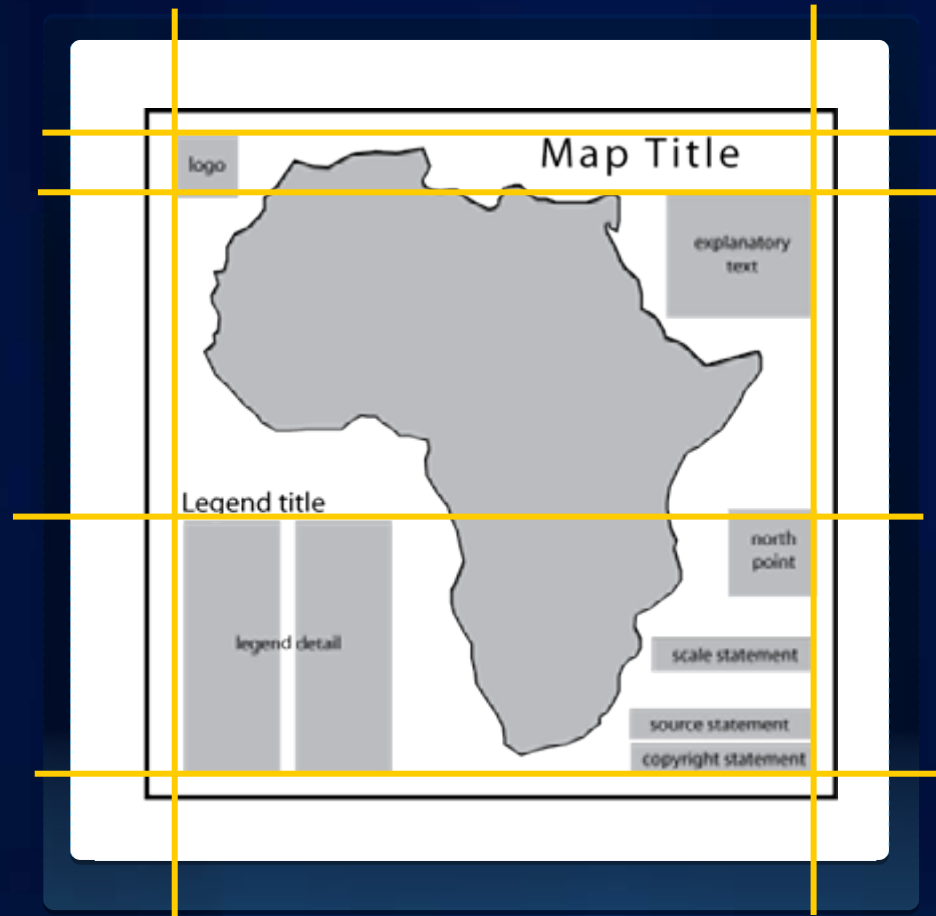
Marginalia: Orientation



Visual balance



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



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@damiendemaj

acarroll@esri.com